

NIST Special Publication SP-1021

**Cook County Administration Building Fire,
69 West Washington, Chicago, Illinois,
October 17, 2003:
Heat Release Rate Experiments and
FDS Simulations**

D. Madrzykowski

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Building and Fire Research Laboratory

July 2004



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Daniel Madrzykowski
William D. Walton
Building and Fire Research Laboratory
National Institute of Standards and Technology

Abstract

On October 17, 2003, in the Cook County Administration Building, 69 West Washington, Chicago, Illinois, a fire resulted in six fatalities and several injuries. In response to a request from the Governor of Illinois, the National Institute of Standards and Technology (NIST) agreed to provide technical assistance to the Governor's review team headed by James Lee Witt. NIST's focus was the simulation of the fire using the Fire Dynamic Simulator (FDS) and visualizations using Smokeview to provide insight into the fire growth and smoke movement.

A team from NIST visited the fire scene to collect data for the model including; building dimensions, floor plan, door and window locations, materials of construction and furnishing, and fuels. In addition, information collected by the Governor's team on fire service operations and building systems was used to develop the fire timeline. The NIST team also documented the fire damage in order to compare fire model predictions with the observed physical damage. Exemplar interior finish materials and furnishings from the fire floor, but undamaged by flames, were obtained for use in laboratory scale heat release rate experiments. Laboratory scale data for rate of heat release was necessary for the fire model input and comparison to fire model results.

This report documents the furnishings, the experiments conducted, and the results of those experiments. This report also explains the development of a computational simulation and the result of those simulations. The NIST simulation started with a small, flaming fire in the storage room and ended with the start of fire suppression activities by the fire department, 16 min 30 s later.

The FDS simulations provide insight into the fire development in Suite 1240. The simulations examine the impact of the spread of smoke into the southeast stairway with and without a functioning smoke exhaust shaft. Another simulation examined the impact of automatic fire suppression sprinklers. The FDS simulation suggested that had automatic sprinklers been present in the storage room where the fire is believed to have originated, they would have controlled the fire and limited the fire spread to the room of fire origin.

Introduction

On October 17, 2003, in the Cook County Administration Building, 69 West Washington, Chicago, Illinois, a fire resulted in the loss of six lives and several injuries. The victims were found in a stairwell, several floors above the fire floor. The Governor of Illinois established a panel, headed by James Lee Witt & Associates (JLWA), to review the fire incident.

In response to a request from Governor Rod Blagojevich of Illinois, the National Institute of Standards and Technology (NIST) agreed to provide technical assistance to the State's review team. The focus of the NIST team was to recreate the fire using the NIST developed Fire Dynamics Simulator (FDS), a physics-based computer model and Smokeview a scientific visualization tool. The model output provided animated visualizations of the fire growth and smoke movement. FDS was also used to estimate the impact a sprinkler system may have had on the fire growth and smoke movement.

A team from NIST made eight visits to the fire building between October 21st and November 19th, 2003. The model input information collected by the NIST team included; measurements and documentation of the areas involved in the fire, the location, size and time of opening of windows and doors, and the fuels (i.e. furnishings, carpeting, wall covering etc.) that were involved in the fire. In addition, information collected by the JLWA team on fire service operations, building systems, etc. was used to develop the fire timeline and input relevant to changes in ventilation. The NIST team also documented the fire damage in order to compare the predicted fire model results with the observed physical damage.

This incident provided an opportunity to examine and test furnishings from other areas of the building that were similar to those destroyed by the fire. The objective of measuring the heat release rate of exemplar furnishings was to develop benchmark data for comparison with FDS results.

This report documents the furnishings tested, and the experiments conducted and discusses the results of those experiments. This report also explains the development of the computational simulations and the result of those simulations. Finally, this report compares the model predictions with the observations from the fire scene.

Fire Incident Summary

This fire incident summary is focused on the fire development timeline, which was compiled from a variety of witness statements, televised news report video, building security video, and the alarm panel log as provided to NIST by JLWA. The fire originated in a storage room, located in the Southwest corner of Suite 1240, on the 12th floor of the Cook County Administration Building, which was located at 69 West Washington, Chicago, Illinois, as shown in Figure 1.

At approximately 17:00 (5 pm), on October 17, 2003, an occupant of Suite 1240 smelled smoke, alerted the other occupants in the suite and began to evacuate the suite. Another occupant of Suite 1240 went to investigate and found a small fire on the top of a set of wall shelves in the storage room, under a ceiling mounted light fixture. At 17:00:16, the security videos show the officers on duty at the front desk reacting to a signal from the fire alarm panel. The remaining occupants left the suite, after notifying security via telephone. As documented in the security video, one of the security officers is seen answering the phone at 17:01:45.

A security officer placed a call to “911” and the time of the call was logged in by the Chicago Fire Department (CFD) at 17:02:29. The fire department was dispatched at 17:03:30. At 17:03:50, one of the security officers returned to the console desk after being outside the building. He reported that he noticed heavy smoke billowing from the Dearborn Street side of the building. Some of the occupants from Suite 1240 had regrouped in the lobby and exited the building at 17:05:25. Someone from outside of the building warned them of falling glass as they exited. Witnesses on the street indicated that smoke and flames were coming from the 12th floor before the fire department arrived at the building. The first fire engine arrived at approximately 17:06:30.

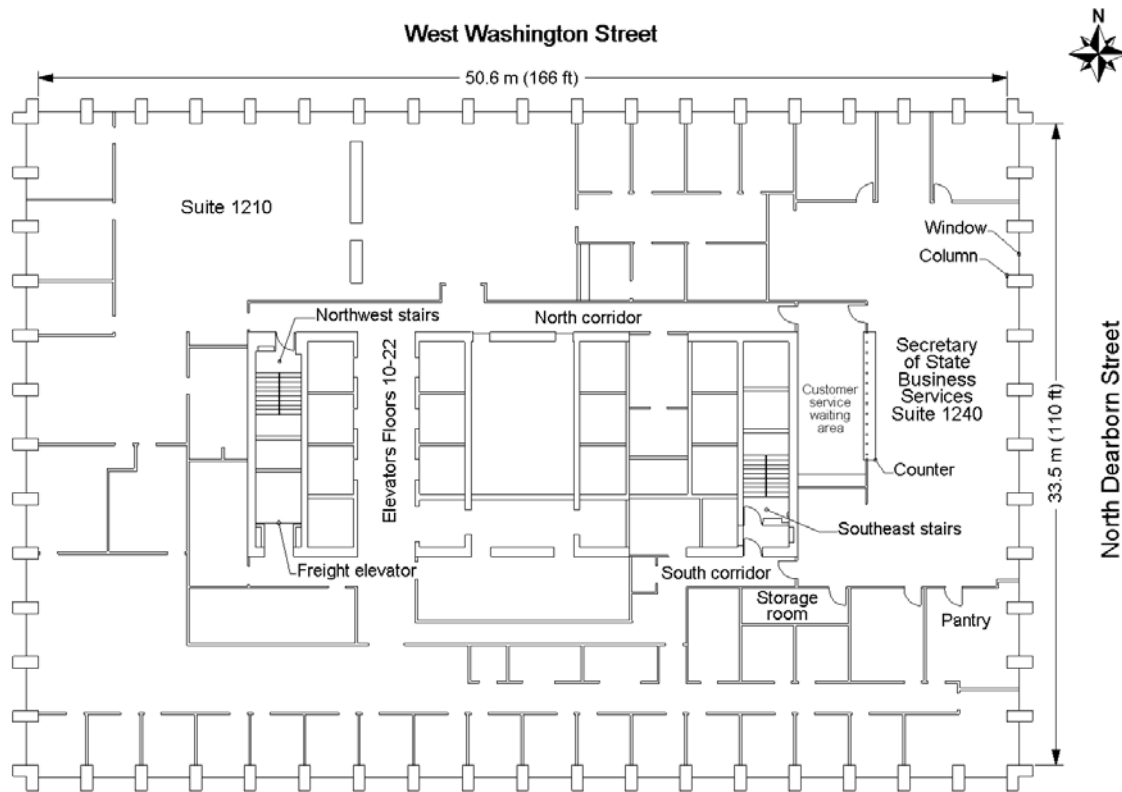


Figure 1. Plan view of the 12th floor of the Cook County Administration Building

The fire continued to grow and spread across Suite 1240 to the north. The fire department entered the building and used the southeast stairwell to reach the 12th floor.

One of the CFD chiefs reported heavy smoke and glass falling from the upper floors on the north side of the building, at approximately 17:12:00. The first fire department crew was approaching the fire floor at this time. At 17:16:04, the alarm panel log records the start of the building’s fire pump and this is consistent with the time estimate provided by the CFD for the start of fire suppression activity. The interior fire suppression team was unable to advance safely out of the southeast stairwell and retreated back into the stairwell. An exterior fire attack was started at approximately 17:52. The fire was reported as “knocked down” at 18:07:45.

The scope of the NIST study started with a small, flaming fire in the storage room and ended 16 min and 30 s later with the start of fire suppression activities by the Chicago Fire Department.

Table 1. Estimated Timeline of Fire Development

Time (hr:min:s)	Event
17:00	Small fire discovered in storage room of Suite 1240
17:03:50	Smoke visible outside of building
17:06:30	Windows on east side of the building have started breaking prior to this time. Fire department on scene
17:12	Windows on north side of the building are breaking
17:16	Fire Suppression efforts begin
17:52	Exterior fire suppression efforts begin
18:08	Report that fire is “knocked-down”

Post-Fire Scene

The Cook County Administration Building is 37 stories tall with one level below grade. The building is constructed with reinforced cast-in-place concrete and has concrete and glass panel exterior walls. More details of the building construction are provided in the modeling section of this report.

Compartmentalization contained the fire damage to a single office suite (Figure 2). Closed solid core doors and 16 mm (0.625 in) gypsum board partition walls limited the fire damage in rooms, on both the north end and south end of Suite 1240. However, the partition walls did not extend above the drop ceiling. The lack of partitions above the drop ceiling allowed for the rapid spread of smoke and fire gases throughout the 12th floor and then throughout the building, through penetrations, HVAC ducts, and open doors. The gross area of the 12th floor is approximately 1695 m² (18260 ft²), based on the overall dimensions of the floor that included the building core. The areas of Suite 1240 that were most heavily damaged by the fire were the open plan office area and the storage room. This area was approximately 243 m² (2620 ft²) or about 14 % of the total floor area.

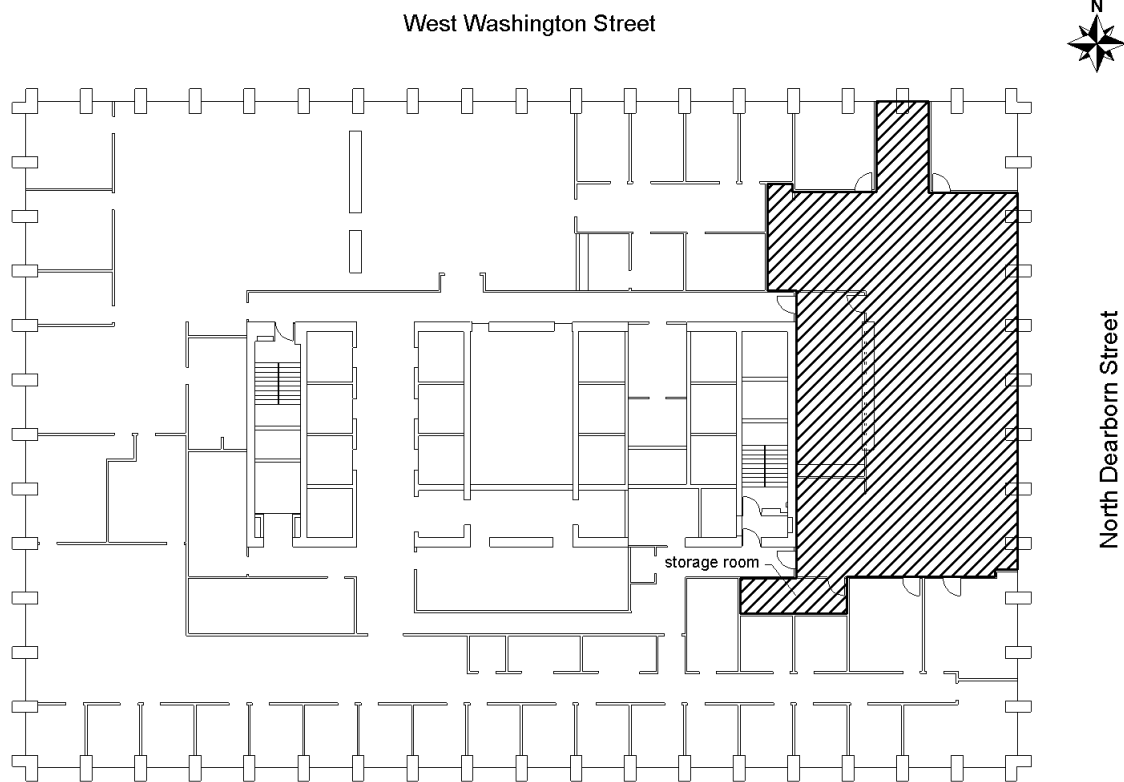


Figure 2. Plan view of 12th floor, showing area of significant fire damage

Building Exterior

While soot and fire gases were dispersed throughout the 12th floor and other locations in the building, the majority of the thermal damage from the fire occurred in Suite 1240. On the exterior of the building, soot “stains” or deposits mark those windows that were broken out by fire (Figures 3-5). Eight windows were broken on the east side (North Dearborn St.) of the building. Two windows were broken during the fire on the north side of the building (West Washington Street).

The fire did not extend to other floors of the building. The windows without soot staining on the 12th floor and on the floors below and above were removed by the fire department to vent additional smoke and heat from the building. The eight windows on the east side of the 12th floor that were broken by the fire were located in the “open office” portion of Suite 1240 (Figure 4). The three windows on the southern end of the east face of the 12th and the single window on the north end of the east face were not broken by the fire. These windows are located in rooms that were separated from the “open office” portion of the suite by closed solid core doors and gypsum board partition walls.



Figure 3. The northeast corner of the Cook County Administration Building, 12 days after the fire



Figure 4. View of east side of the Cook County Administration Building



Figure 5. View of north side of the Cook County Administration Building

On the north side of the building, two “half windows” were broken out by the fire, Figure 5. Again these windows were adjacent to the open office portion of Suite 1240. The window and half sections east and west of the windows that were boarded up with plywood, were in offices that were separated from the “open office” portion of the suite by closed solid-core doors and gypsum board partition walls.

12th Floor

Figure 6 focuses on Suite 1240 and shows the entry doors from the north and south corridors. The storage room was reported to be the area of fire origin. A portion of the storage room extended westward, parallel to the south corridor, and directly across from the southeast stairway. The area with the workstations will be referred to as the “open plan” office area.

Smoke and soot residue were observed throughout the 12th floor. The walls of the north and south corridors and the elevator lobby were stained with smoke residue. The two entry doors to Suite 1240, one in the north corridor and one in the south corridor, are shown in Figures 7 and 8. Thermal damage to the wall covering material can be seen just below the level of the suspended ceiling. The thermal damage on the wall covering is limited to within 3.6 m (12 ft) of the suite entry doors.

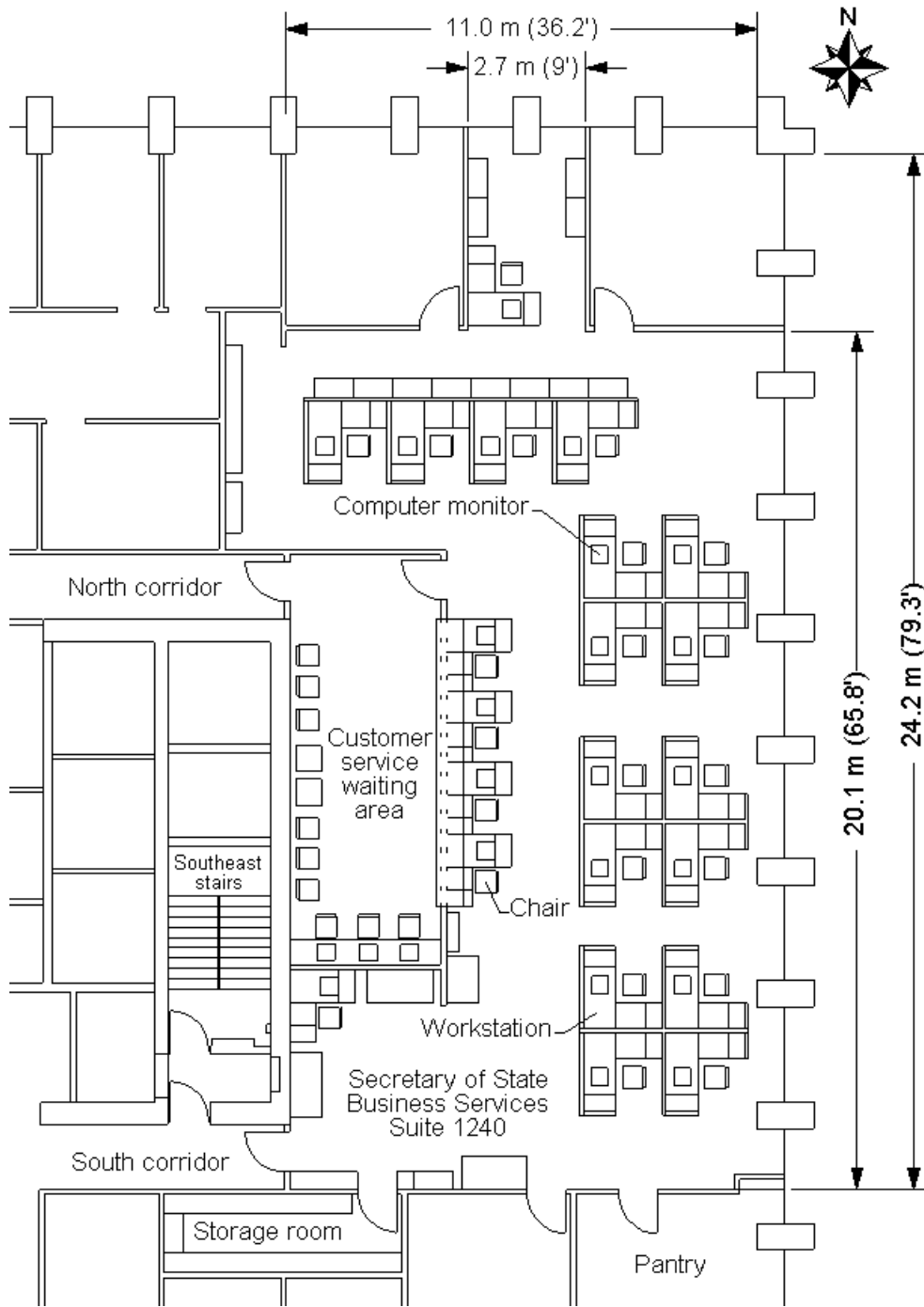


Figure 6. Plan view of Suite 1240 depicting furniture arrangement



Figure 7. North corridor looking east to Suite 1240, main entry door



Figure 8. South Corridor looking east toward Suite 1240 doorway. The area of fire origin, the storage room, is on the right

As shown in Figure 8, the partition walls did not extend from the concrete floor slab to the concrete ceiling. The partition walls went only as high as the suspended ceiling, which was 2.7 m (8.7 ft) above the floor. As a result the combustion products and hot gases from the fire were able to move freely above the partition walls and spread throughout the 12th floor. This helped distribute the high temperature gases to areas outside of Suite 1240. In the corridors most of the wall covering was not burned and other than being dirty, the carpeting in the corridors was intact. The same was true for offices adjacent to the fire area, where thermal damage was very limited.

According to the witnesses, the fire started in a storage room that was located in the southwest portion of Suite 1240. The storage room was approximately 1.8 m (6 ft) wide and 5.6 m (18.3 ft) long with a ceiling height of 2.7 m (8.7 ft). Shelves were located on the south wall of the storage room and were loaded principally with paper, forms, brochures and boxes of envelopes. The shelves were approximately 2.4 m (8 ft) high. Boxes of copier paper were stacked along the west wall and north wall of the storage room. In addition, supplies such as paper towels, foam plastic cups, toner cartridges, computers, and holiday decorations were also stored in the room. Figures 9 and 10 show several of the shelf units with their remaining contents. The door from the “open office” area to the storage room was open at the time of the fire.

Figure 11 shows the area just outside the storage room with the doorway that led to the south corridor to the right of the photograph. Between the doorways of the storage room and the south corridor, were stacks of cardboard boxes filled with envelopes. Based on the height of the drywall that had been protected in the corner, 2 m (6.6 ft), the boxes were stacked 8 high. Shorter stacks of similar boxes of envelopes were found on the east side of the door way to the storage room and on the north side of the doorway to the south corridor. That was the area of Suite 1240 that was closest to the southeast stairway.



Figure 9. Looking south through the storage room doorway, east end of shelf units



Figure 10. Looking south in storage room, from south corridor (corridor wall removed), west end of shelf units



Figure 11. Looking towards the storage room from the open plan office area of Suite 1240

Open Office Area

The next series of photographs, Figures 12 – 23, show a 360 degree sweep of the open plan office area of Suite 1240. The photographs begin with the northwest corner and continue around in a clockwise direction.

While thermal damage was significant throughout the area, the furnishings near the open windows on the east side were burned more completely than the areas on the west side of the suite, away from the windows. Steel components make up the majority of the remains of the 12 workstations that were located near the windows on the east side. The workstations on the north side had the most damage toward the east. Towards the west, the fire damage decreased. The western most workstation had fabric, fiberglass and hardboard remaining on several of the panels. In addition, a significant amount of the work surface remained (see Figures 12 and 13).

Temperatures in the northwest office were high enough to soften and distort the plastic in a small TV set, a computer monitor and a printer (see Figure 24). In the northeast corner office, temperatures were higher than those in the northwest office space. In addition to melted plastics, portions of the fabric and foam on chairs in the office had pyrolyzed (see Figure 25). Some of the paper on the gypsum board inside the northeast office had burned.



Figure 12. Northwest portion of Suite 1240



Figure 13. Northwest corner of Suite 1240



Figure 14. North windows



Figure 15. Northeast corner of Suite 1240

The photographs in Figures 16 through 19 cover the east area of the open office portion of Suite 1240. In this area, 12 workstations were located near the windows and four other workstations were next to a customer service counter that separated the work area from the waiting room. Most of the combustible materials that were exposed to the fire, were completely consumed or burned away. The steel frames of the workstation panels and the steel frames of the chairs made up most of the debris in the open office area. The steel filing cabinets were intact, although some of the contents of the steel drawers had been burned. The concrete ceiling above the workstations was free from soot and very white in color. This would be consistent with the fire heating the concrete to a point that the soot would be burned completely off the ceiling.

Figure 20 shows the counter area in the foreground. The background toward the right hand side of the photograph is the storage room. The photographs in Figures 21 and 22 show the waiting room area. This room had 10 sled base chairs and a small work area on the south end and two small cabinets (end tables) positioned against the west wall. The west wall of the waiting room was part of the building core. It was a concrete wall that extended from floor slab to ceiling slab. Figure 23 shows the main entry area into Suite 1240 from the north corridor. A portion of the white door frame can be seen in the right of the photo. The main entry door had a large center glass panel surrounded by a solid core wood frame.



Figure 16. East northeast section of the open office portion of Suite 1240



Figure 17. Looking due east, remains of a set of four workstations

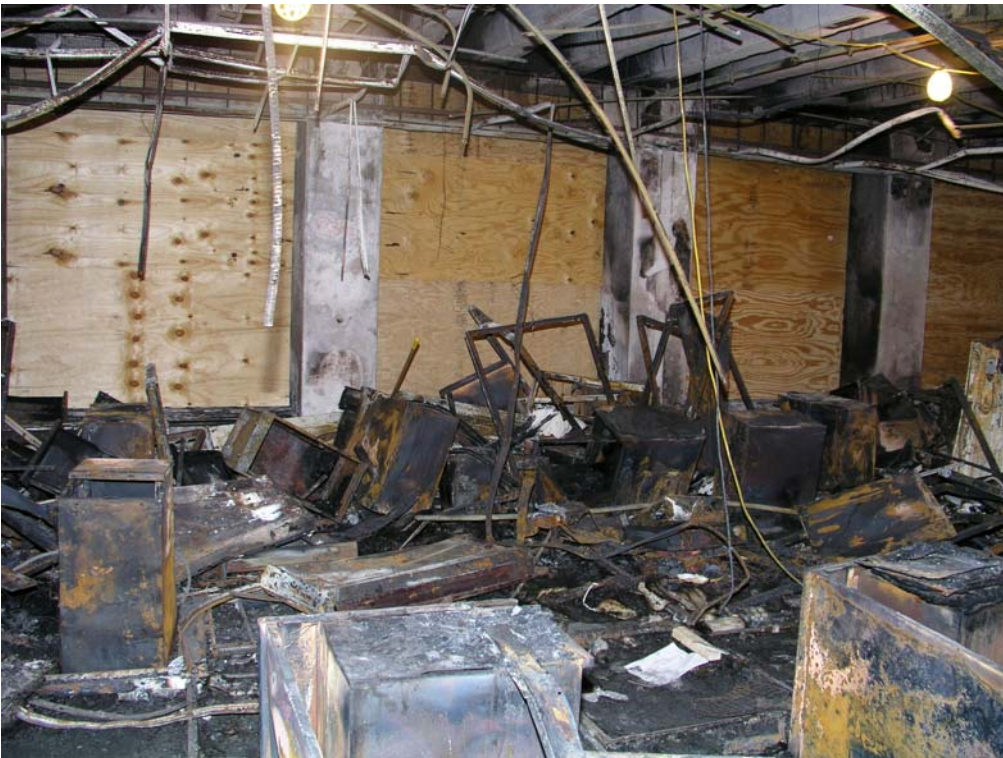


Figure 18. Looking toward the southeast portion of the open office area of Suite 1240



Figure 19. Looking toward the southeast corner of the Suite 1240



Figure 20. Looking south toward the storage room



Figure 21. Looking south through the waiting area into the storage room



Figure 22. West wall of waiting area



Figure 23. Main entry door from north corridor



Figure 24. Northwest office in Suite 1240



Figure 25. Northeast office in Suite 1240

Materials Collected

The 12th floor of the Cook County Administration Building had been recently renovated. The interior finish including carpeting, ceiling tiles, wall covering, and window blinds used in Suite 1240 and an adjoining office, Suite 1210, were similar. Figure 1 shows the locations of Suite 1210 and Suite 1240. The furnishings installed in the two suites were also similar. The furniture plan is shown in Figure 6. Both areas had similar office chairs, guest chairs, workstations constructed with similar materials, computers, wastebaskets and recycling bins, paper etc. Figure 26 is a photograph of the northeast portion of the open office area of Suite 1210. Sample interior finish materials and furnishings from Suite 1210 were transported to NIST for examination and testing to gain insight into the “fireload” in Suite 1240. The workstations, which were dismantled and transported to NIST for testing, are shown in the background. Figures 27 and 28 show single workstations to provide an idea of the contents of the workstations. Figure 28 was taken after the computers had been removed. The white strips on the workstation to the right were vinyl blinds that had been removed from the window.

Table 2 provides a list of the items collected from Suite 1210 on the 12th floor of the Cook County Administration Building. The items collected from Suite 1210 had no visible signs of thermal damage, only damage due to soot deposition on the surfaces. Since the interior walls of the Suite 1210 had been partially removed due to water

damage (see background of Figure 28), the wall covering material was removed from the 12th floor, south corridor, opposite the elevator machine room.



Figure 26. Northwest portion of Suite 1210

In addition to the items collected, the office suite where the fire occurred had a variety of office machines such as printers, typewriters and a copying machine. The office also had a significant amount of paper, in the form of files, forms, boxed envelopes, and boxed copying paper. In the suite where the fire occurred, 16 workstations with computers and office chairs burned. In addition, several other work areas, within the same suite, composed of desks, tables, computers and chairs were also destroyed. Ten sled base chairs with two small cabinets burned in the waiting area of suite 1240. Based on the furniture plan, there were 22 office chairs in Suite 1240, 10 sled base chairs and 16 workstations.



Figure 27. Workstation in Suite 1210



Figure 28. Office workstation in Suite 1210

Table 2. Furnishings and Interior Finish Items Collected from 69 West Washington Street, Chicago, Illinois

Item	Location	Quantity
Upholstered office chair	Suite 1210	6
Sled base guest chair	Suite 1210	6
General office workstations	Suite 1210	5
Ceiling tiles	Suite 1210	60
Light fixtures	12 th floor	2
Wall covering	12 th floor, South corridor room	Approx. opposite elevator machine room, 15.2 m ² (164 ft ²)
Carpeting	Suite 1210	Approx. 24.5 m ² (264 ft ²)
Vertical blinds	Suite 1210	2 pair
Desktop from workstation	Suite 1210	1
Side panels from workstation	Suite 1210	1
Extra slats from vertical blinds	Suite 1210	3
Wastebaskets - recycling bins	Suite 1210	5
Plastic "letter" trays	Suite 1210	20
Computer monitors	Suite 1210	3

Description of Furnishings

The heat release rate of a burning material is dependent on many conditions. These include, but may not be limited to; geometry of the material, location and orientation of the material in the room, adjacent fuels, ventilation, view angles and material properties. Therefore, it is valuable to identify the materials that the furnishings are composed of. In some cases the furnishings had manufacturer serial numbers. In those cases, the materials were identified based on catalog information. Some materials had labels or recycling code markings. Other materials had no identifying marks. In those cases, the materials were identified either by a simple burning characteristics test for textiles [1] or a series of tests for common plastics [2] as outlined in the NFPA Fire Protection Handbook.

Carpeting

The carpeting style was level loop with a total thickness of about 4 mm (0.16 in). The pile fiber of the carpet was nylon with a synthetic backing. The carpet did not have padding and was adhered directly to the concrete floor. The mass per unit area of the carpeting was 2.44 kg/m² (0.5 lb/ft²).



Figure 29. Photograph of carpet sample cut for testing in the cone calorimeter

Ceiling Tiles

The ceiling tiles were each 0.6 m (1.96 ft) by 0.6 m (1.96 ft) and 19 mm (0.75 in) thick. The exposed surface that faced down (side visible from office when installed) had a textured finish and was white in color. The top side was covered with an aluminized facing material. Each ceiling tile had a mass of approximately 2.6 kg (5.8 lb). The ceiling tiles had a Class A rating based on performance in the ASTM E 84 fire test with a flame spread of 25 and a smoke development number of 15 [3].



Figure 30. Photograph of a piece of ceiling tile, shown with finished surface facing up

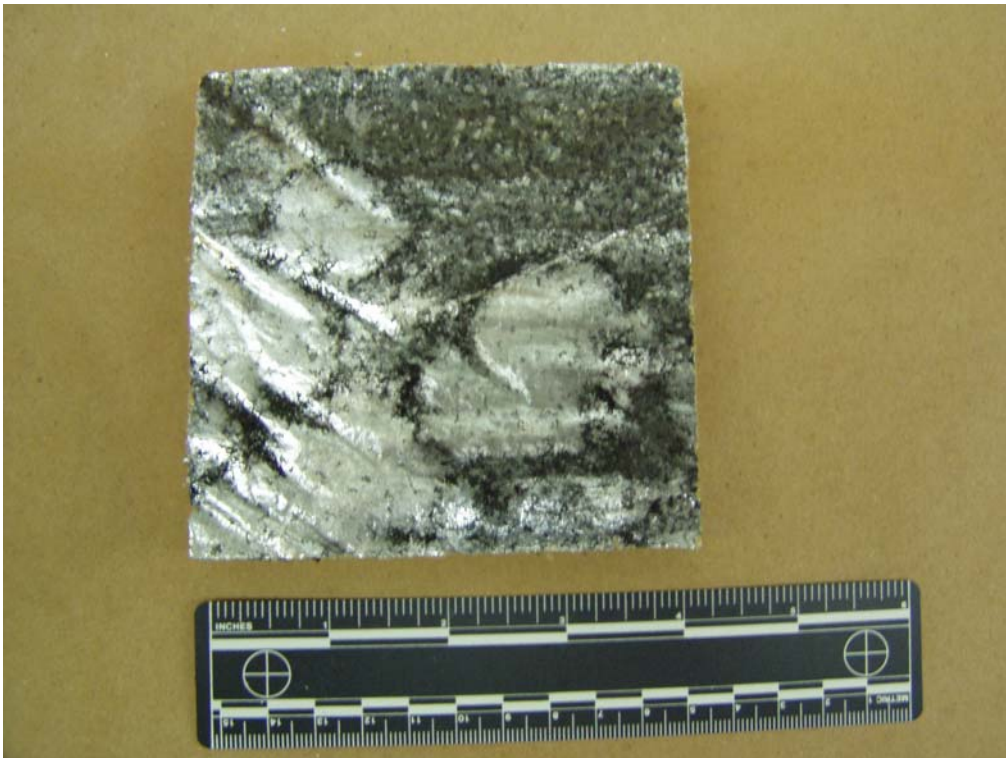


Figure 31. Photograph of a piece of ceiling tile, foil side facing up

Chairs

The two different chairs, the sled base chair and the office chair, had similar upholstered cushion construction. The cushions had a 16 mm (5/8 in) thick plywood base that was covered with polyurethane foam. The foam was covered with 100 % polyester fabric. Figures 32 and 33 show the components of a seat cushion and a back cushion respectively. In Figure 32 the seat cushion components are, beginning from the bottom up, cardboard, plywood, polyurethane foam, polyester fabric. In Figure 33, the back support cushion component layers are, starting at the bottom, polyester fabric, polyurethane foam, plywood, polyurethane foam, and polyester fabric.

Both chairs had labels that read in part “THIS ARTICLE MEETS ALL OF THE FLAMMABILITY REQUIREMENTS OF CALIFORNIA BUREAU OF HOME FURNISHINGS BULLETINS 116 and 117”. Technical bulletin 116 describes the requirements, test procedure and apparatus for testing the flame retardance of upholstered furniture. In the test procedure, each article is basically exposed to burning cigarettes. If the article begins to flame or if char develops more than 51 mm (2 in) in any direction from the cigarette the item does not meet the requirements [4].

Bulletin 117 describes the requirements, test procedure and apparatus for testing the flame retardance of resilient filling materials used in upholstered furniture. In this case, the material is exposed to a flame. In order to meet the requirements of Bulletin 117, the performance must fall within the limits of char length, after flame and afterglow times [5].

The main differences in the chairs were the shape of the steel support structure and the added plastic covering over the pedestal base and the plastic wheels on the office task chair. Photographs of both chairs are shown in Figures 34 and 35

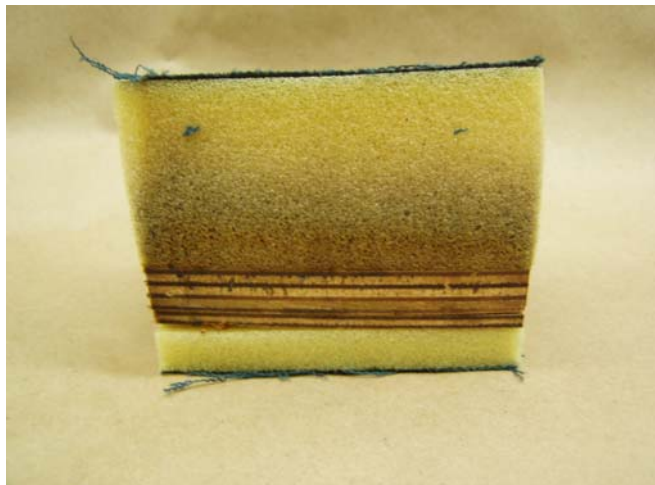
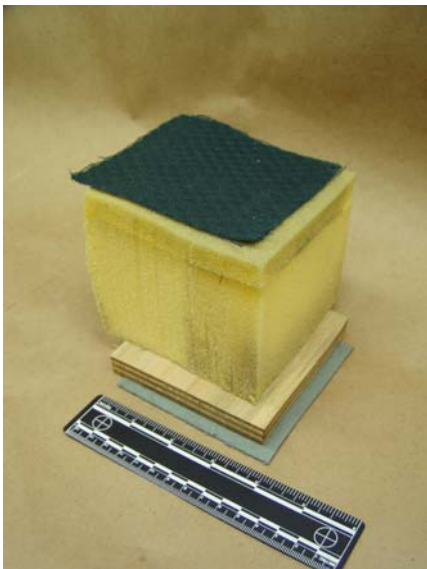


Figure 32. Seat cushion components Figure 33. Back support cushion components



Figure 34. Sled Base Chair



Figure 35. Office Chair

Computer Monitors

The computer monitors were “17 inch” cathode ray tube (CRT) type monitors. The outer case of the monitor was marked that it was a fire retarded acrylonitrile butadiene styrene (ABS). The overall dimensions of the monitor case were 0.41 m (1.3 ft) wide at the screen face and narrowing to 0.32 m (1.0 ft) wide at the back of the monitor, 0.57 m (1.9 ft) deep, 0.41 m (1.3 ft) high. These measurements did not account for the adjustable pedestal base. The majority of the case was 2 mm (0.08 in) thick.



Figure 36. CRT monitor front view



Figure 37. CRT monitor side view

Letter Trays

The trays were molded with a polystyrene identifying mark. The trays were in two sizes: a legal size, which measured 0.41 m (16.3 in) by 0.23 m (9 in) and 0.076 m (3 in) high, and a letter size, which measured 0.28 m (10.9 in) by 0.23 m (9 in) and 0.076 m (3 in) high. The legal size trays had a mass of 0.28 kg (0.62 lb) and the letter size trays had a mass of 0.14 kg (0.31 lb). The bottom sections of the trays were 2 mm (0.08 in) thick.

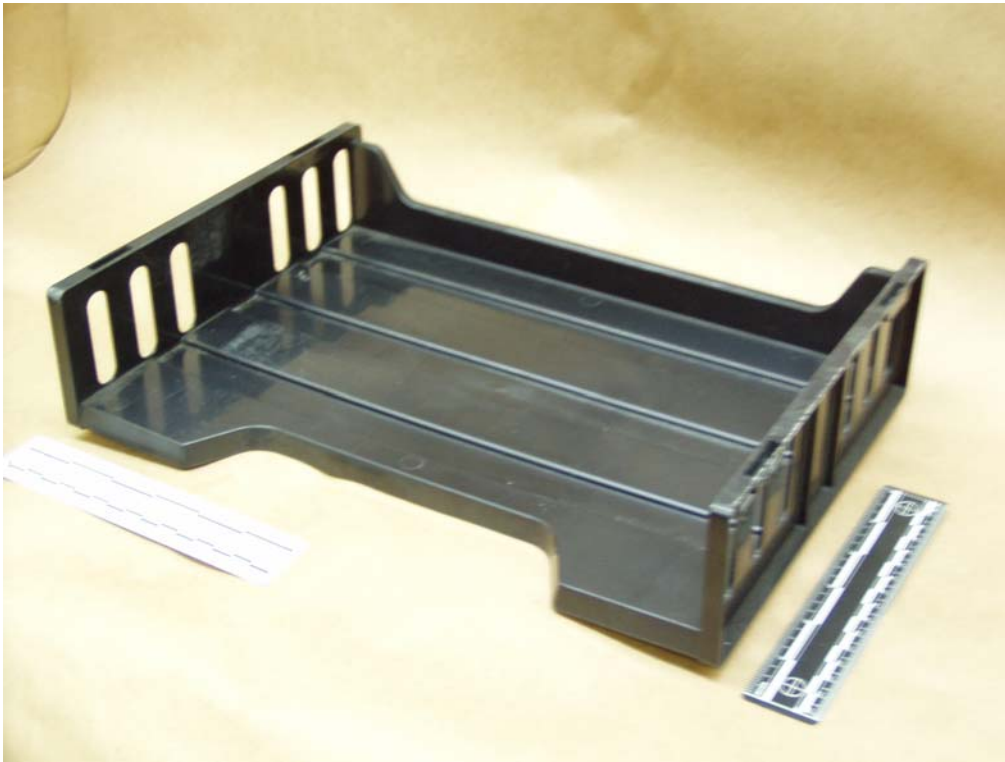


Figure 38. Letter size tray

Paper

The paper used for testing was letter size, 216 mm (8.5 in) by 279 mm (11.0 in), with 30 % recycled material content. The paper was packaged in 500 sheet reams. Each ream was 51 mm (2 in) thick. The paper can also be described by mass, 75 g/m² or 20 lb bond paper in traditional terms. Given that the paper was 20 lb bond, by definition and confirmed by measurement, a ream weighs approximately 2.3 kg (5 lb).

Since much of the paper on the shelves of the storage room was burned in their packages, the paper was left in the wrapping paper for testing (see Figure 39). The paper that was piled on the floor in the storage room and outside the storage room was burned in the boxes. Therefore the paper was also tested in the cone calorimeter with a piece of 2 mm thick cardboard over the paper as shown in Figure 40.



Figure 39. Paper in wrapper



Figure 40. Paper in wrapper with portion of cardboard box on top

Wastebaskets - Recycling Bins

The wastebaskets and recycling bins were made from low density polyethylene (LDPE). The containers were 0.37 m (1.2 ft) by 0.26 m (10.25 in) by 0.38 m (1.3 ft) high. Each container had a mass of 0.84 kg (1.85 lb). The thickness of the material was 2 mm (0.08 in). The capacity of each container was 26.6 L (28.1 qt). The only difference between the wastebaskets and the recycling bins was the color.



Figure 41. Recycling bin

Vertical Blinds

The vertical blinds were installed at each window. For a typical window width, 2.16 m (7.1 ft), the blinds were composed of 24 vinyl slats, 0.089 m (3.5 in) wide and 2.7 m (8.9 ft) long. The slats were 1 mm (0.04 in) thick. The mass per unit area of the slats was 1.2 kg/m^2 (0.25 lb/ft^2), or each slat had a mass of approximately 0.3 kg (0.7 lb).



Figure 42. Portion of a vertical blind slat

Wall Covering

The wall covering was made of vinyl with a textile backing (Figure 43). It had a textured surface on both the front and backsides. The wall covering was slightly less than 1 mm (0.04 in) thick. The mass per unit area of the wall covering was 1.1 kg/m^2 (0.22 lb/ft^2).



Figure 43. Vinyl wall covering

Workstation

The workstations were composed of work surfaces or desktops and side panels. The side panels and work surfaces were connected together using a variety of steel and aluminum brackets depending on the size of the workstation and the number of work surfaces. A keyboard shelf was attached to a shaped piece of steel that slid over the top and bottom of the work surface.

The side panels were 54 mm (2.13 in) thick and came in variety of widths and heights. The panels used in the workstations were in three different sizes: 0.71 m (2.4 ft) wide by 1.04 m (3.4 ft) high, 1.03 m (3.4 ft) wide by 1.04 m (3.4 ft) high, and 0.71 m (2.4 ft) wide by 0.77 m (2.5 ft) high. The panels had a steel perimeter frame and steel raceway panel covers. Inside the frame, the core of the panel was 5 mm (0.19 in) thick hardboard. On each side of the hardboard is a 25 mm (1 in) thick bat of fiberglass. A 100 % polyester fabric covered the fiberglass on both sides of the panel. Figure 44 shows the combustible components of a side panel.

The work surface had a particleboard with a face laminate on the top and a backer laminate on the bottom surfaces. The total thickness of the work surface was 32 mm (1.25 in). Each workstation had two work surface sections. One section was 1.5 m (5 ft) long and 0.76 m (2.5 ft) deep. The second section was 1.07 m (3.5 ft) long and 0.61 m (2 ft) deep.

The long section had a mass of 28.4 kg (62.5 lb). The shorter section had a mass of 16 kg (35 lb). The edges of the work surface were protected with a PVC insert, this can be seen in figure 45.



Figure 44. Combustible workstation side panel components

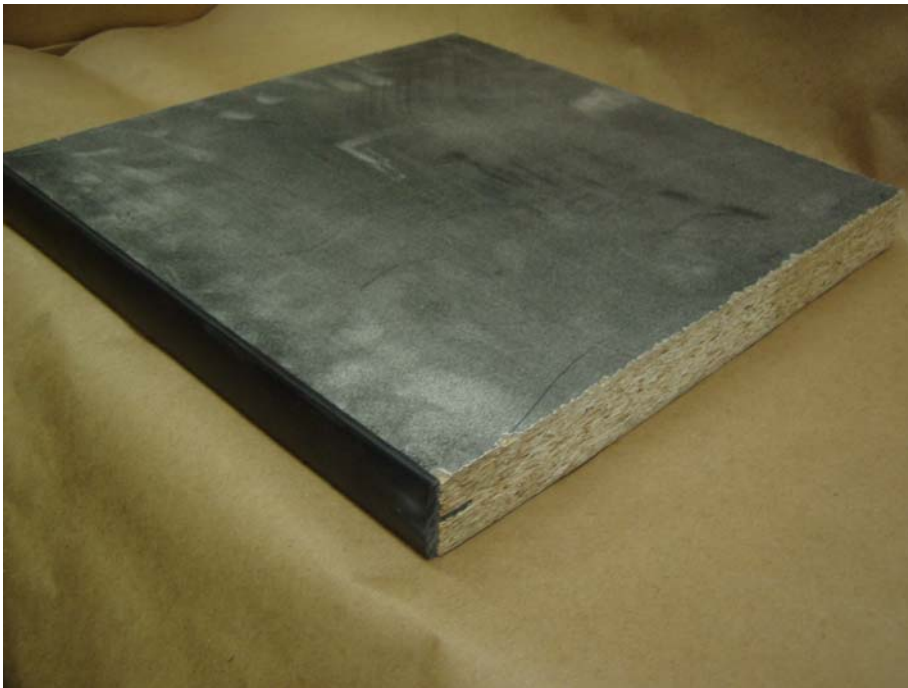


Figure 45. Section of workstation work surface

Heat Release Rate Experiments

As an object or fuel burns, it gives off energy and the rate at which it emits energy is known as the heat release rate. How much, as well as how fast, a burning object releases energy plays a critical role in the fire growth and spread. Babrauskas has described that heat release rate is “the single most important variable in characterizing the ‘flammability’ of products and their consequent fire hazard” [6]. In fire modeling, heat release rate measurements are important as input parameters for the simulations, but can also be useful in validating the performance or predictive capability of a fire model.

The heat release rate experiments conducted for this study were completed at two scales: bench scale experiments using the cone calorimeter, and full-scale experiments in the Large Fire Facility at NIST. Both systems, although they are significantly different in size and capacity, utilized the same principles of oxygen depletion calorimetry to measure the heat release rate.

Cone Calorimeter Experiments

The cone calorimeter is an apparatus that can be used to determine heat release rate, mass loss rate, effective heat of combustion and smoke development of materials. The apparatus has a conical shaped heating element that is used to expose the test material to a known radiant heat flux. The heat flux can be chosen from a range of 0 kW/m² to 100 kW/m². The cross section of the surface to be exposed to the heat flux is 0.1 m (0.33 ft) by 0.1 m (0.33 ft). Various material thicknesses can be accommodated. More information on the cone calorimeter can be found in ASTM E 1354 [7]

The test protocol detailed in ASTM E 1354 was used for these experiments [7]. A test plus two replicates of each sample were conducted in the cone calorimeter, exposed to either an external heat flux of 35 kW/m² or 70 kW/m². While ASTM E 1354 does not prescribe a heat flux, it does note that for exploratory testing, a horizontal sample position with a heat flux of 35 kW/m² is recommended. Based on an analysis of heat flux data obtained by various researchers, Babrauskas recommends using a heat flux value of 35 kW/m² for materials exposed to pre-flashover fires [8]. For post flashover fire exposure, Babrauskas indicates potential heat fluxes as high as 150 kW/m² could be required. This value is beyond the capabilities of most laboratory scale apparatus including the cone calorimeter. In the post flashover fire data analyzed by Babrauskas, heat flux values for exposures to ceiling surfaces ranged from 67 kW/m² to 147 kW/m². In research by Madrzykowski [9], a value of 70 kW/m² is suggested as providing cone calorimeter results similar to full scale performance for office furnishings.

For each test, a 0.1 m (0.33 ft) square sample was oriented horizontally under the cone heater. Each sample was wrapped in aluminum foil on all sides except for the exposed surface. A number of flammability properties were measured including heat release rate, specimen mass loss rate, smoke generation rate, combustion gas production, and ignitability. The data obtained for each sample from the cone calorimeter tests are

contained in Appendix A. The average peak heat release rate, based on three experiments, for each material at the two external heat fluxes are shown in Table 3.

Table 3. Cone Calorimeter – Average Peak Heat Release Rates at 35 and 70 kW/m²

Exposure Heat Flux	35 kW/m²	70 kW/m²
Item	Avg. Peak HRR (kW/m ²)	Avg. Peak HRR (kW/m ²)
Carpeting	260	380
Ceiling Tile (face-down)	10	40
Ceiling Tile (face-up)	70	90
Computer Monitor Case	410	490
Letter Tray	1020	1170
Office Chair	210	350
Paper (stacked flat)	260	340
Paper (stacked on edge)	210	250
Paper (stacked flat - covered with cardboard)	320	460
Plastic Wastebasket	1560	2970
Vinyl Blinds	110	160
Wall Covering	340	460
Workstation – Side Panel	140	230
Workstation - Work Surface	340	590

Full-scale Calorimeter Experiments

Two types of full-scale experiments were conducted. One set of experiments was conducted with single chairs or a single workstation. A small 50 kW natural gas fueled burner was used as an ignition source. The experiments were conducted under an exhaust hood. Therefore, the burning condition was typically fuel limited and there were no compartmentation effects. This is typical of a number of experiments that have been previously been conducted on office furnishings [9,10,11].

The second type of experiment was conducted in a compartment that contained four workstations. In addition to the 50 kW natural gas burner in one of the workstations, the enclosure also had a 2 MW heptane burner to simulate a fire exposure such as flames coming out of the doorway from a flashed-over room.

Test Set-up

The measurements taken during the fire experiments included, mass loss, heat flux and heat release rate. The furniture was positioned on a platform that was located under a 6 m x 6 m (20 ft x 20 ft) exhaust hood which collects the fire products for the oxygen

depletion calorimetry measurements. A natural gas fueled burner was used to provide a repeatable ignition source. The burner, which had an area of 0.09 m^2 (1 ft^2), was supplied with natural gas and was regulated to provide a 50 kW fire. The gas supply to the burner was shut-off after 200 s. This level and duration of heat release rate is representative of the heat release rate and duration of a small trashcan fire [11].

The mass loss was measured by four load cells which supported the platform. Each load cell had a range of 0 kg to 227 kg (500 lbs) with a resolution of a 0.05 kg (0.1 lb). The heat flux measurement was monitored with a Gardon-type heat flux gauge. The sensor was installed approximately 1 m (3.3 ft) from the edge of the furniture being ignited and 1 m (3.3 ft) above the load cell platform. The heat flux gauge was designed for a heat flux of up to 170 kW/m^2 ($15 \text{ Btu/ft}^2 \text{ s}$).

Heat release rate was measured using the NIST 10 MW oxygen depletion calorimeter. Details on the operation and uncertainty in measurements associated with the oxygen depletion calorimeter can be found in [12].

The data from the experiment were recorded every second with a computerized data acquisition system. A section on measurement uncertainty is included in the discussion portion of this paper.

Sled Base Chair

The sled base chairs had a steel frame that supported the seat cushion and a steel back cushion support arm. Plywood was the core support for the seat and back cushions. The cushions were composed of polyurethane foam and were covered with a 100 % polyester fabric. The overall dimensions of the chair were 0.58 m (1.9 ft) wide by 0.61 m (2 ft) deep by 0.91 m (3 ft) tall. The majority of the combustible material in this chair was located in the seat and back cushions. The seat cushion had dimensions of 0.53 m (1.75 ft) wide, 0.51 m (1.7 ft) deep and 0.08 m (0.25 ft) thick. The back cushion had dimensions of 0.47 m (1.54 ft) wide, 0.47 m (1.54 ft) high and 0.06 m (0.21 ft) thick. The average mass of a chair was 11.82 kg (26 lb).

For ignition, the edge of the burner was positioned, 0.75 m (0.25 ft) under the side of the chair and 0.11 m (0.37 ft) under the seat cushion. The burner and chair are shown in Figure 46, just after ignition. Figures 46 through 49 show photographs of the chair as the fire developed. Figure 49 was taken at 180 s at approximately the peak burning rate.

The heat release rate and the mass loss data are shown in Figures 51 and 52, respectively. The peak heat release rate from the chair was approximately 260 kW. The majority of the foam cushion and upholstery fabric was burned away within the first 240 s of burning. The remnants of the chair continued to burn, although at a reduced rate. The small flames that remained were suppressed at approximately 1600 s after ignition. The fire had consumed 4.6 kg (10.1 lb) (Figure 50) and only the steel was left after the fire experiment. Heat flux measurement was not made on the sled base chair.

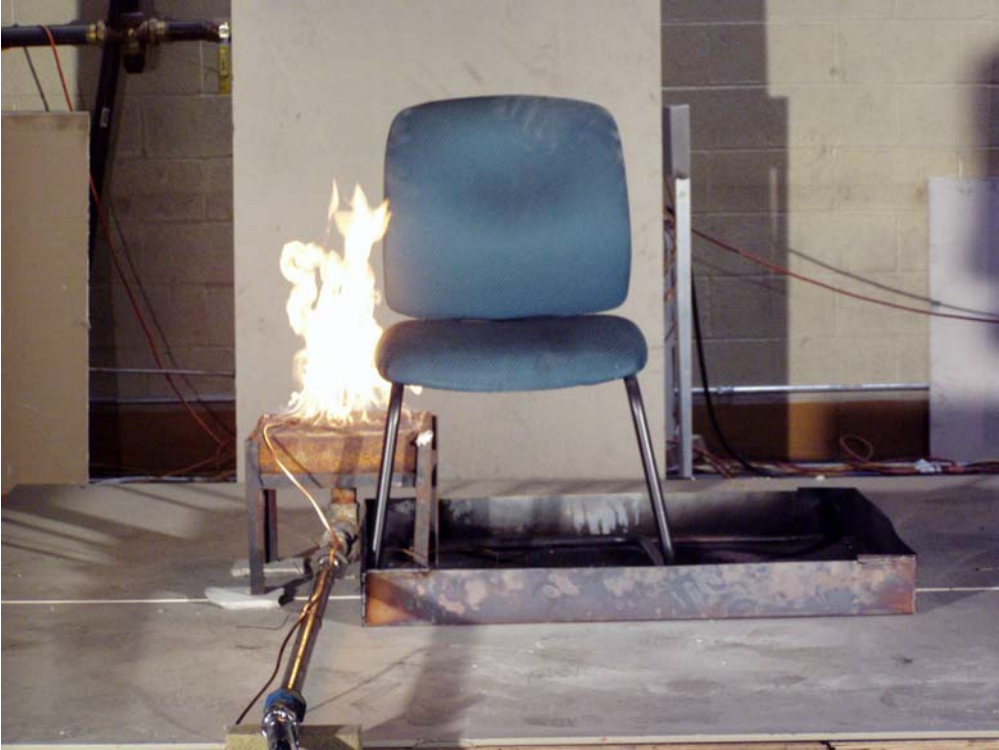


Figure 46. Sled base chair, after ignition of gas burner



Figure 47. Sled base chair, approximately 90 s after ignition



Figure 48. Sled base chair, approximately 150 s after ignition



Figure 49. Sled base chair burning near peak heat release rate, approximately 180 s after ignition



Figure 50. Sled base chair, post test

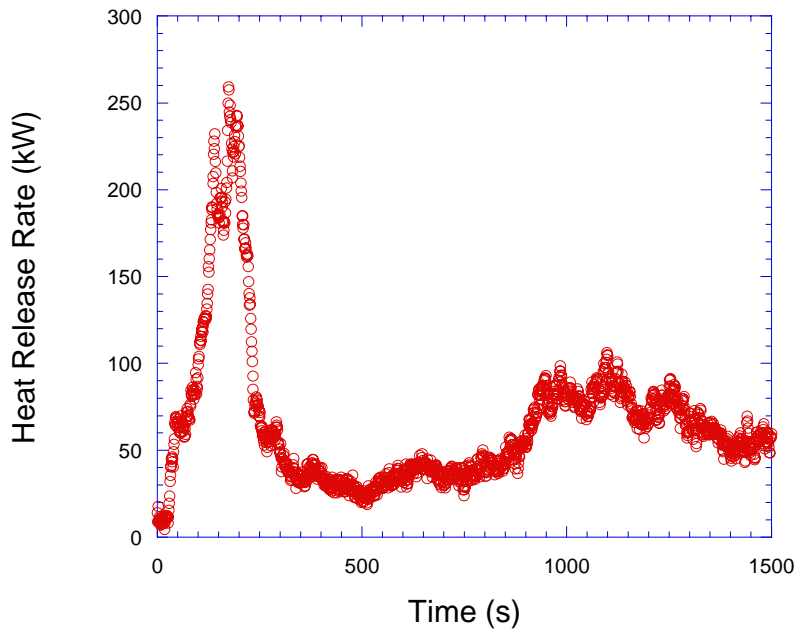


Figure 51. Sled base chair heat release rate versus time

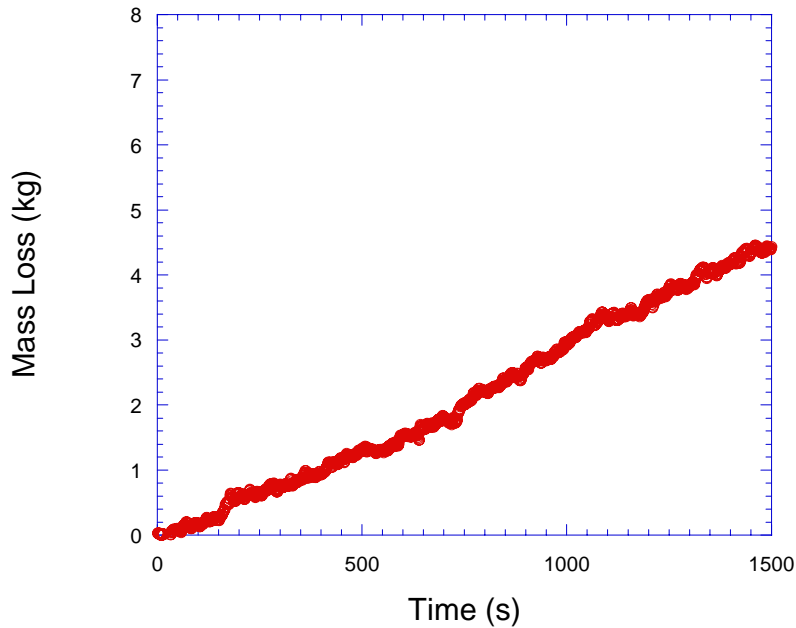


Figure 52. Sled base chair mass loss versus time

Office Chair

The office chairs, or task chairs, had a steel frame that supported the seat cushion, a steel back cushion support arm and steel supports for the arm rests. Plywood provided the core support for the seat and back cushions. The cushions were composed of polyurethane foam and were covered with a 100 % polyester fabric. The overall dimensions of the chair were 0.51 m (1.7 ft) wide by 0.56 m (1.8 ft) deep by 1.04 m (3.4 ft) tall. The majority of the combustible material in this chair was located in the seat and back cushions. The seat cushion had dimensions of 0.53 m (1.75 ft) wide, 0.48 m (1.6 ft) deep and 0.08 m (0.25 ft) thick. The back cushion had dimensions of 0.48 m (1.6 ft) wide, 0.48 m (1.6 ft) high and 0.06 m (0.21 ft) thick. The mass of the chair was 20.45 kg (45 lb).

For ignition, the edge of burner was positioned, 0.025 m (0.08 ft) under the side edge of the chair and 0.11 m (0.37 ft) under the seat cushion. The burner and chair are shown in figure 53. Figure 56 shows a photo of the chair with the back and top of the seat cushion fully involved in fire. This photo was taken at approximately 210 s during the first peak in the burning rate of 340 kW.

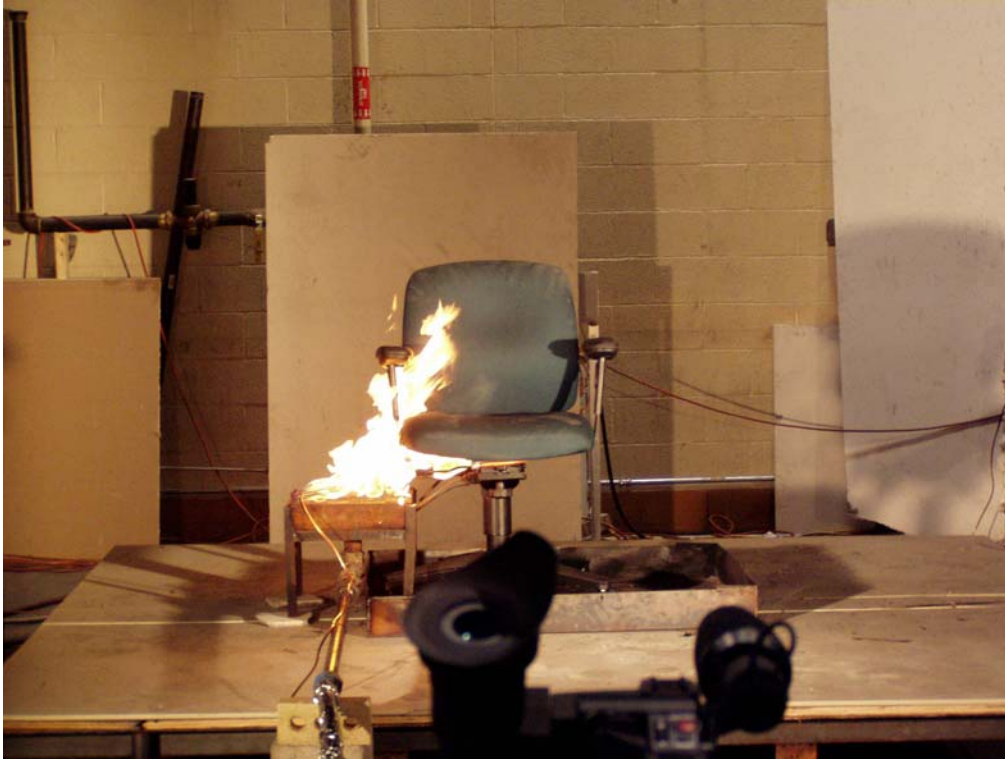


Figure 53. Office chair seconds after ignition of the gas burner



Figure 54. Office chair, 100 s after ignition



Figure 55. Office chair, approximately 150 s after ignition



Figure 56. Office chair, approximately 210 s after ignition, near first peak HRR



Figure 57. Office chair, approximately 380 s after ignition

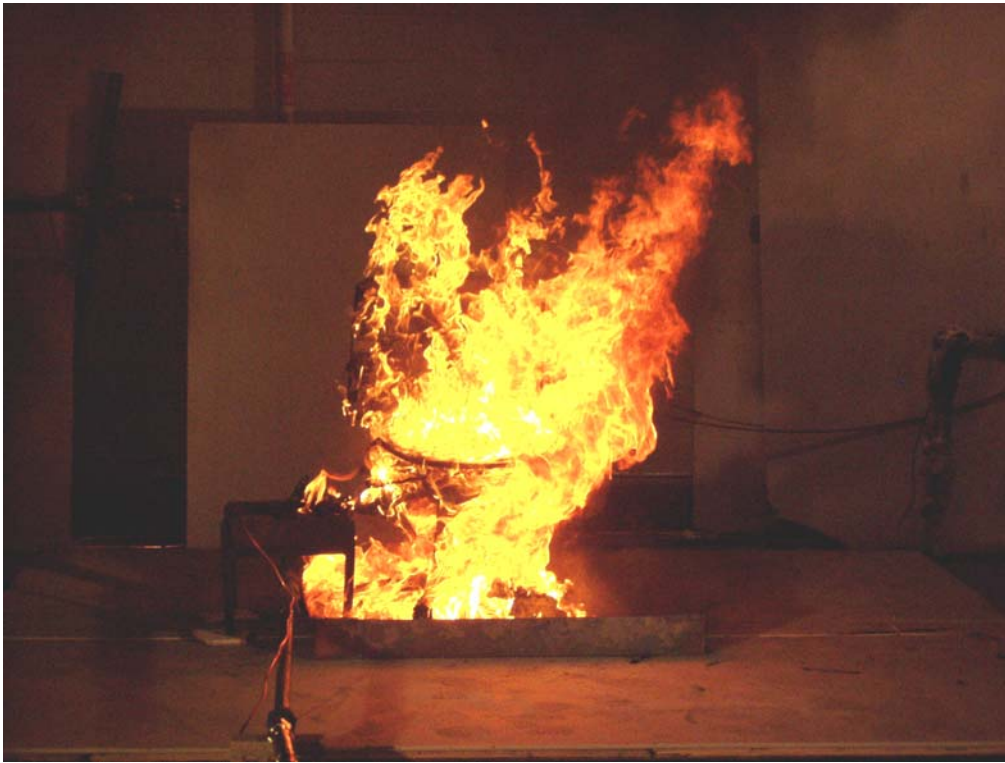


Figure 58. Office chair, approximately 600 s after ignition, near second peak HRR

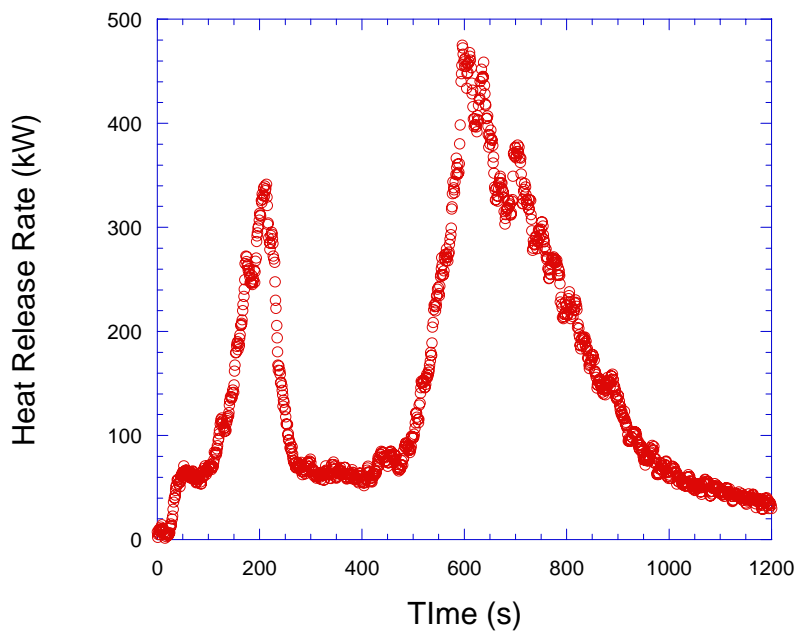


Figure 59. Office Chair heat release rate versus time

The heat release rate, heat flux and mass loss data are shown in Figures 59, 60 and 61, respectively. The first heat release rate peak from the office chair, 340 kW, occurred at approximately 210 s. The majority of the foam cushion and upholstery fabric had burned away by this time and the rate of heat being released decreased. When the plastics on the chair base began to burn the fire size increased which resulted in an increase the amount of heat being released until a second peak of approximately 475 kW was reached at approximately 600 s. The chair continued to burn for more than 20 min prior to the small flames being suppressed.

The heat flux measured during the fire also had two peaks, one at approximately 6 kW/m² at 200 s and another at approximately 5.5 kW/m² at 600 s after ignition. The first peak occurred as the back and seat cushions became fully involved in the fire. As the majority of the polyurethane foam burned away, the amount of energy being released by the fire decreased. Therefore the thermal heat flux decreases. The second peak occurred when the plastic surrounding the metal support pedestal burns in combination with the plywood seat and back cushion supports along with burning debris that had fallen earlier in the fire.

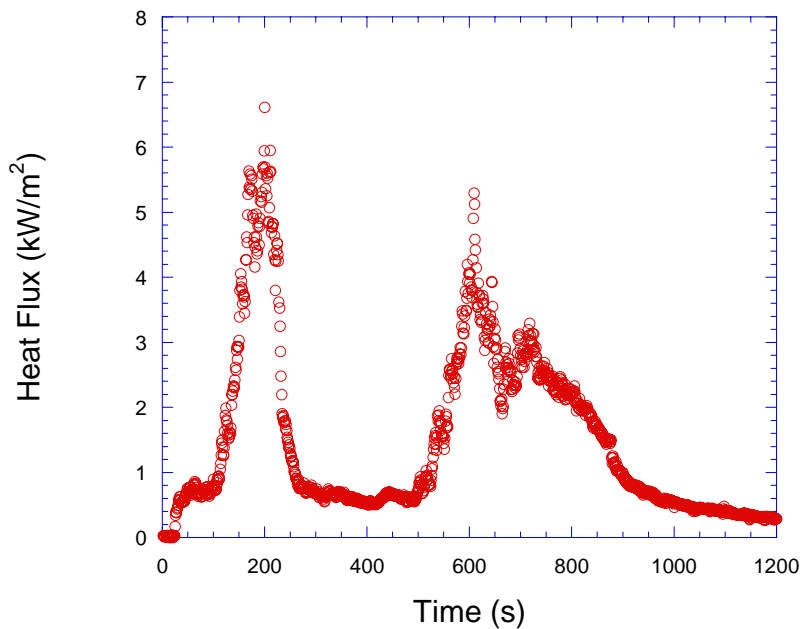


Figure 60. Office chair heat flux versus time

Figure 61 shows the mass loss of the office chair as it burned. The deflection in the mass loss curve at approximately 950 s is the result of portions of the seat dropping into the pan starting at approximately 840 s. It required more than a minute for the load cells to recover. Basically only the steel support pieces were left after the fire experiment and 6.8 kg (15.0 lb) of mass had been consumed by the fire.

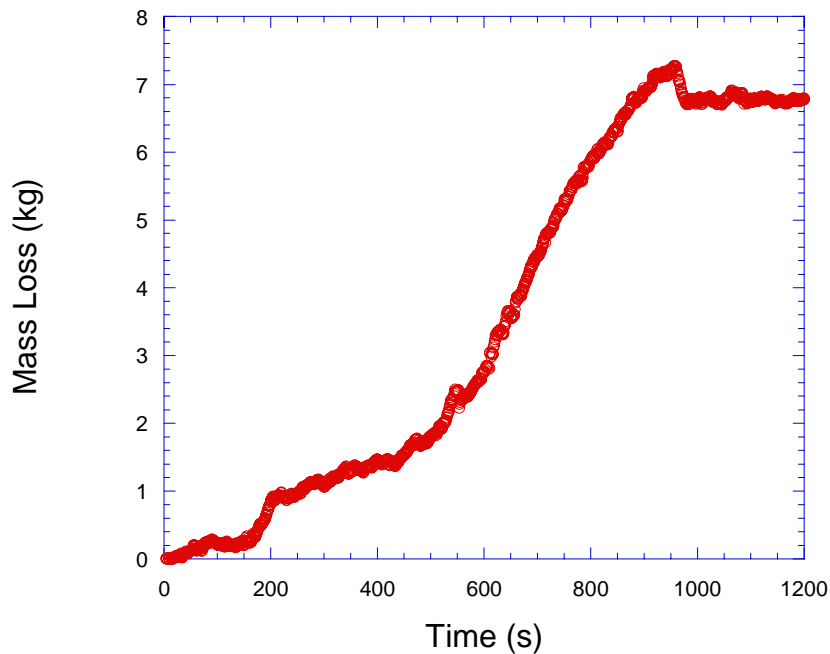


Figure 61. Office chair mass loss versus time

Single Workstation

The single workstation fuel package included a workstation, a computer with monitor and keyboard, an office task chair and a sled base chair. In addition, papers, letter trays, notebooks, a telephone and a phone book were placed on and in the desk. A wastebasket and two recycling bins were placed under the desk. Table 4 provides a description of the items included in the single office workstation. Figures 62 through 64 show schematics of the single office workstation. The drawings also show the general placement of the other office items on and under the work surface. A photograph of the workstation arrangement is shown in Figure 66.

Other items typical of what was observed on the desks in Suite 1210, were telephones, notebooks, papers in the letter trays, telephone books, and calendars etc. The arrangement of these items can be seen in figures below. These items were not collected from the 12th floor.

Table 4. Description of Items Used for the Single Office Workstation

Item	kg	lbs
Carpet 2.13 m x 1.5 m (7 ft x 4.9 ft)	7.9	17.4
Workstation panels, connectors, trim and metal base plates	84	184.8
0.61 m x 1.07 m (2 ft x 3.5 ft) Work surface with metal drawer unit	57.2	125.8
0.76 m x 1.52 m (2.5 ft x 5 ft) Work surface	27.8	61.2
Keyboard shelf w/ metal bracing and support arm	12	26.4
Computer monitor	15.8	34.7
Keyboard	1.9	2.6
Computer	13.5	29.7
Office chair	20.5	45.1
Plastic letter trays (7)	1.1	2.5
#4 LDPE small recycle bin 0.28 m x 0.18 m x 0.305 m high (0.91 ft x 0.58 ft x 1 ft high)	0.5	1.1
#4 LDPE black wastebasket 0.36 m x 0.26 m x 0.38 m high (1.21 ft x 0.85 ft x 1.25 ft)	0.8	1.8
#4 LDPE large blue recycling bin 0.36 m x 0.26 m x 0.38 m (1.21 ft x 0.85 ft x 1.25 ft)	0.8	1.8
75 mm (3 in) Vinyl notebook 0.3 m x 0.29 m high (0.98 ft x 0.96 m with paper (2)	4	8.8
Files in hanging folders for file drawer	6	13.2
Reports on work surface	2	4.4
Reports placed in drawer above file drawer	1.2	2.6
Phonebook 0.27 m x 0.22 m x 0.045 (0.90 ft x 0.73 ft x 0.15 ft)	1.4	3.2
1 kg of paper 216 mm x 280 mm (8.5 in x 11 in) in small recycle bin	1	2.2
Trash (separate table)	0.2	0.5
1 kg of loose paper in large recycle bin	1	2.2
1 kg of newspaper in large recycle bin	1	2.2
Sled base chair	11.8	26.0
Desk blotter/calendar	0.4	0.8
Total (Individual weights have been rounded and may not sum to total weight)	273.2	601.0

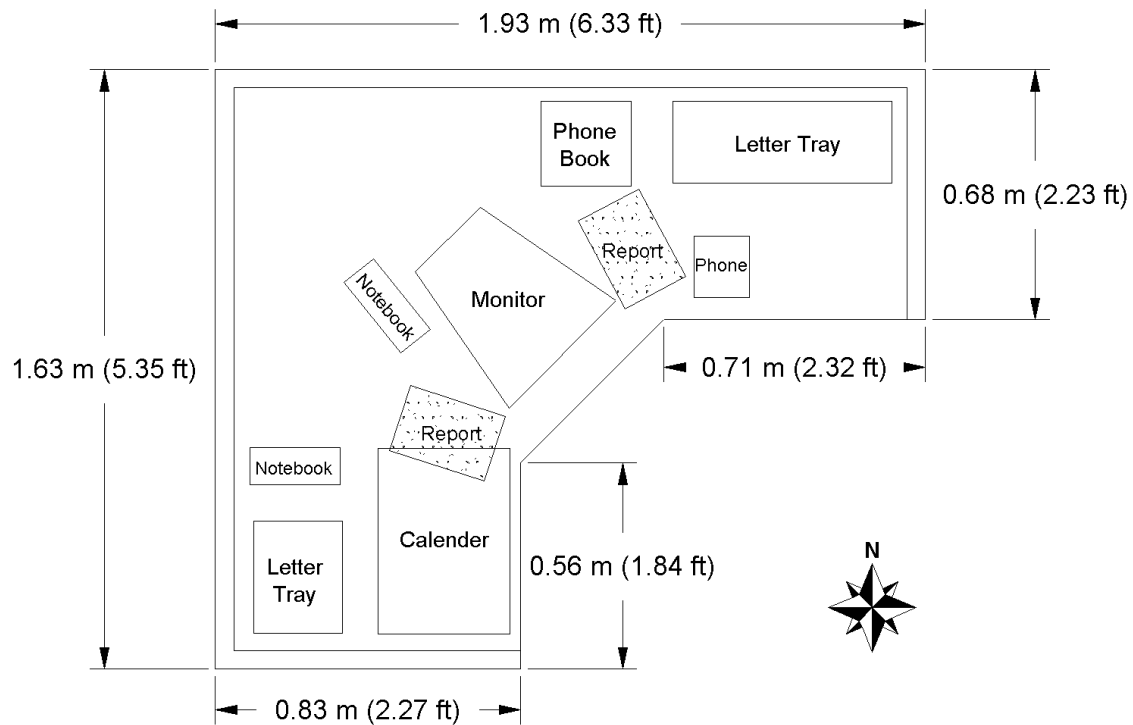


Figure 62. Schematic Plan View of Single Workstation

The workstation covered a floor area of approximately 1.93 m by 1.63 m (6.33 ft x 5.33 ft). The workstation panels, which formed two complete sides of the workstation and two partial sides, were 1.04 m (3.42 ft) high and 0.054 m (0.18 ft) thick. The panels were composed of a layer of 100 % polyester fabric over a 0.025 m thick layer fiberglass batting over 4.8 mm (0.19 in) thick hardboard. The hardboard formed the center core of the panel, hence another layer of fiber glass and fabric covered the other side as well.

The load cell platform had a surface area of 5.95 m² (64 ft²). By dividing the load over this area, yields 45.9 kg/m² (9.4 lb/ft²). If the area is constrained to that covered just by the workstation and subtracting the weight of the guest chair, the effective load per unit area was 83 kg/m² (17 lb/ft²).

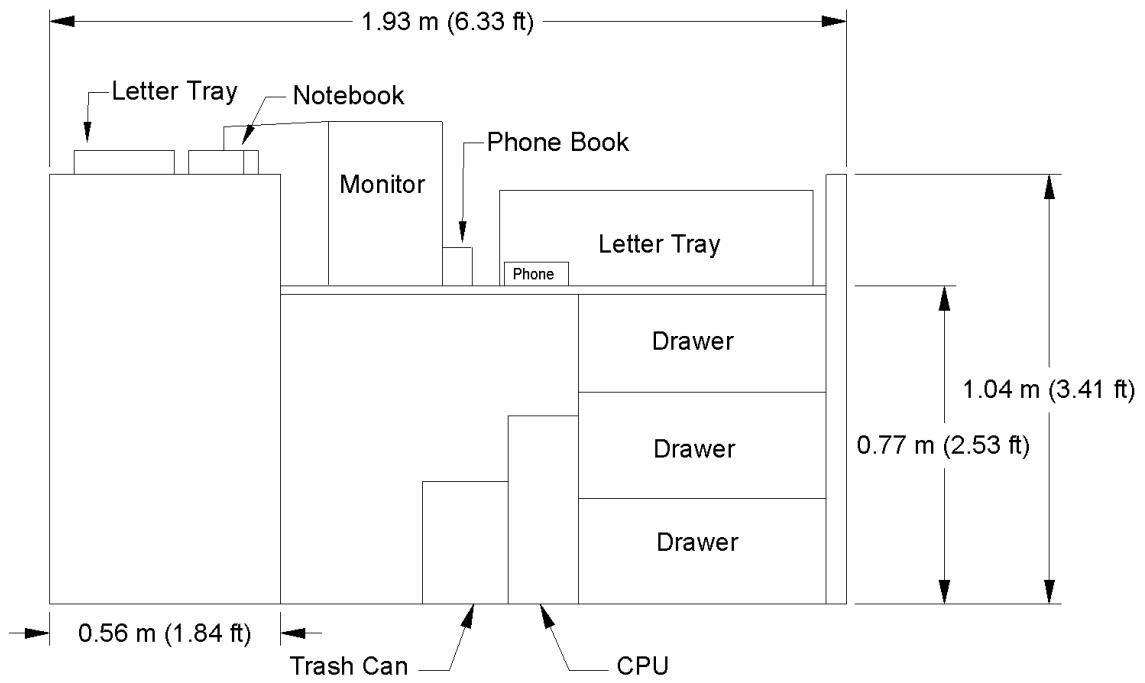


Figure 63. Schematic elevation of single workstation looking north

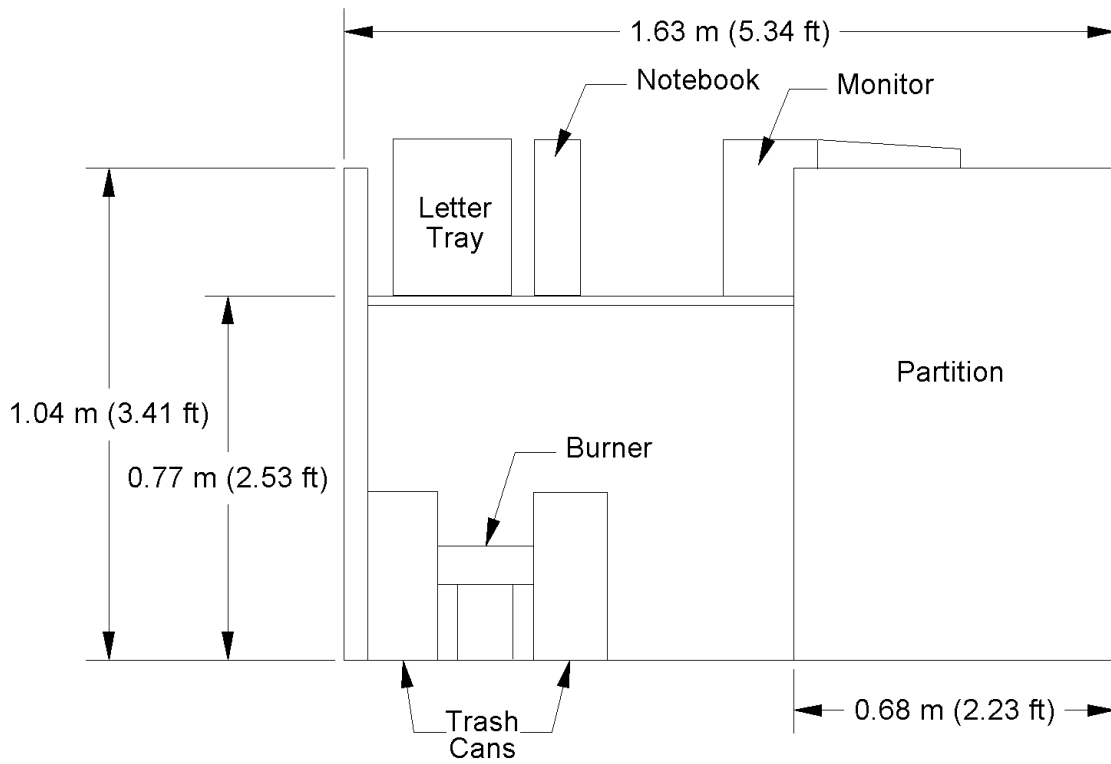


Figure 64. Schematic of single workstation looking west

The work surface was a 32 mm (1.25 in) thick composite made of a particleboard core with a face laminate on the top and a backer laminate on the bottom surface. The work surface provided a work area of 1.8 m² (19.5 ft²)

The computer monitors had plastic cases labeled as fire retarded ABS. The monitor was one of those collected from the 12th floor. The computer and the keyboard used in the experiment were from NIST government surplus that were identified for disposal.

The office chair and the sled base chair were similar to the chairs burned individually. The recycling bins, wastebaskets and letter trays were collected from the 12th floor or were similar in material and geometry as those from the 12th floor. The liner and trash in the wastebasket are listed below in Table 5 and shown in Figure 65. The papers in the recycling bins are shown in Table 4.

Table 5. Trash assortment in plastic wastebasket

Item	kg	lbs
Wastebasket liner	0.02	0.044
10 pieces of 8.5 in x 11 in (0.22 m x 0.28 m) paper crumpled	0.04	0.088
Paper fast food bag	0.06	0.13
2-20 oz (0.59 L) plastic foam cups	0.02	0.044
3-Waxed paper 12 oz/16 oz/20 oz (0.35 L/0.47 L/0.59 L) cups	0.06	0.13
1- #1 PETE .5 L water bottle	0.02	0.044
Total	0.22	0.48



Figure 65. Photograph of trash assortment for each wastebasket



Figure 66. Single workstation fuel package

The 50 kW natural gas fueled burner was positioned between the plastic wastebasket on the left and the plastic recycling bin on the right. On the right hand side of the desk, next to the metal file cabinet was the computer and the “white paper” recycling bin. As in the previous experiments the burner was ignited and burned for 200 s before the gas supply was shut off.

Figures 67 through 70 show the single workstation fire in several stages of development. The fire growth began slowly. It took almost 60 s for the flames from the burner to “attach” to the chair and the work surface. During the next 30 s, the fire began to involve the keyboard shelf and smoke became more visible. By 120 s after ignition, the computer monitor had become involved in the fire and the seat of the chair was burning while the back cushion of the desk chair was pyrolyzing. Figure 68 shows the fire development at 150 s after ignition. Several items on the work surface had begun to burn and the both cushions of the desk chair were burning. At 158 s after ignition, the computer monitor tilted forward and fell into the desk chair. This appeared to slow the fire growth.

The heat release rate of the fire then began to increase, but the bulk of the visible fire volume was lower due in part to the re-positioning of the monitor. At 240 s after ignition, the fire had spread to a large portion of the space under the work surface. Within the next 60 s, fire had become established around the base of the desk chair. The

fire continued to grow at a rapid rate, until it reached a peak heat release rate of 3.3 MW at approximately 380 s after ignition (Figure 69). The fire slowly decreased in burning rate and size when the sled base chair ignited, this caused the fire to grow again. At 630 s after ignition, the workstation began to collapse. The fire continued to decline from that point on. Figure 70 shows the collapsed workstation burning. Flames can be seen coming from the paper burning in the steel file cabinet. The fire continued to burn for more than 35 min from the time of ignition and then the remaining fire was suppressed.



Figure 67. Single workstation a few seconds after the ignition of the gas burner



Figure 68. Single workstation, 150 s after ignition



Figure 69. Single workstation, 360 s after ignition, near peak HRR of 3.3 MW



Figure 70. Single workstation at 930 s after ignition

Figure 71 shows the heat release rate curve for the single workstation. The heat release rate of the single workstation peaked at 3.3 MW at approximately 380 s. At that point the fire involved the chair, most of the workstation interior surfaces and items within the workstation area both above and below the work surface. The second heat release rate peak coincided with the sled base chair becoming fully involved in the fire and sections of the workstation opening up and providing increased ventilation to burning items. Suppression was started approximately 35 min after ignition.

The heat flux time history from the single workstation experiment is shown in Figure 72. Three distinct peaks can be seen on the graph. The first small peak, of 5.8 kW/m^2 at approximately 160 s, was the result of the computer monitor burning and then falling into the office chair. The second peak of almost 28 kW/m^2 at 380 s, occurred when the office chair and most of the workstation were burning. The third peak corresponded to the sled base chair burning. The magnitude of the third peak is larger than the second peak and this is the inverse of the magnitudes of the heat release rate peaks. This was consistent with the heat flux gauge being closer to the sled base chair, than the rest of the workstation as it burned.

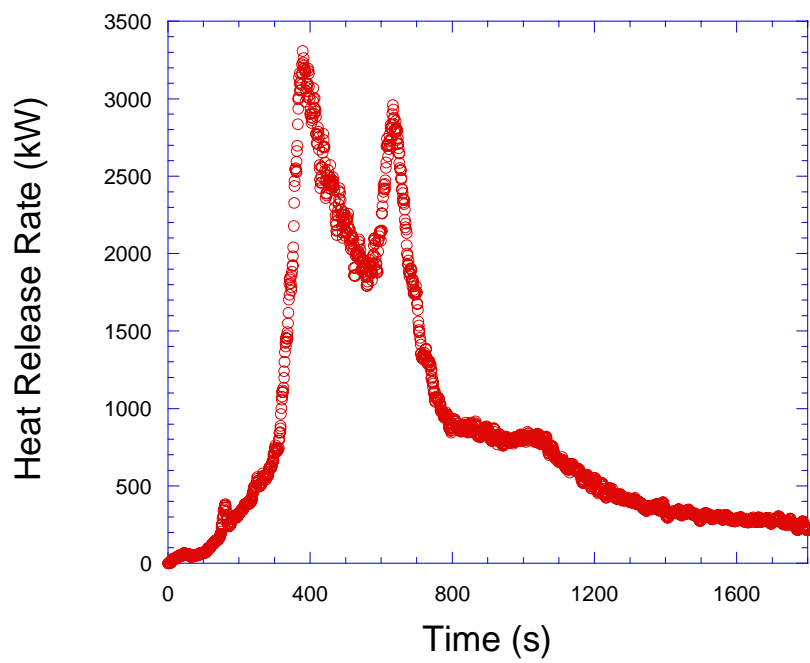


Figure 71. Single workstation heat release rate versus time

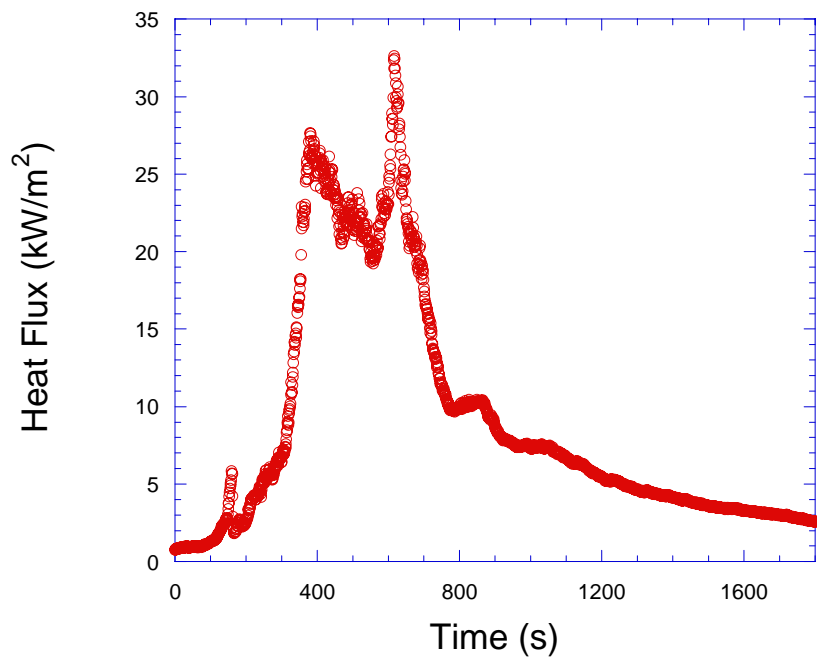


Figure 72. Single workstation heat flux versus time

The mass loss graph also reflects the heat release rate curve. The discontinuity shown at approximately 650 s is the result of burning material and debris that fell off of the load cell. After the fire experiment was completed this debris was placed back on the load cell for the final measurement. Approximately 100 kg (220 lbs) of material had burned, or about 37 % of the original mass. The non-combustible pieces were collected and weighed 153 kg (337 lbs). This accounts for approximately 56 % of the original mass of the single workstation. Therefore approximately 20 kg (44 lb) or 17 % of the combustible mass was unburned during the experiment.

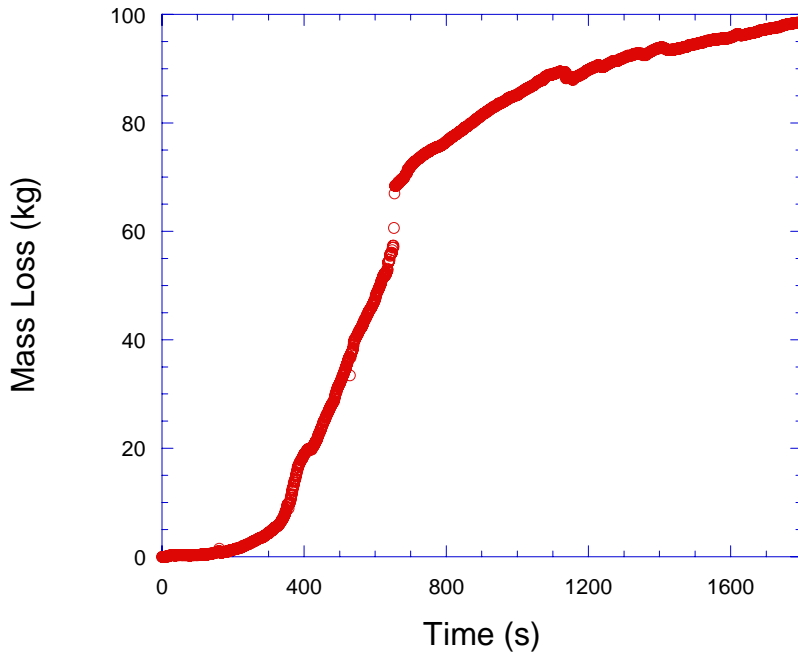


Figure 73. Single workstation mass loss versus time

Enclosure Fire Experiment

The heat release rate experiments with the individual chairs and the single workstation were similar in that they were conducted under “free burn” conditions, which means there were no compartmentation effects and no ventilation limits. In addition, the fires were initiated with relatively small gas burner fires, which represented a small trashcan fire. In the Cook County Administration Building fire, the ignition of the workstations was potentially very different. The fire developed to the point of flashover within the storage room and then spread to the furnishings in the office suite. Therefore, the workstations, chairs, etc., were being exposed to high thermal conditions over a larger surface area than just a trashcan ignition. In addition, the furnishings were potentially exposed to burning embers and other hot material that was being spread throughout the office suite by the fire gases.

The multiple workstation enclosure experiment was designed to simulate the ignition and heat release rate of multiple workstations exposed to a high thermal insult in a partially enclosed area. This was similar but not exactly the same as the conditions developed during the Cook County Administration Building fire. In the test fire, a heptane spray burner was used to create large flames, representative of the fire from other burning objects in the area.

Multiple Workstation Experiment

Four workstations that were loaded in a similar manner to the single workstation were assembled in a 7.0 m (23 ft) wide by 7.3 m (24 ft) deep enclosure with ceiling height of 3.4 m (11.2 ft). A suspended ceiling assembly was installed at 2.7 m (8.8 ft) above the floor. The test area was enclosed on 3 sides, as well as the ceiling and floor. The west side of the enclosure remained open. Schematics of the enclosure are shown in Figures 74 and 75. A photograph, taken of the west side of the enclosure, shows the furniture arrangement, and the interstitial space above the suspended ceiling (Figure 76).

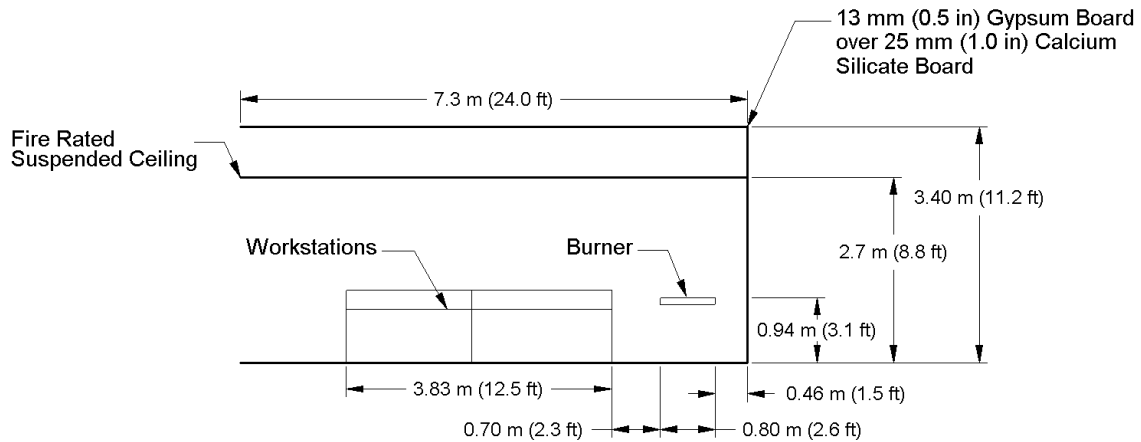


Figure 74. Schematic section of enclosure, looking north

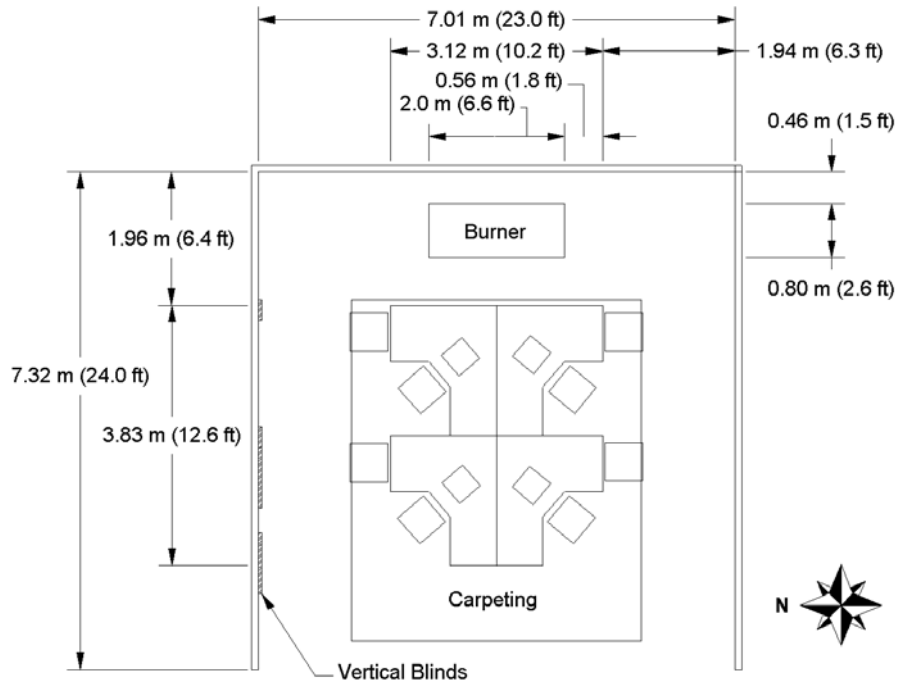


Figure 75. Schematic plan view of enclosure with workstations and burner



Figure 76. Multiple workstation experimental arrangement

Fuel Load

The ceiling, floor and three walls of the enclosure were covered with 25 mm (1 in) of calcium silicate board, a fire resistant board. Over the calcium silicate board, the interior surface of the enclosure was covered with 12 mm (0.5 in) thick gypsum board. The seams between the sheets of gypsum board were sealed with drywall joint compound/spackling. The interior walls were then painted with two coats of water based, latex paint.

The heptane spray burner consisted of a fuel delivery line that supplied a 1.5 m (5 ft) wide manifold with 4 nozzles that discharged into a 2 m (6.6 ft) by 0.80 m (2.8 ft) by 0.1 m (0.33 ft) deep steel pan. The manifold was centered over the pan and was 0.43 m (1.4 ft) above the top edge of the pan. The pan was centered along the east wall and was positioned 0.46 m (1.5 ft) west of the east wall. The top edge of the pan was 0.94 m (3.1 ft) above the floor. The west edge of the burn pan was 0.7 m (2.3 ft) from the east edge of the workstations (Figure 77).



Figure 77. Heptane spray burner looking south

The suspended ceiling was composed of three different materials in different areas. The ceiling area over the burner was fire hardened with a 1.22 m (4 ft) by 2.44 (8 ft) by 0.012 m (0.04 ft) thick sheet of calcium silicate board. The area of the ceiling, centered in the enclosure over the workstations consisted of ceiling tiles collected from the 12th floor of the Cook County Administration Building. Ceiling tiles purchased from a local

supplier were installed in the northeast and southeast corners of the suspended ceiling and along the north and south walls of the suspended ceiling. The ceiling tiles that were purchased locally had a Class A fire performance rating similar to the ceiling tiles from the 12th floor. However these tiles were thinner and lighter than the tiles from the Cook County Administration Building. Each ceiling tile was 16 mm (0.625 in) and had a mass of approximately 1.1 kg (2.4 lb).

Four ceiling vents were installed in the suspended ceiling. Each perforated metal vent took the place of a 0.61 m (2 ft) by 0.61 m (2 ft) ceiling tile. The two vents on the north side were both installed 1.83 m (6 ft) south of the north wall. The northeast vent was 1.83 m (6 ft) in from the east and the northwest vent was 1.83 m (6 ft) in from the west edge of the enclosure. On the south side of the enclosure, the two vents were positioned in line with the north vents going east to west, but they were only 1.5 m (5 ft) north of the south wall. A vent is shown in Figure 78.



Figure 78. Photograph of the northwest ceiling vent (foreground) and the northeast ceiling vent (rear)

Given the limited amount of carpeting collected, the entire enclosure could not be carpeted. Carpeting was only installed under the workstations in the center area of the enclosure. The area carpeted was approximately 5 m (16.5 ft) long and 4.25 m (14 ft) wide.

The four workstations assembled together covered an area 3.83 m (12.5 ft) long and 3.21 m (10.5 ft). The workstations were arranged and loaded in a manner similar to the single workstation. The workstation in the southeast corner of the grouping had a 50 kW natural gas burner positioned between the plastic wastebasket and the plastic recycling bin under the work surface, again similar to the single workstation arrangement.

Two pairs of vertical blinds were installed side-by-side, and centered on the north wall of the enclosure. Each of the support rods was 2.13 m (7 ft) in length. Typically a set of blinds would have 24 slats. In these sets, the pair installed to the northwest had 19 slats and the northeast set had 22. The slats in the northwest set were spread apart as if the blind was partially closed. The slats on the northeast set were pushed together as if the blinds were open (see Figure 79).



Figure 79. North wall of enclosure with vertical blinds

Instrumentation

The enclosure experiment was instrumented to measure heat release rate, heat flux, and gas temperatures. In addition, several video cameras were installed both inside and outside of the compartment to record the fire development.

Heat Release Rate

The smoke that flowed out of the opening on the west side of the enclosure was captured by the 9 m (29.5 ft) by 12 m (39.3 ft) hood that served as the intake for the NIST 10 (nominal) MW oxygen depletion calorimeter. Heat release rate was measured with this apparatus.

Heat Flux

Four heat flux gauges were installed in the enclosure on the north side of the workstations, see Figure 80. The heat flux gauges were installed in pairs, with one heat flux gauge of each pair faced towards the ceiling and the other faced south at a workstation. The heat flux gauges were positioned approximately 1 m (3.3 ft) north of the northern edge of the workstations and 1 m (3.3 ft) above the floor. The heat flux gauges were centered on each of the northern workstations in the east - west plane. The heat flux gauges were water-cooled Gardon-type transducers.

Temperature

Four thermocouple arrays were installed in the enclosure. Each array was located 2.44 m (4 ft) away from adjacent walls as shown in Figure 80. Each array had thermocouples in contact with the ceiling tile, and 0.15 m (0.5 ft), 0.305 m (1 ft), 0.610 m (2 ft), 0.914 m (3 ft), 1.22 m (4 ft), 1.52 m (5 ft), 1.83 m (6 ft), 2.13 m (7 ft) and 2.44 m (8 ft) below the ceiling. In addition, a thermocouple was positioned above the suspended ceiling over each thermocouple array, mid way between the top of the suspended ceiling and the roof of the enclosure or 0.35 m (1.15 ft) below the ceiling of the enclosure. Thermocouples were also installed adjacent to the burners for use as a time marker to show the start time of the burners.

The thermocouples used were 0.51 mm (0.02 in) nominal diameter bare bead, Type K thermocouples.

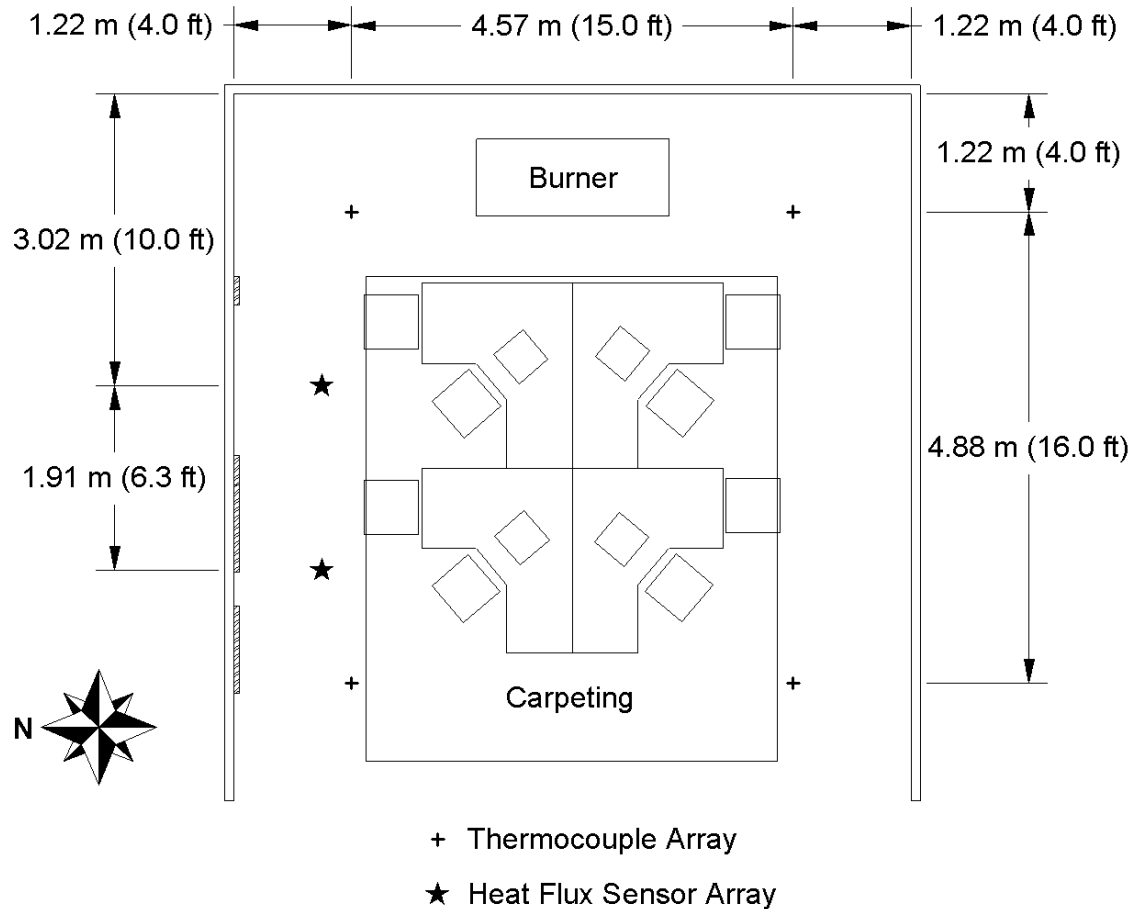


Figure 80. Schematic plan view of enclosure with instrumentation locations

Video Cameras

Two video cameras were located near the floor of the enclosure on the south wall looking northeast. One of the cameras was focused on the southeast workstation. The other interior camera had a wider view of both of the southern workstations. Both of these cameras were installed in a double walled, water-cooled stainless steel enclosure with a ceramic view port to protect the cameras from the thermal conditions in the enclosure.

Three video cameras were located outside of the enclosure to the west. One of the cameras was located to the west-southwest of the enclosure opening and two of the cameras were on an elevated platform due west of the enclosure.

Experimental Procedure

Prior to ignition, each of the analyzers was zeroed and calibrated and the data acquisition system and videos were started to collect background data. Data were recorded at 1 s intervals. Ignition of the burners was initiated with propane pilot flames simultaneously at two locations; the large heptane burner located at the east end of the enclosure and the small natural gas burner located under the southeast workstation. The fire gases that emerged from the open wall on the west end of the enclosure were captured in the hood of the oxygen depletion calorimeter. The test plan allowed the fire to continue until such time that fire gases production exceeded the capacity of the smoke control equipment. At that time, manual fire suppression was initiated.

Experimental Results

The fire was started by igniting both the heptane spray and the natural gas burners simultaneously. Flames from the heptane fueled burner, ignited paper on the gypsum board and flames on the painted paper layer of the gypsum board spread laterally. Between 30 s and 60 s after ignition, most of the vinyl blinds on the northwest portion of the wall (most remote from the burner) had detached and fallen to the floor. Approximately 60 s after ignition, some of the paper materials on the southeast workstation work surface had begun to burn. The office chair was pyrolyzing as were other materials on the desk due to the heat flux from the heptane burner.

By 80 s after ignition, all of the vinyl blinds had detached and fallen to the floor next to the north wall. Within 120 s after ignition, the back and seat cushions of the office chair, in the southeast workstation, were burning and fire had spread to a number of items on the work surface including the computer monitor and letter trays. The fire on the gypsum board had moved along the ceiling to the south wall and extended westward along the south wall.

During the next minute, the fire continued to spread on top of the work surface of the southeast workstation. A fire began to grow around the base of the office chair due to burning material that dropped down from the seat and the back cushions. The letter tray and the monitor on the northeast workstation ignited. The sled base chair next to the southeast workstation was pyrolyzing. Flames were extending toward the west along the north wall. At 200 s after ignition, the natural gas burner was shut off.

At 240 s after ignition, the office chair, in the southeast workstation, was fully involved in fire, with flames extending from the floor under the chair to approximately 1 m (3.3 ft) above the top of the chair back. The monitor appeared to be fully engulfed in flames as well. The interior panel surfaces of the workstation were pyrolyzing as was the sled base chair. Within another 15 s, the majority of the southeast workstation was burning. The northeast workstation was also heavily involved in fire at this time. Flames were visible in the smoke layer near the ceiling above the east workstations.

Ceiling tiles and paper debris began falling at 270 s after ignition. Earlier in the experiment one or two tiles near the east wall had fallen, but at this point the tiles were falling from areas over the workstations and they were falling in rapid succession. The southeast sled base chair, the northeast sled base chair and the southwest sled base chair also ignited at this time. The southwest computer monitor ignited along with most of the other materials on top of the southwest workstation work surface. The northwest computer had a small fire on the top of the case.

By 5 min or 300 s after ignition, most of the combustible materials in the southeast portion of the enclosure had ignited, including the gypsum board that was covering the floor. Many of the ceiling tiles that had dropped continued to burn on the floor. The drop down of the tiles appeared to have reduced the amount of fire visible in the enclosure, as if the tiles smothered portions of the fire. The northwest sled base chair had ignited. The southwest portion of the ceiling grid collapsed at approximately 305 s after ignition.

At 360 s after ignition, all of the chairs in the enclosure were involved in the fire. At 400 s after ignition, the fire appeared to be growing with flames extending along the north wall. Most of the fuel within the enclosure was burning. The exception was the western most panels on the northwest and southwest workstations.

Manual suppression of the fire by two 38 mm (1.5 in) fire hoses began at 455 s after ignition. The firefighters remained outside of the enclosure. The majority of the fire was suppressed within 30 s. Figures 81 through 84 show the progression of the fire.



Figure 81. View of the enclosure 20 s after ignition of the burners



Figure 82. View of the enclosure, approximately 180 s after ignition



Figure 83. View of the enclosure, approximately 300 s after ignition



Figure 84. View of the enclosure, approximately 430 s after ignition

Heat Release Rate

The heat release rate time history is presented in Figure 85. For the first 60 s after ignition, the majority of the heat release was provided by the heptane burner. As the furnishings began to burn, the heat release rate increased and reached a peak of approximately 17 MW. The ceiling tiles began to fall at approximately 270 s after ignition culminating in a partial collapse of the ceiling grid in the southwest corner of the enclosure at approximately 305 s after ignition. This caused a significant reduction in the heat release rate as the ceiling tiles smothered some of the fire. The fallen ceiling tiles also began to burn and the heat release rate of the fire rebounded to reach approximately 19 MW before being suppressed.

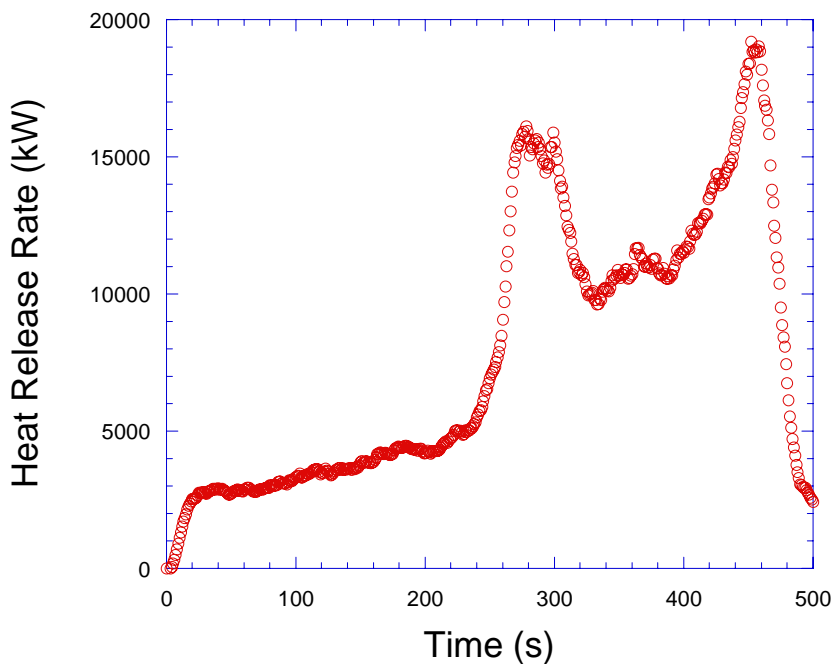


Figure 85. Multiple workstation heat release rate versus time

Heat Flux

The measurements from the two pairs of heat flux gauges are given in Figures 86 and 87. The northwest set of gauges was positioned further away from the heptane burner and the areas of the most intense burning. Hence the peak heat flux values were approximately half of those from the northeast position heat flux gauges. In both graphs it can be seen that the heat flux measured by the gauges that faced the workstations surpassed the heat flux values from the gauges that faced the ceiling once the workstations were fully involved with fire.

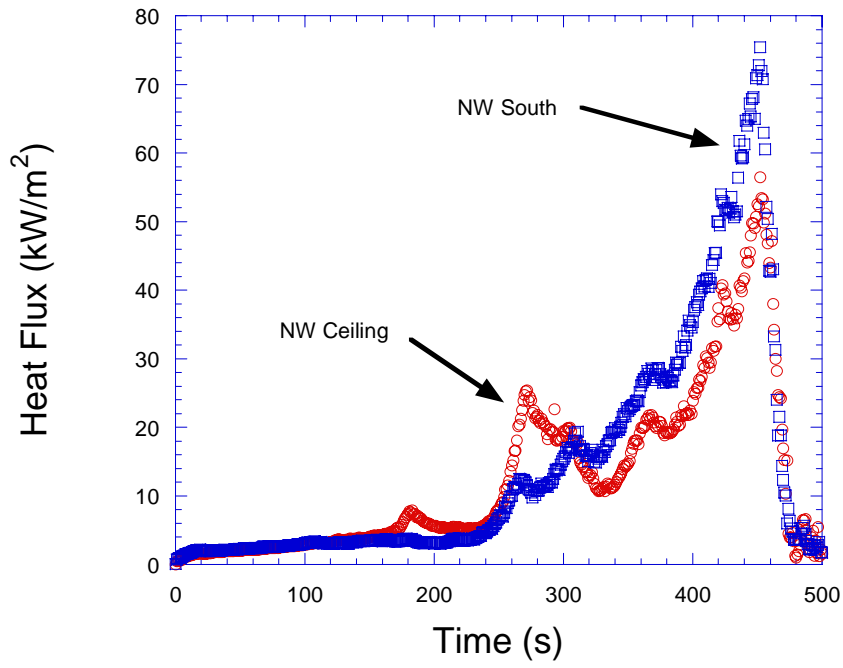


Figure 86. Multiple workstation heat flux versus time, northwest position

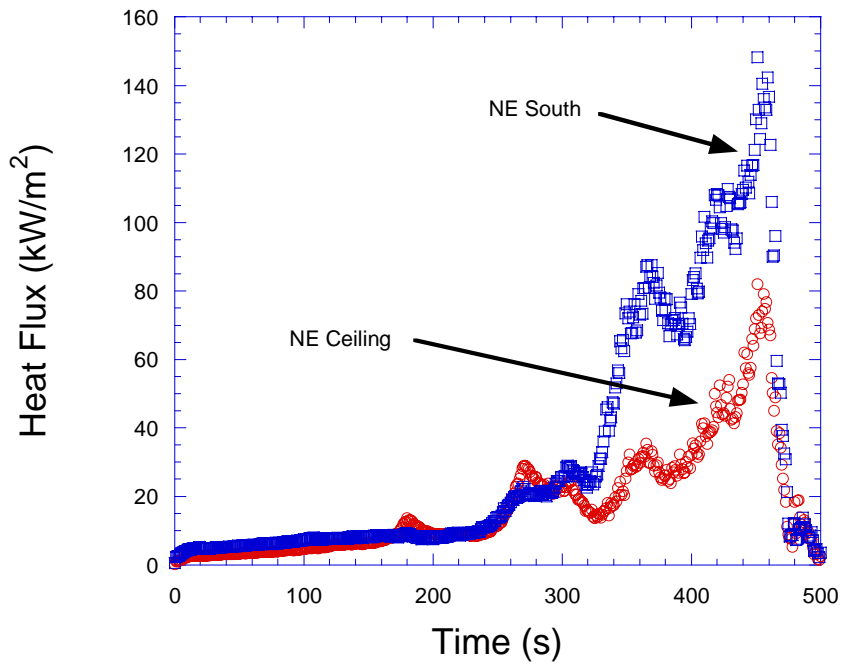


Figure 87. Multiple workstation heat flux versus time, northeast position

Temperature

The gas temperatures measured with the four thermocouple arrays, below the suspended ceiling, are shown in Figures 88 through 91. The temperatures from the four thermocouples in contact with the ceiling are provided in Figure 92. The temperatures from the four thermocouples installed in the interstitial space are shown in Figure 93.

Examining the temperature graph from the northwest array, the temperature of the top two thermocouples, 0.15 m (6 in) below the ceiling and 0.30 m (12 in) below the ceiling, increased rapidly.

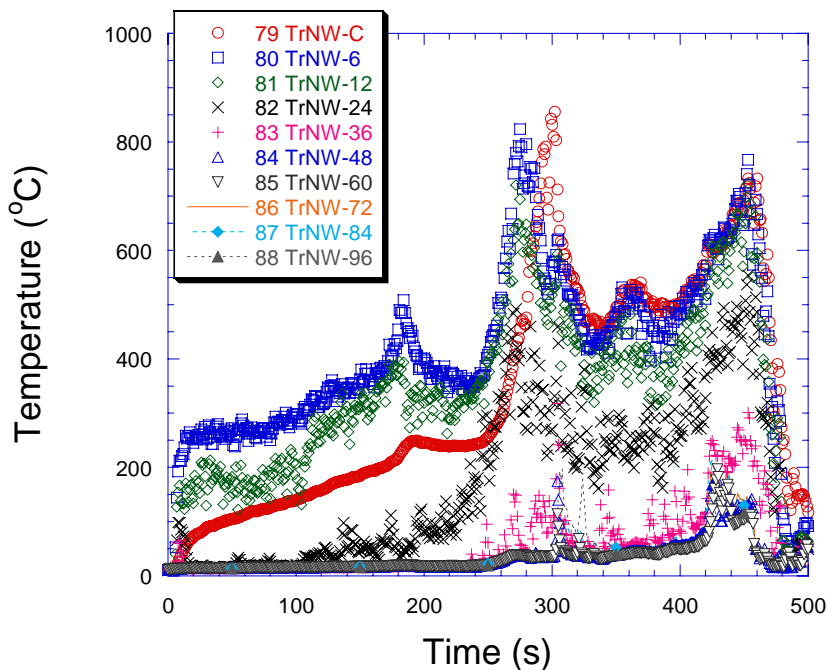


Figure 88. Northwest thermocouple array temperature versus time

The northwest thermocouple array temperatures show a steady ceiling jet of hot gas that is less than 0.61 m (2 ft) thick for the first 100 s. The smoke layer began to thicken as the temperatures 0.61 m (2 ft) below the ceiling increased. The sharp increase in temperature occurred at approximately 260 s, with the temperature near the ceiling being representative of flame impingement. Based on the data it appeared that the thermocouples, 0.92 m (3 ft) below the ceiling and lower, were never fully enveloped by the hot gas layer. The temperatures near the floor increased when low level burning, due to the fallen ceiling, occurred or the temperature increase could be partially due to radiation heating of the thermocouple.

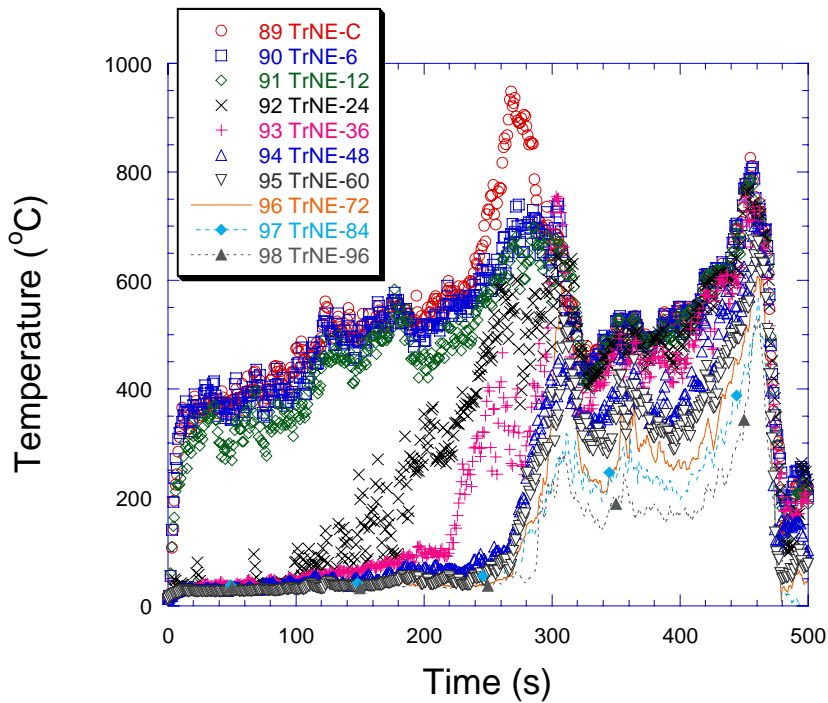


Figure 89. Northeast thermocouple array temperature versus time

The northeast thermocouple array was located closer to the heptane burner, hence the temperatures near the ceiling are higher. The hot gas layer thickness was similar to that of the northwest thermocouple array: the layer was less than 0.61 m (2 ft) until 100 s after ignition, then the layer began to thicken. The temperatures continued to increase and the layer continued to thicken. By 220 s after ignition the layer had dropped to 0.92 m (3 ft) below the ceiling. At approximately 270 s after ignition, the temperatures in the lower half of the room began to increase. This is consistent with a well-mixed area of hot gas that could signify a flashover. However due to the ceiling collapse, the nature of the fire changed and all of the temperatures cooled somewhat until approximately 450 s after ignition, when temperatures 1.83 m (6 ft) below the ceiling exceeded 600 °C.

The measurements from the southeast thermocouple array are similar in terms of magnitude and time of response with exception of the thermocouple located 0.61 m (2 ft) below the ceiling. The temperature of that thermocouple increases sooner than its northeast counterpart. This could be due to additional heat and smoke being generated by the ignition of the southeast workstation by the 50 kW burner.

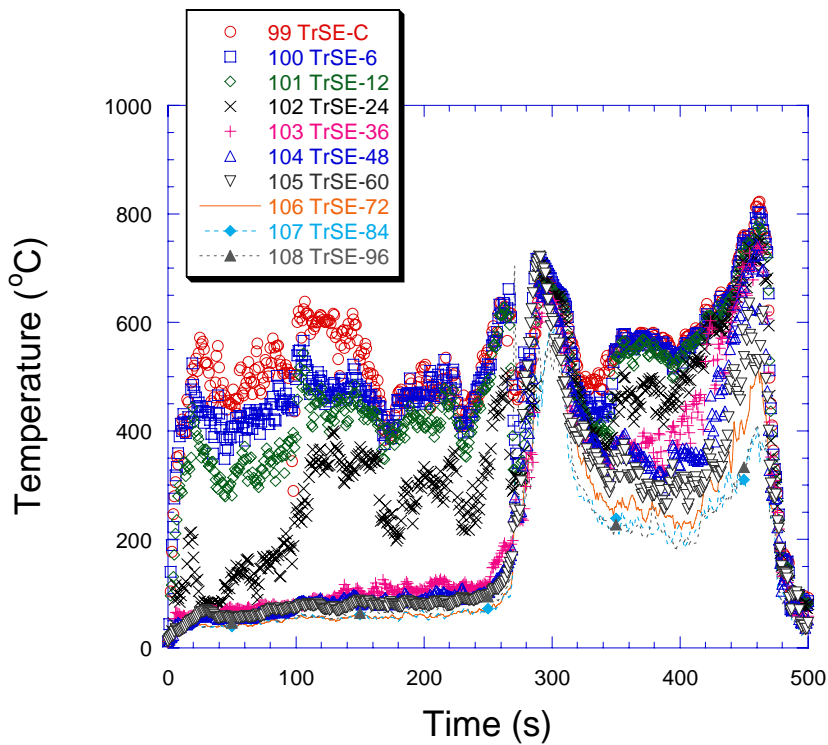


Figure 90. Southeast thermocouple array temperature versus time

The southwest thermocouple array recorded the least amount of temperature increase of the four thermocouple array positions. The hot gas layer did not increase to the 0.61 m (2 ft) level below the ceiling until approximately 200 s after ignition. The time scale of the southwest thermocouple array temperatures has been expanded because after the southwest portion of the ceiling grid collapsed, the thermocouple array moved so that any temperature measurements made after that time lost meaning.

Figure 92 shows the time history of the thermocouples that were in contact with the ceiling tile. The two thermocouples positioned on the eastern side of the enclosure track very well with the temperatures near the ceiling. The two ceiling thermocouples to the west lag the temperature increase of the thermocouples located 0.15 m (6 in) below the ceiling and 0.30 m (1 ft) below the ceiling, until approximately 250 s after ignition when they catch up.

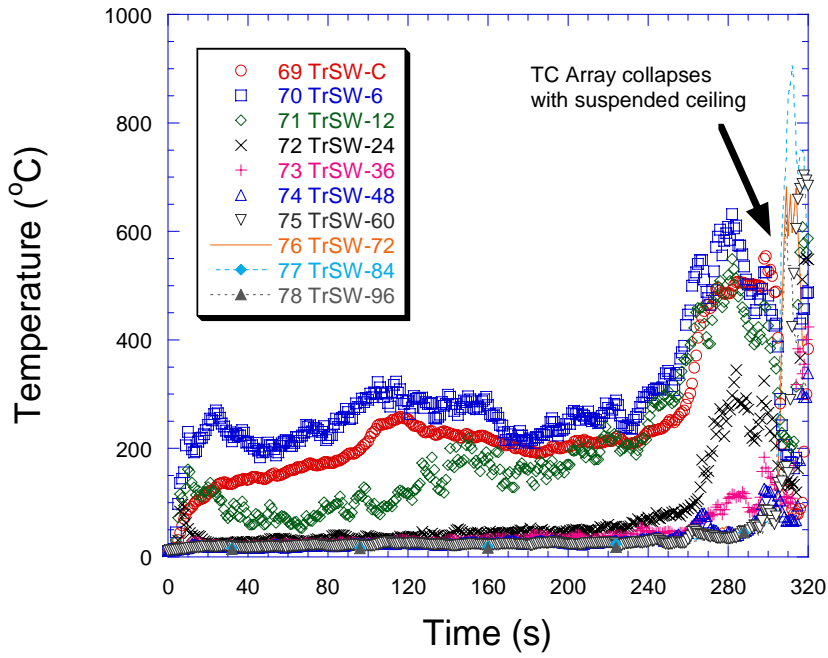


Figure 91. Southwest thermocouple array temperatures versus time

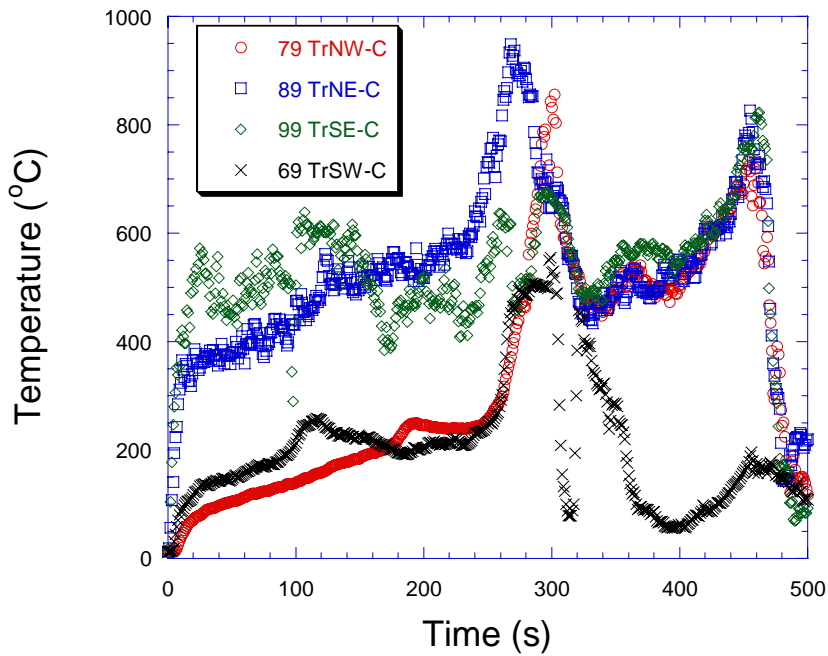


Figure 92. Multiple workstations, ceiling temperatures versus time

Figure 93 contains the temperature data from the thermocouples located above the suspended ceiling. The temperatures track very well together with the exception of the thermocouple in the southeast corner. It appears that flames or hot gases flowed into the interstitial space near the southeast workstation faster than in the other quadrants of the room.

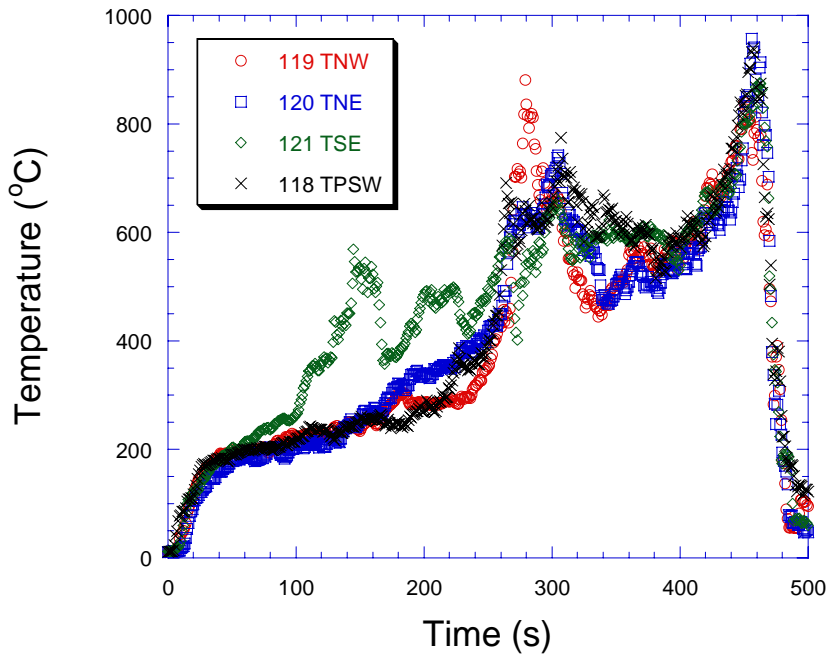


Figure 93. Multiple workstations, interstitial space temperature versus time

Discussion of Results

Based on the estimated timeline of fire development, the fire spread from the storage room and throughout the open plan office space in approximately 10 min to 12 min. The fire department was unable to suppress the fire from the southeast stairway. These two facts are indicative of a fire that developed rapidly and generated high temperatures in and around Suite 1240. This raises the question, was there something special or unusual about the furnishings and/or the interior finish, or other factors, which led to the fire conditions encountered by the fire department? Or were the conditions consistent with office building fires?

One method of examining the fuel load was to compare it to the heat release rate of other “common” materials. The heat release rate from the cone calorimeter is provided as a heat release rate per unit area. Some representative peak heat release rates from cone experiments are given in Table 6. The items demonstrate a range of approximately

100 kW/m² to 600 kW/m² for materials that are commonly found in homes and offices. Comparing these values to those presented in Table 2, it can be seen that all of the materials tested fall within this range with the exception of the letter trays and the wastebasket/recycling bins. However, on a mass basis, an area basis, or a total heat release rate basis the letter trays and the wastebasket/recycling bins provide a small fraction of the total energy released by the office workstation fuel package.

Table 6. A cross section of representative heat release rates

Item	Reference	Peak HRR (kW/m²)	Exposure Heat Flux (kW/m²)
Unpainted gypsum board	13	89	35
Unpainted gypsum board	13	110	70
Plywood	14	220	35
Plywood	14	254	70
Heavy polyolefin fabric over polyurethane foam	15	300	25
Heavy polyolefin fabric over polyurethane foam	15	620	75

The measured peak heat release rates of the single fuel packages the sled base chair and the office chair, were approximately 250 kW and 500 kW, respectively. The mass of the sled base chair was 11.8 kg (26 lb) and the mass of the office chair was 20.45 kg (45 lb).

Heat release rate testing has been conducted on a wide variety of chairs. A cross section of results is presented in NFPA 72 [16]. The range of heat release rates for a single chair is shown as ranging from 35 kW up to 2.6 MW, depending on the frame, the materials used in construction and the amount of upholstery. The chairs range from molded fiberglass chairs, with no upholstery or padding, at the low end of the range up through upholstered “living room” chairs at the high end of the range. Recently a heat release rate experiment was conducted on an “overstuffed”, upholstered chair, the peak heat release rate was approximately 2.5 MW [17].

Hence the chairs from Suite 1240 of the Cook County Administration Building had a peak heat release rate that was typical of office furnishings and significantly less than the heat release level considered characteristic of household furniture.

In previous experiments, the peak heat release rate of workstations with a floor area of 3.8 m² (40.9 ft²) ranged from 2.8 MW to 6.9 MW range. The range was dependent on the number of sides enclosed. The workstation with the lower heat release rate had two sides

enclosed while the workstation with the higher heat release rate had 4 sides enclosed with an opening for an entry way. The side panels of the workstations tested were in similar construction to those from the Cook County Administration Building. The fuel load per unit floor area was approximately 88 kg/m^2 (18 lb/ft^2)[9].

The single workstation from the Cook County Administration Building covered a floor area of 3.15 m^2 (33.9 ft^2) and had a similar fuel load per unit area of 83 kg/m^2 (17 lb/ft^2). The Cook County workstation had two sides enclosed and two partial sides enclosed. The peak heat release, 3.5 MW, falls within the lower quartile of the data range from the previous experiments.

Based on the heat release rate comparisons, the furnishings in Suite 1240 of the Cook County Administration Building would be considered “typical” or representative of office furnishing or interior finish materials that have been tested previously.

It should be noted that several other fires have taken place in high rise office buildings, in which the fire had advanced to a significant level and then challenged the capabilities of the fire department to extinguish the fire.

First Interstate Bank Building - A fire started in a workstation located in an open plan office area on the 12th floor. It is estimated that, within 15 min of the fire starting, approximately 25 % of the 12th floor was involved in fire. The fire continued to spread and within an hour the 12th floor was fully involved with the exception of some private offices on the northeast corner of the building. By that time the fire had begun to spread vertically [18].

Alexis Nihon Plaza, Montreal, Canada, October 26, 1986 – Approximately 15 min to 20 min after detection of the fire, the fire department began an interior attack on the fire on the 10th floor. The intensity of the fire and low water pressure “prevented fire fighters from reaching the seat of the fire” [19].

One Meridian Plaza, Philadelphia, PA., February 23, 1991 - Within 8 min of the fire alarm system activating, the fire on the 22nd floor had broken out windows. The investigators determined that the room of origin had reached flash over and that the fire had spread beyond the room of origin prior to the fire department’s arrival. The report concludes that “when the magnitude of the fire reaches the level encountered by those first arriving fire fighters, little can be done to quickly intervene and suppress the fire” [20].

Based on the heat release rate data and the historical information from previous high rise, office building fires, the fire load and the fire development follows the trend of being a typical fire in this type of occupancy.

Uncertainty Analysis

There are different components of uncertainty in the gas temperatures, mass of fuel packages, total heat flux and heat release rate data reported here. Uncertainties are grouped into two categories according to the method used to estimate them. Type A uncertainties are those that are evaluated by statistical methods, and Type B are those that are evaluated by other means [21]. Type B analysis of systematic uncertainties involves estimating the upper (+ a) and lower (- a) limits for the quantity in question such that the probability that the value would be in the interval ($\pm a$) is essentially 100 %. After estimating uncertainties by either Type A or B analysis, the uncertainties are combined in quadrature to yield the combined standard uncertainty. Multiplying the combined standard uncertainty by a coverage factor of two results in the expanded uncertainty that corresponds to a 95 % confidence interval (2σ).

Components of uncertainty are tabulated in Table 7. Some of these components, such as the zero and calibration elements, are derived from instrument specifications. Other components, such as soot deposition or radiative cooling/heating include past experience with thermophoretic deposition on cool surfaces and thermocouples in high temperature fuel rich environments.

The uncertainty in the gas temperature measurements includes radiative cooling in each of the tests series, but also includes radiative heating for thermocouple located in the lower layer of the full-scale tests. Pitts et al. quantified the errors of bare bead thermocouples as ranging from 7 % in the hot upper gas layer to as much as 75 % in the lower layer [22]. The potential for large errors in the lower layer are a function of the effective temperature of the surroundings. In cases where the effective temperature of the surroundings is high then the error can be great. In cases, similar to a developing fire in a compartment, the temperature measurement errors in the lower are small as the fire develops through flashover, since the effective temperature of the floor and walls are relatively cool. Post-flashover, the potential for measurement error increases as the temperature of the surroundings increase. In addition, small diameter thermocouples were used to limit the impact of radiative heating and cooling. This resulted in an estimate of ± 15 % total expanded uncertainty.

The potential for soot deposition on the face of the water-cooled total heat flux gauges contributed significant uncertainty to the heat flux measurements. Calibration of heat flux gauges was completed at lower fluxes and then extrapolated to higher values and this resulted in a higher uncertainty in the flux measurement. Combining all of component uncertainties for total heat flux resulted in a total expanded uncertainty of - 24 % to + 13 % for the flux measurements.

Several load cells were utilized to measure fuel package mass. Each load cell was calibrated with a standard mass prior to recording the mass of each fuel item. All fuel items, such as chairs, paper, or computers, were then selected at random to be reweighed a second time in order to help estimate repeatability.

Expanded uncertainties (95 % confidence level) associated with oxygen calorimetry techniques, discussed in greater detail by Bryant et al. [12], are estimated to be 11 %.

Table 7. Estimated uncertainty in Experimental Data

	Component Standard Uncertainty	Combined Standard Uncertainty	Total Expanded Uncertainty
Gas Temperature Calibration [23] Radiative Cooling Radiative Heating Repeatability ¹ Random ¹	± 1 % - 5 % to + 0 % - 0 % to + 5 % ± 5 % ± 3 %	- 8 % to + 8 %	- 15 % to + 15 %
Total Heat Flux Calibration [24] Zero Soot Deposition Repeatability ¹ Random ¹	± 3 % - 2 % to + 2 % - 10 % to + 0 % ± 5 % ± 3 %	- 12 % to + 7 %	- 24 % to + 13 %
Mass of Fuel Package Zero Calibration Repeatability Random	± 0.02 % ± 1 % ± 5 % ± 3 %	± 9 %	± 18 %
Notes: 1. Random and repeatability evaluated as Type A, other components as Type B.			

Modeling With NIST Fire Dynamics Simulator

The NIST Fire Dynamics Simulator (FDS) is a computational fluid dynamics (CFD) model of fire-driven fluid flow. It solves numerically a form of the Navier-Stokes equations appropriate for low-speed, thermally driven flow with an emphasis on smoke and heat transport from fires [26]. Version 1 was publicly released in February 2000. The predictions performed here were made with the public pre-release version 4 of the model. Version 4 includes several new features such as multi-blocking which were critical in performing these calculations.

A CFD model requires that the room or building of interest be divided into small three-dimensional rectangular control volumes or computational cells. The CFD model computes the density, velocity, temperature, pressure and species concentration of the gas in each cell as it steps through time. Based on the laws of conservation of mass, momentum, species, and energy the model tracks the generation and movement of fire gases. Radiative heat transfer is included in the model via the solution of the radiation transport equation for a non-scattering gray gas. All solid surfaces are assigned thermal boundary conditions, plus information about the burning behavior of the material. Heat and mass transfer to and from solid surfaces is usually handled with empirical correlations. FDS utilizes material properties of the furnishings, walls, floors, and ceilings to compute fire growth and spread. A complete description of the FDS model is given in references [26, 27].

Smokeview

Smokeview is a scientific visualization program that was developed to display the results of an FDS model computation [28]. Smokeview allows the viewing of FDS results in three-dimensional snapshots or animations. Smokeview can display contours of temperature, velocity and gas concentration in planar slices. It can also display properties with iso-surfaces that are three-dimensional versions of a constant value of the property. Iso-surfaces are most commonly used to provide a three-dimensional approximation of the flame surface where fuel, heat and oxygen are present such that flames may exist.

FDS Inputs

Inputs required by FDS include the geometry of the structure, the computational cell size, the location of the ignition source, the energy release rate of the ignition source, thermal properties of walls, ceilings, floors, furnishings, and the size, location, and timing of door and window openings to the outside which critically influence fire growth and spread.

Geometry

FDS approximates the governing equations on a rectilinear grid. This three-dimensional grid represents the volume modeled by FDS. The grid is isolated from the surroundings, that is, all the smoke and heat generated by the fire stays within the grid and the air does not enter the grid. The user may, however, prescribe vents that allow smoke and heat to leave and air to enter the grid area. The user prescribes rectangular obstructions that are forced to conform to the underlying grid. Multi-blocking is a term used to describe the use of more than one rectangular grid or mesh in a calculation.

FDS predications are sensitive to grid size in that smaller cells will generally capture more features of the flow. The downside on using small cells is that the computation time increases more than linearly with increased number of grid cells. Computation times of one day on a fast computer are not uncommon but may increase to several months with a large number of grid cells. Therefore, is important to use the smallest number of grid cells that still capture the important features of the fire. One way to reduce the number of grid cells is the use of multi-blocking. With multi-blocking smaller grid cells that capture more detail are used near the fire and larger grid cells with less detail are used remote from the fire.

Building items such as walls, floors, windows, doors and furniture are described in FDS as rectilinear blocks. These blocks must have sides that are either horizontal or vertical and no sloped or curved surfaces are allowed. The blocks may be colored for identification and may be assigned material properties. The blocks may be entered into the simulation with exact measurements from the building. However FDS can only work with items that fall exactly on grid cell boundaries. FDS takes the input blocks and adjusts them to match the grid cell boundaries. As a result, items may either grow or shrink to match the grid. In most cases this does not have a major impact on the calculations, although it can result in walls with no thickness or walls with gaps at intersections. Usually these issues are resolved by adjusting the size of the blocks slightly to produce the desired geometry that matches the grid size.

The Cook County Administration Building, 69 West Washington Street, Chicago, Illinois is 37 stories tall with one level below grade. It was constructed of reinforced cast-in-place concrete with concrete and glass panel exterior walls. Figure 94 shows a view of the building from the West Washington Street side.



Figure 94. Cook County Administration Building, 69 West Washington Street – view from northwest

The core that contains the elevators and two stairs is masonry and concrete construction. The southeast stairs were designed as a “smoke-proof tower” (Figure 95). The stairs contained a vestibule with a louvered vent to a smoke shaft that extended to the roof of the building. Figure 96 shows a detailed plan of the southeast stairs. The partition walls were 1.59 cm (5/8 in) thick type X gypsum board on steel studs. On the 12th floor the partitions extended from floor to a drop ceiling in all areas except the core. The drop ceiling was 2.7 m (8.8 ft) above the floor and the distance from floor to floor was 3.8 m (12.5 ft). Ventilation supply to the floor was provided by fixed and flexible ducts from the supply air duct shafts in the core to ceiling mounted supply registers throughout the area. Return air registers in the drop ceiling led directly to the space between the drop ceiling and the underside of the concrete floor above. The space between the drop ceiling and the floor above served as the return air plenum. Return air traveled through the plenum to return air duct shafts in the core. Figure 97 shows areas of significant damage within the building.

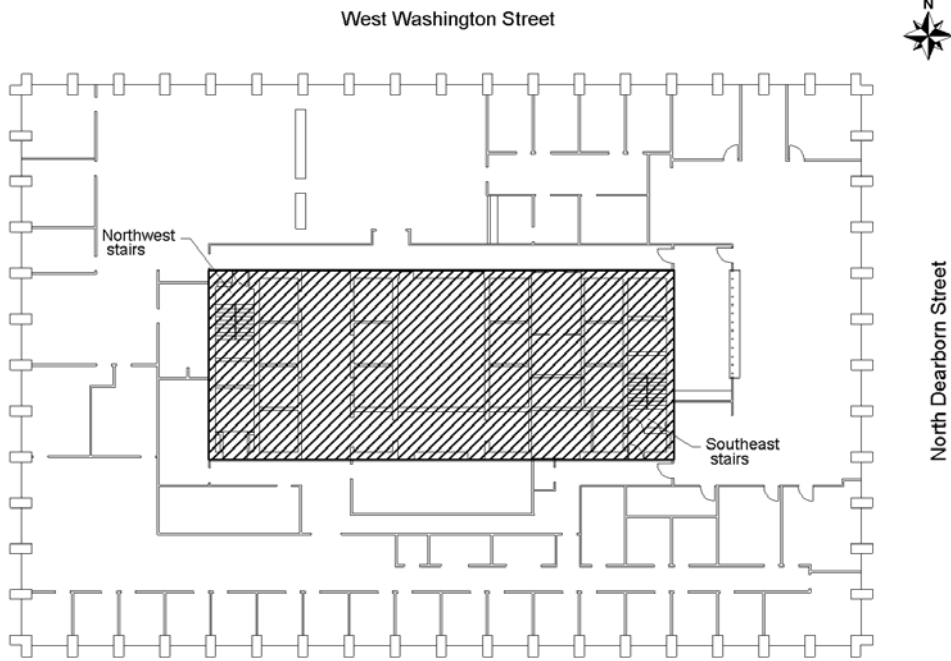


Figure 95. Building core, 12th floor

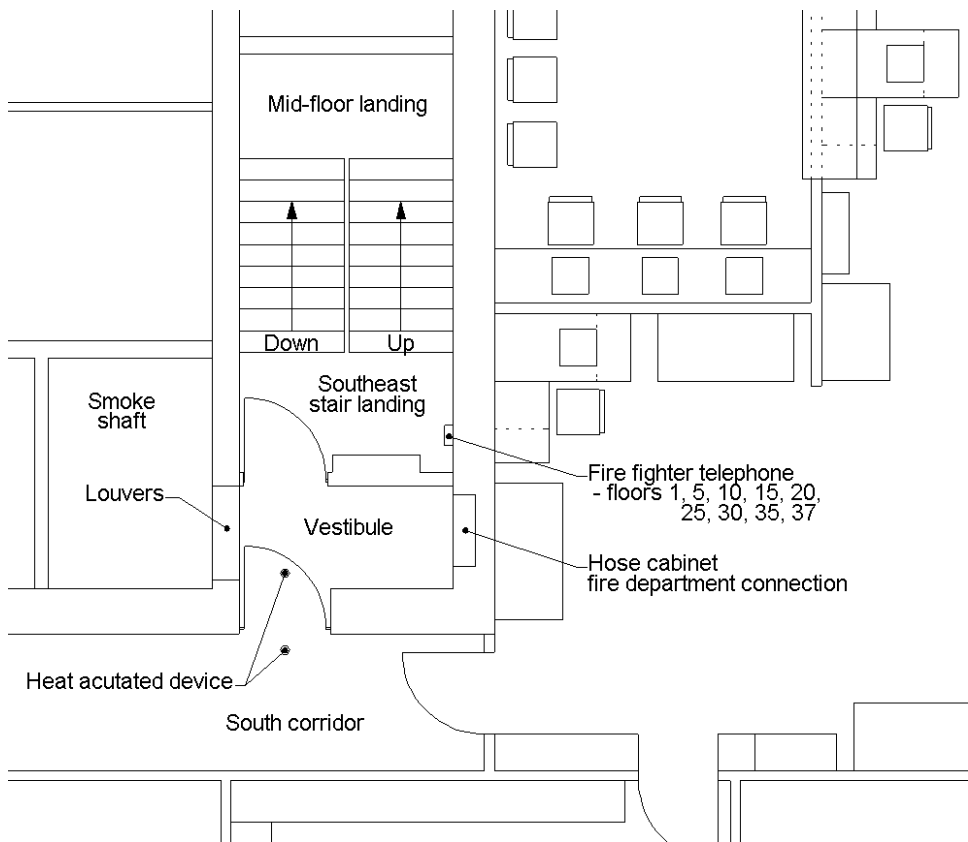


Figure 96. Plan of southeast stairs, 12th floor

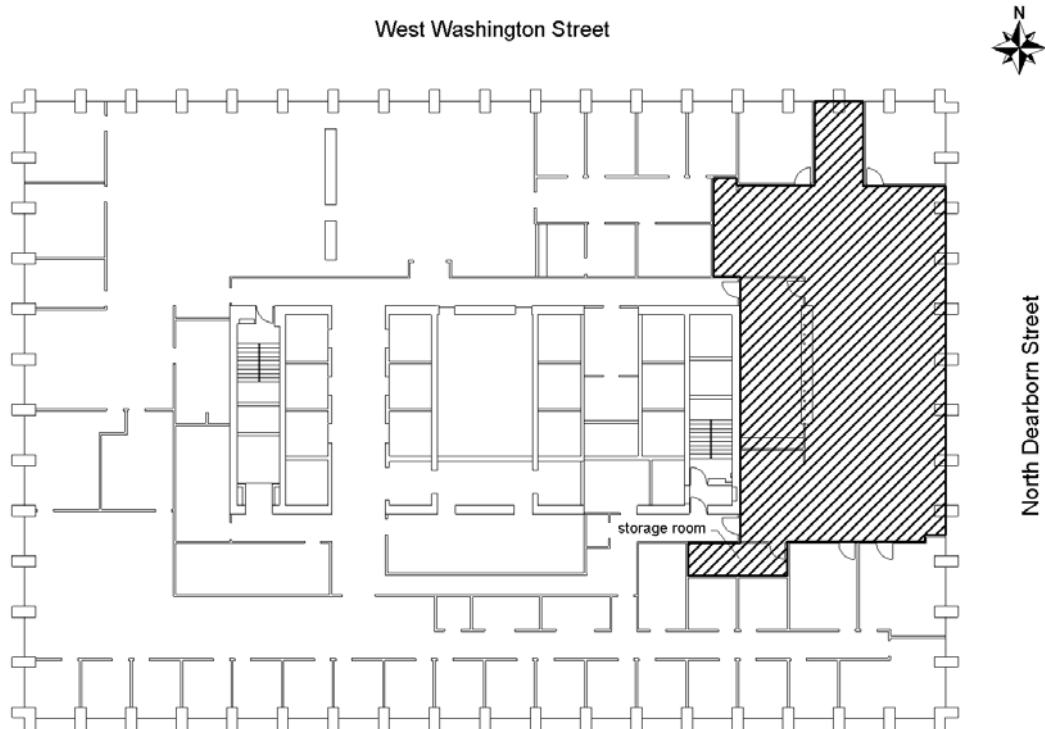


Figure 97. Area of significant fire damage, 12th floor

The 12th floor of the building at 69 West Washington Street was modeled with FDS using dimensions taken from floor plans and measurements made after the fire. The area including the fire suite had 130 000 grid cells 0.28 m (11.0 in) by 0.29 m (11.4 in) by 0.19 m (7.5 in) high. The area outside the fire area was comprised of two blocks with a total of 49 248 grid cells 0.5 m (19.7 in) by 0.5 m by 0.47 m (18.5 in) high. The grid was slightly larger than the floor area and extended from the top of the 12th floor slab to the top of the 14th floor slab, one story up. There was no floor labeled as the 13th floor in the building. The southeast stairs were modeled with 55 440 grid cells 0.28 m (11.0 in) by 0.29 m (11.4 in) by 0.19 m (7.5 in) high. This grid included the stairwell and smoke shaft from the 14th floor to the 27th floor. The 27th floor was selected to be far enough away from the 12th floor to examine the initial phase of flow in the stairs. Figure 98 shows the building as modeled by FDS without the stairs looking from the south. The black lines around the floor show the extent of the grid. Figure 99 shows the building with the floor slab above the 12th floor removed and Figure 100 with the drop ceiling removed. Figure 101 is a close up view within the Secretary of State Business Services, Suite 1240, showing the grid structure used. From this view the furniture within the suite can be seen. Figure 102 shows a cutaway through the building with the southeast stairs.

NIST

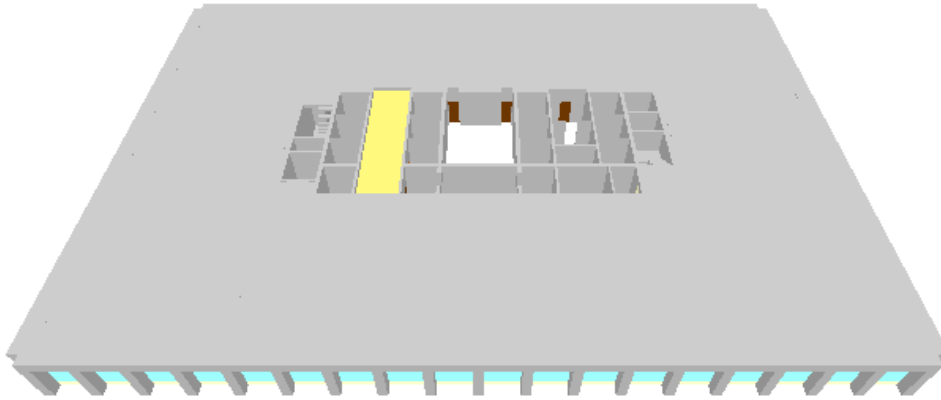


Figure 98. 12th floor viewed from south

NIST

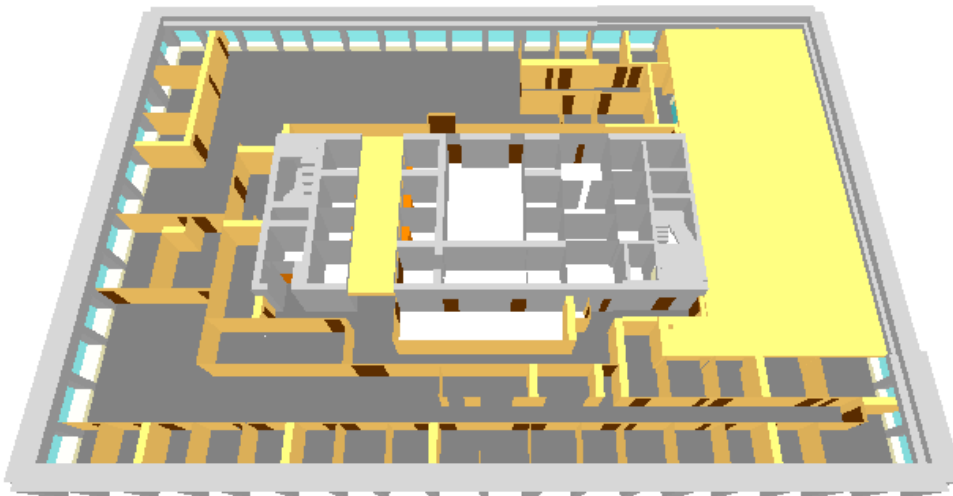


Figure 99. 12th floor with floor slab above removed

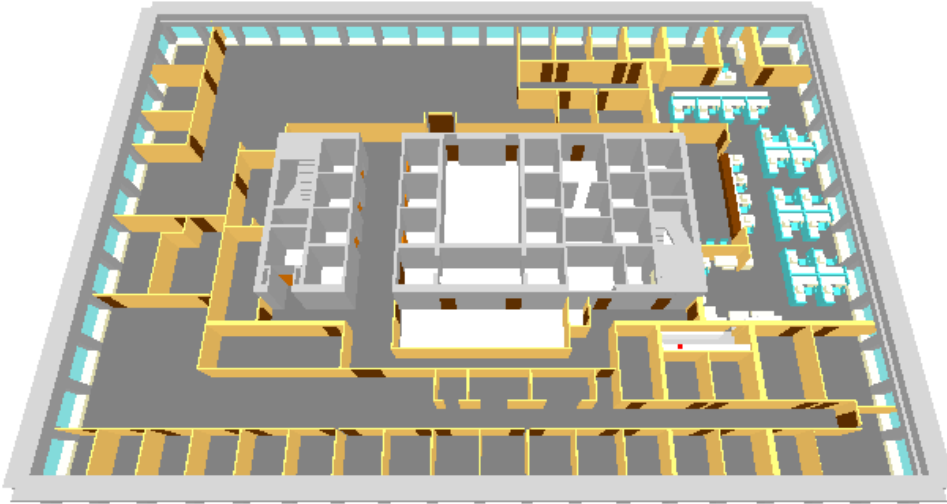


Figure 100. 12th floor with floor slab above and drop ceiling removed

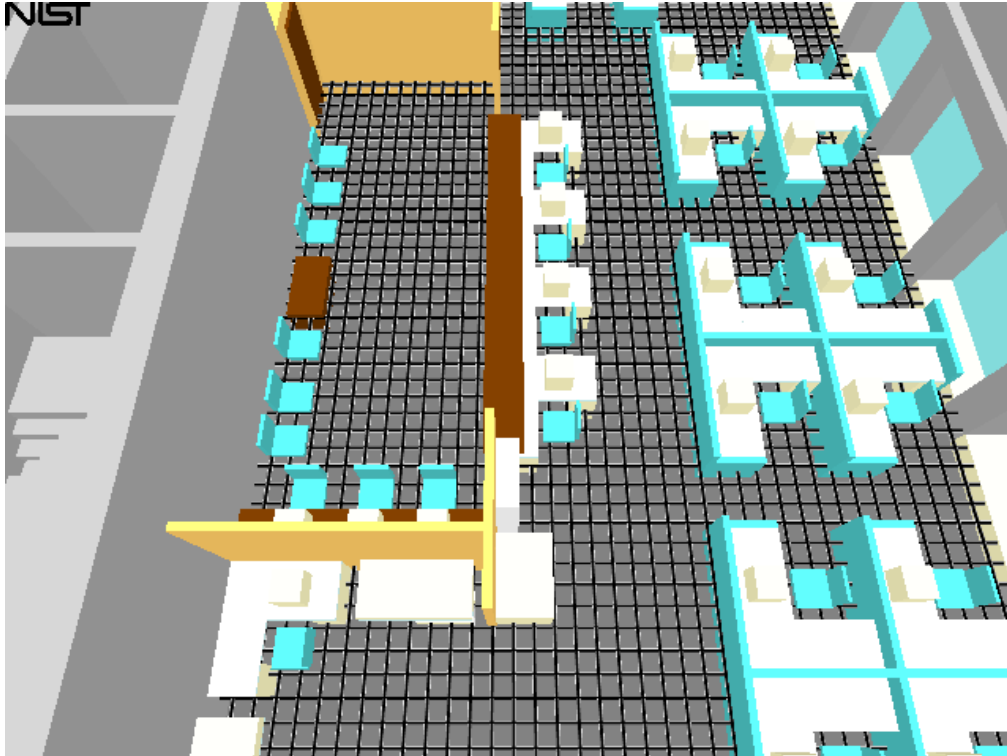


Figure 101. Example of grid in suite where fire occurred

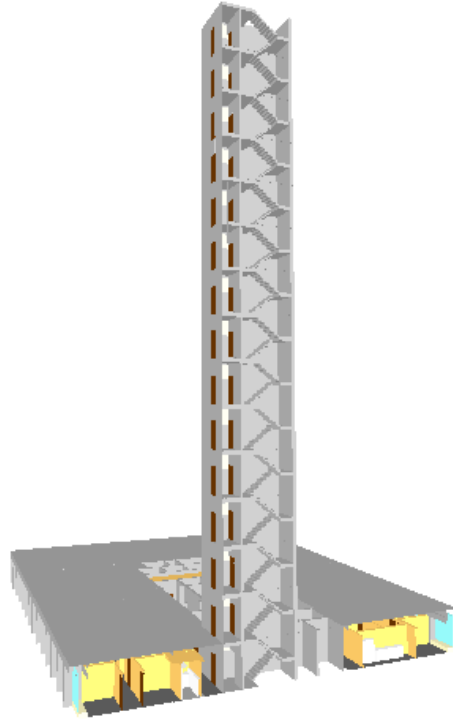


Figure 102. Cutaway view of southeast stairs

Vents

Vents in FDS are openings from the model to ambient conditions outside the computational domain. Vents allow smoke and heat to leave the grid area and air to enter. Vents may be either simple openings that allow natural flow to occur based on the buoyancy of the hot gases, or vents may use a specified or forced flow rate such as the flow from a fan. Both types of vents were used in the model of the 12th floor. Natural vents to the outside were placed along the north and east side of the grid in front of the windows that broke-out during the fire. Natural vents were also placed over the southeast stairs at the level of the 14th floor slab at the top of the grid. Looking at the building from the northeast corner the natural vents are shown in Figure 103 with outlines. When the smoke shaft was simulated a vent was placed at the top of the shaft.

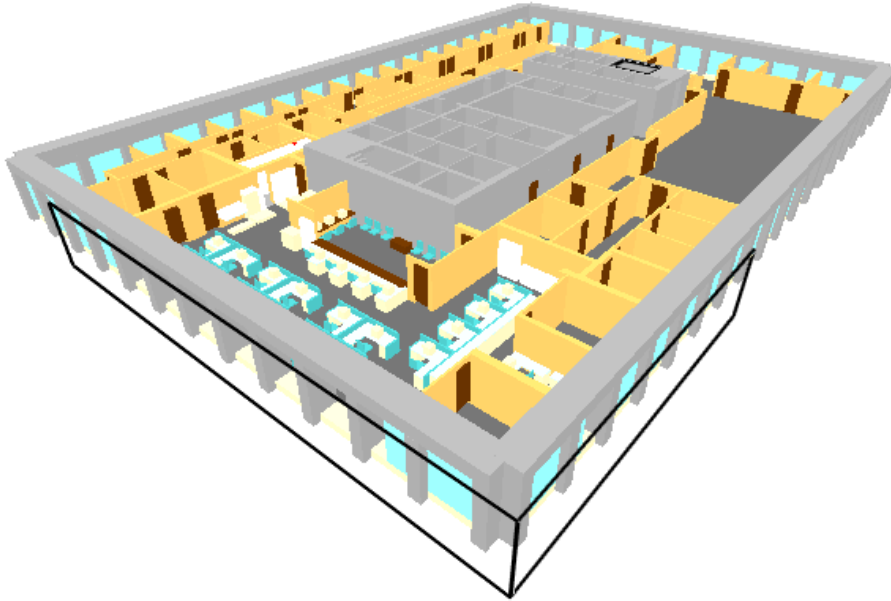


Figure 103. Vents to the outside – outlines

At the time of the fire the wind speed was less than 1.1 m/s (2.5 mph) and the temperature was approximately 13° C (55° F) at both O’Hare and Midway airports. Since the wind speed was very low, no outside wind conditions were simulated at the vents.

In the storage room, a single forced ventilation vent was used to represent the air supply register. The design airflow from the register was 0.054 m³/s (115 ft³/min). The air supplies within the building were designed to shut down upon smoke detector activation so supplies in other parts of the floor should not have been operating when the fire reached them.

Openings Within the Grid

The placement of blocks within the grid forms the structure of the building and its contents. The hydrodynamic calculations performed by FDS allow air, hot gases, smoke and flames to move through the building. Thermal radiation, like light, travels by line-of-sight and may be intercepted by obstacles within the grid.

Normal buildings may appear tightly constructed, but there are many small openings or leaks within a building that allow for the flow of air or combustion products. Since objects can only exist at grid boundaries, small leaks may be created by either using a very small grid size, or by representing many small leaks by fewer large leaks. The latter

was used for this building. Leaks from the fire suite were represented by removing a one grid cell high block from the top and bottom of several doors and a window. This process is sometimes referred to as undercutting or overcutting a door or window. The doors and window with undercut and overcuts are shown in Figure 104.

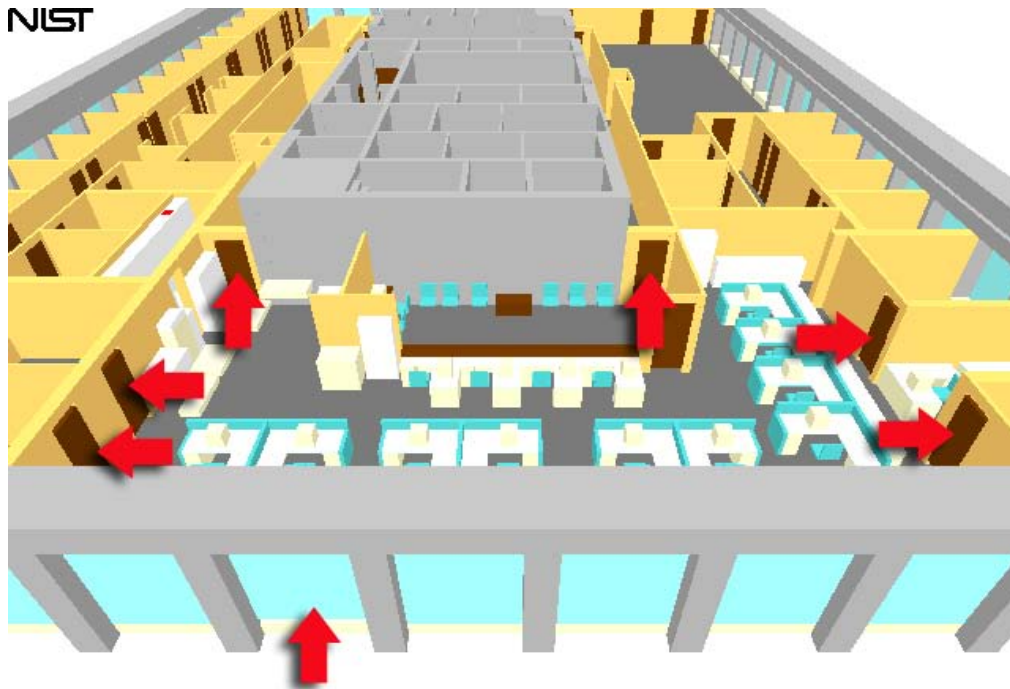


Figure 104. Doors and window with undercut and overcut

There were numerous return air registers in the drop ceiling throughout the floor connecting the office space to the space above the drop ceiling. Rather than model all of these openings individually, the drop ceiling outside the fire area was removed from the calculation. This allowed smoke and hot gasses in the space above the ceiling to infiltrate the entire floor. The return air registers in the suite where the fire was were represented by a single opening in the ceiling on the northwest side of the suite.

The leaks into the elevator shafts, other parts of the building core, and outside walls of the building were represented by leaving the door the northwest stairs open. Although this door was not continuously open during the fire, it was selected since it was relatively far from the fire. The vent to the outside of the grid at the top of the stairs allowed some of the smoke and hot gasses to leave the floor. During the fire, smoke was reported on a number of floors above the fire area.

During the course of a fire, some items within the building may be consumed by the fire or otherwise change position. FDS does not have the capability to calculate burn-through or collapse but the user can remove items during the course of the calculations. Items

that are removed can represent objects that fall or are destroyed by the fire, or objects that are changed by people such as doors that are opened.

Windows on the east and north side of the building were broken out by the fire. Figure 105 is a photograph of the building taken from the northeast corner several weeks after the fire. The plywood-covered windows on all but one window on the east side can be used to identify the 12th floor. Also, the smoke stain on the side of the building originates at the 12th floor. Other plywood-covered windows were broken by the fire department to remove smoke and heat from the building.



Figure 105. 69 West Washington Street – northeast corner

The exact time of window breakage on the 12th floor could not be determined. The first arriving fire department units reported “nothing showing” but were located on the West Washington Street side and would not have had a clear view of the windows on the Dearborn Street side. Witnesses described windows breaking around the time of the fire department arrival. The flaming fire was believed to have started at approximately 17:00:00 and the first fire department units were on the scene at 17:06:29. Using 17:00:00 as the start of the simulation, windows were removed in the model at the times shown in Table 8. The window locations were based on the column letters and numbers corresponding to columns in the original design plans for the building. The lettered columns ran from north to south and the numbered columns ran from east to west. The

building columns were spaced 2.84 m (9.3 ft) on center. The column letters and numbers are shown in Figure 106. There were no columns 1, A, I, or O.

Table 8. Objects removed during simulation

Object Removed	Simulation Time	Clock Time
East window – columns K-J	360 s (6 min)	17:06:00
East window – columns L-K	400 s (6 min 40 s)	17:06:40
East window – columns J-H	450 s (7 min 30 s)	17:07:30
East window - columns H-G	500 s (8 min 20 s)	17:08:20
East window – columns G-F	550 s (9 min 10 s)	17:09:10
East window – columns F-E	600 s (10 min)	17:10:00
East window – columns E-D	650 s (10 min 50 s)	17:10:50
Drop ceiling fire suite	660 s (11 min)	17:11:00
East window – columns D-C	700 s (11 min 40 s)	17:11:40
North window - columns 4-5	700 s (11 min 40 s)	17:11:40
North window - columns 3-4	720 s (12 min)	17:12:00
Southeast stair door	930 s (15 min 30 s)	17:15:30
Smoke shaft vent	930 s (15 min 30 s)	17:15:30

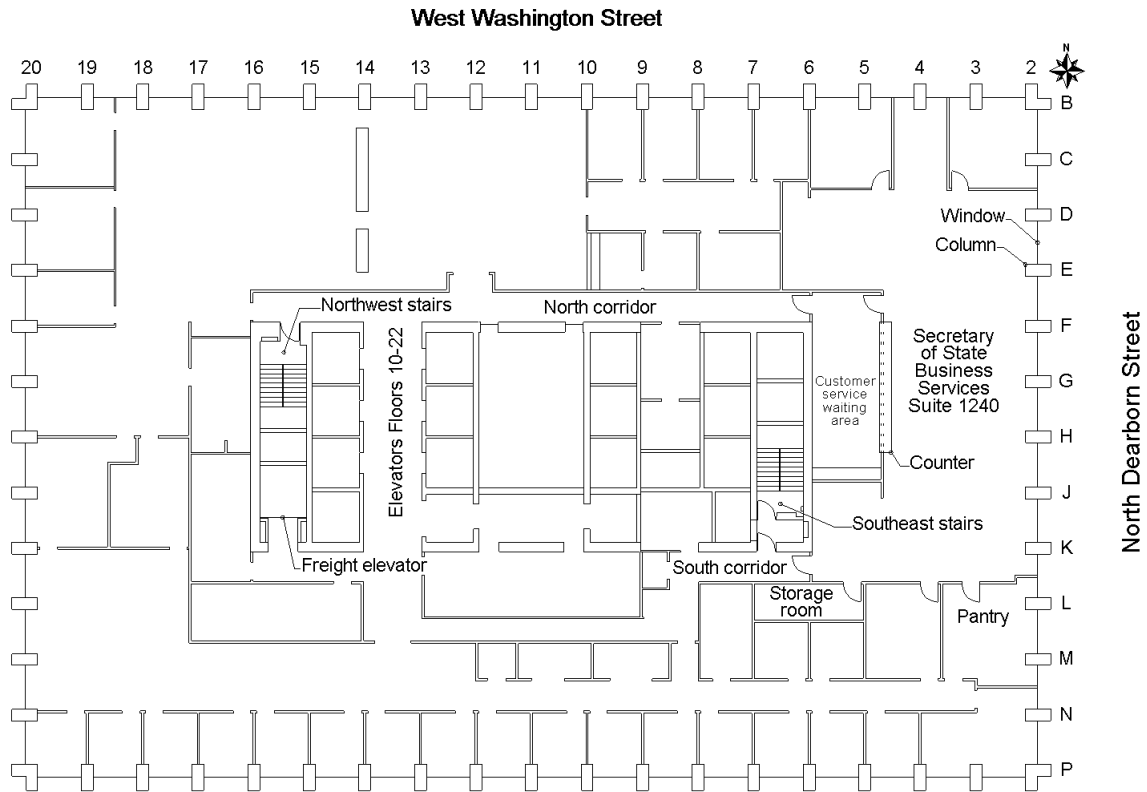


Figure 106. Building column numbers

At the end of the fire, the entire drop ceiling in the fire suite had fallen. It is not known at what time the ceiling fell, but during the four workstation experimental burn at NIST, the ceiling began to fall at 270 s (4 min 30 s). The grid supporting the ceiling partially collapsed at 305 s (5 min 5 s) after ignition. In order to include the effect of falling ceiling, the main part of the drop ceiling in the fire area was removed after 660 s (11 min). Although the ceiling was removed in the simulation, the ceiling tiles did not fall to the floor and continue to burn. The removed material simply disappeared from the simulation.

The fire department entered the 12th floor through the southeast stairwell to fight the fire. The exact time the stairway door was opened is not known. The fire pump in the building started at 17:16:04 indicating that the fire department was flowing water. Assuming the door was opened a short time before a hose line was in operation, the door was opened at 930 s (15 min 30 s) into the simulation. For the model simulation with the smoke shaft, the vent to the shaft was also opened at 930 s (15 min 30 s). To enhance the view of the model results, views of the building before 930 s (15 min 30 s) did not include the southeast stairs above the 12th floor.

Another object that moved during the fire was the paper material stacked outside the storage room. During the course of the fire a significant amount of this paper fell off the stacks onto the floor. Since objects cannot be moved during an FDS simulation, material was placed on the floor in front of the stacks of paper. Figure 107 shows the materials on the floor after the fire. Some of the material had been moved to create a walkway. Figure 108 shows the material on the floor in the FDS model.



Figure 107. Material on floor in front of storage room

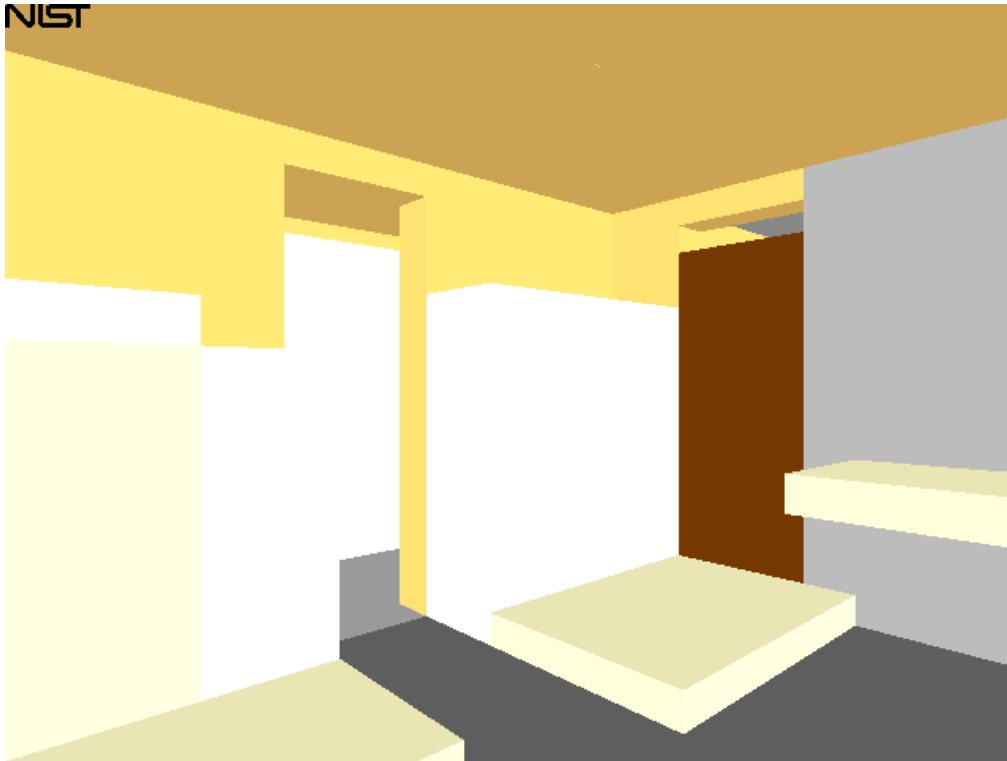


Figure 108. Material on floor in front of storage room in model

Materials

When a wall, ceiling, piece of furniture, or any other material is defined for use in the FDS model, it is given a set of physical and thermal properties that are used by the model. Some of these properties such as thermal diffusivity, thermal conductivity, density and thickness impact the heat transfer in the material. For materials that burn, additional parameters such as ignition temperature, heat of combustion, heat of vaporization and maximum burning rate are specified. The properties for most of the materials were taken from standard references or fire experiments. Two of the materials used were modified for this project.

The material on the shelves of the storage room was specified as a modified paper. The contents of the storage room shelves were mostly paper materials. Since objects in FDS are blocks with smooth surfaces, using paper for the storage room shelves would result in modeling the material on the shelves as blocks of solid paper. A solid block of paper is difficult to ignite with a small fire source and would not spread flame easily. The material on the shelves had many small surfaces, some of which would ignite and facilitate flame spread. To model the materials on the shelves, the ignition temperature of the paper was reduced. This material was also used for stacks of paper materials in other areas of the fire suite.

To simulate miscellaneous material on the desktops throughout the suite, the properties of the blocks that represent computer monitors were modified to include these materials. The properties of the modified computer monitor blocks were based on the Factory Mutual Research Corporation standard plastic test commodity that has previously been used in FDS simulations [29]. In this case, the density of the standard commodity was increased by a factor of five to represent the collected computer monitor and desktop items. The combustible items in the desk drawers were not included since they would not have played a significant role during the period of the simulation. The floor of suite 1240 except for the storage room was covered with carpet. The vertical windows blinds were not included since they would have melted and fallen early in the fire and the blinds did not contribute a significant quantity of fuel when compared to the other items in the suite.

The selection of material properties can have a significant impact on FDS predictions, particularly when the fire is small. The determination of material properties is one of the most difficult aspects of FDS utilization. Ideally, extensive small and large scale testing and model verification are utilized to characterize material properties. For these simulations, material properties were adjusted to match the known sequence of events.

Ignition Source

The ignition source at 69 West Washington Street was unknown, however, an ignition source or initial fire is required in FDS to start the simulation. Since fuels are described as flat surfaces, it is generally not possible to use an ignition source as small as a match. The simulation, with the specified grid size, would not capture the small three-dimensional features that contribute to the ignition of materials with a fire source the size of a match.

According to the statements in public depositions by the occupants of the Secretary of State Business Services, Suite 1240, when the fire was first discovered, it was at the top of the storage room near a light fixture. The occupants of Suite 1240, left the suite and could provide no further information on the growth of the flames, other than the suite was filling with smoke.

This simulation did not address the source of ignition. Instead, a small flaming fire with a prescribed burning rate was used to initiate the fire in the suite. The small flaming fire would correspond to the fire described by the occupants. The initiating fire was the size of one grid cell and is shown by the large red square in Figure 109. It grew linearly from a heat release rate of 0 kW/m² at the start of the simulation to 1.5 kW/m² at 340 s (5 min 40 s) into the simulation and back to 0 kW/m² at 345 s (5 min 45 s). This fire was adequate to start other materials burning on the top of the shelves in the storage room.



Figure 109. Fire source and fire sprinkler locations

Sprinklers

FDS has the ability to model the activation of automatic fire sprinklers and impact of the water from the sprinklers on the growth of a fire [29]. Although there were no sprinklers installed on the 12th floor at the time of the fire, a complete automatic fire sprinkler system was being installed in the building as a result of the fire. In the simulation, two sprinklers were placed in the storage room to examine the impact of sprinklers on the fire. Typical standard response, K-5, pendent sprinklers with a K factor of $81 \text{ L/min}/(\text{bar})^{1/2}$, activation temperature of 74° C (165° F) and a response time index of $150 (\text{m}\cdot\text{s})^{1/2}$ were used. Each sprinkler was centered in one half of the storage room, which would be common installation practice. The sprinklers are the two small red squares in Figure 109.

Model Uncertainty

FDS can provide valuable insight into how a fire may have developed. However the model is only a simulation. The model output was dependent on a variety of input values such as material properties, time lines, geometry, and ventilation openings. Since complete knowledge of every detail of the fire site, fuel load or fire timeline was not available; estimations are incorporated into the model. For example, the estimation of the energy release rate of an initial “source fire” as a starting point for fire development and spread throughout the structure was a necessary part of re-creating this fire scenario.

The ability of the FDS model to predict accurately the temperature and velocity of fire gases has been previously evaluated by conducting experiments, both lab-scale and full-scale, and measuring quantities of interest. For relatively simple fire driven flows, such as buoyant plumes and flows through doorways, FDS predictions are within the experimental uncertainty of the values measured in the experiments [29]. For example, if a gas flow velocity is measured at 0.5 m/s (1.6 ft/s) with an experimental uncertainty of ± 0.05 m/s (± 0.2 ft/s), the FDS model gas flow velocity predictions were also in the range between 0.45 m/s and 0.55 m/s (1.5 ft/s and 1.8 ft/s).

In large scale fire tests reported in [30], FDS temperature predictions were found to be within 15 % of the measured temperatures and the FDS heat release rates were predicted to within 20 % of the measured values.

For a complex building such as the one modeled here, there are a significant number of approximations and input options. Although FDS is physics based model, the predictions can vary widely depending on the inputs selected. The principal object in generating the model input for this case was to match the fire growth to observations during the fire and the examination of the fire scene after the fire. The model can then be used to examine the conditions that would likely have occurred in the building during the course of the fire. The model can also provide insight into alternative scenarios such as the presence of sprinklers or the operation of the vent to the smoke shaft.

Discussion of Model Results

FDS can provide a wide range of output files for visualization in Smokeview. One of the most useful for examining fire spread is a red colored iso-surface where air and fuel are present at the proper ratio for burning, such that flames would likely exist. In the following figures describing fire spread the smoke is not displayed to clarify the flame visualization. Figure 120 shows the 12th floor viewed from the east with areas above the drop ceiling removed. The time in the lower left corner is the simulation time in minutes and seconds and the bar represents the fraction of the total simulation time of 990 s (16 min 30 s). The total simulation time corresponds to the approximate time the fire fighters began applying water to the fire on the 12th floor. The application of water would have had an impact on the fire and smoke conditions that could not be predicted by FDS.

Fire Spread

At 150 s (2 min 30 s) into the simulation, a small fire can be seen on the top of the shelves in the storage room (Figure 110). At 220 s (3 min 40), the fire was spreading along the top of the shelves (Figure 111). At 242 s (4 min 2 s) flames were beginning to extend outside the storage room (Figure 112). Figure 113 is a view from inside the suite at same time. At 300 s (5 min) flames were involving the material stacked outside the

storage room and the material on the floor (Figure 114). At 360 s (6 min) the fire began to spread to the materials across from the storage room (Figure 115). Figure 116 shows the oxygen concentration in a vertical plane or slice through the building. The color bar on the right gives the oxygen in volume fraction with normal air being blue and no oxygen being red. From this figure it can be seen that the oxygen concentration near the storage room was very low. Figure 115 shows that flaming within the storage room was limited to the area near the door due to the lack of oxygen within the room. Figure 117 shows the shelves in the storage room after the fire, with considerable combustible materials remaining. At 390 s (6 min 30 s) flames were beginning on the workstations (Figure 118) and the first window was removed. At 420 s (7 min) two windows were removed (Figure 119) and at 450 s (7 min 30 s) flames spread across several workstations with three windows removed (Figure 120). At 540 s (9 min) flames were across approximately one-half the suite (Figure 121).

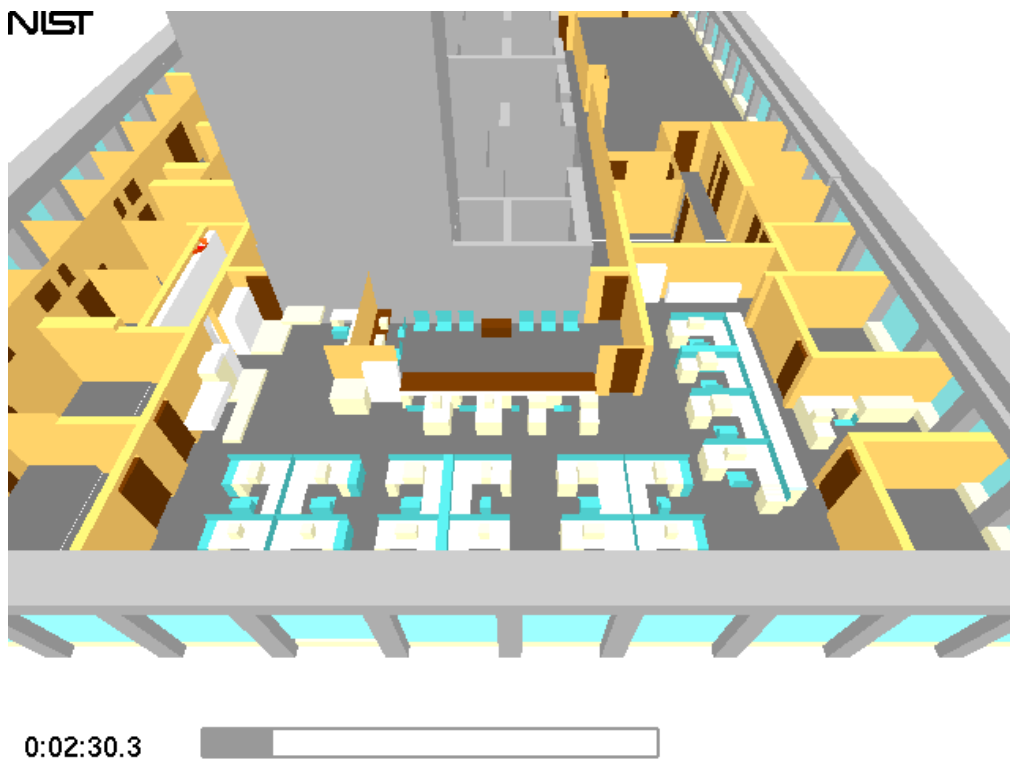


Figure 110. Flame iso-surface at 150 s (2 min 30 s)

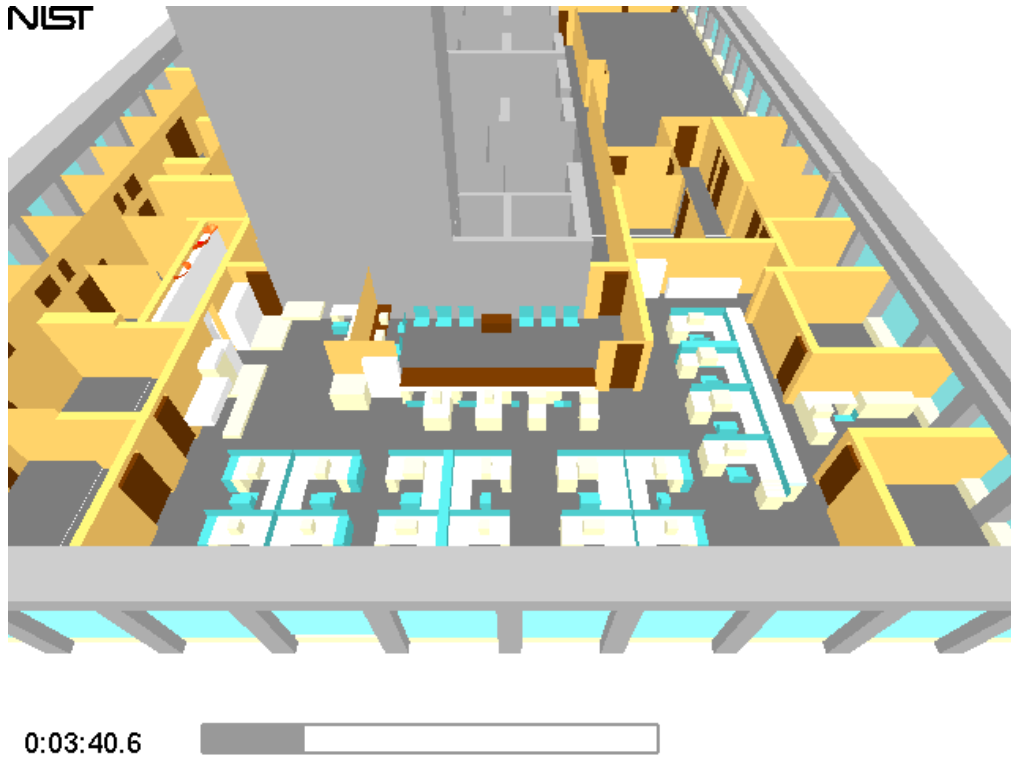


Figure 111. Flame iso-surface at 220 s (3 min 40 s)

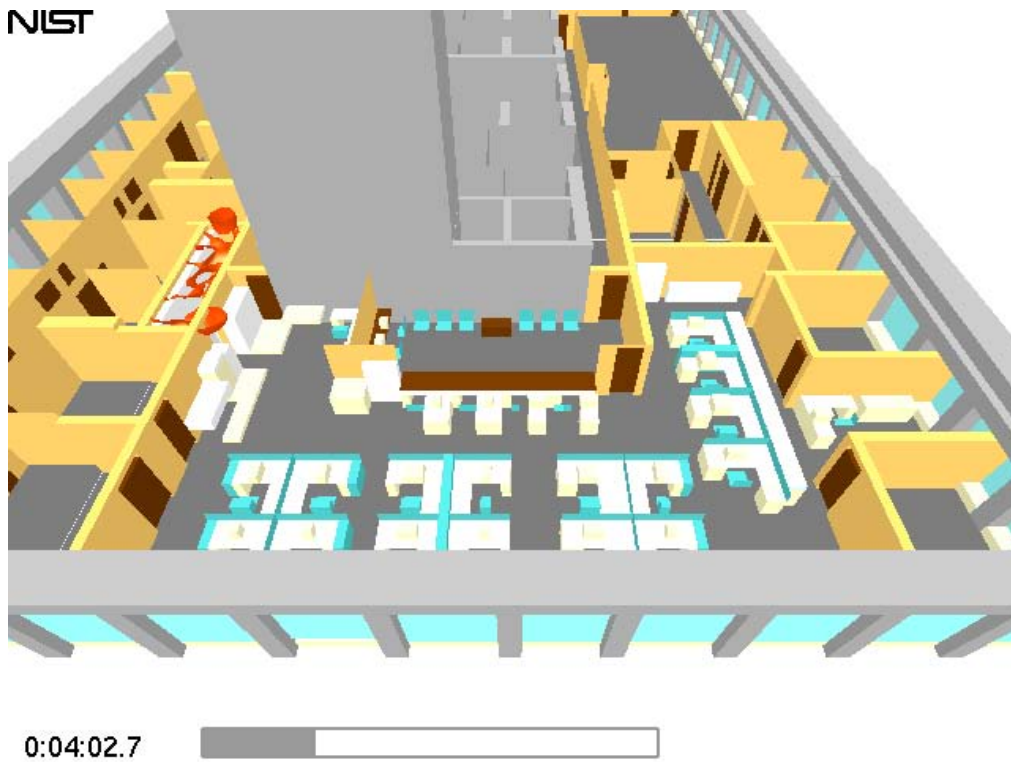


Figure 112. Flame iso-surface at 242 s (4 min 2 s)



0:04:02.7

Figure 113. Flame iso-surface at 242 s (4 min 2 s), inside view



0:05:00.7

Figure 114. Flame iso-surface at 300 s (5 min), inside view

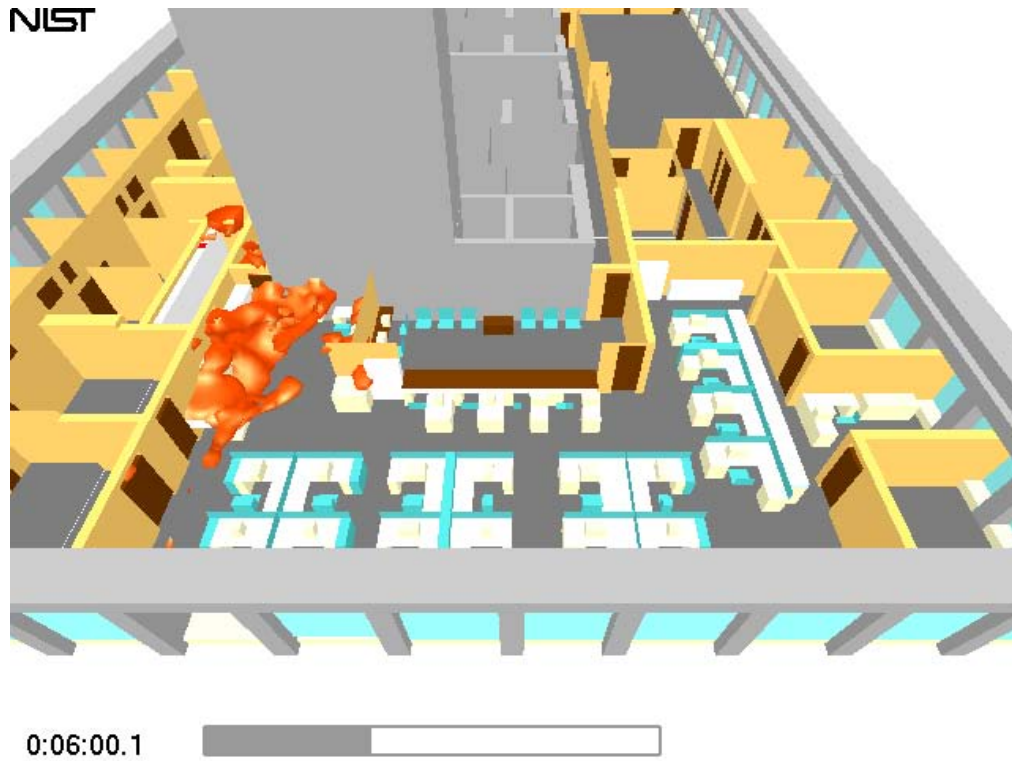


Figure 115. Flame iso-surface, 360 s (6 min)



Figure 116. Oxygen concentration, 360 s (6 min)



Figure 117. Material on storage room shelves after fire

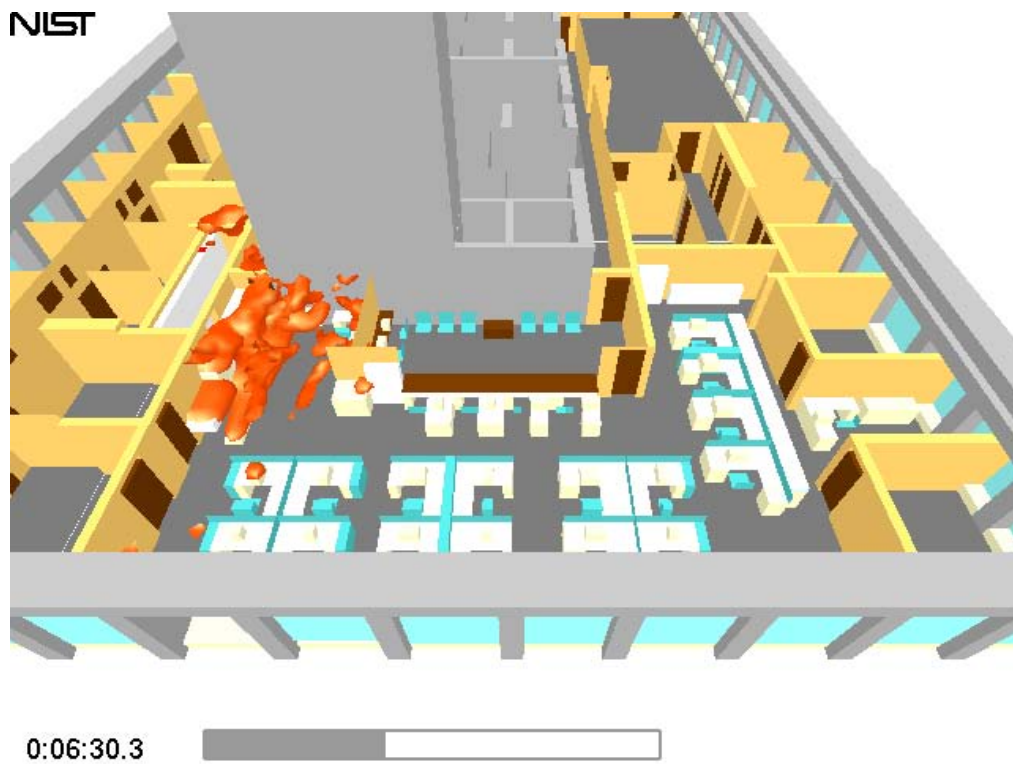


Figure 118. Flame iso-surface at 390 s (6 min 30 s)

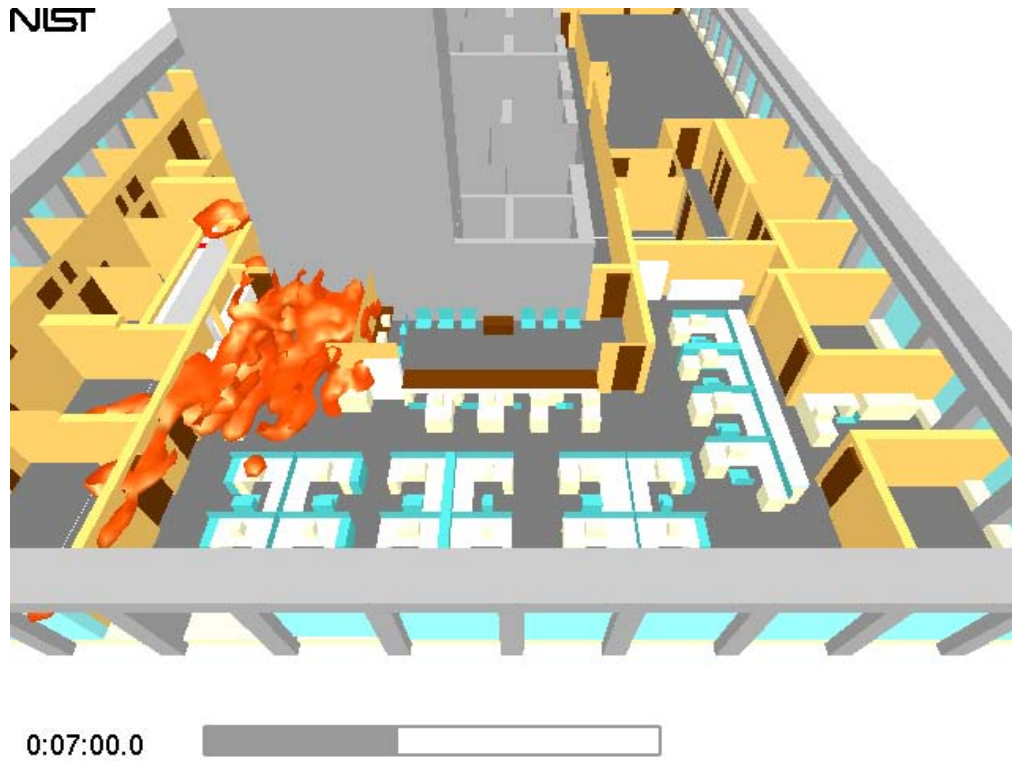


Figure 119. Flame iso-surface at 420 s (7 min)

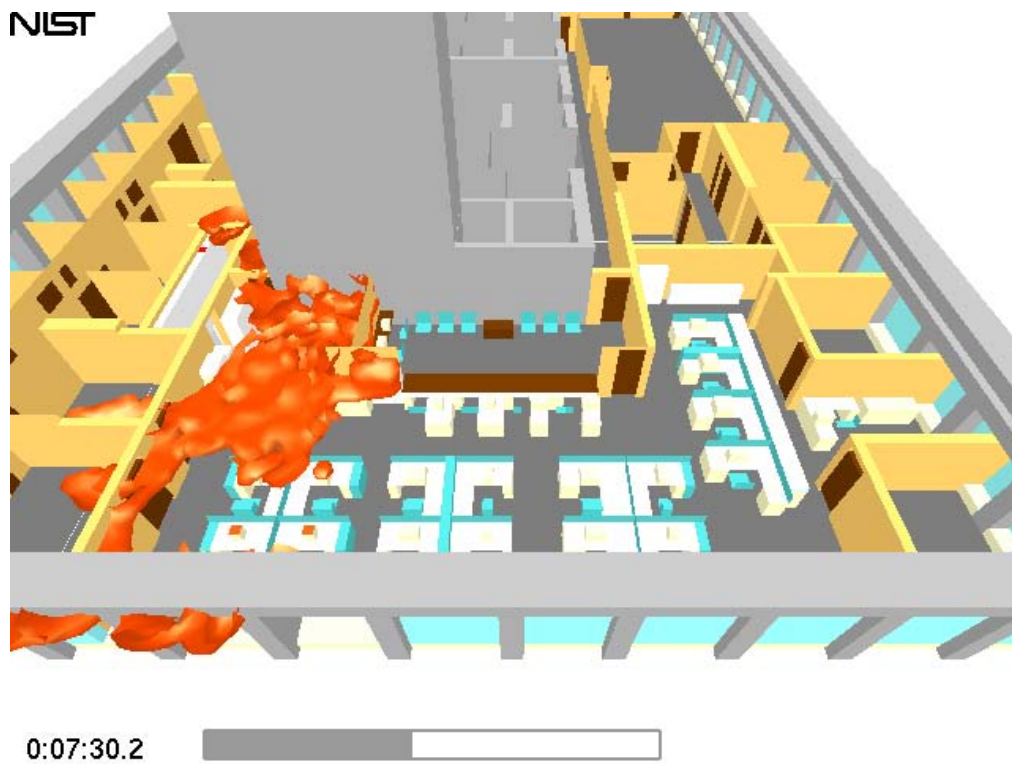


Figure 120. Flame iso-surface at 450 s (7 min 30 s)

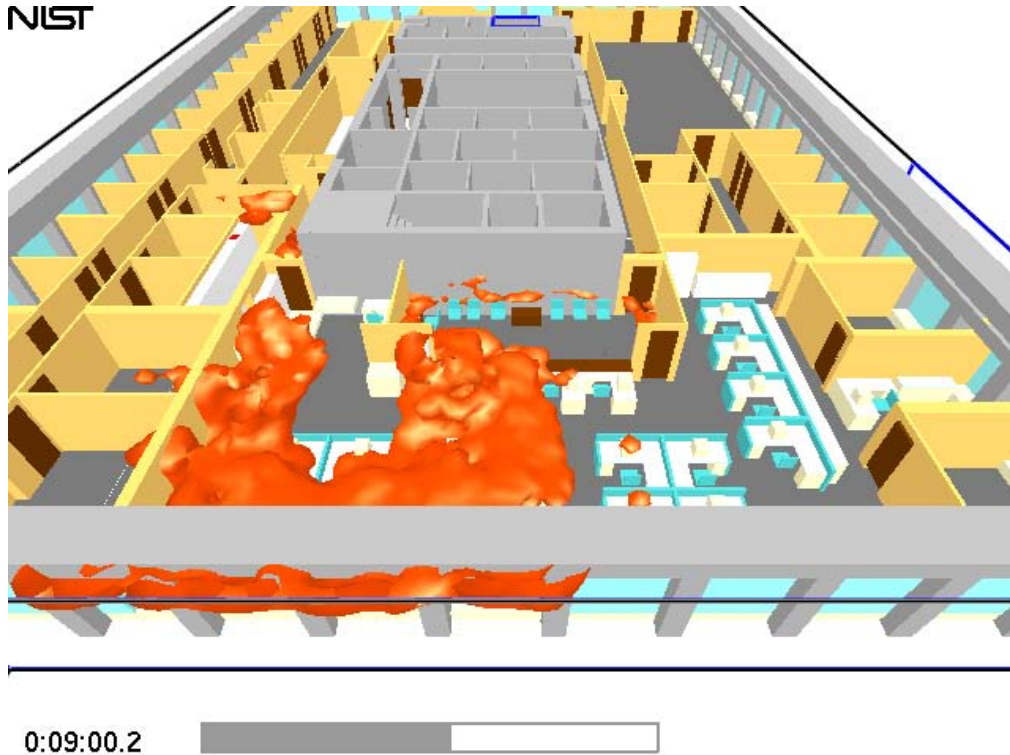


Figure 121. Flame iso-surface at 540 s (9 min)

At 660 s (11 min) flames were nearly across the entire suite and the main area of the drop ceiling in the suite was removed. Figure 122 shows the drop ceiling just before it was removed from the simulation and Figure 123 just after it was removed. There was little flaming in the waiting area due to the very low oxygen concentration in that area. At 720 s (12 min) the last window on the north side was removed (Figure 124). The fire at that point had reached basically a steady burning rate limited by the oxygen available primarily through the windows. Figure 125 shows a graph of the heat release rate, which although fluctuating, began to level off at approximately 29 MW. It is likely the fire would have continued at approximately this rate until the fuel was consumed if no other ventilation was provided and the fire did not cause the failure of the walls or doors in the fire suite.

NIST

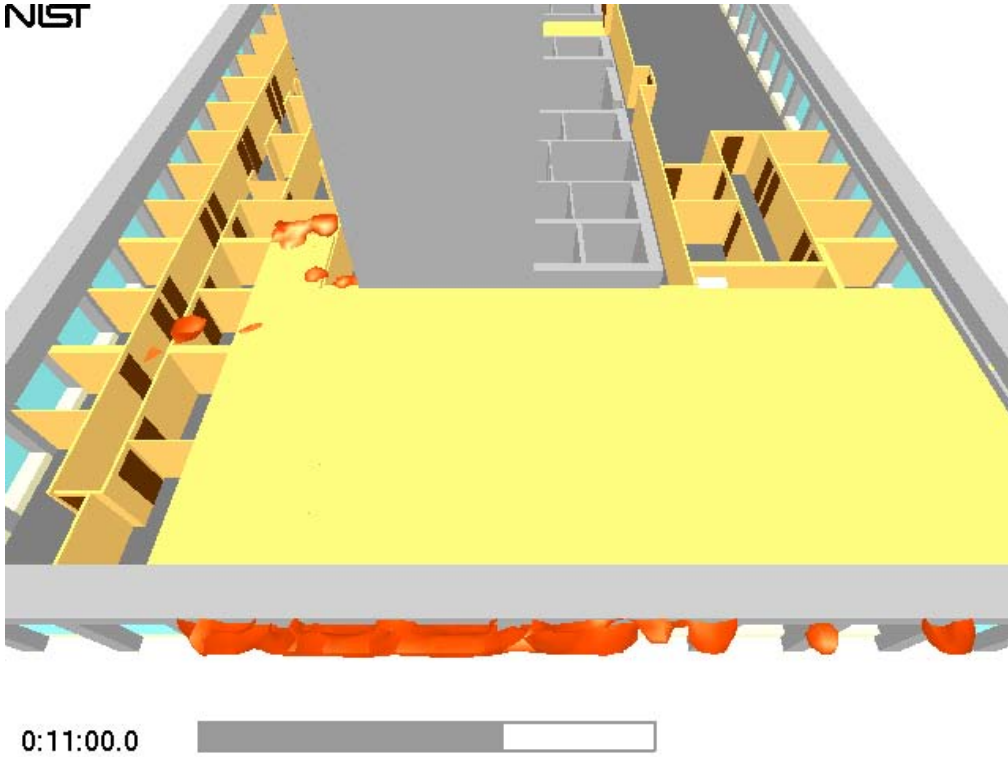


Figure 122. Flame iso-surface at 660 s (11 min), before drop ceiling removed

NIST

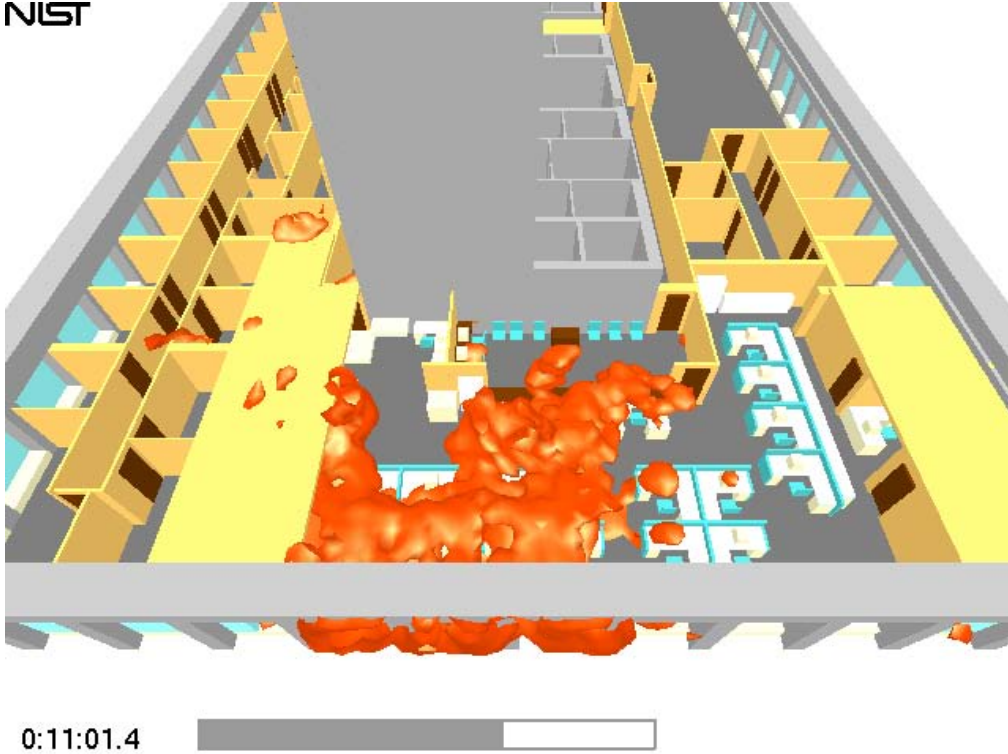


Figure 123. Flame iso-surface at 661 s (11 min 1 s), after drop ceiling removed

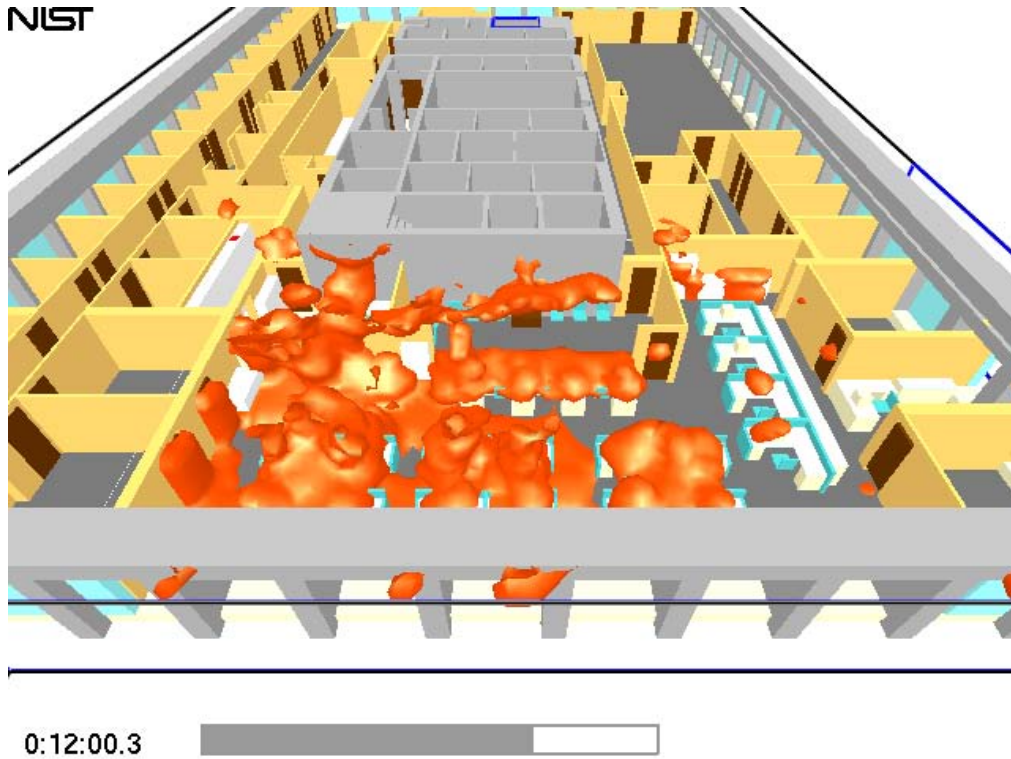


Figure 124. Flame iso-surface at 720 s (12 min)

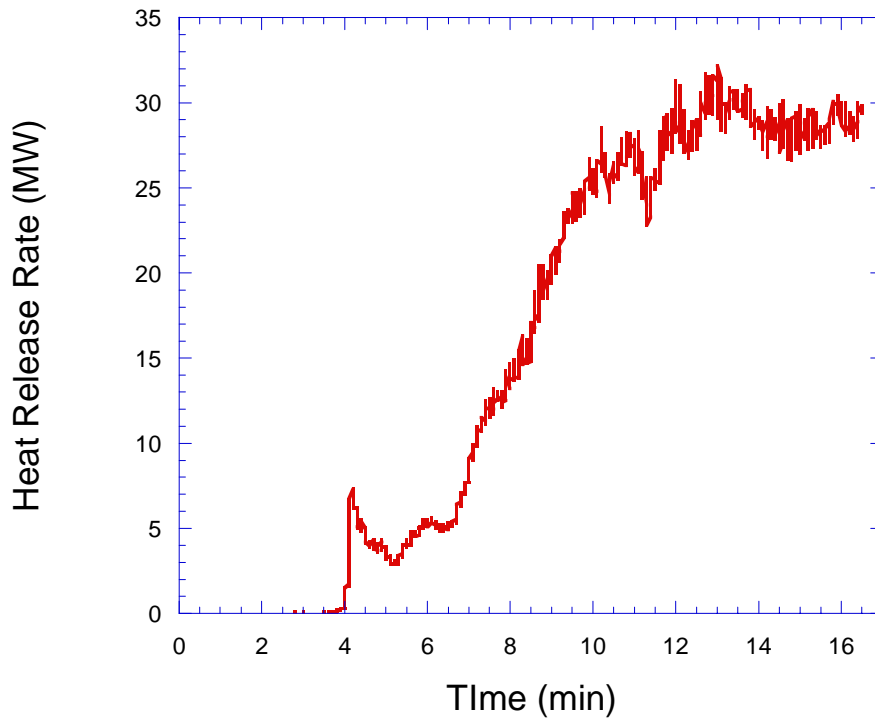


Figure 125. Fire heat release rate

Although the fire was extinguished by the fire department, much of the fuel in the south end of the suite had been consumed. Figure 126 shows the extent of the damage to the workstations in the south end of the suite. The workstations may have been moved by fire fighting operations. In the north end of the suite there was more fuel remaining in the workstations (Figure 127). After the fire, stacked paper material, which can burn for a longer period of time than furniture was found throughout the suite and storage room. The type-X gypsum board partition walls, concrete building core walls and solid core doors surrounding the suite contained the majority of the fire. The damage suggested that heat had leaked past the doors in the corridors and surrounding rooms. Figure 128 shows the door to the suite from the north corridor. It appears there were some flames or very hot gases in the north corridor but the flames did not spread down the corridor. The only door from the north corridor to the suite had a large glass that may have broken during the fire, and this would have allowed flames into the corridor. Figure 129 shows the door from the south corridor. Heat damage can be seen on the upper wall but it does not appear fire spread down the corridor. Figure 130 shows the office in the northeast corner of the suite. Although the heat in the room was sufficient to melt plastic material, there does not appear to have been flaming in the room.



Figure 126. Fire suite, south end



Figure 127. Fire suite, north end



Figure 128. North corridor, looking towards the fire suite



Figure 129. South corridor, looking towards the fire suite



Figure 130. Northwest room

Smoke Spread on the 12th Floor

Another way to examine this fire is through the visualization of smoke. Smoke is a complex combination of gases, particulates and droplets. This discussion focuses on the particulates to visualize the smoke travel. Due to the uncertainty in characterizing the specific fuels burned in this fire, the toxicity of the smoke will not be addressed. The burning of common materials such as the paper, plastic and wood in this fire produced particulates that were principally carbon. FDS transported the particulates generated during burning. The particulate generation rate is prescribed. The particulates are small and normally travel with the combustion gases; however, when the particulates come in contact with surfaces they may become deposited on the surfaces. Hot smoke tends to deposit more rapidly on cold surfaces. FDS does not predict the deposition of smoke particulates. The visibility of smoke is a function of not only the composition of the smoke but lighting conditions and scatter. The smoke visualization from FDS should only be used as an indication of the presence of smoke and may not be an accurate representation of the visibility.

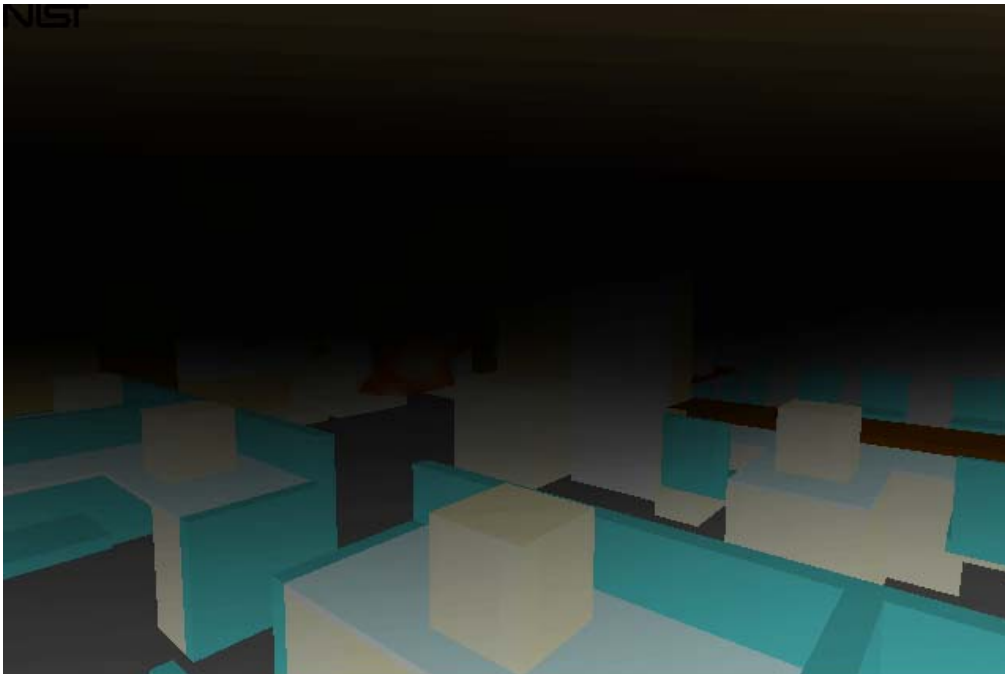
The following figures show the smoke combined with the iso-surface representing flames. Figure 131 is a view looking towards the storage room at 120 s (2 min). At this time the smoke was beginning to flow from the storage room. At 242 s (4 min 2 s), flames were emerging from the storage room and rate of smoke production was increasing (Figure 132). At 270 s (4 min 30 s), smoke was down to the desk level (Figure 133). From an overhead view at the same time (Figure 134) smoke moved through the plenum above the drop ceiling. The drop ceiling in the area outside the fire suite was not included in the calculation. At 300 s (5 min) smoke filled approximately three quarters of the plenum (Figure 135) and at 360 s (6 min) the entire plenum (Figure 136). A cutaway of the building through the south corridor shows the smoke had descended throughout most of the 12th floor (Figure 137). The plenum in the building contained wiring, ductwork, light fixtures and other surfaces upon which smoke was deposited. Further, as smoke entered the office area through the return air vents in the drop ceiling, smoke particulates were deposited on surfaces in the office areas. Figure 138 shows a return air register with the drop ceiling tiles removed. Note the concrete floor slab above is black with deposited smoke. At 480 s (8 min), smoke had descended nearly to the floor (Figure 139) and by 900 s (15 min) the 12th floor was completely filled with smoke (Figure 140). The simulation ends at 990 s (16 min 30 s) with most of the suite involved in fire and smoke and some flames rising from broken windows on the north and east sides of the building (Figure 141).



Figure 131. Smoke at 120 s (2 min)

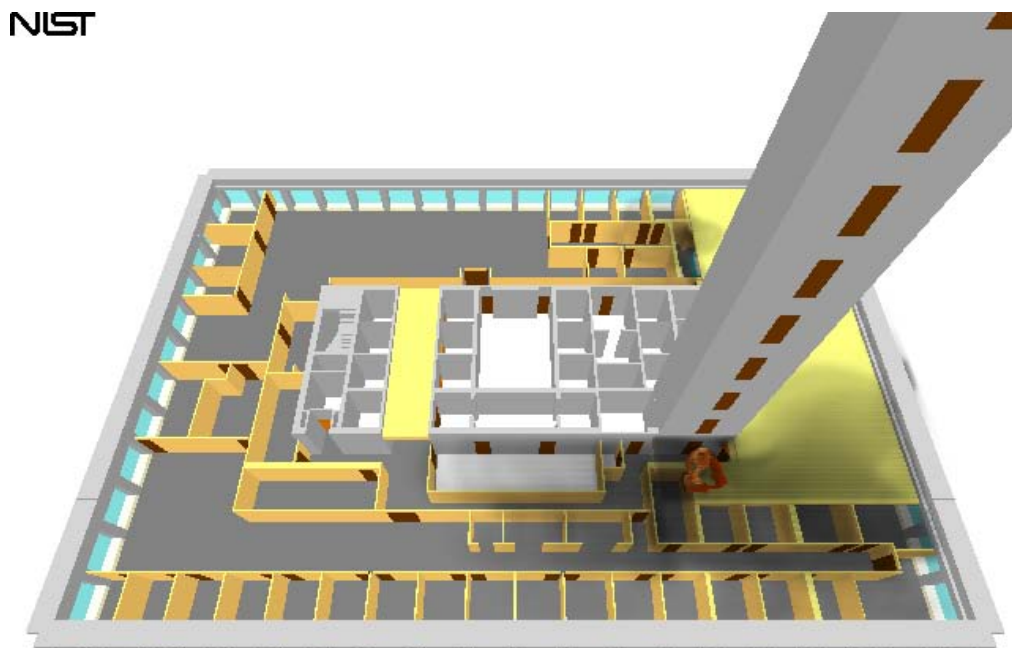


Figure 132. Smoke at 242 s (4 min 2 s)



0:04:30.1

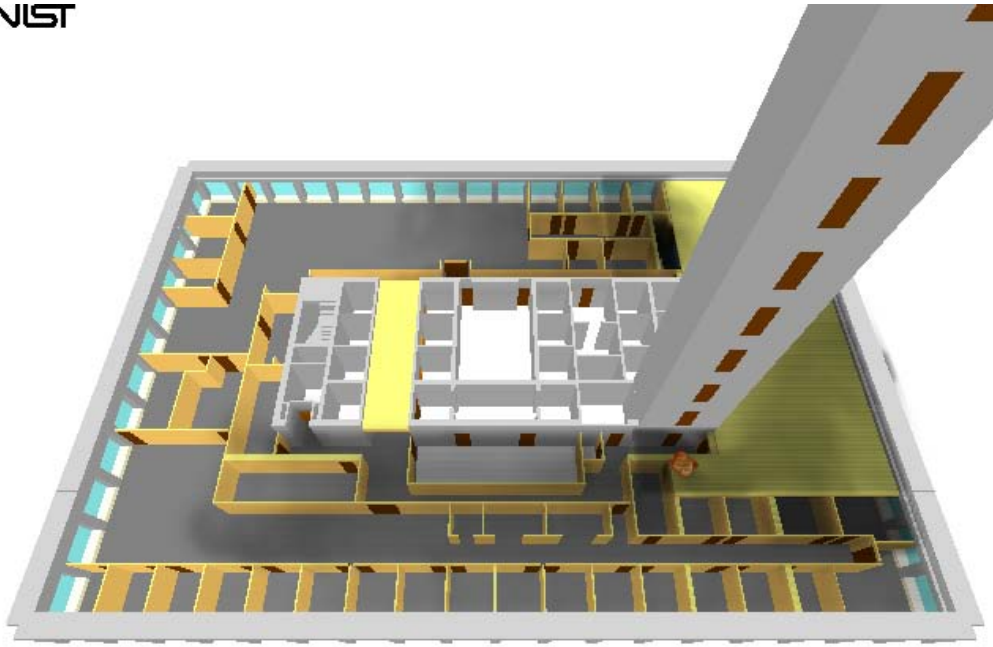
Figure 133. Smoke at 270 s (4 min 30 s)



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Figure 134. Smoke at 270 s (4 min 30 s)

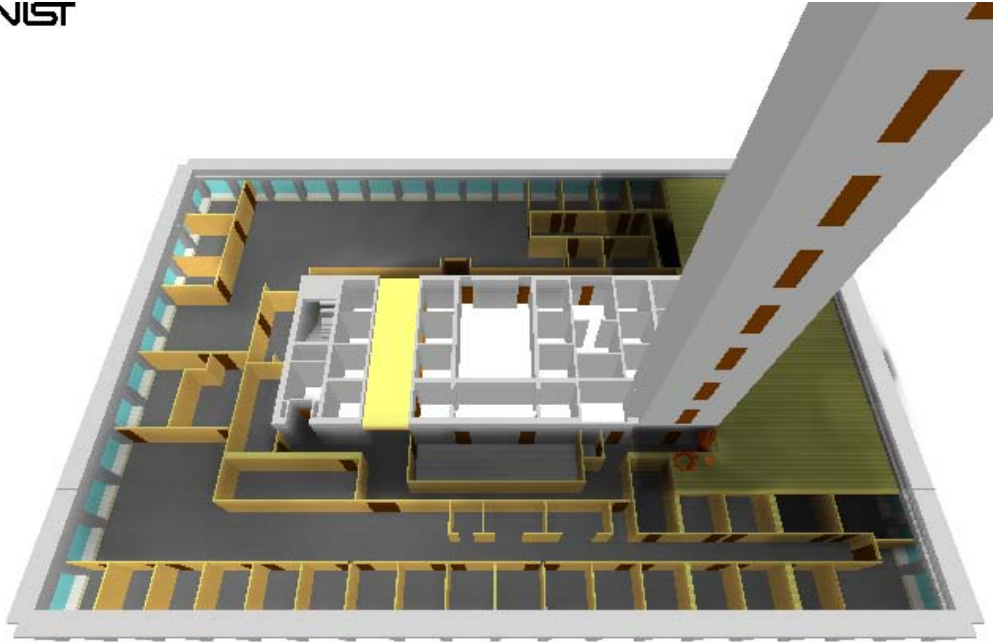
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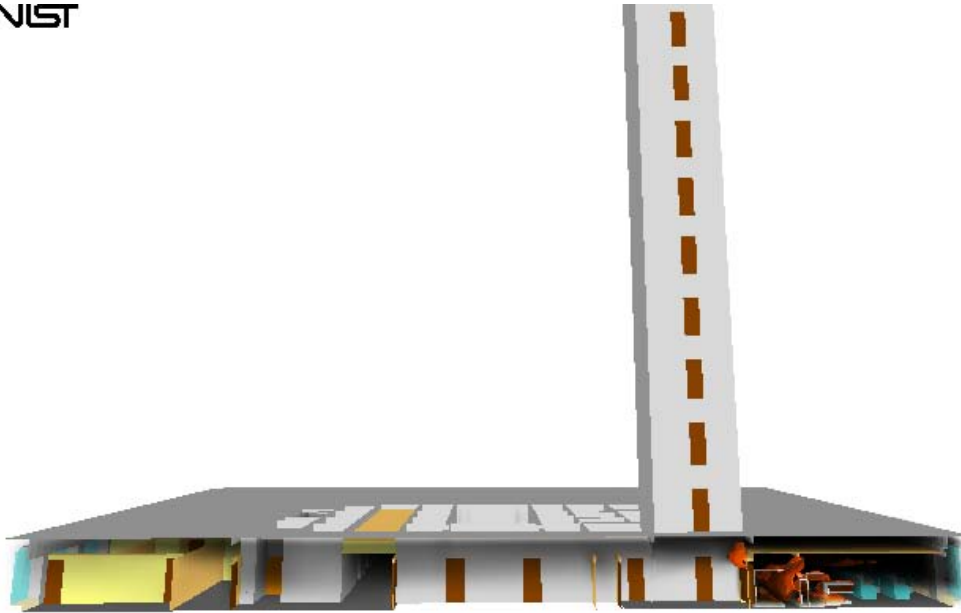
Figure 135. Smoke at 300 s (5 min)

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Figure 136. Smoke at 360 s (6 min)



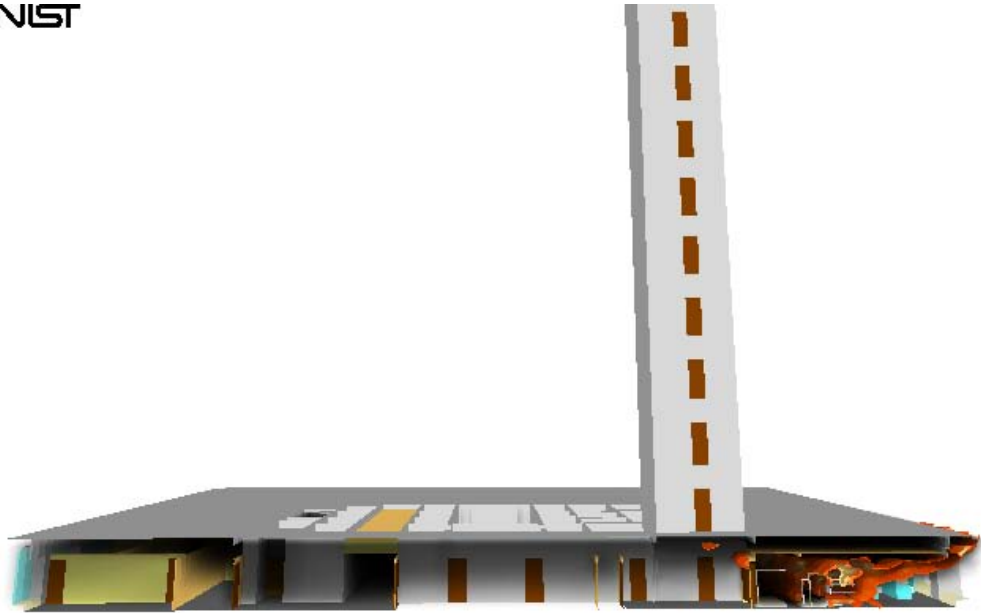
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Figure 137. Smoke at 360 s (6 min)



Figure 138. Return air register

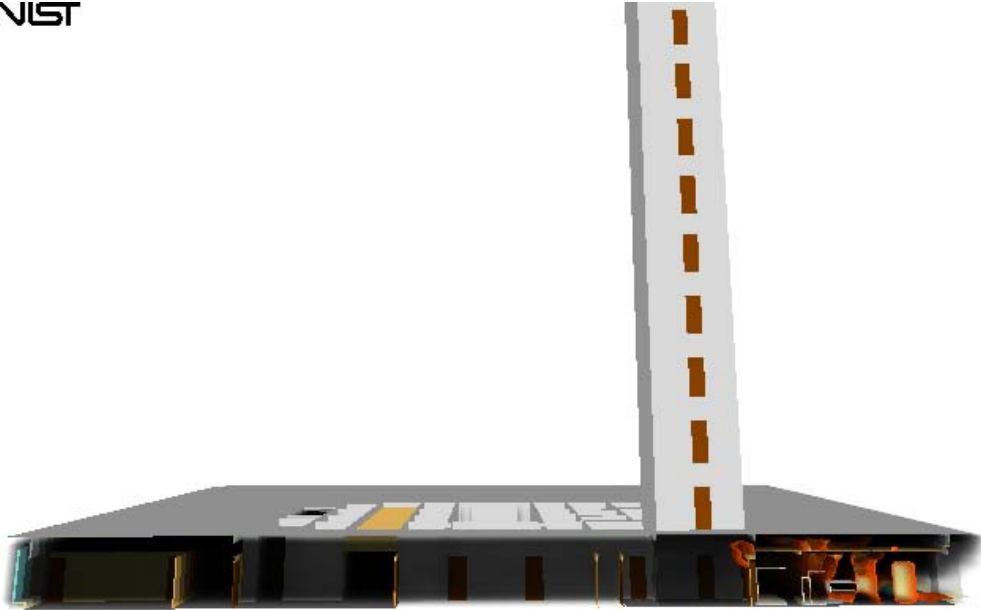
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Figure 139. Smoke at 480 s (8 min)

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Figure 140. Smoke at 900 s (15 min)

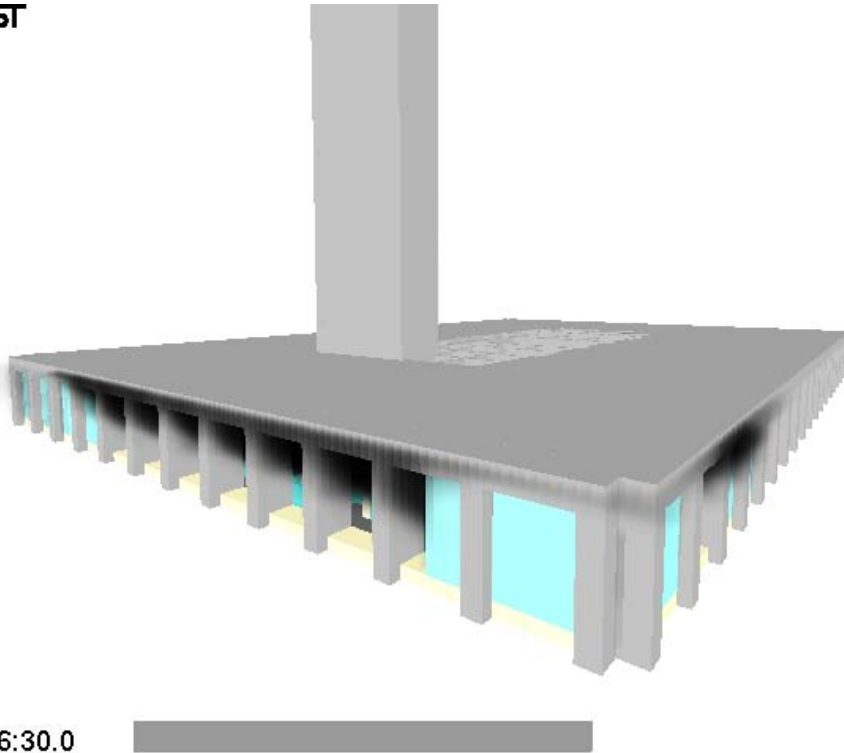


Figure 141. Smoke at 990 s (16 min 30 s)

Smoke Spread Up the Southeast Stairs Without a Functioning Smoke Shaft

At 930 s (15 min 30 s) the door to the southeast stairway was opened simulating the entry of the fire fighters onto the 12th floor to attack the fire. The southeast stairway had a door from the corridor to a vestibule and a door from the vestibule to the stairs. A vent to a smoke shaft, which extended to an opening on top of the roof, was located in the vestibule. For this simulation, the vent to the smoke shaft remained closed. Although the vent to the smoke shaft was designed to open via a heat actuated device (HAD) in the corridor or a HAD in the vestibule, the vent may have failed to open during the fire even though the HAD operated.

The flow of hot smoke up a stairway is a complex event. The hot smoke rises in the stairs and begins to mix with the cool air in the stairs, reducing the temperature of the smoke and thus its buoyancy. The smoke also loses heat to the stairs and stairway walls and floors, further reducing its temperature and buoyancy. The rising smoke must either push the cool air up the stairs or move past the cool air as it rises. Since the stairs had no leaks, the smoke had to displace the air in the shaft and the turbulence caused by the stairs would have resulted in the mixing of the air with the smoke.

Figure 142 shows a cross section of the building through the southeast stairs at 935 s (15 min 35 s), which was 5 s after the corridor door was opened. Smoke had begun to move up the stairs. In the simulation, the stairs extended to the 27th floor. During the fire the stairway above the fire was mostly closed with the exception of a few occupants

entering or leaving the stairs. The mostly closed stairway would have restricted the flow of smoke as compared to a stairway with open doors or leaks. The stairway in the model is completely closed above the 12th floor with no leaks. Openings to the stairs below the fire floor would have also had an impact on the smoke flow in the stairs. While the status of the stair openings during the fire was not known, the stairway was assumed to be closed below the 12th floor.

Figure 143 shows smoke in the stairs at 945 s (15 min 45 s) that had reached the 15th floor. In this view the stairs are shown in a wire frame view. At 690 s (16 min) smoke reached the 16th floor (Figure 144). Figure 145 shows the smoke in the stairs had reached the 17th floor at the end of the simulation 990 s (16 min 30 s).

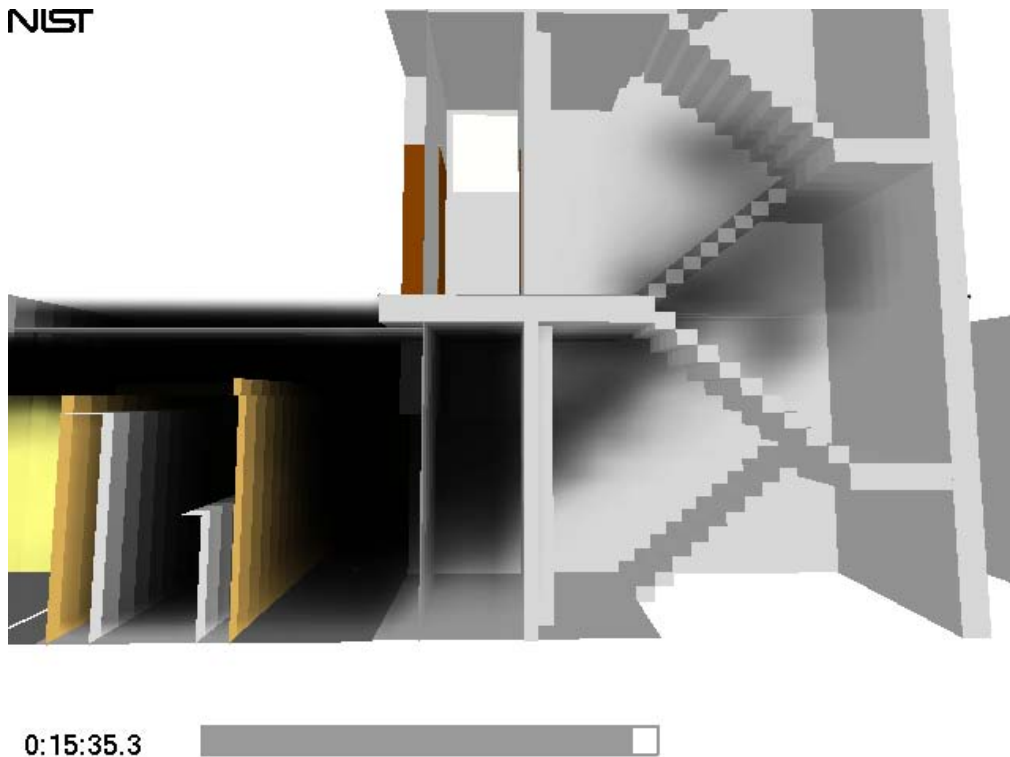
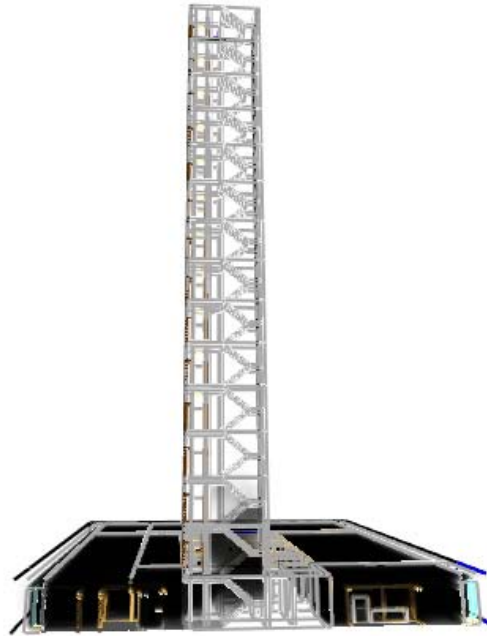


Figure 142. Smoke in southeast stairs at 935 s (15 min 35 s)

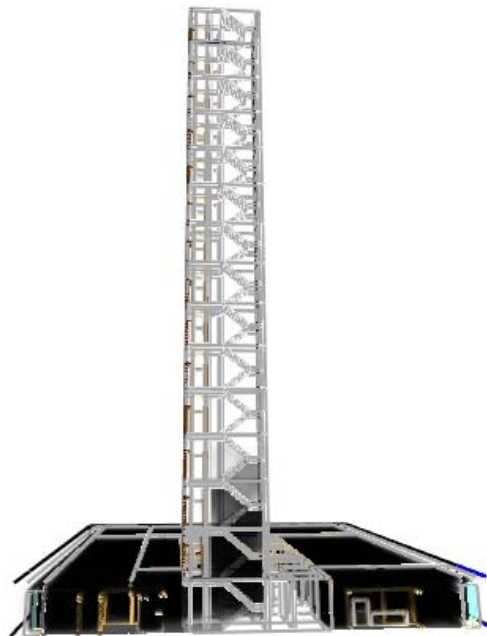
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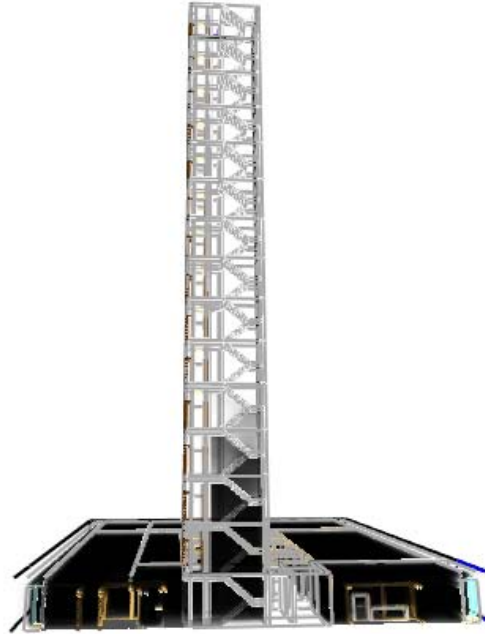
Figure 143. Smoke in southeast stairs at 945 s (15 min 45 s)

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Figure 144. Smoke in southeast stairs at 960 s (16 min)



0:16:30.0

Figure 145. Smoke in southeast stairs at 990 s (16 min 30 s)

Smoke Spread Up the Southeast Stairs With a Functioning Smoke Shaft

To examine the impact of the smoke shaft on the flow of smoke into the southeast stairway, the vent to the smoke shaft in the vestibule of the stairway was opened at 690 s (11 min 30 s), at the same time as the door to the south corridor was opened. Figure 146 shows the vent to the smoke shaft as viewed from the vestibule with the louvers open and Figure 147 shows the top of the smoke shaft on the roof of the building. Figure 148 shows the vent to the smoke shaft as viewed from the model. The smoke shaft in the simulation was opened at the top of the 27th floor to the outside at the time the vent from the vestibule opened. The smoke shaft in the building was always open to the outside.

Similar to the flow of hot smoke into the stairway, the flow of hot smoke up a shaft is also a complex event. The hot smoke rises in the shaft and begins to mix with the cool air in the shaft, reducing the temperature of the smoke and thus its buoyancy. The smoke also loses heat to the sides of the shaft, further reducing its temperature and buoyancy. The rising smoke must either push the cool air up the shaft or move past the cool air as it rises. As more hot smoke enters the shaft and the walls of the shaft heat up, less heat is lost to the shaft walls and the flow up the shaft increases. The flow in the shaft can also be affected by outside winds. The wind may blow down the shaft reducing the flow or create a reduced pressure at the top of the shaft, which could increase the flow up the shaft. Placing a vent to the outside in the shaft at the top of the 27th floor in the simulation was far enough above the 12th floor to simulate flow up the shaft similar to a vent on the roof.



Figure 146. Smoke shaft vent with louvers open



Figure 147. Top of smoke shaft on roof

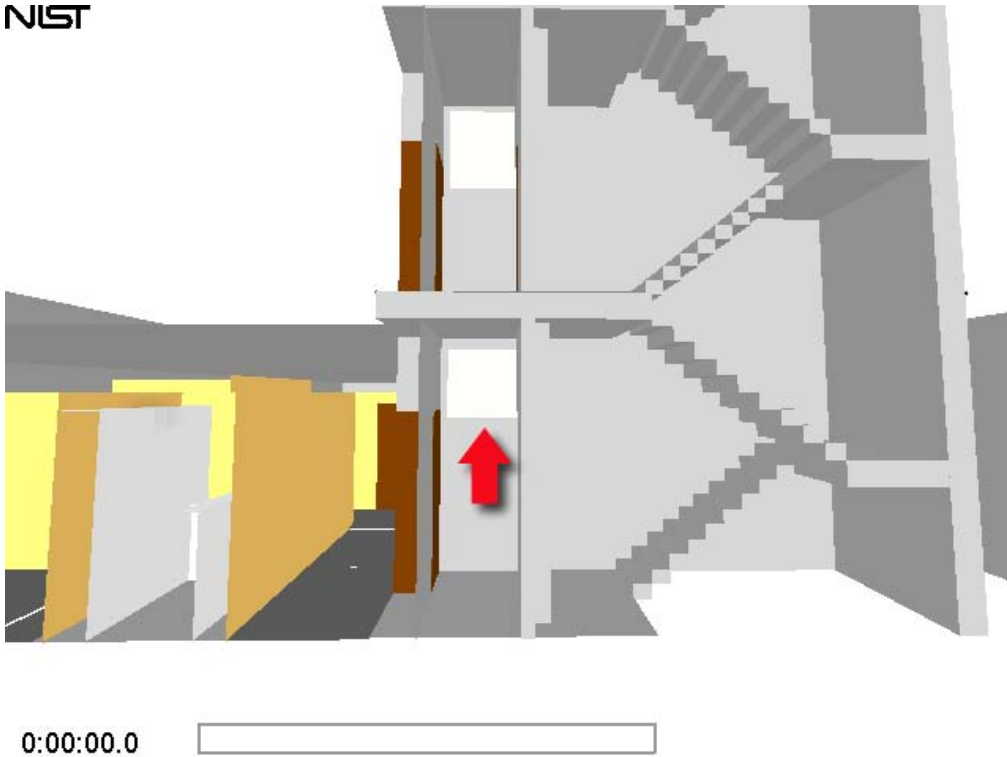
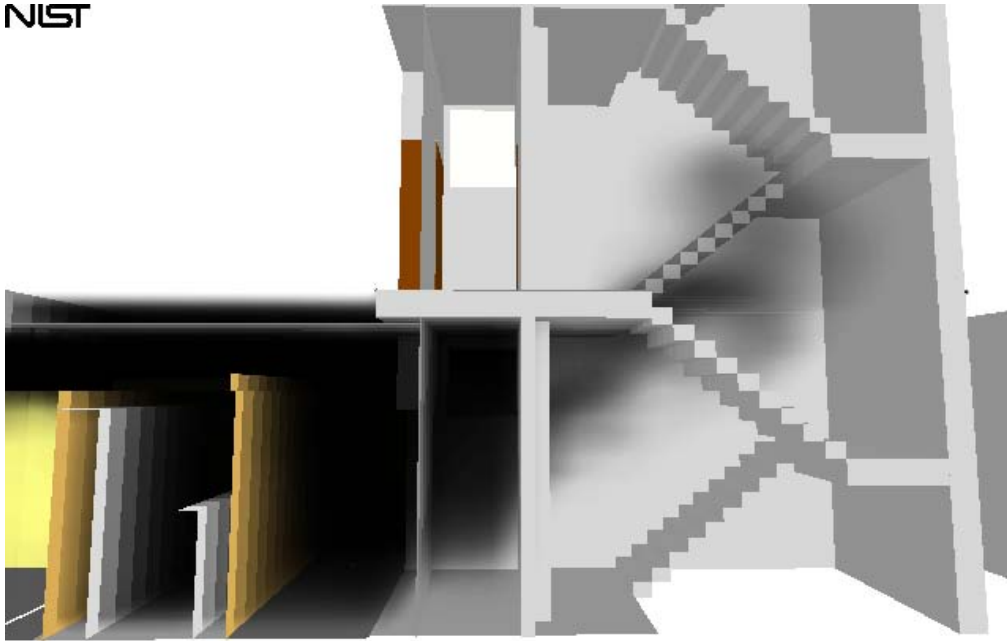


Figure 148. Southeast stairs showing smoke shaft vent

Figure 149 shows a cross section of the building through the southeast stairs at 935 s (15 min 35 s), which was 5 s after the door corridor was opened. Smoke had begun to move up the stairs. The vent to the smoke shaft had opened at that time and can be seen in Figure 150 looking at the smoke shaft in cutaway. Figure 151 shows the smoke in the stairs at 945 s (15 min 45 s). In this view the stairs are shown in a wire frame view. The smoke in the smoke shaft can be seen to the left of the stairs. At 690 s (16 min) smoke had reached the 15th floor in the stairs and reached the top of the smoke shaft in the simulation (Figure 152). Figure 153 shows the smoke in the stairs had reached the 16th floor at the end of the simulation 990 s (16 min 30 s). Smoke was flowing out the top of the smoke shaft.

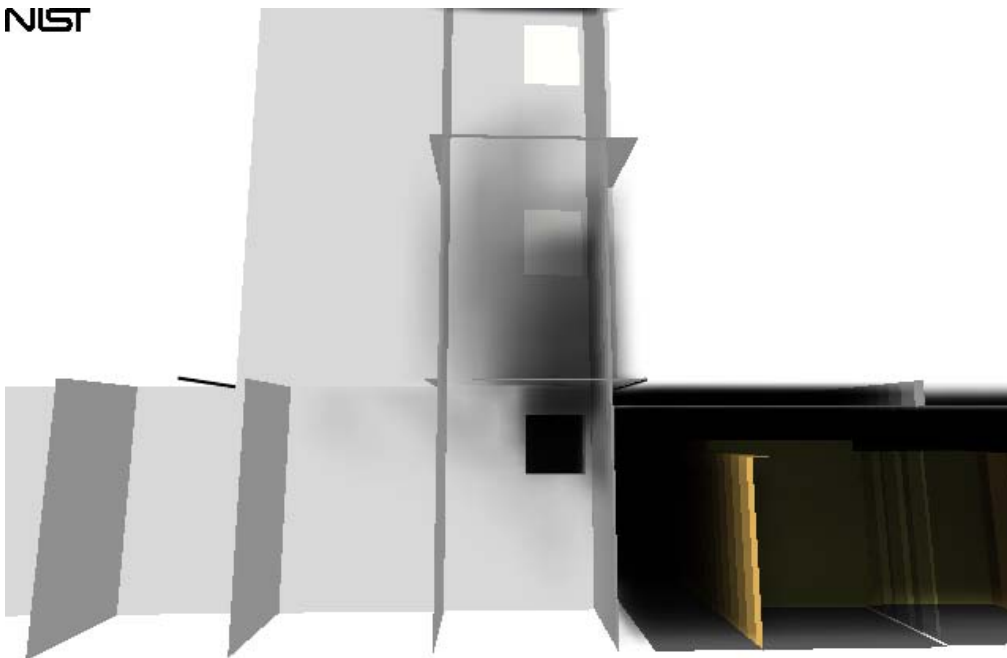
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Figure 149. Smoke in southeast stairs at 935 s (15 min 35 s), with smoke shaft

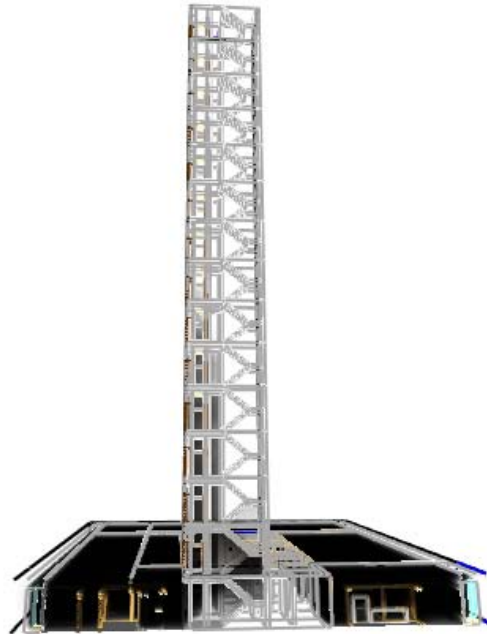
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Figure 150. Smoke in smoke shaft at 935 s (15 min 35 s)

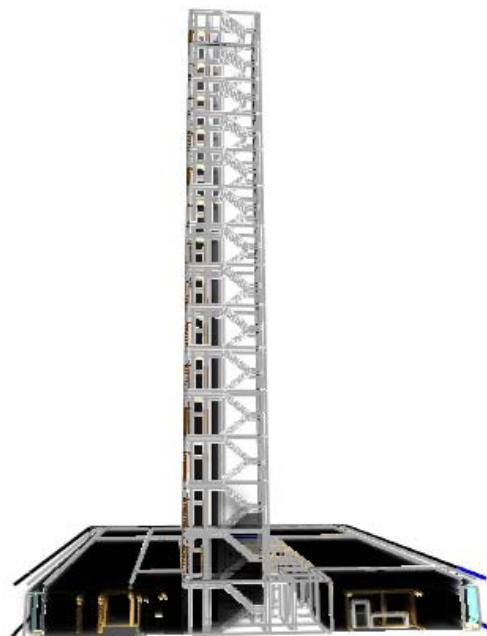
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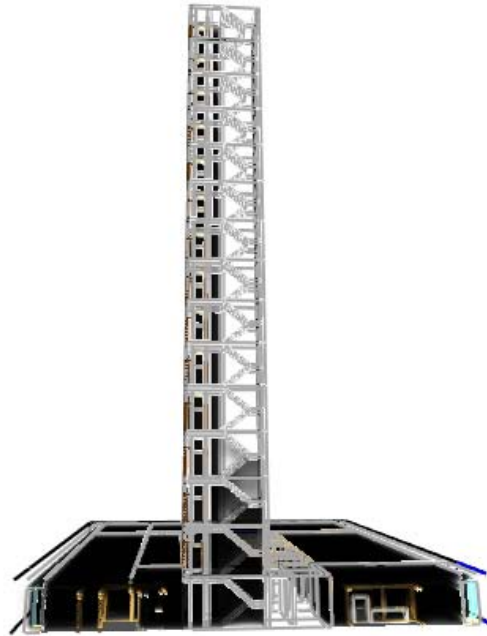
Figure 151. Smoke in southeast stairs at 945 s (15 min 45 s), with smoke shaft

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Figure 152. Smoke in southeast stairs at 960 s (16 min)



0:16:30.0

Figure 153. Smoke in southeast stairs at 990 s (16 min 30 s), with smoke shaft

Comparison of Southeast Stair Environment With and Without a Functioning Smoke Shaft

These results suggest that for the conditions simulated here, the opening of the louvered vent to the smoke shaft would have had some impact on the initial flow of smoke into the southeast stairs. At the time the door from the stairs to the corridor was opened by the fire department, hot smoke had completely filled the corridor. With the corridor door and vestibule door open at the same time, the smoke shaft would have been unable to remove all the smoke entering the vestibule. At the end of the simulation smoke had traveled one less floor with the vent to the smoke shaft open. With the louvered vent open and both doors closed, the smoke shaft may have been able to vent the smoke that leaked from the corridor to the vestibule, but that case was not examined.

Figure 154 shows a temperature slice through the southeast stairs at 990 s without a functioning smoke shaft and Figure 155 a temperature slice through the southeast stairs at 990 s with a functioning smoke shaft. From these figures it can be seen that the temperature in the vestibule is higher with the vent open. It should be noted the temperature in the corridor is well above the maximum range of the temperature scale, 150° C (302° F).

Figure 156 shows velocity vectors in a plane through the southeast stairs at (16 min 30 s) with the vent to the smoke shaft closed. Figure 157 shows the same vectors with the smoke vent open. The color and length of the vectors represent the magnitude of the velocity.

With the vent to the smoke shaft closed, a hot recirculation zone formed in the vestibule above the door. In the upper part of both the corridor doorway and the vestibule doorway the flow was from the corridor, through the vestibule and into the stairs. In the lower part of the doorways the flow was from the stairs, through the vestibule and into the corridor. This flow was the air displaced from the stairs by the entry of the hot smoke.

With the vent to the smoke shaft open, smoke from the corridor flowed in both the top and the bottom of the corridor door. In the vestibule above the door, smoke flowed into the smoke shaft vent. The flow into the stairs from the vestibule and the flow from the stairs into the vestibule were reduced. This resulted in less smoke moving up the stairs. The velocity vectors shown are in a single plane through the door and while representative of the flows, vectors through other planes were different.

With the vent to the smoke shaft closed, the temperature profile in the vestibule took a two-layer form. That is, hot smoke at the top and cooler air from the stairs at the bottom. With the vent closed, the vestibule was filled with more uniformly hot smoke. Since the smoke flowed up the smoke shaft and out of the building, the smoke shaft would have drawn smoke and fire towards the stairs.

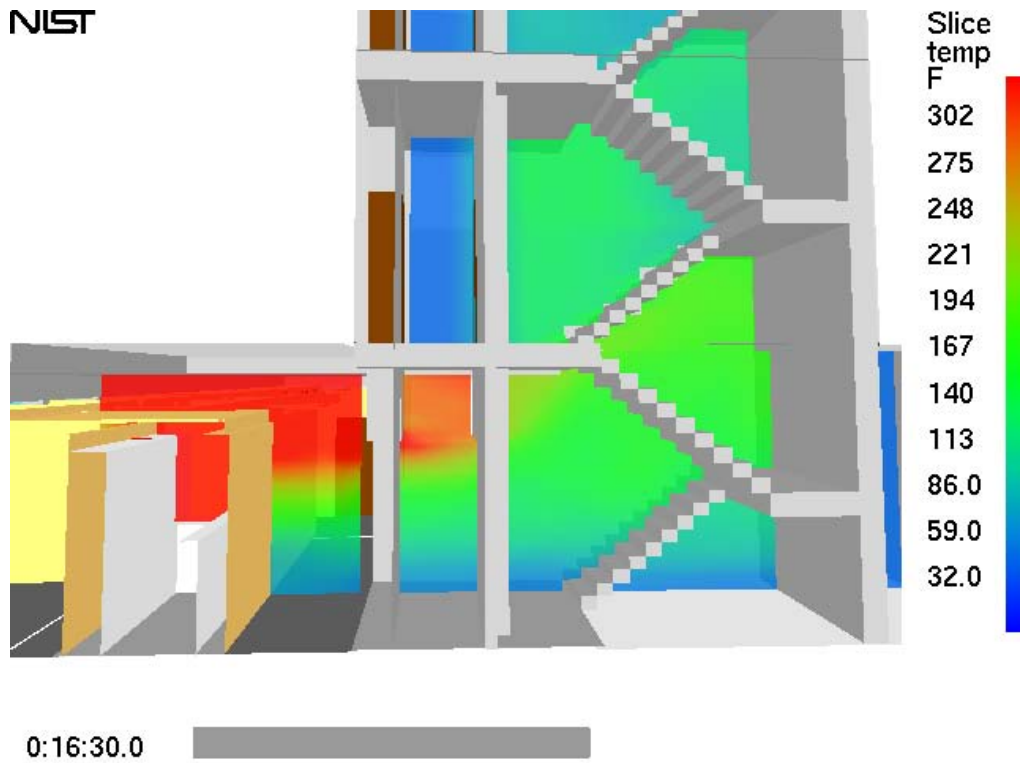


Figure 154. Temperature in southeast stairs at 990 s (16 min 30 s)

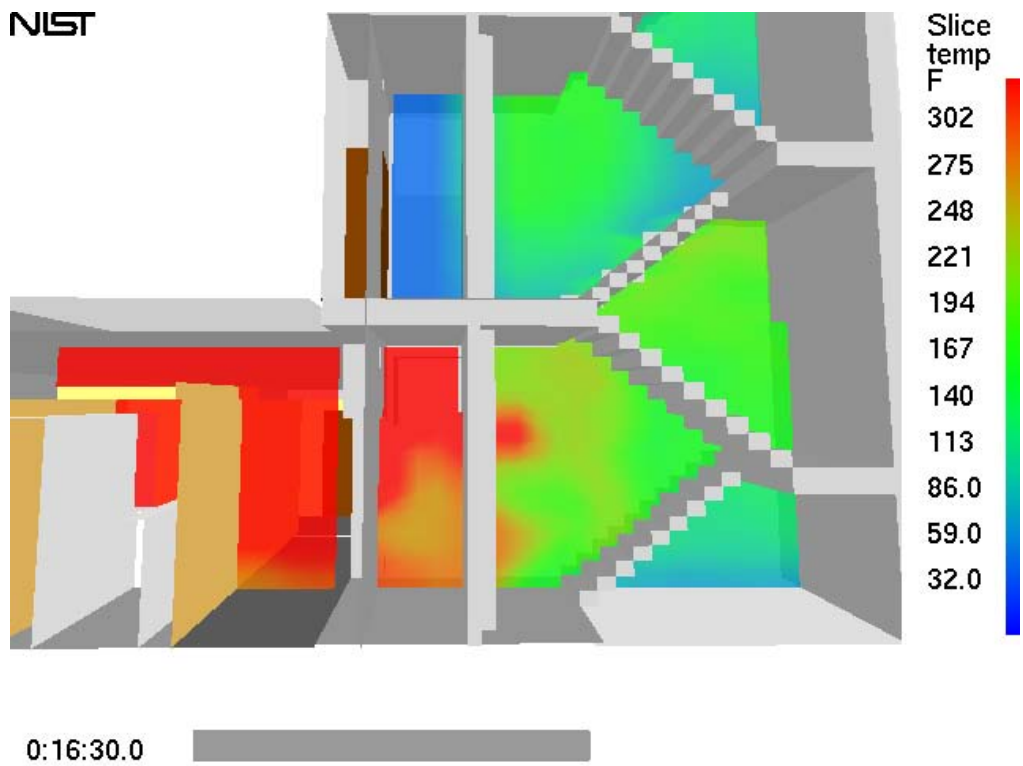


Figure 155. Temperature in southeast stairs at 990 s (16 min 30 s), with smoke shaft

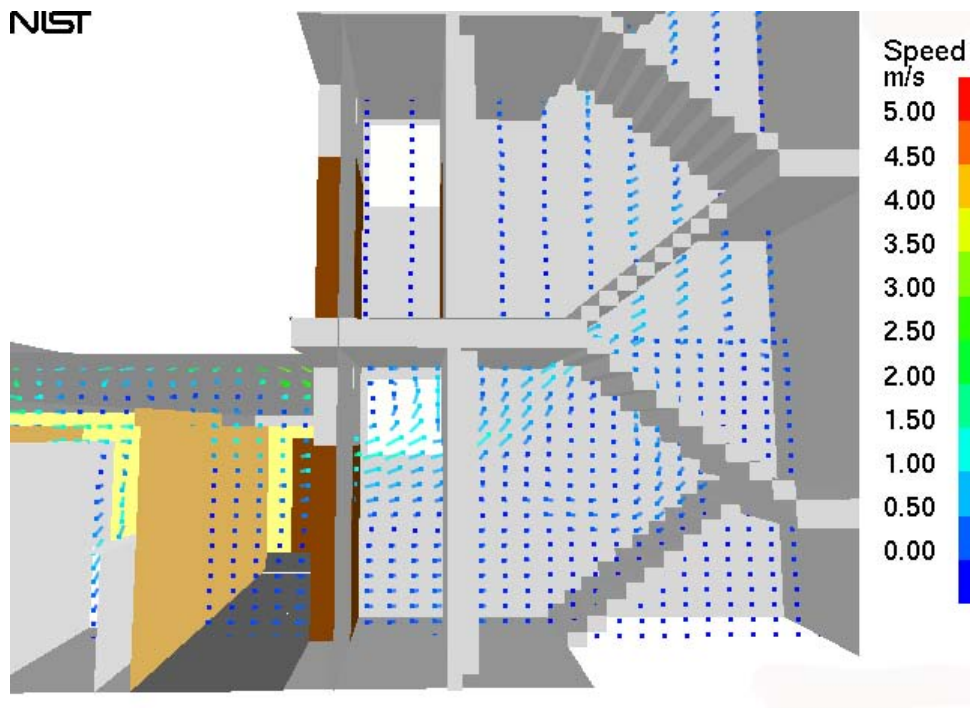


Figure 156. Velocity in southeast stairs at 990 s (16 min 30 s)

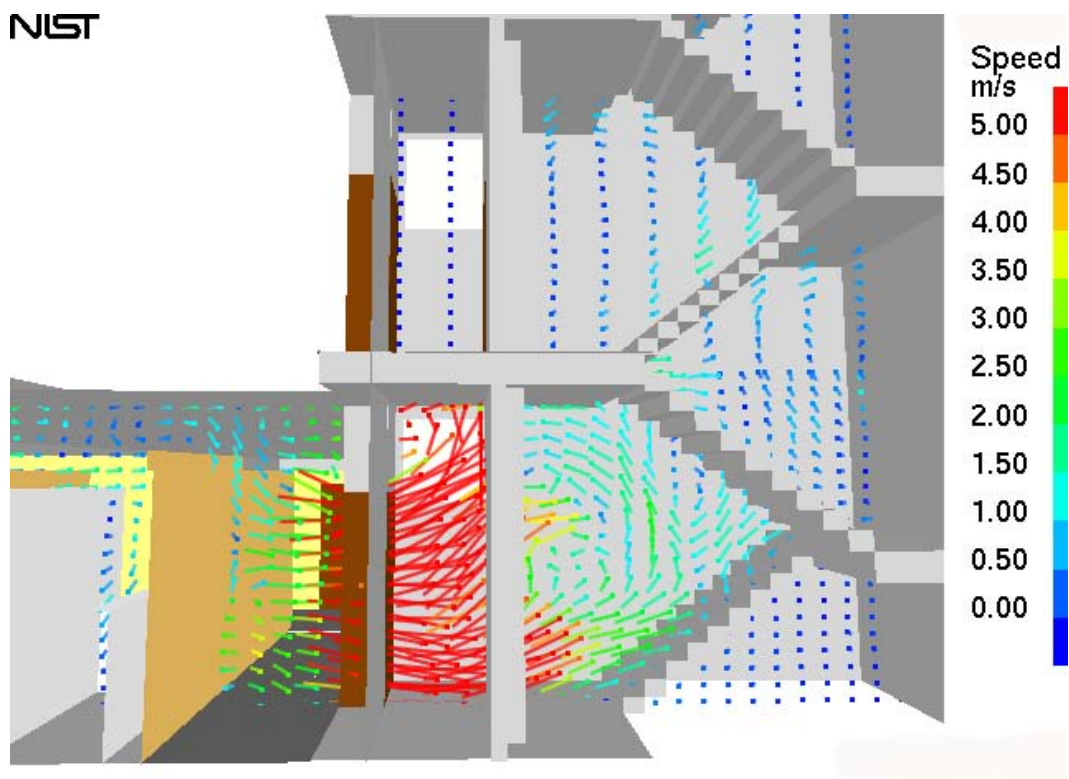


Figure 157. Velocity in southeast stairs at 990 s (16 min 30 s), with smoke shaft

Results With Automatic Fire Sprinklers Predicted by FDS

Figure 158 shows the flame iso-surface just before sprinkler activation. The sprinkler on the west side (left in Figure 158) of the storage room operated at 242 s (4 min 2 s) and the sprinkler on the east side of the room at 245 s (4 min 5 s). At 250 s (4 min 10 s) the blue dots representing water drops from the sprinklers can be seen in the storage room (Figure 159). The ring of fire to the upper left of the storage room was associated with fire in the return air register above the storage room. At 265 s (4 min 25 s) the fire was basically suppressed (Figure 160). Although FDS predicted the fire was suppressed, the predictions show smoke filled the suite at 360 s (6 min); however, very little reached the plenum (Figure 161). At 600 s (10 min) FDS predicted the smoke was well dispersed in the suite, (Figure 162) and continued to disperse until the end of the simulation at 990 s (16 min 30 s) (Figure 163).

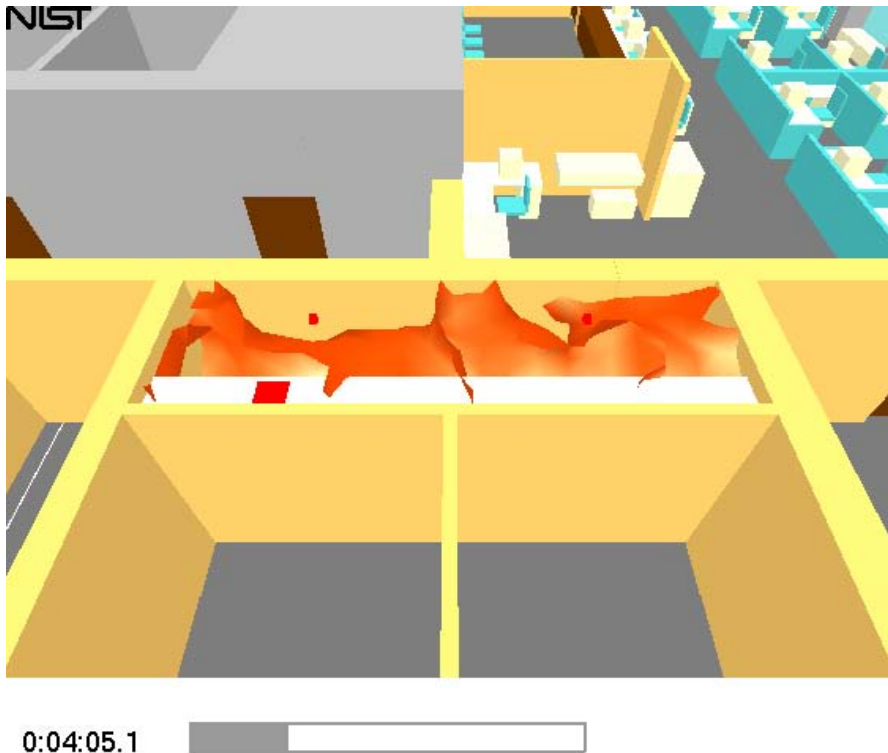
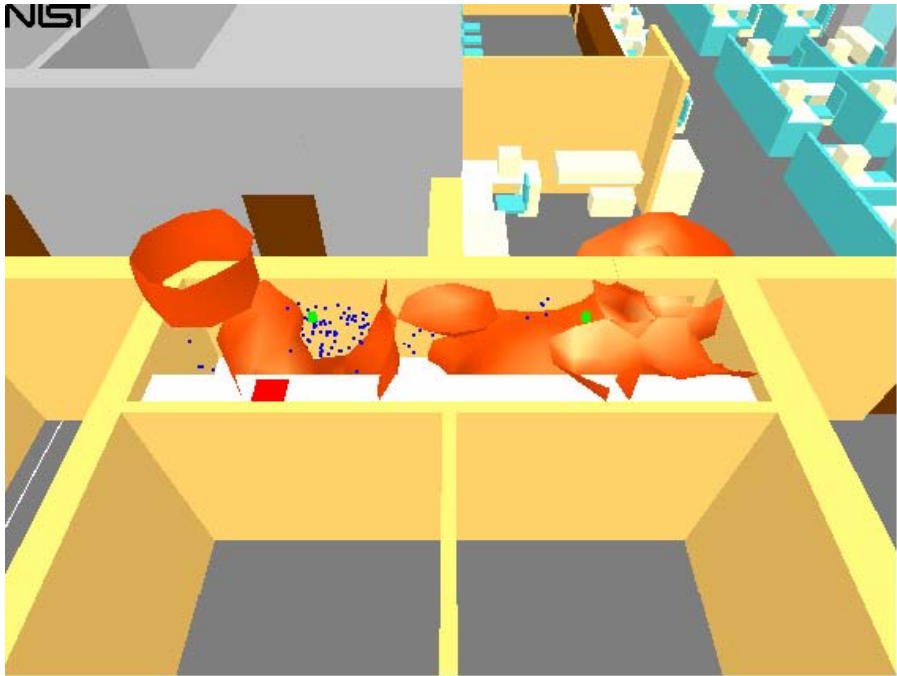
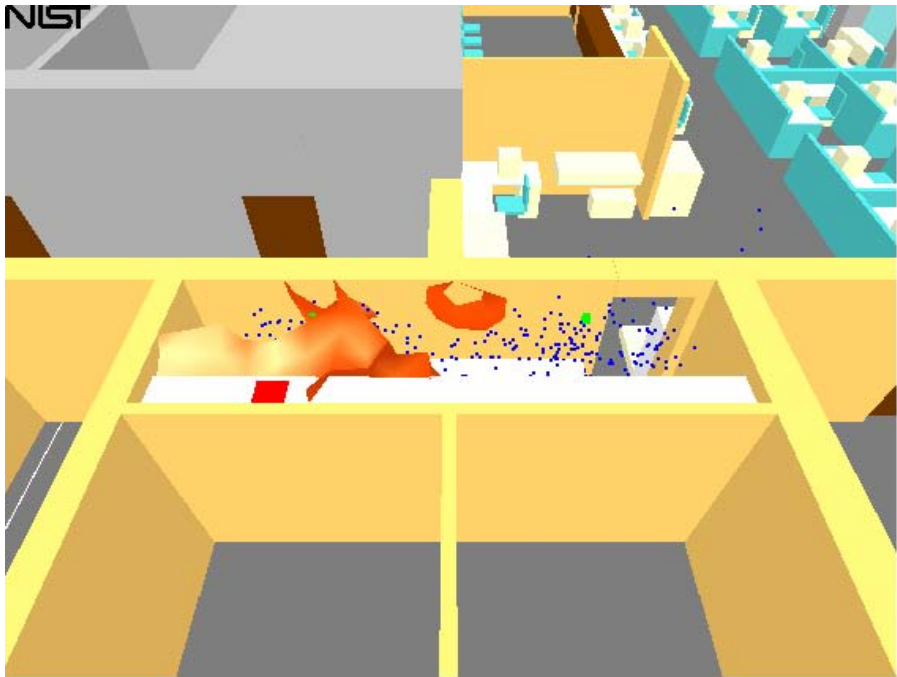


Figure 158. Flame iso-surface at 245 s (4 min 5 s), with sprinklers



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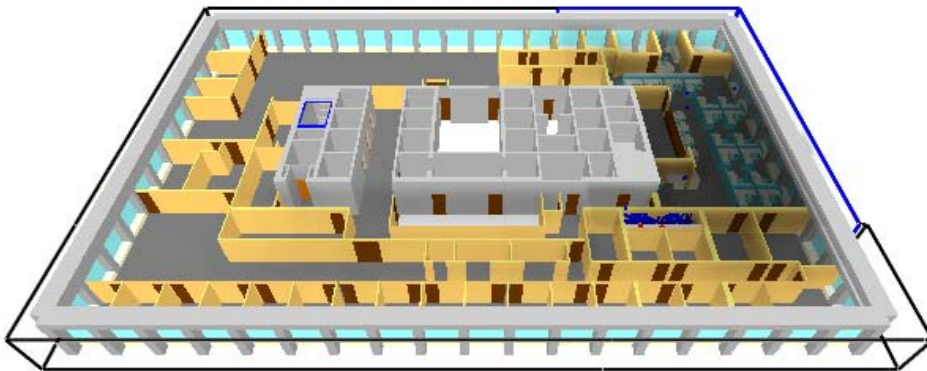
Figure 159. Flame iso-surface at 250 s (4 min 10 s), with sprinklers



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Figure 160. Flame iso-surface at 265 s (4 min 25 s), with sprinklers

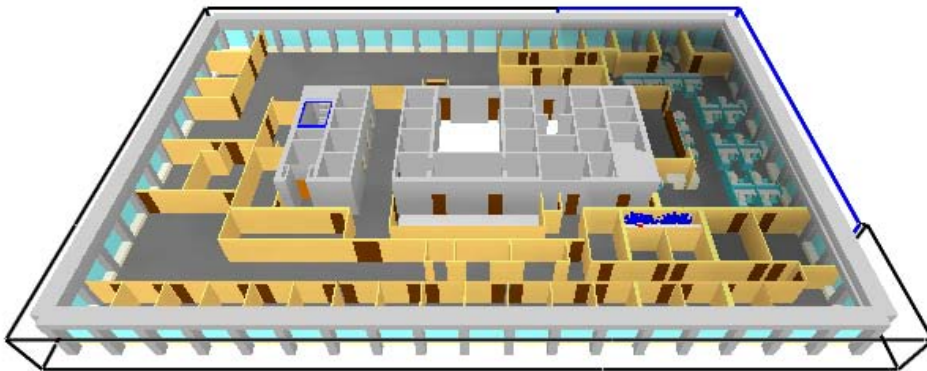
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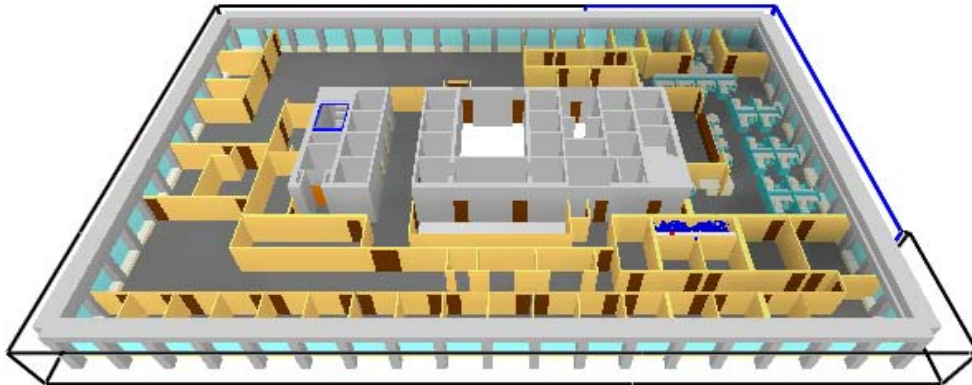
Figure 161. Smoke at 360 s (6 min), with sprinklers

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Figure 162. Smoke at 600 s (10 min), with sprinklers



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Figure 163. Smoke at 990 s (16 min 30 s), with sprinklers

Summary and Conclusions

NIST conducted a series of heat release rate experiments to examine the fuel load in Suite 1240 of the Cook County Administration Building. Based on the heat release rate data and historical information from previous high rise, office building fires, the fire load and the fire development followed the trend of being a “typical” fire in this type of occupancy.

The NIST Fire Dynamics Simulator (FDS) provided a physics-based simulation of a high rise office building fire subject to the limitations of the model and the assumptions associated with the inputs used. Although the simulation results are subject to interpretation, they can be useful in analyzing the conditions in the building during the fire.

1) The FDS simulation showed the spread of flames and smoke from a fire that started in the Suite 1240 storage room on the 12th floor of the Cook County Administration Building, 69 West Washington Street, Chicago, Illinois. The model predicted the flame spread throughout suite 1240 and smoke spread throughout the 12th floor and into the southeast stairway during the 990 s (16 min 30 s) of the simulation. The key features of the simulation appear to match observations at the time of the fire and the condition of the building and contents after the fire.

2) The FDS simulation provided insight into the spread of smoke in the southeast stairway with and without a functioning smoke shaft. With the door from the corridor to the stairway vestibule and the door from the vestibule to the stairs opened at 930 s (15 min 30 s) into the simulation, smoke would have entered both the vestibule and the stairs. With the louvered vent to the smoke shaft closed, smoke reached the 17th floor at 990 s (16 min 30 s), the end of the simulation. The predicted gas temperatures in the vestibule were hotter above the top of the vestibule doors than below the top of the vestibule doors. With the louvered vent to the smoke shaft open, smoke reached the 16th floor at 990 s (16 min 30 s), the end of the simulation. The predicted gas temperatures in the vestibule were comparable to the hotter temperatures with the vent closed but approximately the same throughout the vestibule.

3) The FDS simulation predicted automatic fire sprinklers would have been effective in controlling a fire in the Suite 1240 storage room and preventing the spread of fire beyond the storage room. Although FDS predicted the sprinklers suppressed the fire in the storage room, the predictions indicate there would likely have been some smoke in Suite 1240.

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APPENDIX A

Cone calorimeter experiments were conducted on eleven different materials at two different levels of external heat flux, 35 kW/m² or 70 kW/m². This appendix contains the data in tabular form for each of the 84 experiments. Descriptions and photographs of the materials are given in Description of Furnishings section of the report. Average peak heat release rates at both applied heat flux levels are given in the Table 3.

The test protocol detailed in ASTM E 1354 was used for these experiments¹. A test plus two replicates of each sample were conducted in the cone calorimeter, exposed to either an external heat flux of 35 kW/m² or 70 kW/m².

For each test, a 0.1 m square sample was oriented horizontally under the cone heater. Each sample was wrapped in aluminum foil on all sides except for the exposed surface. The distance between the top surface of the sample and the cone housing was 25 mm. The energy release per mass of oxygen depleted was assumed to be a constant 13.1 MJ/kg.

The data tables provide the test time, heat release rate, specimen mass loss rate, carbon dioxide yield, carbon monoxide yield, specific extinction area, mass, smoke extinction coefficient, duct mass flow rate, duct volumetric flow rate, and the effective heat of combustion. The data sets are grouped by external (applied) heat flux. The materials are presented in the order shown in Table A-1, within each heat flux group.

Table A-1. Material Identification for Cone Calorimeter Experiments

Material Identification
Carpeting
Ceiling Tile (face-down)
Ceiling Tile (face-up)
Computer Monitor Case
Letter Tray
Office Chair
Paper (stacked flat)
Paper (stacked on edge)
Paper (stacked flat - covered with cardboard)
Plastic Wastebasket
Vinyl Blinds
Wall Covering
Workstation – Side Panel
Workstation - Work Surface

¹ ASTM E 1354-04a, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter.*, ASTM International, West Conshohocken, PA., 2004.

Carpeting**Test 1**External Heat Flux 35 kW/m²

Test Results::

Time to Sustained Ignition (s):	65.00
Peak Heat Release Rate (kW/m ²):	218.81
Time to Peak Heat Release Rate (s):	89.00
Total Heat Release (MJ/m ²):	46.57
60 s Average Heat Release Rate (kW/m ²):	179.49
Total Mass Loss (g):	15.36
Average Mass Loss Rate (g/s):	0.048
Average Effective Heat of Combustion (MJ/kg):	30.31
Average Smoke Extinction Area (m ² /kg):	660.54
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0074

Specimen:

Initial mass (g):	29.4
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	65
Time to flameout (s):	384

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	1.54	0.01	-0.33	-0.03	7301.65	29.45	0.03	0.03	26.11	26.26	153.86
5	2.49	0.01	-0.41	-0.04	1515.14	29.41	0.01	0.03	25.74	25.89	249.08
8	3.52	2.2	0	0	23.05	29.29	0.02	0.03	25.93	26.08	1.6
11	1.25	-4.62	0	0	-1.78	29.32	0	0.03	25.88	26.03	-0.27
14	0.6	-0.47	0.01	0	-281.21	29.49	0.05	0.03	25.8	25.94	-1.26
17	-1.46	2.54	0	0	26.03	29.35	0.03	0.03	25.62	25.77	-0.58
20	-1.7	-0.67	0.01	0	-38.63	29.37	0.01	0.03	26.23	26.39	2.52
23	0.52	3.55	0	0	8.65	29.35	0.01	0.03	25.64	25.81	0.15
26	1.35	0.3	-0.01	0	247.01	29.21	0.03	0.03	25.85	26.03	4.5
29	-1.96	-5.04	0	0	-6.08	29.34	0.01	0.03	25.47	25.66	0.39
32	-0.93	0.99	0	0	183.97	29.44	0.07	0.03	26.1	26.3	-0.94
35	1.24	1.83	0	0	0	29.31	0	0.03	26.17	26.37	0.68
38	-0.25	-1.3	0	0	-59.44	29.35	0.03	0.03	25.86	26.07	0.19
41	-1.33	4.41	0	0	10.95	29.34	0.02	0.03	25.74	25.95	-0.3
44	1.93	1.32	0	0	64.41	29.15	0.03	0.03	25.66	25.87	1.46
47	1.84	-6.18	0	0	-27.81	29.29	0.06	0.03	26.31	26.53	-0.3
50	0.41	-0.45	0.01	0	-669.94	29.43	0.11	0.03	25.92	26.14	-0.92
53	2.61	1.43	0	0	171.99	29.33	0.09	0.03	26.13	26.36	1.82
56	2.79	4.66	0	0	72.2	29.34	0.13	0.03	25.97	26.18	0.6
59	1.31	1.92	0	0	207.94	29.1	0.15	0.03	25.64	25.85	0.68
62	3.99	-2.12	0	0	-225.54	29.23	0.19	0.03	25.38	25.6	-1.88
65	23.85	3.3	0	0	203.66	29.16	0.26	0.03	25.65	25.88	7.23
68	70.3	-1.12	0	0	-218.56	29.09	0.09	0.03	25.87	26.14	-62.97
71	120.43	6.7	0	0	44.45	29.15	0.12	0.03	25.29	25.66	17.97
74	145.94	11.13	0	0	39	28.72	0.17	0.03	24.63	25.24	13.11
77	176.44	3.04	0	0	329.4	28.56	0.4	0.03	24.4	25.25	58
80	196.17	8.12	0	0	182.77	28.45	0.59	0.03	24.27	25.26	24.17
83	203.34	9.65	0	0	176.76	28.1	0.66	0.03	24.45	25.67	21.08
86	212.28	3.82	0	0	534.67	27.92	0.78	0.03	24.66	26.06	55.6
89	218.81	7.09	0	0	339.09	27.81	0.89	0.03	25.39	26.9	30.88
92	208.85	10.27	0	0	244.49	27.49	0.96	0.03	24.68	26.23	20.34
95	212.39	6.26	0	0	444	27.24	1.03	0.03	25.3	26.93	33.94
98	210.03	6.01	0	0	550.3	27.09	1.23	0.03	25.35	26.99	34.95
101	207.17	9.63	0	0	378.17	26.85	1.34	0.03	25.47	27.11	21.5
104	200.45	8.28	0	0	474.35	26.55	1.47	0.03	25.12	26.71	24.22
107	201.41	5.54	0	0.01	789.58	26.37	1.63	0.03	25.27	26.84	36.37
110	197.05	6.06	0	0.01	654.18	26.19	1.48	0.03	25.16	26.7	32.52
113	194.87	9.01	0	0	429.95	25.99	1.44	0.03	25.33	26.83	21.62
116	194.25	6.33	0	0.01	703.48	25.69	1.65	0.03	25.59	27.06	30.68
119	191.71	4.45	0	0.01	994.61	25.6	1.65	0.03	25.35	26.77	43.11
122	195.11	12.27	0	0	322.49	25.36	1.45	0.03	25.92	27.32	15.9
125	188.42	5.44	0	0.01	654.43	24.96	1.35	0.03	25.03	26.35	34.64

128	193.07	2.22	0	0.02	1676.81	25.01	1.4	0.03	25.25	26.57	86.94
131	196	11.83	0	0.01	377.93	24.74	1.68	0.03	25.36	26.68	16.57
134	196.26	11.83	0	0.01	387.57	24.37	1.71	0.03	25.57	26.88	16.59
137	189.47	5.49	0	0.01	826.94	24.08	1.72	0.03	25.12	26.39	34.49
140	199.02	3.61	0	0.02	1409.24	24.01	1.87	0.03	25.99	27.29	55.06
143	197.74	7.39	0	0.01	545.73	23.82	1.49	0.03	25.75	27.01	26.76
146	193.84	8.11	0	0.01	661.34	23.58	1.99	0.03	25.69	26.93	23.9
149	192.42	5.28	0	0.02	842.67	23.36	1.66	0.03	25.61	26.83	36.42
152	191.39	3.18	0	0.03	1285.77	23.26	1.55	0.03	25.17	26.34	60.23
155	194.81	9.08	0	0.01	607.97	23.12	2.06	0.03	25.61	26.77	21.46
158	195.69	8.09	0	0.01	608.77	22.76	1.81	0.03	26.03	27.2	24.18
161	186.94	1.78	0	0.06	2681.04	22.66	1.83	0.02	25.03	26.13	104.86
164	190.37	10.27	0	0.01	506.26	22.56	1.95	0.03	25.56	26.66	18.54
167	184.86	7.31	0	0.01	657.51	22.12	1.82	0.03	25.25	26.33	25.3
170	184.18	2.87	0	0.03	1703.56	22.13	1.8	0.03	26.04	27.11	64.13
173	187.71	9.5	0	0.01	517.17	21.88	1.79	0.03	26.38	27.43	19.76
176	183.09	3.9	0	0.03	1097.68	21.64	1.6	0.03	25.79	26.79	46.98
179	178.53	6.64	0	0.01	577.08	21.59	1.43	0.03	25.7	26.69	26.91
182	173.91	8.16	0	0.01	544.61	21.25	1.7	0.03	25.25	26.2	21.31
185	176.49	3.08	0	0.03	1630.69	21.15	1.88	0.03	25.79	26.75	57.33
188	177.34	7.34	0	0.01	706.9	21	1.9	0.03	26.28	27.25	24.15
191	167.46	7.44	0	0.01	691.84	20.73	1.96	0.03	25.32	26.24	22.51
194	167.09	1.4	0	0.05	3517.97	20.6	1.89	0.03	25.23	26.12	119.05
197	173.73	4.52	0	0.02	1010.01	20.59	1.69	0.03	26.09	27	38.44
200	169.35	9.23	0	0.01	527.77	20.31	1.81	0.03	26	26.9	18.36
203	167.75	3.87	0	0.02	1195	20.1	1.68	0.03	26.6	27.49	43.33
206	162.68	2.96	0	0.02	1530.52	20.05	1.7	0.03	25.86	26.71	54.97
209	162.42	5.27	0	0.01	853.03	19.9	1.68	0.03	25.92	26.77	30.84
212	158.44	6.53	0	0.01	597.82	19.74	1.46	0.03	25.98	26.82	24.25
215	155.97	6.23	0	0.01	628.41	19.52	1.45	0.03	26.15	26.98	25.02
218	156.61	5.9	0	0.01	680.23	19.37	1.5	0.03	26.01	26.81	26.55
221	154.53	4.88	0	0.01	782.25	19.17	1.42	0.03	26.01	26.81	31.67
224	148.52	7.17	0	0.01	474.78	19.06	1.28	0.03	25.9	26.67	20.71
227	150.89	3.55	0	0.01	1039.5	18.78	1.36	0.03	26.43	27.2	42.56
230	145.64	1	0	0.03	3384.1	18.84	1.3	0.03	25.25	25.97	146.19
233	147.33	8.07	0	0	479.28	18.65	1.46	0.03	25.78	26.51	18.25
236	150.01	4.89	0	0.01	689.81	18.42	1.24	0.03	26.47	27.21	30.69
239	146.03	3.24	0	0.01	1178.46	18.35	1.45	0.03	25.6	26.31	45.08
242	151.49	3.85	0	0.01	898.06	18.21	1.28	0.03	26.29	27.02	39.39
245	144.4	3.62	0	0.01	953.15	18.13	1.32	0.03	25.53	26.22	39.86
248	144.62	7.37	0	0.01	470.64	17.97	1.29	0.03	26.14	26.85	19.62
251	145.3	1.33	0	0.04	3193.15	17.75	1.59	0.03	25.99	26.68	109.41
254	147.18	3.3	0	0.01	1241.62	17.83	1.53	0.03	26.15	26.84	44.56
257	141.06	11.08	0	0	347.74	17.51	1.46	0.03	25.79	26.48	12.73
260	142.97	4.38	0	0.01	800.69	17.27	1.31	0.03	26.05	26.74	32.61
263	142.39	0.41	-0.01	0.05	8696.02	17.23	1.36	0.03	25.47	26.14	347.12
266	144.19	5.27	0	0.01	600.72	17.18	1.19	0.03	25.92	26.6	27.38
269	142.4	7.23	0	0	489.92	16.94	1.33	0.03	25.87	26.56	19.7

272	143.15	1.62	0	0.01	2544.9	16.8	1.56	0.03	25.65	26.34	88.51
275	144.33	4.89	0	0	771.54	16.78	1.41	0.03	26.01	26.7	29.49
278	134.32	7.4	0	0.01	436.15	16.51	1.24	0.03	25.25	25.93	18.15
281	137.33	-0.16	0.03	-0.19	-19523.28	16.4	1.19	0.03	25.95	26.64	-843.81
284	138.01	1.21	0	0.02	3186.78	16.46	1.44	0.03	26.1	26.77	113.89
287	131.55	5.44	0	0	633.28	16.31	1.32	0.03	25.47	26.11	24.18
290	129.65	5.36	0	0.01	554.33	16.16	1.13	0.03	25.72	26.37	24.17
293	130.89	5.81	0	0.01	607.28	15.99	1.34	0.03	25.61	26.24	22.55
296	134.34	0.64	-0.01	0.08	5154.28	15.85	1.21	0.03	26.49	27.13	211.09
299	125.24	3.32	0	0.01	839.65	15.89	1.05	0.03	25.9	26.54	37.72
302	124.94	9.94	0	0	346.38	15.63	1.31	0.03	25.66	26.27	12.57
305	132.61	0.52	-0.01	0.06	7484.29	15.4	1.42	0.03	26.96	27.6	252.73
308	125.04	1.63	0	0.02	2115.96	15.52	1.3	0.03	25.93	26.52	76.87
311	124.3	11.79	0	0	327.02	15.25	1.44	0.03	26.18	26.78	10.54
314	121.01	1.07	0	0	2433.64	14.96	0.99	0.03	25.77	26.36	112.83
317	116.02	-0.81	0	0	-3614.58	15.13	1.11	0.03	25.76	26.35	-143.52
320	111.35	8.13	0	0	339.49	14.93	1.05	0.03	25.63	26.2	13.7
323	110.38	1.53	0	0	1290.42	14.74	0.75	0.03	25.8	26.37	72.01
326	111.1	0.6	-0.01	0	4564.57	14.8	1.03	0.03	26.1	26.66	184.85
329	108.48	4.74	0	0	402.83	14.67	0.72	0.03	25.93	26.47	22.88
332	103.37	2.47	0	0.01	734.19	14.56	0.69	0.03	25.85	26.38	41.86
335	103.03	3.49	0	0	561.17	14.5	0.73	0.03	26.24	26.77	29.52
338	99.05	0.97	0	0	2244.06	14.37	0.82	0.03	26	26.5	102.02
341	91.72	3.64	0	0	305.17	14.41	0.42	0.03	25.87	26.35	25.2
344	91.1	6.7	0	0	241.5	14.15	0.6	0.03	26.27	26.75	13.6
347	84.09	-1.7	0	0	-732.43	14.08	0.47	0.03	25.92	26.37	-49.47
350	75.43	2.42	0	0	662.8	14.17	0.6	0.03	26.25	26.68	31.22
353	66.99	5.61	0	0	182.05	13.94	0.39	0.03	26.09	26.5	11.94
356	64.69	-3.49	0	0	-232.96	13.92	0.3	0.03	26.31	26.69	-18.52
359	58.05	0.2	-0.02	0	3729.97	14.07	0.28	0.03	25.95	26.28	294.31
362	49.41	4.27	0	0	85.03	13.9	0.14	0.03	25.96	26.26	11.57
365	43.4	0.25	-0.02	0	474.44	13.87	0.05	0.03	26.12	26.38	170.36
368	41.92	1.11	0	0	56.71	13.85	0.02	0.03	26.13	26.36	37.9
371	38.27	3.59	0	0	0	13.79	0	0.03	26.51	26.71	10.67
374	32.43	2.69	0	0	0	13.66	0	0.03	26.64	26.81	12.05
377	29.77	-0.72	0.01	-0.03	0	13.65	0	0.03	26.12	26.26	-41.46
380	28.49	-3.36	0	-0.02	0	13.7	0	0.03	26.13	26.23	-8.47
383	26.23	1.21	0	0.05	0	13.8	0	0.03	26.63	26.7	21.73
386	21.84	3.75	0	0.02	0	13.64	0	0.03	26.5	26.56	5.82
389	22.37	-3.76	0	-0.02	0	13.64	0	0.03	26.27	26.31	-5.95
392	18.32	0.51	-0.01	0.16	0	13.79	0	0.03	26.04	26.06	35.78
395	16.04	5.95	0	0.01	0	13.6	0	0.03	26.4	26.42	2.7
398	17.41	-1.69	0	-0.05	0	13.52	0	0.03	26.3	26.3	-10.33
401	18.33	-0.67	0.01	-0.13	0	13.65	0	0.03	26.3	26.3	-27.24
404	14.93	1.79	0	0.06	0	13.55	0	0.03	26.07	26.06	8.36
407	13.97	-2.26	0	-0.05	0	13.58	0	0.03	26.49	26.48	-6.18
410	17.32	-0.14	0.04	-0.73	0	13.64	0	0.03	26.68	26.66	-122.06
413	14.21	0.3	-0.02	0.27	0	13.6	0	0.03	26.4	26.39	47.61

416	12.29	1.33	0	0.08	0	13.62	0	0.03	26.4	26.4	9.24
419	14.99	3.18	0	0.03	0	13.51	0	0.03	26.29	26.28	4.72
422	14.57	-0.43	0.01	-0.2	0	13.47	0	0.03	26.69	26.69	-33.81
425	11.49	-0.02	0.33	-4.81	0	13.51	0	0.03	25.83	25.83	-749.82
428	11.22	3.26	0	0.02	0	13.45	0	0.03	25.71	25.73	3.44
431	13.08	0.01	-0.33	8.66	0	13.37	0	0.03	26.75	26.77	1308.27
434	10.12	0.01	-0.43	5.01	0	13.53	0	0.03	26.09	26.12	1011.79

Carpeting**Test 2**External Heat Flux 35 kW/m²

Test Results::

Time to Sustained Ignition (s):	66.00
Peak Heat Release Rate (kW/m ²):	277.77
Time to Peak Heat Release Rate (s):	134.00
Total Heat Release (MJ/m ²):	46.95
60 s Average Heat Release Rate (kW/m ²):	212.74
Total Mass Loss (g):	15.52
Average Mass Loss Rate (g/s):	0.057
Average Effective Heat of Combustion (MJ/kg):	30.26
Average Smoke Extinction Area (m ² /kg):	570.91
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0082

Specimen:

Initial mass (g):	29
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	66
Time to flameout (s):	336

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-0.44	0.01	-0.53	-0.04	0	29.11	0	0.03	25.89	26.1	-43.67
5	1.32	0.01	-0.45	-0.04	1024.67	29.12	0	0.03	25.81	26.01	131.51
8	3.38	1.91	0	0	0	28.96	0	0.03	26.25	26.45	1.77
11	3.12	-4.58	0	0	-24.53	29.04	0.04	0.03	26.37	26.56	-0.68
14	1.24	0.36	-0.01	0	97.82	29.15	0.01	0.03	25.43	25.62	3.48
17	-0.04	3.38	0	0	19.52	29.03	0.03	0.03	25.67	25.86	-0.01
20	1.27	-0.44	0.01	0	-63.9	29	0.01	0.03	25.55	25.75	-2.89
23	2.18	-2.44	0	0	-38.91	29.04	0.04	0.03	26.04	26.24	-0.9
26	0.57	1.17	0	0	73.49	29.1	0.03	0.03	25.6	25.8	0.49
29	-0.67	1.45	0	0	93.39	28.99	0.05	0.03	26.38	26.59	-0.46
32	1.78	1.74	0	0	46.66	29.02	0.03	0.03	26.03	26.25	1.02
35	-0.52	3.65	0	0	24.6	28.88	0.03	0.03	25.99	26.21	-0.14
38	2.23	-3.62	0	0	-49.09	28.86	0.07	0.03	26.59	26.83	-0.62
41	2.21	0.08	-0.06	0	1400.83	29.03	0.04	0.03	26.3	26.55	28.19
44	0.22	4.72	0	0	18.41	28.85	0.03	0.03	25.95	26.19	0.05
47	3.03	-2.67	0	0	-74.08	28.83	0.07	0.03	26.16	26.41	-1.13
50	3.01	-5.36	0	0	-52.5	28.97	0.11	0.03	25.92	26.16	-0.56
53	2.03	4.27	0	0	69.13	29.06	0.11	0.03	25.64	25.88	0.48
56	3.92	2.92	0	0	134.24	28.79	0.15	0.03	25.44	25.68	1.34
59	3.64	-1.13	0	0	-298.86	28.91	0.13	0.03	26.08	26.33	-3.23
62	3.97	1.61	0	0	364.23	28.82	0.22	0.03	25.84	26.1	2.46
65	20.09	-2.9	0	0	-210.56	28.85	0.24	0.03	25.65	25.89	-6.93
68	60.28	4.76	0	0	125.55	28.91	0.23	0.03	25.8	26.06	12.67
71	117.69	8.41	0	0	22.38	28.6	0.08	0.03	24.7	25.03	14
74	157.23	0.2	-0.01	0	2441.96	28.48	0.19	0.03	24.74	25.31	779.1
77	191.26	10.33	0	0	89.03	28.46	0.36	0.03	24.88	25.73	18.51
80	216.65	16.03	0	0	86.42	27.89	0.54	0.03	24.65	25.76	13.51
83	229.11	4.71	0	0	377.63	27.62	0.68	0.03	24.62	25.95	48.67
86	222.47	8.09	0	0	255.49	27.52	0.83	0.02	23.71	25.03	27.48
89	231.09	9.7	0	0	256.16	27.14	0.96	0.03	24.27	25.83	23.81
92	232.39	5.41	0	0	493.87	26.97	1.02	0.03	24.56	26.21	42.95
95	232.69	9.84	0	0	299.13	26.76	1.12	0.03	24.57	26.28	23.65
98	239.95	12	0	0	204.6	26.4	0.93	0.03	24.73	26.48	20
101	242.08	5.74	0	0	575.16	26.09	1.24	0.03	24.87	26.66	42.19
104	252.09	8.22	0	0	359.85	25.99	1.1	0.03	25.07	26.89	30.67
107	259.3	12.33	0	0	324.35	25.59	1.47	0.03	25.33	27.15	21.02
110	263.84	9.68	0	0.01	482.29	25.3	1.69	0.03	25.75	27.63	27.26
113	262.97	5.85	0	0.01	772.16	25.02	1.65	0.03	25.53	27.4	44.91
116	265.08	7.67	0	0.01	541.45	24.91	1.53	0.03	25.38	27.22	34.56
119	256.78	11.27	0	0.01	381.71	24.54	1.64	0.02	24.48	26.24	22.78
122	261.08	8.53	0	0.01	688.08	24.28	2.16	0.03	25.29	27.11	30.61
125	253.5	11.04	0	0.01	406.75	24	1.68	0.02	24.99	26.76	22.96

128	254.4	11.18	0	0.01	448.84	23.63	1.87	0.02	25.11	26.83	22.76
131	267.79	3.74	0	0.03	1594.48	23.38	2.2	0.03	25.37	27.08	71.56
134	277.77	6.69	0	0.02	913.88	23.33	2.19	0.03	26.14	27.89	41.54
137	259.1	12.96	0	0.01	360.67	22.95	1.77	0.02	24.77	26.43	19.99
140	248.35	5.21	0	0.03	1092.47	22.65	2.2	0.02	24.29	25.88	47.68
143	249.88	9.6	0	0.02	796.49	22.56	2.84	0.02	25.3	26.9	26.03
146	247.2	15	0	0.01	367.17	22.07	2.05	0.02	25.37	26.93	16.48
149	244.62	3.82	0	0.04	1465.09	21.77	2.09	0.02	25.25	26.74	64.1
152	242.89	7.69	0	0.02	785.44	21.74	2.24	0.03	25.49	26.96	31.57
155	246.16	10.82	0	0.02	620.84	21.31	2.46	0.03	25.89	27.34	22.75
158	237.94	3.32	0	0.04	1723.01	21.16	2.12	0.03	25.68	27.08	71.57
161	236.61	8.24	0	0.02	655.2	21.03	1.99	0.03	25.78	27.14	28.7
164	242.33	12.23	0	0.01	464.3	20.67	2.06	0.03	26.17	27.52	19.82
167	229.56	5.37	0	0.03	953.6	20.37	1.91	0.02	25.43	26.73	42.76
170	228.83	6.26	0	0.02	845.05	20.3	1.97	0.03	25.62	26.9	36.58
173	224.44	9.76	0	0.01	511.5	19.98	1.87	0.02	25.45	26.69	23
176	222.19	4.48	0	0.03	1257.84	19.77	2.09	0.03	25.74	26.95	49.61
179	220.52	5.2	0	0.02	1007.64	19.67	1.93	0.03	26.01	27.2	42.41
182	212.33	9.02	0	0.01	458.12	19.44	1.52	0.03	26	27.15	23.55
185	198.69	6.04	0	0.01	782.45	19.18	1.76	0.03	25.73	26.84	32.9
188	197.58	3.38	0	0.02	1466.74	19.07	1.82	0.03	26.14	27.22	58.39
191	190.27	7.09	0	0.01	648.85	18.93	1.72	0.03	25.77	26.79	26.85
194	183.71	9.08	0	0.01	473.29	18.66	1.6	0.03	25.84	26.83	20.24
197	182.75	3.61	0	0.01	894.8	18.43	1.18	0.03	26.49	27.46	50.63
200	174.94	4.65	0	0.01	790.03	18.4	1.37	0.03	25.98	26.87	37.58
203	172.97	7.75	0	0	490.09	18.14	1.37	0.03	26.8	27.7	22.33
206	164.78	1.83	0	0.01	1518.77	17.99	1.03	0.03	26.01	26.86	90.07
209	158.99	5.12	0	0	591.56	17.97	1.15	0.03	25.62	26.43	31.05
212	157.63	9.32	0	0	360.02	17.68	1.25	0.03	26.11	26.9	16.9
215	156.2	3.13	0	0.01	845.26	17.48	0.99	0.03	26.12	26.87	49.86
218	157.74	4.52	0	0	765.22	17.44	1.29	0.03	26.03	26.76	34.92
221	154.27	7.29	0	0	384.17	17.2	1.05	0.03	25.91	26.63	21.16
224	150.28	0.52	-0.01	0.04	6806.51	17.07	1.33	0.03	25.95	26.66	289.34
227	154	3.22	0	0.01	942.99	17.11	1.12	0.03	26.42	27.12	47.75
230	149.2	6.24	0	0	372.74	16.87	0.87	0.03	25.94	26.6	23.89
233	147.61	5.39	0	0.01	705.17	16.76	1.41	0.03	26.28	26.94	27.4
236	140.93	7.08	0	0	383.68	16.53	1.05	0.03	25.32	25.95	19.91
239	140.02	3.28	0	0	782.61	16.37	0.97	0.03	25.8	26.44	42.65
242	138.62	2.67	0	0	1157.66	16.32	1.17	0.03	25.79	26.41	51.89
245	141.76	5.55	0	0	547.05	16.19	1.15	0.03	25.88	26.48	25.56
248	140.17	2.87	0	0	964.82	16.02	1.04	0.03	26.08	26.7	48.89
251	136.57	0.44	-0.01	0.05	6622.43	16.01	1.1	0.03	25.63	26.24	312.65
254	138.31	8.49	0	0	373.15	15.93	1.19	0.03	25.94	26.54	16.3
257	142.14	5.11	0	0	565.21	15.58	1.06	0.03	26.68	27.3	27.79
260	139.02	0.77	-0.01	0.01	3962.93	15.63	1.13	0.03	26.36	26.97	180.23
263	139.32	8.3	0	0	354.03	15.45	1.11	0.03	25.98	26.58	16.79
266	143.02	5.77	0	0	483.75	15.2	1.05	0.03	26.09	26.7	24.77
269	141.72	-1.82	0	-0.01	-1645.15	15.14	1.12	0.03	26.11	26.73	-77.74

272	142.8	3.7	0	0	1012.84	15.21	1.41	0.03	25.96	26.58	38.65
275	143.14	8.12	0	0	408.01	14.92	1.25	0.03	25.91	26.54	17.63
278	137.05	0.62	-0.01	0	4083.73	14.81	0.96	0.03	25.74	26.37	221.64
281	141.26	4.23	0	0	664.29	14.81	1.04	0.03	26.33	26.99	33.41
284	138.95	9.73	0	0	246.04	14.54	0.91	0.03	25.61	26.25	14.28
287	136.38	3.09	0	0	1100.77	14.32	1.28	0.03	25.92	26.57	44.11
290	133.63	-0.58	0.01	-0.01	-6267.13	14.33	1.36	0.03	25.94	26.59	-230.83
293	130.59	7.13	0	0	342.19	14.27	0.91	0.03	26.22	26.87	18.31
296	121.77	2.25	0	0	830.78	13.99	0.71	0.03	25.75	26.37	54.07
299	111.62	-1.18	0	0	-1958.72	14.13	0.87	0.03	25.99	26.59	-94.2
302	100.7	8.23	0	0	226.22	13.97	0.7	0.03	26.12	26.69	12.23
305	91.7	4.29	0	0	357.99	13.72	0.59	0.03	25.38	25.9	21.39
308	85.61	-2.49	0	0	-573.91	13.74	0.54	0.03	26.13	26.62	-34.45
311	77.75	3.18	0	0.01	330.12	13.79	0.4	0.03	26.05	26.5	24.43
314	68.54	5.64	0	0.01	155.98	13.57	0.34	0.03	25.73	26.14	12.15
317	61.9	-3.56	0	-0.02	-337.71	13.53	0.44	0.03	26.98	27.36	-17.37
320	49.67	-0.65	0.01	-0.09	-839.87	13.7	0.2	0.03	26.66	26.96	-75.92
323	46.18	5.87	0	0.01	52.07	13.54	0.11	0.03	26.36	26.61	7.87
326	41.76	0.2	-0.02	0.29	0	13.43	0	0.03	26.08	26.27	204.48
329	34.35	-1.76	0	-0.04	0	13.5	0	0.03	26.16	26.33	-19.5
332	31.74	3.64	0	0.02	0	13.49	0	0.03	26.27	26.41	8.72
335	30.56	1.75	0	0.04	0	13.34	0	0.03	26.59	26.7	17.47
338	24.64	-4.35	0	-0.02	0	13.41	0	0.03	26.65	26.71	-5.67
341	20.34	0.83	0	0.16	0	13.52	0	0.03	26.47	26.51	24.61
344	23.5	5.9	0	0.02	0	13.36	0	0.03	27	27.01	3.98
347	19.87	-2.25	0	-0.07	0	13.26	0	0.03	26.75	26.73	-8.82
350	18.64	-4.32	0	-0.03	0	13.45	0	0.03	27.21	27.18	-4.32
353	20.03	5.17	0	0.02	0	13.43	0	0.03	26.27	26.24	3.87
356	18.38	1.35	0	0.09	0	13.24	0	0.03	26.47	26.43	13.62
359	15.31	-5.08	0	-0.02	0	13.37	0	0.03	25.9	25.86	-3.02
362	16.84	2.98	0	0.04	0	13.44	0	0.03	26.14	26.1	5.65
365	15.86	4.56	0	0.02	0	13.24	0	0.03	26.31	26.28	3.47
368	13.62	-2.52	0	-0.04	0	13.23	0	0.03	25.93	25.91	-5.41
371	13.28	-0.97	0	-0.08	0	13.33	0	0.03	26.34	26.34	-13.64
374	14.9	3.32	0	0.02	0	13.27	0	0.03	25.92	25.92	4.49
377	13.26	-0.7	0.01	-0.07	0	13.19	0	0.03	26.1	26.11	-18.85
380	10.49	-2.2	0	-0.02	0	13.29	0	0.03	26.56	26.57	-4.77
383	12.6	1.81	0	0.02	0	13.28	0	0.03	26.47	26.5	6.97
386	11.84	0.01	-0.34	3.84	0	13.21	0	0.03	25.86	25.89	1183.88
389	9.02	0.01	-0.48	2.72	0	13.22	0	0.03	26.34	26.38	902.46

Carpeting**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	93.00
Peak Heat Release Rate (kW/m ²):	287.26
Time to Peak Heat Release Rate (s):	145.00
Total Heat Release (MJ/m ²):	45.48
60 s Average Heat Release Rate (kW/m ²):	238.16
Total Mass Loss (g):	14.62
Average Mass Loss Rate (g/s):	0.050
Average Effective Heat of Combustion (MJ/kg):	31.11
Average Smoke Extinction Area (m ² /kg):	229.48
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0105

Specimen:

Initial mass (g):	28.8
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	100
Time to ignition (s):	93
Time to flameout (s):	386

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	3.11	0.01	-0.47	-0.04	0	110.96	0	0.03	25.64	25.83	310.99
4	2.86	0.01	-0.46	-0.04	1560.08	154.46	0.01	0.03	25.19	25.38	285.81
7	0.18	123.12	0	0	0.24	154.34	0.01	0.03	25.68	25.88	0
10	-0.35	1.27	0	0	30.98	154.34	0.02	0.03	25.69	25.88	-0.27
13	2.37	0.05	-0.08	-0.01	0	154.27	0	0.03	26.01	26.2	44.02
16	2.73	-3.82	0	0	0	154.35	0	0.03	25.51	25.7	-0.72
19	0.77	-3.66	0	0	0	154.46	0	0.03	25.84	26.04	-0.21
22	0.16	2.47	0	0	0	154.53	0	0.03	25.84	26.04	0.07
25	1.33	3.52	0	0	0	154.35	0	0.03	26.28	26.49	0.38
28	1.54	2.22	0	0	0	154.34	0	0.03	25.42	25.63	0.69
31	-0.63	1.91	0	0	0	154.22	0	0.03	25.38	25.59	-0.33
34	1.19	-2.95	0	0	0	154.25	0	0.03	25.89	26.11	-0.41
37	3	-0.59	0.01	0	0	154.34	0	0.03	25.38	25.61	-5.08
40	1.65	1.95	0	0	0	154.28	0	0.03	25.76	26	0.85
43	-0.06	1.28	0	0	0	154.25	0	0.03	25.94	26.18	-0.05
46	2.42	-3.14	0	0	0	154.23	0	0.03	25.84	26.09	-0.77
49	3.01	0.16	-0.02	0	0	154.39	0	0.03	26.25	26.5	19.38
52	2.84	4.13	0	0	0	154.22	0	0.03	25.67	25.92	0.69
55	1.7	-3.62	0	0	0	154.22	0	0.03	25.85	26.11	-0.47
58	3.23	0.37	-0.01	0	0	154.35	0	0.03	25.33	25.59	8.64
61	3.3	5.97	0	0	0	154.18	0	0.03	25.16	25.42	0.55
64	1.91	0.64	-0.01	0	0	154.08	0	0.03	25.43	25.69	2.99
67	4.81	-3.04	0	0	0	154.13	0	0.03	25.67	25.94	-1.58
70	2.46	0.77	-0.01	0	0	154.2	0	0.03	25.61	25.88	3.22
73	2.39	6.57	0	0	0	154.07	0	0.03	25.83	26.11	0.36
76	4.52	2.92	0	0	0	153.88	0	0.03	25.8	26.08	1.55
79	3.16	-4.09	0	0	0	153.92	0	0.03	26.52	26.8	-0.77
82	4.31	-1.93	0	0	0	154.05	0	0.03	25.76	26.03	-2.23
85	4.3	7.34	0	0	0	153.99	0	0.03	25.53	25.8	0.59
88	3.99	4.89	0	0	0	153.7	0	0.03	25.87	26.16	0.82
91	24.73	-8.09	0	0	0	153.76	0	0.03	26.12	26.42	-3.06
94	57.71	4.82	0	0	0	154	0	0.03	26.31	26.6	11.98
97	130.02	16.04	0	0	0	153.48	0	0.03	25.29	25.62	8.1
100	197.07	4.12	0	0	8.82	153.2	0.01	0.03	24.73	25.34	47.81
103	234.96	6.65	0	0	98.64	153.14	0.26	0.03	24.5	25.41	35.35
106	254.05	14.89	0	0	92.64	152.76	0.54	0.03	24.5	25.69	17.06
109	260.27	10.96	0	0	129.86	152.33	0.56	0.03	24.2	25.57	23.75
112	265.88	7.97	0	0.01	218.02	152.1	0.66	0.03	24.58	26.14	33.37
115	267.27	9.91	0	0.01	234.83	151.82	0.88	0.03	24.61	26.3	26.97
118	269.06	8.31	0	0.01	223.28	151.53	0.7	0.03	24.69	26.47	32.38
121	276.61	10.55	0	0.01	391.02	151.3	1.53	0.03	25.02	26.89	26.22
124	269.85	11.2	0	0.01	257.48	150.91	1.1	0.02	24.38	26.25	24.09

127	271.03	5.81	0	0.02	555.01	150.67	1.2	0.03	24.97	26.92	46.66
130	269.41	8.51	0	0.01	355.79	150.5	1.13	0.03	24.91	26.84	31.64
133	275.21	12.34	0	0.01	224.17	150.15	1	0.03	25.59	27.57	22.31
136	274.44	5.88	0	0.03	328.18	149.83	0.71	0.03	25.34	27.28	46.66
139	278.15	8.69	0	0.02	357.13	149.73	1.14	0.03	25.37	27.27	32
142	278.71	12.19	0	0.01	251.63	149.3	1.14	0.03	25.13	26.99	22.86
145	287.26	9.31	0	0.02	278.59	149.05	0.94	0.03	25.77	27.67	30.87
148	280.38	10.66	0	0.02	326.72	148.72	1.28	0.03	25.34	27.18	26.31
151	279.36	4.74	0	0.04	827.29	148.45	1.43	0.03	25.61	27.43	58.95
154	271.53	5.32	0	0.03	492.71	148.39	0.99	0.02	24.82	26.54	51.04
157	280.74	12.46	0	0.01	356.86	148.08	1.59	0.03	26.17	27.96	22.54
160	277.08	13.37	0	0.01	351.19	147.69	1.7	0.03	25.95	27.69	20.73
163	269.8	10.6	0	0.02	355.02	147.32	1.37	0.03	25.72	27.4	25.45
166	267.79	5.24	0	0.03	722.82	147.07	1.38	0.03	25.72	27.36	51.15
169	263.66	7.83	0	0.02	417.58	146.94	1.21	0.02	25.48	27.07	33.67
172	259.21	10.06	0	0.02	335.07	146.59	1.24	0.03	25.63	27.2	25.77
175	253.65	11.29	0	0.01	285.11	146.35	1.19	0.02	25.47	27	22.46
178	244.52	8.68	0	0.02	319.92	145.95	1.02	0.03	25.78	27.31	28.17
181	244.59	3.7	0	0.03	658.03	145.84	0.86	0.03	26.84	28.38	66.18
184	228.97	8.23	0	0.01	338.06	145.66	1.02	0.03	25.96	27.39	27.82
187	221.15	6.36	0	0.02	268.24	145.39	0.61	0.03	26.44	27.83	34.77
190	208.04	2.48	0	0.04	1008.11	145.29	0.92	0.03	25.77	27.06	83.79
193	198.27	7.02	0	0.01	154.78	145.18	0.4	0.03	25.95	27.19	28.23
196	187.72	7.79	0	0.01	224.77	144.89	0.65	0.03	25.76	26.92	24.1
199	185	7.95	0	0.01	227.65	144.73	0.67	0.03	25.98	27.08	23.27
202	182.78	4.36	0	0.02	328.45	144.45	0.52	0.03	26.47	27.51	41.88
205	177.81	0.88	-0.01	0.07	1374.65	144.46	0.45	0.03	26.14	27.1	202.14
208	175.2	6.98	0	0.01	139.23	144.32	0.36	0.03	25.76	26.65	25.09
211	165.62	7.08	0	0.01	213.23	144.08	0.57	0.03	25.53	26.39	23.39
214	166.68	9.95	0	0.01	53.83	143.89	0.2	0.03	25.83	26.67	16.76
217	163.5	3.75	0	0.01	281.06	143.55	0.39	0.03	25.91	26.72	43.58
220	161.46	-0.56	0.01	-0.09	-1995.33	143.65	0.42	0.03	26.25	27.04	-286.24
223	159.93	6.03	0	0.01	110.85	143.5	0.25	0.03	25.97	26.72	26.53
226	158.89	6.56	0	0.01	99.09	143.32	0.24	0.03	26.56	27.3	24.23
229	155.59	8.31	0	0	204.64	143.11	0.64	0.03	25.73	26.41	18.73
232	155.34	2.34	0	0.02	236.73	142.88	0.21	0.03	25.9	26.6	66.44
235	153.62	1.82	0	0.03	179.84	142.93	0.12	0.03	25.96	26.64	84.55
238	155.22	9.68	0	0	92.8	142.72	0.34	0.03	26.05	26.74	16.03
241	150.88	1.35	0	0.03	751.91	142.45	0.38	0.03	26.05	26.74	112.03
244	154.16	1.01	0	0.04	1265.27	142.58	0.46	0.03	26.9	27.6	152.18
247	147.03	9.84	0	0	133.14	142.33	0.49	0.03	26.1	26.76	14.95
250	142.41	4.07	0	0.01	189.37	142.09	0.29	0.03	25.91	26.56	34.97
253	141.99	1.34	0	0.02	623.45	142.07	0.31	0.03	26.09	26.74	105.84
256	141.26	4.46	0	0.01	194.06	141.96	0.32	0.03	26.59	27.24	31.65
259	131.6	6.5	0	0.01	224.8	141.81	0.55	0.03	25.69	26.32	20.26
262	132.71	5.16	0	0	124.01	141.6	0.24	0.03	26.21	26.84	25.69
265	124.79	-1.35	0	-0.01	-103.82	141.53	0.05	0.03	25.97	26.57	-92.69
268	122.47	4.09	0	0.01	117.35	141.6	0.18	0.03	25.96	26.54	29.94

271	121.58	9.64	0	0	51.45	141.28	0.18	0.03	26.32	26.88	12.62
274	115	3.28	0	0.01	0	141.11	0	0.03	26.15	26.69	35.06
277	117.98	0.12	-0.04	0	0	141.07	0	0.03	27.24	27.79	980.14
280	115.69	0.95	0	0	206.6	141.06	0.07	0.03	27.04	27.56	121.38
283	107.32	7.4	0	0	4.4	140.97	0.01	0.03	26.46	26.95	14.5
286	107.03	5.56	0	0	0	140.68	0	0.03	26.28	26.75	19.25
289	103.52	-0.89	0.01	0	0	140.67	0	0.03	25.74	26.2	-116.21
292	101.43	3.24	0	0	32.59	140.66	0.04	0.03	26.01	26.47	31.29
295	100.05	5.54	0	0	0	140.49	0	0.03	25.63	26.08	18.05
298	101.01	3.66	0	0	0	140.36	0	0.03	26.15	26.6	27.61
301	98.02	0.87	-0.01	0	0	140.28	0	0.03	26.51	26.97	113.27
304	99.61	-0.99	0.01	0	0	140.3	0	0.03	26.8	27.26	-100.24
307	94.63	6.18	0	0	0	140.27	0	0.03	26.21	26.65	15.32
310	92.33	6.28	0	0	0	139.98	0	0.03	26.46	26.9	14.71
313	90	-1.45	0	0	0	139.95	0	0.03	26.31	26.75	-62.23
316	84.16	3.42	0	0	0	139.98	0	0.03	25.8	26.21	24.63
319	81.33	5.33	0	0	0	139.77	0	0.03	25.94	26.35	15.25
322	82.67	-2.44	0	0	0	139.72	0	0.03	26.18	26.59	-33.95
325	75.63	1.08	0	0.01	0	139.84	0	0.03	25.84	26.23	69.95
328	74.27	2.91	0	0	0	139.66	0	0.03	26.55	26.94	25.5
331	72.72	2.32	0	0	0	139.68	0	0.03	26.57	26.94	31.29
334	68.15	6.7	0	0	0	139.5	0	0.03	26.57	26.92	10.18
337	63.24	0.06	-0.06	0.07	0	139.35	0	0.03	26.2	26.53	985.54
340	62.43	-4.29	0	0	0	139.48	0	0.03	26.2	26.51	-14.54
343	55.34	4.58	0	0	0	139.52	0	0.03	26.03	26.33	12.09
346	52.12	4.81	0	0	0	139.26	0	0.03	25.83	26.11	10.83
349	52.28	0.03	-0.15	-0.01	0	139.27	0	0.03	26.49	26.76	2014.01
352	46.88	1.61	0	0	0	139.22	0	0.03	26.21	26.45	29.08
355	42.53	-2.3	0	0	0	139.2	0	0.03	26.19	26.42	-18.47
358	43.04	-0.71	0.01	0	0	139.32	0	0.03	26.55	26.76	-60.6
361	40.03	5.85	0	0	0	139.21	0	0.03	26.65	26.84	6.84
364	34.26	1.77	0	0	0	139.04	0	0.03	26.01	26.18	19.41
367	33.74	-3.24	0	0	0	139.11	0	0.03	26.27	26.43	-10.4
370	31.36	0.97	-0.01	0	0	139.17	0	0.03	26.76	26.9	32.22
373	27.33	0.92	0	0	0	139.08	0	0.03	26.71	26.85	29.78
376	25.39	1.69	0	0	0	139.11	0	0.03	26.34	26.46	15.02
379	24.64	3.82	0	0	0	138.98	0	0.03	26.19	26.3	6.46
382	19.99	-4.03	0	0	0	138.95	0	0.03	26.1	26.21	-4.97
385	17.56	-1.22	0	0	0	139.14	0	0.03	26.47	26.57	-14.43
388	17.96	4.52	0	0	0	139	0	0.03	26.24	26.32	3.98
391	13.45	-1.83	0	-0.01	0	138.95	0	0.03	25.78	25.84	-7.33
394	11.83	-0.29	0.01	-0.15	0	139.06	0	0.03	26.16	26.23	-40.19
397	13.25	4.56	0	0.01	0	138.95	0	0.03	26.29	26.35	2.91
400	12.39	0.03	-0.14	0.64	0	138.85	0	0.03	26.46	26.53	388.53
403	8.56	-2.01	0	-0.01	0	138.93	0	0.03	26.57	26.63	-4.27
406	11.16	0.09	-0.05	0.16	0	138.94	0	0.03	25.95	26	127.2
409	9.7	-0.46	0.01	-0.01	0	138.94	0	0.03	26	26.05	-20.9
412	8.07	2	0	0	0	138.95	0	0.03	25.9	25.94	4.03

415	9.34	3.01	0	0	0	138.83	0	0.03	26.22	26.27	3.1
418	9.37	-3.12	0	0	0	138.82	0	0.03	26.27	26.34	-3.01
421	6.26	-4.6	0	0	0	138.98	0	0.03	26.58	26.65	-1.36
424	8.01	5.57	0	0	0	139.01	0	0.03	26.28	26.36	1.44
427	8.07	4.59	0	0	0	138.73	0	0.03	25.72	25.79	1.76
430	5.38	-7.24	0	0	0	138.81	0	0.03	26.33	26.4	-0.74
433	5.76	0.01	-0.44	-0.03	0	139.04	0	0.03	26.4	26.47	575.67
436	7.51	0.01	-0.47	-0.03	0	138.86	0	0.03	26.49	26.57	751.1

Ceiling Tile (face-down)**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	
Peak Heat Release Rate (kW/m ²):	8.88
Time to Peak Heat Release Rate (s):	153.00
Total Heat Release (MJ/m ²):	-0.12
60 s Average Heat Release Rate (kW/m ²):	-1.71
Total Mass Loss (g):	NA
Average Mass Loss Rate (g/s):	NA
Average Effective Heat of Combustion (MJ/kg):	NA
Average Smoke Extinction Area (m ² /kg):	NA
Average CO ₂ yield (g/g):	NA
Average CO yield (g/g):	NA

Specimen:

Initial mass (g):	81
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	83
Time to ignition (s):	
Time to flameout (s):	

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-1.68	0.01	-0.33	-0.04	15262.06	NA	0.06	0.03	25.76	25.98	-168.14
3	-3.15	0.01	-0.34	-0.05	14165.01	NA	0.05	0.03	26.54	26.78	-315.08
6	-6.15	0	-4.1	-0.39	0.0	NA	0.06	0.03	26.11	26.34	0.0
9	-2.71	-4.43	0	0	-44.24	NA	0.08	0.03	25.75	25.97	0.61
12	-3.84	1.9	0	0	55.16	NA	0.04	0.03	26.07	26.3	-2.02
15	-6.84	3.32	0	0	118.63	NA	0.15	0.03	26.12	26.35	-2.06
18	-5.82	-1.27	0	0	-472.61	NA	0.23	0.03	25.65	25.89	4.59
21	-3.29	3.56	0	0	217.86	NA	0.29	0.03	26.52	26.78	-0.92
24	-4.97	4.18	0	0	148.51	NA	0.24	0.03	25.92	26.18	-1.19
27	-6.34	0.09	-0.06	0	7066.89	NA	0.24	0.03	25.72	25.99	-72.07
30	-3.68	-2.65	0	0	-228.11	NA	0.23	0.03	25.46	25.74	1.39
33	-2.24	0.41	-0.01	0	1874.97	NA	0.3	0.03	25.96	26.25	-5.41
36	-4.1	7.91	0	0	77.95	NA	0.24	0.03	25.64	25.94	-0.52
39	-4.47	2.74	0	0	194.83	NA	0.2	0.03	25.95	26.25	-1.63
42	-2.48	-4.02	0	0	-132.62	NA	0.2	0.03	25.86	26.18	0.62
45	-1.85	0.61	-0.01	0	740.08	NA	0.17	0.03	26.01	26.34	-3.04
48	-3.81	3.3	0	0	154.43	NA	0.2	0.03	25.74	26.07	-1.15
51	-0.83	2.05	0	0.01	299.51	NA	0.23	0.03	25.84	26.17	-0.4
54	-0.35	2.5	0	0.01	211.1	NA	0.2	0.03	25.92	26.25	-0.14
57	-0.86	5.03	0	0.01	99.02	NA	0.19	0.03	26.22	26.55	-0.17
60	-2.11	0.58	-0.01	0.07	872.61	NA	0.19	0.03	25.62	25.95	-3.64
63	0.29	-4.69	0	-0.01	-107.69	NA	0.2	0.03	25.4	25.73	-0.06
66	1.74	-0.65	0.01	-0.08	-644.33	NA	0.16	0.03	25.64	25.97	-2.67
69	-0.38	6.06	0	0.01	69.48	NA	0.16	0.03	26.01	26.34	-0.06
72	-0.69	4.69	0	0.02	101.9	NA	0.19	0.03	25.46	25.79	-0.15
75	3.06	-2.27	0	-0.04	-215.73	NA	0.19	0.03	25.96	26.29	-1.34
78	3.17	2.52	0	0.03	161.47	NA	0.16	0.03	25.85	26.18	1.26
81	0.82	5.39	0	0.02	70.25	NA	0.14	0.03	25.93	26.26	0.15
84	1.93	-3.34	0	-0.03	-108.67	NA	0.14	0.03	25.75	26.08	-0.58
87	4.19	1.68	0	0.08	221.59	NA	0.14	0.03	25.36	25.69	2.5
90	4.28	7.72	0	0.02	38.57	NA	0.11	0.03	25.89	26.23	0.55
93	1.46	2.01	0	0.07	133.14	NA	0.1	0.03	25.91	26.25	0.73
96	4.13	0.15	-0.04	0.97	2106.5	NA	0.12	0.03	25.54	25.88	27.48
99	5.61	3.17	0	0.05	86.2	NA	0.11	0.03	25.5	25.84	1.77
102	3.75	-1.62	0	-0.1	-146.39	NA	0.09	0.03	25.63	25.98	-2.31
105	3.34	-1.25	0	-0.14	-196.74	NA	0.1	0.03	25.36	25.7	-2.67
108	5.78	5.82	0	0.03	38.74	NA	0.09	0.03	25.4	25.74	0.99
111	5.61	6.39	0	0.03	27.32	NA	0.07	0.03	25.82	26.16	0.88
114	4.28	1.5	0	0.14	146.81	NA	0.08	0.03	25.98	26.33	2.86
117	5	-2.03	0	-0.1	-136.96	NA	0.11	0.03	26.14	26.49	-2.46
120	7.12	1.46	0	0.16	105.65	NA	0.06	0.03	26.07	26.42	4.87
123	5.9	4.19	0	0.05	30.32	NA	0.05	0.03	25.34	25.68	1.41

126	5.08	2.89	0	0.07	69.34	NA	0.08	0.03	25.78	26.12	1.76
129	6.74	0.94	-0.01	0.23	117.98	NA	0.04	0.03	25.23	25.57	7.19
132	6.68	3.41	0	0.07	22.22	NA	0.03	0.03	25.59	25.93	1.96
135	4.7	6.43	0	0.04	8.57	NA	0.02	0.03	25.69	26.03	0.73
138	7.17	-2.69	0	-0.09	-29.86	NA	0.03	0.03	26.22	26.56	-2.66
141	8.77	-0.85	0.01	-0.33	-116.95	NA	0.04	0.03	26.11	26.46	-10.26
144	7.5	5.6	0	0.05	23.71	NA	0.05	0.03	26.56	26.9	1.34
147	6.34	0.86	-0.01	0.31	117.37	NA	0.04	0.03	25.48	25.8	7.34
150	8.14	0.01	-0.46	27	21821.93	NA	0.08	0.03	25.7	26.02	814.05
153	8.88	0.01	-0.54	26.61	17434.65	NA	0.07	0.03	25.6	25.93	888.24

Ceiling Tile (face-down)**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	NA
Peak Heat Release Rate (kW/m ²):	10.03
Time to Peak Heat Release Rate (s):	155.00
Total Heat Release (MJ/m ²):	0.09
60 s Average Heat Release Rate (kW/m ²):	3.25
Total Mass Loss (g):	NA
Average Mass Loss Rate (g/s):	NA
Average Effective Heat of Combustion (MJ/kg):	NA
Average Smoke Extinction Area (m ² /kg):	NA
Average CO ₂ yield (g/g):	NA
Average CO yield (g/g):	NA

Specimen:

Initial mass (g):	82.6
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	NA
Time to flameout (s):	NA

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	3.64	0.01	-0.53	-0.03	0	NA	0	0.03	26.04	26.28	364.24
5	4.1	0.01	-0.44	-0.04	0	NA	0	0.03	25.77	26.02	410.24
8	1.27	2.14	0	0	0	NA	0	0.03	25.51	25.77	0.59
11	1.84	0.75	-0.01	0	0	NA	0	0.03	25.84	26.08	2.47
14	3.15	-0.75	0.01	0	0	NA	0	0.03	26.61	26.87	-4.21
17	1.94	-0.29	0.02	0	0	NA	0	0.03	26.03	26.3	-6.59
20	-0.16	0.45	-0.01	0	0	NA	0	0.03	25.81	26.08	-0.36
23	0.5	-2.81	0	0	0	NA	0	0.03	25.64	25.92	-0.18
26	3.87	3.58	0	0	0	NA	0	0.03	26.05	26.33	1.08
29	2.02	7.98	0	0	0	NA	0	0.03	26.51	26.8	0.25
32	0.57	-0.95	0	0	-134.35	NA	0.05	0.03	26.04	26.33	-0.6
35	1.1	-1.9	0	0	0	NA	0	0.03	25.97	26.27	-0.58
38	3.09	1.69	0	0	0	NA	0	0.03	25.66	25.96	1.82
41	3.35	0.36	-0.02	0	0	NA	0	0.03	25.46	25.76	9.3
44	0.96	1.71	0	0	0	NA	0	0.03	25.54	25.85	0.57
47	2.24	0.67	-0.01	0	52.4	NA	0.01	0.03	25.6	25.91	3.34
50	4.93	3.91	0	0	9.43	NA	0.01	0.03	25.54	25.84	1.26
53	2.71	2.82	0	0	0	NA	0	0.03	25.2	25.5	0.96
56	2.65	-5.01	0	0	-1.44	NA	0	0.03	26.14	26.46	-0.53
59	2.42	-0.15	0.04	0	0	NA	0	0.03	25.74	26.06	-16.58
62	5.63	5	0	0	0	NA	0	0.03	25.76	26.08	1.13
65	5.18	3.64	0	0	0	NA	0	0.03	25.7	26.02	1.42
68	3.41	0	1.47	-5.54	0	NA	0	0.03	25.78	26.11	0
71	3.97	0.47	-0.01	0.02	0	NA	0	0.03	25.88	26.21	8.5
74	6.92	0.3	-0.01	0.02	0	NA	0	0.03	26.69	27.03	22.71
77	5.72	2.36	0	0.01	0	NA	0	0.03	25.34	25.67	2.42
80	3.82	0.42	-0.01	0.06	0	NA	0	0.03	25.82	26.14	9.21
83	5.39	0.86	-0.01	0.04	0	NA	0	0.03	25.67	26	6.26
86	8.17	6.77	0	0.01	0	NA	0	0.03	25.82	26.14	1.21
89	5.77	-0.43	0.01	-0.15	0	NA	0	0.03	25.9	26.23	-13.53
92	5.28	-5.35	0	-0.01	0	NA	0	0.03	25.71	26.04	-0.99
95	6.77	0.73	-0.01	0.08	0	NA	0	0.03	25.31	25.62	9.21
98	7.32	5.37	0	0.01	0	NA	0	0.03	25.41	25.72	1.36
101	6.05	5.15	0	0.02	23.06	NA	0.04	0.03	26.08	26.4	1.17
104	5.15	1.1	0	0.07	0	NA	0	0.03	25.42	25.74	4.67
107	7.71	-2.55	0	-0.03	-6.06	NA	0.01	0.03	25.18	25.51	-3.02
110	8.8	1.25	0	0.07	0	NA	0	0.03	25.17	25.49	7.03
113	5.17	3.06	0	0.03	3.39	NA	0	0.03	25.49	25.82	1.69
116	6.23	-0.26	0.02	-0.31	-153.88	NA	0.02	0.03	25.83	26.15	-24.17
119	8.19	4	0	0.02	0.55	NA	0	0.03	25.95	26.27	2.05
122	8.39	7.43	0	0.01	0	NA	0	0.03	25.52	25.84	1.13
125	6	-1.4	0	-0.06	-6.44	NA	0	0.03	25.49	25.81	-4.3

128	7.57	-2.11	0	-0.05	0	NA	0	0.03	25.72	26.05	-3.59
131	9.37	3.89	0	0.03	0.92	NA	0	0.03	26.07	26.4	2.41
134	8.9	2.93	0	0.04	0	NA	0	0.03	25.99	26.32	3.04
137	5.83	0.81	-0.01	0.14	0	NA	0	0.03	25.62	25.95	7.23
140	8.47	2.31	0	0.05	0	NA	0	0.03	25.44	25.77	3.66
143	9.8	4.89	0	0.02	0	NA	0	0.03	25.69	26.02	2
146	7.84	3.78	0	0.03	0	NA	0	0.03	25.9	26.23	2.07
149	6.85	-3.15	0	-0.03	0	NA	0	0.03	26.39	26.72	-2.18
152	9.35	0.01	-0.51	10.26	0	NA	0	0.03	25.94	26.27	934.81
155	10.03	0.01	-0.54	10.76	0	NA	0	0.03	25.64	25.98	1003.48

Ceiling Tile (face-down)**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	
Peak Heat Release Rate (kW/m ²):	12.43
Time to Peak Heat Release Rate (s):	157.00
Total Heat Release (MJ/m ²):	0.10
60 s Average Heat Release Rate (kW/m ²):	3.70
Total Mass Loss (g):	NA
Average Mass Loss Rate (g/s):	NA
Average Effective Heat of Combustion (MJ/kg):	NA
Average Smoke Extinction Area (m ² /kg):	NA
Average CO ₂ yield (g/g):	NA
Average CO yield (g/g):	NA

Specimen:

Initial mass (g):	74.1
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	73
Time to ignition (s):	
Time to flameout (s):	

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	1.86	0.01	-0.44	-0.03	0	NA	0	0.03	25.66	25.91	186.29
4	1.05	0.01	-0.44	-0.04	4955.74	NA	0.02	0.03	25.67	25.93	104.84
7	2.28	-1.8	0	0	-56.39	NA	0.04	0.03	25.78	26.02	-1.27
10	4.01	-1.91	0	0	-65.89	NA	0.05	0.03	25.28	25.53	-2.1
13	0.06	4.04	0	0	0	NA	0	0.03	25.96	26.22	0.02
16	0.41	6.64	0	0	17.58	NA	0.05	0.03	25.54	25.81	0.06
19	2.16	-3.29	0	0	-91.57	NA	0.12	0.03	25.72	26	-0.66
22	0.65	-4.42	0	0	-69.4	NA	0.12	0.03	25.53	25.82	-0.15
25	0.58	2.5	0	0	123.77	NA	0.12	0.03	26.21	26.51	0.23
28	2.12	0.72	-0.01	0	435.06	NA	0.12	0.03	26.17	26.47	2.94
31	2.32	-0.83	0.01	0	-324.73	NA	0.1	0.03	25.65	25.95	-2.8
34	0.43	6.97	0	0	38.5	NA	0.1	0.03	25.49	25.8	0.06
37	2.96	5.61	0	0	45.68	NA	0.1	0.03	26.22	26.54	0.53
40	3.82	-2.18	0	0	-45.63	NA	0.04	0.03	25.46	25.79	-1.75
43	0.91	1.35	0	0	75.18	NA	0.04	0.03	25.98	26.31	0.68
46	2.55	2.25	0	0	29.85	NA	0.03	0.03	25.61	25.95	1.13
49	5.17	-2.65	0	0	-23.76	NA	0.02	0.03	26.09	26.43	-1.95
52	4.33	-2.72	0	0	-28.47	NA	0.03	0.03	25.98	26.33	-1.59
55	2.74	3.24	0	0.01	6.63	NA	0.01	0.03	25.84	26.18	0.85
58	4.92	5.55	0	0	0.94	NA	0	0.03	25.41	25.75	0.89
61	5.65	2.18	0	0.01	26.19	NA	0.02	0.03	26.12	26.46	2.6
64	3.82	-0.06	0.08	-0.42	0	NA	0	0.03	25.65	25.99	-63.5
67	5.58	1.21	0	0.04	0	NA	0	0.03	25.87	26.22	4.61
70	7.34	0.17	-0.03	0.27	0	NA	0	0.03	25.9	26.25	42.71
73	4.54	-0.23	0.02	-0.24	0	NA	0	0.03	25.71	26.07	-19.53
76	5.78	4.5	0	0.01	4.84	NA	0.01	0.03	25.82	26.18	1.28
79	7.72	3.77	0	0.02	4.64	NA	0.01	0.03	25.77	26.13	2.05
82	5.98	0.6	-0.01	0.12	0	NA	0	0.03	25.92	26.29	10
85	6.15	4.75	0	0.02	0	NA	0	0.03	25.73	26.1	1.29
88	8.49	1.38	0	0.07	0	NA	0	0.03	26.15	26.52	6.16
91	8.62	-4.18	0	-0.02	0	NA	0	0.03	26.06	26.42	-2.06
94	5.16	1.38	0	0.07	0	NA	0	0.03	25.53	25.88	3.73
97	10.25	5.32	0	0.02	0	NA	0	0.03	25.95	26.31	1.93
100	9.37	1.39	0	0.08	0	NA	0	0.03	25.33	25.69	6.72
103	7.69	0.23	-0.02	0.54	0	NA	0	0.03	25.66	26.01	33.31
106	7.59	5.09	0	0.03	0	NA	0	0.03	25.75	26.11	1.49
109	9.83	1.84	0	0.08	0	NA	0	0.03	25.76	26.11	5.33
112	8.23	-3.8	0	-0.04	0	NA	0	0.03	25.24	25.59	-2.17
115	7.8	5.7	0	0.03	0	NA	0	0.03	26.06	26.42	1.37
118	11.44	3.96	0	0.04	0	NA	0	0.03	26.07	26.42	2.89
121	9.6	-4.66	0	-0.03	0	NA	0	0.03	25.89	26.25	-2.06
124	8.22	4.84	0	0.03	0	NA	0	0.03	25.73	26.07	1.7

127	9.21	7.62	0	0.02	0	NA	0	0.03	25.59	25.93	1.21
130	10.79	1.28	0	0.13	0	NA	0	0.03	25.92	26.28	8.44
133	8.95	3.05	0	0.06	0	NA	0	0.03	26.16	26.52	2.94
136	10.23	3.39	0	0.05	0	NA	0	0.03	26.2	26.55	3.01
139	12.25	-2.99	0	-0.06	0	NA	0	0.03	25.98	26.32	-4.1
142	10.58	-1.94	0	-0.1	-5.61	NA	0	0.03	25.54	25.88	-5.47
145	10.72	5.04	0	0.04	4.22	NA	0.01	0.03	25.6	25.94	2.13
148	12.42	3.44	0	0.05	9.72	NA	0.01	0.03	25.9	26.25	3.61
151	12.36	0.63	-0.01	0.31	136.63	NA	0.03	0.03	26.46	26.8	19.63
154	9.96	0.01	-0.47	20.89	10475.17	NA	0.04	0.03	26.26	26.59	995.85
157	12.43	0.01	-0.51	21.2	8755.62	NA	0.03	0.03	26.15	26.48	1242.65

Ceiling Tile (face-up)**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	24.00
Peak Heat Release Rate (kW/m ²):	68.13
Time to Peak Heat Release Rate (s):	32.00
Total Heat Release (MJ/m ²):	1.86
60 s Average Heat Release Rate (kW/m ²):	39.56
Total Mass Loss (g):	1.88
Average Mass Loss Rate (g/s):	0.048
Average Effective Heat of Combustion (MJ/kg):	9.92
Average Smoke Extinction Area (m ² /kg):	22.56
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0031

Specimen:

Initial mass (g):	76.2
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	24
Time to flameout (s):	62

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.86	0.01	-0.48	-0.04	0	111.55	0	0.03	25.69	25.9	86.37
5	3.71	0.01	-0.43	-0.03	0	111.61	0	0.03	25.65	25.85	371.22
8	2.05	-2.22	0	0	0	111.65	0	0.03	26.38	26.58	-0.93
11	0.5	-0.12	0.04	0	0	111.72	0	0.03	25.54	25.76	-4.12
14	2.82	5.25	0	0	5.28	111.64	0.01	0.03	25.97	26.19	0.54
17	0.38	1.92	0	0	0	111.47	0	0.03	25.82	26.03	0.2
20	1.57	-2.84	0	0	-19.76	111.54	0.02	0.03	25.75	25.97	-0.55
23	20.07	-0.47	0.01	0	-747.93	111.58	0.14	0.03	25.44	25.66	-42.65
26	50.86	11.74	0	0	86.29	111.5	0.39	0.03	25.92	26.18	4.33
29	66.13	11.71	0	0	0	110.97	0	0.03	25	25.43	5.65
32	68.13	0.4	-0.01	0	0	110.88	0	0.03	25.02	25.58	168.75
35	59.89	5.71	0	0	0	110.84	0	0.03	25.63	26.26	10.49
38	52.74	6.52	0	0	0	110.56	0	0.03	25.46	26.11	8.09
41	49.24	2.74	0	0	0	110.48	0	0.03	25.51	26.16	17.99
44	43.94	6.15	0	0.01	0	110.35	0	0.03	25.76	26.4	7.15
47	39.07	0.15	-0.03	0.53	0	110.17	0	0.03	25.83	26.45	252.56
50	40.94	-0.65	0.01	-0.19	0	110.3	0	0.03	25.98	26.57	-62.81
53	35.54	9.29	0	0.02	1.85	110.13	0.01	0.03	25.99	26.55	3.83
56	32.66	4.96	0	0.04	5.11	109.84	0.01	0.03	25.51	26.04	6.59
59	32.49	2.01	0	0.13	2.67	109.84	0	0.03	25.81	26.31	16.16
62	29.45	1.34	0	0.26	0	109.7	0	0.03	26.28	26.77	21.93
65	26.23	-1.35	0	-0.32	-5.87	109.76	0	0.03	26.12	26.57	-19.43
68	27.23	3.96	0	0.12	16.31	109.73	0.02	0.03	25.9	26.3	6.88
71	25.31	8.6	0	0.05	5.17	109.53	0.02	0.03	25.96	26.34	2.94
74	25.28	0.01	-0.55	46.28	5660.74	109.29	0.02	0.03	26.14	26.5	2527.78
77	26.53	0.01	-0.54	47.05	7988.38	109.33	0.03	0.03	25.93	26.28	2653.43

Ceiling Tile (face-up)**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	22.00
Peak Heat Release Rate (kW/m ²):	71.61
Time to Peak Heat Release Rate (s):	27.00
Total Heat Release (MJ/m ²):	1.74
60 s Average Heat Release Rate (kW/m ²):	40.12
Total Mass Loss (g):	1.39
Average Mass Loss Rate (g/s):	0.039
Average Effective Heat of Combustion (MJ/kg):	12.45
Average Smoke Extinction Area (m ² /kg):	0.00
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0035

Specimen:

Initial mass (g):	76.3
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	22
Time to flameout (s):	57

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	2.69	0.01	-0.41	-0.03	0	76.38	0	0.03	25.93	26.17	268.74
3	0.53	0.01	-0.44	-0.04	0	76.59	0	0.03	25.89	26.14	52.68
6	-0.14	4.32	0	0	0	76.48	0	0.03	25.97	26.21	-0.03
9	3	2.34	0	0	0	76.39	0	0.03	25.68	25.92	1.28
12	1.56	-3.52	0	0	0	76.37	0	0.03	25.5	25.74	-0.44
15	0.22	-3.8	0	0	0	76.55	0	0.03	25.82	26.06	-0.06
18	3.87	7.1	0	0	0	76.52	0	0.03	26.08	26.34	0.54
21	20.84	6.36	0	0	0	76.21	0	0.03	25.97	26.23	3.27
24	51.8	1.44	0	0	0	76.17	0	0.03	26.2	26.48	36.03
27	71.61	6.13	0	0	0	76.06	0	0.03	25.79	26.21	11.69
30	67.71	8.87	0	0	0	75.82	0	0.03	25.14	25.72	7.63
33	59.11	5.96	0	0	0	75.57	0	0.03	25.78	26.45	9.93
36	52.28	5.4	0	0	0	75.45	0	0.03	25.64	26.32	9.68
39	48.43	5.68	0	0	0	75.24	0	0.03	25.85	26.53	8.52
42	40.93	-0.68	0.01	-0.11	0	75.15	0	0.03	25.8	26.46	-59.84
45	39.23	0.65	-0.01	0.18	0	75.22	0	0.03	25.84	26.47	60.21
48	35.41	6.53	0	0.03	0	75.07	0	0.03	25.24	25.82	5.42
51	29.67	3.44	0	0.07	0	74.9	0	0.03	25.15	25.69	8.63
54	32.06	0.77	-0.01	0.33	0	74.87	0	0.03	25.53	26.05	41.57
57	29.4	2.74	0	0.11	0	74.82	0	0.03	26.1	26.59	10.74
60	26.93	3.93	0	0.1	0	74.71	0	0.03	25.85	26.3	6.84
63	27.14	3.73	0	0.12	0	74.59	0	0.03	25.82	26.24	7.28
66	26.36	0.01	-0.55	48.88	0	74.49	0	0.03	26.28	26.69	2636.02
69	23.18	0.01	-0.63	45.9	0	74.42	0	0.03	25.66	26.04	2318.37

Ceiling Tile (face-up)**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	25.00
Peak Heat Release Rate (kW/m ²):	66.28
Time to Peak Heat Release Rate (s):	29.00
Total Heat Release (MJ/m ²):	1.71
60 s Average Heat Release Rate (kW/m ²):	37.31
Total Mass Loss (g):	1.64
Average Mass Loss Rate (g/s):	0.046
Average Effective Heat of Combustion (MJ/kg):	10.41
Average Smoke Extinction Area (m ² /kg):	6.80
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0021

Specimen:

Initial mass (g):	77.9
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	25
Time to flameout (s):	61

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	1.31	0.01	-0.37	-0.03	0	78.08	0	0.03	25.48	25.74	131.37
5	2.66	0.01	-0.36	-0.03	0	78.09	0	0.03	25.13	25.37	266.25
8	0.2	-1.16	0	0	0	78.15	0	0.03	26.17	26.41	-0.17
11	2.31	3.1	0	0	0	78.13	0	0.03	25.71	25.95	0.75
14	2.18	3.75	0	0	0	78	0	0.03	26.35	26.6	0.58
17	0.06	-2.3	0	0	0	77.95	0	0.03	25.69	25.93	-0.03
20	2.03	-1.62	0	0	0	78.08	0	0.03	25.82	26.07	-1.25
23	22.87	5.14	0	0	32.93	78	0.07	0.03	25.75	26.01	4.45
26	52.53	12.11	0	0	16.76	77.78	0.08	0.03	25.66	25.93	4.34
29	66.28	5.19	0	0	0	77.38	0	0.03	24.96	25.38	12.76
32	64.72	0.51	-0.01	0	0	77.46	0	0.03	25.17	25.74	125.85
35	55.43	7.77	0	0	0	77.26	0	0.03	25.89	26.55	7.13
38	52.23	3.04	0	0	0	77.06	0	0.03	26.4	27.09	17.17
41	47.1	6.7	0	0	0	77.03	0	0.03	25.96	26.64	7.03
44	40	6.95	0	0.01	0	76.69	0	0.03	25.86	26.52	5.75
47	38.21	0.51	-0.01	0.2	0	76.66	0	0.03	25.77	26.4	75.48
50	36.86	1.22	0	0.14	0	76.61	0	0.03	25.56	26.16	30.11
53	31.49	1.3	0	0.18	0	76.58	0	0.03	25.71	26.29	24.3
56	32.16	3.92	0	0.07	0	76.51	0	0.03	26.24	26.8	8.21
59	30.06	5.69	0	0.05	0	76.36	0	0.03	26.25	26.77	5.28
62	26.32	3.3	0	0.12	0	76.2	0	0.03	26.5	27	7.98
65	27.84	-1.96	0	-0.23	0	76.18	0	0.03	25.65	26.1	-14.19
68	24.03	2.57	0	0.19	0	76.25	0	0.03	26.28	26.71	9.35
71	24.63	7.05	0	0.07	0	76.02	0	0.03	26.25	26.66	3.49
74	25.93	3.8	0	0.13	0	75.88	0	0.03	25.84	26.22	6.82
77	24.44	0.01	-0.47	51.17	0	75.77	0	0.03	26.2	26.57	2444.03
80	23.01	0.01	-0.45	48.11	0	75.61	0	0.03	25.75	26.1	2300.69

Computer Monitor Case**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	54.00
Peak Heat Release Rate (kW/m ²):	432.22
Time to Peak Heat Release Rate (s):	195.00
Total Heat Release (MJ/m ²):	48.09
60 s Average Heat Release Rate (kW/m ²):	248.74
Total Mass Loss (g):	32.72
Average Mass Loss Rate (g/s):	0.198
Average Effective Heat of Combustion (MJ/kg):	14.70
Average Smoke Extinction Area (m ² /kg):	2363.31
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1416

Specimen:

Initial mass (g):	38.1
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	77
Time to ignition (s):	54
Time to flameout (s):	219

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-0.08	0.01	-0.5	-0.04	0	38.08	0	0.03	25.35	25.62	-7.64
3	1.86	0.01	-0.38	-0.03	0	38.04	0	0.03	25.55	25.82	186.45
6	-0.6	-1.33	0	0	0	38.09	0	0.03	25.17	25.42	0.45
9	0.86	-2.28	0	0	0	38.11	0	0.03	25.66	25.93	-0.38
12	0.72	-1.74	0	0	0	38.21	0	0.03	25	25.25	-0.41
15	0.07	1.3	0	0	0	38.2	0	0.03	25.75	26.01	0.05
18	2.17	-2.97	0	0	0	38.18	0	0.03	25.73	25.99	-0.73
21	2.57	0.31	-0.02	0	0	38.33	0	0.03	26.16	26.43	8.43
24	-1.02	2.29	0	0	0	38.17	0	0.03	25.3	25.57	-0.45
27	1.29	1.73	0	0	0	38.22	0	0.03	25.7	25.98	0.75
30	1.67	0.47	-0.01	0	0	38.07	0	0.03	25.5	25.77	3.57
33	0.08	1.03	0	0	0	38.18	0	0.03	25.67	25.96	0.08
36	1.6	0.6	-0.01	0	0	38.02	0	0.03	25.62	25.9	2.7
39	0.84	1.07	0	0	0	38.13	0	0.03	25.94	26.22	0.79
42	-0.21	1.6	0	0	0	37.95	0	0.03	25.76	26.05	-0.13
45	1.22	-3.17	0	0	-32.5	38.07	0.04	0.03	25.4	25.7	-0.38
48	1.42	3.54	0	0.02	315.53	38.06	0.43	0.03	25.52	25.81	0.4
51	9.94	5.99	0	0.14	973.77	37.87	2.27	0.03	25.31	25.66	1.66
54	31.25	14.38	0	0.13	1242.75	37.67	7.07	0.03	24.76	25.27	2.17
57	70.35	17.98	0	0.13	1933.96	37.04	13.69	0.03	24.69	25.4	3.91
60	128.14	19.05	0	0.15	2083.32	36.61	15.42	0.03	24.83	25.74	6.73
63	190.47	21.96	0	0.13	1834.63	35.9	15.31	0.03	25.17	26.31	8.67
66	209.09	16.9	0	0.17	2519.3	35.35	16.53	0.03	24.53	25.75	12.37
69	221.61	13.05	0	0.23	3742.99	34.87	19.15	0.03	24.21	25.5	16.99
72	240.31	27	0	0.11	1934.72	34.45	20.22	0.03	24.44	25.83	8.9
75	252.74	26.15	0	0.12	1952.23	33.35	19.34	0.03	24.95	26.4	9.67
78	260.81	14.53	0	0.22	3533.35	32.95	19.55	0.03	24.74	26.27	17.95
81	263.77	22.83	0	0.14	2421.8	32.35	21.43	0.03	24.24	25.79	11.56
84	276.93	23.91	0	0.14	1960.56	31.62	18.07	0.03	24.34	25.94	11.58
87	297.31	21.87	0	0.16	2677.34	30.94	21.92	0.03	25.07	26.71	13.59
90	301.29	22.68	0	0.15	2644.66	30.3	22.7	0.03	24.72	26.42	13.29
93	302.68	19.36	0	0.18	2752.51	29.6	20.35	0.02	24.5	26.2	15.63
96	311.74	25.98	0	0.13	2244.07	29.07	22.11	0.03	24.65	26.37	12
99	312.83	25.48	0	0.13	2033.74	28.09	19.46	0.03	24.9	26.63	12.28
102	316.67	14.99	0	0.21	3817.52	27.61	21.07	0.03	25.41	27.15	21.13
105	310.25	21.56	0	0.16	2792.57	27.07	22.25	0.03	25.37	27.07	14.39
108	302.43	26.67	0	0.13	2080.3	26.32	20.82	0.03	24.95	26.64	11.34
111	309.09	24.69	0	0.15	2136.51	25.53	19.76	0.03	25.01	26.7	12.52
114	313.75	24.22	0	0.15	2338.38	24.84	20.97	0.03	25.34	27.01	12.95
117	305.07	16.53	0	0.22	3273.67	24.11	20.15	0.03	25.22	26.85	18.45
120	293.4	25.5	0	0.13	2004.05	23.73	19.69	0.02	24.41	25.95	11.51
123	296.44	30.58	0	0.11	1511.49	22.62	17.45	0.02	24.95	26.49	9.7

126	295.25	15.71	0	0.21	3741.78	22.03	21.83	0.03	25.4	26.92	18.8
129	293.11	20.08	0	0.17	2480.16	21.54	18.38	0.03	25.6	27.09	14.6
132	283.46	25.43	0	0.14	2089.13	20.81	20.09	0.02	25.01	26.45	11.15
135	282.72	22.02	0	0.17	2539.29	20.08	21.34	0.02	24.76	26.2	12.84
138	297.68	22.76	0	0.15	2480.54	19.46	21.29	0.02	25.1	26.52	13.08
141	296.99	25.89	0	0.14	1973.17	18.7	19.33	0.02	25.04	26.44	11.47
144	304.69	23.3	0	0.16	2627.56	17.95	22.31	0.03	26.01	27.45	13.08
147	303.49	23.75	0	0.15	2588.9	17.28	22.43	0.03	26.02	27.41	12.78
150	282.74	20.31	0	0.15	3048.09	16.54	23.67	0.02	24.85	26.15	13.92
153	277.02	24.61	0	0.13	2250.26	16.01	20.85	0.02	25.29	26.56	11.26
156	270.42	28.02	0	0.12	2076.71	15.08	21.95	0.02	25.27	26.51	9.65
159	267.82	18.89	0	0.19	3068.51	14.41	21.96	0.02	25.17	26.39	14.18
162	271.11	21	0	0.17	2903.29	13.87	22.87	0.03	25.45	26.67	12.91
165	277.98	29.38	0	0.12	2033.02	13.11	22.12	0.03	25.78	27	9.46
168	273.12	24.39	0	0.15	2663.7	12.2	24.71	0.02	25.12	26.29	11.2
171	285.66	20.18	0	0.18	3171.2	11.64	23.88	0.03	25.62	26.8	14.15
174	295.4	27.92	0	0.13	2253.98	10.91	23.51	0.03	25.58	26.76	10.58
177	302.58	23.9	0	0.15	2484.05	10.04	22.23	0.03	25.51	26.7	12.66
180	331.18	20.74	0	0.15	3029.08	9.47	23.58	0.02	25.41	26.64	15.97
183	352.63	22.43	0	0.13	2308.59	8.77	19.46	0.02	25.32	26.61	15.72
186	375.6	18.12	0	0.13	2280.61	8.17	15.68	0.02	25	26.35	20.73
189	407.36	14.99	0	0.13	2406.37	7.67	13.86	0.02	24.6	26.03	27.17
192	425.64	16.87	0	0.09	1755.89	7.23	11.23	0.02	24.88	26.37	25.23
195	432.22	11.81	0	0.1	2029.88	6.71	9.06	0.02	24.91	26.44	36.61
198	420.03	10.6	0	0.1	1965	6.5	7.79	0.02	25.19	26.73	39.62
201	391.35	13.09	0	0.07	1319.71	6.05	6.55	0.02	24.85	26.35	29.9
204	373.2	7.19	0	0.12	2066.32	5.77	5.55	0.02	25.26	26.74	51.93
207	344.27	9.44	0	0.08	1456.39	5.56	5.08	0.02	25.62	27.04	36.46
210	295.56	6.48	0	0.1	1122.46	5.24	2.66	0.03	26.01	27.3	45.63
213	257.83	0.15	-0.04	3.37	35660.9	5.2	2	0.03	26.46	27.63	1666.34
216	189.13	4.94	0	0.08	534.45	5.15	0.97	0.03	26.27	27.29	38.3
219	152.8	2.02	0	0.16	76.08	4.95	0.06	0.03	26.5	27.33	75.66
222	117.53	1.3	0	0.2	0	5.02	0	0.03	26.56	27.23	90.53
225	82.9	3.46	0	0.04	20.45	4.85	0.03	0.03	26.91	27.47	23.99
228	65.43	-1.47	0	-0.08	0	4.85	0	0.03	26.27	26.71	-44.59
231	55.48	2.66	0	0.04	0	4.88	0	0.03	26.66	26.99	20.84
234	50.03	0.45	-0.01	0.23	0	4.73	0	0.03	26.58	26.84	110.25
237	44.68	1.34	0	0.07	0	4.84	0	0.03	25.86	26.05	33.36
240	44.22	3.34	0	0.03	0	4.65	0	0.03	26.08	26.21	13.23
243	42.26	-2.57	0	-0.04	0	4.68	0	0.03	26.1	26.19	-16.46
246	40.51	2.79	0	0.04	0	4.73	0	0.03	26.24	26.3	14.5
249	41.46	1.47	0	0.07	0	4.56	0	0.03	26.5	26.52	28.27
252	38.87	-2.39	0	-0.05	0	4.66	0	0.03	26.15	26.15	-16.29
255	39.24	4.19	0	0.03	0	4.63	0	0.03	26.07	26.07	9.37
258	38.79	0.6	-0.01	0.22	0	4.47	0	0.03	26.04	26.04	64.8
261	36.81	0.17	-0.02	0.84	0	4.58	0	0.03	26.17	26.16	211.53
264	39.48	4.32	0	0.03	0	4.43	0	0.03	26.34	26.33	9.14
267	36.88	0.01	-0.41	12.98	0	4.37	0	0.03	26.32	26.31	3688.4

Computer Monitor Case**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	45.00
Peak Heat Release Rate (kW/m ²):	413.33
Time to Peak Heat Release Rate (s):	195.00
Total Heat Release (MJ/m ²):	44.40
60 s Average Heat Release Rate (kW/m ²):	206.93
Total Mass Loss (g):	30.66
Average Mass Loss Rate (g/s):	0.182
Average Effective Heat of Combustion (MJ/kg):	14.48
Average Smoke Extinction Area (m ² /kg):	2369.74
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1385

Specimen:

Initial mass (g):	35.8
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	45
Time to flameout (s):	214

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	0.12	0.01	-0.44	-0.03	0	35.78	0	0.03	25.36	25.56	11.84
3	2.04	0.01	-0.39	-0.04	0	35.94	0	0.03	25.34	25.55	203.77
6	2.07	-0.62	0.01	0	0	35.85	0	0.03	25.76	25.96	-3.32
9	2.48	0.32	-0.02	0	0	35.98	0	0.03	25.79	26	7.86
12	4.76	2.06	0	0	0	35.83	0	0.03	26.17	26.38	2.32
15	1.36	-1.44	0	0	0	35.89	0	0.03	25.13	25.34	-0.95
18	2.56	-2.21	0	0	0	35.89	0	0.03	25.48	25.7	-1.16
21	3.28	1.76	0	0	0	35.99	0	0.03	25.09	25.32	1.87
24	0.06	-0.3	0.02	0	0	35.83	0	0.03	25.68	25.92	-0.21
27	2.1	-4.23	0	0	0	36.02	0	0.03	25.41	25.64	-0.5
30	1.82	4.27	0	0	30.74	36	0.05	0.03	26.39	26.63	0.43
33	-1.58	2.14	0	0	50.75	35.83	0.04	0.03	25.33	25.56	-0.74
36	2.05	-0.25	0.01	0	-1589.65	35.88	0.15	0.03	25.59	25.83	-8.17
39	1.47	0.58	-0.01	0	334.3	35.82	0.08	0.03	25.32	25.57	2.53
42	-0.08	2.05	0	0	289.57	35.83	0.23	0.03	25.6	25.86	-0.04
45	4.14	4.3	0	0.11	1191.2	35.69	2	0.03	25.28	25.56	0.96
48	19.32	12.18	0	0.12	1058.93	35.54	5.09	0.03	24.96	25.31	1.59
51	54.65	14.68	0	0.14	1714.64	34.99	9.98	0.03	24.8	25.23	3.72
54	93.67	14.58	0	0.17	2449.86	34.68	14.02	0.03	24.83	25.48	6.42
57	156.23	20.33	0	0.12	1807.01	34.09	14.08	0.03	25.31	26.09	7.69
60	179.12	15.99	0	0.15	2163.44	33.52	13.31	0.03	25.12	26	11.2
63	192.63	16.83	0	0.16	2392.87	33.09	15.61	0.03	24.84	25.8	11.44
66	204.94	20.57	0	0.13	2004.58	32.49	16.31	0.03	24.27	25.28	9.96
69	220.19	18.89	0	0.14	2569.69	31.9	18.84	0.03	24.64	25.76	11.66
72	234.52	19.12	0	0.15	2428.58	31.35	17.75	0.03	24.98	26.16	12.27
75	239.48	18.43	0	0.15	2565.7	30.75	18.26	0.03	24.68	25.9	12.99
78	253.46	19.81	0	0.14	2507.47	30.23	18.64	0.03	25.36	26.65	12.79
81	258.53	23.18	0	0.14	2134.94	29.55	18.48	0.03	25.45	26.78	11.15
84	256.19	18.49	0	0.17	2990.86	28.89	21.29	0.03	24.62	25.98	13.85
87	275.2	16.13	0	0.19	3198.77	28.43	19.32	0.03	25.32	26.71	17.06
90	271.87	23.7	0	0.13	1949.62	27.86	17.61	0.03	24.85	26.24	11.47
93	275.73	19.92	0	0.15	2483.87	27.08	18.75	0.03	24.98	26.39	13.84
96	284.32	20.79	0	0.16	2742.02	26.64	21.38	0.03	25.22	26.67	13.67
99	289.63	24.05	0	0.13	2290.8	25.82	20.59	0.03	25.3	26.76	12.04
102	296.33	17.53	0	0.19	3157.95	25.26	20.42	0.03	25.62	27.1	16.91
105	285.38	21.35	0	0.15	2430.94	24.7	19.93	0.02	24.62	26.04	13.37
108	289.33	20.62	0	0.16	2390.55	24	18.57	0.03	25.12	26.54	14.03
111	282.67	24.41	0	0.13	2082.15	23.43	19.06	0.03	25.26	26.67	11.58
114	273.53	22.87	0	0.14	2130.77	22.57	18.48	0.02	25	26.37	11.96
117	277.2	17.24	0	0.19	3237.27	22.09	20.98	0.03	25.25	26.61	16.08
120	274.26	23.39	0	0.14	2293.63	21.46	20.27	0.03	25.12	26.46	11.73
123	269.88	19.31	0	0.17	2621.59	20.75	19.27	0.02	24.97	26.27	13.98

126	276.09	20.58	0	0.17	2756.14	20.27	21.1	0.03	25.56	26.88	13.42
129	268.9	22.65	0	0.14	2368.07	19.51	20.41	0.02	25.02	26.28	11.87
132	264.78	20.55	0	0.15	2574.82	18.94	19.82	0.03	25.44	26.69	12.89
135	260.41	20.83	0	0.16	2569.3	18.26	19.97	0.03	25.56	26.79	12.5
138	259.33	18.25	0	0.18	3029.66	17.7	20.68	0.03	25.54	26.75	14.21
141	258.03	25.7	0	0.13	2098.66	17.1	20.4	0.03	25.26	26.44	10.04
144	255.85	22.47	0	0.14	2345.21	16.23	19.95	0.03	25.27	26.42	11.39
147	248.2	16.09	0	0.19	3362.46	15.77	20.81	0.02	24.9	26	15.43
150	254.95	26.23	0	0.12	2066.82	15.16	20.18	0.03	25.74	26.86	9.72
153	250.42	23.24	0	0.14	2251.95	14.29	19.91	0.02	25.21	26.28	10.77
156	253.77	18.24	0	0.18	3288.03	13.78	22.34	0.03	25.78	26.86	13.91
159	243.89	21.94	0	0.14	2515.52	13.13	20.94	0.03	25.32	26.35	11.12
162	240.43	23.06	0	0.12	2243.38	12.48	19.82	0.02	25.09	26.09	10.43
165	248.46	20.14	0	0.15	2759.59	11.78	20.94	0.03	25.54	26.55	12.34
168	253.55	17.87	0	0.16	2851.16	11.27	19.45	0.02	25.19	26.19	14.19
171	260.82	24.04	0	0.12	2103.27	10.65	19.27	0.02	25.24	26.24	10.85
174	274.03	20.35	0	0.14	2362.71	9.89	18.41	0.02	25.1	26.13	13.46
177	281.87	16.12	0	0.16	2998.99	9.43	18.86	0.02	24.59	25.63	17.49
180	300.02	19.84	0	0.12	2017.26	8.87	15.47	0.02	24.78	25.86	15.13
183	320.3	20.67	0	0.11	1854.07	8.26	14.67	0.02	24.97	26.12	15.5
186	346.65	16.11	0	0.12	2114.22	7.67	13.19	0.02	24.63	25.83	21.51
189	378.91	10.48	0	0.17	2799.61	7.3	11.2	0.02	24.86	26.18	36.17
192	386.01	17.56	0	0.08	1567.39	6.95	10.81	0.02	24.11	25.46	21.99
195	413.33	16.94	0	0.07	1177.09	6.3	7.61	0.02	24.74	26.18	24.41
198	410.72	7.24	0	0.13	2477	6	6.86	0.02	24.68	26.14	56.71
201	385.46	5.57	0	0.15	2976.74	5.81	6.24	0.02	25.11	26.57	69.22
204	364.87	10.52	0	0.07	1254.99	5.62	4.83	0.02	25.89	27.34	34.68
207	322.17	10.67	0	0.06	1063.17	5.21	4.16	0.02	25.92	27.3	30.19
210	281.56	2.73	0	0.19	2577.92	5.04	2.52	0.03	26.6	27.86	103.29
213	225.05	-1.94	0	-0.23	-1392.18	5.03	0.97	0.03	26.7	27.84	-115.77
216	162.38	-0.61	0.01	-0.45	-101.29	5.11	0.02	0.03	26.09	27.03	-264.59
219	117.8	3.58	0	0.06	0	5.04	0	0.03	26.42	27.22	32.91
222	77.92	2.72	0	0.05	0	4.93	0	0.03	26.63	27.29	28.68
225	60.13	-1.81	0	-0.05	0	4.9	0	0.03	27.16	27.72	-33.16
228	48.79	1.84	0	0.05	0	4.98	0	0.03	26.67	27.14	26.48
231	43.56	5.22	0	0.02	0	4.8	0	0.03	26.27	26.62	8.34
234	36.64	-2.9	0	-0.03	0	4.75	0	0.03	26.28	26.59	-12.65
237	37.08	-2.02	0	-0.04	0	4.91	0	0.03	26.24	26.47	-18.36
240	36.9	5.74	0	0.02	0	4.82	0	0.03	26.18	26.38	6.43
243	34.28	1.97	0	0.04	0	4.64	0	0.03	26.46	26.63	17.43
246	33.54	-0.05	0.09	-2.04	0	4.69	0	0.03	26	26.14	-681.04
249	35.05	2.69	0	0.04	0	4.61	0	0.03	26.17	26.28	13.04
252	33.43	-0.59	0.01	-0.17	0	4.57	0	0.03	26.25	26.34	-56.33
255	32.51	-0.02	0.25	-4.53	0	4.63	0	0.03	26.15	26.24	-1648.4
258	34.1	-0.16	0.03	-0.6	0	4.57	0	0.03	26.26	26.32	-219.4
261	32.49	3.36	0	0.02	0	4.61	0	0.03	25.84	25.89	9.67
264	30.8	4.58	0	0.02	0	4.39	0	0.03	25.73	25.78	6.73
267	31.85	0.01	-0.39	10.18	0	4.4	0	0.03	25.67	25.73	3184.59

Computer Monitor Case**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	45.00
Peak Heat Release Rate (kW/m ²):	370.72
Time to Peak Heat Release Rate (s):	182.00
Total Heat Release (MJ/m ²):	43.28
60 s Average Heat Release Rate (kW/m ²):	227.93
Total Mass Loss (g):	29.23
Average Mass Loss Rate (g/s):	0.168
Average Effective Heat of Combustion (MJ/kg):	14.81
Average Smoke Extinction Area (m ² /kg):	2425.63
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1420

Specimen:

Initial mass (g):	34.4
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	78
Time to ignition (s):	45
Time to flameout (s):	218

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-0.19	0.01	-0.4	-0.03	7249.05	34.55	0.03	0.03	25.25	25.43	-18.77
5	2.76	0.01	-0.62	-0.03	0	34.41	0	0.03	25.47	25.65	275.64
8	4.5	-5.63	0	0	-0.36	34.44	0	0.03	25.2	25.37	-0.8
11	3.73	-2.57	0	0	-32.59	34.66	0.03	0.03	25.16	25.33	-1.45
14	0.57	4.38	0	0	32.86	34.56	0.06	0.03	25.29	25.47	0.13
17	0.22	-1.68	0	0	-77.22	34.49	0.05	0.03	25.32	25.5	-0.13
20	1.11	-1.5	0	0	-123.53	34.62	0.07	0.03	25	25.19	-0.74
23	2.29	3.02	0	0	115.84	34.55	0.13	0.03	25.95	26.15	0.76
26	1.26	-0.74	0.01	0	-561.92	34.5	0.17	0.03	24.95	25.15	-1.69
29	-0.8	-0.67	0	0	-504.12	34.57	0.13	0.03	25.78	25.98	1.19
32	-0.04	3.02	0	0	194.61	34.51	0.23	0.03	25.31	25.51	-0.01
35	1.91	-1.6	0	0	-401.63	34.44	0.25	0.03	25.64	25.85	-1.19
38	-0.4	2.86	0	0	323.42	34.55	0.36	0.03	25.6	25.81	-0.14
41	-1.04	6.77	0	0	227.35	34.27	0.6	0.03	25.36	25.58	-0.15
44	9.08	4.22	0	0.17	1412.05	34.18	2.32	0.03	25.38	25.63	2.15
47	27.94	11.98	0	0.14	1988.2	33.94	9.54	0.03	24.64	24.97	2.33
50	73.47	19.25	0	0.14	2091.05	33.46	15.93	0.03	24.86	25.28	3.82
53	126.76	18.84	0	0.15	2672	32.85	19.37	0.03	25.4	26	6.73
56	189.43	14.92	0	0.2	3060.52	32.36	17.99	0.03	24.7	25.38	12.7
59	217.45	15.1	0	0.19	2935.22	31.92	17.4	0.03	24.68	25.49	14.4
62	240.26	23.79	0	0.12	2012.36	31.4	18.64	0.03	24.81	25.68	10.1
65	249.46	24.28	0	0.13	2094.28	30.55	19.54	0.03	25.07	26.02	10.28
68	260.45	19.28	0	0.17	2760.99	29.98	20.72	0.03	24.7	25.7	13.51
71	274.3	19.22	0	0.17	2752.54	29.36	20.23	0.03	25.06	26.15	14.27
74	285.7	22.35	0	0.15	2220.38	28.81	18.96	0.03	25.05	26.18	12.78
77	286.18	21.37	0	0.15	2662.1	28.04	22	0.03	24.69	25.85	13.39
80	291.11	22.23	0	0.13	2229.55	27.52	18.91	0.03	25.03	26.21	13.09
83	277.77	19.41	0	0.15	2464.1	26.73	18.81	0.02	24.26	25.43	14.31
86	283.02	21.82	0	0.14	2630.68	26.31	21.69	0.03	25.22	26.46	12.97
89	277.72	26.25	0	0.12	1829.5	25.41	18.45	0.03	24.8	26.03	10.58
92	285.23	18.01	0	0.18	2969.04	24.83	20.27	0.03	25.13	26.37	15.84
95	290.86	17.9	0	0.18	2739.14	24.28	18.28	0.03	25.55	26.81	16.25
98	279.79	22.43	0	0.14	2229.81	23.71	19.36	0.02	24.6	25.83	12.48
101	279.64	25.18	0	0.12	2076.01	22.95	20.03	0.02	24.86	26.09	11.11
104	280.89	19.46	0	0.16	2600.16	22.26	19.24	0.03	25.06	26.29	14.44
107	281.19	19.98	0	0.15	2631.74	21.74	19.69	0.03	25.47	26.72	14.07
110	273.28	20.16	0	0.14	2500.42	21.06	19.02	0.03	25.29	26.5	13.56
113	267.35	24.63	0	0.12	2238.8	20.51	20.33	0.03	25.92	27.12	10.86
116	252.31	20.28	0	0.15	2709.62	19.64	21.25	0.02	24.72	25.86	12.44
119	254.4	18.68	0	0.17	3147.27	19.27	23.06	0.02	24.38	25.49	13.62
122	270.01	22.36	0	0.14	2287.42	18.48	19.12	0.03	25.58	26.75	12.08
125	262.15	23.28	0	0.12	1958.04	17.95	17.5	0.02	24.92	26.05	11.26

128	262.04	22.51	0	0.12	2246.77	17.1	19.12	0.03	25.33	26.45	11.64
131	259.28	17.63	0	0.18	3322.46	16.62	22.07	0.03	25.43	26.53	14.71
134	260.65	20.88	0	0.15	2599.66	15.99	20.5	0.03	25.4	26.49	12.48
137	264.9	25.2	0	0.13	2350.12	15.36	22.3	0.03	25.48	26.56	10.51
140	268.53	24.08	0	0.14	2534.18	14.52	22.76	0.03	25.74	26.81	11.15
143	259.57	18.04	0	0.17	2785.36	13.95	19.35	0.02	24.94	25.97	14.39
146	259.2	19.99	0	0.16	2691.01	13.38	20.53	0.02	25.17	26.2	12.97
149	258.85	25.17	0	0.13	2327.2	12.73	21.98	0.03	25.62	26.66	10.28
152	261.18	25.12	0	0.13	2541.36	11.91	23.48	0.03	26.15	27.18	10.4
155	258.6	16.59	0	0.2	3400.27	11.28	21.12	0.03	25.7	26.7	15.59
158	263.43	20.82	0	0.15	2514.64	10.83	19.71	0.03	25.55	26.55	12.65
161	262.02	23.51	0	0.13	2081.15	10.04	18.7	0.02	25.18	26.17	11.14
164	266.94	20.13	0	0.15	2195.55	9.46	17.14	0.02	24.79	25.78	13.26
167	277.57	14.78	0	0.18	2774.76	8.84	16.04	0.02	24.56	25.57	18.78
170	302.07	15.76	0	0.16	2586.16	8.53	15.66	0.02	24.96	26.02	19.17
173	318.38	19.77	0	0.12	1868.61	7.87	14.35	0.02	24.62	25.74	16.1
176	333.42	16.18	0	0.12	2061.77	7.4	13.26	0.02	24.01	25.16	20.6
179	366.46	12.32	0	0.14	2339.42	6.91	10.84	0.02	25.32	26.58	29.75
182	370.72	9.14	0	0.14	2741.18	6.65	9.4	0.02	25.37	26.65	40.55
185	357.1	11.65	0	0.1	1779.85	6.32	7.72	0.02	25.58	26.85	30.65
188	329.01	10.92	0	0.09	1857.41	5.97	7.73	0.02	25.03	26.24	30.12
191	306.83	8.08	0	0.1	2135.73	5.69	6.4	0.02	25.76	26.97	37.98
194	276.78	3.39	0	0.2	3753.52	5.5	4.79	0.02	25.45	26.6	81.58
197	251.29	7.09	0	0.08	1423.61	5.43	3.74	0.03	25.91	27.01	35.45
200	223.89	4.49	0	0.1	1579.48	5.11	2.6	0.03	26.21	27.25	49.89
203	182.68	-1.32	0	-0.28	-1771.55	5.18	0.85	0.03	26.53	27.46	-138.49
206	147.94	-0.45	0.01	-0.63	-3639.45	5.14	0.62	0.03	26.06	26.89	-325.46
209	111.72	7.12	0	0.04	220.01	5.16	0.57	0.03	26.64	27.37	15.7
212	83.39	4.73	0	0.04	319.93	4.79	0.56	0.03	26.35	26.98	17.64
215	71.11	-4.46	0	-0.04	-217.33	4.92	0.36	0.03	26.38	26.93	-15.93
218	62.54	1.21	0	0.13	525.57	4.95	0.24	0.03	26.35	26.82	51.71
221	53.73	4.18	0	0.04	175.25	4.86	0.27	0.03	26.41	26.81	12.86
224	44.97	-0.77	0	-0.18	-772.09	4.76	0.22	0.03	26.18	26.51	-58.66
227	44.72	1.1	0	0.11	554.26	4.86	0.23	0.03	26.58	26.88	40.68
230	40.51	5.73	0	0.02	119.54	4.67	0.26	0.03	26.09	26.32	7.07
233	35.72	0.12	-0.03	0.94	5143.78	4.59	0.23	0.03	26.17	26.38	299.95
236	37.6	-4.56	0	-0.02	-177.62	4.66	0.3	0.03	26.45	26.62	-8.24
239	36.62	2.98	0	0.03	209.23	4.78	0.24	0.03	26.13	26.29	12.29
242	34.46	3.95	0	0.03	156.24	4.52	0.24	0.03	26.13	26.25	8.73
245	33.83	-2.18	0	-0.05	-316.73	4.59	0.26	0.03	25.9	26.01	-15.55
248	36.53	1.59	0	0.07	304.95	4.59	0.18	0.03	27.01	27.1	23.03
251	33.9	3.42	0	0.04	185.21	4.51	0.24	0.03	25.89	25.97	9.93
254	32.85	-1.42	0	-0.09	-219.23	4.43	0.12	0.03	25.77	25.84	-23.19
257	33.9	-2.58	0	-0.04	-235.72	4.57	0.23	0.03	26.07	26.14	-13.15
260	35.07	5.22	0	0.02	93.01	4.52	0.19	0.03	26.16	26.22	6.72
263	33	5.44	0	0.02	60.1	4.31	0.12	0.03	26.12	26.18	6.07
266	31.1	0.01	-0.49	12.89	41373.64	4.26	0.16	0.03	25.54	25.6	3109.94
269	32.71	0.01	-0.36	11.17	37808	4.41	0.15	0.03	25.85	25.92	3271.45

Letter Tray**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	61.00
Peak Heat Release Rate (kW/m ²):	1002.42
Time to Peak Heat Release Rate (s):	132.00
Total Heat Release (MJ/m ²):	60.37
60 s Average Heat Release Rate (kW/m ²):	353.81
Total Mass Loss (g):	18.11
Average Mass Loss Rate (g/s):	0.159
Average Effective Heat of Combustion (MJ/kg):	33.34
Average Smoke Extinction Area (m ² /kg):	1409.04
Average CO ₂ yield (g/g):	0.61
Average CO yield (g/g):	0.0848

Specimen:

Initial mass (g):	20.4
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	95
Time to ignition (s):	61
Time to flameout (s):	174

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	2.49	0.01	-0.39	-0.04	7359.1	20.38	0.03	0.03	26.02	26.11	248.54
3	2.55	0.01	-0.5	-0.04	10905.69	20.33	0.04	0.03	25.82	25.91	254.94
6	-0.28	-2.58	0	0	-43.22	20.28	0.04	0.03	25.76	25.85	0.11
9	-0.26	-3.77	0	0	-18.55	20.45	0.03	0.03	26.06	26.15	0.07
12	1.08	2.43	0	0	39.66	20.45	0.04	0.03	25.96	26.05	0.44
15	0.25	-0.74	0	0	-99.52	20.37	0.03	0.03	25.87	25.96	-0.33
18	-0.79	-3.66	0	0	-28.69	20.5	0.04	0.03	25.78	25.88	0.22
21	0.65	-0.59	0.01	0	-220.16	20.54	0.05	0.03	25.63	25.74	-1.09
24	1.44	1.9	0	0	51.38	20.53	0.04	0.03	26.21	26.33	0.76
27	-0.7	-0.87	0	0	-64.64	20.47	0.02	0.03	25.91	26.02	0.8
30	-2.37	-1.12	0	0	-120.33	20.57	0.05	0.03	26.07	26.19	2.12
33	-1.87	5.16	0	0	33.98	20.49	0.07	0.03	25.76	25.89	-0.36
36	-0.05	-1.24	0	0	-168.85	20.34	0.08	0.03	25.34	25.47	0.04
39	0.51	-4.08	0	0	-45.1	20.54	0.07	0.03	25.03	25.16	-0.13
42	0.22	4.81	0	0	60.64	20.51	0.12	0.03	25.19	25.33	0.05
45	-0.72	0.99	0	0	266.94	20.34	0.1	0.03	26.21	26.36	-0.73
48	-1.66	-2.44	0	0	-151.09	20.45	0.14	0.03	25.92	26.07	0.68
51	-2.27	2.6	0	0	189.48	20.43	0.19	0.03	25.96	26.11	-0.87
54	-2.38	2.05	0	0	216.22	20.33	0.18	0.03	25.18	25.33	-1.16
57	-0.7	-0.47	0.01	0	-867.51	20.32	0.16	0.03	25.31	25.45	1.51
60	0.83	-1	0.01	0	-506.43	20.34	0.19	0.03	26.07	26.22	-0.82
63	2.97	4.88	0	0	203.97	20.34	0.38	0.03	25.72	25.87	0.61
66	13.32	5.59	0	0	579.88	20.09	1.28	0.03	25.16	25.35	2.38
69	32.61	0.49	-0.01	0.19	12060.73	20.04	2.33	0.03	25.11	25.4	66.41
72	59.57	4.34	0	0.04	2012.11	20	3.48	0.03	24.71	25.11	13.72
75	107.33	4.96	0	0.05	2155.41	19.8	4.26	0.03	24.53	25.09	21.65
78	141.59	7.3	0	0.05	1557.8	19.68	4.54	0.03	24.34	25.03	19.39
81	175.74	13.17	0	0.03	1013.12	19.34	5.24	0.03	24.68	25.48	13.34
84	212.61	7.71	0	0.06	1902.72	18.97	5.85	0.03	24.14	25.09	27.56
87	246.53	8.43	0	0.08	2122.91	18.83	7	0.03	24.38	25.54	29.26
90	282.95	14.95	0	0.05	1244.85	18.42	7.33	0.02	24.02	25.38	18.92
93	350.21	13.66	0	0.08	1487.31	17.98	8.03	0.02	23.72	25.32	25.63
96	414.19	19.8	0	0.07	1177.79	17.56	8.99	0.02	24.08	25.93	20.91
99	489.62	24.2	0.02	0.06	1060.37	16.81	10.17	0.02	23.12	25.24	20.23
102	552.08	18.75	0.21	0.09	1600.17	16.17	11.69	0.02	23.23	25.67	29.44
105	594.86	22.75	0.27	0.07	1282.33	15.62	11.63	0.02	22.5	25.09	26.14
108	670.34	24.44	0.42	0.08	1302.35	14.82	12.26	0.02	23	25.97	27.43
111	714.65	27.53	0.51	0.07	1185.18	14.15	12.34	0.02	23.23	26.44	25.96
114	753.34	27.82	0.61	0.08	1205.02	13.19	12.63	0.02	23.17	26.54	27.08
117	800.19	19.15	1.14	0.12	1946.99	12.54	13.84	0.02	23.28	26.95	41.78
120	814.42	30.73	0.84	0.08	1130.23	11.91	13.15	0.02	22.65	26.42	26.5
123	824.23	30.79	0.9	0.08	1057.9	10.77	12.79	0.02	21.68	25.46	26.77

126	889.6	19.14	1.63	0.13	1786.93	10.13	12.97	0.02	22.24	26.37	46.49
129	915.95	35.27	0.93	0.07	985.72	9.44	13.11	0.02	22.26	26.53	25.97
132	1002.42	33.62	1.04	0.08	1150.25	8.14	13.59	0.02	23.81	28.45	29.82
135	968.89	19.59	1.58	0.13	1769.09	7.51	12.62	0.02	22.91	27.48	49.45
138	975.91	31.36	0.88	0.08	1104.3	6.79	12.33	0.02	23.5	28.1	31.12
141	975.8	25.17	0.87	0.09	1080.3	5.74	9.33	0.02	24.54	29.15	38.76
144	907.03	15.6	0.96	0.13	2178.9	5.31	11.95	0.02	24.1	28.45	58.16
147	858.88	21.58	0.46	0.09	1366.06	4.7	10.06	0.02	25	29.29	39.8
150	799.77	16.62	0.18	0.1	1794.74	4.08	10.07	0.02	25.61	29.62	48.12
153	741.91	15.63	0	0.09	1956.86	3.69	10.25	0.02	26.09	29.83	47.46
156	658.43	14.06	0	0.09	1927.27	3.15	8.96	0.02	26.78	30.24	46.84
159	570.09	8.64	0	0.1	2489.24	2.87	7.24	0.02	26.72	29.68	66.01
162	507.41	9.1	0	0.07	1731.25	2.59	5.2	0.02	27.58	30.27	55.77
165	395.54	5.97	0	0.07	1397.93	2.34	2.77	0.02	27.87	30.17	66.28
168	311.92	2.85	0	0.09	2459.31	2.24	2.33	0.02	28.26	30.09	109.51
171	235.76	-0.08	0.06	-1.73	0	2.17	1.42	0.02	27.83	29.25	0
174	155.42	-2.22	0	-0.02	-702.94	2.23	0.55	0.02	27.41	28.42	-70.06
177	115.17	-0.41	0.01	-0.01	-1035.01	2.27	0.15	0.02	27.52	28.27	-283.17
180	87.57	0.94	0	0	0	2.26	0	0.02	27.65	28.13	92.97
183	55.67	2.37	0	0	0	2.22	0	0.02	27.62	27.86	23.51
186	43.27	1.44	0	0	0	2.14	0	0.03	27.64	27.71	30.08
189	33.97	-2.42	0	0	0	2.15	0	0.02	27.1	27	-14.06
192	30.85	-0.92	0	0	0	2.24	0	0.03	27.08	26.85	-33.44
195	28.49	0.43	-0.01	0	0	2.2	0	0.03	27.61	27.28	66.08
198	23.49	1.17	0	0	81.34	2.22	0.04	0.03	27.19	26.78	20.05
201	20.79	0.85	0	0	49.47	2.14	0.02	0.03	27.46	26.99	24.53
204	18.66	-1.3	0	0	0	2.18	0	0.03	27.27	26.75	-14.39
207	17.48	0.42	-0.01	0	0	2.2	0	0.03	27.01	26.45	41.31
210	17.15	-1.74	0	0	-22.4	2.18	0.01	0.03	26.65	26.08	-9.85
213	15.88	-0.33	0.01	0	-287.42	2.27	0.04	0.03	26.94	26.34	-47.4
216	13.42	4.3	0	0	14.19	2.18	0.02	0.03	26.64	26.05	3.12
219	11.47	0.45	-0.01	0	7.28	2.08	0	0.03	27.62	27	25.37
222	10.28	0.01	-0.38	-0.03	0	2.13	0	0.03	26.68	26.12	1027.67
225	10.85	0.01	-0.42	-0.04	2421.38	2.05	0.01	0.03	26.18	25.61	1084.91

Letter Tray**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	73.00
Peak Heat Release Rate (kW/m ²):	829.02
Time to Peak Heat Release Rate (s):	156.00
Total Heat Release (MJ/m ²):	59.41
60 s Average Heat Release Rate (kW/m ²):	312.41
Total Mass Loss (g):	18.35
Average Mass Loss Rate (g/s):	0.153
Average Effective Heat of Combustion (MJ/kg):	32.37
Average Smoke Extinction Area (m ² /kg):	1410.88
Average CO ₂ yield (g/g):	0.35
Average CO yield (g/g):	0.0832

Specimen:

Initial mass (g):	20.9
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	92
Time to ignition (s):	73
Time to flameout (s):	194

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-1.14	0.01	-0.43	-0.04	0	-16.5	0	0.03	25.87	25.98	-113.71
3	0.61	0.01	-0.4	-0.04	0	152.18	0	0.03	26.11	26.22	60.95
6	0.51	464.63	0	0	0	152.25	0	0.03	26.34	26.44	0
9	0.28	-1.26	0	0	0	152.37	0	0.03	25.87	25.97	-0.22
12	1.32	3.83	0	0	0	152.32	0	0.03	25.63	25.73	0.34
15	-0.19	-11.03	0	0	0	152.33	0	0.03	25.43	25.53	0.02
18	-1.15	-74.39	0	0	0	153.28	0	0.03	25.96	26.07	0.02
21	1.11	-44.91	0	0	0	156.05	0	0.03	26	26.11	-0.02
24	-0.41	81	0	0	0	155.3	0	0.03	25.98	26.1	-0.01
27	-1.97	54.19	0	0	0	152.29	0	0.03	25.99	26.12	-0.04
30	1.98	-9.31	0	0	0	152.4	0	0.03	25.67	25.8	-0.21
33	1.9	-2.87	0	0	0	152.37	0	0.03	25.82	25.95	-0.66
36	-1.35	-2.13	0	0	0	152.55	0	0.03	25.67	25.8	0.63
39	-2.19	2.48	0	0	0	152.47	0	0.03	25.77	25.91	-0.88
42	-1.44	0	-1.45	-0.21	0	152.45	0	0.03	26.01	26.16	-681.03
45	0.09	-0.26	0.02	0	0	152.46	0	0.03	25.69	25.84	-0.35
48	-1.86	-1.07	0	0	0	152.47	0	0.03	25.46	25.61	1.74
51	-2.21	-1.29	0	0	0	152.52	0	0.03	25.33	25.48	1.71
54	-1.11	1.78	0	0	0	152.52	0	0.03	25.4	25.55	-0.63
57	0.55	1.99	0	0	53.7	152.43	0.04	0.03	25.22	25.37	0.27
60	0.63	-2.45	0	0	-26.31	152.43	0.02	0.03	25.72	25.88	-0.26
63	-0.51	0.01	-0.3	-0.03	19837.8	152.53	0.1	0.03	25.9	26.07	-37.9
66	-1.76	1.59	0	0	87.65	152.44	0.05	0.03	25.59	25.75	-1.11
69	-1.63	-2.82	0	0	-3.91	152.48	0	0.03	25.72	25.89	0.58
72	-0.93	-0.08	0.04	0	-1497.98	152.56	0.05	0.03	25.92	26.09	11.22
75	1.42	5.6	0	0	51.71	152.46	0.11	0.03	26.17	26.35	0.25
78	7.3	3.3	0	0.01	616.78	152.28	0.78	0.03	26.07	26.26	2.21
81	19.54	2.2	0	0.03	2307.69	152.26	2.02	0.03	24.88	25.14	8.89
84	47.53	6.19	0	0.02	1391.59	152.11	3.46	0.03	24.54	24.88	7.67
87	91.84	8.42	0	0.03	1215.14	151.89	3.93	0.03	25.49	26	10.91
90	124.77	10.19	0	0.03	928.16	151.61	3.83	0.03	24.13	24.71	12.24
93	166.79	5.26	0	0.07	2496.46	151.33	5.14	0.03	24.81	25.54	31.74
96	196.74	7.87	0	0.06	1714.89	151.24	5.14	0.03	25.36	26.24	25
99	236.02	14.2	0	0.05	1189.23	150.83	6.29	0.03	25.82	26.85	16.62
102	261.85	15	0	0.06	1092.36	150.43	6.53	0.02	24.04	25.11	17.46
105	321.55	13.35	0	0.08	1546.26	149.95	8	0.02	24.4	25.8	24.09
108	385.55	12.55	0	0.1	1807.77	149.62	8.79	0.02	24.21	25.82	30.72
111	427.68	17.6	0	0.08	1412.06	149.15	9.75	0.02	23.6	25.48	24.3
114	497.45	21.52	0	0.07	1156.98	148.57	9.5	0.02	24.08	26.2	23.12
117	553.03	22.38	0	0.07	1218.49	147.89	10.3	0.02	24.12	26.47	24.71
120	585.03	19.87	0.07	0.09	1324.15	147.25	10.02	0.02	23.72	26.25	29.45
123	624.34	20.78	0.21	0.09	1434.4	146.67	11.29	0.02	23.7	26.39	30.05

126	640.03	19.04	0.31	0.1	1585.36	146.02	11.57	0.02	23.32	26.09	33.61
129	674.36	18.27	0.39	0.11	1768.22	145.52	12.19	0.02	23.47	26.5	36.91
132	698.78	26.43	0.32	0.07	1044.81	144.87	10.34	0.02	23.54	26.7	26.43
135	697.89	24.89	0.46	0.08	1075.62	144	10.27	0.02	22.87	26.08	28.04
138	706.36	19.66	0.68	0.1	1539.24	143.4	11.81	0.02	22.37	25.62	35.93
141	739.19	22.29	0.61	0.09	1466.35	142.77	12.47	0.02	22.83	26.21	33.16
144	779.64	23.31	0.6	0.09	1430.57	142.07	12.27	0.02	23.63	27.17	33.44
147	768.11	25.84	0.56	0.08	1250.68	141.36	12.15	0.02	23.1	26.6	29.73
150	762.19	27.21	0.59	0.08	1143.14	140.53	11.88	0.02	22.68	26.17	28.01
153	799.25	28.34	0.61	0.08	1116.6	139.74	11.68	0.02	23.46	27.09	28.2
156	829.02	22.34	0.8	0.1	1413.2	138.88	11.29	0.02	24.17	27.95	37.11
159	820.87	17.41	0.95	0.13	1869.05	138.39	11.74	0.02	23.95	27.71	47.14
162	824.17	21.9	0.73	0.1	1642.65	137.77	12.82	0.02	24.27	28.05	37.63
165	812.03	23.76	0.43	0.09	1393.89	137.09	11.64	0.02	24.68	28.44	34.18
168	771.05	23.9	0.22	0.08	1240.24	136.36	10.52	0.02	24.59	28.18	32.26
171	749.68	17.1	0.03	0.09	1750.04	135.71	10.34	0.02	25.46	28.94	43.84
174	696.58	12.16	0	0.11	2016.18	135.33	8.24	0.02	26.4	29.74	57.28
177	624.71	10.63	0	0.11	1763.5	134.95	6.35	0.02	26.52	29.54	58.74
180	531.59	6.99	0	0.11	2444.8	134.7	5.77	0.02	26.94	29.64	76.01
183	455.93	7.02	0	0.06	1860.95	134.5	4.37	0.02	27.47	29.91	64.97
186	379.95	6.31	0	0.05	1367.14	134.28	2.91	0.02	27.63	29.67	60.19
189	282.43	1.04	-0.01	0.19	5433.25	134.16	1.91	0.02	27.91	29.6	271.98
192	212.33	-2.44	0	-0.04	-897.66	134.2	0.76	0.02	27.7	29.01	-86.92
195	140.8	0.84	0	0	380.3	134.25	0.11	0.02	27.4	28.39	166.96
198	98.63	2.59	0	0	0	134.16	0	0.02	27.61	28.36	38.12
201	71.12	-1.45	0	0	0	134.14	0	0.02	27.6	28.09	-49.14
204	49.43	-1.88	0	0	0	134.23	0	0.03	27.68	27.95	-26.22
207	39.92	1.58	0	0	0	134.22	0	0.03	27.31	27.5	25.34
210	30.71	1.36	0	0	0	134.16	0	0.03	27.34	27.33	22.62
213	25.07	0.14	-0.03	0	0	134.15	0	0.03	26.83	26.68	180.12
216	23.51	-3.29	0	0	0	134.16	0	0.03	27.03	26.77	-7.14
219	23.11	0.21	-0.02	0	0	134.3	0	0.03	27.08	26.75	108.28
222	21.81	3.93	0	0	0	134.15	0	0.03	27.1	26.7	5.54
225	16.51	-1.4	0	0	0	134.13	0	0.03	27.12	26.67	-11.81
228	14.94	-1.29	0	0	0	134.2	0	0.03	26.71	26.25	-11.58
231	15.01	-0.54	0.01	0	0	134.2	0	0.03	27.03	26.53	-27.56
234	14.89	3.21	0	0	0	134.21	0	0.03	26.73	26.22	4.64
237	12.95	3.26	0	0	0	134.03	0	0.03	26.62	26.11	3.97
240	9.87	-3.98	0	0	0	134.07	0	0.03	26.32	25.82	-2.48
243	10.59	-2.51	0	0	0	134.21	0	0.03	26.55	26.05	-4.22
246	11.9	0.72	-0.01	0	0	134.2	0	0.03	26.66	26.17	16.62
249	11.77	3.03	0	0	0	134.18	0	0.03	26.53	26.05	3.88
252	9.01	0.01	-0.49	-0.04	0	134.05	0	0.03	26.68	26.23	900.91
255	6.73	0.01	-0.47	-0.03	0	134.17	0	0.03	26.53	26.08	672.89

Letter Tray**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	63.00
Peak Heat Release Rate (kW/m ²):	1224.65
Time to Peak Heat Release Rate (s):	132.00
Total Heat Release (MJ/m ²):	61.05
60 s Average Heat Release Rate (kW/m ²):	463.14
Total Mass Loss (g):	18.77
Average Mass Loss Rate (g/s):	0.209
Average Effective Heat of Combustion (MJ/kg):	32.53
Average Smoke Extinction Area (m ² /kg):	1259.39
Average CO ₂ yield (g/g):	0.99
Average CO yield (g/g):	0.0844

Specimen:

Initial mass (g):	21.3
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	89
Time to ignition (s):	63
Time to flameout (s):	153

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	1.26	0.01	-0.48	-0.03	0	21.15	0	0.03	25.43	25.55	125.95
3	-0.81	0.01	-0.41	-0.04	0	21.15	0	0.03	25.45	25.58	-81.21
6	-1	-6.22	0	0	0	21.32	0	0.03	25.81	25.94	0.16
9	0.35	6.61	0	0	0	21.46	0	0.03	26.87	26.99	0.05
12	0.49	-51.98	0	0	0	21.37	0	0.03	26.05	26.18	-0.01
15	-0.27	-22.54	0	0	0	23.93	0	0.03	25.73	25.86	0.01
18	-0.41	57.96	0	0	0	22.36	0	0.03	25.67	25.81	-0.01
21	0.37	17.62	0	0	0	21.3	0	0.03	25.85	25.99	0.02
24	0.59	-3.41	0	0	0	21.25	0	0.03	25.67	25.82	-0.17
27	-1.46	-3.08	0	0	0	21.33	0	0.03	25.47	25.62	0.47
30	-2.4	0.49	-0.01	0	0	21.39	0	0.03	25.6	25.75	-4.87
33	-2.32	3.54	0	0	0	21.31	0	0.03	25.63	25.78	-0.65
36	-0.71	-4.73	0	0	0	21.25	0	0.03	25.6	25.76	0.15
39	0.38	-3.28	0	0	0	21.53	0	0.03	25.23	25.4	-0.12
42	-0.05	3.91	0	0	0	21.41	0	0.03	25.46	25.62	-0.01
45	-1.49	0.31	-0.02	0	0	21.37	0	0.03	25.97	26.13	-4.85
48	-2.57	0.5	-0.01	0	0	21.37	0	0.03	25.71	25.87	-5.15
51	-2.1	2.6	0	0	0	21.32	0	0.03	25.39	25.56	-0.8
54	-2.26	1.92	0	0	0	21.23	0	0.03	25.65	25.83	-1.18
57	-1.12	-2.42	0	0	0	21.23	0	0.03	25.87	26.05	0.46
60	0.71	-4.28	0	0	-20.42	21.36	0.03	0.03	25.72	25.89	-0.17
63	1.58	0.47	-0.01	0	221.12	21.44	0.04	0.03	25.76	25.93	3.34
66	4.56	5.81	0	0	48.34	21.32	0.11	0.03	26.07	26.26	0.78
69	17.6	5.1	0	0.01	426.3	21.13	0.85	0.03	25.3	25.55	3.45
72	41.56	6.7	0	0.02	946.11	21.01	2.46	0.03	25.35	25.7	6.21
75	76.66	6.61	0	0.03	1609.1	20.74	4.22	0.03	24.73	25.18	11.6
78	129.41	9.22	0	0.04	1321.41	20.59	4.78	0.03	24.84	25.46	14.04
81	179.77	11.5	0	0.04	1241.25	20.19	5.71	0.03	24.22	25.01	15.63
84	233.22	9.37	0	0.08	1919.48	19.93	7.14	0.03	24.26	25.2	24.89
87	270.07	11.72	0	0.08	1351.65	19.6	6.33	0.02	23.91	25.04	23.04
90	329.08	12.54	0	0.09	1113.49	19.23	5.6	0.02	23.55	24.94	26.24
93	405.23	17.17	0	0.08	1074.18	18.82	7.3	0.02	23.54	25.27	23.6
96	461.83	17.56	0.02	0.09	1424.06	18.22	9.94	0.02	23.1	25.15	26.31
99	540.65	24.78	0.14	0.08	1078.52	17.72	10.52	0.02	23.09	25.39	21.82
102	635.74	33.29	0.36	0.06	791.78	16.74	10.15	0.02	23.22	25.97	19.1
105	684.4	24.68	0.74	0.09	1254.11	15.84	12.25	0.02	22.23	25.27	27.73
108	765.28	23.83	1.02	0.1	1456.23	15.21	13.3	0.02	22.71	26.08	32.12
111	851.87	30.32	1.04	0.09	1093.86	14.36	12.54	0.02	22.69	26.44	28.1
114	908.13	32.99	1.11	0.09	1107.71	13.41	14.06	0.02	22.01	25.99	27.53
117	996.47	32.02	1.33	0.1	1272.11	12.41	15.34	0.02	22.28	26.55	31.12
120	1071.35	29.33	1.68	0.12	1428.14	11.5	15.23	0.02	22.84	27.49	36.53
123	1121.58	36.33	1.45	0.09	1143.91	10.58	15.02	0.02	22.74	27.67	30.87
126	1166.36	43.66	1.3	0.08	929.88	9.33	14.61	0.02	22.67	27.79	26.72
129	1163.02	30.94	1.79	0.11	1354.13	8.1	15.38	0.02	22.11	27.24	37.59
132	1224.65	32.32	1.81	0.11	1206.51	7.38	13.72	0.02	22.97	28.42	37.89
135	1213.06	37.09	1.35	0.09	1071.99	6.13	13.99	0.02	22.93	28.42	32.71

138	1177.37	28.22	1.47	0.1	1502.03	5.25	14.92	0.02	23.04	28.42	41.72
141	1146.43	23.54	1.41	0.11	1619.03	4.42	13.17	0.02	23.61	28.94	48.71
144	1098.03	16.45	1.33	0.12	2047.86	3.85	11.12	0.02	25.03	30.31	66.74
147	969.45	15.36	0.52	0.1	1844.67	3.39	9.24	0.02	25.77	30.66	63.1
150	795.99	12.96	0	0.07	1653.56	2.94	6.94	0.02	26.42	30.87	61.4
153	670.68	2.6	0	0.17	4955.71	2.67	4.06	0.02	27.62	31.68	258.09
156	502.99	1.74	0	0.18	2472.76	2.71	1.35	0.02	28.36	31.75	289.78
159	328.77	2.9	0	0.04	0	2.54	0	0.02	28.89	31.59	113.43
162	206.73	-0.28	0.01	-0.09	0	2.57	0	0.02	28.96	31.05	-728.34
165	141.65	-3.79	0	0	0	2.56	0	0.02	28.88	30.6	-37.42
168	89.1	-4.69	0	0	0	2.77	0	0.02	28.32	29.59	-19
171	63.24	1.85	0	0	0	2.79	0	0.02	28.29	29.18	34.14
174	51.31	2.88	0	0	0	2.7	0	0.02	28.01	28.64	17.79
177	46.46	0.57	-0.01	0	0	2.65	0	0.02	27.96	28.36	82.05
180	41.68	-0.81	0	0	0	2.66	0	0.03	27.94	28.11	-51.48
183	36.02	-1.03	0	0	0	2.69	0	0.03	27.86	27.84	-34.86
186	32.29	0.25	-0.02	0	0	2.71	0	0.03	28.42	28.25	128.94
189	28.29	3.88	0	0	0	2.66	0	0.03	27.67	27.42	7.29
192	26.51	-0.58	0.01	0	0	2.53	0	0.03	27.96	27.6	-45.95
195	25.2	-2.97	0	0	0	2.68	0	0.03	27.49	27.06	-8.48
198	22.21	-0.96	0	0	0	2.68	0	0.03	26.77	26.32	-23.22
201	19.83	0.01	-0.27	-0.02	0	2.75	0	0.03	26.96	26.46	1982.61
204	17.8	0.01	-0.36	-0.03	0	2.74	0	0.03	27.08	26.53	1780.48

Office Chair**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	10.00
Peak Heat Release Rate (kW/m ²):	196.25
Time to Peak Heat Release Rate (s):	73.00
Total Heat Release (MJ/m ²):	130.93
60 s Average Heat Release Rate (kW/m ²):	172.72
Total Mass Loss (g):	94.43
Average Mass Loss Rate (g/s):	0.059
Average Effective Heat of Combustion (MJ/kg):	13.87
Average Smoke Extinction Area (m ² /kg):	63.21
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0086

Specimen:

E (MJ/kg):	13.1
Initial mass (g):	142
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	103
Time to ignition (s):	10
Time to flameout (s):	1603

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	4.31	0.01	-0.35	-0.04	1328.9	141.83	0.01	0.03	25.7	26	430.69
4	5.46	0.01	-0.41	-0.04	13313.56	141.91	0.05	0.03	25.48	25.76	546.28
7	31.78	-0.24	0.02	0	-646.06	142.02	0.06	0.03	25.62	25.9	-132.79
10	78.04	7.08	0	0.01	326.41	141.89	0.88	0.03	25.85	26.15	11.03
13	144.37	8.65	0	0.07	764	141.63	2.57	0.03	25.19	25.73	16.69
16	165.73	15.01	0	0.05	633.77	141.35	3.82	0.03	24.16	24.89	11.04
19	183.49	16.15	0	0.05	633.33	140.77	4	0.03	24.54	25.56	11.36
22	181.78	8.9	0	0.09	1178.37	140.44	4.09	0.03	24.46	25.62	20.42
25	176.38	7.24	0	0.11	1305.75	140.2	3.65	0.03	24.6	25.9	24.37
28	178.7	13.98	0	0.05	665.05	139.95	3.53	0.03	25.02	26.37	12.78
31	185.9	16.08	0	0.04	824.44	139.39	4.9	0.03	25.67	27.08	11.56
34	178.5	7.91	0	0.09	1161.41	139.06	3.48	0.03	25.01	26.42	22.56
37	174.68	6.24	0	0.12	1432.28	138.87	3.41	0.03	24.77	26.18	28.01
40	178.98	11.04	0	0.07	791.44	138.63	3.26	0.03	25.36	26.79	16.21
43	182.25	14.57	0	0.05	651.06	138.22	3.54	0.03	25.35	26.78	12.51
46	181.58	9.59	0	0.07	727.14	137.82	2.6	0.03	25.41	26.85	18.93
49	175.54	9.72	0	0.06	769.42	137.62	2.84	0.03	24.88	26.29	18.06
52	179.62	10.03	0	0.05	586.42	137.23	2.17	0.03	25.66	27.1	17.91
55	176.52	5.67	0	0.08	719.87	137.04	1.52	0.03	25.49	26.92	31.12
58	176.41	10.02	0	0.04	454.61	136.83	1.68	0.03	25.73	27.15	17.61
61	169.78	12.25	0	0.03	309.05	136.45	1.48	0.03	24.34	25.65	13.86
64	173.85	7.45	0	0.04	575.96	136.15	1.66	0.03	24.59	25.92	23.32
67	189.82	7.65	0	0.04	542.17	135.98	1.53	0.03	25.73	27.11	24.81
70	195.21	7.91	0	0.03	451.95	135.68	1.34	0.03	25.32	26.68	24.68
73	196.25	9.1	0	0.03	605.45	135.49	2.07	0.03	25.23	26.6	21.58
76	195.55	11.91	0	0.02	285.01	135.13	1.26	0.03	25.46	26.89	16.42
79	192.24	13.44	0	0.02	260.45	134.79	1.31	0.03	25.28	26.7	14.3
82	194.54	7.59	0	0.02	501.18	134.37	1.44	0.03	25.06	26.46	25.62
85	192.44	6.49	0	0.02	400.46	134.3	0.99	0.03	24.97	26.36	29.64
88	190.37	11.64	0	0.01	178.69	133.94	0.79	0.03	24.9	26.3	16.35
91	190.23	8.52	0	0.02	319.25	133.66	1.01	0.03	25.41	26.82	22.34
94	187.15	8.75	0	0.01	272.15	133.41	0.9	0.03	25.16	26.56	21.39
97	190.67	8.1	0	0.01	307.33	133.14	0.92	0.03	25.74	27.13	23.55
100	183.92	6.33	0	0.01	403.55	132.93	0.97	0.03	25.11	26.45	29.03
103	177.72	9.07	0	0.01	278.77	132.72	0.98	0.02	24.5	25.8	19.6
106	185.22	16.14	0	0.01	161.87	132.36	0.96	0.03	25.77	27.12	11.48
109	179.96	9.97	0	0.01	181.35	131.85	0.68	0.03	25.23	26.55	18.04
112	177.1	3.72	0	0.02	384.16	131.76	0.53	0.03	25.64	26.97	47.63
115	175.48	9.46	0	0.01	136.61	131.54	0.47	0.03	26.02	27.33	18.55
118	162.39	9.18	0	0	86.91	131.23	0.3	0.03	25.04	26.28	17.68
121	168.35	10.35	0	0	108.64	130.99	0.41	0.03	26.18	27.45	16.27
124	163.3	8.31	0	0	152.69	130.63	0.48	0.03	25.23	26.4	19.65
127	165.19	5.13	0	0	158.88	130.49	0.3	0.03	25.64	26.82	32.22
130	164.99	12.04	0	0	36.71	130.25	0.16	0.03	25.95	27.14	13.71
133	155.65	12.36	0	0	43.26	129.82	0.2	0.03	25.47	26.61	12.6
136	154.26	6.17	0	0	79.58	129.56	0.18	0.03	25.7	26.83	24.98

139	150.46	3.7	0	0	40.45	129.41	0.06	0.03	25.92	27.02	40.64
142	147.54	10.52	0	0	8.93	129.27	0.03	0.03	25.92	27	14.02
145	141.05	12.1	0	0	16.85	128.82	0.08	0.03	25.64	26.7	11.65
148	133.86	4.98	0	0	0	128.61	0	0.03	25.9	26.92	26.9
151	127.44	7.35	0	0	0	128.46	0	0.03	25.54	26.51	17.35
154	129.59	7.16	0	0	11.67	128.18	0.03	0.03	26.51	27.49	18.1
157	122.41	7.81	0	0	0	128.03	0	0.03	25.2	26.1	15.67
160	120.93	10.51	0	0	0	127.7	0	0.03	25.88	26.77	11.5
163	116.02	6.36	0	0	0	127.44	0	0.03	25.87	26.74	18.23
166	112.94	4.41	0	0	0	127.31	0	0.03	25.77	26.6	25.62
169	106.76	5.35	0	0	0	127.15	0	0.03	25.13	25.91	19.96
172	114.37	9.61	0	0	0	126.96	0	0.03	26.82	27.62	11.91
175	109.28	9.7	0	0	0	126.6	0	0.03	25.62	26.38	11.27
178	108.6	9.48	0	0	0	126.38	0	0.03	25.98	26.73	11.46
181	101.97	8.66	0	0	0	126.05	0	0.03	25.62	26.36	11.77
184	101.3	0.77	-0.01	0	0	125.91	0	0.03	26.24	26.97	131.32
187	97	5.81	0	0	0	125.91	0	0.03	25.45	26.14	16.71
190	97.63	13.28	0	0	0	125.54	0	0.03	26.04	26.72	7.35
193	90.95	6.09	0	0	0	125.21	0	0.03	25.31	25.97	14.93
196	88.07	3.36	0	0	0	125.15	0	0.03	25.99	26.63	26.19
199	84.57	4.08	0	0	0	124.98	0	0.03	25.63	26.24	20.74
202	85.39	5.79	0	0	0	124.9	0	0.03	25.99	26.6	14.74
205	83.16	6.14	0	0	0	124.64	0	0.03	25.54	26.12	13.54
208	81.22	9.68	0	0	0	124.51	0	0.03	25.77	26.33	8.39
211	80.9	8.97	0	0	0	124.09	0	0.03	26.33	26.89	9.02
214	79.01	4.03	0	0	0	124	0	0.03	25.78	26.32	19.62
217	80.03	6.05	0	0	0	123.81	0	0.03	25.41	25.93	13.24
220	79.17	3.97	0	0	0	123.66	0	0.03	25.84	26.37	19.96
223	74.05	6.62	0	0	0	123.54	0	0.03	25.37	25.9	11.19
226	71.42	6.33	0	0	0	123.28	0	0.03	26.26	26.79	11.28
229	71.31	3.51	0	0	0	123.18	0	0.03	25.57	26.07	20.3
232	74.33	3.65	0	0	0	123.05	0	0.03	25.82	26.31	20.39
235	76.8	10.97	0	0	0	122.91	0	0.03	26.09	26.58	7
238	74.89	10.59	0	0	0	122.45	0	0.03	26.11	26.62	7.07
241	74.7	2.85	0	0	0	122.33	0	0.03	26.06	26.58	26.2
244	73.25	3.08	0	0	0	122.22	0	0.03	25.93	26.43	23.77
247	76.55	4.86	0	0	0	122.12	0	0.03	25.75	26.27	15.75
250	77.06	7.88	0	0	0	121.92	0	0.03	25.83	26.36	9.77
253	76.28	7	0	0	0	121.68	0	0.03	25.7	26.24	10.89
256	73.88	8.16	0	0	0	121.49	0	0.03	25.79	26.35	9.06
259	73.69	4.52	0	0	0	121.22	0	0.03	26.11	26.67	16.3
262	72.96	3.6	0	0	0	121.2	0	0.03	25.79	26.34	20.26
265	75.92	8.22	0	0	0	120.97	0	0.03	25.83	26.39	9.24
268	76.91	6.89	0	0	0	120.75	0	0.03	25.95	26.52	11.16
271	74.93	4.22	0	0	0	120.57	0	0.03	25.63	26.2	17.74
274	73.34	3.53	0	0	0	120.48	0	0.03	25.87	26.45	20.8
277	75.03	8.31	0	0	0	120.31	0	0.03	25.73	26.31	9.03
280	76.35	9.77	0	0.01	0	120	0	0.03	25.9	26.49	7.81
283	78.2	7.12	0	0.01	0	119.76	0	0.03	26.19	26.79	10.98
286	76.21	6.54	0	0.01	0	119.57	0	0.03	26.19	26.79	11.65
289	72.65	4.15	0	0.01	0	119.38	0	0.03	25.74	26.32	17.52
292	72.73	1.31	0	0.03	0	119.31	0	0.03	25.8	26.39	55.6

295	77.21	6.43	0	0	0	119.24	0	0.03	25.81	26.39	12.01
298	77.08	11.63	0	0	0	118.93	0	0.03	25.91	26.5	6.62
301	75.91	6.73	0	0.01	0	118.62	0	0.03	25.69	26.28	11.29
304	73.61	1.65	0	0.03	0	118.53	0	0.03	25.53	26.12	44.71
307	77.24	7.27	0	0.01	0	118.44	0	0.03	26	26.6	10.63
310	80.37	7.2	0	0.01	0	118.13	0	0.03	26.01	26.63	11.16
313	80.9	6.22	0	0.01	0	118.02	0	0.03	25.91	26.54	13
316	79.28	8.05	0	0.01	0	117.74	0	0.03	25.87	26.5	9.85
319	78.29	6.7	0	0.01	0	117.56	0	0.03	25.69	26.31	11.68
322	79.94	6.18	0	0.01	0	117.33	0	0.03	26.44	27.09	12.94
325	81.95	3.85	0	0.02	0	117.19	0	0.03	25.75	26.39	21.28
328	82.15	10.81	0	0.01	0	117.04	0	0.03	25.71	26.36	7.6
331	83.11	10.79	0	0.01	0	116.6	0	0.03	25.91	26.57	7.7
334	79.79	3.47	0	0.01	0	116.44	0	0.03	25.84	26.5	22.96
337	81.45	2.7	0	0.02	0	116.34	0	0.03	26.19	26.86	30.15
340	81.74	6.61	0	0.01	0	116.24	0	0.03	25.71	26.39	12.37
343	83.62	9.31	0	0.01	0	115.95	0	0.03	26.36	27.05	8.98
346	76.43	6.29	0	0.01	0	115.73	0	0.03	25.22	25.87	12.15
349	77.47	7.69	0	0.01	0	115.55	0	0.03	25.78	26.45	10.08
352	80.6	5.97	0	0.01	0	115.28	0	0.03	25.91	26.58	13.5
355	80.37	7.29	0	0	0	115.17	0	0.03	25.56	26.22	11.03
358	80.98	8.68	0	0.01	0	114.84	0	0.03	25.65	26.32	9.33
361	78.24	5.95	0	0.01	0	114.68	0	0.03	25.23	25.88	13.16
364	82.91	8.2	0	0.01	0	114.46	0	0.03	26.13	26.82	10.11
367	82.89	5.89	0	0.01	0	114.22	0	0.03	25.66	26.34	14.08
370	86.61	2.63	0	0.01	0	114.11	0	0.03	25.89	26.57	32.98
373	84.45	6.52	0	0	0	114.01	0	0.03	25.7	26.38	12.96
376	84.25	9.9	0	0	0	113.72	0	0.03	26.13	26.84	8.51
379	85.23	7.52	0	0.01	0	113.46	0	0.03	26.37	27.08	11.33
382	83.83	4.97	0	0.01	0	113.27	0	0.03	25.36	26.04	16.88
385	85.44	7.87	0	0.01	0	113.12	0	0.03	26.1	26.8	10.85
388	80.79	11.27	0	0	0	112.8	0	0.03	25.11	25.79	7.17
391	80.7	6.82	0	0.01	0	112.5	0	0.03	25.93	26.62	11.83
394	79.83	2.91	0	0.02	0	112.39	0	0.03	25.35	26.03	27.44
397	85.16	4.78	0	0.01	0	112.28	0	0.03	26.18	26.88	17.82
400	79.76	7.51	0	0.01	0	112.09	0	0.03	25.12	25.79	10.63
403	79.96	7.49	0	0.01	0	111.85	0	0.03	25.86	26.55	10.68
406	76.41	10.36	0	0	0	111.63	0	0.03	25.14	25.8	7.37
409	81.19	6.63	0	0	0	111.27	0	0.03	25.9	26.58	12.24
412	78.78	2.26	0	0.01	0	111.23	0	0.03	25.73	26.4	34.92
415	75.76	9.1	0	0	0	111.06	0	0.03	25.36	26	8.33
418	74.83	8.83	0	0	0	110.73	0	0.03	26	26.66	8.47
421	75.01	4.36	0	0.01	0	110.56	0	0.03	25.83	26.46	17.2
424	76.88	5.15	0	0.01	0	110.43	0	0.03	26.02	26.65	14.92
427	75.15	4.52	0	0.01	0	110.26	0	0.03	25.77	26.39	16.61
430	72.27	8.25	0	0	0	110.13	0	0.03	25.96	26.57	8.76
433	71.28	8.85	0	0.01	0	109.79	0	0.03	25.99	26.6	8.05
436	73.27	6.99	0	0	0	109.62	0	0.03	25.64	26.24	10.49
439	75.6	6.19	0	0	0	109.36	0	0.03	25.78	26.37	12.21
442	75.26	3.63	0	0.01	0	109.26	0	0.03	25.75	26.35	20.74
445	70.28	8.73	0	0	0	109.09	0	0.03	25.27	25.85	8.05
448	72.42	8.87	0	0	0	108.77	0	0.03	25.66	26.25	8.16

451	72.49	1.08	0	0.02	0	108.61	0	0.03	25.16	25.74	66.96
454	74.93	5.35	0	0	0	108.62	0	0.03	25.72	26.33	14.01
457	73.07	12.55	0	0	0	108.27	0	0.03	25.84	26.44	5.82
460	69.82	7.04	0	0.01	0	107.96	0	0.03	25.76	26.36	9.92
463	68.11	2.68	0	0.02	0	107.84	0	0.03	25.5	26.07	25.45
466	72.57	5.35	0	0.01	0	107.75	0	0.03	26.08	26.67	13.55
469	73.15	5.81	0	0.01	0	107.53	0	0.03	26.09	26.68	12.6
472	70.83	6.43	0	0	0	107.4	0	0.03	25.8	26.39	11.02
475	68.54	8.87	0	0	0	107.14	0	0.03	26.05	26.64	7.72
478	69.69	3.54	0	0.01	0	106.92	0	0.03	25.71	26.29	19.67
481	71.33	3.43	0	0.01	0	106.89	0	0.03	25.79	26.37	20.81
484	72.33	8.3	0	0	0	106.67	0	0.03	25.66	26.24	8.72
487	71.27	9.82	0	0	0	106.42	0	0.03	26.34	26.94	7.25
490	70.27	6.25	0	0	0	106.13	0	0.03	26.42	27.02	11.25
493	69.07	0.19	-0.02	0.09	0	106.06	0	0.03	25.88	26.46	357.91
496	71.05	5.78	0	0	0	106.03	0	0.03	25.92	26.5	12.3
499	70.05	8.95	0	0	0	105.72	0	0.03	25.62	26.19	7.82
502	68.91	6.81	0	0	0	105.53	0	0.03	25.86	26.43	10.11
505	65.65	6.95	0	0	0	105.3	0	0.03	25.73	26.31	9.44
508	66.62	4.76	0	0	0	105.13	0	0.03	25.86	26.44	14.01
511	70.78	5.77	0	0	0	105	0	0.03	26.64	27.24	12.27
514	69.04	6.8	0	0	0	104.78	0	0.03	25.51	26.08	10.15
517	66.16	6.11	0	0	0	104.6	0	0.03	25.36	25.92	10.83
520	65.11	5.12	0	0	0	104.42	0	0.03	25.76	26.33	12.72
523	66.43	2.89	0	0	0	104.3	0	0.03	25.75	26.3	23.02
526	69.35	6.17	0	0	0	104.21	0	0.03	26.03	26.59	11.24
529	67.82	8.18	0	0	0	103.93	0	0.03	25.32	25.87	8.29
532	66.73	9.44	0	0	0	103.73	0	0.03	25.84	26.4	7.07
535	66.54	6.07	0	0	0	103.41	0	0.03	25.77	26.33	10.97
538	67.83	1.39	0	0.02	0	103.37	0	0.03	25.7	26.27	48.91
541	72.27	4.73	0	0	0	103.26	0	0.03	25.84	26.4	15.28
544	70.89	8.07	0	0	0	103.08	0	0.03	26.02	26.6	8.78
547	67.88	7.35	0	0	0	102.81	0	0.03	25.45	26.03	9.23
550	69.89	4.82	0	0	0	102.66	0	0.03	26.29	26.88	14.49
553	71.89	3.28	0	0	0	102.51	0	0.03	26.21	26.81	21.94
556	69.04	4.86	0	0.01	0	102.44	0	0.03	25.64	26.22	14.2
559	65.71	7.87	0	0	0	102.21	0	0.03	25.85	26.43	8.34
562	68.58	9.92	0	0	0	101.97	0	0.03	26.14	26.73	6.91
565	69.36	6.42	0	0	0	101.66	0	0.03	25.43	26.01	10.81
568	69.63	1.63	0	0.01	0	101.6	0	0.03	25.77	26.35	42.81
571	66.78	6.27	0	0	0	101.49	0	0.03	25.98	26.57	10.65
574	65.86	8.77	0	0	0	101.23	0	0.03	25.87	26.45	7.51
577	67.68	4.53	0	0	0	101.01	0	0.03	25.75	26.33	14.96
580	68.33	3.69	0	0	0	100.94	0	0.03	25.9	26.47	18.5
583	64.58	5.16	0	0.01	0	100.77	0	0.03	25.3	25.85	12.53
586	64.19	7.33	0	0.01	0	100.63	0	0.03	25.46	26.03	8.76
589	71.07	6.47	0	0.01	0	100.35	0	0.03	26.46	27.04	10.98
592	70.1	6.07	0	0	0	100.24	0	0.03	25.82	26.39	11.54
595	67.31	5.4	0	0	0	99.99	0	0.03	25.85	26.42	12.46
598	67.61	3.62	0	0.01	0	99.91	0	0.03	25.79	26.37	18.68
601	71	9.87	0	0	0	99.72	0	0.03	25.97	26.55	7.2
604	70.33	6.91	0	0	0	99.39	0	0.03	25.46	26.03	10.17

607	68.74	-0.66	0.01	-0.02	0	99.34	0	0.03	25.91	26.49	-104.81
610	66.57	7.08	0	0	0	99.32	0	0.03	25.41	25.97	9.4
613	70.49	9.88	0	0	0	98.94	0	0.03	25.47	26.03	7.14
616	69.41	3.61	0	0	0	98.79	0	0.03	24.86	25.41	19.23
619	72.8	7.23	0	0	0	98.67	0	0.03	25.92	26.51	10.07
622	69.07	3.75	0	0	0	98.4	0	0.03	25.67	26.26	18.44
625	70.76	5.58	0	0	0	98.4	0	0.03	25.8	26.39	12.68
628	70.47	11.03	0	0	0	98.04	0	0.03	25.47	26.06	6.39
631	72.43	3.56	0	0	0	97.83	0	0.03	25.71	26.31	20.34
634	72.42	1.34	0	0.02	0	97.79	0	0.03	26.6	27.22	54.19
637	70.12	10.5	0	0	0	97.67	0	0.03	25.92	26.52	6.68
640	69.6	7.79	0	0	0	97.25	0	0.03	25.57	26.17	8.93
643	74.2	-0.05	0.09	-0.42	0	97.24	0	0.03	26.01	26.62	0
646	71.41	6.93	0	0	0	97.15	0	0.03	25.51	26.11	10.31
649	72.03	10.89	0	0	0	96.84	0	0.03	26.07	26.68	6.62
652	69	6.94	0	0	0	96.55	0	0.03	25.92	26.52	9.94
655	69.49	1.72	0	0.01	0	96.44	0	0.03	25.31	25.91	40.4
658	72.31	4.4	0	0	0	96.39	0	0.03	25.71	26.31	16.42
661	71.9	7.65	0	0	0	96.16	0	0.03	25.7	26.3	9.39
664	69.19	7.55	0	0	0	95.96	0	0.03	25.69	26.29	9.17
667	68.38	7.16	0	0	0	95.72	0	0.03	25.86	26.46	9.55
670	72.34	0.97	0	0.01	0	95.57	0	0.03	25.93	26.54	74.4
673	70.73	3.52	0	0	0	95.6	0	0.03	25.54	26.13	20.07
676	69.43	11.83	0	0	0	95.31	0	0.03	25.28	25.88	5.87
679	69.13	9.36	0	0	0	94.97	0	0.03	25.92	26.52	7.38
682	70.62	1.6	0	0.01	0	94.79	0	0.03	25.65	26.24	44.23
685	73.44	3.95	0	0	0	94.8	0	0.03	26.21	26.82	18.61
688	72.19	7.77	0	0	0	94.54	0	0.03	25.42	26.01	9.29
691	69.97	6.06	0	0	0	94.37	0	0.03	25.8	26.4	11.55
694	68.14	7.29	0	0	0	94.16	0	0.03	25.77	26.36	9.34
697	70.35	4.8	0	0	0	93.96	0	0.03	26.79	27.4	14.66
700	69.83	1.42	0	0.01	0	93.88	0	0.03	25.69	26.26	49.32
703	70.03	6.91	0	0	0	93.81	0	0.03	25.68	26.25	10.14
706	68.49	9.13	0	0	0	93.49	0	0.03	25.93	26.51	7.5
709	65.25	3.23	0	0	0	93.32	0	0.03	25.59	26.15	20.18
712	66.24	4.75	0	0	0	93.24	0	0.03	25.27	25.83	13.94
715	70.16	7.2	0	0	0	93.03	0	0.03	26.3	26.89	9.75
718	70	4.5	0	0	0	92.84	0	0.03	25.83	26.4	15.57
721	67.63	8.57	0	0	0	92.72	0	0.03	25.66	26.23	7.89
724	66.02	5.89	0	0	0	92.38	0	0.03	25.63	26.2	11.21
727	68.59	0.59	-0.01	0	0	92.38	0	0.03	25.93	26.5	116.17
730	68.75	5.16	0	0	0	92.27	0	0.03	25.64	26.21	13.33
733	69.63	7.7	0	0	0	92.08	0	0.03	25.76	26.34	9.05
736	66.96	6.38	0	0	0	91.84	0	0.03	25.93	26.49	10.5
739	68.39	5.77	0	0	0	91.7	0	0.03	26.18	26.76	11.86
742	68.3	5.4	0	0	0	91.49	0	0.03	25.89	26.46	12.64
745	70.56	0.89	-0.01	0	0	91.39	0	0.03	25.83	26.4	79.22
748	68.37	7.22	0	0	0	91.36	0	0.03	25.5	26.06	9.47
751	66.37	11.23	0	0	0	90.98	0	0.03	26.09	26.65	5.91
754	64.79	3.68	0	0	0	90.77	0	0.03	25.91	26.46	17.6
757	66.84	3.01	0	0	0	90.71	0	0.03	25.31	25.85	22.24
760	68.08	4.32	0	0	0	90.57	0	0.03	25.64	26.18	15.76

763	66.17	6.43	0	0	0	90.45	0	0.03	25.87	26.43	10.3
766	65.57	6.77	0	0	0	90.2	0	0.03	25.87	26.42	9.68
769	66.22	4.84	0	0	0	90.06	0	0.03	25.42	25.97	13.67
772	69.76	0.97	0	0.01	0	89.92	0	0.03	25.57	26.13	71.66
775	69.27	2.75	0	0	0	89.95	0	0.03	25.39	25.94	25.21
778	68.46	13.24	0	0	0	89.7	0	0.03	26.26	26.83	5.17
781	65.48	8.74	0	0	0	89.27	0	0.03	25.83	26.39	7.49
784	67.18	0.88	-0.01	0	0	89.2	0	0.03	26.13	26.7	76.66
787	69.38	3.19	0	0	0	89.14	0	0.03	26.27	26.84	21.72
790	67.9	5.74	0	0	0	89	0	0.03	25.62	26.17	11.83
793	66.77	6.78	0	0	0	88.81	0	0.03	26.09	26.66	9.85
796	63.65	6.53	0	0	0	88.61	0	0.03	25.55	26.09	9.75
799	64.79	3.46	0	0	0	88.44	0	0.03	26.05	26.6	18.75
802	68.31	5.32	0	0	0	88.36	0	0.03	26.41	26.96	12.84
805	67.82	9.27	0	0	0	88.1	0	0.03	25.78	26.34	7.32
808	67.29	7.1	0	0	0	87.86	0	0.03	26.06	26.62	9.48
811	64.71	2.16	0	0.01	0	87.7	0	0.03	25.67	26.22	29.93
814	64.75	3.91	0	0	0	87.68	0	0.03	25.73	26.29	16.54
817	66.54	4.86	0	0	0	87.46	0	0.03	25.9	26.46	13.68
820	66.81	5.72	0	0	0	87.39	0	0.03	25.45	26	11.67
823	66.52	8.66	0	0	0	87.11	0	0.03	25.81	26.36	7.68
826	65.26	2.31	0	0	0	86.93	0	0.03	25.86	26.41	28.19
829	65.33	0.39	-0.01	0.05	0	86.94	0	0.03	26.12	26.68	167.09
832	67.39	7.31	0	0	0	86.84	0	0.03	25.95	26.5	9.22
835	69.22	8.2	0	0	0	86.54	0	0.03	25.95	26.51	8.44
838	69.41	6.73	0	0	0	86.37	0	0.03	26.32	26.89	10.31
841	66.15	6.39	0	0	0	86.13	0	0.03	25.84	26.4	10.36
844	64.01	5.45	0	0	0	85.99	0	0.03	25.3	25.84	11.75
847	67.01	1.61	0	0.03	0	85.82	0	0.03	25.9	26.46	41.65
850	68.69	2.55	0	0.01	0	85.86	0	0.03	25.6	26.15	26.96
853	68.72	9.89	0	0	0	85.62	0	0.03	25.78	26.33	6.95
856	68.67	10.78	0	0	0	85.32	0	0.03	25.75	26.31	6.37
859	68.12	3.07	0	0.01	0	85.04	0	0.03	26.06	26.64	22.16
862	68.95	0.67	-0.01	0	0	85.09	0	0.03	25.45	26.02	103.36
865	70.68	7.23	0	0	0	84.93	0	0.03	25.57	26.15	9.78
868	70.47	8.06	0	0	0	84.7	0	0.03	25.33	25.91	8.74
871	70.15	4.6	0	0	0	84.49	0	0.03	26.24	26.82	15.26
874	68.45	3.02	0	0.01	0	84.41	0	0.03	25.79	26.37	22.65
877	71.64	4.46	0	0.01	0	84.28	0	0.03	26.32	26.91	16.06
880	72.36	7.14	0	0	0	84.13	0	0.03	25.61	26.21	10.13
883	73.83	9.2	0	0	0	83.86	0	0.03	25.68	26.28	8.03
886	72.23	7.81	0	0	0	83.61	0	0.03	25.73	26.32	9.25
889	72.52	4.32	0	0	0	83.4	0	0.03	26.34	26.96	16.78
892	71.11	5.41	0	0	0	83.31	0	0.03	25.7	26.32	13.14
895	73.01	6.96	0	0	0	83.07	0	0.03	25.6	26.23	10.49
898	75.63	7.06	0	0	0	82.91	0	0.03	25.55	26.17	10.72
901	74.98	6.93	0	0	0	82.66	0	0.03	25.52	26.16	10.82
904	74.6	2.25	0	0.01	0	82.52	0	0.03	25.51	26.14	33.16
907	76.96	4.68	0	0	0	82.47	0	0.03	25.58	26.21	16.44
910	79.74	7.14	0	0	0	82.23	0	0.03	25.34	25.99	11.17
913	81.03	6.13	0	0.01	0	82.07	0	0.03	26.02	26.7	13.23
916	79.13	8.03	0	0	0	81.85	0	0.03	25.99	26.67	9.86

919	78.11	5.24	0	0	0	81.62	0	0.03	26.39	27.07	14.9
922	79.83	2.13	0	0	0	81.54	0	0.03	25.94	26.61	37.42
925	81.2	7.33	0	0	0	81.43	0	0.03	25.83	26.5	11.08
928	80.99	8.34	0	0	0	81.12	0	0.03	25.79	26.46	9.71
931	80.84	7.52	0	0	0	80.95	0	0.03	26.29	26.98	10.75
934	79.38	8.74	0	0	0	80.66	0	0.03	25.67	26.34	9.08
937	81.12	7.57	0	0	0	80.44	0	0.03	25.79	26.47	10.71
940	81.76	6.79	0	0	0	80.2	0	0.03	25.2	25.87	12.05
943	82.82	7.24	0	0	0	80.02	0	0.03	25.68	26.36	11.45
946	80.65	8.67	0	0	0	79.77	0	0.03	25.65	26.33	9.3
949	80.98	5.46	0	0	0	79.53	0	0.03	25.58	26.28	14.84
952	82.56	3.48	0	0	0	79.43	0	0.03	25.52	26.2	23.75
955	85.26	6.16	0	0	0	79.29	0	0.03	25.16	25.84	13.83
958	88.46	8.13	0	0	0	79.06	0	0.03	26.14	26.84	10.88
961	83.33	7.88	0	0	0	78.82	0	0.03	25.3	26	10.57
964	86.45	5.76	0	0	0	78.6	0	0.03	26.56	27.28	15
967	86.63	5.54	0	0	0	78.46	0	0.03	25.62	26.32	15.63
970	87.84	9.17	0	0	0	78.24	0	0.03	25.81	26.53	9.58
973	87.69	10.55	0	0	0	77.93	0	0.03	25.7	26.42	8.31
976	88.17	7.63	0	0	0	77.64	0	0.03	25.94	26.65	11.55
979	89.23	4.7	0	0	0	77.47	0	0.03	25.64	26.35	18.97
982	91.2	5.34	0	0	0	77.33	0	0.03	25.72	26.45	17.07
985	91.44	8.22	0	0	0	77.13	0	0.03	25.72	26.45	11.13
988	90.16	8.45	0	0	0	76.86	0	0.03	25.9	26.63	10.67
991	89.93	9.08	0	0	0	76.62	0	0.03	25.78	26.51	9.9
994	93.98	7.8	0	0	0	76.33	0	0.03	26.07	26.81	12.05
997	92.65	5.21	0	0	0	76.16	0	0.03	25.39	26.12	17.8
1000	93.68	6.53	0	0	0	75.99	0	0.03	25.64	26.38	14.35
1003	92.09	8.97	0	0	0	75.76	0	0.03	25.79	26.54	10.27
1006	93.83	9.12	0	0	0	75.47	0	0.03	25.51	26.26	10.29
1009	96.98	5.18	0	0	0	75.25	0	0.03	25.86	26.62	18.72
1012	96.98	2.82	0	0	0	75.14	0	0.03	25.59	26.34	34.36
1015	92.49	9.92	0	0	0	75.01	0	0.03	24.91	25.65	9.33
1018	95.54	12.04	0	0	0	74.58	0	0.03	25.53	26.29	7.94
1021	96.72	5.94	0	0	0	74.35	0	0.03	25.44	26.21	16.27
1024	98.59	6.45	0	0	0	74.18	0	0.03	25.69	26.46	15.29
1027	97.89	9.59	0	0	0	73.94	0	0.03	25.81	26.58	10.2
1030	96.29	11.7	0	0	0	73.61	0	0.03	25.61	26.39	8.23
1033	101.07	10.47	0	0	0	73.26	0	0.03	26.15	26.94	9.65
1036	100.88	5.63	0	0	0	73.01	0	0.03	25.5	26.27	17.92
1039	103.73	4.41	0	0	0	72.9	0	0.03	25.81	26.6	23.51
1042	100.63	9.99	0	0	0	72.7	0	0.03	25.62	26.4	10.07
1045	101.96	10.39	0	0	0	72.33	0	0.03	26.08	26.88	9.82
1048	102.36	6.27	0	0	0	72.11	0	0.03	25.91	26.7	16.31
1051	103.69	6.7	0	0	0	71.92	0	0.03	25.27	26.03	15.48
1054	105.44	9.49	0	0	0	71.69	0	0.03	25.85	26.64	11.11
1057	103.61	10.81	0	0	0	71.37	0	0.03	25.59	26.38	9.58
1060	105.01	6.73	0	0	0	71.08	0	0.03	25.65	26.45	15.59
1063	105.5	4.3	0	0	0	70.95	0	0.03	25.22	26.01	24.54
1066	109.43	8.7	0	0	0	70.77	0	0.03	25.9	26.72	12.58
1069	106.3	10.45	0	0	0	70.44	0	0.03	25.28	26.09	10.17
1072	109.03	10.27	0	0	0	70.16	0	0.03	26.18	27.02	10.62

1075	105.4	9.46	0	0	0	69.84	0	0.03	25.02	25.82	11.14
1078	114.67	8.31	0	0	0	69.59	0	0.03	26.24	27.09	13.8
1081	112.57	9.17	0	0	0	69.32	0	0.03	25.73	26.56	12.28
1084	112.98	11.59	0	0	0	69.03	0	0.03	26.02	26.86	9.75
1087	111.18	8.93	0	0	0	68.66	0	0.03	25.84	26.69	12.45
1090	114.88	6.95	0	0	0	68.49	0	0.03	25.86	26.71	16.52
1093	114.88	7.56	0	0	0	68.22	0	0.03	25.58	26.42	15.19
1096	114.35	7.15	0	0	0	68.04	0	0.03	25.94	26.79	15.99
1099	112.51	12.23	0	0	0	67.76	0	0.03	25.5	26.34	9.2
1102	114.36	10.94	0	0	0	67.35	0	0.03	25.44	26.29	10.45
1105	117.58	5.9	0	0	0	67.13	0	0.03	25.52	26.38	19.93
1108	121.15	7.46	0	0	0	66.95	0	0.03	26.09	26.96	16.23
1111	118.47	9.72	0	0	0	66.67	0	0.03	25.83	26.7	12.19
1114	115.29	10.98	0	0	0	66.38	0	0.03	25.36	26.23	10.5
1117	122.73	10.22	0	0	0	66.03	0	0.03	26	26.88	12.01
1120	120.11	6.54	0	0	0	65.78	0	0.03	25.23	26.08	18.36
1123	120.79	7.87	0	0	0	65.6	0	0.03	25.82	26.7	15.35
1126	117.83	12.41	0	0	0	65.29	0	0.03	25.64	26.52	9.49
1129	120.08	9.67	0	0	0	64.91	0	0.03	25.6	26.47	12.42
1132	122.26	5.76	0	0	0	64.72	0	0.03	25.45	26.32	21.21
1135	122.83	7.35	0	0	0	64.52	0	0.03	25.87	26.75	16.72
1138	119.8	14.68	0	0	0	64.24	0	0.03	25.47	26.34	8.16
1141	116.62	12.51	0	0	0	63.71	0	0.03	25.21	26.06	9.32
1144	120.93	5.83	0	0	0	63.52	0	0.03	25.8	26.67	20.73
1147	118.08	7.14	0	0	0	63.31	0	0.03	25.09	25.94	16.54
1150	120.88	7.39	0	0	0	63.1	0	0.03	25.79	26.64	16.35
1153	115.79	10.15	0	0	0	62.85	0	0.03	25.3	26.14	11.4
1156	115.33	10.81	0	0	0	62.51	0	0.03	25.65	26.49	10.66
1159	114.92	3.84	0	0	0	62.25	0	0.03	25.31	26.13	29.93
1162	117.29	5.1	0	0	0	62.21	0	0.03	25.56	26.38	23.01
1165	113.7	12.61	0	0	0	61.9	0	0.03	25.42	26.22	9.02
1168	110.64	9.91	0	0	0	61.53	0	0.03	25.29	26.08	11.16
1171	112.68	8.65	0	0	0	61.3	0	0.03	26.07	26.87	13.02
1174	110.3	7.36	0	0	0	61.01	0	0.03	25.18	25.94	14.98
1177	113.2	7.94	0	0	0	60.84	0	0.03	26.03	26.81	14.26
1180	110.28	10.71	0	0	0	60.52	0	0.03	25.75	26.51	10.3
1183	108.19	8.71	0	0	0	60.24	0	0.03	25.86	26.62	12.42
1186	103.5	4.48	0	0	0	60.01	0	0.03	25.34	26.06	23.11
1189	102.68	4.11	0	0	0	59.94	0	0.03	25.48	26.2	25
1192	107.99	9.22	0	0	0	59.72	0	0.03	26.17	26.9	11.71
1195	105.6	10.18	0	0	0	59.41	0	0.03	25.74	26.46	10.37
1198	102.32	9.21	0	0	0	59.13	0	0.03	25.47	26.17	11.11
1201	102.29	4.87	0	0	0	58.88	0	0.03	26.32	27.03	20.98
1204	101.28	3.54	0	0	0	58.82	0	0.03	26.02	26.71	28.65
1207	100.18	9.12	0	0	0	58.62	0	0.03	25.64	26.31	10.98
1210	102.05	8.63	0	0	0	58.31	0	0.03	25.84	26.5	11.82
1213	99.63	4.8	0	0	0	58.13	0	0.03	25.96	26.62	20.75
1216	93.08	4.48	0	0	0	58	0	0.03	25.01	25.66	20.79
1219	93.49	7.78	0	0	0	57.83	0	0.03	25.54	26.19	12.01
1222	95.29	9.32	0	0	0	57.54	0	0.03	25.48	26.11	10.22
1225	93.78	9.19	0	0	0	57.29	0	0.03	25.23	25.85	10.2
1228	94.56	7.27	0	0	0	57.01	0	0.03	25.93	26.55	13

1231	91.03	3.17	0	0	0	56.87	0	0.03	25.88	26.5	28.69
1234	87.19	4.11	0	0	0	56.78	0	0.03	25.64	26.24	21.24
1237	88.19	6.94	0	0	0	56.6	0	0.03	26.15	26.76	12.7
1240	89.15	7.6	0	0	0	56.38	0	0.03	25.89	26.47	11.73
1243	89.23	6.94	0	0	0	56.16	0	0.03	25.98	26.55	12.85
1246	85.55	5.72	0	0	0	55.97	0	0.03	25.47	26.02	14.95
1249	84.09	1.7	0	0	0	55.83	0	0.03	25.84	26.4	49.4
1252	83.4	4.97	0	0	0	55.81	0	0.03	26	26.55	16.77
1255	84.41	8.19	0	0	0	55.53	0	0.03	26.08	26.63	10.3
1258	84.75	6.04	0	0	0	55.36	0	0.03	25.93	26.47	14.03
1261	81.68	7.07	0	0	0	55.15	0	0.03	26.15	26.7	11.56
1264	78.88	3.87	0	0	0	54.97	0	0.03	26.13	26.67	20.4
1267	76.58	0.93	-0.01	0	0	54.92	0	0.03	26.05	26.58	82.28
1270	78.76	5.25	0	0	0	54.86	0	0.03	26.05	26.57	14.99
1273	76.93	7.76	0	0	0	54.61	0	0.03	25.79	26.3	9.92
1276	75.59	7.16	0	0	0	54.42	0	0.03	26.03	26.52	10.55
1279	70.98	4.02	0	0	0	54.21	0	0.03	25.62	26.11	17.67
1282	74.07	0.36	-0.01	0	0	54.18	0	0.03	26.33	26.82	203.11
1285	74.24	3.52	0	0	0	54.13	0	0.03	26.2	26.68	21.12
1288	71.49	8.22	0	0	0	53.95	0	0.03	25.62	26.09	8.7
1291	69.67	6.8	0	0	0	53.68	0	0.03	26.46	26.93	10.25
1294	65.2	4.83	0	0	0	53.56	0	0.03	25.51	25.95	13.51
1297	67.32	0.87	0	0	0	53.41	0	0.03	26.4	26.84	77.06
1300	69.45	-1.52	0	0	0	53.48	0	0.03	26.34	26.78	-45.66
1303	67.88	8.4	0	0	0	53.41	0	0.03	26.09	26.53	8.08
1306	64.3	8.33	0	0	0	53.05	0	0.03	25.68	26.1	7.72
1309	62.31	1.29	0	0.01	0	52.97	0	0.03	25.67	26.1	48.19
1312	62.25	2.46	0	0	0	52.92	0	0.03	25.56	25.98	25.33
1315	61.26	2.7	0	0	0	52.82	0	0.03	25.1	25.5	22.71
1318	61.1	4.57	0	0	0	52.75	0	0.03	25.84	26.24	13.36
1321	59.72	5.66	0	0	0	52.55	0	0.03	26.37	26.77	10.54
1324	57.36	0.89	0	0.01	0	52.44	0	0.03	25.81	26.19	64.33
1327	58.38	3.4	0	0	0	52.45	0	0.03	25.25	25.62	17.16
1330	62.22	4.83	0	0	0	52.24	0	0.03	26.33	26.71	12.89
1333	59.47	3.65	0	0	0	52.18	0	0.03	25.79	26.16	16.28
1336	54.82	4.51	0	0.01	0	52.01	0	0.03	25.7	26.07	12.17
1339	54.3	4.22	0	0	0	51.92	0	0.03	26.36	26.74	12.88
1342	54.89	0.48	-0.01	0	0	51.78	0	0.03	26.25	26.61	113.71
1345	58.1	2.15	0	0.01	0	51.85	0	0.03	26.51	26.87	27.07
1348	55.33	7.36	0	0.01	0	51.63	0	0.03	25.74	26.1	7.52
1351	54.68	3.16	0	0.01	0	51.48	0	0.03	25.96	26.33	17.33
1354	53.25	-0.05	0.11	-0.55	0	51.44	0	0.03	25.93	26.29	0
1357	53.96	1.04	0	0.01	0	51.45	0	0.03	25.61	25.97	51.8
1360	55.11	1.16	0	0.03	0	51.38	0	0.03	26.1	26.48	47.35
1363	53.65	5.73	0	0.01	0	51.35	0	0.03	26.03	26.4	9.36
1366	49.74	5.47	0	0	0	51.07	0	0.03	25.22	25.57	9.09
1369	48.18	-0.51	0.01	-0.03	0	51.06	0	0.03	25.8	26.15	-94.69
1372	47.67	1.83	0	0.02	0	51.04	0	0.03	26.15	26.48	26.01
1375	48.97	2	0	0.01	0	50.96	0	0.03	26	26.34	24.54
1378	49.59	6.19	0	0.01	0	50.9	0	0.03	25.77	26.1	8.01
1381	48.42	5.93	0	0.01	0	50.62	0	0.03	25.89	26.21	8.17
1384	45.72	-0.15	0.04	-0.23	0	50.59	0	0.03	26.27	26.6	-304.32

1387	41.97	-0.81	0	-0.03	0	50.59	0	0.03	25.59	25.9	-51.76
1390	42.49	1.52	0	0.02	0	50.61	0	0.03	25.76	26.07	28.03
1393	45.5	5.15	0	0.01	0	50.49	0	0.03	26.4	26.71	8.83
1396	45.53	2.85	0	0.02	0	50.34	0	0.03	26.02	26.32	16
1399	41.74	0.46	-0.01	0.11	0	50.32	0	0.03	24.81	25.1	90.92
1402	43.25	-0.14	0.03	-0.36	0	50.3	0	0.03	25.83	26.13	-301.17
1405	41.21	0.26	-0.02	0.18	0	50.32	0	0.03	26.07	26.37	161.41
1408	41.95	6.59	0	0.01	0	50.24	0	0.03	25.87	26.17	6.37
1411	42.8	5.5	0	0.01	0	49.98	0	0.03	26.14	26.46	7.78
1414	42.4	-0.32	0.01	-0.19	0	49.95	0	0.03	26.11	26.41	-131.59
1417	38.52	-0.46	0.01	-0.15	0	49.96	0	0.03	25.43	25.73	-83.18
1420	37.51	1.72	0	0.05	0	49.96	0	0.03	25.9	26.19	21.86
1423	36.21	3.18	0	0.02	0	49.86	0	0.03	25.48	25.76	11.38
1426	39.77	2.96	0	0.03	0	49.78	0	0.03	26.19	26.48	13.42
1429	37.82	0.62	-0.01	0.2	0	49.7	0	0.03	26.22	26.51	61.41
1432	37.12	1.23	0	0.09	0	49.72	0	0.03	26.37	26.64	30.29
1435	34.05	2.33	0	0.04	0	49.62	0	0.03	25.64	25.9	14.59
1438	35.58	0.45	-0.01	0.17	0	49.6	0	0.03	25.92	26.19	79.83
1441	37.8	2.46	0	0.03	0	49.57	0	0.03	25.87	26.14	15.36
1444	37.65	4.41	0	0.01	0	49.46	0	0.03	25.87	26.16	8.55
1447	35.27	3.22	0	0.03	0	49.33	0	0.03	26.21	26.49	10.94
1450	33.14	-0.43	0.01	-0.3	0	49.28	0	0.03	26	26.28	-77.84
1453	33.25	-1.96	0	-0.07	0	49.34	0	0.03	25.93	26.22	-16.98
1456	34.29	0.67	-0.01	0.23	0	49.36	0	0.03	26.24	26.52	51.22
1459	34.01	4.44	0	0.04	0	49.29	0	0.03	26.03	26.31	7.66
1462	31.62	2.72	0	0.06	0	49.14	0	0.03	26.06	26.33	11.61
1465	30.03	-1.37	0	-0.11	0	49.14	0	0.03	25.45	25.71	-21.94
1468	32.09	-0.64	0.01	-0.23	0	49.19	0	0.03	25.96	26.22	-50.45
1471	33.56	1.96	0	0.06	0	49.16	0	0.03	25.15	25.41	17.12
1474	31.31	2.79	0	0.05	0	49.08	0	0.03	25.72	25.99	11.23
1477	30.08	3.46	0	0.04	0	49	0	0.03	25.79	26.06	8.69
1480	31.13	2.38	0	0.06	0	48.89	0	0.03	25.51	25.77	13.08
1483	32.75	-1.03	0	-0.12	0	48.87	0	0.03	25.63	25.89	-31.89
1486	32.8	1.17	0	0.12	0	48.91	0	0.03	25.9	26.16	28.08
1489	29.53	3.32	0	0.04	0	48.8	0	0.03	25.85	26.13	8.88
1492	30.07	3.61	0	0.04	0	48.73	0	0.03	26.28	26.56	8.32
1495	30.27	2.82	0	0.04	0	48.6	0	0.03	25.68	25.95	10.73
1498	31.91	-4.01	0	-0.04	0	48.59	0	0.03	26.08	26.35	-7.96
1501	28.57	-0.08	0.05	-1.87	0	48.76	0	0.03	25.93	26.2	-353.92
1504	27.06	5.38	0	0.03	0	48.59	0	0.03	26.22	26.48	5.03
1507	28.01	1.85	0	0.08	0	48.5	0	0.03	26.24	26.5	15.13
1510	30.62	-1.74	0	-0.08	0	48.48	0	0.03	26.4	26.65	-17.62
1513	29.66	-2.06	0	-0.06	0	48.58	0	0.03	26.23	26.49	-14.4
1516	26.96	3.97	0	0.04	0	48.56	0	0.03	26.31	26.56	6.8
1519	26.21	4.43	0	0.03	0	48.38	0	0.03	25.72	25.97	5.91
1522	29.93	-0.4	0.01	-0.28	0	48.33	0	0.03	25.81	26.07	-75.72
1525	31.55	-0.41	0.01	-0.29	0	48.37	0	0.03	26.14	26.41	-77.48
1528	29.84	3.79	0	0.03	0	48.32	0	0.03	25.63	25.9	7.87
1531	28.34	5.27	0	0.02	0	48.17	0	0.03	26.41	26.7	5.38
1534	26.6	-0.51	0.01	-0.23	0	48.06	0	0.03	26.05	26.34	-52.57
1537	28.25	-2.86	0	-0.04	0	48.17	0	0.03	26.36	26.65	-9.89
1540	27.93	-0.24	0.02	-0.49	0	48.19	0	0.03	26.23	26.5	-117.53

1543	25.79	3.17	0	0.04	0	48.18	0	0.03	26.04	26.3	8.13
1546	24.14	3.4	0	0.04	0	48.03	0	0.03	26.14	26.4	7.09
1549	25.99	-0.97	0	-0.12	0	48.01	0	0.03	25.57	25.83	-26.83
1552	27.92	-0.47	0.01	-0.23	0	48.05	0	0.03	25.72	25.99	-59.86
1555	29.03	-0.53	0.01	-0.19	0	48.03	0	0.03	25.82	26.1	-54.74
1558	25.64	1.65	0	0.06	0	48.07	0	0.03	26.31	26.6	15.55
1561	24.76	4.36	0	0.02	0	47.94	0	0.03	26.24	26.53	5.68
1564	24.75	-2.14	0	-0.04	0	47.87	0	0.03	25.94	26.22	-11.59
1567	28.78	-3.42	0	-0.03	0	48.03	0	0.03	26.4	26.68	-8.42
1570	27.89	4.79	0	0.02	0	48.01	0	0.03	26.17	26.44	5.83
1573	26.76	5.32	0	0.02	0	47.79	0	0.03	26.12	26.4	5.03
1576	25.2	-0.51	0.01	-0.22	0	47.74	0	0.03	26.27	26.57	-49.12
1579	25.81	-1.3	0	-0.09	0	47.79	0	0.03	25.97	26.27	-19.92
1582	26.68	1.52	0	0.08	0	47.79	0	0.03	25.61	25.91	17.6
1585	27.78	0.61	-0.01	0.17	0	47.72	0	0.03	25.79	26.08	45.33
1588	26.28	2.91	0	0.03	0	47.73	0	0.03	26.03	26.32	9.04
1591	23.85	3.88	0	0.02	0	47.56	0	0.03	25.72	26.01	6.14
1594	22.84	-3.3	0	-0.03	0	47.55	0	0.03	26.28	26.58	-6.92
1597	22.54	-1.75	0	-0.07	0	47.7	0	0.03	25.79	26.06	-12.85
1600	23.09	4.9	0	0.03	0	47.62	0	0.03	25.82	26.09	4.71
1603	23.93	2.53	0	0.06	0	47.47	0	0.03	25.78	26.05	9.44
1606	22.41	-2.61	0	-0.07	0	47.49	0	0.03	25.65	25.91	-8.59
1609	20.22	-1.3	0	-0.13	0	47.58	0	0.03	25.77	26.03	-15.55
1612	19.62	2.66	0	0.07	0	47.55	0	0.03	26.52	26.77	7.38
1615	23.26	2.79	0	0.07	0	47.44	0	0.03	26.73	26.98	8.34
1618	23.24	3.27	0	0.05	0	47.38	0	0.03	25.82	26.08	7.1
1621	23.4	0.36	-0.01	0.47	0	47.27	0	0.03	25.76	26.01	64.47
1624	20.11	-1.83	0	-0.1	0	47.36	0	0.03	26.39	26.65	-10.97
1627	19.74	-0.19	0.02	-0.88	0	47.35	0	0.03	26.04	26.29	-105.25
1630	20.65	2.46	0	0.07	0	47.36	0	0.03	26.08	26.34	8.38
1633	23.06	4.86	0	0.03	0	47.21	0	0.03	26.09	26.34	4.74
1636	21.79	2.68	0	0.06	0	47.1	0	0.03	25.95	26.19	8.14
1639	19.68	-1.07	0	-0.15	0	47.06	0	0.03	25.6	25.85	-18.34
1642	18.89	-3.37	0	-0.05	0	47.15	0	0.03	26.37	26.63	-5.6
1645	21.47	0.11	-0.05	1.4	0	47.22	0	0.03	25.54	25.78	195.55
1648	22.32	4.39	0	0.04	0	47.14	0	0.03	26.15	26.4	5.09
1651	22.17	0.01	-0.37	16.39	0	47	0	0.03	25.73	25.97	2217.47
1654	19.04	0.01	-0.58	17.65	0	47	0	0.03	25.64	25.89	1904.13

Office Chair**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	10.00
Peak Heat Release Rate (kW/m ²):	207.46
Time to Peak Heat Release Rate (s):	182.00
Total Heat Release (MJ/m ²):	177.47
60 s Average Heat Release Rate (kW/m ²):	155.55
Total Mass Loss (g):	96.51
Average Mass Loss Rate (g/s):	0.068
Average Effective Heat of Combustion (MJ/kg):	18.39
Average Smoke Extinction Area (m ² /kg):	234.75
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0074

Specimen:

Initial mass (g):	139.8
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	96
Time to ignition (s):	10
Time to flameout (s):	1424

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	2.44	0.01	-0.35	-0.03	0	139.67	0	0.03	25.83	26.06	243.96
5	9.59	0.01	-0.48	-0.04	0	139.62	0	0.03	25.88	26.1	958.53
8	30.18	0.17	-0.03	0	1901.53	139.68	0.13	0.03	25.55	25.76	176.11
11	68.6	2.07	0	0.01	744.12	139.59	0.6	0.03	25.35	25.59	33.14
14	115.59	4.06	0	0.02	1014.92	139.55	1.61	0.03	25.26	25.67	28.46
17	132.12	9.9	0	0.02	455.86	139.33	1.77	0.03	24.9	25.54	13.35
20	139.63	8.36	0	0.03	673.39	139.01	2.19	0.03	24.95	25.73	16.71
23	142.39	9.48	0	0.03	577.67	138.81	2.07	0.03	25.54	26.46	15.03
26	140.03	8.42	0	0.03	603.12	138.46	1.92	0.03	25.45	26.48	16.63
29	140.22	2.38	0	0.08	2140.92	138.34	1.93	0.03	25.29	26.35	59
32	144.91	9.86	0	0.02	452.44	138.22	1.72	0.03	24.9	25.95	14.7
35	148.85	11.81	0	0.02	408.72	137.78	1.83	0.03	25.23	26.34	12.6
38	155.43	7.43	0	0.03	709.32	137.56	2.01	0.03	25.06	26.21	20.93
41	165.07	5.19	0	0.04	1021.52	137.32	2.02	0.03	25.11	26.28	31.8
44	176.8	6.73	0	0.04	830.23	137.22	2.08	0.03	25.63	26.87	26.25
47	180.17	12.37	0	0.02	452.16	136.89	2.09	0.03	25.56	26.81	14.56
50	188.49	10.19	0	0.03	592.6	136.53	2.24	0.03	25.64	26.92	18.5
53	194.47	10.25	0	0.03	769.91	136.27	2.94	0.03	25.53	26.81	18.98
56	198.83	9.79	0	0.04	676.98	135.92	2.51	0.03	25.06	26.37	20.32
59	205.36	6.85	0	0.06	986.79	135.7	2.52	0.03	25.49	26.87	29.99
62	204.69	9.39	0	0.04	680.74	135.47	2.39	0.03	25.31	26.69	21.81
65	203.2	11.46	0	0.03	635.58	135.13	2.73	0.03	25.3	26.68	17.73
68	191.42	12.08	0	0.03	494.69	134.8	2.28	0.03	24.83	26.21	15.85
71	189.48	7.11	0	0.05	986.2	134.45	2.62	0.03	25.36	26.75	26.66
74	185.98	5.32	0	0.06	1104.75	134.34	2.21	0.03	25.24	26.57	34.96
77	191.35	14.04	0	0.03	453.02	134.05	2.35	0.03	25.71	27.02	13.63
80	191.48	14.37	0	0.03	309.32	133.56	1.66	0.03	25.47	26.74	13.32
83	198.07	6.14	0	0.06	990.8	133.26	2.29	0.03	25.34	26.59	32.28
86	204.4	4.7	0	0.09	1258.37	133.14	2.23	0.03	25.28	26.53	43.48
89	204.78	12.61	0	0.04	379.03	132.9	1.82	0.03	25	26.23	16.23
92	201.03	14.2	0	0.03	479.18	132.43	2.58	0.03	25.13	26.36	14.16
95	203.37	10.09	0	0.04	549.26	132.1	2.05	0.03	25.78	27.06	20.15
98	204.73	10.86	0	0.04	670.25	131.8	2.7	0.03	25.69	26.93	18.86
101	202.89	9.26	0	0.05	811.4	131.46	2.85	0.03	25.18	26.39	21.92
104	202.2	7.06	0	0.06	954.52	131.24	2.54	0.03	25.36	26.57	28.64
107	199.42	14.44	0	0.03	469.69	130.97	2.53	0.03	25.55	26.76	13.81
110	189.64	12.15	0	0.04	373.8	130.44	1.75	0.02	24.81	25.98	15.61
113	189.89	7.65	0	0.05	729.27	130.26	2.13	0.03	24.99	26.15	24.83
116	194.39	9.1	0	0.04	528.15	129.94	1.78	0.03	25.84	27.03	21.35
119	181.26	7.8	0	0.04	633.58	129.73	1.89	0.03	25.05	26.17	23.24
122	187.35	14.76	0	0.02	349.07	129.42	1.92	0.03	25.77	26.9	12.69
125	183.23	10.21	0	0.03	494.13	128.92	1.91	0.03	25.34	26.42	17.95
128	181.31	3.32	0	0.09	1300.78	128.82	1.64	0.03	25.27	26.36	54.58
131	179.98	13.3	0	0.02	398.19	128.61	1.98	0.03	25.7	26.77	13.53
134	169.6	13.42	0	0.02	397.57	128.09	2.02	0.03	25.38	26.43	12.64
137	174.49	7.09	0	0.04	517.54	127.85	1.36	0.03	25.98	27.01	24.61

140	175.37	6.29	0	0.05	753.92	127.63	1.76	0.03	25.92	26.93	27.89
143	173.44	4.04	0	0.08	1342.3	127.48	2.01	0.03	25.98	26.96	42.95
146	165.7	8.91	0	0.03	519.7	127.33	1.76	0.03	25.3	26.25	18.59
149	174.73	13.15	0	0.02	305.14	126.95	1.49	0.03	25.97	26.91	13.29
152	175.06	7.98	0	0.03	637.82	126.61	1.93	0.03	25.42	26.36	21.94
155	175.6	6.98	0	0.04	772.32	126.44	2.03	0.03	25.57	26.52	25.16
158	174.84	8.84	0	0.03	579.26	126.17	1.93	0.03	25.65	26.59	19.79
161	176.92	8.53	0	0.03	579.65	125.92	1.82	0.03	26.21	27.18	20.75
164	173.85	11.07	0	0.02	378.06	125.65	1.61	0.03	25.1	26.03	15.7
167	180.01	7.84	0	0.03	984.65	125.3	2.92	0.03	25.5	26.45	22.97
170	183.83	2.93	0	0.08	1453.35	125.18	1.61	0.03	25.47	26.43	62.73
173	188.21	12.03	0	0.02	503.55	125.03	2.29	0.03	25.49	26.43	15.64
176	194.06	13.33	0	0.02	308.1	124.51	1.54	0.03	25.61	26.61	14.56
179	202.88	4.8	0	0.05	1087.45	124.3	1.96	0.03	25.66	26.67	42.31
182	207.46	6.71	0	0.04	873.75	124.15	2.19	0.03	25.74	26.78	30.92
185	199.11	10.97	0	0.03	561.85	123.88	2.3	0.03	25.71	26.8	18.15
188	182.22	11.12	0	0.02	356.98	123.53	1.5	0.03	25.43	26.51	16.39
191	180.82	7.79	0	0.03	548.28	123.24	1.59	0.03	25.81	26.88	23.22
194	176.86	4.17	0	0.04	990.96	123.06	1.55	0.03	25.73	26.75	42.4
197	171.07	6.39	0	0.03	820.97	122.94	1.95	0.03	25.85	26.86	26.78
200	166.97	10.9	0	0.01	275.46	122.66	1.13	0.03	25.49	26.47	15.32
203	178.38	11.85	0	0.01	264.05	122.32	1.16	0.03	26.07	27.02	15.06
206	178.41	5.66	0	0.02	657.32	122	1.4	0.03	25.68	26.63	31.51
209	176.01	3.41	0	0.03	894.29	121.95	1.14	0.03	25.79	26.76	51.54
212	176.49	11.86	0	0.01	222.07	121.72	1	0.03	25.51	26.44	14.89
215	178.59	12.74	0	0.01	220.73	121.29	1.06	0.03	25.68	26.65	14.02
218	186.27	4.91	0	0.02	545.47	121.02	0.98	0.03	26.25	27.24	37.93
221	179.51	6.74	0	0.01	460.75	120.93	1.18	0.03	25.42	26.41	26.62
224	178.71	11.48	0	0.01	265.45	120.59	1.15	0.03	25.49	26.5	15.57
227	177.26	10.97	0	0.01	251.39	120.28	1.04	0.03	25.61	26.63	16.16
230	179.4	10.53	0	0.01	223	119.94	0.88	0.03	25.82	26.84	17.03
233	173.03	5.38	0	0.01	410.24	119.68	0.84	0.02	25.24	26.24	32.16
236	174.12	6.74	0	0.01	272.66	119.57	0.68	0.03	26.16	27.2	25.83
239	169.53	11.16	0	0	162.04	119.25	0.67	0.03	26.02	27.06	15.19
242	169.26	7.06	0	0.01	401.09	118.96	1.07	0.03	25.56	26.55	23.96
245	178.07	5.85	0	0.01	338.8	118.81	0.74	0.03	25.93	26.95	30.44
248	176.84	9.86	0	0	241.25	118.57	0.9	0.03	25.48	26.49	17.93
251	173.7	8.19	0	0.01	304.91	118.25	0.95	0.02	25.27	26.27	21.21
254	171.74	9.17	0	0	178.54	118.06	0.63	0.02	25.11	26.12	18.74
257	180.32	9.62	0	0	221.68	117.71	0.8	0.03	25.62	26.66	18.75
260	170.55	4.71	0	0.01	289.32	117.52	0.53	0.02	24.69	25.72	36.24
263	170.25	9.01	0	0	242.28	117.36	0.82	0.03	25.54	26.6	18.89
266	170.91	9.92	0	0	206.94	117	0.76	0.03	25.86	26.91	17.24
269	163.31	9.52	0	0	202.55	116.78	0.74	0.02	25.14	26.18	17.16
272	168	6.29	0	0	224.99	116.45	0.53	0.03	25.52	26.54	26.72
275	170.43	7.03	0	0	188.58	116.37	0.5	0.03	25.63	26.64	24.26
278	172.51	12.16	0	0	122.22	115.99	0.55	0.03	26.18	27.24	14.18
281	162.88	9.68	0	0	126.35	115.7	0.47	0.02	24.94	25.95	16.83
284	175.07	7.71	0	0	189.15	115.41	0.53	0.03	26.58	27.63	22.69
287	163.77	7.44	0	0	203.57	115.22	0.58	0.02	25.34	26.35	22
290	166.21	11.28	0	0	98.42	114.94	0.41	0.03	25.82	26.85	14.74
293	165.85	9.48	0	0	159.81	114.58	0.58	0.02	25.35	26.33	17.49

296	166.83	10.47	0	0	154.47	114.36	0.6	0.03	26.02	27.03	15.93
299	160.2	8.15	0	0	143.01	113.97	0.44	0.03	25.6	26.61	19.66
302	165.13	5.66	0	0	297.21	113.86	0.63	0.03	25.72	26.7	29.19
305	174.51	11.58	0	0	121.03	113.58	0.51	0.03	26.5	27.52	15.07
308	169.52	9.81	0	0	116.63	113.22	0.43	0.03	25.86	26.86	17.28
311	167.11	6.71	0	0	202.21	113	0.5	0.03	26.08	27.11	24.91
314	164.87	5.58	0	0	195.47	112.8	0.41	0.02	25.45	26.43	29.53
317	169.7	13.86	0	0	92.1	112.6	0.48	0.03	25.59	26.58	12.24
320	166.93	10.02	0	0	95.37	112.05	0.36	0.02	25.26	26.25	16.66
323	170.35	6.29	0	0	199.05	112.01	0.46	0.03	26.06	27.07	27.09
326	166.9	9.54	0	0	88.56	111.62	0.32	0.03	25.8	26.81	17.49
329	166.88	9.13	0	0	94.67	111.45	0.32	0.03	25.79	26.78	18.29
332	165.56	13.38	0	0	102.6	111.05	0.5	0.03	26.37	27.39	12.37
335	156.9	6.1	0	0	209.23	110.73	0.48	0.03	25.79	26.79	25.73
338	156.17	2.58	0	0	331.12	110.66	0.32	0.03	25.71	26.68	60.63
341	155.58	10.43	0	0	129.34	110.49	0.51	0.03	25.54	26.49	14.92
344	146.64	10.04	0	0	117.12	110.09	0.45	0.02	25.2	26.12	14.6
347	149.5	7.86	0	0	139.61	109.91	0.41	0.03	26.09	27.04	19.01
350	150.39	9.69	0	0	134.03	109.59	0.48	0.03	25.93	26.85	15.52
353	147.86	11.74	0	0	48.14	109.33	0.21	0.03	25.58	26.49	12.6
356	145.96	6.4	0	0	122.84	108.94	0.29	0.03	25.88	26.78	22.79
359	145.84	0.63	-0.01	0	1189.67	108.94	0.28	0.03	25.82	26.71	230.3
362	150.97	11.2	0	0	81.43	108.79	0.34	0.03	26.21	27.1	13.48
365	145.2	11.37	0	0	71.82	108.34	0.31	0.03	25.72	26.6	12.77
368	142.05	5.71	0	0	127.9	108.15	0.28	0.03	25.56	26.42	24.87
371	146.84	5.62	0	0	176.67	107.95	0.37	0.03	25.92	26.79	26.15
374	146.07	10.51	0	0	65.88	107.77	0.26	0.02	25.41	26.27	13.89
377	147.18	14.67	0	0	28.37	107.33	0.16	0.03	25.95	26.82	10.04
380	144.54	6.79	0	0	105.08	106.98	0.27	0.03	25.77	26.65	21.29
383	144.97	5.08	0	0	96.21	106.89	0.19	0.02	25.43	26.29	28.54
386	146.45	7.13	0	0	74.94	106.64	0.2	0.03	25.66	26.53	20.54
389	146.83	8.05	0	0	84.17	106.46	0.25	0.03	25.74	26.6	18.24
392	148.25	9.38	0	0	57.12	106.16	0.2	0.03	25.89	26.78	15.81
395	151.1	5.33	0	0	93.59	105.93	0.19	0.03	25.79	26.69	28.34
398	149.48	13.28	0	0	33.4	105.76	0.17	0.02	25.42	26.3	11.25
401	149.02	10.58	0	0	27.29	105.21	0.11	0.02	25.32	26.21	14.08
404	152.26	4.39	0	0	111.56	105.15	0.18	0.03	25.73	26.65	34.66
407	154.56	10.37	0	0	72.77	104.86	0.28	0.03	25.79	26.71	14.91
410	154.54	11.19	0	0	85.65	104.56	0.36	0.03	25.58	26.48	13.81
413	149.85	8.57	0	0	90.15	104.22	0.29	0.03	25.55	26.46	17.49
416	148.88	5.86	0	0	131.03	104.05	0.29	0.03	25.79	26.75	25.42
419	151.51	8.14	0	0	100.51	103.83	0.31	0.02	25.46	26.37	18.61
422	154.01	11.88	0	0	38.09	103.55	0.17	0.03	25.77	26.69	12.96
425	149.61	7.24	0	0	16.75	103.17	0.05	0.02	25.25	26.19	20.67
428	150.13	9.23	0	0	7.78	103.07	0.03	0.02	25.46	26.39	16.26
431	153.31	11.46	0	0	18.54	102.62	0.08	0.03	26.02	26.97	13.38
434	149.89	9.65	0	0	43.55	102.42	0.16	0.03	25.79	26.72	15.53
437	148.37	7.63	0	0	83.61	102.04	0.24	0.03	25.87	26.78	19.45
440	145.58	7.78	0	0	104.88	101.94	0.31	0.03	25.66	26.58	18.72
443	144.88	12.78	0	0	21.93	101.54	0.11	0.03	25.71	26.61	11.34
446	143.92	8.2	0	0	105.73	101.24	0.33	0.03	25.64	26.54	17.55
449	145.23	3.09	0	0	187.35	101.05	0.21	0.03	26.19	27.1	47.05

452	142.46	8.22	0	0	25.35	100.98	0.08	0.03	25.99	26.89	17.34
455	142.26	14.24	0	0	19.48	100.55	0.1	0.03	25.97	26.84	9.99
458	137.65	8.66	0	0	79.73	100.21	0.26	0.03	25.68	26.53	15.9
461	142.12	5.53	0	0	75.97	100.02	0.16	0.03	26.13	26.99	25.71
464	142.9	7.62	0	0	57.67	99.83	0.17	0.03	25.73	26.57	18.76
467	144.16	12.62	0	0	15.7	99.55	0.08	0.03	25.55	26.39	11.42
470	144.5	9.02	0	0	22.25	99.14	0.08	0.03	25.54	26.37	16.02
473	143.7	2.67	0	0	62.17	99.02	0.06	0.03	25.79	26.64	53.78
476	148.07	9.59	0	0	29.41	98.88	0.1	0.03	26.27	27.15	15.43
479	146.23	15.62	0	0	29.37	98.45	0.17	0.03	25.86	26.71	9.36
482	140	5.56	0	0	90.35	98.06	0.19	0.02	24.99	25.82	25.16
485	143.62	5.94	0	0	117.77	98.05	0.26	0.03	25.77	26.64	24.18
488	146.13	10.4	0	0	53.21	97.67	0.21	0.03	25.95	26.82	14.05
491	150.26	9.94	0	0	57.6	97.46	0.21	0.03	25.87	26.72	15.11
494	147.86	7.21	0	0	104.55	97.09	0.28	0.03	25.78	26.65	20.5
497	147.57	8.61	0	0	42.36	97	0.14	0.03	25.75	26.63	17.15
500	148.09	11.53	0	0	37.62	96.56	0.16	0.02	25.42	26.32	12.85
503	151.01	11.83	0	0	22.92	96.33	0.1	0.03	25.89	26.77	12.77
506	152.03	7.49	0	0	73.92	95.89	0.21	0.03	26.08	26.98	20.31
509	154.54	5.7	0	0	132.99	95.86	0.28	0.03	25.83	26.73	27.12
512	151.4	11.31	0	0	64.34	95.49	0.27	0.03	25.57	26.49	13.38
515	150.07	10.71	0	0	61.77	95.22	0.25	0.03	25.65	26.57	14.01
518	151.15	6.46	0	0	166.59	94.88	0.4	0.03	25.92	26.85	23.41
521	157.27	9.41	0	0	80.8	94.79	0.28	0.03	26.23	27.19	16.7
524	161.49	11.77	0	0	76.91	94.31	0.34	0.03	25.97	26.91	13.72
527	155.85	9.55	0	0	47.06	94.11	0.17	0.03	25.72	26.68	16.33
530	149.9	7.98	0	0	53.81	93.74	0.16	0.03	25.7	26.67	18.78
533	155.35	7.52	0	0	94.68	93.62	0.26	0.03	26.38	27.35	20.66
536	156.27	11.48	0	0	44.14	93.26	0.19	0.03	26.29	27.23	13.61
539	151.75	9.74	0	0	77.32	92.97	0.29	0.02	25.15	26.07	15.59
542	159.25	9.67	0	0	95.23	92.67	0.35	0.02	25.36	26.3	16.47
545	156.72	8.08	0	0	76.38	92.4	0.24	0.02	25.2	26.15	19.4
548	156.01	11.93	0	0	59.91	92.15	0.27	0.03	25.69	26.66	13.08
551	162.51	11.85	0	0	106.2	91.71	0.47	0.03	25.86	26.81	13.72
554	167.61	4.43	0	0	261.12	91.48	0.44	0.02	25.55	26.51	37.8
557	166.86	8.84	0	0	126.81	91.36	0.42	0.03	25.66	26.68	18.88
560	164.5	13.78	0	0	84.63	90.94	0.44	0.03	25.74	26.78	11.94
563	163.49	12.06	0	0	110.02	90.59	0.5	0.03	25.68	26.71	13.56
566	162.12	7.35	0	0	165.71	90.24	0.46	0.02	25.25	26.28	22.04
569	166.14	10.92	0	0	117.8	90.09	0.47	0.03	26.07	27.13	15.22
572	162.04	11.61	0	0	94.93	89.61	0.41	0.03	26.03	27.07	13.95
575	163.41	8.5	0	0	174.61	89.42	0.55	0.03	26.13	27.15	19.22
578	169.72	9.13	0	0	178.67	89.07	0.61	0.03	25.83	26.84	18.59
581	166.52	11.68	0	0	141.15	88.86	0.62	0.02	25.43	26.43	14.25
584	159.93	12.25	0	0	87.18	88.38	0.41	0.02	24.83	25.83	13.06
587	162.15	8.56	0	0	139.62	88.15	0.45	0.02	25.63	26.66	18.95
590	159.86	9.3	0	0	98.71	87.84	0.35	0.02	25.48	26.5	17.18
593	165.91	13.47	0	0	103.02	87.57	0.52	0.02	25.62	26.62	12.32
596	166.88	10.06	0	0	141.75	87.08	0.55	0.02	25	25.99	16.59
599	169.19	7.45	0	0	159.22	86.96	0.45	0.02	25.19	26.2	22.71
602	172.52	12.64	0	0	71.55	86.58	0.33	0.03	26.01	27.09	13.64
605	170.93	11.88	0	0	104.52	86.24	0.45	0.03	26.24	27.32	14.39

608	167.82	8.19	0	0	161.52	85.89	0.5	0.02	25.56	26.59	20.5
611	174.49	7.13	0	0	152.96	85.73	0.41	0.02	25.54	26.58	24.48
614	174.47	16.9	0	0	95.29	85.39	0.6	0.02	25.68	26.73	10.32
617	168.74	14.13	0	0	78.87	84.8	0.42	0.02	25.31	26.36	11.94
620	178.1	5.17	0	0	328.19	84.59	0.63	0.02	25.79	26.84	34.44
623	178.89	11.3	0	0	111.24	84.39	0.47	0.02	25.58	26.61	15.83
626	188.02	14.15	0	0	90.52	83.93	0.47	0.03	26.36	27.46	13.29
629	174.6	8.36	0	0	175.55	83.6	0.57	0.02	24.57	25.62	20.88
632	184.54	8.19	0	0	191.55	83.39	0.58	0.03	26.02	27.16	22.54
635	181.22	13.83	0	0	95.58	83.06	0.49	0.02	25.8	26.92	13.1
638	174.68	17.24	0	0	81.54	82.58	0.53	0.02	25.33	26.45	10.13
641	180.81	8.68	0	0	189.13	82.12	0.61	0.02	25.61	26.72	20.83
644	181.87	6.16	0	0	260.22	82.02	0.61	0.02	25.11	26.19	29.54
647	181.13	13.6	0	0	90.59	81.67	0.46	0.02	25.56	26.69	13.32
650	177.23	17.41	0	0	73.22	81.23	0.47	0.02	25.86	27.01	10.18
653	177.95	8.66	0	0	162.03	80.72	0.53	0.02	25.53	26.62	20.54
656	184.65	9.78	0	0	168.71	80.64	0.62	0.02	25.69	26.79	18.89
659	180.17	14.53	0	0	102.05	80.1	0.56	0.02	25.43	26.54	12.4
662	178.75	10.23	0	0	119.02	79.83	0.46	0.02	25.21	26.3	17.48
665	183.42	13.58	0	0	87.26	79.44	0.45	0.02	25.38	26.48	13.51
668	183.41	13.64	0	0	92.51	79.04	0.48	0.02	25.38	26.47	13.45
671	186.97	8.77	0	0	174.1	78.66	0.56	0.03	26.37	27.5	21.33
674	186.51	9.05	0	0	167.65	78.47	0.56	0.02	25.98	27.09	20.62
677	186.02	14.32	0	0	104.76	78.08	0.57	0.02	25.4	26.5	12.99
680	185.9	16.01	0	0	96.53	77.64	0.58	0.02	25.51	26.61	11.61
683	187.76	10.75	0	0	92.4	77.17	0.36	0.03	26.13	27.28	17.46
686	190.06	8.8	0	0	148.55	76.97	0.48	0.02	25.98	27.11	21.6
689	188.91	11.91	0	0	141.11	76.6	0.62	0.02	25.82	26.95	15.86
692	190.6	15.95	0	0	81.48	76.25	0.48	0.02	25.87	27	11.95
695	196.84	15.71	0	0	81.97	75.68	0.47	0.03	26.13	27.27	12.53
698	197.11	8.87	0	0	173.25	75.36	0.57	0.02	25.81	26.95	22.23
701	191.97	9.34	0	0	169.07	75.09	0.59	0.02	25.51	26.66	20.55
704	198.05	13.42	0	0	74.05	74.76	0.37	0.02	25.79	26.96	14.76
707	203.3	15.74	0	0	86.6	74.3	0.51	0.02	25.74	26.9	12.91
710	197	10.72	0	0	120.65	73.87	0.49	0.02	25.31	26.51	18.38
713	193.68	14.03	0	0	104.88	73.61	0.55	0.02	25.68	26.89	13.81
716	195	12.75	0	0	107.42	73.06	0.52	0.02	25.35	26.52	15.29
719	201.94	9.33	0	0	160.12	72.85	0.54	0.03	26.37	27.59	21.63
722	193.3	19.6	0	0	78.58	72.41	0.57	0.02	25.8	26.98	9.86
725	193.07	16.52	0	0	99.48	71.77	0.62	0.02	25.38	26.54	11.69
728	203.8	8.37	0	0	171.49	71.46	0.53	0.02	25.93	27.08	24.35
731	202.57	9.76	0	0	196.39	71.19	0.71	0.02	25.84	27.03	20.76
734	203.2	16.62	0	0	86.69	70.83	0.53	0.02	26.14	27.36	12.22
737	196.45	12.63	0	0	103.11	70.27	0.49	0.02	25.26	26.44	15.55
740	206.14	7.97	0	0	192.64	70.08	0.56	0.03	26.32	27.56	25.88
743	198.92	16.59	0	0	87.15	69.71	0.55	0.02	25.26	26.4	11.99
746	200.55	13.74	0	0	94.83	69.16	0.48	0.02	25.92	27.13	14.6
749	195.47	8.44	0	0	166.31	68.9	0.53	0.02	25.46	26.64	23.17
752	198.6	16.45	0	0	79.84	68.56	0.48	0.02	25.98	27.16	12.07
755	194.73	14.6	0	0	124.39	67.98	0.68	0.02	25.45	26.6	13.34
758	196.58	10.31	0	0	140	67.71	0.54	0.02	25.5	26.67	19.07
761	198.54	11.33	0	0	181.24	67.32	0.77	0.02	25.63	26.79	17.53

764	201.84	17.01	0	0	90.99	66.99	0.57	0.02	26	27.16	11.86
767	199.47	15.42	0	0	87.59	66.35	0.51	0.02	25.25	26.39	12.94
770	193.75	6.77	0	0	142.55	66.11	0.37	0.02	25.19	26.35	28.61
773	189.38	16.19	0	0	77.18	65.83	0.47	0.02	25.21	26.35	11.7
776	197.08	15.28	0	0	104.4	65.21	0.6	0.02	25.65	26.77	12.9
779	197.81	8.84	0	0	137.68	64.95	0.46	0.02	25.48	26.61	22.37
782	189.88	11.63	0	0	147.97	64.62	0.65	0.02	25.44	26.57	16.32
785	188.87	14.44	0	0	64.09	64.25	0.35	0.02	25.49	26.61	13.08
788	194.08	14.92	0	0	120.57	63.77	0.67	0.02	25.83	26.94	13.01
791	187.87	9.72	0	0	135.57	63.39	0.5	0.02	25.47	26.58	19.32
794	191.08	12.98	0	0	94.68	63.13	0.45	0.02	26.08	27.18	14.73
797	187.05	12	0	0	147.85	62.64	0.68	0.02	25.12	26.17	15.59
800	187.81	8.55	0	0	199.98	62.43	0.65	0.02	25.44	26.5	21.97
803	180.79	12.18	0	0	155.68	62.07	0.72	0.02	25.37	26.44	14.84
806	179.73	15.37	0	0	89.32	61.7	0.52	0.02	25.34	26.36	11.69
809	186.92	12.05	0	0	129.15	61.2	0.58	0.02	25.73	26.76	15.52
812	189.92	7.31	0	0	221.1	60.99	0.59	0.02	26.16	27.23	25.98
815	183.21	11.87	0	0	135.28	60.7	0.6	0.02	25.7	26.74	15.43
818	188.17	13.58	0	0	120.44	60.29	0.59	0.03	26.46	27.51	13.85
821	180.42	9.31	0	0	158.23	59.93	0.54	0.02	26.04	27.04	19.38
824	178.02	9.86	0	0	138.34	59.7	0.51	0.02	25.94	26.93	18.06
827	176.08	16	0	0	87.27	59.3	0.53	0.02	25.57	26.52	11
830	176.08	11.24	0	0	157.46	58.81	0.66	0.02	26.03	27.02	15.66
833	171.11	6.68	0	0	322.29	58.62	0.81	0.02	25.64	26.57	25.6
836	171.95	16.03	0	0	112.94	58.32	0.69	0.02	25.45	26.36	10.73
839	167.66	9.89	0	0	165.19	57.76	0.62	0.02	25.23	26.13	16.96
842	163.67	5.17	0	0	477.46	57.72	0.93	0.02	25.57	26.47	31.68
845	165.97	13.6	0	0	116.21	57.36	0.59	0.02	25.85	26.76	12.2
848	169.17	10.09	0	0	165.65	56.98	0.63	0.02	25.86	26.74	16.76
851	167.79	8.37	0	0	213.35	56.75	0.67	0.02	25.9	26.78	20.04
854	164.13	9.16	0	0	218.2	56.46	0.75	0.02	25.88	26.76	17.92
857	161.9	13.1	0	0	111.25	56.18	0.55	0.02	25.66	26.51	12.36
860	162.11	7.54	0	0	214.91	55.74	0.6	0.02	25.98	26.82	21.5
863	156.64	5.51	0	0	343.31	55.7	0.71	0.02	25.82	26.64	28.41
866	153.82	14.84	0	0	114.15	55.33	0.65	0.02	25.39	26.19	10.36
869	155.69	7.01	0	0	235.19	54.93	0.62	0.02	25.97	26.78	22.2
872	152.89	3.78	0	0	498.16	54.88	0.69	0.03	26.48	27.29	40.49
875	148.07	13.5	0	0	110.45	54.61	0.57	0.02	25.58	26.35	10.96
878	152.18	10.94	0	0	139.96	54.15	0.57	0.02	25.89	26.67	13.91
881	148.46	3.43	0	0	503.63	53.99	0.64	0.03	26.18	26.95	43.25
884	143.72	10.71	0	0	171.31	53.85	0.68	0.03	26.08	26.82	13.42
887	141.72	8.84	0	0	142.61	53.41	0.47	0.03	26.08	26.81	16.04
890	140.35	1.98	0	0	809.4	53.35	0.6	0.03	26.04	26.74	71.05
893	137.22	8.9	0	0	181.34	53.19	0.61	0.02	25.82	26.5	15.41
896	135.37	9.13	0	0	210.58	52.86	0.71	0.03	26.37	27.06	14.82
899	130.02	4.17	0	0	359.29	52.68	0.57	0.02	25.56	26.21	31.2
902	129.82	9.23	0	0	134.19	52.54	0.47	0.03	26	26.63	14.07
905	124.17	9.57	0	0	160.46	52.16	0.58	0.03	25.98	26.59	12.97
908	120.79	3.09	0	0	433.99	52.02	0.51	0.02	25.78	26.37	39.06
911	121.97	1.36	0	0	1033.9	51.94	0.53	0.03	25.92	26.5	89.72
914	121.98	8.29	0	0	179.65	51.87	0.55	0.03	26.37	26.94	14.72
917	118.3	11.98	0	0	111.21	51.47	0.5	0.03	26.28	26.82	9.87

920	113.82	1.02	0	0	1248.5	51.26	0.48	0.03	26.14	26.68	111.77
923	115.39	3.31	0	0	436.65	51.32	0.54	0.03	26.5	27.03	34.84
926	111.95	10.97	0	0	124.32	51.02	0.52	0.03	25.81	26.3	10.21
929	108.38	2.4	0	0	614.07	50.77	0.56	0.03	25.66	26.16	45.06
932	106	0.68	-0.01	0	1776.79	50.83	0.45	0.03	26.18	26.68	155.98
935	103.78	5.08	0	0	220.97	50.68	0.43	0.03	25.8	26.28	20.43
938	105.68	6.66	0	0	176.07	50.55	0.44	0.03	26.45	26.92	15.86
941	101.58	5.02	0	0	228.69	50.31	0.43	0.03	26.39	26.85	20.23
944	100.99	2.77	0	0	372.78	50.25	0.39	0.03	26.1	26.56	36.43
947	100.67	5.89	0	0	173.86	50.1	0.39	0.03	26.12	26.58	17.11
950	97.58	6.95	0	0	143.15	49.91	0.38	0.03	25.77	26.2	14.04
953	94.26	1.29	0	0	919.85	49.73	0.46	0.03	25.54	25.95	72.88
956	96.52	1.46	0	0	729.75	49.79	0.4	0.03	26.34	26.76	66.07
959	97.74	8	0	0	119.94	49.6	0.36	0.03	26.14	26.56	12.21
962	93.27	3.38	0	0	305.82	49.39	0.39	0.03	26.15	26.57	27.58
965	87.81	0.9	0	0	1234.08	49.39	0.43	0.03	25.66	26.08	97.38
968	88.1	4.83	0	0	168.59	49.29	0.31	0.03	25.8	26.2	18.22
971	91.4	4.15	0	0	251.31	49.13	0.39	0.03	26	26.4	22.04
974	88.64	3.75	0	0	247.2	49.04	0.35	0.03	26.16	26.57	23.62
977	85.39	2.88	0	0	325.81	48.91	0.35	0.03	26.29	26.7	29.6
980	84.23	0.13	-0.04	0	6771.58	48.88	0.35	0.03	25.78	26.17	628.62
983	87.8	5.72	0	0	172.04	48.84	0.36	0.03	26.83	27.23	15.35
986	80.33	3.94	0	0	229.86	48.58	0.34	0.03	25.94	26.32	20.4
989	79.12	-1.31	0	0	-600.79	48.63	0.3	0.03	26.03	26.41	-60.22
992	81.79	4.64	0	0	189.23	48.58	0.33	0.03	26.22	26.61	17.61
995	77.01	6.83	0	0	110.21	48.38	0.29	0.03	25.62	25.99	11.28
998	76.5	1.71	0	0	479.86	48.23	0.31	0.03	26.05	26.42	44.85
1001	75.42	-0.22	0.02	0	-4100.8	48.25	0.35	0.03	25.81	26.17	-341.65
1004	76.62	4.83	0	0	165.76	48.19	0.3	0.03	26.08	26.45	15.87
1007	73.83	6.1	0	0	127.06	47.99	0.29	0.03	26.17	26.54	12.1
1010	68.71	1.05	0	0	701.98	47.87	0.28	0.03	26.02	26.37	65.43
1013	69.45	-2.64	0	0	-297.21	47.91	0.29	0.03	26.5	26.85	-26.29
1016	68.42	2.67	0	0	295.92	47.96	0.3	0.03	25.92	26.26	25.66
1019	68.32	6.88	0	0	101.42	47.76	0.27	0.03	25.78	26.1	9.93
1022	63.17	-0.29	0.02	0	-2574.22	47.63	0.29	0.03	25.79	26.11	-216.01
1025	62.25	0.32	-0.02	0	2416.02	47.73	0.29	0.03	26.25	26.58	193.46
1028	63.95	6.9	0	0	109.39	47.57	0.28	0.03	26.29	26.6	9.28
1031	61.15	1.54	0	0	454.65	47.4	0.27	0.03	25.63	25.93	39.59
1034	58.95	-0.65	0.01	0	-1217.07	47.46	0.31	0.03	25.48	25.77	-91.17
1037	57.65	3.22	0	0	255.18	47.39	0.31	0.03	26	26.3	17.88
1040	59.96	2.95	0	0	219.83	47.29	0.24	0.03	26.39	26.69	20.34
1043	56.77	1.44	0	0	412.33	47.23	0.23	0.03	25.16	25.44	39.38
1046	55.81	-0.62	0.01	0	-1472.09	47.21	0.35	0.03	26.05	26.33	-89.57
1049	53.54	4.67	0	0	157.15	47.21	0.28	0.03	25.91	26.19	11.46
1052	54.63	6.8	0	0	100.06	46.95	0.26	0.03	26.16	26.44	8.04
1055	54.32	-2.22	0	0	-300	46.88	0.25	0.03	25.91	26.18	-24.43
1058	51.68	-2.78	0	0	-285.04	47.03	0.3	0.03	26.46	26.73	-18.56
1061	49.3	2.32	0	0	295.26	47	0.26	0.03	25.8	26.06	21.29
1064	52.31	4.41	0	0	166.7	46.91	0.28	0.03	26.04	26.3	11.87
1067	50.78	1.5	0	0	523.97	46.78	0.3	0.03	26.12	26.38	33.82
1070	50.25	-0.98	0	0	-879.06	46.82	0.32	0.03	26.83	27.09	-51.02
1073	48.7	2.05	0	0	381.05	46.8	0.29	0.03	26.33	26.59	23.81

1076	49.96	2.73	0	0	265.86	46.71	0.28	0.03	26.07	26.33	18.3
1079	49.36	4.26	0	0	159.21	46.63	0.26	0.03	26.11	26.37	11.6
1082	46.71	0.67	-0.01	0	1059.18	46.49	0.27	0.03	26.29	26.54	69.83
1085	47.31	-1.64	0	0	-404.92	46.58	0.25	0.03	26.19	26.46	-28.84
1088	48.74	4.11	0	0	197.93	46.53	0.31	0.03	26.12	26.38	11.85
1091	46.48	4.77	0	0	135.81	46.37	0.25	0.03	25.75	26.01	9.74
1094	44.08	-1.41	0	0	-544.53	46.29	0.29	0.03	26.36	26.63	-31.17
1097	42.31	-0.74	0.01	0	-1012.46	46.41	0.29	0.03	25.7	25.96	-57.08
1100	46.18	4.76	0	0	158.88	46.3	0.28	0.03	26.3	26.56	9.7
1103	46.34	4.43	0	0	179.63	46.16	0.3	0.03	26.4	26.66	10.46
1106	43.54	-1.48	0	0	-491.47	46.08	0.28	0.03	26.01	26.28	-29.33
1109	43.37	-1.29	0	0	-671.91	46.21	0.33	0.03	26.29	26.56	-33.67
1112	45.16	6.43	0	0	132.28	46.1	0.32	0.03	26.25	26.5	7.03
1115	44.58	4.14	0	0	165.4	45.89	0.26	0.03	26.33	26.57	10.76
1118	40.48	-3.77	0	0	-248.79	45.89	0.36	0.03	25.94	26.18	-10.74
1121	40.52	-0.79	0.01	0	-1055.55	46.04	0.32	0.03	25.8	26.04	-51.18
1124	43.92	6.42	0	0	123.9	45.91	0.3	0.03	26.48	26.73	6.84
1127	41.98	1.25	0	0	597.81	45.74	0.28	0.03	26.03	26.26	33.57
1130	40.39	-3.74	0	0	-180.41	45.83	0.26	0.03	26.17	26.41	-10.79
1133	39.58	1	0	0	754.96	45.89	0.29	0.03	25.79	26.04	39.51
1136	43.75	6.96	0	0	93.47	45.77	0.25	0.03	26.04	26.29	6.29
1139	43.14	0.69	-0.01	0	1077.37	45.57	0.27	0.03	26.94	27.2	62.67
1142	38.46	-3.81	0	0	-185.06	45.71	0.27	0.03	25.74	25.99	-10.08
1145	36.89	4.43	0	0	161.01	45.71	0.27	0.03	25.97	26.23	8.34
1148	39.47	1.59	0	0	471.68	45.52	0.29	0.03	25.79	26.04	24.78
1151	42.08	-0.53	0.01	0	-1210.32	45.61	0.24	0.03	26.79	27.06	-79.95
1154	39.99	3.11	0	0	218.33	45.51	0.25	0.03	26.38	26.65	12.86
1157	37.43	0.48	-0.01	0	1366.38	45.46	0.25	0.03	25.82	26.09	77.17
1160	37.35	1.97	0	0	346.03	45.46	0.26	0.03	26.1	26.38	18.93
1163	41.32	3.94	0	0	172.24	45.34	0.26	0.03	26.16	26.43	10.48
1166	37.85	-1.36	0	0	-562.58	45.27	0.29	0.03	25.84	26.12	-27.83
1169	34.43	-2.9	0	0	-266.32	45.39	0.3	0.03	25.69	25.97	-11.86
1172	35.49	7.03	0	0	100.78	45.37	0.27	0.03	25.55	25.84	5.04
1175	38.59	2.82	0	0	218.51	45.07	0.24	0.03	25.33	25.61	13.67
1178	39.46	-5.04	0	0	-167.42	45.22	0.32	0.03	26.26	26.56	-7.83
1181	34.65	2.89	0	0	233.66	45.26	0.26	0.03	26.06	26.35	11.99
1184	36.39	3.84	0	0	197.9	45.09	0.28	0.03	26.43	26.71	9.48
1187	37.76	0.37	-0.01	0	1741.29	45.07	0.25	0.03	25.86	26.14	101.81
1190	35.22	0.22	-0.02	0	3599.87	45.05	0.31	0.03	25.99	26.26	158.2
1193	34.38	-1.73	0	0	-437.85	45.06	0.29	0.03	25.71	25.98	-19.91
1196	35.07	2.34	0	0	322.57	45.11	0.28	0.03	26.23	26.5	14.99
1199	36.79	4.23	0	0	167.45	44.94	0.27	0.03	25.99	26.27	8.7
1202	34.91	1.82	0	0	414.87	44.89	0.29	0.03	26.07	26.34	19.13
1205	32.62	-1.17	0	0	-713.66	44.83	0.32	0.03	26.16	26.43	-27.92
1208	33.26	-0.42	0.01	0	-1751.91	44.93	0.28	0.03	25.95	26.22	-79.44
1211	34.96	5.87	0	0	123.76	44.82	0.28	0.03	25.97	26.24	5.96
1214	35.58	1.86	0	0.01	331.58	44.66	0.24	0.03	25.86	26.13	19.12
1217	32.95	-4.43	0	0	-169.82	44.73	0.29	0.03	26.12	26.4	-7.44
1220	31.12	0.06	-0.08	-0.01	12643.29	44.84	0.31	0.03	25.93	26.2	492.1
1223	33.39	6.82	0	0	101.99	44.71	0.26	0.03	26.35	26.63	4.89
1226	34.92	0.21	-0.02	0.02	3465.69	44.53	0.27	0.03	26.21	26.48	167.82
1229	32.11	-4.51	0	0	-164.51	44.68	0.28	0.03	26.01	26.28	-7.12

1232	29.9	0.95	0	0.01	808.01	44.72	0.29	0.03	26.1	26.38	31.32
1235	31.32	3.13	0	0	217.69	44.65	0.26	0.03	25.7	25.97	10.01
1238	31.03	1.57	0	0	390.65	44.57	0.24	0.03	25.45	25.73	19.83
1241	29.64	-0.99	0	-0.02	-770.89	44.56	0.29	0.03	25.76	26.03	-30.03
1244	27.88	-0.23	0.02	-0.03	-2904.33	44.6	0.25	0.03	25.59	25.85	-123.89
1247	30.85	3.51	0	0	145.28	44.55	0.19	0.03	26.22	26.49	8.79
1250	33.08	2.13	0	0	265.71	44.43	0.22	0.03	25.76	26.04	15.56
1253	29.58	-1.04	0	-0.01	-699.15	44.44	0.28	0.03	25.69	25.96	-28.38
1256	29.48	-2.11	0	-0.01	-304.7	44.47	0.24	0.03	26.02	26.29	-13.99
1259	31.65	3.25	0	0	217.63	44.52	0.27	0.03	26.18	26.45	9.75
1262	32.75	4.14	0	0	147.5	44.31	0.23	0.03	26.3	26.58	7.92
1265	30.03	-1.66	0	-0.02	-339.88	44.32	0.21	0.03	26.16	26.44	-18.12
1268	28.05	-1.46	0	-0.02	-406.65	44.37	0.23	0.03	25.92	26.19	-19.21
1271	30.49	1.71	0	0.02	372.35	44.38	0.24	0.03	26.11	26.38	17.79
1274	29.62	4.86	0	0.01	117.39	44.27	0.22	0.03	26.24	26.52	6.09
1277	27.07	-0.06	0.07	-0.41	-9248.42	44.15	0.21	0.03	26	26.26	-448.73
1280	26.07	-3.15	0	-0.01	-195.93	44.26	0.23	0.03	26.14	26.41	-8.27
1283	26.28	1.78	0	0.02	370.25	44.28	0.25	0.03	25.84	26.11	14.76
1286	29.37	7.1	0	0.01	83.18	44.15	0.22	0.03	26.02	26.29	4.14
1289	28.53	-0.2	0.02	-0.31	-3127.21	43.94	0.24	0.03	26.31	26.58	-142.23
1292	25.86	-5.27	0	-0.01	-110.18	44.15	0.22	0.03	25.66	25.92	-4.91
1295	26.41	3.73	0	0.01	150.91	44.16	0.21	0.03	26.69	26.96	7.08
1298	28.81	4.04	0	0.01	112.69	43.98	0.17	0.03	26.36	26.63	7.13
1301	27.74	-2.88	0	-0.02	-156.85	43.97	0.18	0.03	25.44	25.7	-9.64
1304	26.17	-1.49	0	-0.03	-394.46	44.09	0.23	0.03	25.76	26.01	-17.58
1307	23.88	5.58	0	0.01	69.68	44.02	0.15	0.03	25.52	25.77	4.28
1310	25.05	1.08	0	0.07	250.21	43.84	0.1	0.03	26.19	26.45	23.21
1313	27.21	-2.39	0	-0.03	-172.91	43.95	0.16	0.03	25.84	26.09	-11.36
1316	27.42	0.67	-0.01	0.11	653.8	43.93	0.16	0.03	26.71	26.97	40.72
1319	24.66	2.28	0	0.03	154.86	43.92	0.13	0.03	25.87	26.12	10.83
1322	24.6	3.82	0	0.01	24.35	43.81	0.04	0.03	26.05	26.3	6.44
1325	27.7	-2.16	0	-0.02	-87.41	43.74	0.07	0.03	26.1	26.36	-12.84
1328	27.06	-3.63	0	-0.02	-63.72	43.9	0.09	0.03	26.25	26.52	-7.46
1331	24.81	3.16	0	0.03	46.39	43.9	0.06	0.03	26	26.26	7.85
1334	23.07	3.4	0	0.02	20.81	43.76	0.03	0.03	25.87	26.13	6.79
1337	25.19	0.97	0	0.09	0	43.72	0	0.03	26.09	26.35	26.02
1340	26.16	-0.83	0.01	-0.11	-45.88	43.69	0.01	0.03	26.17	26.43	-31.54
1343	23.61	0.83	-0.01	0.1	0	43.74	0	0.03	25.62	25.87	28.46
1346	23.18	0.13	-0.04	0.64	0	43.66	0	0.03	26.12	26.38	179.68
1349	24.07	1.87	0	0.04	0	43.72	0	0.03	26.02	26.28	12.85
1352	26.61	2.26	0	0.03	0	43.56	0	0.03	25.58	25.83	11.76
1355	25.92	-3.11	0	-0.03	0	43.62	0	0.03	25.81	26.08	-8.34
1358	23.53	1.11	-0.01	0.05	0	43.68	0	0.03	25.92	26.19	21.15
1361	23.68	5.2	0	0.01	0	43.55	0	0.03	26.59	26.86	4.55
1364	25.94	1.25	0	0.07	0	43.43	0	0.03	25.63	25.89	20.75
1367	25.61	-4.61	0	-0.02	0	43.49	0	0.03	25.95	26.23	-5.55
1370	23.3	-1.12	0	-0.09	0	43.63	0	0.03	26.25	26.53	-20.75
1373	23.37	5.32	0	0.02	0	43.54	0	0.03	25.66	25.92	4.39
1376	26.32	2.34	0	0.04	0	43.38	0	0.03	26.19	26.46	11.25
1379	23.38	-2.57	0	-0.03	0	43.41	0	0.03	25.81	26.08	-9.09
1382	21.69	-0.55	0.01	-0.14	0	43.48	0	0.03	25.79	26.06	-39.39
1385	22.24	3.99	0	0.03	0	43.43	0	0.03	26.18	26.46	5.57

1388	23.74	0.62	-0.01	0.2	0	43.3	0	0.03	25.47	25.74	38.31
1391	23.16	-1.69	0	-0.06	0	43.39	0	0.03	25.93	26.21	-13.73
1394	21.78	-0.3	0.01	-0.39	0	43.37	0	0.03	25.82	26.09	-71.91
1397	23.79	0.59	-0.01	0.17	0	43.4	0	0.03	25.99	26.27	40.33
1400	25.22	4.56	0	0.02	0	43.32	0	0.03	26.41	26.68	5.53
1403	23.98	1.5	0	0.07	0	43.18	0	0.03	25.98	26.25	15.98
1406	20.29	-3.79	0	-0.03	0	43.25	0	0.03	26.08	26.35	-5.35
1409	21.17	-1.89	0	-0.06	0	43.35	0	0.03	25.67	25.92	-11.2
1412	23.47	7.05	0	0.02	0	43.31	0	0.03	26.01	26.26	3.33
1415	20.41	2.62	0	0.04	0	43.03	0	0.03	25.86	26.12	7.8
1418	20.29	-4.51	0	-0.02	0	43.18	0	0.03	26.35	26.62	-4.5
1421	22.81	0.47	-0.01	0.31	0	43.21	0	0.03	25.79	26.05	48.63
1424	21.21	2.41	0	0.06	0	43.17	0	0.03	25.71	25.97	8.81
1427	20.06	-2.1	0	-0.05	0	43.11	0	0.03	26.02	26.29	-9.56
1430	20.54	-0.36	0.01	-0.3	0	43.25	0	0.03	26.45	26.73	-57.1
1433	22.76	2.06	0	0.06	0	43.12	0	0.03	25.79	26.06	11.06
1436	22.75	3.6	0	0.04	0	43.14	0	0.03	25.71	25.98	6.33
1439	19.7	0.87	-0.01	0.15	0	42.94	0	0.03	25.98	26.25	22.57
1442	19.01	-4.61	0	-0.03	0	43.1	0	0.03	25.8	26.08	-4.13
1445	22.27	0.38	-0.02	0.31	0	43.14	0	0.03	26.06	26.33	57.98
1448	22.41	5.09	0	0.03	0	43.08	0	0.03	27.26	27.55	4.4
1451	16.91	-0.54	0.01	-0.3	0	42.91	0	0.03	26.14	26.42	-31.6
1454	15.58	-1.76	0	-0.12	0	43.08	0	0.03	25.71	25.97	-8.88
1457	18.76	1.45	0	0.18	0	42.98	0	0.03	26.36	26.62	12.93
1460	17.83	1.12	0	0.23	0	43.02	0	0.03	26.02	26.27	15.88
1463	15.07	-1.19	0	-0.23	0	42.93	0	0.03	25.62	25.87	-12.69
1466	16.31	-0.47	0.01	-0.55	0	43.07	0	0.03	25.75	26	-34.92
1469	18.02	4.57	0	0.06	0	42.93	0	0.03	25.74	25.99	3.94
1472	17.48	0.01	-0.43	28.09	0	42.85	0	0.03	26.03	26.29	1747.97
1475	15.05	0.01	-0.52	26.56	0	42.85	0	0.03	26.13	26.38	1505.18

Office Chair**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	13.00
Peak Heat Release Rate (kW/m ²):	211.60
Time to Peak Heat Release Rate (s):	840.00
Total Heat Release (MJ/m ²):	178.07
60 s Average Heat Release Rate (kW/m ²):	138.19
Total Mass Loss (g):	97.01
Average Mass Loss Rate (g/s):	0.066
Average Effective Heat of Combustion (MJ/kg):	18.36
Average Smoke Extinction Area (m ² /kg):	263.58
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0054

Specimen:

Initial mass (g):	143.3
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	80
Time to ignition (s):	13
Time to flameout (s):	1481

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	8.68	0.01	-0.39	-0.04	37232.48	133.09	0.14	0.03	25.95	26.15	867.59
3	7.7	0.01	-0.44	-0.04	41742.41	127.71	0.16	0.03	25.77	25.97	769.88
6	4.65	-17	0	0	-25.17	127.7	0.17	0.03	25.59	25.79	-0.27
9	6.9	0.05	-0.06	-0.01	12449.43	127.8	0.26	0.03	25.56	25.75	126.49
12	27.08	3.55	0	0	309.32	127.69	0.43	0.03	25.36	25.55	7.62
15	73.26	5.3	0	0	389.05	127.6	0.77	0.03	26.4	26.63	13.84
18	89.49	5.23	0	0.01	735.3	127.39	1.5	0.03	25.2	25.55	17.12
21	103.25	4.28	0	0.03	939.49	127.29	1.56	0.03	25.31	25.87	24.1
24	108.26	4.7	0	0.03	853.29	127.12	1.54	0.03	25.45	26.12	23.03
27	105.8	8.5	0	0.01	531.62	126.99	1.74	0.03	25.17	25.91	12.44
30	105.62	6.67	0	0.02	556.34	126.65	1.43	0.03	25.11	25.9	15.83
33	110.68	5.53	0	0.03	749.99	126.58	1.58	0.03	25.44	26.28	20.01
36	119.72	6.42	0	0.02	590.49	126.3	1.43	0.03	25.64	26.52	18.64
39	126.5	9.23	0	0.01	463.13	126.19	1.6	0.03	25.75	26.67	13.7
42	127.36	5.15	0	0.03	964.8	125.79	1.94	0.03	24.7	25.61	24.74
45	144.35	3.24	0	0.06	1696.84	125.86	2.05	0.03	25.73	26.73	44.59
48	154.17	12.74	0	0.02	513.58	125.52	2.54	0.03	24.79	25.8	12.1
51	171.15	11.34	0	0.02	571.48	125.17	2.45	0.03	25.36	26.45	15.09
54	182.9	6.56	0	0.05	1055.36	124.87	2.58	0.03	25.71	26.87	27.89
57	192.28	4.44	0	0.08	1813.8	124.75	3.02	0.03	25.44	26.65	43.28
60	193.37	13.42	0	0.03	637.06	124.53	3.27	0.03	24.9	26.15	14.41
63	188.86	11.89	0	0.03	636.54	124.02	2.88	0.03	24.94	26.24	15.89
66	188.77	7.08	0	0.05	1029.04	123.84	2.69	0.03	25.72	27.07	26.65
69	190.92	8.95	0	0.04	666.28	123.55	2.22	0.03	25.55	26.89	21.32
72	198.14	11.56	0	0.03	600.74	123.3	2.58	0.03	25.54	26.89	17.14
75	195.35	9.08	0	0.04	780.31	122.89	2.67	0.03	25.18	26.52	21.52
78	194.99	5.55	0	0.07	1285.41	122.76	2.65	0.03	25.52	26.88	35.15
81	193.17	11.85	0	0.03	561.47	122.49	2.48	0.03	25.45	26.8	16.3
84	193.81	10.72	0	0.03	784.81	122.09	3.11	0.03	25.68	27.04	18.08
87	185.76	10.2	0	0.03	689.39	121.85	2.61	0.03	25.67	26.99	18.2
90	172.82	6.08	0	0.06	1171.02	121.5	2.66	0.03	25.51	26.8	28.41
93	174	7.71	0	0.04	590.88	121.44	1.68	0.03	25.94	27.19	22.57
96	172.15	12.59	0	0.03	485.99	121.02	2.26	0.03	25.87	27.08	13.68
99	164.7	7.66	0	0.04	792.04	120.76	2.24	0.03	25.86	27.03	21.51
102	153.84	6.76	0	0.04	762.53	120.54	1.96	0.03	25.16	26.26	22.75
105	158.23	6.3	0	0.04	949.08	120.34	2.21	0.03	26.02	27.11	25.12
108	156.61	12.79	0	0.02	386.73	120.11	1.84	0.03	25.78	26.83	12.25
111	155.17	9.42	0	0.03	457.14	119.64	1.63	0.03	25.38	26.38	16.47
114	159.27	4.27	0	0.07	1231.13	119.56	1.95	0.03	25.94	26.93	37.32
117	157.53	8.87	0	0.03	574.04	119.31	1.95	0.03	25.18	26.12	17.76
120	159.74	12.19	0	0.02	423.3	119.04	1.96	0.03	25.36	26.3	13.11
123	156.85	8.48	0	0.03	644.16	118.64	2.04	0.03	25.81	26.75	18.5
126	153.95	3.41	0	0.08	1332.56	118.54	1.67	0.03	26.28	27.24	45.11
129	145.87	8.8	0	0.03	585.94	118.36	1.94	0.03	25.64	26.55	16.57
132	144.68	11.9	0	0.02	344.58	118.03	1.53	0.03	25.9	26.78	12.16
135	146.26	4.95	0	0.04	892	117.71	1.63	0.03	26.17	27.04	29.53

138	149.49	5.5	0	0.04	779	117.67	1.6	0.03	25.9	26.75	27.16
141	157.11	14.75	0	0.02	352.02	117.32	1.92	0.03	26.17	27.02	10.65
144	145.21	8.44	0	0.03	615.87	116.9	2.01	0.03	25.04	25.89	17.2
147	143.18	4.82	0	0.04	629.15	116.81	1.13	0.03	26	26.88	29.73
150	139.44	5.67	0	0.03	702.2	116.57	1.48	0.03	26.02	26.87	24.6
153	142.13	8.93	0	0.02	662.58	116.45	2.21	0.03	26	26.83	15.91
156	142.03	10.26	0	0.02	472.84	116.05	1.83	0.03	25.7	26.52	13.84
159	138.15	7.22	0	0.03	630.6	115.86	1.71	0.03	25.83	26.64	19.15
162	137.77	5.03	0	0.04	998.75	115.61	1.85	0.03	26.32	27.15	27.41
165	138.48	5.78	0	0.03	669.34	115.54	1.44	0.03	25.98	26.79	23.94
168	139.11	10.62	0	0.02	369.47	115.24	1.49	0.03	25.61	26.41	13.1
171	137.61	3.87	0	0.04	1260.22	114.98	1.82	0.03	25.96	26.77	35.55
174	136.51	5.31	0	0.03	1062.62	114.95	2.08	0.03	26.35	27.17	25.69
177	139.11	11	0	0.01	410.23	114.63	1.69	0.03	25.97	26.77	12.64
180	133.24	9.61	0	0.01	539.53	114.35	1.97	0.03	25.52	26.3	13.87
183	127.42	3.45	0	0.04	1288.76	114.09	1.65	0.03	26.12	26.91	36.89
186	126.6	1.19	0	0.11	3458.95	114.11	1.53	0.03	26.2	26.97	106.25
189	123.87	7.07	0	0.02	623.47	113.96	1.67	0.03	25.64	26.38	17.52
192	123.43	8.3	0	0.02	515.09	113.71	1.62	0.03	25.73	26.46	14.87
195	128.56	5.88	0	0.02	575.37	113.49	1.26	0.03	26.22	26.95	21.86
198	134.62	3.5	0	0.04	1012.15	113.36	1.35	0.03	25.66	26.36	38.42
201	135.36	9.51	0	0.02	508.18	113.22	1.82	0.03	25.77	26.52	14.24
204	127.6	5.85	0	0.02	663.85	112.85	1.46	0.03	25.83	26.58	21.82
207	121.01	0.26	-0.02	0.43	16110.53	112.89	1.61	0.03	25.56	26.3	459.62
210	128.41	5.73	0	0.02	595.24	112.76	1.27	0.03	26.03	26.76	22.41
213	128.26	8.11	0	0.01	574.21	112.56	1.8	0.03	25.17	25.86	15.81
216	131.4	9.04	0	0.01	356.43	112.29	1.2	0.03	26.05	26.79	14.54
219	124.91	1.57	0	0.08	1761.68	112.07	1.07	0.03	25.15	25.85	79.45
222	130.53	5.14	0	0.02	812.36	112.12	1.58	0.03	25.79	26.51	25.39
225	134.22	9.52	0	0.01	393.69	111.76	1.41	0.03	25.86	26.57	14.1
228	135.09	4.13	0	0.03	939.2	111.62	1.45	0.03	26.09	26.82	32.69
231	133.16	4.92	0	0.03	759.21	111.47	1.41	0.03	25.78	26.52	27.04
234	130.74	8.63	0	0.01	365.32	111.3	1.22	0.03	25.14	25.88	15.16
237	138.13	9.12	0	0.01	377.89	110.97	1.28	0.03	26.15	26.91	15.15
240	140.16	5.65	0	0.02	605.37	110.78	1.28	0.03	25.91	26.66	24.79
243	137.05	3.62	0	0.04	856.24	110.62	1.18	0.03	25.45	26.22	37.82
246	139.3	7.03	0	0.02	387.51	110.52	1.02	0.03	25.97	26.77	19.82
249	131.12	10.71	0	0.01	439.94	110.2	1.82	0.03	25.14	25.9	12.25
252	134.45	1.14	0	0.11	2246.46	109.97	0.94	0.03	26.25	27.05	118.34
255	133.83	2.16	0	0.05	1629.67	110.06	1.33	0.03	25.73	26.51	61.95
258	134.06	11.18	0	0.01	383.46	109.78	1.61	0.03	25.76	26.55	11.99
261	129.22	10.84	0	0.01	344.01	109.46	1.43	0.03	25.39	26.16	11.92
264	126.79	4.09	0	0.02	740.62	109.18	1.15	0.03	25.54	26.31	31.02
267	124.03	7.79	0	0.01	414.48	109.14	1.23	0.03	25.5	26.28	15.91
270	126.5	7.86	0	0.01	341.68	108.74	1	0.03	26.04	26.81	16.1
273	127.79	-0.24	0.01	-0.22	-13463.88	108.73	1.2	0.03	25.76	26.5	-542.39
276	130.18	4.87	0	0.01	618.33	108.66	1.11	0.03	26.31	27.09	26.72
279	123.08	5.81	0	0	414.28	108.45	0.91	0.03	25.57	26.33	21.19
282	118.58	10.45	0	0	207.73	108.29	0.82	0.03	25.68	26.42	11.35
285	115.29	8.17	0	0	298.34	107.88	0.93	0.03	25.5	26.24	14.12
288	122.83	2.63	0	0	829.43	107.83	0.81	0.03	26.29	27.05	46.72
291	122.25	4	0	0	559.66	107.67	0.86	0.03	25.19	25.91	30.59

294	124.76	10.08	0	0	195.46	107.56	0.74	0.03	25.7	26.45	12.38
297	126.4	4.54	0	0	590.4	107.14	1.02	0.03	25.53	26.28	27.86
300	129.29	4.32	0	0	391.03	107.25	0.64	0.03	25.66	26.43	29.92
303	123.6	11.01	0	0	170.18	106.83	0.72	0.03	25.21	25.98	11.23
306	121.57	6.28	0	0	339.25	106.66	0.8	0.03	25.83	26.63	19.35
309	121.92	4.83	0	0	427.04	106.44	0.79	0.03	25.23	26	25.25
312	130.1	8.62	0	0	230.01	106.34	0.74	0.03	26.19	26.98	15.08
315	124.69	6.67	0	0	286.35	105.96	0.73	0.03	25.47	26.25	18.69
318	125.48	2.75	0	0.01	619.07	105.95	0.64	0.03	25.68	26.48	45.66
321	128.1	5.21	0	0	390.52	105.75	0.76	0.03	26.08	26.89	24.58
324	122.34	8.63	0	0	262.33	105.63	0.85	0.03	25.8	26.59	14.17
327	122.76	11.05	0	0	165.66	105.24	0.68	0.03	26.19	27	11.11
330	123.58	4.82	0	0	369.78	105.03	0.67	0.03	25.79	26.6	25.64
333	125.64	3.38	0	0	550.2	104.92	0.69	0.03	26.05	26.84	37.22
336	120.75	7.15	0	0	238.02	104.78	0.66	0.02	24.88	25.65	16.88
339	130.01	8.9	0	0	176.32	104.51	0.59	0.03	25.89	26.69	14.61
342	133.52	3.33	0	0	593.43	104.3	0.73	0.03	26.16	26.97	40.11
345	127.42	6.05	0	0	230.28	104.25	0.54	0.03	25.21	26.01	21.05
348	126.13	10.86	0	0	141.79	103.92	0.59	0.03	25.22	26.01	11.62
351	131.24	7.9	0	0	213.29	103.66	0.63	0.03	25.83	26.65	16.61
354	133.97	4.32	0	0	428.91	103.45	0.7	0.03	25.74	26.56	31.04
357	133.92	7.27	0	0	308.48	103.35	0.85	0.03	25.64	26.47	18.43
360	134.34	8.69	0	0	185.92	103.03	0.6	0.03	26.07	26.94	15.46
363	134.91	3.38	0	0	438.18	102.88	0.55	0.03	25.91	26.77	39.91
366	135.11	4.15	0	0	393.11	102.78	0.61	0.03	25.99	26.84	32.57
369	135.71	9.13	0	0	164.6	102.6	0.56	0.03	25.76	26.62	14.86
372	136.21	7.99	0	0	228.41	102.27	0.7	0.03	25.37	26.22	17.05
375	136.61	5.9	0	0	202.99	102.13	0.45	0.03	25.62	26.49	23.14
378	131.89	7.22	0	0	208.11	101.9	0.58	0.03	25.25	26.11	18.27
381	132.16	10.17	0	0	173.48	101.69	0.68	0.03	25.1	25.97	13
384	140.9	2.55	0	0	575.62	101.36	0.54	0.03	26.19	27.09	55.25
387	132.23	5.06	0	0	318.08	101.46	0.62	0.03	25.12	25.99	26.16
390	136.47	9.86	0	0	157.93	101.04	0.58	0.03	25.75	26.65	13.84
393	140.17	3.33	0	0	462.33	100.94	0.58	0.03	25.82	26.72	42.13
396	139.69	8.81	0	0	181.65	100.76	0.6	0.03	25.85	26.75	15.85
399	150.3	11.69	0	0	129.62	100.43	0.55	0.03	26.56	27.5	12.86
402	149.38	8.02	0	0	230.68	100.11	0.69	0.03	25.91	26.83	18.62
405	144.12	3.24	0	0	383.24	99.95	0.47	0.03	25.72	26.65	44.44
408	146.01	11.17	0	0	141.8	99.83	0.6	0.03	25.58	26.51	13.07
411	151.27	8.09	0	0	163.06	99.36	0.51	0.02	25.08	25.99	18.71
414	154.99	4.09	0	0	409.01	99.35	0.62	0.03	25.84	26.82	37.93
417	159.42	7.16	0	0	190	99.06	0.5	0.03	26.23	27.24	22.27
420	157.55	11.32	0	0	137.32	98.91	0.59	0.03	25.46	26.43	13.92
423	154.79	7.88	0	0	174.81	98.44	0.52	0.03	25.4	26.41	19.63
426	156.36	3.78	0	0	379.9	98.44	0.53	0.03	26	27.01	41.33
429	156.19	11.03	0	0	127.4	98.13	0.53	0.03	25.72	26.74	14.16
432	152.06	7.18	0	0	200.1	97.85	0.54	0.03	25.61	26.62	21.16
435	148.75	4.65	0	0	295.01	97.7	0.52	0.03	25.49	26.5	31.97
438	156.39	9.14	0	0	168.58	97.52	0.59	0.03	25.36	26.33	17.11
441	160.78	10.44	0	0	128.15	97.17	0.5	0.03	25.62	26.62	15.4
444	157.81	3.77	0	0	374.77	96.95	0.52	0.03	26.01	27.05	41.83
447	156.09	9.32	0	0	152.69	96.86	0.53	0.03	25.97	27.01	16.74

450	153.22	9.47	0	0	135.48	96.43	0.49	0.02	25.37	26.38	16.19
453	151.06	5.74	0	0	244.74	96.32	0.53	0.03	25.72	26.75	26.3
456	146.53	9.74	0	0	129.32	96.03	0.48	0.02	25.11	26.1	15.05
459	155.11	8.73	0	0	130.38	95.78	0.43	0.02	25.4	26.4	17.77
462	159.93	2.27	0	0	632.54	95.54	0.54	0.03	25.63	26.63	70.35
465	157.19	6.29	0	0	214.36	95.56	0.52	0.02	24.71	25.67	25
468	169.58	13.03	0	0	98.17	95.15	0.47	0.03	26	27.02	13.01
471	158.9	5.86	0	0	276.06	94.88	0.62	0.02	24.97	26	27.1
474	158.61	6.06	0	0	192.03	94.75	0.43	0.03	25.77	26.82	26.16
477	154.62	11.58	0	0	70.97	94.47	0.31	0.02	25.23	26.23	13.35
480	157.93	10.18	0	0	146.98	94.1	0.56	0.03	25.59	26.61	15.52
483	157.33	5.22	0	0	261.9	93.89	0.51	0.03	25.64	26.65	30.16
486	158.7	11.42	0	0	120.58	93.72	0.51	0.03	25.76	26.78	13.9
489	164.26	8.72	0	0	158.14	93.26	0.51	0.03	25.85	26.88	18.84
492	166.64	5.24	0	0	299.39	93.2	0.58	0.03	26.12	27.16	31.81
495	159.81	9.16	0	0	150.82	92.9	0.52	0.02	25.5	26.52	17.45
498	160.44	7.81	0	0	166.18	92.68	0.49	0.02	25.29	26.3	20.53
501	163.98	4.53	0	0	264.64	92.44	0.45	0.02	25.44	26.46	36.17
504	161.93	6.76	0	0	189.58	92.37	0.48	0.03	25.84	26.87	23.96
507	161.54	11.24	0	0	85.43	92.02	0.35	0.03	26.3	27.34	14.37
510	155.25	6.34	0	0	202.96	91.76	0.49	0.02	25.29	26.29	24.47
513	158.5	7.34	0	0	188.68	91.6	0.51	0.03	26.26	27.28	21.59
516	155.43	8.81	0	0	131.25	91.31	0.43	0.03	25.7	26.67	17.64
519	157.43	10.37	0	0	125.4	91.08	0.49	0.03	25.63	26.6	15.18
522	154.77	6.87	0	0	194.38	90.72	0.49	0.03	26.15	27.15	22.52
525	146.67	8.62	0	0	164.59	90.63	0.53	0.03	25.73	26.71	17.01
528	150.39	10.47	0	0	119.93	90.21	0.46	0.03	26.22	27.18	14.36
531	148.77	5.32	0	0	256.14	90.05	0.52	0.02	25.51	26.43	27.96
534	153.1	5.65	0	0	206.42	89.85	0.43	0.03	25.94	26.88	27.1
537	153.18	10.13	0	0	130.97	89.68	0.5	0.03	25.67	26.61	15.12
540	152.97	10	0	0	97.22	89.28	0.37	0.03	25.65	26.57	15.3
543	152.72	4.57	0	0	258.62	89.12	0.44	0.03	26.21	27.16	33.39
546	146.36	6.19	0	0	219.81	88.95	0.51	0.02	25.53	26.44	23.66
549	150.63	10.44	0	0	116.44	88.73	0.46	0.02	25.46	26.34	14.43
552	153.57	6.67	0	0	242.56	88.38	0.6	0.03	25.89	26.8	23.01
555	145.99	6.12	0	0	221.54	88.3	0.51	0.02	25.54	26.43	23.86
558	146.4	13.15	0	0	102.09	87.97	0.5	0.03	25.75	26.62	11.13
561	153.56	6.71	0	0	229.29	87.6	0.57	0.03	26.04	26.93	22.87
564	153.01	7.09	0	0	142.89	87.52	0.37	0.03	26.28	27.17	21.59
567	149.38	12.55	0	0	98.87	87.14	0.46	0.03	26.27	27.18	11.9
570	148.97	9.67	0	0	96.59	86.83	0.35	0.03	25.99	26.89	15.41
573	148.23	3.66	0	0	287.82	86.58	0.39	0.03	26.03	26.91	40.52
576	143.35	8.24	0	0	135.22	86.53	0.42	0.02	25.49	26.36	17.4
579	147.71	11.76	0	0	89.69	86.1	0.39	0.03	25.94	26.82	12.56
582	148.26	4.24	0	0	218.05	85.9	0.34	0.03	26.17	27.07	34.97
585	136.89	9.86	0	0	111.45	85.76	0.42	0.02	25.54	26.41	13.89
588	134.86	10.89	0	0	87.53	85.34	0.36	0.03	25.66	26.52	12.38
591	138.58	6.39	0	0	152.74	85.14	0.37	0.03	25.82	26.66	21.7
594	142.65	7.18	0	0	189.93	84.91	0.51	0.03	25.96	26.8	19.85
597	148.82	10.52	0	0	85.61	84.69	0.34	0.03	26	26.84	14.15
600	147.63	13.09	0	0	84.85	84.29	0.42	0.02	25.55	26.41	11.28
603	144.57	6.61	0	0	137.3	83.96	0.34	0.03	25.65	26.54	21.86

606	138.25	9.55	0	0	85.91	83.84	0.31	0.02	25.52	26.41	14.48
609	134.1	9.97	0	0	85.09	83.41	0.32	0.02	25.52	26.38	13.45
612	136.41	6.99	0	0	111.02	83.26	0.3	0.02	25.08	25.91	19.53
615	147.44	5.87	0	0	185.22	82.97	0.4	0.03	26.49	27.35	25.1
618	142.96	11.15	0	0	105.03	82.87	0.44	0.02	25.53	26.38	12.83
621	138.32	11.79	0	0	78.49	82.34	0.36	0.02	24.55	25.38	11.73
624	144.6	3.93	0	0	280.72	82.21	0.42	0.03	25.59	26.46	36.76
627	146.77	9.6	0	0	80.95	82.01	0.29	0.03	26.29	27.19	15.29
630	143.29	11.09	0	0	82.58	81.66	0.34	0.03	25.7	26.57	12.93
633	143.74	9.86	0	0	100.48	81.37	0.38	0.02	25.49	26.37	14.58
636	143.7	7.37	0	0	111.69	81.08	0.31	0.03	25.75	26.62	19.49
639	137.56	12.85	0	0	56.95	80.87	0.28	0.02	25.56	26.44	10.71
642	139.77	10.71	0	0	91.82	80.36	0.38	0.02	25.29	26.14	13.05
645	146.52	6.5	0	0	180.32	80.25	0.44	0.03	25.8	26.66	22.56
648	145.65	10.14	0	0	123.87	79.91	0.46	0.03	26.43	27.34	14.36
651	138.87	12.46	0	0	78.44	79.65	0.37	0.03	25.83	26.72	11.14
654	141.36	6.55	0	0	181.13	79.22	0.44	0.03	25.97	26.86	21.59
657	140.77	6.42	0	0	207.89	79.21	0.5	0.03	26.01	26.9	21.93
660	138.18	14.77	0	0	60.03	78.78	0.33	0.03	25.68	26.54	9.36
663	142.02	8.21	0	0	145.03	78.43	0.44	0.03	25.95	26.83	17.3
666	139.48	6.23	0	0	151.05	78.26	0.35	0.03	25.76	26.65	22.4
669	137.21	8.26	0	0	133.94	78.02	0.42	0.02	25.47	26.32	16.6
672	137.85	12.42	0	0	83.79	77.75	0.4	0.02	25.15	26	11.1
675	136.95	8.33	0	0	106.27	77.33	0.33	0.03	25.66	26.55	16.44
678	133.69	7.78	0	0	121.5	77.23	0.35	0.03	25.9	26.76	17.19
681	133.56	13.8	0	0	59.72	76.82	0.31	0.03	25.65	26.5	9.68
684	138.2	11.1	0	0	84.05	76.46	0.35	0.03	25.66	26.51	12.45
687	140.52	9.15	0	0	133.45	76.15	0.46	0.02	25.55	26.38	15.35
690	143.66	9.41	0	0	98.62	75.89	0.34	0.03	26.3	27.19	15.27
693	140.08	12.21	0	0	65.48	75.57	0.3	0.03	25.98	26.87	11.48
696	140.72	6.61	0	0	113.27	75.21	0.28	0.03	25.87	26.75	21.29
699	138.63	8.91	0	0	103.3	75.12	0.35	0.02	25.45	26.3	15.57
702	138.08	11.94	0	0	91.62	74.67	0.42	0.02	25.28	26.14	11.57
705	144.64	9.38	0	0	105.91	74.45	0.38	0.02	25.4	26.26	15.42
708	152.27	6.08	0	0	181.93	74.11	0.41	0.03	26.18	27.07	25.04
711	146.72	11.74	0	0	108.92	74.02	0.49	0.02	25.28	26.15	12.5
714	151.55	13.25	0	0	66.47	73.44	0.32	0.03	26.27	27.2	11.43
717	148.25	5.87	0	0	179.32	73.29	0.4	0.02	25.38	26.29	25.24
720	155.22	12.54	0	0	88.7	73	0.41	0.03	25.95	26.9	12.38
723	156.36	11.58	0	0	118.03	72.58	0.52	0.02	25.47	26.41	13.51
726	162.36	10.18	0	0	127.81	72.31	0.49	0.02	25.61	26.58	15.94
729	156.1	10.36	0	0	114.64	71.96	0.46	0.02	24.83	25.79	15.06
732	154.11	11.9	0	0	74.33	71.67	0.34	0.02	25.26	26.25	12.95
735	156.59	13.78	0	0	75.27	71.24	0.39	0.03	25.72	26.72	11.36
738	161.52	8.41	0	0	152.85	70.9	0.48	0.02	25.55	26.54	19.2
741	161.35	8.88	0	0	149.38	70.7	0.5	0.02	25.41	26.41	18.17
744	161.74	15.25	0	0	102.55	70.32	0.59	0.02	25.63	26.66	10.61
747	167.5	10.17	0	0	119.91	69.86	0.45	0.03	26.06	27.13	16.47
750	174.41	8.06	0	0	160.52	69.69	0.47	0.03	26.52	27.61	21.65
753	168.41	14.27	0	0	88.75	69.32	0.47	0.03	25.96	27.03	11.8
756	164.22	12.42	0	0	88.62	68.89	0.42	0.02	24.92	25.97	13.23
759	171.62	9.56	0	0	139.3	68.58	0.5	0.02	25.69	26.77	17.95

762	168.85	10.08	0	0	129.66	68.29	0.49	0.02	25.42	26.51	16.75
765	168.05	13.26	0	0	81.81	67.96	0.41	0.02	25.49	26.6	12.67
768	169.89	11.4	0	0	93.9	67.53	0.4	0.02	25.43	26.53	14.91
771	170.48	9.58	0	0	134.14	67.28	0.48	0.02	25.69	26.78	17.8
774	177.38	12.28	0	0	107.6	66.93	0.47	0.03	26.74	27.88	14.45
777	180.56	14.09	0	0	107.1	66.55	0.54	0.03	26.61	27.75	12.81
780	172.44	9.88	0	0	124.08	66.12	0.46	0.02	25.48	26.57	17.46
783	171.69	11.18	0	0	114.11	65.92	0.48	0.02	25.33	26.43	15.35
786	183.69	14.89	0	0	111.3	65.43	0.6	0.03	26.36	27.5	12.34
789	183.42	10.38	0	0	176.1	65.08	0.68	0.02	25.61	26.72	17.68
792	177.35	9.97	0	0	140.17	64.78	0.54	0.02	24.94	26.02	17.79
795	182.95	14.58	0	0	95.42	64.45	0.52	0.02	25.6	26.73	12.55
798	185.16	14.27	0	0	97.73	63.95	0.53	0.02	25.41	26.55	12.97
801	187.02	6.59	0	0	228.97	63.64	0.57	0.02	25.39	26.54	28.37
804	188.48	11.68	0	0	145.93	63.46	0.64	0.02	25.34	26.48	16.14
807	196.33	13.18	0	0	138.17	62.96	0.67	0.02	25.85	27.03	14.89
810	197.8	12.65	0	0	136.23	62.69	0.64	0.02	25.91	27.11	15.64
813	197.17	15.46	0	0	114.48	62.18	0.65	0.02	25.96	27.18	12.75
816	197.67	14.49	0	0	114.92	61.79	0.62	0.02	25.55	26.77	13.64
819	198.76	10.99	0	0	180.84	61.33	0.74	0.02	25.66	26.89	18.08
822	198.94	10.5	0	0	163.47	61.1	0.63	0.02	25.84	27.08	18.95
825	200.54	17.95	0	0	94.29	60.64	0.63	0.02	25.75	26.99	11.17
828	208.07	14.9	0	0	127.53	60.1	0.69	0.03	26.36	27.65	13.96
831	205.33	10.29	0	0	215.32	59.76	0.81	0.02	26.14	27.41	19.95
834	202.85	12.83	0	0	153.02	59.43	0.73	0.02	25.67	26.92	15.8
837	201.7	15.97	0	0	130.54	58.99	0.79	0.02	25.25	26.5	12.63
840	211.6	10.13	0	0	242.45	58.53	0.88	0.03	26.52	27.83	20.88
843	207.53	11.56	0	0	217.11	58.33	0.93	0.02	25.74	27	17.96
846	202.58	17.13	0	0	120.6	57.81	0.79	0.02	24.82	26.06	11.83
849	205.94	13.25	0	0	176.66	57.37	0.87	0.02	25.57	26.85	15.55
852	202.78	11.65	0	0	172.56	57	0.75	0.02	25.41	26.68	17.41
855	207.18	16.34	0	0	154.06	56.63	0.94	0.02	25.59	26.84	12.68
858	209.08	14.97	0	0	192.49	56.06	1.06	0.02	25.81	27.08	13.97
861	209.13	9.35	0	0	262.21	55.76	0.9	0.02	26.02	27.28	22.37
864	210.04	17.18	0	0	155.66	55.41	0.99	0.02	25.88	27.13	12.22
867	204.52	14.27	0	0	174.87	54.8	0.95	0.02	25.1	26.34	14.34
870	207.3	8.29	0	0	353.27	54.58	1.08	0.02	25.77	27.02	25.01
873	206.18	17.16	0	0	167.67	54.2	1.06	0.02	25.9	27.16	12.02
876	204.41	16.9	0	0	165.86	53.61	1.04	0.02	25.71	26.96	12.1
879	199.95	10.79	0	0	233.57	53.23	0.95	0.02	25.36	26.58	18.53
882	201.8	11.99	0	0	228.88	52.91	1.01	0.02	25.99	27.23	16.83
885	200.93	17.19	0	0	160.13	52.48	1.01	0.02	26.05	27.29	11.69
888	192.75	8.46	0	0	320.71	51.97	1.02	0.02	25.45	26.64	22.78
891	190.41	11.24	0	0	227.08	51.9	0.96	0.02	25.52	26.68	16.94
894	191.76	20.57	0	0	131.67	51.25	1	0.02	25.92	27.08	9.32
897	186.64	7.95	0	0	314.84	50.81	0.94	0.02	25.53	26.65	23.47
900	182.54	9.53	0	0	290.91	50.68	1.05	0.02	25.36	26.45	19.16
903	187.92	14.86	0	0	182.84	50.21	1	0.02	26.12	27.21	12.64
906	190.22	12.08	0	0	229.48	49.85	1.01	0.02	26.26	27.34	15.74
909	188.37	9	0	0	321.38	49.48	1.05	0.03	26.44	27.53	20.94
912	174.62	13.29	0	0	178.94	49.26	0.89	0.02	25.53	26.58	13.14
915	174.98	13.82	0	0	181.88	48.71	0.94	0.02	25.69	26.7	12.66

918	176.49	7.71	0	0	375.71	48.47	1.06	0.03	26.41	27.42	22.89
921	162.7	11.25	0	0	229.56	48.19	0.98	0.02	25.38	26.36	14.46
924	162.92	13.46	0	0	181.24	47.81	0.93	0.02	25.42	26.35	12.1
927	160.33	8.83	0	0	288.16	47.43	0.98	0.02	25.16	26.05	18.15
930	162.35	7.1	0	0	397.02	47.25	1.05	0.02	25.95	26.85	22.85
933	161.31	14.36	0	0	154.15	46.94	0.82	0.02	25.99	26.86	11.24
936	159.92	9.31	0	0	269.16	46.48	0.93	0.02	26	26.85	17.17
939	158.24	6.66	0	0	380.71	46.37	0.94	0.02	26.04	26.87	23.76
942	158.35	11.27	0	0	176.58	46.03	0.74	0.02	26	26.82	14.06
945	163.14	9.8	0	0	199.55	45.73	0.72	0.03	26.39	27.21	16.64
948	155.91	8.25	0	0	285.65	45.44	0.86	0.03	26.41	27.25	18.91
951	149.34	9.74	0	0	202.82	45.21	0.73	0.03	26.32	27.12	15.33
954	145.4	12.61	0	0	149.62	44.85	0.71	0.02	25.96	26.74	11.53
957	142.55	5.97	0	0	344.82	44.52	0.77	0.02	25.89	26.63	23.87
960	139.18	7.07	0	0	291.38	44.44	0.78	0.02	25.52	26.25	19.68
963	144.41	11.7	0	0	148.8	44.07	0.65	0.03	26.1	26.82	12.34
966	146.63	7.68	0	0	244.66	43.8	0.7	0.03	26.11	26.83	19.1
969	139.7	7.69	0	0	250.83	43.59	0.71	0.03	26.3	27.03	18.17
972	135.58	9	0	0	126.73	43.32	0.42	0.03	26.14	26.84	15.07
975	133.58	8.59	0	0	176.89	43.06	0.57	0.02	25.77	26.45	15.54
978	133	5.4	0	0	347.4	42.82	0.69	0.03	26.55	27.23	24.63
981	126.41	10.24	0	0	148.97	42.68	0.58	0.02	25.61	26.24	12.35
984	125.66	8.35	0	0	228.14	42.25	0.72	0.02	25.72	26.35	15.04
987	124.48	5.43	0	0	199.13	42.19	0.41	0.03	26.05	26.66	22.92
990	114.8	6.7	0	0	188.72	41.9	0.48	0.02	25.72	26.3	17.13
993	112.66	7.42	0	0	132.2	41.79	0.37	0.03	25.97	26.54	15.18
996	110.52	6.77	0	0	208.87	41.47	0.53	0.03	26	26.55	16.32
999	105.65	3.6	0	0	232.19	41.4	0.31	0.03	26.02	26.55	29.36
1002	105	8.23	0	0	117.4	41.2	0.37	0.03	25.75	26.24	12.75
1005	105.23	4.43	0	0	214.74	40.96	0.36	0.02	25.67	26.15	23.75
1008	101.81	5.33	0	0	137.72	40.9	0.28	0.03	26.1	26.58	19.11
1011	99.07	5.81	0	0	171.06	40.64	0.37	0.03	26.28	26.74	17.06
1014	100.23	4.38	0	0	156.14	40.57	0.25	0.03	26.6	27.04	22.86
1017	99.55	3.03	0	0	309.82	40.38	0.35	0.03	26.11	26.54	32.87
1020	97.21	3.29	0	0	255.02	40.37	0.32	0.03	26.16	26.58	29.54
1023	94.57	10.38	0	0	49.59	40.14	0.19	0.03	26.65	27.07	9.11
1026	94.24	1.49	0	0	459.98	39.86	0.26	0.03	26.15	26.56	63.23
1029	92.01	1.95	0	0	377.52	39.99	0.28	0.03	25.95	26.34	47.28
1032	89.7	8.05	0	0	76.08	39.7	0.23	0.03	26.16	26.54	11.14
1035	91.85	0.55	-0.01	0	1128.38	39.59	0.23	0.03	26.26	26.64	168.02
1038	89.29	6.27	0	0	110.07	39.58	0.26	0.03	25.89	26.26	14.24
1041	84.15	6.45	0	0	56.39	39.25	0.14	0.03	26.24	26.61	13.06
1044	83.76	3.13	0	0	197.71	39.23	0.23	0.03	26.26	26.62	26.79
1047	85.38	2.33	0	0	241.56	39.05	0.21	0.03	25.93	26.29	36.67
1050	82.43	1.44	0	0	402.25	39.08	0.22	0.03	25.44	25.8	57.26
1053	83.36	9.95	0	0	50.09	38.9	0.19	0.03	26.31	26.68	8.38
1056	81.79	2.8	0	0	137.1	38.59	0.14	0.03	26.23	26.61	29.22
1059	83.7	0.34	-0.01	0	1249.79	38.71	0.16	0.03	26.29	26.66	244.85
1062	81	4.93	0	0	100.52	38.51	0.19	0.03	26.13	26.48	16.45
1065	77.47	3.67	0	0	109.39	38.45	0.15	0.03	26.17	26.53	21.13
1068	81.86	2.43	0	0	148.38	38.3	0.14	0.03	26.35	26.7	33.66
1071	79.45	1.84	0	0	181.03	38.29	0.13	0.03	26.02	26.37	43.11

1074	76.76	7.32	0	0	54.59	38.15	0.15	0.03	26.21	26.57	10.49
1077	74.05	3.58	0	0	107.73	37.92	0.15	0.03	25.85	26.19	20.66
1080	76.29	-0.51	0.01	0	-948.71	37.93	0.18	0.03	26.15	26.5	-148.7
1083	76.86	8.46	0	0	36.36	37.86	0.12	0.03	26.22	26.56	9.09
1086	75.16	2.32	0	0	160.35	37.53	0.14	0.03	26.36	26.7	32.44
1089	75.38	-1.97	0	0	-199.12	37.71	0.15	0.03	25.91	26.26	-38.28
1092	78.29	5.83	0	0	60.06	37.56	0.13	0.03	26.67	27.03	13.44
1095	74.05	3.45	0	0	92.23	37.43	0.12	0.03	26.28	26.63	21.43
1098	73.01	3.64	0	0	85.49	37.35	0.12	0.03	26.28	26.65	20.08
1101	74.03	0.78	-0.01	0	583.09	37.23	0.17	0.03	26.1	26.46	95.3
1104	72.18	2.43	0	0	134.59	37.27	0.13	0.03	25.7	26.04	29.74
1107	73.89	6.84	0	0	49.19	37.06	0.13	0.03	26.2	26.55	10.81
1110	74.85	2.42	0	0	108.6	36.92	0.1	0.03	26.14	26.5	30.95
1113	73.27	-1.77	0	0	-199.54	36.92	0.13	0.03	25.93	26.3	-41.39
1116	72.29	3.31	0	0	110.64	36.96	0.14	0.03	25.73	26.09	21.81
1119	77.34	6.81	0	0	58.92	36.73	0.15	0.03	26	26.38	11.36
1122	75.12	-0.46	0.01	0	-951.38	36.62	0.17	0.03	26.04	26.43	-163.51
1125	72.76	1.38	0	0	213.08	36.7	0.11	0.03	26.63	27.03	52.91
1128	72.35	6.92	0	0	37.5	36.51	0.1	0.03	25.88	26.26	10.45
1131	74.17	2.71	0	0	118.06	36.35	0.12	0.03	25.82	26.21	27.33
1134	72.51	-1.59	0	0	-235.44	36.35	0.14	0.03	26.06	26.47	-45.54
1137	73.72	3.28	0	0	140.61	36.38	0.17	0.03	26.1	26.5	22.45
1140	74.74	6.74	0	0	45.38	36.17	0.12	0.03	25.56	25.96	11.09
1143	76.24	-0.48	0.01	0	-790.21	36.05	0.14	0.03	25.98	26.39	-159.82
1146	78.3	2.4	0	0	235.2	36.13	0.21	0.03	26.86	27.3	32.61
1149	77.73	7.18	0	0	44.12	35.89	0.12	0.03	25.96	26.39	10.82
1152	77.17	-2.4	0	0	-155.18	35.79	0.14	0.03	26.3	26.74	-32.15
1155	73.41	2.76	0	0	127.12	35.94	0.13	0.03	26.11	26.55	26.6
1158	72.04	7.25	0	0	51.67	35.63	0.14	0.03	25.97	26.4	9.94
1161	73.86	-0.55	0.01	0	-625.9	35.59	0.13	0.03	25.33	25.77	-134.54
1164	75.53	1.2	0	0	379.72	35.6	0.17	0.03	25.8	26.24	63.01
1167	73	4.03	0	0	89.73	35.5	0.14	0.03	25.8	26.23	18.12
1170	75.1	6.58	0	0	46.38	35.37	0.12	0.03	25.87	26.31	11.42
1173	75.93	-1.88	0	0	-234.92	35.18	0.17	0.03	25.84	26.28	-40.31
1176	71.47	1.27	0	0	410.63	35.39	0.2	0.03	26.01	26.46	56.08
1179	72.49	12.09	0	0	31.61	35.06	0.14	0.03	26.34	26.8	6
1182	74.59	-2.61	0	0	-137.67	34.84	0.14	0.03	25.48	25.93	-28.62
1185	75.58	-0.43	0.01	0	-1058.03	35.1	0.17	0.03	25.85	26.29	-175.23
1188	73.61	7.71	0	0	43.5	34.82	0.13	0.03	25.69	26.16	9.55
1191	71.51	2.42	0	0	95.97	34.73	0.09	0.03	25.64	26.09	29.53
1194	68.01	1.6	0	0	218.1	34.65	0.13	0.03	25.93	26.39	42.63
1197	67.74	1.64	0	0	233.96	34.62	0.15	0.03	25.99	26.43	41.25
1200	72.15	4.49	0	0	65.56	34.54	0.11	0.03	26.63	27.08	16.06
1203	69.45	-0.41	0.01	0	-1051.91	34.4	0.16	0.03	26.12	26.57	-168.49
1206	65.37	2.34	0	0	150.69	34.51	0.14	0.03	25.68	26.12	27.89
1209	64.82	7.26	0	0	38.6	34.25	0.11	0.03	25.72	26.15	8.93
1212	69.57	-3.01	0	0	-110.06	34.17	0.12	0.03	26.3	26.73	-23.14
1215	67.28	0.43	-0.01	0	592.29	34.34	0.1	0.03	25.8	26.23	155.44
1218	62.71	6.23	0	0	43.46	34.13	0.1	0.03	26.07	26.49	10.07
1221	63.23	0.74	-0.01	0	418.21	34.05	0.12	0.03	26.15	26.57	85.37
1224	64.62	1.02	0	0	244.2	34.05	0.09	0.03	26.24	26.65	63.61
1227	60.67	3.31	0	0	100.16	33.97	0.13	0.03	26.14	26.55	18.31

1230	58.37	3.89	0	0	70.53	33.86	0.1	0.03	26	26.39	14.99
1233	61.9	-0.79	0	0	-335.29	33.77	0.1	0.03	26.29	26.69	-78.74
1236	58.98	0.4	-0.01	0	796.87	33.87	0.12	0.03	25.64	26.02	146.92
1239	58.15	7.33	0	0	32.21	33.71	0.09	0.03	26.3	26.68	7.93
1242	58.12	0.18	-0.03	0	843.03	33.52	0.06	0.03	25.82	26.21	330.82
1245	60.99	-1.17	0	0	-274.92	33.66	0.12	0.03	26.22	26.58	-52.26
1248	58.38	5.11	0	0	51.6	33.54	0.1	0.03	25.83	26.2	11.43
1251	56.33	1.38	0	0	106.07	33.42	0.06	0.03	26.13	26.5	40.82
1254	57.09	0.19	-0.02	0	1460.93	33.44	0.11	0.03	26.08	26.43	297.3
1257	55.11	0.87	-0.01	0	276.7	33.39	0.09	0.03	26.26	26.6	63.2
1260	51.7	3.93	0	0	85.6	33.37	0.13	0.03	25.53	25.87	13.16
1263	53.68	5.88	0	0	38.14	33.17	0.08	0.03	26.09	26.43	9.12
1266	53.49	-1.61	0	0	-155.28	33.08	0.09	0.03	26.19	26.53	-33.24
1269	48.34	1.64	0	0	157.85	33.19	0.1	0.03	25.87	26.2	29.39
1272	50	5.64	0	0	38.96	32.98	0.08	0.03	26.12	26.46	8.87
1275	52.79	-0.61	0.01	0	-289.14	32.92	0.06	0.03	26.75	27.09	-87.22
1278	47.84	1.05	0	0	278.33	32.97	0.11	0.03	26.14	26.47	45.37
1281	47.14	1.68	0	0	131.47	32.86	0.08	0.03	26.32	26.64	28.05
1284	50.53	2.06	0	0	85.9	32.87	0.07	0.03	26.58	26.9	24.47
1287	48.43	-0.81	0.01	0	-258.11	32.76	0.08	0.03	26.37	26.68	-59.84
1290	48.82	0.99	0	0	197.27	32.88	0.07	0.03	26.36	26.66	49.21
1293	51.74	6.71	0	0	24.26	32.68	0.06	0.03	26.21	26.51	7.71
1296	50.17	-3.94	0	0	-61.85	32.59	0.09	0.03	25.83	26.14	-12.74
1299	44.87	0.33	-0.01	0	465.03	32.81	0.06	0.03	25.71	26.02	136.79
1302	47.24	7.3	0	0	15.47	32.55	0.04	0.03	26.23	26.55	6.47
1305	48.8	-2.94	0	0	-80.45	32.49	0.09	0.03	26.57	26.88	-16.6
1308	43.57	1.09	0	0	218.19	32.63	0.09	0.03	26.28	26.57	39.96
1311	42.64	5.59	0	0	35.21	32.42	0.07	0.03	25.96	26.26	7.63
1314	45.04	-1.61	0	0	-188.8	32.38	0.11	0.03	26.21	26.51	-28.03
1317	44.59	-0.11	0.04	0	-1973.96	32.46	0.08	0.03	26	26.29	-423.95
1320	44.9	3.72	0	0	42.95	32.36	0.06	0.03	26.21	26.5	12.07
1323	48.32	1.51	0	0	112.62	32.28	0.06	0.03	26.49	26.78	31.96
1326	47.71	-0.43	0.01	0	-873.75	32.27	0.14	0.03	26.03	26.34	-110.44
1329	45.64	1.37	0	0	199.65	32.28	0.1	0.03	26.01	26.32	33.34
1332	44.57	4.65	0	0	53.09	32.18	0.09	0.03	25.93	26.26	9.59
1335	45.15	0.25	-0.02	0	805.31	32.05	0.08	0.03	26.39	26.71	180.12
1338	39.39	-1.31	0	0	-177.76	32.15	0.09	0.03	25.88	26.19	-30.14
1341	37.36	5.61	0	0	45.69	32.07	0.1	0.03	25.74	26.05	6.66
1344	39.01	1.44	0	0	160.97	31.89	0.09	0.03	25.92	26.23	27.09
1347	38.51	-3.34	0	0	-100.28	31.99	0.13	0.03	26.51	26.81	-11.51
1350	36.43	6.11	0	0	41.1	31.99	0.09	0.03	26.52	26.81	5.96
1353	37.86	3.19	0	0	63.77	31.71	0.08	0.03	26.41	26.71	11.85
1356	38.63	-4.27	0	0	-50.3	31.83	0.08	0.03	26.52	26.81	-9.05
1359	34.88	2.96	0	0	104.31	31.86	0.12	0.03	26.29	26.57	11.77
1362	35.69	3.51	0	0	67.64	31.69	0.09	0.03	25.95	26.22	10.18
1365	38.51	1.31	0	0	169.92	31.68	0.08	0.03	26.18	26.45	29.46
1368	35.8	-0.24	0.02	0	-1370.62	31.61	0.12	0.03	26.04	26.3	-150.1
1371	34.43	-0.72	0.01	0	-385.57	31.68	0.11	0.03	26.16	26.42	-47.64
1374	37.41	4.48	0	0	39.07	31.62	0.07	0.03	26.15	26.41	8.34
1377	37.51	-0.26	0.02	0	-972.19	31.47	0.1	0.03	26.3	26.58	-141.83
1380	34.66	0.06	-0.08	0	5404.09	31.6	0.11	0.03	25.91	26.19	622.45
1383	34.96	5.46	0	0	55.47	31.44	0.11	0.03	26.24	26.52	6.41

1386	35.89	-2.87	0	0	-106.5	31.36	0.12	0.03	26	26.27	-12.51
1389	33.53	-0.92	0	0	-327.65	31.54	0.11	0.03	26.41	26.69	-36.56
1392	33.26	4.64	0	0	62.16	31.39	0.11	0.03	26.23	26.51	7.17
1395	35.07	-1.86	0	0	-145.53	31.35	0.1	0.03	26.11	26.38	-18.85
1398	34.35	0.4	-0.01	0.01	1207.44	31.45	0.18	0.03	26.09	26.36	85.72
1401	31.89	3.96	0	0	81.78	31.31	0.12	0.03	26.36	26.64	8.05
1404	33.2	-0.99	0	0	-272.52	31.27	0.1	0.03	25.91	26.18	-33.46
1407	33.76	-0.65	0.01	-0.02	-553.75	31.34	0.14	0.03	25.99	26.26	-51.8
1410	30.51	0.73	-0.01	0.02	395.42	31.3	0.11	0.03	26.53	26.81	41.69
1413	29.91	2.37	0	0.01	81.76	31.29	0.07	0.03	26.13	26.4	12.63
1416	32.49	3.24	0	0	81.31	31.16	0.1	0.03	26.21	26.48	10.04
1419	31.63	-2.26	0	0	-179.48	31.14	0.15	0.03	26.29	26.56	-14.01
1422	29.2	0.95	0	0	222.8	31.24	0.08	0.03	26.15	26.42	30.85
1425	27.6	5.03	0	0	38.17	31.08	0.07	0.03	26.34	26.62	5.49
1428	30.79	-3.19	0	-0.01	-101.12	31.02	0.12	0.03	26.2	26.46	-9.66
1431	30.27	0.61	-0.01	0.05	466.16	31.19	0.11	0.03	25.84	26.1	49.28
1434	26.78	7.25	0	0	27.72	30.96	0.08	0.03	26.03	26.3	3.7
1437	26.51	-1.5	0	-0.01	-160.72	30.86	0.09	0.03	25.95	26.21	-17.72
1440	27.38	-2.69	0	-0.01	-78.77	31	0.08	0.03	25.97	26.23	-10.17
1443	25.5	4.75	0	0	46.06	30.96	0.08	0.03	25.93	26.2	5.37
1446	24.1	-0.84	0.01	-0.04	-241.84	30.81	0.08	0.03	26.13	26.39	-28.76
1449	26.99	-2.58	0	-0.01	-130.34	30.98	0.13	0.03	25.71	25.96	-10.46
1452	26.74	4.41	0	0.01	65.52	30.9	0.11	0.03	25.61	25.85	6.06
1455	24.87	-0.29	0.01	-0.14	-834.94	30.8	0.09	0.03	25.67	25.91	-87.03
1458	23.93	-3.36	0	-0.01	-73.09	30.91	0.09	0.03	25.87	26.11	-7.12
1461	26.56	2.78	0	0.02	127.9	30.94	0.14	0.03	26.12	26.37	9.54
1464	26.75	1.36	0	0.06	194.69	30.79	0.1	0.03	26.42	26.68	19.69
1467	23.45	-0.37	0.01	-0.21	-485.48	30.86	0.07	0.03	25.38	25.64	-63.2
1470	23.07	0.61	-0.01	0.12	584.37	30.8	0.14	0.03	26.08	26.34	37.81
1473	22.52	-1.81	0	-0.06	-210.12	30.84	0.15	0.03	25.82	26.07	-12.42
1476	21.7	3.64	0	0.05	90.75	30.85	0.12	0.03	26.36	26.61	5.96
1479	19.76	1.73	0	0.08	203.25	30.67	0.13	0.03	26.02	26.25	11.43
1482	23.27	-3.17	0	-0.04	-119.14	30.77	0.14	0.03	26.75	26.99	-7.33
1485	23.4	3.07	0	0.03	122.64	30.79	0.14	0.03	26.36	26.6	7.62
1488	20.78	1.89	0	0.06	153.18	30.63	0.11	0.03	26.16	26.39	11
1491	19.51	-0.8	0	-0.16	-440.16	30.69	0.13	0.03	26.49	26.73	-24.45
1494	21.2	1.94	0	0.07	169.87	30.64	0.13	0.03	26.1	26.34	10.92
1497	19.53	1.86	0	0.11	181.94	30.59	0.13	0.03	26.34	26.57	10.51
1500	18.12	2.15	0	0.1	152.17	30.53	0.12	0.03	26.26	26.49	8.42
1503	17.53	-0.37	0.01	-0.35	-1082.5	30.48	0.16	0.03	25.89	26.12	-46.82
1506	19.17	-4.32	0	-0.03	-68.36	30.56	0.11	0.03	25.82	26.05	-4.43
1509	18.49	1.16	0	0.19	348.39	30.67	0.16	0.03	25.63	25.86	15.99
1512	15.2	5.15	0	0.04	50.55	30.51	0.1	0.03	25.9	26.12	2.95
1515	15.65	-5.21	0	-0.04	-56.02	30.46	0.11	0.03	26.09	26.32	-3
1518	17.84	-1.19	0.01	-0.17	-347.04	30.72	0.15	0.03	26.93	27.16	-14.99
1521	17.38	6.03	0	0.04	52.21	30.51	0.12	0.03	26.33	26.54	2.88
1524	13.92	-2.28	0	-0.1	-160.22	30.47	0.14	0.03	26.48	26.69	-6.1
1527	14.51	0.01	-0.52	23.22	37575.71	30.58	0.14	0.03	25.85	26.06	1451.16
1530	15.74	0.01	-0.46	23.43	36339.86	30.47	0.14	0.03	25.75	25.97	1573.76

Paper (stacked flat)**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	214.42
Time to Peak Heat Release Rate (s):	23.00
Total Heat Release (MJ/m ²):	54.09
60 s Average Heat Release Rate (kW/m ²):	149.48
Total Mass Loss (g):	41.20
Average Mass Loss Rate (g/s):	0.064
Average Effective Heat of Combustion (MJ/kg):	13.13
Average Smoke Extinction Area (m ² /kg):	61.05
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0373

Specimen:

Initial mass (g):	371.8
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	9
Time to flameout (s):	704

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-0.15	0.01	-0.4	-0.03	0	371.71	0	0.03	25.51	25.7	-14.52
5	-0.58	0.01	-0.4	-0.04	0	371.74	0	0.03	25.77	25.96	-57.81
8	3.46	0.16	-0.02	0.01	2758.2	371.82	0.17	0.03	25.17	25.36	21.66
11	14.75	14.41	0	0	7.52	371.65	0.04	0.03	24.52	24.73	1.02
14	59.91	19.49	0	0	27.66	371.03	0.23	0.02	23.32	23.78	3.07
17	115.72	12.44	0	0.01	111.93	370.57	0.56	0.03	23.97	24.69	9.3
20	194	15.61	0	0.01	20.37	370.23	0.13	0.03	24.42	25.27	12.43
23	214.42	11.09	0	0.01	0	369.68	0	0.03	24.8	25.79	19.34
26	207.46	7.02	0	0.01	0	369.55	0	0.03	24.69	25.72	29.53
29	190.23	17.78	0	0.01	0	369.16	0	0.03	24.94	26.03	10.7
32	177.27	15.62	0	0.01	0	368.57	0	0.03	24.6	25.72	11.35
35	171.09	8.76	0	0.02	0	368.26	0	0.03	24.81	25.95	19.52
38	172.16	7.64	0	0.03	2.26	368	0.01	0.03	25.08	26.23	22.54
41	166.6	14.51	0	0.01	0	367.75	0	0.03	24.91	26.05	11.48
44	155.76	10.31	0	0.02	0	367.21	0	0.03	24.74	25.86	15.11
47	155.34	3.94	0	0.06	0	367.14	0	0.03	25.38	26.53	39.43
50	151.8	14.96	0	0.01	0.59	366.85	0	0.03	24.74	25.85	10.15
53	155.07	18.23	0	0.01	5.63	366.3	0.04	0.03	25.46	26.59	8.51
56	159.84	10.08	0	0.03	0	365.84	0	0.03	25.72	26.86	15.85
59	164.09	9.38	0	0.03	0	365.64	0	0.03	25	26.12	17.49
62	169.29	13.85	0	0.02	3.62	365.24	0.02	0.03	25.25	26.36	12.23
65	166.77	10.78	0	0.03	7.38	364.86	0.03	0.03	24.83	25.94	15.47
68	174.06	13.76	0	0.02	0	364.56	0	0.03	25.97	27.11	12.65
71	163.31	14.93	0	0.02	0.85	364.05	0	0.03	24.85	25.93	10.94
74	164.35	12.02	0	0.03	8.75	363.69	0.04	0.03	25.25	26.36	13.68
77	168.04	7.92	0	0.05	2.24	363.33	0.01	0.02	24.86	25.95	21.23
80	171.21	12.6	0	0.03	6.39	363.15	0.03	0.03	25.18	26.28	13.58
83	166.86	17.03	0	0.02	3.88	362.58	0.02	0.03	25.4	26.48	9.8
86	166.07	5.99	0	0.06	0.33	362.24	0	0.03	25.44	26.52	27.72
89	161.28	10.49	0	0.03	2.9	362.12	0.01	0.02	24.75	25.78	15.37
92	157.13	14.65	0	0.02	0	361.6	0	0.02	24.86	25.87	10.72
95	161.32	10.47	0	0.04	14.11	361.3	0.05	0.03	26.05	27.1	15.41
98	157.35	9	0	0.04	0	360.96	0	0.03	25.66	26.67	17.48
101	150.81	8.42	0	0.04	6.19	360.75	0.02	0.03	25.37	26.34	17.91
104	144.63	13.05	0	0.02	12.74	360.42	0.06	0.03	25.28	26.23	11.09
107	143.23	5.51	0	0.05	6.19	360.04	0.01	0.03	25.78	26.72	26.01
110	144.27	11.46	0	0.03	9.1	360.01	0.04	0.03	26.15	27.08	12.59
113	136.13	14	0	0.02	0	359.38	0	0.03	25.43	26.32	9.72
116	135.11	1.88	0	0.13	75.98	359.26	0.05	0.03	25.55	26.42	72.04
119	133.37	12.06	0	0.02	6.4	359.12	0.03	0.03	25.6	26.46	11.06
122	134.72	10.13	0	0.02	3.78	358.61	0.01	0.03	26.14	26.98	13.3
125	123.7	5.01	0	0.04	5.66	358.54	0.01	0.03	25.36	26.17	24.72
128	119.95	6.62	0	0.03	0	358.26	0	0.03	25.38	26.16	18.12
131	120.91	9.46	0	0.02	11.56	358.13	0.04	0.03	25.83	26.6	12.77
134	117.97	9.81	0	0.02	11.97	357.72	0.04	0.03	25.7	26.45	12.03
137	113.23	7.07	0	0.03	0	357.56	0	0.03	25.37	26.1	16.01

140	116.51	11.45	0	0.02	1.06	357.25	0	0.03	25.68	26.41	10.18
143	116.04	8.98	0	0.03	15.25	356.92	0.05	0.03	25.66	26.38	12.93
146	111.85	2.77	0	0.09	18.28	356.73	0.02	0.03	25.61	26.3	40.43
149	111.56	6.78	0	0.04	2.6	356.68	0.01	0.03	25.79	26.47	16.47
152	111.96	14.45	0	0.02	5.9	356.3	0.03	0.03	25.84	26.5	7.75
155	108.42	8.08	0	0.04	0	355.92	0	0.03	25.72	26.38	13.41
158	103.52	1.1	-0.01	0.27	8.94	355.82	0	0.03	25.15	25.78	93.75
161	107.01	6.7	0	0.04	0	355.76	0	0.03	25.92	26.55	15.97
164	107.31	11.24	0	0.02	4.88	355.43	0.02	0.03	26.04	26.65	9.55
167	104.69	5.18	0	0.04	13.14	355.16	0.03	0.03	26.18	26.78	20.21
170	97.88	2.28	0	0.11	11.46	355.09	0.01	0.03	25.84	26.41	42.95
173	96.6	9.59	0	0.03	1.01	354.95	0	0.03	25.64	26.2	10.07
176	96.87	8.06	0	0.03	0	354.58	0	0.03	25.69	26.25	12.03
179	95.94	6.34	0	0.04	0	354.48	0	0.03	26.07	26.62	15.13
182	96.36	7.96	0	0.03	4.02	354.17	0.01	0.03	25.81	26.36	12.1
185	96.32	5.58	0	0.04	0	354.02	0	0.03	25.84	26.37	17.25
188	91.57	4.45	0	0.06	0	353.83	0	0.03	25.83	26.36	20.55
191	90.67	7.01	0	0.03	0	353.73	0	0.03	25.81	26.32	12.93
194	93.03	11.16	0	0.02	0	353.4	0	0.03	26.34	26.85	8.33
197	90.58	5.83	0	0.04	1.43	353.13	0	0.03	25.97	26.47	15.55
200	86.12	0.1	-0.04	2.12	0	353.05	0	0.03	25.54	26.03	849.69
203	88.08	4.52	0	0.05	0	353.04	0	0.03	25.79	26.28	19.47
206	89.88	12.71	0	0.02	0	352.75	0	0.03	26	26.48	7.07
209	86.96	9.45	0	0.02	0	352.37	0	0.03	25.72	26.19	9.2
212	86.71	-0.44	0.01	-0.51	0	352.23	0	0.03	25.79	26.26	-199.01
215	87.04	8.88	0	0.03	0	352.26	0	0.03	25.99	26.45	9.8
218	82.28	11.89	0	0.02	0	351.74	0	0.03	25.29	25.73	6.92
221	80.59	-0.09	0.05	-2.75	0	351.65	0	0.03	25.71	26.16	-933.77
224	81.94	7.3	0	0.03	0	351.62	0	0.03	25.49	25.92	11.22
227	83.3	10.57	0	0.02	0	351.23	0	0.03	25.56	25.99	7.88
230	78.51	2.54	0	0.08	0	351.06	0	0.03	24.97	25.4	30.87
233	80.89	4.72	0	0.05	0	351.01	0	0.03	25.61	26.05	17.13
236	83.26	9.77	0	0.02	0	350.76	0	0.03	25.79	26.23	8.53
239	80.35	8.64	0	0.03	0	350.48	0	0.03	25.31	25.74	9.3
242	78.65	-0.15	0.03	-1.55	0	350.29	0	0.03	25.69	26.11	-539.18
245	76.58	5.43	0	0.04	0	350.38	0	0.03	25.72	26.15	14.1
248	76.98	10.3	0	0.02	0	349.96	0	0.03	25.99	26.42	7.47
251	73.71	3.8	0	0.06	0	349.85	0	0.03	25.6	26.01	19.39
254	70.96	4.8	0	0.04	0	349.69	0	0.03	25.65	26.06	14.79
257	73.26	6.2	0	0.03	0	349.55	0	0.03	25.45	25.86	11.82
260	75.34	7	0	0.03	0	349.33	0	0.03	25.52	25.93	10.77
263	70.87	3.08	0	0.06	0	349.16	0	0.03	24.96	25.36	22.98
266	74.13	5.75	0	0.03	0	349.09	0	0.03	25.96	26.37	12.9
269	74.78	9.4	0	0.02	0	348.81	0	0.03	25.81	26.22	7.96
272	74.07	1.2	0	0.17	0	348.61	0	0.03	25.64	26.04	61.9
275	71.86	5.51	0	0.03	0	348.66	0	0.03	25.44	25.84	13.04
278	70.52	8.68	0	0.02	0	348.28	0	0.03	25.18	25.58	8.12
281	74.56	3.83	0	0.05	0	348.19	0	0.03	26.15	26.57	19.46
284	73.76	3.17	0	0.07	0	348.03	0	0.03	26.19	26.61	23.29
287	70.87	4.68	0	0.04	12.28	347.98	0.02	0.03	25.85	26.25	15.13
290	73.07	10.8	0	0.02	5.07	347.72	0.02	0.03	25.8	26.21	6.77
293	72.19	6.16	0	0.03	0	347.41	0	0.03	25.24	25.64	11.72

296	70.26	4.09	0	0.05	0	347.34	0	0.03	25.71	26.12	17.18
299	70.73	2.68	0	0.08	57.4	347.15	0.06	0.03	26.05	26.47	26.36
302	70.11	7.07	0	0.03	27.33	347.14	0.07	0.03	25.39	25.79	9.91
305	70.04	4.97	0	0.04	36.65	346.77	0.07	0.03	25.78	26.19	14.08
308	66.74	2	0	0.1	93.3	346.84	0.07	0.03	25.55	25.95	33.37
311	70.12	8.8	0	0.02	26.19	346.59	0.09	0.03	26.18	26.6	7.96
314	68.19	6.97	0	0.03	44.97	346.37	0.12	0.03	25.59	26	9.78
317	66.97	3	0	0.07	109.16	346.19	0.12	0.03	25.95	26.35	22.33
320	67.74	2.95	0	0.07	127.84	346.16	0.14	0.03	25.99	26.39	22.97
323	68.12	8.38	0	0.02	54.39	345.97	0.18	0.03	25.42	25.8	8.13
326	66.48	7.22	0	0.03	63.56	345.71	0.18	0.03	25.77	26.16	9.21
329	64.44	1.53	0	0.15	326.38	345.57	0.19	0.03	25.6	25.99	42.24
332	65.31	4.33	0	0.05	129.97	345.55	0.22	0.03	25.61	26	15.1
335	66.58	10	0	0.02	56.66	345.29	0.22	0.03	25.59	25.98	6.66
338	63.19	3.84	0	0.06	162.06	345.03	0.24	0.03	25.19	25.57	16.47
341	62.34	3.29	0	0.06	203.08	345.03	0.26	0.03	25.32	25.69	18.94
344	63.48	4.35	0	0.05	155.33	344.82	0.26	0.03	25.39	25.77	14.59
347	63.27	7.55	0	0.03	103.08	344.75	0.3	0.03	25.3	25.68	8.38
350	63.52	4.55	0	0.05	190.16	344.41	0.33	0.03	25.93	26.31	13.96
353	66.26	3.62	0	0.06	237.1	344.47	0.32	0.03	26.09	26.48	18.29
356	63.48	7.88	0	0.03	92.51	344.16	0.28	0.03	25.38	25.76	8.06
359	61.87	0.97	-0.01	0.22	927.82	344.06	0.35	0.03	25.62	26.01	63.91
362	63.38	5.74	0	0.04	150.35	344.02	0.33	0.03	25.7	26.09	11.04
365	64.99	9.97	0	0.02	85.86	343.72	0.33	0.03	25.56	25.95	6.52
368	64.34	2.82	0	0.08	254.76	343.51	0.28	0.03	25.75	26.14	22.79
371	61.5	-0.29	0.02	-0.74	-2679.92	343.52	0.31	0.03	25.28	25.66	-209.48
374	61.82	6.73	0	0.04	124.12	343.45	0.32	0.03	25.47	25.85	9.18
377	63.95	10.61	0	0.02	86.55	343.15	0.35	0.03	25.76	26.15	6.03
380	62.37	0.81	-0.01	0.28	1086.91	342.91	0.34	0.03	25.84	26.21	76.77
383	60.56	0.05	-0.08	4.54	16783.61	343.03	0.34	0.03	25.5	25.87	1166
386	61.49	10.58	0	0.02	82.11	342.83	0.33	0.03	25.72	26.09	5.81
389	61.38	7.72	0	0.03	111.84	342.49	0.33	0.03	25.47	25.84	7.95
392	59.23	-0.42	0.01	-0.58	-2049.46	342.4	0.33	0.03	25.82	26.19	-141.07
395	59.4	2.74	0	0.09	333.68	342.44	0.35	0.03	25.58	25.95	21.69
398	60.28	9.09	0	0.03	99.09	342.22	0.35	0.03	25.48	25.85	6.63
401	61.45	2.54	0	0.1	297.62	341.98	0.29	0.03	25.54	25.91	24.17
404	57.12	5.18	0	0.05	173.84	342	0.35	0.03	25.31	25.68	11.02
407	60.32	7.25	0	0.03	136.94	341.67	0.37	0.03	26.11	26.5	8.32
410	61.18	4.58	0	0.05	203.08	341.6	0.35	0.03	25.9	26.29	13.36
413	58.23	2.58	0	0.09	364.66	341.39	0.36	0.03	25.42	25.79	22.56
416	57.36	5.43	0	0.05	166	341.41	0.35	0.03	25.58	25.95	10.57
419	59.01	9.6	0	0.03	98.12	341.06	0.36	0.03	25.77	26.14	6.15
422	58.54	1.84	0	0.13	479.46	340.92	0.34	0.03	25.31	25.67	31.82
425	57.83	-0.2	0.02	-1.15	-4698.01	340.91	0.36	0.03	26.08	26.45	-288.91
428	55.07	7.13	0	0.03	136.63	340.86	0.38	0.03	25.37	25.73	7.72
431	57.91	8.83	0	0.03	102.22	340.52	0.35	0.03	25.28	25.64	6.56
434	59.28	-0.34	0.02	-0.64	-2779.39	340.41	0.36	0.03	25.66	26.02	-175.35
437	57.47	4.7	0	0.05	201.67	340.44	0.36	0.03	26.09	26.46	12.23
440	55.75	8.11	0	0.03	125.79	340.13	0.39	0.03	25.97	26.33	6.87
443	57.7	5.13	0	0.05	206.3	340.01	0.4	0.03	26	26.36	11.24
446	56.97	1.85	0	0.14	551.78	339.83	0.39	0.03	25.6	25.96	30.77
449	54.82	2.63	0	0.1	342.45	339.86	0.35	0.03	25.31	25.67	20.85

452	56.47	8.99	0	0.03	110.64	339.63	0.39	0.03	25.37	25.74	6.28
455	56.71	6.47	0	0.04	148.66	339.38	0.37	0.03	25.46	25.83	8.76
458	54.7	3.3	0	0.08	283.8	339.25	0.36	0.03	25.49	25.85	16.56
461	53.23	0.59	-0.01	0.41	1752.85	339.18	0.4	0.03	25.33	25.69	90.6
464	57.23	6.9	0	0.03	155.13	339.16	0.41	0.03	26.02	26.39	8.3
467	57.09	6.62	0	0.04	146.65	338.81	0.38	0.03	25.36	25.72	8.62
470	54.06	2.5	0	0.1	397.85	338.79	0.38	0.03	25.47	25.84	21.63
473	55.81	8.32	0	0.03	124.02	338.59	0.4	0.03	25.72	26.09	6.71
476	57.26	7.45	0	0.04	144.79	338.33	0.41	0.03	25.98	26.35	7.69
479	55.05	1.58	0	0.18	629.07	338.18	0.39	0.03	25.1	25.46	34.9
482	53.78	1.92	0	0.14	552.8	338.19	0.41	0.03	25.35	25.71	28.08
485	55.81	6.2	0	0.04	158.75	338.04	0.38	0.03	25.41	25.77	9.01
488	56.25	6.49	0	0.04	162.72	337.85	0.41	0.03	25.13	25.48	8.67
491	55.62	1.03	-0.01	0.26	942.51	337.69	0.37	0.03	25.9	26.27	54.04
494	54.17	3.4	0	0.08	336.22	337.73	0.43	0.03	26.03	26.4	15.95
497	57.15	8.45	0	0.03	127.7	337.46	0.41	0.03	25.82	26.19	6.77
500	58.58	5.38	0	0.05	180.48	337.28	0.37	0.03	26.18	26.55	10.88
503	56.67	3.62	0	0.07	263.13	337.14	0.36	0.03	25.93	26.3	15.67
506	55.7	2.85	0	0.09	353.15	337.06	0.38	0.03	25.8	26.17	19.54
509	57.85	6.27	0	0.04	159.26	336.94	0.38	0.03	26.04	26.41	9.23
512	57.59	3.46	0	0.08	291.78	336.72	0.38	0.03	26.07	26.44	16.65
515	54.54	4.21	0	0.06	238.49	336.71	0.39	0.03	25.37	25.74	12.97
518	56.31	5.52	0	0.05	169.97	336.46	0.36	0.03	25.49	25.86	10.21
521	57.88	4.76	0	0.06	198.07	336.39	0.36	0.03	25.82	26.2	12.16
524	55.86	2.67	0	0.1	353.37	336.19	0.36	0.03	25.62	26	20.94
527	55.03	4.76	0	0.06	217.03	336.2	0.4	0.03	25.7	26.08	11.56
530	57.36	9.65	0	0.03	97.96	335.88	0.37	0.03	25.51	25.89	5.94
533	55.32	4.41	0	0.06	201.13	335.69	0.35	0.03	25.32	25.69	12.53
536	54.39	1.49	0	0.18	505.62	335.61	0.29	0.03	25.42	25.8	36.45
539	56.44	2.35	0	0.11	395.33	335.57	0.36	0.03	25.36	25.75	24
542	58.59	8.8	0	0.03	104.58	335.43	0.34	0.03	26.32	26.71	6.66
545	56.05	3.29	0	0.09	277.32	335.13	0.34	0.03	26.09	26.48	17.02
548	54.42	-2.26	0	-0.12	-365.82	335.23	0.32	0.03	25.38	25.75	-24.1
551	54.67	9.85	0	0.03	81.01	335.14	0.31	0.03	25.11	25.48	5.55
554	53.78	5.2	0	0.05	152.07	334.75	0.3	0.03	25.62	26	10.35
557	56.44	1.43	0	0.2	565.91	334.83	0.3	0.03	26.22	26.6	39.42
560	57.31	6.03	0	0.05	142.17	334.6	0.32	0.03	26.27	26.65	9.5
563	54.41	5.46	0	0.05	148.7	334.5	0.31	0.03	25.66	26.03	9.97
566	52.46	4.77	0	0.06	167	334.28	0.3	0.03	25.84	26.22	11
569	54.71	0.51	-0.01	0.56	1172.31	334.23	0.23	0.03	25.36	25.72	106.51
572	54.53	6.78	0	0.04	91.14	334.18	0.24	0.03	25.72	26.09	8.05
575	51.61	4.29	0	0.07	144.22	333.88	0.24	0.03	25.44	25.81	12.04
578	53.96	3.7	0	0.08	128.2	333.92	0.18	0.03	25.57	25.93	14.6
581	53.97	2.97	0	0.1	145.73	333.66	0.17	0.03	25.49	25.84	18.17
584	51.85	4.6	0	0.07	73.08	333.72	0.13	0.03	25.4	25.76	11.26
587	50.9	5.14	0	0.06	62.39	333.39	0.13	0.03	25.27	25.62	9.91
590	53.89	3.65	0	0.08	52.52	333.43	0.07	0.03	25.67	26.03	14.76
593	52.69	8.2	0	0.04	19.44	333.14	0.06	0.03	25.76	26.12	6.42
596	50.92	4.32	0	0.07	9.07	332.99	0.02	0.03	25.63	25.99	11.78
599	55.09	1.06	0	0.28	33.26	332.87	0.01	0.03	26.12	26.49	52.05
602	54.74	7.66	0	0.04	11.56	332.86	0.03	0.03	26.13	26.49	7.15
605	51.22	5	0	0.06	6.11	332.48	0.01	0.03	25.46	25.81	10.24

608	51.41	-2.02	0	-0.15	0	332.59	0	0.03	25.89	26.24	-25.46
611	52.88	8.88	0	0.03	0	332.48	0	0.03	25.4	25.75	5.95
614	53.11	7.91	0	0.04	0	332.13	0	0.03	25.61	25.96	6.72
617	50.07	1.19	0	0.24	0	332.05	0	0.03	25.43	25.77	41.91
620	51.61	0.75	-0.01	0.38	0	332.02	0	0.03	25.76	26.11	68.43
623	52.47	4.89	0	0.06	0	331.97	0	0.03	25.84	26.19	10.74
626	48.83	2.98	0	0.09	0	331.76	0	0.03	25.02	25.37	16.36
629	50.74	3.15	0	0.08	0	331.77	0	0.03	25.76	26.11	16.13
632	53.31	9.43	0	0.03	0	331.54	0	0.03	25.47	25.82	5.65
635	50.62	5.4	0	0.05	0	331.28	0	0.03	25.7	26.05	9.37
638	49.76	-2.04	0	-0.12	0	331.23	0	0.03	25.45	25.79	-24.36
641	52.09	5.35	0	0.05	0	331.3	0	0.03	25.42	25.77	9.74
644	51.93	5.34	0	0.05	0	330.96	0	0.03	25.58	25.92	9.72
647	49.61	3.14	0	0.09	0	331	0	0.03	25.77	26.11	15.8
650	50.68	1.71	0	0.16	0	330.76	0	0.03	25.48	25.82	29.62
653	52.17	0.01	-0.58	28.38	0	330.88	0	0.03	26.11	26.46	5216.72
656	50.25	0.01	-0.45	27.69	0	330.62	0	0.03	25.55	25.89	5024.91

Paper (stacked flat)**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	319.63
Time to Peak Heat Release Rate (s):	21.00
Total Heat Release (MJ/m ²):	64.78
60 s Average Heat Release Rate (kW/m ²):	199.67
Total Mass Loss (g):	48.62
Average Mass Loss Rate (g/s):	0.075
Average Effective Heat of Combustion (MJ/kg):	13.32
Average Smoke Extinction Area (m ² /kg):	3.56
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0388

Specimen:

Initial mass (g):	407.4
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	77
Time to ignition (s):	8
Time to flameout (s):	704

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	0.71	0.01	-0.31	-0.04	4829.98	407.35	0.02	0.03	25.63	25.82	70.64
3	-0.89	0.01	-0.4	-0.04	4104.73	407.16	0.02	0.03	25.46	25.64	-88.96
6	1.94	-3.31	0	0	-34.06	407.37	0.04	0.03	25.38	25.56	-0.59
9	9.37	15.55	0	0	17.43	407.21	0.11	0.03	25.16	25.35	0.6
12	42.22	18.27	0	0	0	406.54	0	0.03	23.37	23.73	2.31
15	126.46	19.81	0	0	143.57	406.14	1.2	0.02	22.95	23.7	6.38
18	226.23	21.46	0	0	100.21	405.36	0.87	0.02	23.59	24.63	10.54
21	319.63	13.66	0	0.01	27.09	404.91	0.14	0.03	24.62	25.91	23.4
24	317.26	21.99	0	0.01	0	404.44	0	0.02	23.85	25.23	14.43
27	308.2	18.34	0	0.01	1.34	403.67	0.01	0.02	24.04	25.56	16.8
30	285.55	16.7	0	0.02	0	403.33	0	0.02	23.34	24.88	17.1
33	284.58	18.3	0	0.02	0	402.64	0	0.02	24.78	26.44	15.55
36	262.34	15.85	0	0.02	0	402.26	0	0.02	24.8	26.44	16.55
39	246.66	16.67	0	0.02	0	401.67	0	0.02	24.94	26.57	14.79
42	234.13	17.49	0	0.02	0	401.26	0	0.02	24.76	26.36	13.39
45	225.56	12.29	0	0.02	0	400.67	0	0.02	24.77	26.36	18.35
48	218.12	5.64	0	0.04	0	400.52	0	0.02	24.92	26.47	38.64
51	206.43	16.79	0	0.01	0	400.21	0	0.03	25.33	26.86	12.29
54	194.87	11.17	0	0.02	0	399.63	0	0.03	25.52	26.99	17.45
57	183.61	7.43	0	0.03	0	399.53	0	0.03	26.02	27.45	24.72
60	167.87	15.82	0	0.01	0	399.09	0	0.02	24.91	26.24	10.61
63	166.97	18.11	0	0.01	0	398.62	0	0.03	25.31	26.59	9.22
66	165.15	9.79	0	0.02	0	398.09	0	0.03	25.34	26.6	16.87
69	170.17	7.5	0	0.03	0	397.99	0	0.03	25.51	26.76	22.7
72	179.69	21.72	0	0.01	0	397.52	0	0.03	25.65	26.88	8.27
75	183.3	19.54	0	0.01	0	396.8	0	0.02	25.05	26.25	9.38
78	191.51	11.64	0	0.02	0	396.4	0	0.03	25.53	26.74	16.45
81	185.37	15.83	0	0.02	0	396.02	0	0.02	24.8	25.95	11.71
84	186.1	16.97	0	0.03	0	395.46	0	0.02	25.36	26.5	10.97
87	177.51	13.4	0	0.04	0	395.04	0	0.03	25.55	26.64	13.25
90	168.22	9.35	0	0.07	0	394.67	0	0.03	26.31	27.38	18
93	154.76	3.97	0	0.17	0	394.47	0	0.03	25.72	26.68	38.96
96	145.79	11.12	0	0.06	0	394.34	0	0.03	25.62	26.55	13.11
99	140.21	12.56	0	0.05	0	393.84	0	0.03	25.61	26.49	11.16
102	138.82	9.56	0	0.06	0	393.62	0	0.03	26.13	27	14.52
105	135.44	14.72	0	0.03	0	393.22	0	0.03	25.59	26.4	9.2
108	136.36	10.7	0	0.04	0	392.8	0	0.03	25.7	26.47	12.74
111	134.33	6.7	0	0.06	0	392.57	0	0.03	25.69	26.46	20.04
114	137.74	14.88	0	0.02	0	392.31	0	0.03	25.75	26.52	9.26
117	143.41	17.09	0	0.02	0	391.72	0	0.03	25.61	26.37	8.39
120	148.65	13.39	0	0.02	0	391.33	0	0.03	26.09	26.85	11.1
123	148.28	7.93	0	0.04	0	390.93	0	0.03	25.55	26.31	18.69

126	152.84	9.7	0	0.03	0	390.8	0	0.03	25.6	26.36	15.75
129	151.36	12.28	0	0.02	0	390.35	0	0.03	25.22	25.97	12.32
132	147.67	3.2	0	0.09	0	390.14	0	0.03	25.51	26.26	46.14
135	146.03	6.81	0	0.04	0	390.07	0	0.03	25.75	26.49	21.45
138	141.52	8.01	0	0.04	0	389.74	0	0.03	25.89	26.62	17.66
141	128.48	8.12	0	0.04	0	389.6	0	0.03	25.59	26.28	15.82
144	123.31	3.65	0	0.09	0	389.29	0	0.03	25.76	26.42	33.76
147	119.21	5.51	0	0.05	0	389.33	0	0.03	25.76	26.41	21.62
150	113.97	14.8	0	0.02	0	388.91	0	0.03	25.73	26.36	7.7
153	110	7.74	0	0.04	0	388.56	0	0.03	25.63	26.24	14.21
156	109.17	3.01	0	0.1	0	388.43	0	0.03	25.83	26.42	36.28
159	107.12	11.52	0	0.03	0	388.29	0	0.03	25.56	26.14	9.3
162	102.26	11.68	0	0.03	0	387.8	0	0.02	24.86	25.42	8.75
165	110.26	0.39	-0.01	0.92	0	387.66	0	0.03	26.08	26.65	285.89
168	108.13	8.75	0	0.05	0	387.64	0	0.03	26	26.55	12.36
171	102.26	12.1	0	0.04	0	387.17	0	0.03	25.71	26.25	8.45
174	101.51	4.77	0	0.1	0	386.99	0	0.03	25.59	26.11	21.29
177	101.78	6.35	0	0.07	0	386.82	0	0.03	25.85	26.36	16.02
180	100.8	12.05	0	0.03	0	386.58	0	0.03	26.22	26.74	8.36
183	97.63	6.03	0	0.05	0	386.18	0	0.03	25.41	25.9	16.2
186	99.63	5.61	0	0.05	0	386.18	0	0.03	25.25	25.74	17.76
189	99.02	8.8	0	0.03	0	385.81	0	0.03	25.44	25.94	11.25
192	98.54	5.54	0	0.05	0	385.7	0	0.03	25.62	26.12	17.78
195	102.28	8.43	0	0.03	0	385.44	0	0.03	25.87	26.37	12.13
198	104.26	7.76	0	0.04	0	385.21	0	0.03	25.91	26.42	13.43
201	100.32	9.98	0	0.03	0	384.96	0	0.03	25.04	25.55	10.06
204	103.03	5.36	0	0.05	0	384.66	0	0.03	25.44	25.96	19.22
207	103.48	8.32	0	0.03	0	384.59	0	0.03	25.62	26.13	12.44
210	101.61	10.2	0	0.03	0	384.16	0	0.03	25.5	26.01	9.97
213	100.34	4.91	0	0.07	0	384.03	0	0.03	25.52	26.03	20.44
216	100.6	5.94	0	0.07	0	383.83	0	0.03	25.53	26.03	16.95
219	97.21	10.07	0	0.04	0	383.65	0	0.03	25.84	26.34	9.65
222	94.58	9.42	0	0.04	0	383.26	0	0.03	25.58	26.07	10.04
225	94.74	3.89	0	0.09	0	383.11	0	0.03	24.95	25.43	24.35
228	100.91	11.66	0	0.03	0	382.94	0	0.03	26.1	26.61	8.66
231	99.02	11.19	0	0.03	0	382.47	0	0.03	25.53	26.03	8.85
234	103.29	4.21	0	0.08	0	382.31	0	0.03	25.98	26.47	24.55
237	105.19	7.45	0	0.04	0	382.14	0	0.03	26.11	26.62	14.12
240	100.07	12.53	0	0.02	0	381.85	0	0.03	25.39	25.88	7.99
243	101.25	6.15	0	0.05	0	381.47	0	0.03	25.85	26.34	16.47
246	101.02	7.98	0	0.04	0	381.43	0	0.03	25.33	25.81	12.66
249	98.36	7.43	0	0.04	0	381.01	0	0.03	25.04	25.52	13.23
252	96.97	0.79	-0.01	0.33	0	381.02	0	0.03	25.4	25.87	123.51
255	102.39	7.33	0	0.04	0	380.87	0	0.03	26.26	26.75	13.98
258	98.87	10.67	0	0.03	0	380.6	0	0.03	25.74	26.22	9.27
261	99.43	7.99	0	0.04	0	380.28	0	0.03	26.48	26.98	12.44
264	100.81	4.98	0	0.06	0	380.12	0	0.03	25.83	26.32	20.23
267	101.25	8.38	0	0.04	0	379.93	0	0.03	25.85	26.35	12.09

270	99.37	11.69	0	0.03	0	379.63	0	0.03	26.04	26.53	8.5
273	99.65	4.33	0	0.08	0	379.3	0	0.03	25.78	26.27	23
276	102.11	6.26	0	0.06	0	379.3	0	0.03	26.1	26.6	16.32
279	95.98	12.67	0	0.03	0	378.9	0	0.03	25.29	25.76	7.58
282	95.14	1.36	0	0.27	0	378.66	0	0.03	25.06	25.53	69.98
285	96.98	5.02	0	0.07	0	378.72	0	0.03	25.8	26.27	19.32
288	93.46	10.49	0	0.03	0	378.34	0	0.03	25.59	26.05	8.91
291	94.81	6.32	0	0.05	0	378.16	0	0.03	25.71	26.17	15.01
294	93.29	4.03	0	0.09	0	377.95	0	0.03	25.53	25.99	23.16
297	92.03	8.71	0	0.04	0	377.87	0	0.03	25.83	26.28	10.56
300	96.21	8.5	0	0.03	0	377.46	0	0.03	26.23	26.68	11.32
303	93.39	4.48	0	0.07	0	377.38	0	0.03	25.71	26.14	20.85
306	91.87	8.93	0	0.04	0	377.13	0	0.03	25.91	26.35	10.28
309	90.57	9.98	0	0.03	0	376.87	0	0.03	25.57	26.01	9.08
312	90.63	5.35	0	0.06	0	376.58	0	0.03	25.33	25.76	16.93
315	89.52	3.02	0	0.11	0	376.53	0	0.03	25.86	26.29	29.64
318	85.34	11.7	0	0.03	0	376.32	0	0.03	25.37	25.79	7.29
321	87.95	4.49	0	0.07	0	375.93	0	0.03	25.65	26.07	19.59
324	87.23	3.54	0	0.09	0	376.01	0	0.03	26.12	26.54	24.67
327	85.91	11.57	0	0.03	0	375.66	0	0.03	25.92	26.34	7.43
330	87.27	3.97	0	0.08	0	375.42	0	0.03	25.57	25.99	21.99
333	87.38	5.62	0	0.06	0	375.36	0	0.03	26.01	26.44	15.55
336	88.5	9.89	0	0.03	0	375.07	0	0.03	26.22	26.65	8.94
339	87.78	2.26	0	0.13	0	374.85	0	0.03	25.51	25.92	38.89
342	83.41	4.89	0	0.06	0	374.86	0	0.03	24.8	25.21	17.07
345	85.72	14.63	0	0.02	0	374.51	0	0.03	25.74	26.16	5.86
348	85.79	3.84	0	0.07	0	374.12	0	0.03	25.31	25.72	22.33
351	84.83	2.53	0	0.12	0	374.21	0	0.03	25.67	26.09	33.5
354	82.09	11.6	0	0.03	0	373.9	0	0.03	25.57	25.98	7.08
357	87.73	6.03	0	0.05	0	373.62	0	0.03	26.27	26.69	14.55
360	85.11	0.73	-0.01	0.4	0	373.53	0	0.03	25.81	26.21	115.89
363	82.96	9.04	0	0.03	0	373.48	0	0.03	26.04	26.45	9.18
366	83.36	7.68	0	0.04	0	373.06	0	0.03	25.7	26.11	10.85
369	82.31	4.26	0	0.07	0	373.04	0	0.03	25.51	25.91	19.32
372	80.63	4.68	0	0.06	0	372.77	0	0.03	25.84	26.24	17.24
375	81.35	5	0	0.06	0	372.76	0	0.03	25.52	25.92	16.27
378	81.66	6.47	0	0.05	0	372.47	0	0.03	25.25	25.65	12.63
381	79.76	5.15	0	0.06	0	372.39	0	0.03	25.75	26.15	15.49
384	78.18	7.16	0	0.04	0	372.14	0	0.03	25.3	25.7	10.92
387	82.18	4.93	0	0.06	0	371.98	0	0.03	25.73	26.14	16.69
390	82.99	9.13	0	0.03	0	371.8	0	0.03	25.87	26.28	9.09
393	80.52	6.28	0	0.05	0	371.48	0	0.03	26.09	26.5	12.83
396	82.54	2.64	0	0.12	0	371.43	0	0.03	26.06	26.47	31.28
399	82.58	7.64	0	0.04	0	371.26	0	0.03	25.92	26.33	10.81
402	76.35	7.93	0	0.04	0	371	0	0.03	25.21	25.6	9.63
405	78.14	3.29	0	0.09	0	370.82	0	0.03	26.21	26.61	23.76
408	76.79	6.44	0	0.05	0	370.75	0	0.03	25.8	26.19	11.93
411	74.15	8.66	0	0.03	0	370.44	0	0.03	25.74	26.13	8.56

414	75.17	6.38	0	0.04	0	370.27	0	0.03	25.84	26.24	11.78
417	76.6	1.73	0	0.16	0	370.07	0	0.03	25.76	26.15	44.28
420	75.75	8.97	0	0.03	0	370.09	0	0.03	25.72	26.1	8.45
423	73.75	4.76	0	0.06	0	369.61	0	0.03	25.69	26.08	15.51
426	74.26	0.89	-0.01	0.34	0	369.8	0	0.03	25.55	25.94	83.07
429	74.1	9.3	0	0.03	0	369.47	0	0.03	25.59	25.97	7.97
432	71.87	6.74	0	0.04	0	369.31	0	0.03	26.13	26.51	10.66
435	71.52	2.06	0	0.13	0	369.08	0	0.03	25.86	26.22	34.71
438	73.76	4.77	0	0.06	0	369.14	0	0.03	26.2	26.58	15.47
441	70.51	10.13	0	0.03	0	368.78	0	0.03	25.66	26.03	6.96
444	69.28	4.73	0	0.06	0	368.6	0	0.03	26.31	26.68	14.65
447	70.16	5.93	0	0.05	0	368.46	0	0.03	25.96	26.32	11.83
450	67.56	6.13	0	0.05	0	368.25	0	0.03	25.23	25.59	11.02
453	67.59	3.17	0	0.08	0	368.11	0	0.03	25.66	26.02	21.32
456	68.14	4.96	0	0.05	0	368.03	0	0.03	25.62	25.97	13.73
459	71.13	5.09	0	0.05	0	367.82	0	0.03	25.78	26.14	13.96
462	67.99	5.71	0	0.05	0	367.72	0	0.03	25.21	25.56	11.9
465	67.73	1.77	0	0.16	0	367.51	0	0.03	25.79	26.15	38.22
468	67.84	3.1	0	0.09	0	367.58	0	0.03	25.83	26.19	21.9
471	68.83	11.12	0	0.03	0	367.28	0	0.03	25.82	26.18	6.19
474	68.28	2.85	0	0.09	0	367.02	0	0.03	26.21	26.57	23.95
477	65.1	2.49	0	0.1	0	367.06	0	0.03	25.71	26.06	26.15
480	67.2	10.03	0	0.03	0	366.81	0	0.03	25.65	26	6.7
483	66.7	6.35	0	0.05	0	366.53	0	0.03	26.05	26.4	10.5
486	64.04	0.13	-0.04	2.09	0	366.45	0	0.03	25.68	26.02	485.56
489	65.91	8.83	0	0.03	0	366.42	0	0.03	25.74	26.08	7.46
492	63.95	5.91	0	0.04	0	366	0	0.03	25.24	25.58	10.81
495	63.07	-0.17	0.03	-1.6	0	366.09	0	0.03	25.74	26.08	-378.04
498	63.34	4.46	0	0.06	0	365.93	0	0.03	26.09	26.43	14.21
501	65.33	10.05	0	0.03	0	365.82	0	0.03	26.31	26.65	6.5
504	63.13	5.99	0	0.05	0	365.4	0	0.03	25.84	26.17	10.53
507	61.44	-0.07	0.07	-4.29	0	365.47	0	0.03	25.77	26.1	-922.93
510	62.06	6.18	0	0.04	0	365.32	0	0.03	25.46	25.79	10.05
513	61.78	5.74	0	0.05	0	365.14	0	0.03	25.89	26.23	10.77
516	58.83	2.75	0	0.1	0	365	0	0.03	25.55	25.88	21.42
519	58.7	1.38	0	0.19	0	364.96	0	0.03	25.64	25.97	42.58
522	59.81	8.54	0	0.03	0	364.86	0	0.03	25.15	25.47	7
525	60.01	6.25	0	0.04	0	364.52	0	0.03	25.18	25.5	9.59
528	58.83	-0.3	0.01	-0.89	0	364.51	0	0.03	25.75	26.07	-195.5
531	58.31	4.5	0	0.06	0	364.45	0	0.03	25.67	25.99	12.96
534	63.09	9.14	0	0.03	0	364.24	0	0.03	26.31	26.64	6.91
537	59.56	3.35	0	0.08	0	363.98	0	0.03	25.19	25.5	17.8
540	57.43	2.59	0	0.1	0	364.01	0	0.03	24.97	25.28	22.18
543	57.76	6.49	0	0.04	0	363.79	0	0.03	25.34	25.66	8.91
546	59.65	6.79	0	0.04	0	363.65	0	0.03	25.53	25.85	8.78
549	59.73	1.68	0	0.17	0	363.42	0	0.03	25.8	26.13	35.52
552	57.48	4.38	0	0.06	0	363.49	0	0.03	25.78	26.11	13.12
555	59.09	7.21	0	0.04	0	363.15	0	0.03	25.71	26.03	8.2

558	59.54	3.09	0	0.09	0	363.11	0	0.03	25.62	25.95	19.25
561	57.08	1.46	0	0.18	0	362.95	0	0.03	25.61	25.94	39.11
564	57.11	5.74	0	0.05	0	362.98	0	0.03	26.42	26.75	9.95
567	54.48	8.52	0	0.03	0	362.62	0	0.03	25.69	26.01	6.39
570	56.95	1.63	0	0.17	0	362.53	0	0.03	25.9	26.22	34.96
573	56.28	1.52	0	0.18	0	362.47	0	0.03	25.79	26.11	36.99
576	54.4	7.3	0	0.04	0	362.4	0	0.03	25.78	26.1	7.45
579	54.24	7.05	0	0.04	0	362.08	0	0.03	25.79	26.11	7.69
582	55.45	-0.56	0.01	-0.47	0	362.02	0	0.03	25.45	25.77	-98.24
585	55.8	6.35	0	0.04	0	362.02	0	0.03	25.69	26.01	8.79
588	53.71	9.12	0	0.03	0	361.67	0	0.03	25.83	26.15	5.89
591	52.83	4.96	0	0.05	0	361.52	0	0.03	25.36	25.67	10.66
594	56.47	2.61	0	0.09	0	361.36	0	0.03	25.71	26.03	21.6
597	57.13	4.19	0	0.06	0	361.33	0	0.03	25.92	26.25	13.64
600	54.05	6.8	0	0.04	0	361.1	0	0.03	25.59	25.92	7.95
603	55.53	5.03	0	0.05	0	360.96	0	0.03	25.91	26.23	11.03
606	56.24	0.8	-0.01	0.33	0	360.81	0	0.03	25.49	25.82	70.69
609	55.49	6.07	0	0.04	0	360.85	0	0.03	25.49	25.82	9.14
612	54.09	4.84	0	0.06	0	360.49	0	0.03	25.6	25.93	11.17
615	55.63	2.93	0	0.09	0	360.56	0	0.03	25.53	25.85	18.99
618	57.46	5.81	0	0.04	0	360.28	0	0.03	25.92	26.26	9.89
621	56.49	1.05	0	0.23	0	360.26	0	0.03	26.18	26.52	53.85
624	53.76	7.81	0	0.03	0	360.15	0	0.03	25.74	26.07	6.88
627	55.78	5	0	0.05	0	359.85	0	0.03	25.69	26.02	11.16
630	55.92	1.87	0	0.13	0	359.85	0	0.03	25.58	25.91	29.96
633	53.38	4.14	0	0.06	0	359.7	0	0.03	25.43	25.76	12.91
636	56.5	7.54	0	0.03	0	359.6	0	0.03	26.04	26.38	7.49
639	55.25	7.86	0	0.03	0	359.28	0	0.03	25.45	25.77	7.03
642	54.58	1.22	0	0.18	0	359.17	0	0.03	25.83	26.15	44.67
645	53.9	3.72	0	0.06	0	359.14	0	0.03	25.9	26.22	14.51
648	55.42	6.66	0	0.04	0	358.94	0	0.03	25.58	25.91	8.32
651	55.23	6.02	0	0.04	0	358.77	0	0.03	25.81	26.15	9.17
654	52.23	0.01	-0.49	22.91	0	358.62	0	0.03	25.29	25.62	5222.87
657	54.85	0.01	-0.4	23.78	0	358.75	0	0.03	25.62	25.95	5484.54

Paper (stacked flat)**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	238.24
Time to Peak Heat Release Rate (s):	23.00
Total Heat Release (MJ/m ²):	47.83
60 s Average Heat Release Rate (kW/m ²):	177.81
Total Mass Loss (g):	38.75
Average Mass Loss Rate (g/s):	0.060
Average Effective Heat of Combustion (MJ/kg):	12.34
Average Smoke Extinction Area (m ² /kg):	72.33
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0390

Specimen:

Initial mass (g):	378.6
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	99
Time to ignition (s):	8
Time to flameout (s):	705

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-0.55	0.01	-0.4	-0.04	0	378.52	0	0.03	25.54	25.72	-55.29
5	-0.7	0.01	-0.31	-0.03	0	378.65	0	0.03	26.05	26.23	-69.96
8	5.3	4.25	0	0	69.64	378.68	0.11	0.03	25.76	25.93	1.25
11	14.76	16.23	0	0	10.41	378.37	0.07	0.03	25.2	25.46	0.91
14	65.51	14.35	0	0	45.66	377.81	0.27	0.03	23.75	24.26	4.56
17	155.05	15.43	0	0	54.2	377.49	0.34	0.02	23.5	24.25	10.05
20	216.34	22.68	0	0	5.9	376.85	0.05	0.03	24.96	25.99	9.54
23	238.24	13.89	0	0	0	376.24	0	0.03	24.1	25.19	17.16
26	230.85	12.9	0	0.01	0	375.96	0	0.02	23.59	24.67	17.89
29	231.63	18.99	0	0.01	0	375.42	0	0.02	24.17	25.45	12.2
32	226.32	13.8	0	0.01	0	374.9	0	0.02	24.4	25.68	16.4
35	211.06	9.5	0	0.02	0	374.59	0	0.03	24.85	26.19	22.22
38	197.74	9.85	0	0.02	0	374.29	0	0.03	24.84	26.14	20.08
41	189.07	18.43	0	0.01	0	373.94	0	0.03	25.06	26.4	10.26
44	180.73	13.54	0	0.02	1.3	373.27	0.01	0.02	24.3	25.62	13.35
47	197.6	13.21	0	0.02	0	373.1	0	0.03	24.97	26.36	14.95
50	206.05	18.31	0	0.02	0	372.44	0	0.02	24.67	26.06	11.25
53	213.96	16.36	0	0.02	3.77	372.05	0.02	0.03	25.23	26.65	13.08
56	206.13	12.15	0	0.02	0	371.48	0	0.02	24.8	26.18	16.96
59	209.12	8.65	0	0.03	0	371.31	0	0.03	25.72	27.15	24.17
62	193.36	17.25	0	0.01	0	370.88	0	0.02	24.95	26.27	11.21
65	177.56	12.37	0	0.01	3.45	370.37	0.02	0.03	25.25	26.53	14.35
68	167.62	5.96	0	0.02	0	370.15	0	0.03	25.95	27.2	28.12
71	154.3	10.5	0	0.01	0	369.93	0	0.03	25.26	26.43	14.7
74	146.18	14.71	0	0.01	0	369.53	0	0.03	25.49	26.61	9.94
77	141.9	8.67	0	0.02	0	369.12	0	0.03	25.63	26.7	16.36
80	137.67	6.75	0	0.02	0	368.98	0	0.03	26.07	27.1	20.39
83	129.37	14.5	0	0.01	0	368.65	0	0.03	25.76	26.73	8.92
86	122.71	7.36	0	0.02	0	368.21	0	0.03	25.46	26.38	16.68
89	123.73	3.75	0	0.05	0	368.19	0	0.03	25.51	26.39	32.97
92	124.85	10.29	0	0.02	0	367.91	0	0.03	26.3	27.17	12.13
95	117.65	9.54	0	0.02	0	367.62	0	0.03	25.91	26.73	12.33
98	113.8	7.28	0	0.02	0	367.35	0	0.03	25.65	26.43	15.62
101	112.32	8.88	0	0.02	0	367.15	0	0.03	25.77	26.52	12.65
104	109.27	11.43	0	0.02	0	366.82	0	0.03	25.99	26.72	9.56
107	101.43	2.39	0	0.08	0	366.54	0	0.03	25.48	26.15	42.35
110	98.72	5.49	0	0.03	0	366.59	0	0.03	25.2	25.84	17.97
113	97.57	11.76	0	0.02	0	366.19	0	0.03	26.16	26.78	8.3
116	93.75	4.56	0	0.04	0	365.98	0	0.03	26.1	26.69	20.54
119	92.94	5.15	0	0.04	0	365.87	0	0.03	26.07	26.64	18.06
122	92.57	7.84	0	0.03	0	365.65	0	0.03	26.07	26.62	11.81
125	87.23	6.84	0	0.03	0	365.43	0	0.03	25.68	26.2	12.75

128	85.06	1.31	0	0.17	0	365.26	0	0.03	26.13	26.64	65.15
131	86.26	8.58	0	0.03	0	365.26	0	0.03	26.27	26.77	10.06
134	85.54	11.35	0	0.02	1.02	364.78	0	0.03	26.05	26.53	7.54
137	82.17	1.91	0	0.12	0	364.66	0	0.03	25.72	26.18	43.05
140	81.12	4.95	0	0.04	0	364.58	0	0.03	25.58	26.04	16.39
143	80.64	8.59	0	0.02	0	364.36	0	0.03	25.4	25.85	9.39
146	77.69	7.65	0	0.02	0	364.11	0	0.03	25.31	25.75	10.15
149	76.12	1.77	0	0.11	31.55	363.93	0.02	0.03	25.72	26.15	43.08
152	76.99	6.5	0	0.04	0.16	363.93	0	0.03	25.91	26.33	11.85
155	72.51	9.56	0	0.02	0	363.55	0	0.03	25.31	25.71	7.58
158	70.84	1.27	0	0.2	0	363.43	0	0.03	25.61	26.01	55.92
161	72.37	7.6	0	0.03	6.69	363.38	0.02	0.03	25.77	26.16	9.53
164	75.42	10.16	0	0.03	0.13	362.99	0	0.03	26.18	26.57	7.42
167	72.07	6.62	0	0.04	0	362.82	0	0.03	25.46	25.84	10.88
170	71.29	3.76	0	0.08	0	362.59	0	0.03	25.83	26.21	18.94
173	73.76	5.51	0	0.06	0	362.55	0	0.03	26.1	26.49	13.38
176	72.56	10.27	0	0.03	0	362.25	0	0.03	25.91	26.29	7.06
179	69.74	0.54	-0.01	0.54	0	362.03	0	0.03	25.75	26.12	128.79
182	69.42	5.3	0	0.06	0	362.11	0	0.03	25.6	25.97	13.1
185	69.36	13.03	0	0.02	0.22	361.69	0	0.03	25.4	25.76	5.32
188	67.88	5.2	0	0.06	0	361.44	0	0.03	25.78	26.15	13.06
191	66.78	2.91	0	0.1	0	361.35	0	0.03	25.58	25.94	22.96
194	71.41	4.95	0	0.06	0	361.23	0	0.03	26.45	26.82	14.43
197	69.69	6.23	0	0.05	0	361.06	0	0.03	25.8	26.17	11.19
200	66.54	2.71	0	0.11	0	360.89	0	0.03	25.65	26.01	24.6
203	65.23	6.71	0	0.04	0	360.84	0	0.03	25.35	25.71	9.72
206	69	10.57	0	0.03	0	360.49	0	0.03	25.78	26.15	6.53
209	67.03	4.44	0	0.07	0	360.28	0	0.03	25.79	26.15	15.11
212	65.16	4.18	0	0.07	0	360.19	0	0.03	25.5	25.87	15.6
215	65.42	3.5	0	0.09	0	360.02	0	0.03	25.48	25.84	18.67
218	65.12	5.2	0	0.06	0	359.96	0	0.03	25.5	25.86	12.53
221	63.2	3.71	0	0.09	0	359.73	0	0.03	25.55	25.91	17.02
224	63.53	5.8	0	0.06	0	359.71	0	0.03	25.88	26.24	10.96
227	63.54	9.91	0	0.03	0	359.37	0	0.03	25.32	25.67	6.41
230	62.02	3.31	0	0.1	0	359.19	0	0.03	25.24	25.59	18.74
233	61.54	4.41	0	0.07	0	359.13	0	0.03	25.57	25.92	13.94
236	61.68	2.2	0	0.13	0	358.94	0	0.03	25.79	26.16	28.07
239	63.31	6.11	0	0.05	0	358.96	0	0.03	25.63	25.98	10.35
242	60.54	3.53	0	0.08	0	358.62	0	0.03	25.64	25.99	17.15
245	60.33	0.78	-0.01	0.35	0	358.74	0	0.03	26.02	26.38	77.78
248	59.97	12.38	0	0.02	0	358.48	0	0.03	25.63	25.98	4.84
251	59.01	5.18	0	0.05	0	358.13	0	0.03	25.57	25.92	11.39
254	59.66	2.5	0	0.12	0	358.14	0	0.03	26.09	26.44	23.84
257	59.18	4.15	0	0.07	8.32	357.94	0.01	0.03	25.37	25.72	14.25
260	59.69	4.72	0	0.06	0	357.9	0	0.03	25.54	25.9	12.64
263	56.9	8.28	0	0.03	0	357.64	0	0.03	25.48	25.84	6.87
266	60.53	10.65	0	0.03	0	357.41	0	0.03	26.1	26.47	5.68
269	61.63	14.47	0	0.02	3.95	357	0.02	0.03	25.99	26.34	4.26

272	59.21	8.69	0	0.03	0.73	356.61	0	0.03	25.52	25.87	6.81
275	58.55	-0.07	0.07	-3.95	-546.06	356.49	0.02	0.03	25.47	25.82	-786.93
278	59.57	5.31	0	0.06	0	356.51	0	0.03	25.08	25.43	11.21
281	61.42	11.05	0	0.03	0	356.17	0	0.03	25.77	26.12	5.56
284	60.02	5.88	0	0.05	10.51	355.93	0.02	0.03	25.95	26.3	10.2
287	59.1	2.24	0	0.14	0	355.81	0	0.03	25.54	25.88	26.36
290	60.76	3.5	0	0.09	6.15	355.75	0.01	0.03	25.94	26.29	17.38
293	58.54	7.86	0	0.04	9.1	355.58	0.03	0.03	26.13	26.49	7.45
296	56.98	2.53	0	0.12	30.18	355.35	0.03	0.03	25.55	25.9	22.5
299	59.74	3.37	0	0.09	35.62	355.38	0.05	0.03	25.93	26.29	17.75
302	57.63	9.36	0	0.03	11	355.11	0.04	0.03	25.53	25.87	6.16
305	54.42	0.24	-0.03	1.19	240.76	354.92	0.02	0.03	25.6	25.94	226.43
308	56.99	3.2	0	0.09	38.9	355.02	0.05	0.03	25.79	26.14	17.82
311	59.1	10.48	0	0.03	9.04	354.7	0.04	0.03	26.11	26.46	5.64
314	56.24	3.55	0	0.08	43.09	354.49	0.06	0.03	25.65	26	15.86
317	54.45	2.45	0	0.11	48.14	354.45	0.05	0.03	25.6	25.95	22.26
320	55.38	3.95	0	0.07	42.67	354.31	0.07	0.03	25.08	25.43	14.02
323	56.63	7.46	0	0.04	26.38	354.2	0.08	0.03	25.84	26.2	7.59
326	55	6.49	0	0.05	31.05	353.9	0.08	0.03	25.95	26.31	8.48
329	56.45	-0.79	0.01	-0.36	-276.77	353.85	0.08	0.03	25.72	26.08	-71.7
332	57.44	7.71	0	0.04	25.6	353.85	0.07	0.03	25.98	26.34	7.45
335	53.3	3.43	0	0.08	69.55	353.47	0.09	0.03	25.44	25.79	15.54
338	54.47	0.41	-0.01	0.67	543.23	353.63	0.09	0.03	25.41	25.76	133.24
341	57.25	11.85	0	0.02	30.96	353.35	0.14	0.03	25.55	25.9	4.83
344	55.64	3.7	0	0.07	107.95	353.05	0.15	0.03	25.79	26.15	15.04
347	53.87	1.5	0	0.18	271.87	353.1	0.16	0.03	25.86	26.22	35.8
350	54.85	2.72	0	0.1	143.25	352.93	0.15	0.03	25.29	25.64	20.2
353	56.36	5.15	0	0.05	82.61	352.92	0.16	0.03	26.02	26.39	10.95
356	54.3	7.79	0	0.03	54.84	352.63	0.16	0.03	26.15	26.51	6.97
359	53.18	-1.01	0	-0.24	-471	352.53	0.18	0.03	25.55	25.91	-52.48
362	53.71	5.46	0	0.04	83.95	352.58	0.18	0.03	25.56	25.91	9.84
365	53.19	11.08	0	0.02	43.37	352.21	0.18	0.03	26.1	26.47	4.8
368	51.71	-0.36	0.02	-0.65	-1486.51	352.04	0.2	0.03	25.61	25.97	-144.85
371	53.56	2	0	0.11	282.77	352.14	0.22	0.03	25.34	25.69	26.73
374	53.41	10.06	0	0.02	68.85	351.88	0.26	0.03	25.89	26.25	5.31
377	50.54	1.56	0	0.16	434.37	351.65	0.26	0.03	25.62	25.98	32.47
380	53.03	2.02	0	0.13	271.15	351.72	0.21	0.03	25.52	25.88	26.3
383	53.64	7.69	0	0.03	81.56	351.49	0.24	0.03	25.63	25.99	6.97
386	50.83	2.97	0	0.08	244.57	351.33	0.28	0.03	25.78	26.13	17.12
389	50.88	2.64	0	0.09	268.1	351.28	0.28	0.03	25.28	25.63	19.28
392	49.62	4.77	0	0.05	154.65	351.15	0.29	0.03	24.86	25.2	10.4
395	50.71	6.34	0	0.04	131.95	351	0.32	0.03	25.65	26.01	8
398	49.3	3.94	0	0.06	206.66	350.8	0.31	0.03	25.69	26.04	12.5
401	51.69	2.94	0	0.08	311.79	350.75	0.35	0.03	26.17	26.53	17.6
404	48.84	7.38	0	0.03	122.04	350.59	0.35	0.03	25.1	25.44	6.62
407	48.43	2.27	0	0.11	351.43	350.38	0.31	0.03	25.55	25.9	21.35
410	50.64	0.97	-0.01	0.25	886.1	350.43	0.33	0.03	25.81	26.17	52.27
413	51.5	8.71	0	0.03	109.39	350.26	0.36	0.03	25.76	26.12	5.91

416	48.7	4.35	0	0.06	226.61	349.99	0.38	0.03	25.86	26.21	11.2
419	49.55	2.73	0	0.09	334.53	349.98	0.35	0.03	25.77	26.11	18.18
422	51.68	7.39	0	0.03	130.01	349.78	0.37	0.03	25.88	26.21	6.99
425	49.73	5.99	0	0.04	167.82	349.58	0.39	0.03	25.61	25.95	8.3
428	48.76	1.45	0	0.15	642.1	349.44	0.36	0.03	25.79	26.13	33.52
431	50.45	2.14	0	0.11	441.5	349.45	0.36	0.03	25.53	25.88	23.59
434	50.93	7.27	0	0.03	126.78	349.28	0.36	0.03	25.46	25.82	7.01
437	50.5	5.32	0	0.05	170.86	349.07	0.34	0.03	26.19	26.56	9.5
440	50.86	0.42	-0.01	0.58	2204.8	348.98	0.35	0.03	25.69	26.05	121.75
443	50.36	4.63	0	0.05	205.07	348.98	0.37	0.03	25.22	25.57	10.87
446	49.16	8.83	0	0.03	121.24	348.71	0.41	0.03	25.79	26.15	5.57
449	49.2	0.35	-0.01	0.7	2698.62	348.53	0.36	0.03	25.59	25.95	142.08
452	51.76	3.51	0	0.07	285.54	348.61	0.39	0.03	25.5	25.86	14.73
455	50.49	9.62	0	0.03	112.07	348.3	0.42	0.03	25.57	25.93	5.25
458	49.93	0.3	-0.02	0.82	3406.7	348.14	0.38	0.03	26.05	26.41	168.24
461	52.77	1.97	0	0.12	489.49	348.21	0.36	0.03	26.15	26.52	26.81
464	51.13	7.89	0	0.03	113.47	347.98	0.35	0.03	25.31	25.68	6.48
467	49.47	5.01	0	0.05	189.5	347.8	0.36	0.03	25.68	26.05	9.87
470	50.52	2.51	0	0.09	411.74	347.68	0.4	0.03	25.62	25.99	20.16
473	49.86	2.82	0	0.09	366.28	347.62	0.4	0.03	25.19	25.55	17.69
476	48.48	8.14	0	0.03	120.71	347.48	0.38	0.03	25.36	25.73	5.95
479	48.74	4.27	0	0.06	243.27	347.2	0.4	0.03	25.48	25.84	11.41
482	51.39	0.78	-0.01	0.34	1345.28	347.22	0.39	0.03	26.33	26.69	65.72
485	49.21	6.84	0	0.04	155.86	347.09	0.41	0.03	25.74	26.1	7.19
488	46.71	3.13	0	0.08	315.69	346.88	0.39	0.03	25.26	25.61	14.93
491	48.23	0.03	-0.2	8.59	34207.92	346.9	0.38	0.03	25.35	25.71	1683.04
494	51.5	7.36	0	0.03	152.27	346.81	0.43	0.03	25.71	26.07	7
497	50.37	5.11	0	0.05	209.75	346.52	0.41	0.03	25.66	26.02	9.86
500	49.04	2.25	0	0.11	455.57	346.51	0.39	0.03	25.89	26.25	21.83
503	50.85	7.23	0	0.03	146.72	346.33	0.41	0.03	25.7	26.06	7.03
506	49.71	4.67	0	0.05	246.92	346.12	0.44	0.03	25.73	26.09	10.64
509	49	2.18	0	0.12	508.28	346.05	0.42	0.03	25.96	26.32	22.49
512	51.3	3.54	0	0.07	295.92	345.96	0.4	0.03	26.03	26.39	14.47
515	50.19	5.71	0	0.04	187.27	345.83	0.41	0.03	25.57	25.93	8.8
518	47.71	5.77	0	0.04	179.5	345.64	0.4	0.03	25.7	26.06	8.27
521	47.89	-1.14	0	-0.22	-820.38	345.53	0.36	0.03	25.49	25.85	-42.04
524	50.68	4.35	0	0.06	249.93	345.62	0.41	0.03	25.92	26.28	11.64
527	51.2	9.62	0	0.03	114.9	345.28	0.42	0.03	25.95	26.3	5.32
530	48.01	-2.08	0	-0.12	-450.68	345.16	0.37	0.03	25.19	25.53	-23.13
533	47.79	4	0	0.06	238.49	345.28	0.37	0.03	25.23	25.57	11.95
536	51.7	12.81	0	0.02	80.63	344.9	0.39	0.03	25.88	26.23	4.04
539	51.83	1.56	0	0.16	671.1	344.65	0.4	0.03	25.93	26.29	33.21
542	50.24	0.79	-0.01	0.3	1235.07	344.74	0.37	0.03	26.15	26.52	63.21
545	49.96	8.56	0	0.03	105.08	344.54	0.35	0.03	25.07	25.42	5.84
548	52.06	4.76	0	0.05	179.43	344.3	0.33	0.03	25.5	25.87	10.93
551	52.62	1.16	0	0.19	822.32	344.26	0.36	0.03	26.08	26.46	45.29
554	49.16	4.55	0	0.05	192.36	344.18	0.34	0.03	25.71	26.08	10.8
557	48.8	5.18	0	0.04	171.74	344	0.34	0.03	25.44	25.81	9.43

560	50.63	4.17	0	0.06	235.44	343.88	0.39	0.03	25.03	25.4	12.13
563	49.96	4.31	0	0.05	189.27	343.74	0.32	0.03	25.33	25.7	11.59
566	49.43	3.42	0	0.07	262.59	343.63	0.35	0.03	25.43	25.8	14.44
569	50.99	6.74	0	0.03	139.52	343.51	0.36	0.03	25.78	26.15	7.56
572	50.52	4.86	0	0.04	175.74	343.26	0.33	0.03	25.44	25.81	10.38
575	49.68	-1.44	0	-0.16	-610.67	343.24	0.34	0.03	25.64	26	-34.47
578	50.56	7.22	0	0.03	113.61	343.25	0.31	0.03	25.75	26.12	7.01
581	52.3	9.83	0	0.02	84.12	342.85	0.32	0.03	25.48	25.84	5.32
584	53.04	-1.72	0	-0.13	-484.12	342.75	0.32	0.03	25.73	26.1	-30.86
587	50.58	3.28	0	0.06	248.91	342.85	0.31	0.03	25.54	25.91	15.44
590	52.35	9	0	0.03	103.56	342.55	0.36	0.03	25.81	26.19	5.82
593	53.7	2.55	0	0.09	302.19	342.39	0.3	0.03	25.49	25.86	21.09
596	52.43	0.37	-0.01	0.63	2014.25	342.37	0.29	0.03	25.48	25.85	142.45
599	50.1	3.41	0	0.07	249.94	342.33	0.33	0.03	25.41	25.78	14.71
602	51.05	7.4	0	0.03	102.09	342.16	0.29	0.03	25.41	25.78	6.89
605	52.59	6.72	0	0.03	130.3	341.92	0.34	0.03	25.74	26.11	7.82
608	51.15	0.98	0	0.24	919.4	341.79	0.34	0.03	25.94	26.31	52.23
611	49.76	4.33	0	0.05	199.22	341.8	0.33	0.03	25.65	26.02	11.5
614	52.88	10.66	0	0.02	86.14	341.51	0.35	0.03	25.71	26.08	4.96
617	52.12	1.71	0	0.12	467.02	341.26	0.31	0.03	25.66	26.02	30.48
620	49.47	0.32	-0.02	0.65	2454.93	341.36	0.31	0.03	25.65	26.02	152.86
623	50.69	8.49	0	0.03	99.84	341.18	0.32	0.03	25.92	26.28	5.97
626	52.92	4.23	0	0.05	188.25	340.93	0.31	0.03	25.76	26.12	12.5
629	51.35	0.55	-0.01	0.36	1230.83	340.92	0.26	0.03	25.54	25.9	93.92
632	50.04	3.79	0	0.05	176.5	340.85	0.26	0.03	25.14	25.49	13.19
635	50.58	6.11	0	0.03	91.59	340.7	0.22	0.03	25.44	25.81	8.28
638	52.56	6.46	0	0.03	92.38	340.5	0.23	0.03	25.52	25.89	8.14
641	51.62	0.64	-0.01	0.37	835.32	340.35	0.2	0.03	25.87	26.23	80.98
644	49.02	0.54	-0.01	0.42	1001.45	340.42	0.21	0.03	25.72	26.09	90.64
647	50.57	10.41	0	0.02	49.32	340.25	0.19	0.03	26.03	26.39	4.86
650	50.71	3.15	0	0.07	146.39	339.91	0.18	0.03	25.07	25.42	16.12
653	49.69	0.01	-0.42	22.09	43539.98	340.05	0.17	0.03	25.39	25.76	4969.45
656	48.57	0.01	-0.5	23.64	53071.67	339.93	0.2	0.03	25.95	26.32	4857.43

Paper (stacked on edge)**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	245.55
Time to Peak Heat Release Rate (s):	24.00
Total Heat Release (MJ/m ²):	3.97
60 s Average Heat Release Rate (kW/m ²):	66.07
Total Mass Loss (g):	0.92
Average Mass Loss Rate (g/s):	0.034
Average Effective Heat of Combustion (MJ/kg):	21.61
Average Smoke Extinction Area (m ² /kg):	87.19
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	-0.0001

Specimen:

Initial mass (g):	382.2
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	161
Time to ignition (s):	9
Time to flameout (s):	38

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	7.57	0.01	-0.61	-0.06	270.07	382.26	0	0.03	25.46	25.64	756.65
3	15.15	0.01	-0.92	-0.06	0	382.42	0	0.03	25.86	26.04	1514.63
6	15.54	5.2	0	0	0	382.46	0	0.03	26.08	26.26	2.99
9	8.52	6.93	0	0	91.23	382.3	0.12	0.03	25.37	25.55	1.23
12	31.77	13.63	0	0	68.96	382.24	0.18	0.03	25.32	25.62	2.33
15	89.28	20.59	0	0	97.14	381.9	0.39	0.03	24.98	25.57	4.34
18	177.36	9.57	0	0	119.41	381.69	0.22	0.03	24.97	25.68	18.53
21	237.82	1.6	-0.01	0	388.54	381.6	0.12	0.03	25.15	25.98	148.95
24	245.55	7.97	0	0	0.81	381.58	0	0.03	25.47	26.33	30.83
27	204.52	13.76	0	0	0	381.37	0	0.03	25.6	26.41	14.86
30	164.93	-3.01	0	-0.02	0	381.25	0	0.03	25.99	26.72	-54.87
33	104.89	-6.95	0	-0.01	0	381.41	0	0.03	26.33	26.95	-15.1
36	59.64	10.61	0	0	0	381.38	0	0.03	26.24	26.76	5.62
39	29.34	4.97	0	0	0	381.17	0	0.03	26.1	26.57	5.9
42	13.83	-8.98	0	0	0	381.26	0	0.03	26.22	26.64	-1.54
45	13.62	7.12	0	0	0	381.34	0	0.03	25.97	26.34	1.91
48	8.27	12.07	0	0	0	381.09	0	0.03	25.94	26.26	0.69
51	2.57	-8.32	0	0	0	381.06	0	0.03	26.23	26.54	-0.31
54	-0.44	-3.58	0	0	0	381.25	0	0.03	25.42	25.69	0.12
57	2.32	15.78	0	0	0	381.12	0	0.03	25.92	26.18	0.15
60	-1.83	3.32	0	0	0	380.89	0	0.03	26.02	26.26	-0.55
63	-2.6	-9.44	0	0	0	381.02	0	0.03	25.98	26.21	0.28
66	-0.79	0.01	-0.98	-0.08	0	381.06	0	0.03	26.03	26.24	-79.23
69	-1.11	0.01	-1.16	-0.07	0	380.84	0	0.03	25.62	25.83	-111.03

Paper (stacked on edge)**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	7.00
Peak Heat Release Rate (kW/m ²):	256.98
Time to Peak Heat Release Rate (s):	20.00
Total Heat Release (MJ/m ²):	3.89
60 s Average Heat Release Rate (kW/m ²):	70.23
Total Mass Loss (g):	
Average Mass Loss Rate (g/s):	0.044
Average Effective Heat of Combustion (MJ/kg):	16.36
Average Smoke Extinction Area (m ² /kg):	50.01
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0004

Specimen:

Initial mass (g):	388.2
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	93
Time to ignition (s):	7
Time to flameout (s):	32

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	30.09	0.01	-0.84	-0.06	0	388.18	0	0.03	26.06	26.3	3009.47
5	24.06	0.01	-0.85	-0.08	0	388.31	0	0.03	25.97	26.21	2406.2
8	20.56	6.5	0	0	80.35	388.2	0.1	0.03	25.42	25.66	3.16
11	44.46	18.75	0	0	12.63	388.1	0.05	0.03	24.71	25.12	2.37
14	123.28	27.97	0	0	25.51	387.66	0.15	0.03	23.87	24.46	4.41
17	225.27	10.98	0	0	211.18	387.36	0.46	0.03	24.48	25.33	20.52
20	256.98	3.46	0	0.01	50.21	387.3	0.03	0.03	24.8	25.68	74.2
23	238.61	-0.32	0.02	-0.32	0	387.24	0	0.03	25.37	26.18	-754.08
26	177.79	-1.46	0.01	-0.08	0	387.3	0	0.03	26.24	26.99	-121.67
29	113.33	6.72	0	0.01	0	387.25	0	0.03	25.57	26.25	16.87
32	72.88	7.35	0	0.01	0	387.12	0	0.03	25.36	25.95	9.91
35	53.09	0.24	-0.03	0.47	203.95	387.05	0.01	0.03	25.84	26.35	216.88
38	32.24	1.51	0	0.09	0	387.09	0	0.03	25.93	26.38	21.33
41	18.57	2.21	0	0.04	0	387.01	0	0.03	25.74	26.16	8.42
44	14.92	5.73	0	0.01	9.61	387.01	0.01	0.03	25.7	26.09	2.6
47	14.42	7.12	0	0	0.1	386.84	0	0.03	26.36	26.72	2.03
50	15.19	-0.25	0.04	0	0	386.83	0	0.03	25.72	26.03	-61.65
53	9.53	-4.26	0	0	0	386.84	0	0.03	25.71	26.01	-2.24
56	4.43	7	0	0	0	386.9	0	0.03	25.82	26.1	0.63
59	3.55	11.25	0	0	0	386.66	0	0.03	25.59	25.86	0.32
62	4.5	-10.67	0	0	0	386.65	0	0.03	25.47	25.72	-0.42
65	7.16	0.01	-0.99	-0.07	0	386.88	0	0.03	24.97	25.2	716.17
68	8.08	0.01	-0.79	-0.08	0	386.76	0	0.03	25.44	25.67	807.63

Paper (stacked on edge)**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	117.83
Time to Peak Heat Release Rate (s):	19.00
Total Heat Release (MJ/m ²):	0.88
60 s Average Heat Release Rate (kW/m ²):	27.51
Total Mass Loss (g):	0.44
Average Mass Loss Rate (g/s):	0.037
Average Effective Heat of Combustion (MJ/kg):	9.88
Average Smoke Extinction Area (m ² /kg):	53.91
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	-0.0001

Specimen:

Initial mass (g):	381.7
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	97
Time to ignition (s):	9
Time to flameout (s):	20

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.26	0.01	-0.81	-0.06	0	381.82	0	0.03	25.8	26.05	25.78
4	8.62	0.01	-0.78	-0.07	0	381.8	0	0.03	25.62	25.87	862.06
7	13.4	10.1	0	0	0	381.7	0	0.03	25.41	25.66	1.33
10	14.72	12.95	0	0	123.08	381.51	0.31	0.03	25.21	25.46	1.14
13	48.01	13.04	0	0	0	381.33	0	0.03	25.38	25.81	3.68
16	98.05	1.88	0	0.01	0	381.16	0	0.03	25.23	25.75	52.18
19	117.83	-5.77	0	-0.01	0	381.26	0	0.03	25.19	25.72	-20.41
22	101.96	4.2	0	0.03	0	381.27	0	0.03	25.8	26.29	24.29
25	60.98	9.1	0	0.01	0	381.15	0	0.03	25.53	25.96	6.7
28	38.52	-1.76	0.01	-0.05	0	381.06	0	0.03	26.2	26.61	-21.86
31	21.78	-8	0	-0.01	0	381.18	0	0.03	26.06	26.44	-2.72
34	10.49	7.93	0	0.01	0	381.22	0	0.03	25.78	26.13	1.32
37	7.47	14.11	0	0.01	0	380.98	0	0.03	25.8	26.13	0.53
40	9.36	-4.38	0	0	0	380.88	0	0.03	25.75	26.06	-2.14
43	7.4	-5.44	0	0	0	381.05	0	0.03	25.57	25.88	-1.36
46	2.73	9.77	0	0.01	0	380.99	0	0.03	25.94	26.25	0.28
49	4.88	2.99	0	0.02	0	380.84	0	0.03	25.95	26.25	1.63
52	6.4	-6.93	0	-0.01	0	380.91	0	0.03	26.28	26.58	-0.92
55	4.97	4.15	0	0.01	0	380.97	0	0.03	26.1	26.38	1.2
58	-0.54	14.32	0	0	0	380.79	0	0.03	25.32	25.6	-0.04
61	-0.89	-0.42	0.02	0	0	380.63	0	0.03	25.42	25.7	2.11
64	4.46	0.01	-0.64	-0.08	0	380.77	0	0.03	25.65	25.91	445.76
67	5.76	0.01	-0.91	-0.07	0	380.71	0	0.03	25.33	25.6	576.36

Paper (stacked flat - covered with cardboard)**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	17.00
Peak Heat Release Rate (kW/m ²):	299.32
Time to Peak Heat Release Rate (s):	55.00
Total Heat Release (MJ/m ²):	61.70
60 s Average Heat Release Rate (kW/m ²):	227.09
Total Mass Loss (g):	46.03
Average Mass Loss Rate (g/s):	0.072
Average Effective Heat of Combustion (MJ/kg):	13.40
Average Smoke Extinction Area (m ² /kg):	54.83
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0345

Specimen:

Initial mass (g):	368.9
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	100
Time to ignition (s):	17
Time to flameout (s):	703

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.3	0.01	-0.32	-0.04	0	369.04	0	0.03	25.39	25.61	30.31
4	0.4	0.01	-0.4	-0.04	0	369.22	0	0.03	25.41	25.64	39.67
7	0.73	1.28	0	0	0	369.08	0	0.03	26.02	26.25	0.57
10	4.06	-3.9	0	0	0	369.18	0	0.03	25.78	26.01	-1.04
13	3.51	1.86	0	0	0	369.23	0	0.03	25.38	25.63	1.89
16	4.08	13	0	0	36.18	369.02	0.19	0.03	25.09	25.35	0.31
19	31.12	27.52	0	0.01	58.62	368.44	0.65	0.03	24.23	24.79	1.13
22	114.87	27.68	0	0	29.91	367.49	0.34	0.02	23.04	24.29	4.15
25	196.36	11.7	0	0	4.97	366.89	0.02	0.03	24.49	25.98	16.78
28	251.03	19.36	0	0	5.64	366.63	0.04	0.03	24.13	25.67	12.97
31	258.87	24.54	0	0	32.73	365.74	0.31	0.02	23.93	25.64	10.55
34	275.53	10.52	0	0	6.39	365.29	0.03	0.03	24.71	26.6	26.19
37	270.63	13.52	0	0	0	365	0	0.03	24.93	26.77	20.01
40	241.36	19.22	0	0	0	364.45	0	0.03	24.96	26.74	12.56
43	216.36	16.81	0	0	0	363.91	0	0.03	24.79	26.5	12.87
46	213.16	10.86	0	0.01	0	363.46	0	0.02	23.99	25.74	19.62
49	241.63	12.34	0	0.01	2.54	363.2	0.01	0.02	24.01	26	19.59
52	288.46	20.94	0	0.01	0	362.67	0	0.02	24.44	26.57	13.78
55	299.32	18.18	0	0.01	0	362.02	0	0.02	24.73	26.79	16.46
58	283.24	11.71	0	0.02	0	361.61	0	0.02	25.05	27.05	24.19
61	261.11	14.89	0	0.02	0	361.25	0	0.02	24.66	26.59	17.53
64	261.52	21.28	0	0.02	0	360.7	0	0.02	24.71	26.62	12.29
67	268.47	12.45	0	0.02	0	360.08	0	0.02	24.85	26.76	21.56
70	271.64	4.7	0	0.07	0	359.94	0	0.02	25.11	27	57.74
73	264.25	21.5	0	0.02	0	359.62	0	0.02	25.02	26.82	12.29
76	255.94	29.93	0	0.02	0	358.7	0	0.02	25.11	26.83	8.55
79	244.92	22.21	0	0.03	0	357.95	0	0.02	24.77	26.38	11.03
82	245.38	14.4	0	0.04	0	357.38	0	0.03	25.72	27.3	17.04
85	230.37	11.37	0	0.05	0	357.05	0	0.03	25.69	27.16	20.27
88	209.67	10.08	0	0.05	0	356.68	0	0.02	25.27	26.58	20.8
91	204.93	12	0	0.04	0	356.43	0	0.03	26.27	27.55	17.08
94	184.71	7.99	0	0.06	0	356	0	0.03	25.66	26.79	23.13
97	170.2	5.19	0	0.08	0	355.93	0	0.03	26.16	27.2	32.77
100	154.78	14.34	0	0.03	0	355.6	0	0.03	25.72	26.66	10.8
103	152.25	15.32	0	0.02	0	355.13	0	0.03	26.1	26.99	9.94
106	148.53	15.42	0	0.02	0	354.7	0	0.03	25.87	26.7	9.63
109	141.81	13.95	0	0.02	0	354.22	0	0.03	25.63	26.4	10.16
112	139.1	3.57	0	0.08	0	353.92	0	0.03	25.85	26.6	38.91
115	138.38	1.29	0	0.21	0	353.94	0	0.03	25.96	26.68	107.35
118	136.92	13.51	0	0.02	0	353.74	0	0.03	25.73	26.41	10.14
121	134.28	16.49	0	0.02	0	353.2	0	0.03	25.9	26.55	8.14
124	128.23	3.19	0	0.08	0	352.87	0	0.03	25.88	26.51	40.15

127	123.19	-4.82	0	-0.05	0	352.97	0	0.03	25.55	26.15	-25.56
130	125.43	3.4	0	0.09	0	353.04	0	0.03	26.1	26.69	36.94
133	123.31	10.46	0	0.03	0	352.77	0	0.03	26.26	26.84	11.79
136	115.75	6.77	0	0.04	0	352.49	0	0.03	25.82	26.36	17.1
139	108.62	3.06	0	0.08	0	352.37	0	0.03	25.28	25.78	35.51
142	110.1	5.48	0	0.04	0	352.26	0	0.03	26.05	26.54	20.1
145	107.71	12.05	0	0.02	0	352.01	0	0.03	26.07	26.53	8.94
148	104.03	11.89	0	0.02	0	351.59	0	0.03	25.89	26.33	8.75
151	99.52	2.2	0	0.12	0	351.36	0	0.03	25.93	26.36	45.24
154	96.28	4.01	0	0.07	0	351.38	0	0.03	25.5	25.92	24
157	100.19	8.85	0	0.03	0	351.1	0	0.03	26.02	26.45	11.32
160	100.29	4.48	0	0.07	0	350.91	0	0.03	25.7	26.13	22.38
163	100.69	8.67	0	0.04	0	350.77	0	0.03	26.43	26.87	11.61
166	96.13	9.91	0	0.03	0	350.41	0	0.03	25.77	26.19	9.7
169	96.62	7.05	0	0.04	0	350.21	0	0.03	25.8	26.22	13.7
172	98	9.18	0	0.03	0	349.95	0	0.03	25.96	26.39	10.68
175	93.27	5.74	0	0.05	0	349.69	0	0.03	25.31	25.74	16.26
178	90.99	6.29	0	0.05	0	349.58	0	0.03	25.63	26.05	14.46
181	90.58	5.61	0	0.06	0	349.32	0	0.03	26.06	26.49	16.14
184	91.39	2.6	0	0.11	0	349.26	0	0.03	25.9	26.34	35.21
187	90.73	10.77	0	0.03	0	349.09	0	0.03	26.11	26.55	8.43
190	86.69	13.15	0	0.02	0	348.65	0	0.03	25.56	25.98	6.59
193	87.81	5.95	0	0.05	0	348.37	0	0.03	25.69	26.11	14.76
196	90.82	2.92	0	0.1	0	348.27	0	0.03	26.06	26.49	31.07
199	87.53	8.15	0	0.04	0	348.14	0	0.03	25.16	25.58	10.74
202	87.16	10.33	0	0.03	0	347.8	0	0.03	26	26.44	8.44
205	85.92	6.09	0	0.05	0	347.57	0	0.03	26.09	26.53	14.1
208	85.44	1.03	0	0.25	0	347.43	0	0.03	25.34	25.76	82.63
211	85.36	7.4	0	0.03	0	347.42	0	0.03	25.44	25.87	11.54
214	84.63	13.69	0	0.02	0	346.99	0	0.03	25.82	26.25	6.18
217	84.57	4.94	0	0.05	0	346.71	0	0.03	25.82	26.26	17.11
220	85.8	0.26	-0.02	1.06	0	346.67	0	0.03	25.68	26.11	326.51
223	84.66	6.01	0	0.04	0	346.61	0	0.03	25.3	25.74	14.08
226	82.85	13.69	0	0.02	0	346.3	0	0.03	25.33	25.77	6.05
229	84.46	10.64	0	0.02	0	345.87	0	0.03	25.81	26.27	7.94
232	86.1	2.19	0	0.11	0	345.7	0	0.03	25.92	26.38	39.24
235	86.19	1.89	0	0.14	0	345.68	0	0.03	25.8	26.25	45.52
238	83.42	10.02	0	0.03	0	345.53	0	0.03	25.79	26.24	8.32
241	81.06	6.91	0	0.04	0	345.16	0	0.03	25.73	26.18	11.73
244	82.86	-1.23	0	-0.19	0	345.14	0	0.03	26.03	26.47	-67.21
247	81.37	5.47	0	0.05	0	345.12	0	0.03	25.51	25.94	14.87
250	79.67	13.91	0	0.02	0	344.8	0	0.03	25.49	25.93	5.73
253	82.24	8.48	0	0.03	0	344.39	0	0.03	26.53	26.99	9.7
256	80.06	-0.58	0.01	-0.42	0	344.32	0	0.03	25.42	25.85	-136.97
259	82.53	1.17	-0.01	0.22	0	344.34	0	0.03	25.7	26.13	70.79
262	83.73	11.09	0	0.02	0	344.19	0	0.03	25.91	26.36	7.55
265	81.8	12.48	0	0.02	0	343.75	0	0.03	25.73	26.19	6.55
268	79.33	0.04	-0.11	7.33	0	343.54	0	0.03	25.37	25.82	2259.3

271	80.8	1.28	0	0.2	0	343.64	0	0.03	25.83	26.29	62.96
274	81.33	12.46	0	0.02	0	343.39	0	0.03	25.93	26.39	6.53
277	82.07	11.44	0	0.03	0	342.99	0	0.03	26.5	26.98	7.17
280	77.87	2.33	0	0.11	0	342.77	0	0.03	25.84	26.3	33.48
283	78.06	0.31	-0.02	0.86	0	342.79	0	0.03	26.06	26.52	254.88
286	80.24	9.63	0	0.03	0	342.66	0	0.03	25.98	26.43	8.33
289	78.12	12.32	0	0.02	0	342.26	0	0.03	25.41	25.85	6.34
292	77.72	4.19	0	0.06	0	342.01	0	0.03	25.59	26.04	18.54
295	76.32	0.73	-0.01	0.32	0	341.98	0	0.03	25.84	26.29	105.06
298	78.49	7.29	0	0.03	0	341.89	0	0.03	26.23	26.69	10.76
301	79.01	11.42	0	0.02	0	341.56	0	0.03	25.93	26.39	6.92
304	78.01	6.35	0	0.04	0	341.27	0	0.03	25.85	26.3	12.28
307	76.19	0.04	-0.1	5.62	0	341.19	0	0.03	25.95	26.4	1945.44
310	73.99	2.43	0	0.1	0	341.2	0	0.03	25.8	26.24	30.4
313	74.85	10.42	0	0.02	0	341	0	0.03	25.67	26.11	7.18
316	75.49	12.43	0	0.02	0	340.62	0	0.03	25.27	25.71	6.07
319	74.42	6.05	0	0.04	0	340.32	0	0.03	25.23	25.67	12.3
322	73.46	-1.03	0	-0.26	0	340.26	0	0.03	25.49	25.93	-71.01
325	73.2	2.93	0	0.09	0	340.29	0	0.03	25.54	25.96	25.01
328	74.25	10.89	0	0.02	0	340.06	0	0.03	25.7	26.11	6.82
331	73.93	7.45	0	0.04	0	339.73	0	0.03	25.85	26.26	9.93
334	72.77	1.34	0	0.21	0	339.64	0	0.03	25.99	26.4	54.44
337	69.44	2.3	0	0.12	0	339.59	0	0.03	25.65	26.06	30.16
340	71.47	8.7	0	0.03	0	339.45	0	0.03	25.9	26.31	8.21
343	70.87	14.18	0	0.02	0	339.08	0	0.03	25.27	25.68	5
346	69.84	8.65	0	0.03	0	338.69	0	0.03	25.43	25.83	8.07
349	69.12	0.54	-0.01	0.49	0	338.58	0	0.03	25.36	25.76	128.07
352	70.84	1.13	0	0.24	0	338.59	0	0.03	25.59	26	62.97
355	71.09	7.85	0	0.03	0	338.46	0	0.03	25.43	25.83	9.06
358	71.02	11.26	0	0.02	0	338.14	0	0.03	26.2	26.62	6.31
361	67.2	8.1	0	0.03	0	337.84	0	0.03	25.61	26.01	8.3
364	68.35	5.11	0	0.05	0	337.66	0	0.03	25.71	26.12	13.37
367	70.99	4.19	0	0.06	0	337.52	0	0.03	26.08	26.5	16.94
370	70.58	6.48	0	0.04	0	337.38	0	0.03	26.04	26.46	10.9
373	69.86	7.54	0	0.04	0	337.14	0	0.03	26.15	26.58	9.26
376	69.79	1.42	0	0.2	0	336.98	0	0.03	26.28	26.71	49.23
379	69.91	-0.59	0.01	-0.47	0	337.02	0	0.03	25.93	26.35	-119.04
382	69.6	9.44	0	0.03	0	336.93	0	0.03	25.49	25.91	7.38
385	68.95	11.8	0	0.02	0	336.51	0	0.03	25.9	26.33	5.84
388	66.26	1.29	0	0.19	0	336.31	0	0.03	25.57	26	51.28
391	68.65	-0.64	0.01	-0.42	0	336.37	0	0.03	25.76	26.19	-107.09
394	70.12	8.08	0	0.03	0	336.27	0	0.03	25.82	26.25	8.68
397	67.15	11.94	0	0.02	0	335.92	0	0.03	25.52	25.94	5.62
400	65.18	5.47	0	0.05	0	335.63	0	0.03	25.46	25.87	11.92
403	66.68	1.7	0	0.15	0	335.58	0	0.03	25.65	26.07	39.16
406	66.73	2.78	0	0.09	0	335.49	0	0.03	25.22	25.63	23.98
409	66.4	4.85	0	0.05	0	335.4	0	0.03	25.69	26.11	13.7
412	65.14	8.92	0	0.03	0	335.19	0	0.03	25.72	26.14	7.3

415	66.22	3.77	0	0.07	0	334.93	0	0.03	25.83	26.24	17.58
418	68.07	-1.34	0	-0.19	0	334.96	0	0.03	25.88	26.29	-50.95
421	68.2	7.01	0	0.04	0	334.91	0	0.03	25.88	26.29	9.73
424	66.17	11.67	0	0.02	0	334.57	0	0.03	25.68	26.08	5.67
427	65.84	4.58	0	0.06	0	334.3	0	0.03	25.86	26.26	14.37
430	67.13	-0.86	0.01	-0.26	0	334.28	0	0.03	25.59	26	-78.3
433	69.54	5.12	0	0.05	0	334.27	0	0.03	25.61	26.02	13.58
436	67.86	12.25	0	0.02	6.75	333.97	0.03	0.03	25.65	26.07	5.54
439	67.33	5.68	0	0.04	21.5	333.63	0.05	0.03	25.93	26.34	11.86
442	65.66	-0.01	0.7	-37.79	-21981.29	333.62	0.06	0.03	26.4	26.82	0
445	63.95	3.68	0	0.07	35.29	333.56	0.05	0.03	25.61	26.01	17.4
448	66.04	6.52	0	0.04	38.49	333.4	0.1	0.03	25.69	26.1	10.13
451	64.91	6.98	0	0.03	43.88	333.19	0.12	0.03	25.71	26.12	9.3
454	63.09	4.98	0	0.05	51.01	333	0.1	0.03	25.37	25.77	12.67
457	64.13	5.35	0	0.04	81.67	332.88	0.17	0.03	25.09	25.49	11.98
460	68.88	6.01	0	0.04	93.65	332.68	0.21	0.03	26.24	26.67	11.46
463	66.46	4.77	0	0.05	131.09	332.53	0.24	0.03	25.81	26.23	13.93
466	65.71	3.56	0	0.07	184.94	332.39	0.25	0.03	25.8	26.22	18.47
469	68.5	5.71	0	0.04	130.68	332.29	0.28	0.03	26.37	26.81	12
472	68.28	8.46	0	0.03	89.61	332.05	0.29	0.03	25.44	25.87	8.07
475	68.02	6.66	0	0.03	126.17	331.82	0.32	0.03	25.84	26.27	10.22
478	66.13	6.09	0	0.04	147.22	331.64	0.34	0.03	25.59	26.01	10.85
481	65.87	2.75	0	0.08	333.44	331.47	0.36	0.03	25.04	25.46	23.97
484	69.33	-0.86	0.01	-0.26	-1150.27	331.47	0.38	0.03	26.03	26.47	-80.26
487	66.55	4.22	0	0.05	255.75	331.46	0.41	0.03	25.81	26.24	15.75
490	64.59	10.08	0	0.02	124.52	331.21	0.47	0.03	26.04	26.47	6.41
493	65.74	8.4	0	0.03	155.08	330.91	0.49	0.03	25.96	26.39	7.83
496	66.92	0	-1.96	106.12	559693.97	330.76	0.48	0.03	25.66	26.08	0
499	66.44	1.53	0	0.15	861	330.84	0.5	0.03	25.8	26.23	43.35
502	63.68	7.68	0	0.03	166.77	330.63	0.49	0.03	25.48	25.89	8.29
505	64.5	5.25	0	0.05	245.1	330.44	0.49	0.03	25.66	26.08	12.29
508	66.35	3.28	0	0.07	386.64	330.32	0.49	0.03	25.76	26.18	20.2
511	66.33	4.3	0	0.05	322.55	330.22	0.53	0.03	25.74	26.15	15.43
514	63.98	8.13	0	0.03	173.33	330.04	0.54	0.03	25.65	26.07	7.87
517	63.03	8.14	0	0.03	174.93	329.76	0.54	0.03	25.98	26.4	7.74
520	64.05	4.57	0	0.05	311.38	329.58	0.54	0.03	25.93	26.35	14.02
523	64.94	4.89	0	0.05	284.24	329.46	0.54	0.03	25.46	25.87	13.28
526	63.75	4.36	0	0.06	314.43	329.29	0.53	0.03	25.33	25.73	14.63
529	63.88	2.19	0	0.12	657.76	329.21	0.54	0.03	26.07	26.49	29.18
532	62.6	5.69	0	0.04	239.81	329.12	0.52	0.03	25.99	26.4	11
535	63.39	9.52	0	0.03	151.26	328.86	0.55	0.03	25.7	26.11	6.66
538	66.76	4.81	0	0.05	291.22	328.61	0.52	0.03	26.32	26.74	13.88
541	64.87	1.49	0	0.16	951.73	328.57	0.53	0.03	26.35	26.77	43.45
544	62.98	1.88	0	0.14	765.38	328.49	0.54	0.03	26.2	26.62	33.44
547	60.21	5.57	0	0.04	262.9	328.43	0.57	0.03	25.2	25.6	10.81
550	62.38	8.42	0	0.03	155.03	328.16	0.51	0.03	25.39	25.79	7.4
553	64.1	4.52	0	0.05	282.48	327.97	0.49	0.03	25.48	25.89	14.17
556	63.11	2.58	0	0.09	493.75	327.88	0.49	0.03	25.41	25.83	24.5

559	62.8	1.63	0	0.14	803.65	327.8	0.5	0.03	25.73	26.16	38.42
562	62.57	9.09	0	0.02	141.11	327.72	0.49	0.03	25.62	26.04	6.88
565	64.48	12.86	0	0.02	105.34	327.29	0.52	0.03	25.57	25.97	5.01
568	64.64	2.72	0	0.08	477.44	327.05	0.5	0.03	25.49	25.9	23.75
571	62.17	1.33	0	0.18	918.39	327.07	0.47	0.03	25.69	26.11	46.8
574	59.7	4.69	0	0.05	262.78	326.93	0.48	0.03	25.5	25.91	12.72
577	61.85	5.21	0	0.05	245.77	326.8	0.49	0.03	25.93	26.34	11.87
580	62.26	5.34	0	0.04	228.26	326.63	0.47	0.03	25.67	26.08	11.67
583	59.98	1.04	0	0.22	1132.62	326.51	0.46	0.03	25.32	25.72	57.79
586	60.63	0.8	-0.01	0.29	1356.33	326.53	0.41	0.03	26.24	26.64	75.68
589	59.54	6.52	0	0.04	180.25	326.42	0.45	0.03	25.5	25.88	9.14
592	62.96	10.02	0	0.02	119.82	326.16	0.46	0.03	25.91	26.29	6.28
595	62.62	6.52	0	0.04	186.54	325.88	0.47	0.03	25.62	26	9.6
598	61.3	0.52	-0.01	0.45	2371.41	325.79	0.47	0.03	25.83	26.21	117.84
601	59.76	1.53	0	0.16	814.16	325.79	0.47	0.03	25.95	26.34	39.19
604	59.63	7.47	0	0.03	159.73	325.65	0.46	0.03	25.33	25.71	7.98
607	62.34	10.74	0	0.02	115.41	325.37	0.48	0.03	25.56	25.95	5.8
610	61.8	4.46	0	0.05	281.11	325.08	0.48	0.03	25.67	26.05	13.85
613	59.43	-0.66	0.01	-0.35	-1708.12	325.09	0.44	0.03	25.25	25.63	-89.55
616	60.41	3.37	0	0.07	357.84	325.05	0.47	0.03	25.17	25.56	17.91
619	63.11	10.94	0	0.02	108.17	324.86	0.45	0.03	25.62	26.01	5.77
622	62.9	9.76	0	0.02	123.19	324.46	0.47	0.03	25.43	25.82	6.44
625	61.34	1.07	0	0.21	1087.38	324.33	0.45	0.03	25.64	26.03	57.06
628	59.3	-0.38	0.01	-0.55	-3201.65	324.34	0.47	0.03	25.34	25.73	-155.72
631	62.22	5.67	0	0.04	231.37	324.29	0.5	0.03	25.89	26.29	10.97
634	62.3	13.12	0	0.02	96.7	323.99	0.49	0.03	25.71	26.12	4.75
637	60.62	9.78	0	0.02	131.49	323.59	0.5	0.03	25.55	25.95	6.2
640	59.56	-0.4	0.01	-0.59	-2748.44	323.46	0.42	0.03	25.86	26.26	-149.34
643	61.46	-1.25	0	-0.19	-934.33	323.54	0.44	0.03	26.02	26.42	-49.03
646	62.65	6.41	0	0.04	194.83	323.47	0.48	0.03	25.67	26.07	9.78
649	61.87	0.01	-0.49	22.28	124153.05	323.2	0.48	0.03	25.67	26.07	6187.08
652	58.92	0.01	-0.41	22.04	119283.43	322.99	0.46	0.03	25.65	26.05	5892.05

Paper (stacked flat - covered with cardboard)**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	15.00
Peak Heat Release Rate (kW/m ²):	334.90
Time to Peak Heat Release Rate (s):	35.00
Total Heat Release (MJ/m ²):	63.23
60 s Average Heat Release Rate (kW/m ²):	232.74
Total Mass Loss (g):	46.80
Average Mass Loss Rate (g/s):	0.073
Average Effective Heat of Combustion (MJ/kg):	13.51
Average Smoke Extinction Area (m ² /kg):	6.33
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0357

Specimen:

Initial mass (g):	403.6
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	87
Time to ignition (s):	15
Time to flameout (s):	705

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-1.5	0.01	-0.46	-0.04	3417.52	403.59	0.01	0.03	25.75	25.95	-150.13
5	-1.85	0.01	-0.48	-0.03	0	403.66	0	0.03	25.52	25.72	-184.64
8	0.07	-1.54	0	0	0	403.82	0	0.03	25.43	25.62	-0.04
11	2.25	8.89	0	0	29.34	403.7	0.1	0.03	25.87	26.07	0.25
14	1.66	9.26	0	0	68.63	403.36	0.24	0.03	25.89	26.11	0.18
17	11.39	15.44	0	0.01	83.38	403.11	0.52	0.03	24.51	24.85	0.74
20	60.34	21.72	0	0	45.83	402.43	0.42	0.02	22.56	23.47	2.78
23	164.01	20.25	0	0	37.75	401.86	0.3	0.03	23.71	25.07	8.1
26	236.67	27.2	0	0	31.21	401.17	0.33	0.03	24.2	25.67	8.7
29	259.56	25.51	0	0	54.94	400.3	0.56	0.02	23.42	25.11	10.18
32	295.02	17.09	0	0.01	91.94	399.69	0.62	0.02	23.5	25.52	17.26
35	334.9	14.41	0	0.01	43.34	399.23	0.24	0.02	24.31	26.44	23.24
38	334.23	17.33	0	0	16.94	398.78	0.11	0.03	25.23	27.33	19.28
41	294.06	16.7	0	0.01	0	398.21	0	0.03	25.58	27.61	17.6
44	252.59	11.17	0	0.01	0	397.81	0	0.03	24.92	26.88	22.62
47	238.38	12.42	0	0.01	17.72	397.49	0.09	0.02	23.89	25.84	19.19
50	261.91	20.2	0	0.01	17.6	397.02	0.14	0.02	24.08	26.17	12.96
53	286.96	24.04	0	0.01	5.19	396.31	0.05	0.02	24.38	26.52	11.94
56	283.9	22.97	0	0.01	3.26	395.62	0.03	0.02	23.63	25.67	12.36
59	293.66	11.79	0	0.02	0	395.01	0	0.02	24.7	26.84	24.91
62	286.73	4.14	0	0.07	0	394.88	0	0.02	24.77	26.81	69.33
65	273.18	13.12	0	0.02	3.17	394.63	0.02	0.02	24.97	26.93	20.83
68	255.78	17.43	0	0.02	0	394.12	0	0.02	25.25	27.12	14.68
71	238.47	17.78	0	0.02	0	393.63	0	0.02	25.47	27.21	13.41
74	224.18	13.67	0	0.03	0	393.09	0	0.02	25.57	27.18	16.4
77	211.81	10.62	0	0.03	0	392.8	0	0.03	25.76	27.26	19.95
80	196.53	14.48	0	0.02	5.99	392.41	0.03	0.03	25.73	27.1	13.57
83	182.44	11.35	0	0.03	4.8	391.97	0.02	0.03	25.6	26.87	16.08
86	172.69	9.48	0	0.03	0	391.72	0	0.02	25.4	26.55	18.22
89	167.04	12.1	0	0.03	0	391.37	0	0.02	25.27	26.35	13.81
92	163.95	12.77	0	0.03	0	391	0	0.03	25.56	26.58	12.83
95	163.88	10.94	0	0.04	0	390.62	0	0.03	26.06	27.04	14.98
98	165.05	12.5	0	0.03	0	390.32	0	0.03	26.42	27.36	13.2
101	163.5	14.73	0	0.03	0	389.87	0	0.03	25.82	26.7	11.1
104	165.61	10.15	0	0.04	0	389.49	0	0.03	25.95	26.81	16.32
107	163.95	8.06	0	0.05	0.91	389.24	0	0.03	25.84	26.7	20.33
110	164.59	9.39	0	0.05	0	388.97	0	0.03	25.54	26.41	17.52
113	167.87	12.85	0	0.03	0	388.66	0	0.02	25.23	26.09	13.06
116	176.64	16.03	0	0.03	0	388.21	0	0.03	25.88	26.77	11.02
119	176.23	12.25	0	0.04	0	387.75	0	0.03	25.76	26.64	14.38
122	171.01	8.15	0	0.05	2.6	387.48	0.01	0.02	25.19	26.05	20.97
125	172.44	11.68	0	0.04	2.53	387.21	0.01	0.03	25.66	26.53	14.77

128	172.1	16.3	0	0.02	0	386.77	0	0.03	25.65	26.52	10.56
131	167.45	16.37	0	0.02	0.93	386.27	0.01	0.02	25.13	25.96	10.23
134	164.32	9.45	0	0.04	0	385.84	0	0.02	25.27	26.08	17.39
137	159.89	4.55	0	0.08	0	385.68	0	0.02	25.2	25.99	35.13
140	160.07	10.74	0	0.03	0	385.48	0	0.03	25.4	26.17	14.91
143	161.58	17.32	0	0.02	0	385.03	0	0.03	26.05	26.85	9.33
146	156.2	13.19	0	0.02	0	384.52	0	0.03	25.54	26.32	11.84
149	156.29	5.74	0	0.05	0	384.27	0	0.03	25.83	26.61	27.25
152	156.62	3.04	0	0.1	0	384.14	0	0.03	25.85	26.62	51.55
155	151.25	13.39	0	0.02	0	384	0	0.03	25.48	26.2	11.29
158	145.22	14.99	0	0.02	0	383.4	0	0.03	25.86	26.56	9.69
161	138.14	1.43	0	0.22	0	383.21	0	0.03	25.97	26.63	96.77
164	132.36	0.68	-0.01	0.42	0	383.22	0	0.03	25.77	26.39	195.14
167	127.7	11.07	0	0.02	0	383.07	0	0.03	25.85	26.42	11.53
170	122.65	17.36	0	0.02	0	382.59	0	0.03	26.1	26.64	7.06
173	118.65	14.89	0	0.02	0.31	382.11	0	0.03	26.4	26.9	7.97
176	116.3	5.02	0	0.05	0	381.75	0	0.03	26.6	27.07	23.15
179	111.47	-1.77	0	-0.14	0	381.78	0	0.03	25.75	26.19	-62.84
182	108.96	7.62	0	0.03	0	381.74	0	0.03	25.65	26.07	14.31
185	106.28	14.36	0	0.01	0	381.34	0	0.03	25.77	26.18	7.4
188	103.74	10.68	0	0.02	0	380.96	0	0.03	26.07	26.47	9.72
191	100.57	4.14	0	0.05	0	380.72	0	0.03	25.43	25.8	24.29
194	101.3	8.5	0	0.03	0	380.63	0	0.03	25.9	26.26	11.91
197	100.07	13.99	0	0.02	0	380.2	0	0.03	26.11	26.46	7.15
200	97.52	5.33	0	0.05	0	379.89	0	0.03	26.14	26.49	18.28
203	95.2	2.16	0	0.12	0	379.84	0	0.03	25.67	26	44.09
206	94.35	8.3	0	0.03	0	379.69	0	0.03	25.47	25.8	11.36
209	94.38	10.92	0	0.02	0	379.37	0	0.03	25.69	26.02	8.64
212	93.55	10.19	0	0.02	0	379.07	0	0.03	26.05	26.39	9.18
215	91.31	3.11	0	0.07	0	378.8	0	0.03	25.85	26.19	29.39
218	92.71	0.67	-0.01	0.32	0	378.84	0	0.03	25.82	26.16	139.29
221	93.21	10.6	0	0.02	0	378.67	0	0.03	25.68	26.03	8.79
224	91.63	14.05	0	0.02	0	378.25	0	0.03	25.6	25.96	6.52
227	91.31	6.99	0	0.03	0	377.91	0	0.03	25.92	26.29	13.06
230	89.79	1.05	-0.01	0.23	0	377.83	0	0.03	25.38	25.75	85.51
233	92.92	4.53	0	0.06	0	377.77	0	0.03	25.81	26.18	20.53
236	92.32	9.31	0	0.03	0	377.54	0	0.03	25.66	26.04	9.91
239	90.45	10.01	0	0.03	0	377.25	0	0.03	25.84	26.21	9.04
242	86.6	6.61	0	0.05	0	376.97	0	0.03	25.67	26.03	13.11
245	85.68	4.27	0	0.08	0	376.85	0	0.03	25.61	25.97	20.04
248	88.32	4.68	0	0.07	1.62	376.69	0	0.03	25.82	26.18	18.86
251	86.22	4.5	0	0.08	11.2	376.57	0.02	0.03	25.4	25.74	19.17
254	85.36	5.37	0	0.06	0.24	376.42	0	0.03	25.94	26.29	15.91
257	80.84	3.56	0	0.09	0	376.26	0	0.03	25.59	25.93	22.69
260	78.1	5.03	0	0.07	0	376.18	0	0.03	25.41	25.74	15.51
263	80.44	5.63	0	0.06	0	375.96	0	0.03	25.84	26.17	14.29
266	78.68	4.41	0	0.07	0	375.86	0	0.03	25.39	25.72	17.85
269	77.58	5.25	0	0.07	2.5	375.68	0.01	0.03	25.52	25.84	14.77

272	77.17	7.66	0	0.05	0	375.53	0	0.03	25.65	25.98	10.08
275	78.52	10.97	0	0.03	0	375.22	0	0.03	25.93	26.27	7.16
278	80.26	8.43	0	0.04	0	374.91	0	0.03	26.07	26.42	9.53
281	78.1	7.08	0	0.05	0	374.71	0	0.03	25.93	26.27	11.04
284	73.33	2.79	0	0.11	0	374.51	0	0.03	25.48	25.81	26.32
287	70.63	-0.06	0.1	-5.31	0	374.53	0	0.03	25.3	25.62	0
290	74.38	5.27	0	0.06	4.38	374.45	0.01	0.03	25.98	26.32	14.12
293	74.33	7.4	0	0.04	0	374.24	0	0.03	25.58	25.91	10.04
296	72.74	5.95	0	0.05	3.72	374.04	0.01	0.03	25.7	26.04	12.22
299	70.98	5.13	0	0.06	0	373.88	0	0.03	25.61	25.94	13.84
302	72.09	4.7	0	0.06	9.07	373.73	0.02	0.03	25.47	25.81	15.35
305	73.93	3.84	0	0.08	9.63	373.6	0.01	0.03	26.12	26.47	19.27
308	70.84	4.25	0	0.07	0	373.49	0	0.03	25.85	26.2	16.66
311	70.09	4.26	0	0.07	0	373.34	0	0.03	26.17	26.54	16.45
314	69.55	6.53	0	0.04	0	373.21	0	0.03	25.62	25.98	10.65
317	71.15	8.7	0	0.03	3.64	372.95	0.01	0.03	25.72	26.08	8.18
320	69.93	6.05	0	0.04	0.33	372.73	0	0.03	25.61	25.97	11.55
323	67.15	3.36	0	0.08	13.32	372.59	0.02	0.03	25.46	25.83	19.99
326	66.89	1.24	0	0.21	0	372.52	0	0.03	25.56	25.93	53.85
329	69.27	4.77	0	0.06	0	372.47	0	0.03	25.77	26.14	14.52
332	70.12	10.32	0	0.03	0	372.22	0	0.03	25.64	26.01	6.79
335	68.18	6.46	0	0.04	0	371.93	0	0.03	25.7	26.06	10.55
338	66.01	-0.07	0.07	-3.73	0	371.85	0	0.03	25.56	25.93	-957.8
341	67.11	3.58	0	0.08	0	371.85	0	0.03	25.98	26.35	18.77
344	68.82	11.28	0	0.02	0	371.61	0	0.03	26.16	26.54	6.1
347	66.09	8.08	0	0.03	2.94	371.26	0.01	0.03	25.73	26.08	8.18
350	64.18	4.2	0	0.06	0	371.13	0	0.03	25.9	26.26	15.28
353	63.96	4.62	0	0.06	0	370.97	0	0.03	25.56	25.92	13.83
356	65.11	4.13	0	0.07	0	370.86	0	0.03	25.45	25.81	15.78
359	65.77	5.67	0	0.05	0	370.71	0	0.03	25.73	26.1	11.61
362	63.96	5	0	0.05	0	370.53	0	0.03	25.75	26.13	12.79
365	61.83	2.82	0	0.1	0	370.42	0	0.03	25.64	26.02	21.91
368	61.78	6.34	0	0.05	0	370.32	0	0.03	25.51	25.89	9.75
371	63.62	7.95	0	0.04	0	370.05	0	0.03	25.95	26.33	8
374	61.81	5.1	0	0.05	0	369.88	0	0.03	26.02	26.39	12.12
377	59.58	2.05	0	0.13	0	369.75	0	0.03	25.76	26.12	29.01
380	61.48	1.67	0	0.16	0	369.74	0	0.03	25.98	26.33	36.75
383	63.24	6.05	0	0.05	0	369.61	0	0.03	25.9	26.25	10.46
386	61.13	8.21	0	0.03	0	369.39	0	0.03	25.55	25.89	7.45
389	59.87	6.1	0	0.04	0	369.16	0	0.03	25.83	26.18	9.82
392	59.06	1.63	0	0.15	0	369.04	0	0.03	25.02	25.36	36.31
395	61.82	2.8	0	0.09	0	369.02	0	0.03	25.64	25.99	22.1
398	61.27	7.05	0	0.04	0	368.85	0	0.03	25.95	26.3	8.69
401	59.9	8.08	0	0.03	0	368.62	0	0.03	25.96	26.31	7.41
404	61.6	4.73	0	0.05	0	368.4	0	0.03	26.14	26.49	13.02
407	61.68	4.42	0	0.06	0	368.32	0	0.03	25.37	25.71	13.97
410	59.94	4.57	0	0.06	0	368.13	0	0.03	25.81	26.16	13.11
413	57.25	3.25	0	0.08	10.22	368.05	0.01	0.03	25.55	25.9	17.64

416	57.92	4.97	0	0.05	0	367.91	0	0.03	25.45	25.81	11.66
419	59.96	4.25	0	0.06	0	367.77	0	0.03	25.3	25.65	14.11
422	59.85	6.17	0	0.04	0	367.64	0	0.03	25.75	26.11	9.7
425	58.32	6.78	0	0.04	0	367.41	0	0.03	26.19	26.55	8.6
428	58.31	3.64	0	0.07	0	367.26	0	0.03	26.02	26.38	16.04
431	59.06	2.52	0	0.11	0	367.17	0	0.03	25.65	26	23.41
434	57.46	8.44	0	0.03	0	367.06	0	0.03	25.53	25.88	6.81
437	55.91	9.39	0	0.03	0	366.7	0	0.03	25.55	25.91	5.95
440	57.19	4.1	0	0.06	0	366.54	0	0.03	25.79	26.15	13.94
443	59.22	2.57	0	0.1	0	366.43	0	0.03	25.77	26.13	23.05
446	60.09	3.11	0	0.09	0	366.37	0	0.03	25.96	26.32	19.3
449	59.07	7.17	0	0.04	0	366.22	0	0.03	25.58	25.94	8.24
452	58.16	6.12	0	0.05	0	365.97	0	0.03	25.63	26	9.5
455	59.05	3.66	0	0.07	0	365.86	0	0.03	25.97	26.35	16.13
458	59.44	3.58	0	0.08	0	365.74	0	0.03	25.33	25.69	16.6
461	61.01	4.14	0	0.07	0	365.64	0	0.03	25.93	26.3	14.72
464	58.65	5.42	0	0.05	0	365.48	0	0.03	26.1	26.47	10.83
467	58.46	6.38	0	0.04	0	365.32	0	0.03	26.11	26.49	9.17
470	59.41	8.41	0	0.03	0	365.09	0	0.03	25.82	26.2	7.07
473	60.77	6.74	0	0.04	2.73	364.84	0.01	0.03	25.5	25.88	9.02
476	61.08	1.1	0	0.25	0	364.72	0	0.03	25.72	26.11	55.72
479	59.27	1.14	0	0.24	0	364.73	0	0.03	25.76	26.15	52.1
482	59.17	6.8	0	0.04	0	364.61	0	0.03	25.55	25.94	8.7
485	61.27	8.12	0	0.03	0	364.35	0	0.03	25.62	26.02	7.55
488	63.82	7.73	0	0.03	0	364.14	0	0.03	25.92	26.33	8.25
491	64.26	5.81	0	0.04	0	363.91	0	0.03	26.18	26.59	11.06
494	60.97	2.08	0	0.11	0	363.8	0	0.03	25.74	26.13	29.35
497	59.74	2.25	0	0.11	0	363.75	0	0.03	25.54	25.95	26.51
500	63.04	6.58	0	0.04	0	363.63	0	0.03	25.58	25.99	9.58
503	62.61	7.72	0	0.03	0	363.38	0	0.03	25.47	25.87	8.11
506	63.02	4.73	0	0.05	0	363.2	0	0.03	26.11	26.53	13.32
509	61	2.44	0	0.09	0	363.09	0	0.03	25.62	26.03	24.96
512	62.66	1.66	0	0.13	0	363.04	0	0.03	25.84	26.25	37.79
515	63.16	6.97	0	0.03	0	362.95	0	0.03	25.6	26.01	9.06
518	60.61	8.24	0	0.03	0	362.65	0	0.03	25.51	25.92	7.35
521	59.89	1.15	0	0.19	0	362.51	0	0.03	26.04	26.46	52.22
524	59	2.53	0	0.09	0	362.52	0	0.03	25.21	25.61	23.33
527	62.01	10.83	0	0.02	0.97	362.31	0	0.03	25.72	26.13	5.72
530	60.55	10.55	0	0.02	1.42	361.94	0.01	0.03	25.55	25.96	5.74
533	58.87	2.54	0	0.08	0	361.74	0	0.03	25.62	26.02	23.14
536	57.98	-1.46	0	-0.15	0	361.76	0	0.03	25.34	25.74	-39.83
539	59.13	1.53	0	0.14	0	361.77	0	0.03	25.32	25.71	38.75
542	59.21	8.63	0	0.02	0	361.63	0	0.03	25.8	26.19	6.86
545	56.97	11.19	0	0.02	0	361.29	0	0.03	25.78	26.16	5.09
548	56.01	4.1	0	0.05	0	361.03	0	0.03	25.06	25.45	13.65
551	59.86	2.45	0	0.09	0	361.01	0	0.03	25.59	25.98	24.45
554	59.92	5.11	0	0.04	0	360.85	0	0.03	25.82	26.2	11.72
557	57.61	4.02	0	0.06	0	360.72	0	0.03	25.85	26.23	14.34

560	58.48	1.92	0	0.13	0	360.62	0	0.03	26.13	26.51	30.43
563	56.63	4.48	0	0.05	0	360.57	0	0.03	25.31	25.66	12.65
566	55.63	8.47	0	0.03	0	360.34	0	0.03	25.46	25.81	6.57
569	54.72	5.85	0	0.04	0	360.11	0	0.03	25.63	25.99	9.35
572	55.21	2.8	0	0.09	0	360	0	0.03	25.82	26.19	19.75
575	57.49	0.55	-0.01	0.46	0	359.94	0	0.03	25.49	25.86	105.41
578	59.63	3.67	0	0.07	0	359.92	0	0.03	26.42	26.79	16.24
581	56.17	9.51	0	0.03	0	359.7	0	0.03	26.04	26.4	5.91
584	57.22	7.01	0	0.04	4.03	359.41	0.01	0.03	26.15	26.51	8.17
587	58.43	2.06	0	0.13	0	359.3	0	0.03	25.86	26.2	28.35
590	56.55	1.44	0	0.18	0	359.26	0	0.03	25.37	25.71	39.28
593	54.85	3.75	0	0.07	0	359.19	0	0.03	25.65	25.99	14.63
596	55.4	5.66	0	0.04	0	359.03	0	0.03	25.82	26.16	9.79
599	57.88	5.6	0	0.05	0	358.86	0	0.03	26.22	26.57	10.34
602	57.83	4.18	0	0.06	0	358.7	0	0.03	25.78	26.13	13.84
605	54.88	8.03	0	0.03	0	358.58	0	0.03	25.48	25.83	6.83
608	53.19	6.39	0	0.04	0	358.27	0	0.03	25.29	25.63	8.32
611	54.72	-1.88	0	-0.13	0	358.24	0	0.03	25.45	25.78	-29.12
614	57.89	0.62	-0.01	0.37	0	358.3	0	0.03	25.95	26.3	92.73
617	56.31	7.55	0	0.03	1.99	358.17	0.01	0.03	25.87	26.22	7.46
620	56.17	7.37	0	0.03	0	357.9	0	0.03	25.88	26.24	7.62
623	56.96	2.71	0	0.09	0	357.76	0	0.03	25.56	25.9	21.05
626	56.23	4.46	0	0.06	0	357.69	0	0.03	25.97	26.32	12.62
629	53.85	8.31	0	0.03	0	357.48	0	0.03	25.87	26.22	6.48
632	53.41	4.17	0	0.06	0	357.25	0	0.03	25.51	25.87	12.82
635	55.54	-1.71	0	-0.15	0	357.24	0	0.03	25.35	25.69	-32.53
638	56.22	2.31	0	0.12	0	357.28	0	0.03	25.51	25.87	24.33
641	55	8.24	0	0.03	0	357.08	0	0.03	25.77	26.12	6.68
644	54.24	6.87	0	0.04	0	356.84	0	0.03	25.6	25.96	7.89
647	54.41	1.85	0	0.14	0	356.7	0	0.03	25.27	25.61	29.44
650	53.47	0.01	-0.5	25.99	0	356.69	0	0.03	25.46	25.81	5346.88
653	52.51	0.01	-0.52	24.19	0	356.55	0	0.03	25.74	26.1	5250.75

Paper (stacked flat - covered with cardboard)**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	13.00
Peak Heat Release Rate (kW/m ²):	320.63
Time to Peak Heat Release Rate (s):	49.00
Total Heat Release (MJ/m ²):	48.21
60 s Average Heat Release Rate (kW/m ²):	230.08
Total Mass Loss (g):	49.61
Average Mass Loss Rate (g/s):	0.078
Average Effective Heat of Combustion (MJ/kg):	9.72
Average Smoke Extinction Area (m ² /kg):	123.31
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0295

Specimen:

Initial mass (g):	385.5
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	109
Time to ignition (s):	13
Time to flameout (s):	701

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-25.48	0.01	-0.49	-0.03	70543.33	385.81	0.27	0.03	25.79	25.97	0
4	-27.13	0.01	-0.3	-0.03	75414.09	385.58	0.29	0.03	26.04	26.22	0
7	-28.57	-4.15	0	0	-189.47	385.62	0.31	0.03	25.4	25.56	6.88
10	-30.5	-3.62	0	0	-263.68	385.76	0.37	0.03	25.68	25.85	8.43
13	-29.2	5.74	0	0.01	203	385.76	0.45	0.03	25.79	25.97	-5.09
16	-4.54	21.66	0	0.01	49.02	385.37	0.41	0.03	25.54	25.79	-0.21
19	64.75	25.57	0	0	42.64	384.55	0.46	0.02	22.96	23.87	2.53
22	172.25	14.64	0	0	108.54	383.94	0.62	0.03	24.11	25.54	11.77
25	240.13	29.54	0	0	47.13	383.5	0.53	0.03	24.64	26.16	8.13
28	248.97	35.17	0	0	76.05	382.24	1.06	0.02	23.54	25.18	7.08
31	276.17	14.16	0	0.01	136.37	381.59	0.75	0.02	23.71	25.75	19.5
34	310.99	8.2	0	0.01	144.81	381.29	0.44	0.03	24.78	26.91	37.94
37	296.86	11.94	0	0.01	83.04	381.01	0.37	0.03	24.96	27.06	24.87
40	263.52	19.76	0	0.01	43.72	380.54	0.33	0.02	24.07	26.12	13.34
43	253.5	22.89	0	0.01	52.93	379.86	0.48	0.02	23.17	25.3	11.07
46	291.98	22.28	0	0.01	33.26	379.2	0.29	0.02	23.31	25.6	13.11
49	320.63	18.15	0	0.01	43.21	378.55	0.29	0.02	24.59	26.99	17.66
52	312.95	12.89	0	0.01	60.74	378.12	0.29	0.02	24.51	26.84	24.27
55	306.9	11.11	0	0.01	73.48	377.75	0.3	0.02	25.18	27.48	27.62
58	287.59	10.11	0	0.02	83.02	377.44	0.31	0.02	25	27.18	28.46
61	270.97	15.98	0	0.01	51.45	377.1	0.3	0.02	25.07	27.15	16.96
64	255.74	11.74	0	0.02	64.28	376.55	0.27	0.02	25.72	27.78	21.79
67	239.43	8.53	0	0.03	91.24	376.39	0.28	0.02	25.69	27.56	28.07
70	230.39	15.27	0	0.02	51.02	375.97	0.28	0.02	25.71	27.52	15.09
73	221.72	13.39	0	0.02	58.38	375.53	0.29	0.02	25.49	27.21	16.56
76	213.22	15.91	0	0.02	57.07	375.14	0.33	0.02	25.53	27.15	13.4
79	200.24	17.33	0	0.01	47.41	374.58	0.31	0.02	25.39	26.92	11.56
82	192.61	12.89	0	0.02	61.53	374.14	0.29	0.03	25.97	27.42	14.94
85	184.73	13.61	0	0.02	59.91	373.77	0.3	0.03	26.06	27.41	13.58
88	173.24	16.68	0	0.01	54.17	373.31	0.33	0.03	25.84	27.09	10.39
91	161.65	10.25	0	0.02	85.29	372.84	0.32	0.03	25.85	27.01	15.77
94	149.48	9.12	0	0.03	100.23	372.66	0.34	0.03	25.8	26.88	16.39
97	145.62	16.13	0	0.02	62.55	372.23	0.38	0.03	25.86	26.86	9.03
100	142.76	17.06	0	0.02	61.14	371.73	0.39	0.03	26.1	27.04	8.37
103	135.96	12.86	0	0.02	79.09	371.25	0.38	0.03	25.78	26.66	10.57
106	134.45	9.29	0	0.03	107.47	370.96	0.37	0.03	25.96	26.81	14.47
109	133.98	7.96	0	0.03	115.38	370.67	0.35	0.03	25.62	26.43	16.82
112	134.84	14.4	0	0.02	66.65	370.43	0.37	0.02	25.47	26.26	9.37
115	133.05	14.28	0	0.02	68.22	369.85	0.37	0.02	25.35	26.11	9.32
118	132.9	7.32	0	0.05	129.22	369.62	0.36	0.03	25.73	26.48	18.16
121	132.94	9.18	0	0.03	105.38	369.35	0.36	0.03	25.86	26.6	14.48
124	135.55	10.9	0	0.03	96.69	369.06	0.39	0.03	26.18	26.91	12.43

127	132.21	14.43	0	0.02	66.61	368.69	0.36	0.03	25.77	26.48	9.16
130	130.02	15.35	0	0.02	62.22	368.22	0.36	0.03	25.73	26.41	8.47
133	127.48	8.03	0	0.04	108.13	367.83	0.33	0.03	25.69	26.36	15.88
136	128.76	6.25	0	0.05	139.28	367.7	0.33	0.03	26.06	26.73	20.61
139	125.73	12.97	0	0.02	63.11	367.39	0.31	0.03	25.89	26.54	9.69
142	120.8	13.37	0	0.02	69.21	366.96	0.35	0.03	25.65	26.29	9.04
145	120.1	7.68	0	0.04	117.73	366.63	0.34	0.03	26.21	26.85	15.63
148	115.1	10.27	0	0.03	91.6	366.44	0.36	0.03	25.26	25.87	11.21
151	115.51	15.34	0	0.02	60.39	366	0.36	0.03	25.47	26.07	7.53
154	115.02	10.37	0	0.02	104.18	365.6	0.41	0.03	25.7	26.31	11.09
157	108.25	6.49	0	0.04	149.27	365.37	0.37	0.03	25.66	26.25	16.68
160	104.65	7.31	0	0.04	116.31	365.17	0.33	0.03	25.57	26.12	14.32
163	102.77	9.76	0	0.03	81.76	364.92	0.3	0.03	25.76	26.31	10.52
166	100.07	10.84	0	0.03	81.7	364.6	0.34	0.03	25.77	26.31	9.23
169	95.21	5.63	0	0.05	154.14	364.31	0.33	0.03	25.67	26.19	16.93
172	95.89	7.96	0	0.04	122.14	364.21	0.36	0.03	26.64	27.17	12.05
175	92.83	10.95	0	0.03	87.86	363.82	0.37	0.03	25.6	26.1	8.48
178	92.39	7.63	0	0.04	108.22	363.59	0.31	0.03	26	26.5	12.1
181	89.68	8.37	0	0.04	119.1	363.34	0.38	0.03	26.07	26.56	10.72
184	87.43	7.43	0	0.04	121.35	363.1	0.34	0.03	25.98	26.46	11.76
187	86.35	5.51	0	0.06	160.79	362.9	0.34	0.03	25.77	26.25	15.66
190	84.65	8.01	0	0.04	101.32	362.74	0.31	0.03	25.95	26.43	10.56
193	81.3	12.82	0	0.03	68.47	362.41	0.33	0.03	25.91	26.38	6.34
196	79.45	8.58	0	0.04	89.13	362.04	0.29	0.03	25.48	25.94	9.26
199	79.61	0.94	-0.01	0.35	795.32	361.92	0.29	0.03	25.42	25.87	84.28
202	77.2	3.73	0	0.09	181.24	361.9	0.26	0.03	25.97	26.43	20.7
205	76.65	14.41	0	0.02	57.35	361.64	0.31	0.03	26.15	26.61	5.32
208	76.18	9.13	0	0.03	86.62	361.15	0.3	0.03	25.52	25.95	8.35
211	73.83	-1.11	0	-0.27	-648.34	361.13	0.28	0.03	25.27	25.69	-66.78
214	70.96	7.62	0	0.04	86.93	361.08	0.25	0.03	25.58	26	9.31
217	68.5	11.69	0	0.02	61.15	360.68	0.28	0.03	25.49	25.9	5.86
220	67.38	19.73	0	0.01	34.16	360.36	0.26	0.03	25.97	26.38	3.42
223	63.42	17.88	0	0.02	38.99	359.58	0.26	0.03	25.9	26.31	3.55
226	61.23	5.17	0	0.06	143.8	359.37	0.28	0.03	25.81	26.2	11.84
229	61.86	7.89	0	0.04	80.08	359.17	0.24	0.03	25.8	26.2	7.84
232	61.23	7.19	0	0.04	84.49	358.91	0.23	0.03	26.17	26.56	8.51
235	56.2	4.14	0	0.07	146.18	358.75	0.23	0.03	25.98	26.37	13.56
238	56.47	3.96	0	0.07	152.98	358.64	0.23	0.03	25.95	26.33	14.25
241	56.94	6.44	0	0.04	110.93	358.49	0.27	0.03	25.86	26.23	8.85
244	55.25	9.09	0	0.03	78.59	358.25	0.27	0.03	26.11	26.48	6.08
247	52.31	5.66	0	0.05	106.54	357.99	0.23	0.03	25.61	25.97	9.24
250	53.95	8.59	0	0.03	79.82	357.87	0.26	0.03	25.82	26.19	6.28
253	52.86	10.91	0	0.03	63.84	357.48	0.27	0.03	25.54	25.91	4.85
256	51.09	1.72	0	0.16	317.11	357.3	0.21	0.03	25.66	26.04	29.69
259	52.34	1.57	0	0.17	377.32	357.32	0.23	0.03	25.81	26.19	33.4
262	53.45	6.73	0	0.04	92.92	357.16	0.24	0.03	25.93	26.31	7.94
265	50.31	5.97	0	0.04	115.18	356.95	0.26	0.03	25.69	26.07	8.43
268	48.65	6.74	0	0.04	105.94	356.79	0.27	0.03	26.37	26.76	7.22

271	48.32	8.53	0	0.03	88.02	356.54	0.29	0.03	25.84	26.21	5.67
274	48.58	8.32	0	0.03	96.09	356.3	0.31	0.03	25.58	25.95	5.84
277	47.37	2.58	0	0.1	250.79	356.08	0.25	0.03	25.7	26.07	18.33
280	44.6	0.93	0	0.26	667.49	356.11	0.24	0.03	25.72	26.09	47.74
283	45.19	10.14	0	0.02	61.33	355.95	0.24	0.03	25.38	25.74	4.46
286	45.08	5.72	0	0.04	102.61	355.6	0.23	0.03	25.43	25.79	7.88
289	43.32	1.64	0	0.15	404.63	355.6	0.25	0.03	25.84	26.2	26.43
292	43.63	9.06	0	0.03	77.61	355.42	0.27	0.03	25.61	25.97	4.81
295	44.61	8.89	0	0.03	72.02	355.11	0.25	0.03	25.75	26.12	5.02
298	43.28	6.18	0	0.04	92.6	354.91	0.21	0.03	26.43	26.8	7
301	40.32	3.07	0	0.07	177.7	354.74	0.21	0.03	25.67	26.04	13.11
304	43.11	3.35	0	0.07	167.93	354.7	0.22	0.03	25.77	26.14	12.86
307	44.15	4.38	0	0.05	136.73	354.53	0.23	0.03	26	26.37	10.09
310	41.82	3.88	0	0.06	135.9	354.44	0.2	0.03	25.96	26.33	10.78
313	39.66	7.61	0	0.03	73.25	354.27	0.21	0.03	25.6	25.96	5.21
316	41.19	9.14	0	0.02	52.05	354.01	0.18	0.03	25.95	26.32	4.51
319	41.98	4.77	0	0.05	95.87	353.77	0.17	0.03	26.08	26.45	8.8
322	39.72	0.71	-0.01	0.32	801.5	353.71	0.22	0.03	25.8	26.17	55.97
325	39.78	10.17	0	0.02	52.41	353.63	0.21	0.03	25.51	25.89	3.91
328	41.39	9.36	0	0.03	55.46	353.17	0.2	0.03	25.03	25.41	4.42
331	42.35	-0.56	0.01	-0.42	-820.29	353.14	0.18	0.03	25.11	25.49	-76.02
334	41.62	4.87	0	0.05	85.68	353.1	0.16	0.03	25.65	26.05	8.55
337	40.32	10.36	0	0.02	51.96	352.84	0.2	0.03	26.01	26.42	3.89
340	41.06	6.53	0	0.04	63.05	352.55	0.16	0.03	25.83	26.23	6.28
343	39.98	3.15	0	0.08	99.26	352.45	0.12	0.03	25.56	25.95	12.7
346	37.98	7.32	0	0.03	53.14	352.31	0.15	0.03	25.39	25.78	5.18
349	37.42	4.47	0	0.05	101.73	352.05	0.17	0.03	25.98	26.38	8.37
352	38.87	0.03	-0.19	7.37	13507.78	352.05	0.16	0.03	26.1	26.49	1254.1
355	38.9	4.92	0	0.05	91.53	351.98	0.17	0.03	25.58	25.97	7.9
358	37.66	8.19	0	0.03	55.96	351.76	0.17	0.03	25.95	26.35	4.6
361	36.16	8.49	0	0.03	48.21	351.52	0.16	0.03	25.98	26.37	4.26
364	37.08	5.75	0	0.04	46.09	351.28	0.1	0.03	25.53	25.92	6.45
367	38.49	1.84	0	0.13	127.85	351.18	0.09	0.03	25.41	25.8	20.89
370	37.9	8.02	0	0.03	34.22	351.1	0.1	0.03	26.06	26.46	4.73
373	35.72	10.65	0	0.02	33.61	350.73	0.14	0.03	25.74	26.13	3.35
376	37.86	-0.83	0.01	-0.3	-397.36	350.56	0.13	0.03	25.88	26.28	-45.36
379	37.51	-2.26	0	-0.1	-114.97	350.7	0.1	0.03	25.2	25.59	-16.62
382	36.15	7.51	0	0.03	44.42	350.61	0.13	0.03	25.26	25.66	4.81
385	35.46	9.83	0	0.02	37.71	350.3	0.14	0.03	25.86	26.27	3.61
388	37.31	4.54	0	0.05	67.91	350.08	0.12	0.03	25.7	26.11	8.22
391	38.78	3.99	0	0.05	83.25	350	0.13	0.03	25.8	26.22	9.71
394	37.38	9.01	0	0.02	36.64	349.79	0.13	0.03	25.82	26.24	4.15
397	36.55	9.6	0	0.02	30.46	349.49	0.11	0.03	26.09	26.51	3.81
400	37.02	1.97	0	0.12	99.2	349.28	0.07	0.03	25.74	26.15	18.77
403	36.38	1.41	0	0.16	176.24	349.32	0.1	0.03	25.29	25.69	25.76
406	35.75	8.51	0	0.03	27.97	349.14	0.09	0.03	25.74	26.15	4.2
409	35	7.9	0	0.03	39.42	348.87	0.12	0.03	25.84	26.26	4.43
412	37.06	2.09	0	0.1	143.02	348.7	0.11	0.03	25.95	26.37	17.76

415	38.27	2.69	0	0.08	116.47	348.7	0.12	0.03	25.56	25.98	14.23
418	36.98	6.44	0	0.03	64.19	348.52	0.16	0.03	25.48	25.88	5.75
421	34.25	5.17	0	0.04	75.99	348.34	0.15	0.03	25.18	25.57	6.62
424	33.98	5.78	0	0.03	70.18	348.2	0.16	0.03	24.9	25.3	5.87
427	36.66	5.96	0	0.03	52.23	348	0.12	0.03	25.52	25.93	6.15
430	36.16	8.77	0	0.02	51.7	347.82	0.17	0.03	25.62	26.03	4.12
433	36.55	7.98	0	0.02	54.82	347.5	0.16	0.03	26.34	26.76	4.58
436	36.59	3.22	0	0.06	171.54	347.37	0.21	0.03	25.64	26.05	11.37
439	38.97	3.12	0	0.06	181.14	347.27	0.21	0.03	26.04	26.44	12.47
442	37.25	5.03	0	0.04	108.28	347.17	0.21	0.03	25.74	26.14	7.41
445	34.67	6.97	0	0.03	85.55	346.97	0.23	0.03	25.66	26.07	4.97
448	36.01	3.42	0	0.06	196.31	346.79	0.25	0.03	26.13	26.55	10.51
451	38.37	2.13	0	0.1	325.86	346.75	0.26	0.03	26.34	26.76	18.01
454	37.78	6.92	0	0.03	123.29	346.61	0.32	0.03	25.89	26.31	5.46
457	35.82	9.42	0	0.02	93.85	346.35	0.34	0.03	25.76	26.17	3.8
460	37.13	6.49	0	0.03	122.97	346.09	0.3	0.03	26.22	26.64	5.72
463	37.57	0.67	-0.01	0.32	1202.88	345.98	0.31	0.03	25.77	26.19	55.9
466	35.7	5.11	0	0.04	170.97	345.98	0.34	0.03	25.37	25.79	6.99
469	34.37	11.74	0	0.02	74.73	345.66	0.34	0.03	25.57	26	2.93
472	35.8	6.67	0	0.03	127.58	345.36	0.32	0.03	26	26.43	5.37
475	38.47	2.54	0	0.08	375.24	345.25	0.36	0.03	26.11	26.55	15.17
478	37.24	6.84	0	0.03	152.1	345.14	0.4	0.03	25.83	26.25	5.44
481	36.01	7.55	0	0.03	142.9	344.87	0.41	0.03	25.75	26.18	4.77
484	35.38	0.64	-0.01	0.31	1656.39	344.75	0.4	0.03	25.85	26.29	55.45
487	36.81	-0.64	0.01	-0.32	-1705.35	344.79	0.42	0.03	25.78	26.2	-57.35
490	33.8	6.7	0	0.03	167.48	344.72	0.43	0.03	25.45	25.87	5.05
493	31.88	9.16	0	0.02	123.88	344.42	0.44	0.03	25.42	25.84	3.48
496	34.06	5.22	0	0.04	233.72	344.22	0.47	0.03	25.62	26.05	6.52
499	36.31	3.97	0	0.05	315.71	344.09	0.48	0.03	25.83	26.26	9.15
502	34.06	5.26	0	0.04	253.36	343.96	0.51	0.03	25.89	26.31	6.47
505	32.05	9.41	0	0.02	143.04	343.76	0.51	0.03	26.04	26.45	3.41
508	32.19	7.6	0	0.03	162.24	343.44	0.48	0.03	25.3	25.7	4.24
511	34.06	-1.17	0	-0.19	-1141.85	343.35	0.52	0.03	25.39	25.78	-29.01
514	33.16	0.49	-0.01	0.5	2882.61	343.43	0.55	0.03	25.45	25.84	67.2
517	33.04	8.12	0	0.03	184.63	343.27	0.57	0.03	25.75	26.15	4.07
520	32.73	7.36	0	0.03	206.89	343.01	0.59	0.03	25.39	25.78	4.45
523	34.3	2.21	0	0.11	649.68	342.87	0.55	0.03	25.59	25.99	15.52
526	32.89	3.23	0	0.07	459.45	342.83	0.57	0.03	25.79	26.19	10.2
529	31.98	10.15	0	0.02	156.99	342.63	0.61	0.03	25.83	26.23	3.15
532	32.66	9.27	0	0.02	158.39	342.28	0.58	0.03	25.06	25.44	3.52
535	32.56	3.07	0	0.07	483.15	342.11	0.58	0.03	25.28	25.67	10.6
538	31.5	5.93	0	0.04	286.9	342.03	0.64	0.03	26.28	26.68	5.31
541	31.26	6.63	0	0.04	241.38	341.77	0.61	0.03	25.88	26.28	4.72
544	33.09	0.65	-0.01	0.38	2432.88	341.68	0.61	0.03	25.73	26.13	50.85
547	32.25	1.48	0	0.16	1073	341.68	0.61	0.03	25.64	26.03	21.79
550	31.25	7.35	0	0.03	216.22	341.55	0.61	0.03	25.53	25.92	4.25
553	32.69	8.65	0	0.03	185.26	341.27	0.62	0.03	25.46	25.86	3.78
556	34.18	6.43	0	0.03	249.02	341.06	0.62	0.03	25.48	25.88	5.32

559	32.54	4.47	0	0.05	355.1	340.89	0.61	0.03	25.7	26.1	7.28
562	31.65	4.83	0	0.05	341.97	340.77	0.63	0.03	25.83	26.23	6.55
565	33.19	9.08	0	0.02	182.6	340.57	0.64	0.03	25.32	25.71	3.65
568	34.06	5.15	0	0.04	316.02	340.29	0.62	0.03	25.77	26.17	6.61
571	30.92	-2.02	0	-0.11	-834.43	340.28	0.64	0.03	25.78	26.17	-15.3
574	30.23	2.58	0	0.09	655.15	340.33	0.66	0.03	25.37	25.76	11.7
577	32.16	7.85	0	0.03	218.65	340.12	0.66	0.03	25.67	26.06	4.1
580	31.62	4.82	0	0.05	364.42	339.91	0.67	0.03	25.66	26.05	6.56
583	30.94	6.09	0	0.04	286.79	339.81	0.66	0.03	25.94	26.34	5.08
586	30.72	9.65	0	0.02	174.88	339.53	0.65	0.03	25.57	25.97	3.18
589	32.93	3.2	0	0.06	532.86	339.29	0.66	0.03	25.45	25.85	10.29
592	32.34	4.84	0	0.04	335.24	339.29	0.62	0.03	25.74	26.14	6.69
595	29.79	7.31	0	0.03	239.35	339	0.68	0.03	25.27	25.66	4.08
598	31.42	2.83	0	0.07	635.62	338.9	0.69	0.03	25.79	26.18	11.1
601	33	0.89	0	0.23	1916.07	338.81	0.65	0.03	25.57	25.96	37.29
604	31.21	2.32	0	0.09	716.37	338.81	0.65	0.03	25.34	25.73	13.44
607	29.98	9.1	0	0.02	197.36	338.63	0.7	0.03	25.39	25.78	3.3
610	31.88	10.67	0	0.02	173.37	338.31	0.71	0.03	25.71	26.11	2.99
613	32.3	4.67	0	0.04	382.37	338.05	0.68	0.03	25.78	26.17	6.92
616	29.89	1.18	0	0.18	1469.18	338.01	0.67	0.03	25.51	25.9	25.43
619	30.26	4.81	0	0.05	358.92	337.93	0.66	0.03	25.61	26	6.29
622	31.96	8.38	0	0.03	213.41	337.72	0.68	0.03	25.75	26.14	3.81
625	31.21	4.65	0	0.05	395.52	337.48	0.69	0.03	26.43	26.84	6.71
628	27.8	1.59	0	0.14	1068.2	337.44	0.66	0.03	25.22	25.61	17.52
631	28.83	5.48	0	0.04	316.28	337.33	0.67	0.03	25.46	25.85	5.26
634	32.04	6.36	0	0.04	270.82	337.13	0.66	0.03	25.61	26	5.04
637	30.49	4.08	0	0.05	408.74	336.97	0.64	0.03	25.68	26.08	7.47
640	28.76	6.54	0	0.03	266.87	336.85	0.67	0.03	25.48	25.88	4.4
643	30.07	8.94	0	0.02	189.18	336.58	0.65	0.03	25.78	26.18	3.37
646	30.94	5.8	0	0.04	286.68	336.36	0.63	0.03	26.05	26.44	5.33
649	29.35	0.01	-0.49	20.43	0	336.23	0.65	0.03	25.77	26.16	2934.53
652	30.01	0.01	-0.38	20.99	0	336.14	0.6	0.03	25.27	25.65	3000.64

Plastic Wastebasket**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	70.00
Peak Heat Release Rate (kW/m ²):	1417.86
Time to Peak Heat Release Rate (s):	164.00
Total Heat Release (MJ/m ²):	83.59
60 s Average Heat Release Rate (kW/m ²):	168.46
Total Mass Loss (g):	17.93
Average Mass Loss Rate (g/s):	0.139
Average Effective Heat of Combustion (MJ/kg):	46.61
Average Smoke Extinction Area (m ² /kg):	429.73
Average CO ₂ yield (g/g):	1.55
Average CO yield (g/g):	0.0280

Specimen:

Initial mass (g):	21.4
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	87
Time to ignition (s):	70
Time to flameout (s):	198

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-2.43	0.01	-0.48	-0.03	9978.67	21.45	0.04	0.03	25.16	25.34	-242.51
5	-0.09	0.01	-0.31	-0.04	13287.85	21.65	0.05	0.03	25.75	25.92	-9.08
8	-0.63	1.91	0	0	95.77	21.71	0.07	0.03	25.69	25.86	-0.33
11	-0.61	-1.06	0	0	-150.51	21.6	0.06	0.03	25.72	25.89	0.58
14	1.18	-2.72	0	0	-59.85	21.76	0.06	0.03	25.24	25.41	-0.43
17	-0.22	4.99	0	0	39.49	21.71	0.08	0.03	25.44	25.6	-0.04
20	-1.22	0.62	-0.01	0	223.57	21.55	0.05	0.03	25.79	25.96	-1.97
23	0.99	-1.29	0	0	-86.56	21.66	0.04	0.03	25.23	25.4	-0.77
26	-1.01	1.97	0	0	70.01	21.59	0.05	0.03	25.39	25.57	-0.51
29	-4.12	-2.48	0	0	-39.12	21.59	0.04	0.03	25.86	26.03	1.66
32	-0.64	-0.67	0.01	0	-113.75	21.7	0.03	0.03	25.54	25.73	0.95
35	-0.61	1.35	0	0	91.8	21.62	0.05	0.03	25.9	26.11	-0.45
38	-2.38	-0.73	0.01	0	-179.17	21.64	0.05	0.03	26.16	26.36	3.25
41	-3.04	-0.2	0.02	0	-906.04	21.65	0.07	0.03	25.81	26	15.46
44	-1.74	0.45	-0.01	0	398.2	21.65	0.07	0.03	25.37	25.57	-3.91
47	-0.52	2.89	0	0	67.29	21.61	0.08	0.03	25.42	25.63	-0.18
50	-1.58	1.63	0	0	184.7	21.51	0.12	0.03	25.07	25.29	-0.97
53	-2.5	-2.74	0	0	-138.25	21.53	0.14	0.03	26.02	26.24	0.91
56	-2.22	1.12	0	0.01	364.63	21.61	0.16	0.03	25.67	25.9	-1.99
59	0.41	1.98	0	0	171.91	21.49	0.13	0.03	25.29	25.51	0.21
62	0.81	-4.11	0	0	-99.51	21.54	0.16	0.03	25.75	25.98	-0.2
65	0.15	-0.34	0.01	-0.08	-1679.11	21.67	0.22	0.03	25.45	25.69	-0.45
68	0.76	0.75	-0.01	0.07	825.07	21.58	0.24	0.03	25.35	25.59	1.02
71	3.77	-1.28	0	-0.04	-192.69	21.64	0.1	0.03	25.1	25.35	-2.94
74	10.5	5.86	0	0	15.29	21.59	0.04	0.03	25.06	25.35	1.79
77	23.41	9.26	0	0	13.27	21.32	0.05	0.03	25.04	25.39	2.53
80	38.63	0.67	-0.01	0	270.71	21.12	0.07	0.03	25.73	26.15	57.62
83	49.23	-1.13	0	0	-362.51	21.23	0.16	0.03	24.86	25.32	-43.63
86	62.52	4.07	0	0	163.11	21.14	0.26	0.03	24.89	25.47	15.37
89	82.03	2.85	0	0	433.83	21.03	0.48	0.03	24.95	25.64	28.73
92	112.72	2.42	0	0	639.23	20.97	0.6	0.03	24.73	25.54	46.66
95	133.15	2.43	0	0.01	751.18	20.88	0.72	0.03	24.44	25.34	54.71
98	154.93	3.64	0	0.01	646.25	20.81	0.91	0.03	24.74	25.78	42.55
101	177.92	7.31	0	0.01	340.09	20.64	0.93	0.03	25.54	26.72	24.35
104	187.63	9.84	0	0.01	242.23	20.38	0.91	0.03	24.84	26.07	19.07
107	201.84	6.8	0	0.01	324.43	20.1	0.86	0.03	24.32	25.6	29.68
110	225.49	3.37	0	0.03	886.19	19.97	1.14	0.03	24.88	26.28	66.82
113	239.9	8.52	0	0.01	461.52	19.83	1.54	0.02	24.1	25.58	28.16
116	271.06	10.35	0	0.01	401.45	19.48	1.6	0.02	24.25	25.97	26.19
119	306.8	5.8	0	0.03	797.53	19.26	1.8	0.02	23.87	25.76	52.92
122	365.05	8.46	0	0.02	594.67	19.09	1.96	0.02	23.56	25.66	43.17
125	416.8	12.36	0	0.02	466.04	18.74	2.24	0.02	23.36	25.73	33.72

128	473.41	11.49	0	0.02	582.06	18.37	2.57	0.02	23.2	25.98	41.2
131	513.36	15.88	0.21	0.02	427.39	18.01	2.72	0.02	21.95	24.98	32.33
134	630.17	22.58	0.45	0.02	331.51	17.41	2.91	0.02	22.23	25.7	27.91
137	706.58	21.38	0.97	0.03	415.01	16.71	3.56	0.02	21.15	24.9	33.05
140	803.66	24.06	1.28	0.03	334.81	16.1	3.21	0.02	20.84	25.07	33.4
143	895.48	24.47	1.74	0.03	309.53	15.28	3.01	0.02	20.58	25.19	36.59
146	1027.33	22.08	2.49	0.04	408.31	14.65	3.38	0.02	21.03	26.67	46.54
149	1225.31	26.31	2.59	0.04	370.85	13.91	3.49	0.02	21.51	27.93	46.58
152	1369.41	33.87	2.22	0.03	331.7	13.05	3.85	0.02	22.12	29.18	40.44
155	1410.67	32.71	2.11	0.03	327.58	11.94	3.71	0.02	21.69	28.87	43.12
158	1392.83	27.29	2.22	0.03	350.81	11.13	3.37	0.02	21.29	28.43	51.04
161	1310.11	26.25	1.98	0.03	392.31	10.28	3.75	0.02	20.61	27.43	49.9
164	1417.86	21.05	2.55	0.04	491.86	9.57	3.34	0.02	23.39	30.96	67.35
167	1249.37	21.85	1.9	0.03	409.34	8.98	3.14	0.02	21.72	28.5	57.18
170	1186.06	23.24	1.58	0.03	415.24	8.26	3.4	0.02	21.85	28.36	51.03
173	1195.3	19.44	1.65	0.03	523.31	7.62	3.39	0.02	23.46	30.06	61.48
176	1133.67	17.37	1.85	0.03	582.42	7.08	3.32	0.02	24	30.45	65.26
179	1099.53	18.49	1.74	0.03	519.87	6.55	3.16	0.02	24.18	30.41	59.46
182	1088.9	23.95	1.31	0.02	405.69	5.94	3.17	0.02	24.56	30.65	45.47
185	1009.88	20.09	1.3	0.03	446.14	5.18	3.1	0.02	23.32	28.88	50.26
188	1019.4	13.12	1.54	0.03	679.38	4.76	3	0.02	24.3	29.73	77.69
191	938.73	13.71	0.91	0.03	602.07	4.34	2.81	0.02	24.29	29.33	68.46
194	884.89	12.05	0.23	0.03	658.79	3.95	2.6	0.02	25.72	30.5	73.43
197	818.16	6.95	0.01	0.04	764.83	3.64	1.65	0.02	27.85	32.25	117.8
200	700.67	2.61	0	0.05	0	3.53	0	0.02	29.87	33.31	268.39
203	485.1	-1.12	0	-0.04	0	3.48	0	0.02	29.66	32.21	-432.94
206	252.91	-3.29	0	0	0	3.58	0	0.02	29.1	30.9	-76.84
209	162.83	2	0	0	0	3.62	0	0.02	28.96	30.15	81.39
212	116.95	1.7	0	0	0	3.5	0	0.02	29.26	29.82	68.67
215	91	-6.11	0	0	0	3.57	0	0.02	29.45	29.55	-14.89
218	71.84	-0.3	0.01	0	0	3.77	0	0.02	29.08	28.85	-236.29
221	58.29	6.26	0	0	0	3.59	0	0.02	29.04	28.54	9.31
224	51.63	-2.64	0	0	0	3.5	0	0.02	28.42	27.71	-19.52
227	46.16	-2.81	0	0	0	3.69	0	0.02	28.09	27.2	-16.43
230	40.45	4.4	0	0	0	3.62	0	0.02	27.88	26.83	9.19
233	36.14	2.86	0	0	0	3.48	0	0.02	27.96	26.8	12.62
236	33.84	-1.95	0	0	0	3.47	0	0.03	28.13	26.89	-17.34
239	30.3	-2.71	0	0	0	3.57	0	0.03	27.77	26.5	-11.19
242	26.91	0.1	-0.04	0	0	3.61	0	0.02	27.25	25.97	264.63
245	26.35	0.01	-0.37	-0.03	0	3.58	0	0.03	27.55	26.24	2635.13
248	24.02	0.01	-0.37	-0.03	0	3.58	0	0.03	27.33	26.04	2402.28

Plastic Wastebasket**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	67.00
Peak Heat Release Rate (kW/m ²):	1645.51
Time to Peak Heat Release Rate (s):	148.00
Total Heat Release (MJ/m ²):	89.25
60 s Average Heat Release Rate (kW/m ²):	240.71
Total Mass Loss (g):	17.56
Average Mass Loss Rate (g/s):	0.113
Average Effective Heat of Combustion (MJ/kg):	50.81
Average Smoke Extinction Area (m ² /kg):	478.06
Average CO ₂ yield (g/g):	2.03
Average CO yield (g/g):	0.0362

Specimen:

Initial mass (g):	20.4
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	85
Time to ignition (s):	67
Time to flameout (s):	225

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-0.02	0.01	-0.44	-0.04	17373.28	20.29	0.07	0.03	25.57	25.66	-2.44
4	-0.2	0.01	-0.4	-0.04	7611.85	20.38	0.03	0.03	25.79	25.89	-19.55
7	3.12	0.63	0	0	145.86	20.48	0.03	0.03	26.13	26.24	4.97
10	2.41	0.73	-0.01	0	363.58	20.37	0.1	0.03	25.82	25.92	3.31
13	-0.76	-4.45	0	0	-55.86	20.48	0.1	0.03	25.49	25.59	0.17
16	1.78	-1.53	0	0	-127.88	20.58	0.08	0.03	25.16	25.27	-1.16
19	1.15	0.74	-0.01	0	188.5	20.57	0.05	0.03	25.3	25.42	1.56
22	-1.01	0.12	-0.04	0	1601.23	20.56	0.07	0.03	25.44	25.57	-8.45
25	0.3	2.59	0	0	81.06	20.54	0.08	0.03	25.26	25.39	0.12
28	1.19	1.73	0	0	122.79	20.42	0.08	0.03	25.74	25.88	0.69
31	-0.74	-0.65	0	0	-422.94	20.45	0.11	0.03	26.19	26.34	1.13
34	-0.81	-0.51	0.01	0	-586.29	20.45	0.12	0.03	25.68	25.83	1.6
37	0.98	-2.01	0	0	-85.18	20.49	0.07	0.03	25.69	25.84	-0.49
40	0.57	-1.09	0	0	-215.73	20.55	0.09	0.03	25.75	25.91	-0.52
43	-0.61	-0.25	0.02	0	-1224.51	20.56	0.12	0.03	25.68	25.84	2.44
46	-1.35	-0.95	0	0	-221.98	20.57	0.08	0.03	25.63	25.79	1.43
49	1.31	1.98	0	0	167.51	20.59	0.13	0.03	25.66	25.83	0.66
52	2.45	1.04	0	0.01	378.62	20.48	0.15	0.03	25.43	25.6	2.35
55	1.52	-0.81	0	-0.02	-527.35	20.53	0.17	0.03	24.93	25.11	-1.88
58	1	2.35	0	0.01	244.85	20.5	0.22	0.03	25.42	25.61	0.43
61	3.3	1.67	0	0.03	467.46	20.42	0.3	0.03	25.73	25.93	1.98
64	4.98	-1.12	0	-0.06	-693.48	20.41	0.3	0.03	25.73	25.92	-4.46
67	4.76	2.3	0	0.04	342.49	20.44	0.31	0.03	25.61	25.81	2.07
70	6.65	5.15	0	0.01	41.94	20.28	0.08	0.03	25.44	25.67	1.29
73	16.52	-0.62	0.01	-0.01	-260.06	20.2	0.06	0.03	25.72	26	-26.74
76	36.45	-2.31	0	0	-85.11	20.29	0.08	0.03	25.69	26.03	-15.76
79	53.56	4.26	0	0	81.5	20.27	0.13	0.03	25.41	25.82	12.58
82	70.6	6.9	0	0	149.43	20.06	0.4	0.03	25.18	25.68	10.24
85	88.71	3.63	0	0	433.43	19.9	0.62	0.03	24.7	25.34	24.43
88	121.31	2.58	0	0.01	797.43	19.83	0.79	0.03	25.18	25.97	47.05
91	147.17	2.93	0	0.02	798.03	19.74	0.91	0.03	24.96	25.85	50.17
94	165.04	5.2	0	0.01	482.03	19.64	1	0.03	24.18	25.17	31.73
97	190.55	7.26	0	0.01	411.81	19.43	1.16	0.03	24.52	25.66	26.26
100	213.41	3.61	0	0.03	957.77	19.24	1.36	0.02	24.19	25.49	59.17
103	242.01	5.95	0	0.02	596.89	19.17	1.4	0.02	23.9	25.34	40.66
106	281.19	13.45	0	0.01	260.28	18.85	1.38	0.02	23.82	25.42	20.91
109	307.81	9.82	0	0.02	469.15	18.44	1.85	0.02	23.1	24.85	31.34
112	341.35	8.89	0	0.02	518.1	18.24	1.86	0.02	22.75	24.82	38.38
115	393.35	12.89	0	0.02	391.04	17.87	1.97	0.02	23.15	25.54	30.5
118	478.21	12.37	0	0.02	467.67	17.49	2.24	0.02	23.15	25.87	38.66
121	518.41	15.94	0.15	0.02	314.47	17.1	2.06	0.02	21.43	24.36	32.51
124	629.95	22.5	0.5	0.02	310.59	16.52	2.7	0.02	22.44	25.84	28

127	747.99	21.22	1.23	0.02	404.7	15.8	3.17	0.02	23.03	27.09	35.24
130	852.24	19.51	1.98	0.04	490.47	15.25	3.58	0.02	22.02	26.75	43.68
133	1019.48	24.78	2.14	0.03	404.36	14.58	3.76	0.02	21.37	26.63	41.15
136	1172.33	35.24	1.91	0.03	306.27	13.72	3.98	0.02	21.25	27.15	33.27
139	1241.37	38.59	2.12	0.03	290.23	12.52	4.3	0.02	19.86	26.04	32.17
142	1473.07	34.4	2.84	0.04	300.87	11.47	3.55	0.02	21.53	29.12	42.82
145	1464.12	32.05	2.82	0.04	361.19	10.45	4.34	0.02	19.4	26.69	45.69
148	1645.51	29.86	3.22	0.04	418.75	9.54	4.29	0.02	21.04	29.17	55.11
151	1644.38	32.86	2.65	0.04	372.69	8.62	4.19	0.02	21.05	29.22	50.04
154	1631.45	27.11	2.68	0.03	474.9	7.63	4.33	0.02	21.58	29.73	60.18
157	1553.03	18.28	3.29	0.05	618.21	7.02	3.8	0.02	21.91	29.77	84.97
160	1461.03	20.18	2.56	0.04	592.55	6.46	3.92	0.02	22.83	30.54	72.38
163	1353.07	24.76	1.77	0.03	489.87	5.78	4	0.02	23.06	30.35	54.65
166	1271.7	23.15	1.25	0.02	477.78	5.02	3.59	0.02	23.77	30.76	54.94
169	1237.26	15.79	0.85	0.03	602.22	4.44	2.94	0.02	25.8	32.37	78.37
172	1033.09	8.96	0.33	0.04	1108.28	4.07	3.11	0.02	26.12	31.92	115.28
175	855.94	6.77	0.01	0.05	1377.51	3.86	2.97	0.02	26.26	31.42	126.47
178	726.52	14.68	0	0.02	512.24	3.59	2.45	0.02	26.21	30.71	49.49
181	650.76	11.68	0	0.02	723.39	3.06	2.72	0.02	27.17	31.08	55.73
184	576.37	0.28	-0.01	0.72	29386.29	2.96	2.63	0.02	28.2	31.41	2053.06
187	443.41	-1.49	0	-0.08	-3592.92	2.98	1.74	0.02	28.29	30.87	-297.23
190	358.94	0.53	-0.01	0.09	4095.41	3.01	0.69	0.02	29.3	31.33	675.43
193	270.77	2.55	0	0	321.21	2.94	0.26	0.02	29.91	31.37	106.33
196	188.49	1.48	0	0	455.51	2.88	0.22	0.02	29.35	30.08	127.77
199	118.48	1.79	0	0	335.4	2.85	0.21	0.02	28.65	28.94	66.04
202	84.7	0.03	-0.12	-0.01	21767.71	2.78	0.21	0.02	28.29	28.25	3067.52
205	71.85	-1.22	0	0	-422.67	2.84	0.18	0.02	28.43	28.13	-59.02
208	63.81	2.65	0	0	198.65	2.82	0.19	0.02	28.36	27.8	24.04
211	57.85	0.77	0	0	659.48	2.72	0.18	0.02	28.74	27.93	74.99
214	49.29	-4.29	0	0	-124.01	2.8	0.19	0.03	29.02	28.07	-11.5
217	43.68	-4.02	0	0	-146.96	2.94	0.22	0.02	28.3	27.26	-10.87
220	41.23	1.4	0	0	387.5	3	0.2	0.02	27.99	26.88	29.51
223	39.39	3.51	0	0	154.75	2.88	0.2	0.02	27.81	26.64	11.23
226	34.26	0	1.65	0.11	0	2.83	0.22	0.02	27.44	26.24	0
229	29.67	-1.69	0	0	-377.58	2.87	0.24	0.02	27.33	26.11	-17.59
232	27.28	-0.01	0.2	0.02	-42112.7	2.91	0.23	0.03	27.52	26.28	0
235	26.43	3.43	0	0	173.69	2.86	0.23	0.03	27.22	26	7.71
238	26.32	2.83	0	0	205.89	2.73	0.23	0.03	26.96	25.77	9.3
241	21.94	-2.27	0	0	-252.97	2.72	0.22	0.03	27.3	26.12	-9.66
244	20.62	-5.69	0	0	-105.63	2.85	0.23	0.03	27.88	26.69	-3.62
247	19.85	2.31	0	0	276.91	2.98	0.24	0.03	27.97	26.81	8.6
250	19.83	5.39	0	0	119.17	2.75	0.24	0.03	27.44	26.37	3.68
253	18.11	-3.63	0	0	-165.35	2.74	0.24	0.03	26.5	25.48	-4.98
256	15.88	-4.41	0	0	-117.97	2.91	0.2	0.03	27.17	26.16	-3.61
259	13.37	-1.02	0	0	-558.46	2.97	0.22	0.03	26.63	25.67	-13.09
262	14.1	1.2	0	0	488.27	2.98	0.23	0.03	26.55	25.64	11.78
265	14.08	2.46	0	0	238.48	2.91	0.23	0.03	26.28	25.43	5.73
268	11.95	1.55	0	0	343.65	2.85	0.21	0.03	26.09	25.28	7.7

Plastic Wastebasket**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	67.00
Peak Heat Release Rate (kW/m ²):	1613.97
Time to Peak Heat Release Rate (s):	167.00
Total Heat Release (MJ/m ²):	91.53
60 s Average Heat Release Rate (kW/m ²):	218.36
Total Mass Loss (g):	19.15
Average Mass Loss Rate (g/s):	0.148
Average Effective Heat of Combustion (MJ/kg):	47.79
Average Smoke Extinction Area (m ² /kg):	501.55
Average CO ₂ yield (g/g):	1.87
Average CO yield (g/g):	0.0293

Specimen:

Initial mass (g):	22.1
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	84
Time to ignition (s):	67
Time to flameout (s):	196

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.49	0.01	-0.4	-0.04	69851.8	22.02	0.27	0.03	26.06	26.16	49.05
5	-1.11	0.01	-0.49	-0.04	68660.82	22.19	0.27	0.03	25.68	25.76	-111.01
8	-0.57	1.73	0	0	474.33	22.19	0.31	0.03	26.29	26.38	-0.33
11	1.51	1.24	0	0	679.81	22.13	0.33	0.03	25.56	25.64	1.22
14	0.7	-2.01	0	0	-377.18	22.14	0.3	0.03	25.35	25.44	-0.35
17	-1.47	-3.21	0	0	-230.57	22.23	0.29	0.03	25.76	25.86	0.46
20	0.17	-0.13	0.03	0	-6441.56	22.3	0.32	0.03	25.72	25.83	-1.29
23	0.59	0.22	-0.02	0	3936.08	22.26	0.33	0.03	25.48	25.59	2.72
26	-0.59	-1.9	0	0	-449.94	22.31	0.33	0.03	25.61	25.72	0.31
29	-1.6	-0.37	0.01	0	-2565.16	22.34	0.37	0.03	25.53	25.65	4.36
32	-0.56	4.32	0	0	195.43	22.31	0.34	0.03	25	25.11	-0.13
35	0.7	0.54	-0.01	0	1332.14	22.14	0.27	0.03	26.26	26.39	1.28
38	1.9	-2.8	0	0	-295.97	22.27	0.32	0.03	25.9	26.02	-0.68
41	1.41	2.12	0	0	472.77	22.25	0.39	0.03	25.74	25.86	0.66
44	-0.39	3.28	0	0	333.02	22.17	0.42	0.03	25.65	25.78	-0.12
47	-0.01	0.44	-0.01	0.01	2327.31	22.09	0.4	0.03	25.6	25.74	-0.02
50	1.05	-2.22	0	0	-500.16	22.14	0.43	0.03	25.95	26.1	-0.47
53	3.31	-0.08	0.05	-0.12	-15903.8	22.19	0.48	0.03	25.49	25.64	-42.68
56	4.06	0.47	-0.01	0.08	2830.34	22.16	0.52	0.03	25.49	25.64	8.61
59	3.61	-2.06	0	-0.01	-690.63	22.18	0.56	0.03	25.17	25.33	-1.75
62	3.66	-0.03	0.16	-2.07	-47674.48	22.25	0.51	0.03	25.7	25.87	-132.59
65	4.13	5.53	0	0.02	313.38	22.16	0.67	0.03	25.62	25.8	0.75
68	6.92	2.2	0	0.04	743.3	21.98	0.64	0.03	25.53	25.72	3.14
71	12.94	-1.42	0	-0.02	-747.54	22.03	0.41	0.03	25.79	26.02	-9.12
74	30.25	5.3	0	0	179.66	21.99	0.36	0.03	25.81	26.1	5.71
77	44.98	5.28	0	0	199.26	21.75	0.41	0.03	25.47	25.82	8.52
80	61.24	4.12	0	0	339.06	21.69	0.55	0.03	25.14	25.58	14.88
83	81.38	3.41	0	0	542	21.51	0.73	0.03	24.81	25.37	23.89
86	108.3	-1.74	0	-0.01	-1424.18	21.51	0.97	0.03	24.88	25.55	-62.13
89	131.04	3.54	0	0.01	709.08	21.54	0.97	0.03	25.03	25.81	37.03
92	151.58	6.56	0	0.01	469.79	21.31	1.2	0.03	24.77	25.68	23.12
95	175.62	4.64	0	0.02	744.49	21.18	1.36	0.03	24.27	25.31	37.89
98	201.07	6.62	0	0.01	615.38	21.01	1.61	0.02	24.19	25.35	30.36
101	226.13	6.74	0	0.02	627.03	20.79	1.67	0.02	24.01	25.3	33.57
104	275.77	6.77	0	0.02	614.99	20.6	1.61	0.02	24.34	25.88	40.75
107	313.15	8.11	0	0.02	655.43	20.38	2.06	0.02	24.05	25.75	38.63
110	338.93	11.84	0	0.02	392.92	20.1	1.87	0.02	23.05	24.91	28.63
113	384.57	13.67	0	0.01	360.13	19.68	1.93	0.02	23.31	25.5	28.13
116	445.04	12.62	0	0.02	551.65	19.3	2.72	0.02	23.16	25.57	35.26
119	467.76	10.71	0	0.02	617.12	18.93	2.68	0.02	22.16	24.7	43.68
122	543.44	15.69	0	0.02	473.49	18.61	2.81	0.02	23.44	26.41	34.63
125	581.31	16.18	0.19	0.02	445.17	18.02	2.78	0.02	22.64	25.89	35.94

128	686.55	12.17	0.7	0.03	634.07	17.67	2.83	0.02	23.56	27.27	56.4
131	707.8	20.42	0.84	0.02	408.51	17.2	3.21	0.02	22.13	25.97	34.65
134	779.14	21.79	1.09	0.02	438.34	16.49	3.71	0.02	21.56	25.74	35.75
137	886.98	20.52	1.72	0.03	496.1	15.91	3.87	0.02	21.55	26.28	43.22
140	1008.1	28.23	1.69	0.03	385.17	15.2	4	0.02	21.87	27.16	35.71
143	1061.2	31.88	1.69	0.02	322.19	14.25	3.93	0.02	20.74	26.16	33.28
146	1162.19	30.29	1.91	0.02	337.26	13.33	3.89	0.02	20.49	26.27	38.37
149	1276.22	26.82	2.4	0.03	404.48	12.44	3.94	0.02	21.25	27.53	47.58
152	1306.03	31.11	2.25	0.03	382.44	11.66	4.35	0.02	20.96	27.38	41.98
155	1327.28	33.72	2.16	0.02	341.11	10.59	4.3	0.02	20.21	26.77	39.36
158	1485.95	25.66	3.3	0.04	518.29	9.71	4.58	0.02	21.74	29.03	57.91
161	1497.97	35.01	2.53	0.03	349.56	8.94	4.3	0.02	21.1	28.49	42.79
164	1559.24	32.42	2.66	0.03	368.18	7.69	4.11	0.02	21.41	29.06	48.09
167	1613.97	18.6	4.36	0.05	704.59	7.08	4.36	0.02	22.26	30.07	86.79
170	1551.25	21.58	2.74	0.04	599.03	6.46	4.33	0.02	22.31	29.88	71.88
173	1448.13	23.3	1.86	0.03	516.26	5.78	4.02	0.02	22.74	29.95	62.14
176	1306.91	19.99	1.52	0.03	552.54	5.1	3.62	0.02	23.68	30.54	65.37
179	1202.72	17.07	1.05	0.03	656.86	4.58	3.59	0.02	24.91	31.23	70.46
182	1087.7	17.78	0.42	0.02	621.91	4.05	3.45	0.02	26.12	32.04	61.19
185	944.75	14.95	0.06	0.02	695.63	3.54	3.19	0.02	27.23	32.56	63.21
188	799.97	8.13	0	0.04	1271.54	3.19	3.19	0.02	27.8	32.4	98.42
191	693.19	2.68	0	0.08	2846.17	3.04	2.34	0.02	28.56	32.55	258.71
194	532	-0.5	0.01	-0.28	-9669.11	3.01	1.48	0.02	29.23	32.57	0
197	385.63	-2.14	0	-0.03	-811.62	3.06	0.55	0.02	29.15	31.55	-180.06
200	280.18	-2.37	0	-0.01	-471.16	3.12	0.36	0.02	29.49	31.23	-118.26
203	194.12	4.59	0	0	242.19	3.15	0.36	0.02	29.54	30.73	42.28
206	122.57	2.97	0	0	377.96	2.91	0.37	0.02	29.67	30.22	41.28
209	91.8	-5.39	0	0	-184.94	3.02	0.34	0.02	28.82	28.99	-17.03
212	78.67	-2.48	0	0	-416.74	3.15	0.35	0.02	29.28	29.15	-31.78
215	63.84	-0.85	0	0	-1168.45	3.17	0.34	0.02	29.17	28.91	-75.16
218	54.72	1.27	0	0	702.51	3.2	0.32	0.02	28.4	27.72	42.93
221	49.3	3.53	0	0	269.14	3.1	0.34	0.02	28.49	27.65	13.98
224	45.23	-1.05	0	0	-863.73	3.04	0.34	0.02	27.93	26.97	-42.87
227	42.75	-2.11	0	0	-428.01	3.14	0.34	0.02	27.76	26.69	-20.28
230	40.74	1.93	0	0	484.58	3.12	0.35	0.02	28.11	26.95	21.06
233	36.01	3.35	0	0	292.61	3.04	0.36	0.02	28.07	26.86	10.76
236	30.93	3.46	0	0	270.02	2.94	0.35	0.02	27.58	26.36	8.93
239	28.89	-1.02	0	0	-836.36	2.86	0.33	0.02	27.59	26.34	-28.21
242	28.14	-2.61	0	0	-310.2	2.98	0.31	0.02	27.27	26.03	-10.79
245	27.29	-1.21	0	0	-695.36	2.99	0.32	0.03	27.36	26.13	-22.53
248	24.88	0.01	-0.37	-0.04	92831.2	3.05	0.36	0.03	27.21	26	2488.25
251	21.69	0.01	-0.37	-0.04	91642.62	3.01	0.35	0.03	27.68	26.46	2169.2

Vinyl Blinds**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	51.00
Peak Heat Release Rate (kW/m ²):	109.56
Time to Peak Heat Release Rate (s):	66.00
Total Heat Release (MJ/m ²):	6.51
60 s Average Heat Release Rate (kW/m ²):	75.65
Total Mass Loss (g):	4.63
Average Mass Loss Rate (g/s):	0.040
Average Effective Heat of Combustion (MJ/kg):	14.05
Average Smoke Extinction Area (m ² /kg):	1142.92
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0376

Specimen:

Initial mass (g):	12.4
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	51
Time to flameout (s):	170

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-0.33	0.01	-0.44	-0.04	1334.88	37.75	0.01	0.03	25.87	26.14	-33.49
3	2.39	0.01	-0.49	-0.03	431.63	145.48	0	0.03	25.62	25.9	239.05
6	2.64	299.06	0	0	0	145.59	0	0.03	25.41	25.69	0.01
9	1.05	-5.54	0	0	-1.47	145.54	0	0.03	25.57	25.84	-0.19
12	2.68	-2.47	0	0	0	145.86	0	0.03	25.99	26.26	-1.08
15	1.48	7.25	0	0	0	145.64	0	0.03	26.05	26.32	0.2
18	0.02	4.27	0	0	10.58	145.52	0.02	0.03	25.85	26.12	0
21	1.43	1.47	0	0	66.14	145.39	0.04	0.03	25.76	26.03	0.97
24	0.62	-0.84	0	0	-740.64	145.42	0.24	0.03	26	26.28	-0.74
27	1.75	2.99	0	0	565.02	145.4	0.64	0.03	26.11	26.4	0.59
30	1.88	6.89	0	0	354.39	145.24	0.94	0.03	25.8	26.1	0.27
33	1.08	10.62	0	0	311.02	144.99	1.25	0.03	26.1	26.4	0.1
36	2.67	10.73	0	0	348.93	144.63	1.44	0.03	25.6	25.91	0.25
39	0.83	12.2	0	0	323.12	144.34	1.48	0.03	26.27	26.61	0.07
42	2.78	9.17	0	0	455.55	143.93	1.59	0.03	25.99	26.34	0.3
45	3.99	2.79	0	0	1260.54	143.81	1.34	0.03	25.88	26.24	1.43
48	8.53	6.71	0	0	538.55	143.69	1.38	0.03	25.93	26.27	1.27
51	28.66	11.2	0	0	285.25	143.4	1.22	0.03	25.8	26.14	2.56
54	56.9	9.39	0	0.02	542.55	143.06	1.94	0.03	25.87	26.27	6.06
57	89.44	12.97	0	0.03	840.96	142.8	4.16	0.03	25.73	26.23	6.9
60	108.88	15.82	0	0.03	879.44	142.29	5.3	0.03	25.62	26.26	6.88
63	108.92	7.15	0	0.08	1597.89	141.93	4.44	0.03	24.97	25.71	15.23
66	109.56	12.11	0	0.05	746	141.77	3.4	0.03	25.71	26.57	9.05
69	102.01	12.25	0	0.04	766.08	141.24	3.42	0.03	26.53	27.46	8.33
72	93.23	4.66	0	0.09	1660.22	141.09	2.89	0.03	25.88	26.81	20
75	89	10.01	0	0.04	756.24	140.87	2.87	0.03	25.42	26.33	8.89
78	80.76	8.29	0	0.04	850.23	140.53	2.69	0.03	25.33	26.23	9.74
81	81.63	6.42	0	0.05	1091.07	140.38	2.63	0.03	25.7	26.6	12.72
84	82.26	6.64	0	0.04	1108	140.13	2.75	0.03	25.89	26.77	12.38
87	78.83	3.34	0	0.07	2281.76	140	2.89	0.03	25.5	26.34	23.59
90	80.25	4.54	0	0.05	1795.09	139.91	3.1	0.03	25.45	26.28	17.66
93	76.53	0.71	-0.01	0.27	9158.07	139.76	2.4	0.03	26.1	26.92	108.32
96	70.47	2.33	0	0.07	2570.21	139.83	2.23	0.03	26.02	26.81	30.22
99	66.36	5.3	0	0.02	1015.71	139.61	2.02	0.03	25.94	26.7	12.53
102	56.73	2.78	0	0.03	1960.81	139.54	2.05	0.03	25.89	26.61	20.42
105	48.72	6.89	0	0.01	512.67	139.4	1.33	0.03	25.83	26.51	7.07
108	42.79	1.13	0	0.05	2534.68	139.19	1.08	0.03	26.07	26.71	37.77
111	36.67	1.41	0	0.03	1661.87	139.3	0.88	0.03	26.03	26.63	26.07
114	34.44	3.07	0	0.01	700.57	139.1	0.82	0.03	25.77	26.32	11.22
117	33.8	-4.92	0	0	-367.7	139.17	0.68	0.03	26.1	26.61	-6.86
120	31.08	3.07	0	0.01	588.36	139.29	0.68	0.03	26.24	26.71	10.11
123	31.83	6.26	0	0.01	289.31	139.02	0.68	0.03	26.36	26.81	5.08

126	30.56	-2.09	0	0	-924.83	138.99	0.72	0.03	26.36	26.79	-14.59
129	31.2	2.57	0	0	690.36	139.06	0.67	0.03	26.27	26.68	12.14
132	34.5	4.06	0	0	383.41	138.86	0.59	0.03	26.19	26.57	8.5
135	35.15	-1.75	0	0	-888.67	138.87	0.59	0.03	26.2	26.57	-20.06
138	36.64	1.21	0	0	1657.08	138.91	0.75	0.03	26.43	26.81	30.39
141	36	0.55	-0.01	0	3794.25	138.81	0.8	0.03	26.1	26.46	64.91
144	34.42	-1.59	0	0	-1247.56	138.88	0.75	0.03	25.96	26.32	-21.7
147	35.22	1.72	0	0	1071.04	138.87	0.69	0.03	26.39	26.75	20.48
150	29.61	1.46	0	0	1028.2	138.8	0.58	0.03	25.68	26.02	20.27
153	27.64	3.31	0	0	369.51	138.78	0.46	0.03	26.39	26.74	8.34
156	28.64	0.76	0	0	1551.55	138.63	0.44	0.03	26.58	26.92	37.62
159	27	-0.53	0.01	0	-1649.12	138.72	0.33	0.03	26.2	26.52	-50.78
162	22.3	4.3	0	0	175.32	138.63	0.29	0.03	26.12	26.44	5.18
165	22.61	-3.65	0	0	-182.25	138.54	0.25	0.03	26.49	26.79	-6.19
168	18.78	0.41	-0.01	0	1237.37	138.77	0.19	0.03	26	26.29	45.97
171	15.92	3.66	0	0	141.32	138.52	0.2	0.03	26.1	26.38	4.35
174	18.51	-5.23	0	0	-86.41	138.63	0.17	0.03	26.73	27	-3.54
177	15.52	0.14	-0.04	0.01	2929.59	138.74	0.15	0.03	26.18	26.43	113.51
180	13.52	3.67	0	0	115.14	138.63	0.16	0.03	26.49	26.75	3.68
183	17.16	-0.49	0.01	0	-908.08	138.58	0.17	0.03	26.11	26.35	-34.88
186	14.11	1.84	0	0	211.41	138.62	0.15	0.03	25.91	26.15	7.66
189	13.87	0.01	-0.49	0.19	43111.2	138.47	0.16	0.03	26.62	26.86	1387.1
192	15.23	0.01	-0.51	-0.02	41390.55	138.45	0.15	0.03	26.58	26.82	1522.97

Vinyl Blinds**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	48.00
Peak Heat Release Rate (kW/m ²):	111.74
Time to Peak Heat Release Rate (s):	60.00
Total Heat Release (MJ/m ²):	6.65
60 s Average Heat Release Rate (kW/m ²):	79.61
Total Mass Loss (g):	4.58
Average Mass Loss Rate (g/s):	0.041
Average Effective Heat of Combustion (MJ/kg):	14.52
Average Smoke Extinction Area (m ² /kg):	1130.59
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0398

Specimen:

Initial mass (g):	12.5
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	48
Time to flameout (s):	159

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	3.86	0.01	-0.56	-0.03	0	12.71	0	0.03	26.28	26.54	386.44
3	2.53	0.01	-0.52	-0.04	0	12.76	0	0.03	26.06	26.33	253.43
6	1.74	-1.37	0	0	0	12.77	0	0.03	26.46	26.73	-1.27
9	3.66	-1.09	0	0	0	12.83	0	0.03	25.93	26.18	-3.34
12	1.48	5.32	0	0	0	12.79	0	0.03	25.94	26.17	0.28
15	1.96	0.91	-0.01	0	69.98	12.59	0.02	0.03	25.71	25.95	2.16
18	2.38	-4.29	0	0	-32.92	12.75	0.05	0.03	26.04	26.28	-0.55
21	-0.58	-0.47	0.01	0	-289.44	12.78	0.05	0.03	26.02	26.27	1.23
24	2.77	2.93	0	0	193.36	12.77	0.22	0.03	25.7	25.94	0.95
27	3.36	7.79	0	0	255.94	12.59	0.77	0.03	25.75	26.01	0.43
30	1.94	8.58	0	0	435.45	12.33	1.43	0.03	25.93	26.2	0.23
33	4.28	13.24	0	0	334.65	12.06	1.68	0.03	26.04	26.33	0.32
36	2.82	13.57	0	0	354.86	11.57	1.86	0.03	25.53	25.83	0.21
39	2.5	8.86	0	0	456.7	11.28	1.56	0.03	25.6	25.93	0.28
42	4.7	4.47	0	0	938.03	11.03	1.57	0.03	26.36	26.7	1.05
45	12.57	10.46	0	0	351.97	10.94	1.41	0.03	25.83	26.18	1.2
48	40.04	14.77	0	0	260.2	10.41	1.46	0.03	26.02	26.38	2.71
51	70.22	8.62	0	0.02	755.82	10.12	2.52	0.03	25.47	25.88	8.15
54	93.11	13.19	0	0.04	946.32	9.83	4.85	0.03	25.22	25.74	7.06
57	108.77	12.3	0	0.05	1247.85	9.37	5.93	0.03	25.26	25.89	8.84
60	111.74	6.66	0	0.09	2054.73	9.12	5.25	0.03	25.34	26.08	16.77
63	111.6	13.35	0	0.05	889.62	8.89	4.53	0.03	25.43	26.23	8.36
66	107.92	10.69	0	0.05	907.65	8.38	3.66	0.03	25.69	26.54	10.09
69	100.8	7.69	0	0.07	1220.7	8.25	3.55	0.03	25.56	26.45	13.11
72	101.12	12.73	0	0.04	768.34	7.87	3.65	0.03	25.87	26.78	7.94
75	92.47	6.05	0	0.07	1617.17	7.56	3.63	0.03	26.02	26.94	15.29
78	89.57	6.48	0	0.05	1424.71	7.46	3.49	0.03	25.52	26.41	13.83
81	88.68	5.71	0	0.05	1514.16	7.18	3.25	0.03	25.73	26.62	15.52
84	82.66	0.26	-0.02	0.94	28749.2	7.15	2.86	0.03	25.56	26.43	314.88
87	78.67	5.13	0	0.04	1515.92	7.09	2.94	0.03	25.56	26.4	15.35
90	71.04	7.7	0	0.02	803.32	6.86	2.35	0.03	25.49	26.3	9.22
93	62.6	1.65	0	0.07	2521.6	6.69	1.57	0.03	25.72	26.5	37.9
96	59.55	4.09	0	0.02	751.65	6.7	1.16	0.03	25.67	26.43	14.57
99	56.16	4.17	0	0.01	708.63	6.46	1.09	0.03	26.32	27.04	13.46
102	49.64	0.43	-0.01	0.1	5451.61	6.48	0.9	0.03	25.53	26.19	114.93
105	49.38	0.33	-0.01	0.12	6351.16	6.41	0.79	0.03	25.53	26.17	151.88
108	46.15	0.57	-0.01	0.06	3429.76	6.45	0.73	0.03	26.17	26.79	81.01
111	43.1	3.92	0	0.01	453.71	6.36	0.67	0.03	25.94	26.5	10.98
114	44.04	-2.15	0	-0.01	-720.9	6.28	0.59	0.03	25.78	26.32	-20.45
117	40.43	1.61	0	0.02	1045.73	6.42	0.64	0.03	25.97	26.48	25.04
120	39.28	7.34	0	0	199.43	6.17	0.56	0.03	25.67	26.15	5.35
123	40.7	-1.09	0	0	-1114.98	6.07	0.45	0.03	26.52	26.99	-37.38
126	35.81	0.22	-0.02	0.02	5381.48	6.17	0.45	0.03	26.13	26.59	162.7
129	38.29	3.05	0	0	383.89	6.05	0.44	0.03	26.29	26.71	12.54
132	33.83	0.31	-0.01	0.02	3803.4	6.02	0.45	0.03	25.69	26.09	110.74
135	34.25	3.27	0	0	327.31	6	0.41	0.03	25.8	26.19	10.46

138	33.48	-0.5	0.01	-0.01	-1645.36	5.87	0.31	0.03	26.24	26.62	-66.54
141	28.79	-3.39	0	0	-194.33	6.02	0.26	0.03	25.5	25.85	-8.49
144	29.27	2.13	0	0	152.65	6.02	0.12	0.03	26.62	26.96	13.74
147	24.28	0.96	-0.01	0	172.57	5.93	0.06	0.03	26.43	26.75	25.4
150	21.82	2.58	0	0	0	5.95	0	0.03	26.57	26.88	8.47
153	21.98	3.04	0	0.01	0	5.79	0	0.03	26.33	26.63	7.24
156	16.79	-1.44	0	-0.02	0	5.8	0	0.03	26.03	26.29	-11.68
159	18.51	0.24	-0.01	0.08	0	5.83	0	0.03	26.4	26.65	78.39
162	17.79	-0.94	0	-0.03	0	5.8	0	0.03	26.39	26.62	-18.9
165	15.15	-0.71	0.01	-0.05	0	5.88	0	0.03	25.98	26.19	-21.29
168	15.96	1.99	0	0.01	0	5.83	0	0.03	25.57	25.78	8.04
171	15.57	-2.63	0	-0.01	0	5.81	0	0.03	26.08	26.28	-5.93
174	15.11	0.51	-0.01	0.02	0	5.93	0	0.03	25.9	26.1	29.65
177	16.44	6.06	0	0	0	5.76	0	0.03	25.58	25.79	2.71
180	14.98	-2.6	0	0	0	5.66	0	0.03	26.31	26.52	-5.75
183	14.38	-0.31	0.01	0	0	5.85	0	0.03	25.95	26.17	-46.91
186	16.16	5.91	0	0	0	5.65	0	0.03	25.97	26.19	2.73
189	13.25	-0.05	0.09	-0.15	0	5.58	0	0.03	26.63	26.86	-255.27
192	15.83	-0.8	0.01	0	0	5.63	0	0.03	26.21	26.44	-19.67
195	14.03	-1.38	0	0	0	5.62	0	0.03	25.97	26.21	-10.18
198	13.82	-0.3	0.01	0	0	5.7	0	0.03	26.2	26.43	-45.45
201	13.68	-1.02	0	0	0	5.65	0	0.03	26	26.23	-13.42
204	11.48	-2.21	0	0	0	5.76	0	0.03	26.14	26.37	-5.2
207	15	4.54	0	0	0	5.73	0	0.03	26.59	26.83	3.3
210	13.72	0.01	-0.55	-0.04	0	5.56	0	0.03	26.06	26.29	1371.99
213	10.64	0.01	-0.43	-0.02	0	5.67	0	0.03	25.67	25.9	1064.43

Vinyl Blinds**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	43.00
Peak Heat Release Rate (kW/m ²):	112.63
Time to Peak Heat Release Rate (s):	57.00
Total Heat Release (MJ/m ²):	6.84
60 s Average Heat Release Rate (kW/m ²):	73.19
Total Mass Loss (g):	5.19
Average Mass Loss Rate (g/s):	0.039
Average Effective Heat of Combustion (MJ/kg):	13.18
Average Smoke Extinction Area (m ² /kg):	986.12
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0387

Specimen:

Initial mass (g):	12.7
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	77
Time to ignition (s):	43
Time to flameout (s):	174

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	2.86	0.01	-0.5	-0.03	0	12.81	0	0.03	25.68	25.93	285.58
3	1.6	0.01	-0.36	-0.04	0	12.91	0	0.03	25.85	26.11	160.26
6	1.41	-1.46	0	0	0	12.97	0	0.03	26.32	26.57	-0.97
9	2.5	-2.23	0	0	-8.48	13.01	0.01	0.03	26.3	26.56	-1.12
12	-0.1	-2.6	0	0	0	13.09	0	0.03	25.93	26.18	0.04
15	1.48	2.5	0	0	12.29	13.13	0.01	0.03	25.51	25.76	0.59
18	0.57	2.33	0	0	69.37	12.98	0.06	0.03	26.22	26.48	0.24
21	-0.66	1.03	0	0	191.22	13	0.08	0.03	25.88	26.14	-0.64
24	3.84	4.41	0	0	185.44	12.88	0.31	0.03	26.21	26.48	0.87
27	0.83	9.44	0	0	254.07	12.72	0.92	0.03	25.72	26	0.09
30	1.19	9.98	0	0	425.59	12.35	1.61	0.03	26.05	26.35	0.12
33	3.12	6.69	0	0	649.52	12.15	1.65	0.03	26.08	26.4	0.47
36	0.79	9.23	0	0	439.07	11.91	1.54	0.03	26.04	26.37	0.09
39	2.17	12.17	0	0	296.27	11.6	1.36	0.03	26.24	26.58	0.18
42	8.67	8.33	0	0	467.97	11.22	1.47	0.03	26.1	26.45	1.04
45	21.69	9.41	0	0	357.03	11.06	1.25	0.03	26.44	26.79	2.31
48	58.83	15.11	0	0.01	191.59	10.63	1.12	0.03	25.53	25.91	3.89
51	87.95	10.59	0	0.04	880.02	10.23	3.59	0.03	25.49	25.94	8.3
54	100.97	10.49	0	0.05	1220.34	9.97	5.01	0.03	24.99	25.53	9.63
57	112.63	14.78	0	0.04	906.19	9.57	5.18	0.03	25.18	25.85	7.62
60	110.03	10	0	0.06	1181.39	9.14	4.53	0.03	25.32	26.1	11.01
63	102.85	7.74	0	0.07	1286.45	8.95	3.8	0.03	25.38	26.22	13.29
66	100.76	8.04	0	0.07	1183.22	8.66	3.59	0.03	25.66	26.53	12.53
69	92.26	9.6	0	0.05	811.64	8.46	2.98	0.03	25.29	26.16	9.61
72	88.61	10.28	0	0.04	906.65	8.09	3.52	0.03	25.63	26.5	8.62
75	90.53	5.43	0	0.06	1588.89	7.88	3.21	0.03	26	26.88	16.66
78	86.93	5.67	0	0.05	1562.37	7.73	3.33	0.03	25.72	26.56	15.33
81	84.52	7.14	0	0.04	1149.19	7.53	3.12	0.03	25.43	26.26	11.84
84	84.72	3.78	0	0.06	1958.9	7.34	2.74	0.03	26.17	27	22.44
87	69.2	1.41	0	0.14	4933.39	7.3	2.62	0.03	25.86	26.65	48.96
90	62.39	1.76	0	0.09	2745.67	7.23	1.81	0.03	25.85	26.61	35.52
93	54.76	3.02	0	0.03	1067.6	7.19	1.23	0.03	25.62	26.35	18.1
96	44.97	4.38	0	0.02	438.4	7.05	0.73	0.03	25.71	26.39	10.27
99	39.11	2.78	0	0.02	390.45	6.94	0.41	0.03	25.86	26.49	14.09
102	34.59	3.46	0	0.02	350.74	6.87	0.45	0.03	26.35	26.96	10
105	30.03	4.05	0	0.02	177.7	6.74	0.27	0.03	26.32	26.88	7.42
108	31.24	1.2	0	0.08	915.09	6.65	0.42	0.03	25.82	26.33	26.07
111	29.25	1.15	0	0.07	953.46	6.65	0.42	0.03	25.9	26.38	25.33
114	27.97	1.03	0	0.08	1287.26	6.58	0.5	0.03	26.07	26.51	27.05
117	33.02	-1.06	0	-0.09	-1448.4	6.6	0.57	0.03	26.66	27.08	-31.1
120	30.92	1.78	0	0.04	947.87	6.61	0.62	0.03	26.63	27.03	17.37
123	29.05	3.84	0	0.01	372.67	6.49	0.54	0.03	26.23	26.62	7.56

126	34.46	2.08	0	0.02	508.7	6.4	0.4	0.03	26.19	26.56	16.56
129	32.72	2.99	0	0.01	422.15	6.35	0.48	0.03	25.95	26.3	10.95
132	32.75	0.37	-0.02	0.04	2875.41	6.25	0.41	0.03	26.17	26.53	87.57
135	35.47	-0.45	0.01	-0.02	-2616	6.32	0.45	0.03	25.58	25.94	-78.84
138	36.9	1.28	0	0	738.56	6.26	0.36	0.03	26.15	26.51	28.92
141	38.8	0.36	-0.01	0	4443.72	6.26	0.59	0.03	26.38	26.73	108.8
144	40.26	0.84	-0.01	0	2151.63	6.23	0.69	0.03	25.78	26.13	47.75
147	37.07	1.55	0	0	1181.23	6.21	0.68	0.03	26.6	26.97	23.97
150	36.91	2.54	0	0	513.94	6.13	0.48	0.03	26.83	27.22	14.56
153	36.49	2.03	0	0	529.9	6.06	0.4	0.03	26.7	27.08	18.01
156	32.26	2.11	0	0	289.75	6.01	0.23	0.03	26.45	26.82	15.28
159	27.97	0.72	-0.01	0	851.35	5.95	0.23	0.03	26.17	26.54	38.87
162	27.93	-1.85	0	0	-175.43	5.97	0.12	0.03	26.77	27.12	-15.08
165	23.38	-0.96	0	0	-195.24	6.04	0.07	0.03	26.19	26.5	-24.45
168	20.38	-1.61	0	-0.01	-130.01	6.04	0.08	0.03	26.11	26.42	-12.67
171	20.36	-0.07	0.07	-0.1	-3055.51	6.12	0.08	0.03	26.33	26.63	-299
174	18.01	2.71	0	0.01	42.01	6.03	0.04	0.03	26.3	26.59	6.64
177	14.96	1.27	0	0	128.94	5.98	0.06	0.03	25.93	26.2	11.8
180	17.92	2.17	0	0	46.42	5.94	0.04	0.03	25.9	26.15	8.26
183	15.57	2.92	0	0.01	12.08	5.86	0.01	0.03	25.96	26.21	5.33
186	13.39	0.05	-0.08	0.34	1775.67	5.79	0.04	0.03	26.04	26.3	252.4
189	17.79	-1.85	0	-0.01	-40.9	5.85	0.03	0.03	25.84	26.08	-9.63
192	15.66	-0.38	0.01	-0.06	-193.16	5.88	0.03	0.03	26.63	26.88	-40.82
195	14.36	1.48	0	0.02	61.09	5.86	0.03	0.03	26.74	26.98	9.73
198	16.11	-0.12	0.03	-0.12	-1414.09	5.81	0.07	0.03	26.03	26.27	-129.13
201	14.21	-0.07	0.07	-0.32	-798.64	5.86	0.02	0.03	26.56	26.82	-193.54
204	13.68	-0.62	0.01	-0.02	-338.68	5.82	0.08	0.03	26.58	26.84	-22.05
207	15.17	0.18	-0.03	0	1194.31	5.89	0.08	0.03	26.16	26.41	85.42
210	12.56	2.09	0	0.01	82.36	5.8	0.06	0.03	26.53	26.79	6.01
213	13.5	0.17	-0.02	0	941.5	5.79	0.06	0.03	26.52	26.78	80.84
216	15.08	1.16	0	0	107.42	5.78	0.05	0.03	26.36	26.62	13.03
219	12.21	0.01	-0.47	-0.04	19300.75	5.72	0.07	0.03	26.38	26.63	1221.43
222	12.29	0.01	-0.55	-0.04	15058.72	5.69	0.06	0.03	26.06	26.31	1229.14

Wall Covering**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	19.00
Peak Heat Release Rate (kW/m ²):	343.70
Time to Peak Heat Release Rate (s):	39.00
Total Heat Release (MJ/m ²):	7.49
60 s Average Heat Release Rate (kW/m ²):	141.00
Total Mass Loss (g):	5.21
Average Mass Loss Rate (g/s):	0.174
Average Effective Heat of Combustion (MJ/kg):	14.38
Average Smoke Extinction Area (m ² /kg):	775.17
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0715

Specimen:

Initial mass (g):	11.3
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	92
Time to ignition (s):	19
Time to flameout (s):	48

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	0.92	0.01	-0.37	-0.03	39035.81	11.24	0.15	0.03	25.1	25.38	91.93
3	2.91	0.01	-0.46	-0.03	52721.15	11.31	0.21	0.03	25.18	25.45	291.11
6	3.91	-1.22	0	0	-450.41	11.3	0.22	0.03	24.78	25.04	-3.2
9	3.59	0.89	-0.01	0	627.64	11.36	0.22	0.03	24.53	24.79	4.05
12	1.56	4.48	0	0	185	11.24	0.33	0.03	24.73	24.99	0.35
15	1.71	0.63	-0.01	0	2640.54	11.13	0.67	0.03	24.74	25.01	2.7
18	9.04	10.47	0	0.09	253.48	11.09	1.06	0.03	24.83	25.11	0.86
21	35.85	26.97	0	0.12	266	10.46	3.05	0.03	23.16	23.51	1.33
24	148.25	29.24	0	0.12	927.17	9.58	11.23	0.03	23.29	24.14	5.07
27	235.9	28.92	0	0.08	845.25	8.74	10.04	0.02	23.29	24.35	8.16
30	315.85	19.92	0	0.09	940.48	7.9	7.47	0.02	23.74	25.09	15.85
33	338.42	24.43	0	0.05	605.22	7.46	5.78	0.03	24.1	25.6	13.85
36	340.9	25.15	0	0.04	644.12	6.47	6.46	0.02	23.47	25.09	13.56
39	343.7	6.08	0	0.08	2551.28	6.09	5.98	0.03	24.24	25.94	56.55
42	321.04	3.33	0	0.1	1762.28	6	2.2	0.03	25.06	26.73	96.36
45	234.44	1.7	0	0.08	739.97	5.86	0.47	0.03	25.51	27.03	137.91
48	172.57	1.06	0	0.19	762.58	5.89	0.29	0.03	25.99	27.38	163.55
51	98.51	2.61	0	0.1	329.3	5.78	0.32	0.03	25.62	26.77	37.69
54	68.4	1.15	0	0.26	745.6	5.75	0.32	0.03	25.77	26.8	59.41
57	48.93	0.11	-0.05	3.09	7948.76	5.71	0.31	0.03	25.9	26.8	465.99
60	43.86	1.94	0	0.18	456.19	5.72	0.33	0.03	26.03	26.83	22.59
63	38.55	2.47	0	0.14	384.07	5.6	0.35	0.03	26.23	26.95	15.63
66	35.7	1.8	0	0.2	458.52	5.58	0.31	0.03	25.7	26.31	19.81
69	35.81	0.82	-0.01	0.42	1180.99	5.5	0.37	0.03	25.81	26.36	43.85
72	32.26	0.46	-0.01	0.76	2253.74	5.53	0.4	0.03	25.46	25.93	70.82
75	30.26	2.42	0	0.13	414.7	5.46	0.39	0.03	25.24	25.67	12.5
78	32.84	0.01	-0.45	31.98	0	5.41	0.41	0.03	25.68	26.1	3283.69
81	31.6	0.01	-0.45	28.9	0	5.42	0.39	0.03	25.4	25.77	3160.16

Wall Covering**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	15.00
Peak Heat Release Rate (kW/m ²):	341.03
Time to Peak Heat Release Rate (s):	37.00
Total Heat Release (MJ/m ²):	7.52
60 s Average Heat Release Rate (kW/m ²):	142.97
Total Mass Loss (g):	5.63
Average Mass Loss Rate (g/s):	0.171
Average Effective Heat of Combustion (MJ/kg):	13.35
Average Smoke Extinction Area (m ² /kg):	626.80
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0663

Specimen:

Initial mass (g):	11.2
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	15
Time to flameout (s):	48

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.42	0.01	-0.26	-0.03	9377.12	11.23	0.04	0.03	24.96	25.2	41.85
4	0.59	0.01	-0.45	-0.03	11547.35	11.15	0.05	0.03	25.35	25.58	59.29
7	-0.53	-3.42	0	0	-5.78	11.26	0.01	0.03	24.98	25.22	0.15
10	-0.04	1.21	0	0	556.06	11.3	0.27	0.03	25.06	25.3	-0.03
13	1.1	7.27	0	0	188.91	11.17	0.54	0.03	25.32	25.56	0.15
16	5.79	12.16	0	0.06	177.86	10.86	0.84	0.03	25.38	25.63	0.48
19	62.61	25.42	0	0.14	219.87	10.39	2.37	0.02	23.06	23.57	2.46
22	147.43	32.81	0	0.1	833.93	9.39	11.33	0.03	23.33	24.15	4.49
25	259.55	21.71	0	0.11	978.35	8.55	8.77	0.02	23.12	24.21	11.96
28	309.74	26.49	0	0.06	627.15	7.99	6.64	0.02	23.75	25.04	11.69
31	328.79	25.81	0	0.04	561.18	7	5.67	0.03	24.17	25.53	12.74
34	332.37	14.95	0	0.06	966.58	6.52	5.81	0.02	23.32	24.9	22.23
37	341.03	12.38	0	0.05	878.42	6.05	4.26	0.02	23.86	25.53	27.54
40	307.46	3.5	0	0.07	880.08	5.81	1.16	0.03	24.99	26.63	87.76
43	252.72	4.74	0	0.05	77.94	5.77	0.14	0.03	25.76	27.3	53.31
46	157.48	2.58	0	0.12	37.01	5.54	0.04	0.03	25.79	27.13	61
49	112.09	-1.02	0	-0.45	-29.55	5.63	0.01	0.03	26.48	27.7	-110.04
52	80.97	2.54	0	0.19	0	5.55	0	0.03	25.29	26.35	31.85
55	60.06	0	1.58	-130.16	0	5.51	0	0.03	25.78	26.7	0
58	50.31	0.96	0	0.43	75.01	5.53	0.03	0.03	25.48	26.3	52.66
61	44.36	0.42	-0.01	0.92	0	5.46	0	0.03	25.18	25.88	105.43
64	42.64	1.82	0	0.19	0	5.49	0	0.03	26.3	26.96	23.47
67	35.7	5.11	0	0.06	0	5.34	0	0.03	24.94	25.48	6.99
70	36.71	-1.35	0	-0.22	-73.13	5.25	0.04	0.03	25.97	26.49	-27.2
73	33.41	-2.53	0	-0.11	-21.8	5.39	0.02	0.03	26.43	26.91	-13.21
76	30.07	1.39	0	0.19	0.39	5.36	0	0.03	25.44	25.85	21.59
79	29.61	0.01	-0.45	26.22	0	5.32	0	0.03	25.5	25.89	2961.02
82	27.2	0.01	-0.45	24.11	0	5.23	0	0.03	25.66	26	2719.97

Wall Covering**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	18.00
Peak Heat Release Rate (kW/m ²):	328.49
Time to Peak Heat Release Rate (s):	37.00
Total Heat Release (MJ/m ²):	6.89
60 s Average Heat Release Rate (kW/m ²):	130.25
Total Mass Loss (g):	5.34
Average Mass Loss Rate (g/s):	0.162
Average Effective Heat of Combustion (MJ/kg):	12.91
Average Smoke Extinction Area (m ² /kg):	683.26
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0560

Specimen:

Initial mass (g):	11.9
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	94
Time to ignition (s):	18
Time to flameout (s):	49

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	3.17	0.01	-0.45	-0.03	0	11.93	0	0.03	24.64	24.87	316.51
4	3.43	0.01	-0.56	-0.03	0	11.97	0	0.03	25.03	25.26	343.45
7	0.9	-0.79	0	0	-62.99	11.99	0.02	0.03	24.92	25.15	-1.14
10	1.97	3.03	0	0	79.87	12	0.09	0.03	25.29	25.53	0.65
13	3.11	2.63	0	0	342	11.84	0.35	0.03	25.79	26.04	1.18
16	0.75	4.61	0	0	409.18	11.81	0.75	0.03	25	25.24	0.16
19	18.22	17.36	0	0.05	314.19	11.48	2.19	0.03	24.7	24.94	1.05
22	60.57	25.67	0	0.1	256.97	10.8	2.65	0.03	24.38	24.86	2.36
25	121.33	28.72	0	0.09	1081.64	9.99	13.14	0.02	22.92	23.64	4.22
28	233.77	24.59	0	0.09	917.95	9.14	9.37	0.02	23.02	24.08	9.51
31	293.26	25.45	0	0.06	565.97	8.49	5.76	0.02	23.75	25.02	11.52
34	320.41	25.35	0	0.04	508	7.62	5.14	0.02	23.6	25.06	12.64
37	328.49	14.69	0	0.05	1003.68	7.05	5.79	0.02	23.89	25.46	22.36
40	321.31	4.53	0	0.09	2119.45	6.74	3.68	0.03	24.48	26.08	70.93
43	262.21	1.79	0	0.12	1211.16	6.71	0.81	0.03	25.11	26.63	146.58
46	209.87	4.42	0	0.06	27.63	6.59	0.05	0.03	25.6	27.02	47.44
49	127.67	2.54	0	0.12	65.55	6.47	0.06	0.03	25.53	26.73	50.26
52	91.73	3.57	0	0.11	0	6.42	0	0.03	25.57	26.65	25.68
55	64.22	0	1.14	-80.1	-28644.6	6.29	0.05	0.03	25.85	26.8	0
58	51.26	-3.82	0	-0.1	-10.18	6.42	0.01	0.03	25.4	26.24	-13.41
61	44.28	4.29	0	0.08	0	6.44	0	0.03	25.36	26.12	10.32
64	43.04	-0.18	0.03	-1.92	-637.44	6.24	0.04	0.03	26.19	26.87	-233.8
67	38.42	-0.49	0.01	-0.71	-25.97	6.42	0	0.03	26.38	27	-78.56
70	37.57	6.21	0	0.05	0	6.23	0	0.03	25.65	26.18	6.05
73	34.36	-1.81	0	-0.18	-40.33	6.15	0.03	0.03	25.77	26.26	-18.98
76	32.43	0.19	-0.02	1.63	296.13	6.27	0.02	0.03	25.72	26.15	170.25
79	32.88	0.01	-0.45	30.87	0	6.12	0	0.03	25.58	25.98	3287.87
82	30.48	0.01	-0.46	30.38	14726.97	6.08	0.06	0.03	26.02	26.4	3047.95

Workstation – Side Panel**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	57.00
Peak Heat Release Rate (kW/m ²):	113.50
Time to Peak Heat Release Rate (s):	76.00
Total Heat Release (MJ/m ²):	4.08
60 s Average Heat Release Rate (kW/m ²):	65.97
Total Mass Loss (g):	2.68
Average Mass Loss Rate (g/s):	0.047
Average Effective Heat of Combustion (MJ/kg):	15.20
Average Smoke Extinction Area (m ² /kg):	160.19
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0350

Specimen:

Initial mass (g):	74.7
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	199
Time to ignition (s):	57
Time to flameout (s):	113

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	1.68	0.01	-0.35	-0.03	0	74.88	0	0.03	25.51	25.73	167.89
4	2.08	0.01	-0.43	-0.03	0	74.79	0	0.03	25.19	25.4	208.23
7	4.01	-2.37	0	0	0	74.8	0	0.03	25.16	25.38	-1.69
10	3.23	3.63	0	0	0	74.86	0	0.03	25.34	25.57	0.89
13	0.93	1.8	0	0	0	74.64	0	0.03	25.02	25.26	0.52
16	1.78	-2.66	0	0	0	74.77	0	0.03	25.2	25.46	-0.67
19	2.05	5.21	0	0	0	74.71	0	0.03	25.16	25.43	0.39
22	2.22	2.21	0	0	0	74.53	0	0.03	24.94	25.2	1.01
25	4.55	-2.9	0	0	0	74.6	0	0.03	25.18	25.47	-1.57
28	3.34	0.88	0	0.05	0	74.64	0	0.03	25.25	25.54	3.79
31	4.73	3.2	0	0.02	0	74.55	0	0.03	25.01	25.3	1.48
34	4.44	-0.76	0	-0.1	0	74.5	0	0.03	24.59	24.89	-5.86
37	6.05	0.29	-0.01	0.33	0	74.57	0	0.03	25.2	25.5	21.04
40	7.97	3.03	0	0.03	0	74.47	0	0.03	25.13	25.43	2.63
43	6.54	0.88	0	0.12	0	74.42	0	0.03	25.31	25.62	7.47
46	8.76	-0.56	0.01	-0.19	0	74.41	0	0.03	25.69	26.01	-15.52
49	8.54	2.35	0	0.05	0	74.42	0	0.03	25.17	25.49	3.64
52	7.26	0.62	-0.01	0.24	0	74.29	0	0.03	25.02	25.34	11.75
55	10.31	3.37	0	0.04	0	74.35	0	0.03	25.08	25.41	3.06
58	15.01	9.33	0	0.01	0	74.08	0	0.03	25.53	25.88	1.61
61	30.27	1.9	0	0.07	848.65	73.88	0.65	0.03	24.48	24.91	15.96
64	59.18	6.1	0	0.03	350.83	73.89	0.86	0.03	24.51	24.99	9.71
67	84.12	9.04	0	0.03	254.48	73.52	0.91	0.03	24.56	25.14	9.31
70	103.5	5.59	0	0.05	384.79	73.38	0.84	0.03	24.89	25.56	18.5
73	111.54	11.94	0	0.02	98.87	73.13	0.47	0.03	24.59	25.32	9.35
76	113.5	6.44	0	0.04	230.02	72.75	0.58	0.03	24.86	25.63	17.62
79	113.5	4.68	0	0.05	259.69	72.72	0.47	0.03	24.83	25.62	24.24
82	107.48	5.88	0	0.03	227.89	72.45	0.53	0.03	24.47	25.27	18.29
85	100.21	1.84	0	0.1	493.58	72.4	0.36	0.03	24.71	25.51	54.5
88	93.15	6.51	0	0.02	0	72.28	0	0.03	24.68	25.47	14.31
91	81.7	5.49	0	0.02	0	72.05	0	0.03	25.22	26	14.89
94	69.1	2.58	0	0.04	0	71.97	0	0.03	25.45	26.2	26.73
97	60.52	1.24	0	0.1	0	71.88	0	0.03	25.2	25.9	48.85
100	53.31	0.48	-0.01	0.22	0	71.88	0	0.03	25.67	26.35	111.08
103	45.83	4.4	0	0.02	0	71.82	0	0.03	25.76	26.39	10.42
106	41.35	1.27	0	0.09	0	71.67	0	0.03	25.66	26.25	32.62
109	34.49	-1.04	0	-0.14	0	71.74	0	0.03	25.58	26.13	-33.06
112	31.6	5.63	0	0.03	0	71.67	0	0.03	25.73	26.24	5.62
115	25.61	0.85	-0.01	0.24	0	71.48	0	0.03	25.35	25.81	30.13
118	22.93	-2.54	0	-0.07	0	71.61	0	0.03	25.6	26.03	-9.04
121	20.04	2.91	0	0.06	0	71.57	0	0.03	25.66	26.06	6.9
124	18.16	0.37	-0.01	0.37	0	71.49	0	0.03	25.53	25.91	49.15
127	18.75	-0.67	0	-0.22	0	71.54	0	0.03	25.64	25.99	-27.88
130	16.2	2.77	0	0.05	0	71.5	0	0.03	26.18	26.52	5.84
133	17.36	1.29	0	0.1	0	71.4	0	0.03	25.73	26.06	13.41
136	17.02	2.51	0	0.05	0	71.41	0	0.03	25.37	25.67	6.78

139	15.01	2.58	0	0.05	0	71.26	0	0.03	25.63	25.93	5.81
142	16.51	-2.05	0	-0.07	0	71.28	0	0.03	25.81	26.11	-8.04
145	16.03	0.24	-0.02	0.54	0	71.34	0	0.03	25.45	25.74	67.05
148	15.1	0.01	-0.36	11.56	0	71.27	0	0.03	25.69	25.98	0
151	15.86	0.01	-0.46	10.69	0	71.3	0	0.03	25.83	26.12	0

Workstation – Side Panel**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	46.00
Peak Heat Release Rate (kW/m ²):	113.55
Time to Peak Heat Release Rate (s):	70.00
Total Heat Release (MJ/m ²):	4.19
60 s Average Heat Release Rate (kW/m ²):	65.13
Total Mass Loss (g):	2.74
Average Mass Loss Rate (g/s):	0.044
Average Effective Heat of Combustion (MJ/kg):	15.28
Average Smoke Extinction Area (m ² /kg):	645.19
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0246

Specimen:

Initial mass (g):	73.3
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	46
Time to flameout (s):	110

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-1.61	0.01	-0.46	-0.03	16913.55	73.33	0.07	0.03	25.67	25.9	-160.87
4	-3.05	0.01	-0.35	-0.04	14659.05	73.43	0.06	0.03	25.47	25.7	-305.35
7	0.4	2.1	0	0	87.73	73.35	0.07	0.03	25.04	25.26	0.19
10	-0.84	-0.18	0.02	0	-2217.57	73.34	0.16	0.03	24.99	25.22	4.73
13	-1.25	-0.84	0.01	0	-463.62	73.35	0.15	0.03	25.24	25.49	1.48
16	1.16	0.17	-0.02	0	2377.83	73.37	0.16	0.03	25.72	25.98	6.7
19	-1.74	3.36	0	0	73.74	73.33	0.1	0.03	25.22	25.48	-0.52
22	-0.81	1.34	0	0	257.58	73.21	0.14	0.03	24.79	25.06	-0.6
25	1.69	-1.21	0	0	-313.38	73.25	0.15	0.03	24.67	24.95	-1.4
28	0.34	2.56	0	0	160.91	73.24	0.16	0.03	25.08	25.37	0.13
31	1.71	1.28	0	0.01	313.57	73.13	0.16	0.03	25.47	25.77	1.33
34	1.58	-1.68	0	0	-287.41	73.17	0.19	0.03	24.91	25.21	-0.94
37	1.41	4.4	0	0	115.03	73.17	0.2	0.03	25.43	25.73	0.32
40	3.17	4.19	0	0.01	149.76	72.95	0.25	0.03	24.7	25	0.76
43	1.27	-3.06	0	-0.01	-255.89	72.96	0.31	0.03	25.18	25.48	-0.41
46	4.39	2.26	0	0.02	364.21	73.05	0.32	0.03	25.33	25.65	1.94
49	7.59	6.47	0	0.01	289.1	72.83	0.73	0.03	25.16	25.5	1.17
52	21.54	1.85	0	0.05	1922.4	72.72	1.41	0.03	24.79	25.2	11.67
55	45.43	6.58	0	0.02	638.07	72.66	1.71	0.03	24.04	24.51	6.91
58	70.45	7.96	0	0.02	652.78	72.34	2.07	0.03	24.56	25.13	8.85
61	96.14	5	0	0.04	890.51	72.21	1.73	0.03	25.14	25.8	19.22
64	109.54	9.44	0	0.02	405.9	72	1.48	0.03	25.21	25.92	11.6
67	113.11	6.16	0	0.03	723.45	71.7	1.73	0.03	25.04	25.8	18.37
70	113.55	9.29	0	0.02	456.03	71.59	1.65	0.03	24.85	25.64	12.22
73	108.67	6.68	0	0.02	613.57	71.18	1.58	0.03	25.12	25.92	16.26
76	96.18	-0.32	0.02	-0.35	-9922.37	71.22	1.21	0.03	25.34	26.14	-301.02
79	88.17	5.8	0	0.02	556.56	71.11	1.23	0.03	25.34	26.13	15.21
82	78.76	5.48	0	0.02	556.06	70.91	1.16	0.03	25.5	26.28	14.36
85	71.09	2.84	0	0.03	791.9	70.8	0.88	0.03	24.89	25.62	25.06
88	65.85	5.26	0	0.02	364.16	70.71	0.74	0.03	25.29	25.99	12.53
91	56.81	0.55	-0.01	0.17	3472.62	70.53	0.73	0.03	25.2	25.88	104.05
94	54.62	3.14	0	0.03	472.84	70.63	0.58	0.03	25.13	25.78	17.4
97	47.09	4.51	0	0.02	273.16	70.35	0.48	0.03	25.26	25.89	10.44
100	44.71	-1.69	0	-0.03	-625.21	70.41	0.41	0.03	25.35	25.95	-26.43
103	39.23	4.32	0	0.02	228.49	70.37	0.38	0.03	25.66	26.22	9.09
106	34.85	1.06	0	0.1	913.86	70.21	0.37	0.03	25.74	26.27	32.78
109	28.85	-1.54	0	-0.08	-657.69	70.3	0.39	0.03	25.17	25.65	-18.74
112	24.4	1.3	0	0.13	769.18	70.26	0.38	0.03	26.05	26.51	18.83
115	19.26	0.56	-0.01	0.23	1877.68	70.25	0.4	0.03	25.6	26.02	34.59
118	16.05	2.08	0	0.06	494.81	70.21	0.4	0.03	25.61	26	7.73
121	14.58	0.1	-0.04	1.23	10760.06	70.14	0.4	0.03	25.22	25.59	152.67
124	15.43	1.51	0	0.08	696.44	70.19	0.41	0.03	25.61	25.97	10.19
127	12.63	3.08	0	0.04	346.71	70.05	0.41	0.03	25.41	25.75	4.1
130	14.99	-0.86	0.01	-0.15	-1281.69	70.04	0.42	0.03	25.78	26.1	-17.41
133	12.45	-0.21	0.02	-0.54	-4830.59	70.08	0.4	0.03	25.58	25.89	-57.97
136	14.61	1.01	0	0.13	1061.49	70.05	0.42	0.03	25.3	25.6	14.45

139	13.1	-0.48	0.01	-0.26	-2352.34	70.03	0.43	0.03	25.4	25.69	-27.57
142	12.2	3.48	0	0.04	296.83	70.04	0.41	0.03	25.15	25.43	3.5
145	13.38	1.96	0	0.07	546.69	69.86	0.41	0.03	25.83	26.12	6.83
148	13.61	0.01	-0.34	13.55	103779.9	69.92	0.41	0.03	25.28	25.56	1361.11
151	12.34	0.01	-0.35	13.95	110501.3	69.79	0.43	0.03	25.58	25.86	1234.36

Workstation – Side Panel**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	33.00
Peak Heat Release Rate (kW/m ²):	181.10
Time to Peak Heat Release Rate (s):	48.00
Total Heat Release (MJ/m ²):	3.89
60 s Average Heat Release Rate (kW/m ²):	67.34
Total Mass Loss (g):	2.55
Average Mass Loss Rate (g/s):	0.061
Average Effective Heat of Combustion (MJ/kg):	15.29
Average Smoke Extinction Area (m ² /kg):	629.36
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0257

Specimen:

Initial mass (g):	70.7
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	86
Time to ignition (s):	33
Time to flameout (s):	76

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-2.68	0.01	-0.45	-0.04	77112.88	70.6	0.31	0.03	25.03	25.26	-268.38
3	0.26	0.01	-0.35	-0.03	67466.28	70.67	0.26	0.03	25.41	25.63	25.95
6	-1.48	-3.24	0	0	-234.89	70.93	0.3	0.03	25.12	25.34	0.46
9	0.4	4.84	0	0	149.24	70.83	0.28	0.03	25.26	25.49	0.08
12	-1.14	3.29	0	0	269.59	70.71	0.35	0.03	25.38	25.62	-0.35
15	-1.92	2.66	0	0	322.25	70.64	0.34	0.03	24.92	25.16	-0.72
18	-1.84	0.77	0	0	1278.36	70.56	0.39	0.03	24.92	25.17	-2.4
21	-1.17	-0.11	0.04	0	-8808.08	70.58	0.38	0.03	25.21	25.47	10.6
24	-0.89	1.74	0	0	460.55	70.55	0.32	0.03	24.76	25.02	-0.51
27	-0.06	0.2	-0.02	0	4778.45	70.5	0.37	0.03	25.16	25.43	-0.32
30	-0.91	-0.2	0.02	0	-5955.34	70.53	0.47	0.03	25.33	25.61	4.55
33	2.61	1.82	0	0.01	886.18	70.49	0.64	0.03	24.96	25.24	1.44
36	9.06	7.55	0	0.01	514.97	70.39	1.56	0.03	24.62	24.95	1.2
39	49.85	11.84	0	0.02	568.01	70.04	2.69	0.03	24.53	25	4.21
42	103.03	15.64	0	0.03	528.7	69.69	3.37	0.03	23.88	24.55	6.59
45	150.88	11.08	0	0.04	582.88	69.17	2.63	0.03	23.68	24.52	13.62
48	181.1	6.4	0	0.05	813.64	69.03	2.04	0.03	24.63	25.56	28.28
51	171.31	10.71	0	0.02	426.24	68.73	1.78	0.03	24.71	25.66	15.99
54	138.28	2.86	0	0.06	1505.14	68.46	1.63	0.03	25.44	26.39	48.34
57	113.9	1.92	0	0.06	1615.13	68.51	1.19	0.03	25.03	25.94	59.41
60	97.59	6.07	0	0.02	420.92	68.31	0.97	0.03	25.48	26.37	16.07
63	80.91	1.29	0	0.07	1740.48	68.2	0.86	0.03	25.27	26.12	62.49
66	69.76	5.48	0	0.02	275.67	68.18	0.57	0.03	25.77	26.58	12.72
69	51.25	4.68	0	0.02	210.8	67.91	0.38	0.03	25.15	25.89	10.95
72	41.49	-1.58	0	-0.08	-633.06	67.93	0.38	0.03	25.62	26.29	-26.21
75	36.45	1.11	0	0.16	864.38	67.94	0.36	0.03	25.83	26.46	32.75
78	26.15	-0.71	0.01	-0.28	-1360.93	67.89	0.38	0.03	25.24	25.81	-36.64
81	23.46	2.03	0	0.09	458.99	67.96	0.35	0.03	25.83	26.35	11.55
84	18.85	3.19	0	0.05	239.63	67.78	0.3	0.03	25.35	25.82	5.9
87	15.95	-2.75	0	-0.06	-337.54	67.81	0.36	0.03	25.63	26.07	-5.81
90	16.44	3.79	0	0.05	239.53	67.87	0.35	0.03	25.34	25.74	4.34
93	15.89	1.11	0	0.16	928.35	67.64	0.4	0.03	25.73	26.11	14.29
96	15.75	-2.63	0	-0.07	-356.74	67.81	0.37	0.03	25.31	25.67	-5.98
99	16.43	2.58	0	0.07	307.88	67.74	0.31	0.03	25.55	25.9	6.36
102	14.71	0.15	-0.03	1.08	5900.43	67.7	0.34	0.03	24.92	25.24	99.8
105	15.29	1.46	0	0.11	721.22	67.71	0.4	0.03	25.9	26.21	10.48
108	16.19	1.59	0	0.09	607.05	67.62	0.36	0.03	26.08	26.38	10.21
111	13.61	0.87	-0.01	0.16	1047.56	67.62	0.35	0.03	25.53	25.82	15.63
114	13.45	0.37	-0.01	0.4	2657.83	67.56	0.38	0.03	25.86	26.14	36.38
117	15.5	1.81	0	0.08	516.68	67.58	0.36	0.03	25.58	25.86	8.59
120	13.15	3.11	0	0.05	303.04	67.46	0.37	0.03	25.13	25.39	4.23
123	14.07	0.82	-0.01	0.17	1153.77	67.42	0.37	0.03	25.04	25.3	17.12
126	14.2	-0.55	0.01	-0.27	-1805.09	67.4	0.39	0.03	25.43	25.69	-25.89
129	12.65	1.39	0	0.09	597.96	67.43	0.32	0.03	25.51	25.77	9.08
132	13.89	2.8	0	0.05	308.49	67.32	0.34	0.03	25.36	25.62	4.96
135	12.81	-1.37	0	-0.09	-747.28	67.3	0.4	0.03	25.73	26	-9.32

138	12.46	0.1	-0.03	1.06	9271.46	67.37	0.37	0.03	25.05	25.31	123.87
141	13.8	0.96	0	0.12	919.93	67.3	0.34	0.03	25.47	25.75	14.41
144	11.84	-1	0	-0.11	-884.84	67.33	0.35	0.03	25.21	25.48	-11.86
147	12.62	0.01	-0.46	11.06	0	67.31	0.39	0.03	25.7	25.97	1262.06
150	11.86	0.01	-0.42	10.54	95281.46	67.13	0.37	0.03	25.43	25.7	1185.53

Workstation - Work Surface**Test 1**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	53.00
Peak Heat Release Rate (kW/m ²):	333.92
Time to Peak Heat Release Rate (s):	67.00
Total Heat Release (MJ/m ²):	73.36
60 s Average Heat Release Rate (kW/m ²):	202.76
Total Mass Loss (g):	55.54
Average Mass Loss Rate (g/s):	0.092
Average Effective Heat of Combustion (MJ/kg):	13.21
Average Smoke Extinction Area (m ² /kg):	5.40
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0014

Specimen:

Initial mass (g):	215.9
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	76
Time to ignition (s):	53
Time to flameout (s):	702

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.12	0.01	-0.45	-0.04	0	216.05	0	0.03	26.35	26.6	11.55
4	1.15	0.01	-0.45	-0.04	0	216.03	0	0.03	26.27	26.52	115.2
7	3.96	-1.71	0	0	0	215.93	0	0.03	26.32	26.56	-2.32
10	3.09	-4.69	0	0	0	216.12	0	0.03	25.71	25.95	-0.66
13	1.27	2.2	0	0	0	216.14	0	0.03	25.91	26.15	0.58
16	2.39	3.57	0	0	0	216.03	0	0.03	25.83	26.07	0.67
19	-0.46	-1.58	0	0	0	215.97	0	0.03	26.1	26.35	0.29
22	0.14	-0.65	0.01	0	0	216.08	0	0.03	26.11	26.37	-0.21
25	-0.61	1.77	0	0	0	216	0	0.03	25.97	26.23	-0.34
28	0.43	-1.96	0	0	0	216.02	0	0.03	25.94	26.21	-0.22
31	0.15	-1.91	0	0	0	216.09	0	0.03	25.43	25.7	-0.08
34	-0.38	2.16	0	0	0	216.1	0	0.03	25.62	25.89	-0.18
37	1.64	6.16	0	0	122.92	215.97	0.29	0.03	25.92	26.22	0.27
40	0.34	3.25	0	0	610.33	215.78	0.77	0.03	25.56	25.88	0.11
43	2.52	5.57	0	0	241.55	215.74	0.52	0.03	25.5	25.84	0.45
46	2.18	7.69	0	0.01	185.48	215.44	0.54	0.03	25.92	26.27	0.28
49	6.1	1.63	0	0.11	1742.56	215.33	1.08	0.03	25.84	26.2	3.74
52	43.97	8.3	0	0.04	555.11	215.25	1.7	0.03	26.78	27.17	5.3
55	143.03	18.93	0	0.02	161.42	214.8	1.16	0.03	25.85	26.28	7.56
58	192.97	19.18	0	0.02	0	214.19	0	0.03	24.36	25.07	10.06
61	230.14	21.11	0	0.01	0	213.65	0	0.03	24.42	25.48	10.9
64	290.66	19.71	0	0.01	13.24	212.95	0.1	0.03	25.23	26.63	14.75
67	333.92	20.65	0	0.01	12.96	212.44	0.1	0.03	24.61	26.18	16.17
70	331.99	30.29	0	0.01	25.01	211.66	0.3	0.02	23.71	25.49	10.96
73	320.9	20.77	0	0.01	50.83	210.76	0.4	0.03	24.62	26.73	15.45
76	289.3	12.88	0	0.01	0	210.41	0	0.02	24.42	26.57	22.46
79	266.27	17.49	0	0	0	209.9	0	0.03	24.62	26.84	15.22
82	236.43	17.66	0	0	0	209.38	0	0.02	24.63	26.85	13.39
85	212.23	13.47	0	0	0	208.87	0	0.03	24.93	27.09	15.75
88	197.72	10.94	0	0	0	208.56	0	0.03	25.38	27.5	18.08
91	176.03	14.99	0	0	0	208.17	0	0.02	24.67	26.63	11.74
94	159.69	8.36	0	0	0	207.73	0	0.03	25.47	27.34	19.1
97	153.16	11.57	0	0	0	207.61	0	0.03	25.34	27.07	13.24
100	143.52	11.9	0	0	0	207.05	0	0.03	25.14	26.75	12.06
103	136.01	5.79	0	0	0	206.93	0	0.03	25.38	26.9	23.51
106	134.59	12.49	0	0	0	206.62	0	0.03	25.75	27.16	10.78
109	133.32	9.32	0	0	0	206.25	0	0.03	26.45	27.82	14.31
112	132.1	8.65	0	0	0	206.05	0	0.03	26.05	27.31	15.26
115	126.95	9.44	0	0	0	205.72	0	0.03	25.26	26.4	13.45
118	129.47	7.31	0	0	0	205.5	0	0.03	25.7	26.83	17.7
121	133.4	11.39	0	0	0	205.24	0	0.03	26.38	27.5	11.71
124	134.55	7.89	0	0	0	204.87	0	0.03	26.41	27.48	17.06
127	131.89	4.18	0	0	0	204.77	0	0.03	25.55	26.56	31.54
130	130.23	9.87	0	0	0	204.55	0	0.03	25.5	26.48	13.2
133	135.88	10.69	0	0	0	204.2	0	0.03	25.82	26.79	12.71
136	134.99	9.8	0	0	0	203.92	0	0.03	25.63	26.59	13.78

139	139.27	10.9	0	0	0	203.61	0	0.03	25.88	26.85	12.78
142	139.26	8.18	0	0	0	203.29	0	0.03	25.83	26.8	17.02
145	138.7	11.16	0	0	0	203.08	0	0.03	25.77	26.75	12.43
148	144.23	10.58	0	0	0	202.65	0	0.03	26.06	27.05	13.64
151	142.4	11.22	0	0	0	202.44	0	0.03	25.96	26.95	12.7
154	140.33	10.92	0	0	0	201.98	0	0.03	25.34	26.3	12.86
157	146.29	9.15	0	0	0	201.79	0	0.03	26.35	27.34	15.98
160	141.34	12.78	0	0	0	201.4	0	0.03	25.46	26.43	11.06
163	144.83	11.28	0	0	0	201.06	0	0.03	25.49	26.46	12.84
166	146.51	10.9	0	0	0	200.71	0	0.03	26.12	27.13	13.45
169	144.55	11.21	0	0	0	200.4	0	0.03	25.86	26.85	12.89
172	146.32	13.7	0	0	0	200.03	0	0.03	25.94	26.94	10.68
175	145.89	8.92	0	0	0	199.62	0	0.03	25.89	26.89	16.35
178	149.56	10.49	0	0	0	199.45	0	0.03	26.24	27.26	14.26
181	144.46	12.37	0	0	0	198.99	0	0.03	25.63	26.63	11.68
184	146.04	7.51	0	0	0	198.76	0	0.03	25.9	26.9	19.45
187	144.74	7.99	0	0	0	198.5	0	0.03	25.78	26.77	18.12
190	145.23	9.88	0	0	0	198.26	0	0.03	25.93	26.91	14.7
193	144.08	12.12	0	0	0	197.91	0	0.03	25.6	26.54	11.88
196	143.88	13.6	0	0	0	197.54	0	0.03	26.14	27.1	10.58
199	147.97	9.32	0	0	0	197.13	0	0.03	26.53	27.49	15.88
202	142.66	10.63	0	0	0	196.95	0	0.03	25.89	26.85	13.42
205	141.51	11.26	0	0	0	196.5	0	0.03	26.15	27.11	12.56
208	144.37	9.52	0	0	0	196.29	0	0.03	26.36	27.33	15.17
211	142.22	13.52	0	0	0	195.89	0	0.03	26.47	27.43	10.52
214	142.29	8.91	0	0	0	195.53	0	0.03	26.21	27.15	15.97
217	139.31	8.78	0	0	0	195.33	0	0.03	25.66	26.57	15.86
220	135.41	11.85	0	0	0	194.98	0	0.03	25.5	26.4	11.42
223	137.57	9.94	0	0	0	194.65	0	0.03	25.73	26.64	13.85
226	136.65	9.27	0	0	0	194.38	0	0.03	25.85	26.76	14.74
229	135.51	9.36	0	0	0	194.09	0	0.03	25.66	26.56	14.48
232	133.67	9.96	0	0	0	193.81	0	0.03	25.67	26.56	13.42
235	132.46	9.67	0	0	0	193.49	0	0.03	25.5	26.37	13.7
238	132.19	12.24	0	0	0	193.22	0	0.03	25.46	26.33	10.8
241	133.76	10.87	0	0	0	192.79	0	0.03	26	26.88	12.3
244	133.25	8.54	0	0	0	192.57	0	0.03	25.99	26.87	15.6
247	130.23	13.35	0	0	0	192.23	0	0.03	25.83	26.68	9.75
250	132.09	11.68	0	0	0	191.81	0	0.03	26.12	26.98	11.31
253	126.13	6.66	0	0	0	191.55	0	0.03	25.58	26.42	18.94
256	127.25	10.97	0	0	0	191.35	0	0.03	25.64	26.49	11.6
259	129.23	9.77	0	0	0	190.92	0	0.03	25.76	26.59	13.23
262	127.41	7.07	0	0	0	190.77	0	0.03	26.04	26.88	18.02
265	126.41	11.11	0	0	0	190.46	0	0.03	25.53	26.35	11.38
268	124.5	8.56	0	0	0	190.15	0	0.03	25.61	26.42	14.55
271	125.94	7.12	0	0	0	189.94	0	0.03	25.75	26.56	17.68
274	128.96	10.79	0	0	0	189.69	0	0.03	26.16	26.99	11.95
277	125.88	10.3	0	0	0	189.32	0	0.03	26.09	26.9	12.22
280	124.98	7.78	0	0	0	189.08	0	0.03	25.69	26.49	16.07
283	124.3	11.39	0	0	0	188.81	0	0.03	25.99	26.79	10.91
286	126.3	9.02	0	0	0	188.44	0	0.03	26.45	27.26	14
289	125.72	8.56	0	0	0	188.26	0	0.03	26.29	27.09	14.68
292	121.22	10.83	0	0	0	187.9	0	0.03	25.88	26.64	11.2

295	125.85	11.1	0	0	0	187.62	0	0.03	26.4	27.18	11.34
298	123.24	9.83	0	0	0	187.25	0	0.03	26.08	26.84	12.54
301	122.65	8.37	0	0	0	187.03	0	0.03	26.19	26.96	14.66
304	121.2	12.68	0	0	0	186.72	0	0.03	26.16	26.93	9.56
307	117.88	4.03	0	0	0	186.35	0	0.03	25.83	26.59	29.24
310	122.09	8.99	0	0	0	186.38	0	0.03	26.53	27.31	13.58
313	117.33	11.84	0	0	0	185.83	0	0.03	25.8	26.55	9.91
316	119.15	1.16	0	0	0	185.76	0	0.03	25.96	26.72	102.82
319	118.57	11.64	0	0	0	185.62	0	0.03	26.37	27.13	10.19
322	115.06	10.24	0	0	0	185.14	0	0.03	25.72	26.46	11.23
325	116.86	6.59	0	0	0	185.02	0	0.03	26.02	26.77	17.72
328	114.86	11.78	0	0	0	184.68	0	0.03	25.91	26.65	9.75
331	116.51	9.49	0	0	0	184.36	0	0.03	25.8	26.53	12.28
334	111.33	11.04	0	0	0	184.09	0	0.03	25.62	26.33	10.09
337	113.05	10.27	0	0	0	183.72	0	0.03	25.79	26.51	11.01
340	114	6.58	0	0	0	183.5	0	0.03	25.79	26.5	17.33
343	111.91	7.23	0	0	0	183.29	0	0.03	25.85	26.56	15.49
346	114.13	8.64	0	0	0	183.05	0	0.03	26.02	26.74	13.22
349	109.8	7.9	0	0	0	182.79	0	0.03	25.75	26.46	13.9
352	113.47	7.22	0	0	0	182.58	0	0.03	25.93	26.64	15.71
355	112.07	10.04	0	0	0	182.33	0	0.03	26.2	26.92	11.17
358	110.6	6.9	0	0	0	182.02	0	0.03	25.93	26.64	16.02
361	110.29	7.77	0	0	0	181.89	0	0.03	25.92	26.62	14.19
364	109.71	10.05	0	0	0	181.54	0	0.03	26.24	26.94	10.92
367	108.84	4.49	0	0	0	181.34	0	0.03	26	26.68	24.21
370	106.41	10.96	0	0	0	181.19	0	0.03	25.73	26.41	9.71
373	108.81	8.86	0	0	0	180.74	0	0.03	25.9	26.59	12.28
376	109.63	6.27	0	0	0	180.67	0	0.03	26.23	26.92	17.49
379	104.44	10.33	0	0	0	180.32	0	0.03	25.27	25.94	10.11
382	106.38	5.03	0	0	0	180.1	0	0.03	25.87	26.54	21.16
385	104.3	10.71	0	0	0	179.95	0	0.03	25.65	26.31	9.73
388	112.66	9.29	0	0	0	179.51	0	0.03	27.25	27.93	12.12
391	107.75	5.85	0	0	0	179.41	0	0.03	26.6	27.26	18.41
394	105.33	8.99	0	0	0	179.11	0	0.03	26.02	26.67	11.71
397	103.31	8.95	0	0	0	178.88	0	0.03	25.72	26.35	11.54
400	103.64	7.98	0	0	0	178.58	0	0.03	26.13	26.79	12.99
403	105.54	6.96	0	0	0	178.4	0	0.03	26.22	26.88	15.16
406	103.48	9.71	0	0	0	178.14	0	0.03	26.52	27.17	10.66
409	105.02	6.76	0	0	0	177.86	0	0.03	26.54	27.19	15.53
412	104.26	6.95	0	0	0	177.72	0	0.03	26.66	27.31	14.99
415	101.13	9.19	0	0	0	177.43	0	0.03	26.02	26.65	11.01
418	102.6	9.34	0	0	0	177.18	0	0.03	25.89	26.5	10.99
421	101.76	9.55	0	0	0	176.87	0	0.03	25.94	26.52	10.65
424	106.68	6.71	0	0	0	176.63	0	0.03	26.07	26.65	15.91
427	104.02	9.2	0	0	0	176.43	0	0.03	26.04	26.63	11.31
430	105.25	8.96	0	0	0	176.09	0	0.03	25.94	26.54	11.75
433	107.22	8.42	0	0	0	175.9	0	0.03	26	26.61	12.74
436	106.4	8.18	0	0	0	175.58	0	0.03	25.71	26.32	13.01
439	110.7	7.18	0	0	0	175.41	0	0.03	25.85	26.47	15.41
442	107.27	10.63	0	0	0	175.13	0	0.03	25.79	26.42	10.09
445	107.87	7.21	0	0	0	174.82	0	0.03	25.73	26.37	14.95
448	110.86	8.9	0	0	0	174.66	0	0.03	26.45	27.1	12.45

451	110.19	7.97	0	0	0	174.3	0	0.03	26.32	26.96	13.83
454	109.29	6.8	0	0	0	174.18	0	0.03	25.51	26.14	16.08
457	110.71	11.22	0	0	0	173.86	0	0.03	26.25	26.91	9.87
460	110.98	2.65	0	0	0	173.59	0	0.03	26.15	26.82	41.91
463	108.34	8.06	0	0	0	173.61	0	0.03	25.87	26.53	13.44
466	109.38	11.15	0	0	0	173.12	0	0.03	26.28	26.95	9.81
469	110.6	1.66	0	0	0	173.02	0	0.03	26.58	27.26	66.53
472	105.67	12	0	0	0	172.9	0	0.03	25.89	26.56	8.8
475	109.52	6.72	0	0	0	172.4	0	0.03	27.04	27.73	16.3
478	100.9	4.55	0	0	0	172.48	0	0.03	25.66	26.32	22.17
481	102.12	7.66	0	0	0	172.08	0	0.03	26.04	26.68	13.32
484	99.09	8.5	0	0	0	172.03	0	0.03	25.25	25.84	11.66
487	100.6	10.63	0	0	0	171.57	0	0.03	26.07	26.68	9.46
490	102.8	5.33	0	0	0	171.44	0	0.03	26.58	27.22	19.29
493	99.07	11.82	0	0	0	171.18	0	0.03	26	26.63	8.38
496	101.93	6.74	0	0	0	170.8	0	0.03	26.41	27.04	15.12
499	100.22	6.61	0	0	0	170.74	0	0.03	26.21	26.84	15.16
502	97.9	10.74	0	0	0	170.38	0	0.03	26.24	26.87	9.11
505	96.55	6.44	0	0	0	170.15	0	0.03	25.4	26.01	14.99
508	96.05	8.75	0	0	0	169.95	0	0.03	25.44	26.05	10.97
511	95.14	8.32	0	0	0	169.64	0	0.03	25.69	26.31	11.43
514	96.8	8.27	0	0	0	169.45	0	0.03	26.07	26.68	11.7
517	95.63	7.59	0	0	0	169.15	0	0.03	26.6	27.21	12.6
520	97.46	5.72	0	0	0	169	0	0.03	26.34	26.94	17.05
523	95.01	7.56	0	0	0	168.78	0	0.03	26.07	26.66	12.56
526	94.86	7.63	0	0	0	168.56	0	0.03	26.18	26.78	12.43
529	95.17	9.13	0	0	0	168.32	0	0.03	26.09	26.69	10.42
532	91.78	5.47	0	0	0	168.04	0	0.03	26	26.59	16.77
535	92.9	6.51	0	0	0	167.96	0	0.03	25.63	26.23	14.27
538	94.19	10.17	0	0	0	167.64	0	0.03	26.47	27.08	9.26
541	91.56	2.49	0	0	0	167.42	0	0.03	26.44	27.03	36.83
544	89.93	6.59	0	0	0	167.41	0	0.03	25.57	26.15	13.64
547	89.34	7.89	0	0	0	167.04	0	0.03	26.13	26.73	11.33
550	91.23	7.22	0	0	0	166.95	0	0.03	26.07	26.66	12.63
553	90.99	9	0	0	0	166.6	0	0.03	26.29	26.89	10.11
556	87.33	2.45	0	0	0	166.47	0	0.03	26.23	26.82	35.62
559	89.22	7.84	0	0	0	166.37	0	0.03	25.88	26.46	11.38
562	85.74	7.8	0	0	0	166.03	0	0.03	26.24	26.82	10.99
565	88.99	5.33	0	0	0	165.92	0	0.03	26.25	26.83	16.7
568	88.02	8.22	0	0	0	165.67	0	0.03	26.21	26.78	10.71
571	82.08	6.03	0	0	0	165.46	0	0.03	25.7	26.27	13.6
574	85.15	9.44	0	0	0	165.28	0	0.03	25.57	26.13	9.02
577	82.1	6.46	0	0	0	164.93	0	0.03	25.75	26.3	12.7
580	88.06	4.77	0	0	0	164.88	0	0.03	26.79	27.37	18.45
583	83.89	8.98	0	0	0	164.61	0	0.03	26.17	26.73	9.34
586	82.93	4.99	0	0	0	164.4	0	0.03	25.9	26.45	16.63
589	83.62	7.02	0	0	0	164.27	0	0.03	25.9	26.45	11.92
592	80	10.18	0	0	0	163.97	0	0.03	25.75	26.29	7.86
595	84.28	6.58	0	0	0	163.7	0	0.03	26.63	27.18	12.8
598	81.06	7.45	0	0	0	163.55	0	0.03	25.89	26.41	10.88
601	81.35	5.54	0	0	0	163.27	0	0.03	25.69	26.21	14.69
604	82.54	6.32	0	0	0	163.19	0	0.03	25.97	26.52	13.05

607	77.83	8.2	0	0	0	162.89	0	0.03	25.4	25.93	9.49
610	80.27	6.16	0	0	0	162.73	0	0.03	25.71	26.25	13.04
613	79.36	10.18	0	0	0	162.48	0	0.03	25.77	26.29	7.8
616	79.38	5.76	0	0	0	162.17	0	0.03	25.65	26.17	13.79
619	81.09	4.94	0	0	0	162.11	0	0.03	26.38	26.91	16.43
622	78.95	7.06	0	0	0	161.85	0	0.03	26.12	26.65	11.18
625	79.11	5.5	0	0	0	161.71	0	0.03	25.62	26.13	14.39
628	79.72	6.1	0	0	0	161.51	0	0.03	25.89	26.41	13.07
631	80.34	6.09	0	0	0	161.35	0	0.03	25.87	26.4	13.2
634	80.29	8.49	0	0	0	161.13	0	0.03	26.26	26.78	9.46
637	78.25	7.19	0	0	0	160.86	0	0.03	25.97	26.49	10.88
640	80.78	6	0	0	0	160.7	0	0.03	26.09	26.61	13.47
643	80.21	7.57	0	0	0	160.49	0	0.03	26.06	26.57	10.59
646	79.54	6.19	0	0	0	160.26	0	0.03	25.72	26.23	12.85
649	77.55	7.5	0	0	0	160.1	0	0.03	25.71	26.22	10.34
652	77.22	0.01	-0.49	-0.04	0	159.83	0	0.03	25.77	26.29	7722.34
655	78.95	0.01	-0.44	-0.03	0	159.72	0	0.03	25.86	26.38	7894.77

Workstation - Work Surface**Test 2**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	57.00
Peak Heat Release Rate (kW/m ²):	304.02
Time to Peak Heat Release Rate (s):	80.00
Total Heat Release (MJ/m ²):	74.96
60 s Average Heat Release Rate (kW/m ²):	215.42
Total Mass Loss (g):	57.08
Average Mass Loss Rate (g/s):	0.096
Average Effective Heat of Combustion (MJ/kg):	13.13
Average Smoke Extinction Area (m ² /kg):	14.42
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0093

Specimen:

Initial mass (g):	228.6
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	57
Time to flameout (s):	704

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	2.3	0.01	-0.5	-0.04	2105.06	228.87	0.01	0.03	26.12	26.43	229.9
5	1.61	0.01	-0.4	-0.01	7224.33	228.86	0.03	0.03	25.38	25.67	161.46
8	2.24	1.47	0	0	12.19	228.86	0.01	0.03	25.2	25.48	1.52
11	3.9	-0.86	0.01	0	-13.8	228.79	0	0.03	25.84	26.13	-4.52
14	1.93	-0.73	0.01	0	-88.06	228.9	0.02	0.03	25.59	25.88	-2.66
17	2.93	3.18	0	0	5.25	228.81	0.01	0.03	25.3	25.59	0.92
20	0.99	-1.44	0	0	-2.32	228.76	0	0.03	25.75	26.05	-0.69
23	2.86	-0.77	0.01	0	-35.48	228.86	0.01	0.03	25.48	25.78	-3.71
26	0.26	2.81	0	0	29.05	228.79	0.03	0.03	25.59	25.9	0.09
29	1.61	-3.5	0	0	-3.68	228.76	0.01	0.03	25	25.31	-0.46
32	0.41	0.55	-0.01	0	93.73	228.93	0.02	0.03	25.19	25.49	0.74
35	1.8	10.43	0	0	17.22	228.69	0.07	0.03	25.23	25.54	0.17
38	0.28	3.53	0	0.02	896.9	228.42	1.23	0.03	25.42	25.74	0.08
41	1.49	2.46	0	0.05	1188.97	228.44	1.14	0.03	25.36	25.7	0.61
44	0.27	9.14	0	0.02	363.73	228.21	1.31	0.03	25.02	25.37	0.03
47	2.07	6.21	0	0.04	728.67	227.96	1.75	0.03	25.43	25.81	0.33
50	1.94	5.07	0	0.07	796.35	227.83	1.57	0.03	25.31	25.71	0.38
53	4.76	6.73	0	0.05	437.69	227.63	1.14	0.03	25.4	25.8	0.71
56	15.14	8.92	0	0.03	133.25	227.41	0.47	0.03	24.82	25.27	1.7
59	41.17	20.14	0	0.01	10.74	227.03	0.09	0.03	24.04	24.71	2.04
62	111.22	22.24	0	0.02	16.15	226.27	0.15	0.03	23.55	24.68	5
65	170.07	23.24	0	0.01	15.8	225.72	0.15	0.03	23.9	25.32	7.32
68	240.11	20.1	0	0.02	46.44	224.9	0.36	0.03	24.06	25.85	11.95
71	266.24	23.44	0	0.01	28.21	224.47	0.25	0.03	24.29	26.21	11.36
74	277.88	22.91	0	0.01	62.43	223.53	0.56	0.02	23.35	25.45	12.13
77	300.76	15.35	0	0.01	41.85	223.14	0.24	0.03	24.5	26.77	19.6
80	304.02	17.24	0	0.01	11.77	222.54	0.07	0.03	24.88	27.21	17.64
83	280.76	16.34	0	0	24.63	222.12	0.15	0.02	24.16	26.47	17.19
86	287.59	20.02	0	0	17.49	221.53	0.13	0.03	24.76	27.16	14.36
89	283.44	18.37	0	0	20.16	220.95	0.14	0.02	24.21	26.63	15.43
92	289.78	15.78	0	0	32.29	220.44	0.19	0.02	24.51	26.95	18.37
95	274.57	15.06	0	0.01	40.16	220	0.22	0.02	24.73	27.05	18.23
98	256.85	9.48	0	0.01	41.82	219.57	0.15	0.02	24.98	27.2	27.1
101	233.34	12.48	0	0.01	27.02	219.37	0.12	0.03	25.16	27.26	18.7
104	207.98	12.62	0	0.01	24.45	218.83	0.11	0.03	25.94	27.9	16.48
107	188.57	9.44	0	0.02	40.05	218.64	0.14	0.03	25.89	27.7	19.98
110	172.41	9.44	0	0.02	48.51	218.25	0.17	0.03	25.89	27.55	18.27
113	160.32	10.92	0	0.01	39.78	218.06	0.16	0.03	25.23	26.75	14.69
116	161.61	12.03	0	0.01	37.12	217.6	0.16	0.03	25.65	27.11	13.43
119	154.01	9.61	0	0.02	44.08	217.36	0.16	0.02	24.76	26.09	16.02
122	163.15	13.17	0	0.01	32.64	216.98	0.16	0.03	25.9	27.26	12.39
125	159.33	12.13	0	0.01	42.13	216.6	0.19	0.03	25.11	26.37	13.13
128	159.06	13.2	0	0.01	38.39	216.24	0.2	0.02	24.67	25.88	12.05
131	163.45	11.31	0	0.01	40.29	215.83	0.17	0.03	25.57	26.8	14.45
134	162.98	9.38	0	0.02	42.72	215.56	0.15	0.03	25.36	26.57	17.38
137	162.01	10.25	0	0.01	60.2	215.24	0.23	0.03	25.47	26.66	15.8

140	161.51	10.22	0	0.01	44.7	214.95	0.17	0.03	25.16	26.31	15.8
143	160.88	13.13	0	0.01	38.6	214.61	0.19	0.03	25.31	26.47	12.25
146	162.04	13.39	0	0.01	31.99	214.18	0.16	0.03	25.33	26.47	12.1
149	165.57	12.25	0	0.01	35.5	213.82	0.16	0.03	26.09	27.26	13.52
152	162.75	13.47	0	0.01	31.1	213.44	0.16	0.03	25.49	26.63	12.08
155	158.01	8.73	0	0.01	65.38	213.05	0.22	0.03	25.22	26.33	18.1
158	160.57	9.58	0	0.01	38.66	212.87	0.14	0.03	25.52	26.63	16.77
161	156.61	10.84	0	0.01	30.67	212.46	0.13	0.03	25.48	26.56	14.45
164	158.55	14.04	0	0	14.27	212.21	0.07	0.03	25.67	26.75	11.3
167	156.19	11.58	0	0.01	20.39	211.66	0.09	0.03	25.95	27.03	13.49
170	153.3	12.36	0	0.01	6.94	211.5	0.03	0.03	25.34	26.38	12.4
173	152.38	12.88	0	0.01	16.96	210.92	0.08	0.03	25.63	26.66	11.83
176	153.69	7.55	0	0.01	20.07	210.76	0.06	0.03	25.8	26.83	20.36
179	151.88	8.65	0	0.01	19.01	210.43	0.06	0.03	25.91	26.93	17.55
182	150	9.83	0	0.01	0	210.24	0	0.03	25.38	26.35	15.26
185	147.72	11.72	0	0.01	1.37	209.83	0.01	0.03	25.26	26.22	12.6
188	149.88	10.68	0	0.01	0	209.55	0	0.03	25.76	26.73	14.04
191	145.87	14.04	0	0.01	0	209.16	0	0.03	25.22	26.16	10.39
194	146.12	13.92	0	0	5.92	208.74	0.03	0.03	25.37	26.32	10.5
197	147.31	7.15	0	0.01	17.77	208.37	0.05	0.03	25.71	26.66	20.6
200	142.62	9.8	0	0.01	6.1	208.25	0.02	0.03	25.4	26.34	14.56
203	148.43	10.95	0	0.01	6.88	207.79	0.03	0.03	26.04	27	13.55
206	143.82	9.37	0	0.01	13.56	207.61	0.05	0.03	25.72	26.67	15.35
209	144.76	10.8	0	0.01	10.84	207.21	0.04	0.03	25.64	26.58	13.4
212	139.76	7.91	0	0.01	19.45	206.98	0.06	0.02	25.07	25.97	17.67
215	138.71	12.8	0	0.01	13.55	206.69	0.07	0.02	24.55	25.44	10.83
218	140.44	12.71	0	0.01	2.12	206.25	0.01	0.03	25.31	26.22	11.05
221	143.14	9.18	0	0.01	27.47	205.95	0.09	0.03	26	26.94	15.59
224	138.27	11.7	0	0.01	10.58	205.66	0.05	0.03	25.46	26.35	11.82
227	137.51	8.23	0	0.01	10.57	205.28	0.03	0.03	25.76	26.66	16.71
230	136.58	10.57	0	0.01	15.62	205.13	0.06	0.03	25.77	26.66	12.93
233	133.84	8.54	0	0.01	28.98	204.67	0.09	0.03	25.64	26.51	15.67
236	129.27	10.74	0	0.01	13.88	204.59	0.06	0.02	24.81	25.65	12.04
239	130.03	11.85	0	0.01	27.01	204.04	0.12	0.03	25.31	26.15	10.98
242	131.95	7.97	0	0.01	33.44	203.91	0.1	0.03	25.63	26.48	16.56
245	129.39	12.25	0	0	29.78	203.51	0.14	0.03	25.6	26.44	10.56
248	126.93	4.83	0	0.02	47.29	203.25	0.09	0.02	24.89	25.7	26.29
251	127.36	9.49	0	0.01	22.07	203.14	0.08	0.03	25.39	26.2	13.42
254	128.69	9.74	0	0.01	42.29	202.7	0.16	0.03	25.59	26.4	13.21
257	129.36	12.41	0	0.01	27.56	202.55	0.13	0.03	25.92	26.75	10.42
260	129.24	9.26	0	0.01	44.16	202	0.15	0.03	26.07	26.89	13.96
263	125.93	10.28	0	0.01	25.52	201.97	0.1	0.03	25.86	26.63	12.25
266	125.88	13.11	0	0.01	19.99	201.37	0.1	0.03	25.63	26.39	9.6
269	122.58	6.33	0	0.01	28.61	201.24	0.07	0.03	25.55	26.31	19.37
272	123.18	9.05	0	0.01	34.14	200.93	0.12	0.03	25.4	26.15	13.61
275	122.17	9.8	0	0.01	29.5	200.71	0.11	0.03	25.85	26.6	12.47
278	123.1	7.74	0	0.01	48.43	200.36	0.14	0.03	25.61	26.36	15.9
281	118.84	6.96	0	0.01	53.68	200.23	0.14	0.03	25.4	26.13	17.08
284	123.31	12.68	0	0.01	22.24	199.9	0.11	0.03	25.83	26.58	9.72
287	119.22	10.99	0	0.01	26.07	199.53	0.11	0.03	25.49	26.24	10.85
290	120.77	3.29	0	0.02	89.06	199.28	0.11	0.03	25.55	26.29	36.65
293	115.23	10.25	0	0.01	23.97	199.23	0.1	0.02	24.83	25.56	11.24

296	117.1	13.23	0	0.01	21.28	198.69	0.11	0.03	25.47	26.22	8.85
299	119.4	7.14	0	0.01	40.27	198.5	0.11	0.03	25.78	26.53	16.72
302	115.73	5.72	0	0.01	18.05	198.23	0.04	0.03	25.46	26.2	20.25
305	116.35	10.96	0	0.01	13.54	198.11	0.06	0.03	25.22	25.97	10.62
308	116.53	12.11	0	0	0	197.6	0	0.03	25.7	26.45	9.62
311	116.74	5.21	0	0.01	0	197.43	0	0.03	25.47	26.23	22.43
314	116.24	10.47	0	0	0	197.21	0	0.03	25.98	26.74	11.11
317	115.92	9.89	0	0.01	0	196.84	0	0.03	25.53	26.28	11.72
320	116.76	7.92	0	0.01	0	196.63	0	0.03	26.3	27.06	14.73
323	113.26	6.34	0	0.01	0	196.36	0	0.03	25.17	25.91	17.86
326	113.54	12.12	0	0	0	196.2	0	0.03	25.66	26.4	9.37
329	112.34	9.3	0	0	0	195.69	0	0.03	25.21	25.94	12.08
332	108.66	5.36	0	0.01	0	195.65	0	0.03	25	25.73	20.27
335	110.95	9.01	0	0.01	0	195.32	0	0.03	25.19	25.92	12.31
338	110.2	11.48	0	0	0	195.12	0	0.03	25.26	25.99	9.6
341	110.11	7.99	0	0.01	0	194.67	0	0.03	25	25.72	13.78
344	109.89	4.97	0	0.01	0	194.64	0	0.03	25.54	26.27	22.12
347	111.33	10	0	0	0	194.32	0	0.03	25.45	26.17	11.13
350	109.56	7.19	0	0.01	0	194.09	0	0.03	25.34	26.06	15.24
353	108.35	6.43	0	0.01	0	193.87	0	0.03	24.97	25.69	16.86
356	109.48	10.71	0	0	0	193.66	0	0.03	25.59	26.32	10.22
359	111.91	12.05	0	0	0	193.25	0	0.03	25.65	26.38	9.28
362	111.75	7.23	0	0.01	0	192.99	0	0.03	25.91	26.65	15.47
365	111.01	6.87	0	0.01	0	192.79	0	0.03	25.27	25.99	16.15
368	112.22	9.95	0	0.01	0	192.55	0	0.03	25.33	26.07	11.28
371	114.07	9.96	0	0.01	0	192.21	0	0.03	25.09	25.82	11.45
374	114.79	7.45	0	0.01	0	191.97	0	0.03	25.48	26.23	15.42
377	117.09	9.83	0	0.01	0	191.73	0	0.03	25.3	26.06	11.91
380	116.52	11.85	0	0.01	0	191.38	0	0.03	25.31	26.07	9.83
383	120.87	6.83	0	0.01	0	191.07	0	0.03	25.41	26.18	17.7
386	120.68	7.66	0	0.01	0	190.93	0	0.03	25.41	26.18	15.76
389	123.05	6.99	0	0.01	0	190.61	0	0.03	25.23	26	17.61
392	119.26	10.15	0	0.01	0	190.49	0	0.03	24.94	25.7	11.75
395	123.28	10.58	0	0.01	0	190.02	0	0.03	25.26	26.04	11.65
398	120.43	8.65	0	0.01	0	189.87	0	0.03	25.46	26.25	13.93
401	122.49	12.9	0	0.01	0	189.47	0	0.03	25.71	26.5	9.49
404	119.07	8.21	0	0.01	0	189.16	0	0.03	25.68	26.47	14.5
407	119.43	6.21	0	0.01	0	188.96	0	0.03	25.47	26.25	19.24
410	115.23	6.21	0	0.01	0	188.76	0	0.03	25.33	26.1	18.56
413	116.28	11.28	0	0.01	0	188.55	0	0.03	25.6	26.36	10.31
416	113.37	10.48	0	0.01	0	188.13	0	0.03	25.61	26.36	10.81
419	112.33	8.74	0	0.01	0	187.94	0	0.03	25.43	26.17	12.85
422	109.38	8.39	0	0.01	0	187.59	0	0.03	25.14	25.86	13.04
425	108.06	6.94	0	0.01	0	187.44	0	0.03	25.03	25.75	15.57
428	107.64	6.05	0	0.01	0	187.17	0	0.03	25.03	25.73	17.78
431	108.45	4.35	0	0.02	0	187.07	0	0.03	25.7	26.42	24.95
434	108.28	11.54	0	0.01	0	186.85	0	0.03	25.4	26.12	9.38
437	105.11	10.69	0	0.01	0	186.44	0	0.03	25.13	25.81	9.83
440	105.32	4.97	0	0.01	0	186.25	0	0.03	25.23	25.91	21.2
443	106.5	9.38	0	0.01	0	186.07	0	0.03	26.09	26.78	11.35
446	106.96	7.12	0	0.01	0	185.73	0	0.03	25.89	26.57	15.02
449	101.62	5.43	0	0.01	0	185.64	0	0.03	25.15	25.81	18.73

452	103.88	10.96	0	0.01	0	185.35	0	0.03	25.43	26.09	9.48
455	101.96	8.43	0	0.01	0	185.04	0	0.03	25.47	26.12	12.1
458	104.36	10.22	0	0.01	0	184.82	0	0.03	25.76	26.42	10.21
461	101.62	7.09	0	0.01	0	184.45	0	0.03	25.81	26.47	14.33
464	103.11	6.89	0	0.01	0	184.38	0	0.03	25.55	26.19	14.96
467	100.54	7.04	0	0.01	0	184.03	0	0.03	25.47	26.11	14.29
470	103.19	10.23	0	0	0	183.94	0	0.03	25.61	26.27	10.08
473	98.76	8.37	0	0.01	0	183.46	0	0.03	25.24	25.89	11.8
476	103.13	4.78	0	0.01	0	183.45	0	0.03	26.04	26.69	21.59
479	99.72	5.97	0	0.01	0	183.13	0	0.03	25.58	26.2	16.69
482	100.8	10.51	0	0.01	0	183.07	0	0.03	25.81	26.43	9.59
485	98.9	8.85	0	0.01	0	182.55	0	0.03	25.9	26.52	11.18
488	98.68	7.9	0	0.01	0	182.53	0	0.03	25.26	25.88	12.49
491	97.87	8.25	0	0.01	0	182.06	0	0.03	25.88	26.52	11.87
494	99.23	7.42	0	0.01	0	182.05	0	0.03	25.68	26.32	13.37
497	95.67	7.99	0	0.01	0	181.61	0	0.03	25.46	26.09	11.98
500	98.71	5.98	0	0.01	0	181.58	0	0.03	25.63	26.26	16.52
503	96.34	6.16	0	0.01	0	181.23	0	0.03	25.95	26.59	15.65
506	97.78	9.42	0	0.01	0	181.19	0	0.03	25.61	26.24	10.38
509	95.22	8.64	0	0.01	0	180.7	0	0.03	25.57	26.2	11.03
512	95.74	8.24	0	0.01	0	180.67	0	0.03	25.35	25.97	11.62
515	95	8.97	0	0.01	0	180.2	0	0.03	25.59	26.21	10.59
518	91.37	4.77	0	0.01	0	180.17	0	0.02	24.62	25.21	19.15
521	95.79	5.58	0	0.01	0	179.87	0	0.03	25.83	26.45	17.15
524	94.81	8.71	0	0.01	0	179.81	0	0.03	25.99	26.61	10.89
527	96.73	8.45	0	0.01	0	179.38	0	0.03	25.91	26.53	11.45
530	92.21	7.03	0	0.01	0	179.32	0	0.03	25.81	26.43	13.11
533	94.95	7.98	0	0.01	0	178.94	0	0.03	26	26.63	11.9
536	92.27	7.84	0	0.01	0	178.84	0	0.03	25.16	25.77	11.77
539	93.78	6.93	0	0.01	0	178.48	0	0.03	26.14	26.75	13.53
542	94.54	4.34	0	0.02	0	178.44	0	0.03	25.93	26.54	21.79
545	90.01	8.46	0	0.01	0	178.17	0	0.03	25.53	26.13	10.64
548	91.3	8.9	0	0.01	0	177.95	0	0.03	25.35	25.94	10.26
551	88.45	7.51	0	0.01	0	177.65	0	0.03	25.66	26.26	11.77
554	90.08	10.2	0	0.01	0	177.48	0	0.03	25.47	26.07	8.83
557	87.85	10.57	0	0.01	0	177.06	0	0.03	25.58	26.19	8.31
560	88.9	2.26	0	0.02	0	176.9	0	0.03	25.22	25.81	39.3
563	88.41	5.64	0	0.01	0	176.84	0	0.03	26.12	26.73	15.67
566	86.58	6.72	0	0.01	0	176.57	0	0.03	25.17	25.76	12.88
569	88.1	10.85	0	0	0	176.42	0	0.03	25.81	26.41	8.12
572	89.92	8.88	0	0.01	0	175.96	0	0.03	26.83	27.45	10.12
575	87.86	3.4	0	0.02	0	175.91	0	0.03	25.64	26.23	25.87
578	84.58	7.55	0	0.01	0	175.69	0	0.03	25.48	26.07	11.21
581	89.26	5.88	0	0.01	0	175.49	0	0.03	26.08	26.67	15.18
584	84.68	7.54	0	0.01	0	175.32	0	0.03	25.51	26.07	11.23
587	86.24	6.01	0	0.01	0	175.06	0	0.03	25.43	26	14.36
590	85.87	11.47	0	0	0	174.92	0	0.03	25.56	26.14	7.49
593	85.43	8.21	0	0.01	0	174.43	0	0.03	25.74	26.31	10.4
596	86.4	3.72	0	0.01	0	174.43	0	0.03	26.2	26.78	23.21
599	85.03	9.49	0	0	0	174.14	0	0.03	26.31	26.9	8.96
602	84.92	5.66	0	0.01	0	173.93	0	0.03	25.5	26.07	15
605	81.86	5.77	0	0.01	0	173.78	0	0.03	25.6	26.17	14.19

608	82.28	4.21	0	0.01	0	173.58	0	0.03	25.14	25.7	19.53
611	82.73	7.78	0	0.01	0	173.49	0	0.03	25.57	26.14	10.63
614	81.92	8.94	0	0.01	0	173.13	0	0.03	25.3	25.86	9.16
617	83.94	6.07	0	0.01	0	172.98	0	0.03	25.81	26.38	13.83
620	79.46	8.27	0	0.01	0	172.74	0	0.03	25.41	25.96	9.61
623	81.21	8.48	0	0.01	0	172.5	0	0.03	25.22	25.76	9.58
626	79.83	7.1	0	0.01	0	172.24	0	0.03	25.85	26.42	11.24
629	80.63	5.3	0	0.01	0	172.08	0	0.03	25.36	25.9	15.2
632	77.92	5.71	0	0.01	0	171.91	0	0.03	25.27	25.82	13.65
635	78.66	3.16	0	0.01	0	171.75	0	0.03	25.21	25.75	24.87
638	78.72	9.75	0	0.01	0	171.66	0	0.03	25.44	25.98	8.08
641	78.03	8.68	0	0.01	0	171.21	0	0.03	25.36	25.9	8.99
644	79.5	4.86	0	0.01	0	171.16	0	0.03	25.55	26.09	16.37
647	78.75	7.83	0	0.01	0	170.88	0	0.03	25.88	26.42	10.06
650	77.89	0.01	-0.58	5.26	0	170.7	0	0.03	25.34	25.86	7788.86
653	78.17	0.01	-0.39	6.48	0	170.33	0	0.03	26.07	26.61	7816.86

Workstation - Work Surface**Test 3**External Heat Flux 35 kW/m²

Test Results:

Time to Sustained Ignition (s):	56.00
Peak Heat Release Rate (kW/m ²):	371.52
Time to Peak Heat Release Rate (s):	75.00
Total Heat Release (MJ/m ²):	73.51
60 s Average Heat Release Rate (kW/m ²):	199.07
Total Mass Loss (g):	55.79
Average Mass Loss Rate (g/s):	0.093
Average Effective Heat of Combustion (MJ/kg):	13.18
Average Smoke Extinction Area (m ² /kg):	32.45
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0058

Specimen:

Initial mass (g):	221.3
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	56
Time to flameout (s):	704

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-1.51	0.01	-0.4	-0.04	30067.38	221.38	0.12	0.03	25.67	25.86	-151.17
3	1.99	0.01	-0.41	-0.04	20595.12	221.56	0.08	0.03	26.01	26.21	199.05
6	-1.39	-0.08	0.06	0	-2679.43	221.47	0.08	0.03	25.66	25.86	17.67
9	0.01	2.03	0	0	64.63	221.57	0.05	0.03	25.49	25.68	0
12	-1.67	0.06	-0.07	-0.01	2473.44	221.38	0.06	0.03	25.66	25.86	-28.85
15	1.91	0.03	-0.16	-0.01	2154.21	221.55	0.03	0.03	25.71	25.92	58.06
18	-1.48	0.96	0	0	115.25	221.37	0.04	0.03	25.91	26.14	-1.55
21	-0.24	-1.03	0	0	-98.17	221.52	0.04	0.03	25.52	25.74	0.23
24	1.35	-2.44	0	0	-38.04	221.43	0.04	0.03	25.92	26.16	-0.56
27	-1.18	-2.03	0	0	-19.56	221.64	0.02	0.03	25.74	25.98	0.58
30	-0.61	2.87	0	0	0.87	221.51	0	0.03	25.54	25.79	-0.21
33	1.3	5.84	0	0	0	221.49	0	0.03	25.5	25.75	0.22
36	-1.01	2.83	0	0	404.23	221.21	0.44	0.03	25.49	25.76	-0.36
39	1.63	7.35	0	0.01	250.87	221.27	0.75	0.03	24.39	24.67	0.22
42	0.2	5.19	0	0.02	316.53	220.81	0.63	0.03	25.92	26.24	0.04
45	1.16	2.08	0	0.07	1345.61	220.97	1.09	0.03	25.26	25.59	0.56
48	2.92	6.82	0	0.03	435.5	220.63	1.12	0.03	26.09	26.44	0.43
51	1.15	4.95	0	0.06	654.96	220.6	1.26	0.03	25.28	25.62	0.23
54	4.64	4.68	0	0.08	562.74	220.32	1.02	0.03	25.45	25.81	0.99
57	10.09	11.21	0	0.03	97.83	220.26	0.43	0.03	25.07	25.44	0.9
60	23.37	19.69	0	0.02	8.81	219.64	0.07	0.03	25.04	25.6	1.19
63	72.16	15.17	0	0.02	0	219.16	0	0.03	24.06	24.91	4.76
66	157.17	34.88	0	0.01	6.01	218.57	0.08	0.03	23.95	25.13	4.51
69	259.81	36.17	0	0.01	19.66	217.2	0.29	0.02	22.89	24.64	7.18
72	326.81	17.43	0	0.02	80.83	216.55	0.54	0.02	23.86	25.97	18.74
75	371.52	16.59	0	0.02	0.84	216.04	0.01	0.03	24.54	26.74	22.4
78	336.72	13.02	0	0.01	0	215.56	0	0.03	25.09	27.28	25.87
81	279.78	19.16	0	0.01	2.38	215.19	0.02	0.03	24.63	26.77	14.6
84	268.9	15.79	0	0.01	2.35	214.47	0.01	0.03	25.12	27.32	17.03
87	257.65	12.87	0	0.01	15.01	214.24	0.07	0.03	24.9	27.08	20.02
90	252.85	20.9	0	0.01	0.76	213.63	0.01	0.02	24.72	26.83	12.1
93	238.11	10.52	0	0.01	0	213.11	0	0.02	24.78	26.79	22.64
96	221.41	9.32	0	0.01	0	212.94	0	0.03	25	26.97	23.76
99	208.05	14.76	0	0	14.76	212.5	0.08	0.02	24.78	26.63	14.1
102	202.65	11.92	0	0.01	7.66	212.11	0.03	0.03	25.42	27.21	17
105	194.51	9.61	0	0.01	7.45	211.79	0.03	0.03	25.44	27.14	20.24
108	176.12	8.77	0	0.01	6.81	211.52	0.02	0.03	25.63	27.2	20.09
111	164.72	10.77	0	0	2.79	211.24	0.01	0.03	25.4	26.81	15.3
114	153.35	10.84	0	0.01	0	210.89	0	0.03	25.67	26.96	14.14
117	136.77	5.89	0	0.01	0	210.62	0	0.03	25.56	26.78	23.21
120	129.9	9.22	0	0.01	0	210.48	0	0.03	25.54	26.66	14.08
123	127.04	8.16	0	0.01	0	210.1	0	0.03	26.01	27.06	15.56

126	120.9	6.29	0	0.01	6.81	210	0.02	0.03	25.71	26.67	19.23
129	118.56	10.15	0	0	0	209.68	0	0.03	25.03	25.93	11.68
132	119.33	8.52	0	0	12.85	209.42	0.04	0.03	25.88	26.77	14
135	122.35	11.69	0	0	11.15	209.14	0.05	0.03	26.09	26.97	10.47
138	122.12	9.86	0	0	15.55	208.75	0.06	0.03	25.56	26.4	12.39
141	123.29	9.55	0	0.01	10.2	208.54	0.04	0.03	25.69	26.54	12.91
144	125.19	8.5	0	0.01	27.42	208.18	0.09	0.03	25.33	26.16	14.74
147	124	9.17	0	0.01	20.19	208.02	0.07	0.03	25.4	26.24	13.52
150	128.09	11.57	0	0	37.89	207.62	0.17	0.03	25.59	26.45	11.07
153	128.14	5.06	0	0.01	64.61	207.38	0.12	0.03	25.52	26.38	25.34
156	127.58	9.76	0	0	33.32	207.25	0.12	0.03	25.32	26.17	13.07
159	132.11	11.81	0	0	36.96	206.81	0.16	0.03	25.61	26.49	11.18
162	131.62	6.9	0	0.01	82.9	206.58	0.22	0.03	25.5	26.38	19.09
165	138.29	13.11	0	0	41.32	206.33	0.2	0.03	26.16	27.07	10.55
168	133.87	12.99	0	0	46.61	205.84	0.23	0.03	25.4	26.28	10.3
171	137.32	9.74	0	0.01	47.7	205.58	0.17	0.03	25.82	26.71	14.1
174	136.7	7.81	0	0.01	59.88	205.24	0.18	0.03	25.74	26.65	17.51
177	138.07	7.98	0	0	60.34	205.08	0.18	0.03	26.03	26.95	17.3
180	136.84	14.78	0	0	40.53	204.72	0.23	0.03	25.38	26.28	9.26
183	137.02	10.08	0	0	51.49	204.27	0.2	0.03	25.67	26.58	13.59
186	135.64	11.13	0	0	55.11	204.09	0.24	0.03	25.16	26.07	12.18
189	137.93	9.56	0	0	68.55	203.62	0.25	0.03	25.29	26.2	14.42
192	138.98	3.9	0	0.01	165.33	203.53	0.24	0.03	25.68	26.6	35.62
195	140.17	12.45	0	0	39.55	203.29	0.19	0.03	25.32	26.24	11.26
198	139.22	11.99	0	0	70.35	202.84	0.32	0.03	25.52	26.47	11.61
201	143.64	13.13	0	0	68.38	202.57	0.34	0.03	25.82	26.78	10.94
204	141.09	12.06	0	0	55.87	202.07	0.26	0.03	25.34	26.27	11.7
207	138.62	9.46	0	0	94.25	201.86	0.34	0.03	25.34	26.26	14.65
210	146.11	11.86	0	0	74.94	201.47	0.33	0.03	25.88	26.84	12.32
213	142.39	8.18	0	0	100.26	201.18	0.31	0.03	25.3	26.26	17.41
216	143.91	11.81	0	0	71.33	200.93	0.32	0.03	25.64	26.61	12.19
219	142.63	12.21	0	0	75.97	200.49	0.36	0.03	25.12	26.06	11.69
222	141.15	12.08	0	0	74.21	200.21	0.34	0.03	25.35	26.3	11.68
225	143.15	10.75	0	0	76.17	199.78	0.31	0.02	25.06	26	13.32
228	143.57	7.71	0	0.01	127.62	199.57	0.37	0.03	25.67	26.64	18.62
231	146.89	13.34	0	0	80.31	199.26	0.4	0.03	25.74	26.71	11.01
234	141.53	8.48	0	0	90.2	198.84	0.29	0.03	25.15	26.1	16.69
237	146.09	8.03	0	0.01	112.41	198.72	0.33	0.03	25.98	26.95	18.19
240	145.05	12.43	0	0	76.71	198.32	0.36	0.03	25.89	26.86	11.67
243	141.6	10.34	0	0	84.95	198.02	0.33	0.03	25.45	26.39	13.69
246	142.13	11.33	0	0	92.69	197.69	0.39	0.03	25.7	26.65	12.54
249	137.19	8.53	0	0.01	115.95	197.36	0.38	0.03	25.25	26.17	16.09
252	141.38	12.24	0	0	83.71	197.13	0.38	0.03	25.71	26.64	11.55
255	139.85	11.88	0	0	85.36	196.66	0.37	0.03	26.15	27.09	11.77
258	139.38	5.44	0	0.01	175.75	196.46	0.35	0.03	26.07	26.98	25.64
261	132.76	12.75	0	0	77.87	196.24	0.38	0.02	25	25.87	10.41
264	134.39	8.79	0	0	83.8	195.76	0.27	0.03	25.92	26.81	15.29
267	134.97	6.65	0	0	132.06	195.7	0.33	0.03	25.6	26.47	20.31

270	135.35	10.79	0	0	83.88	195.32	0.33	0.03	26.16	27.05	12.55
273	134.32	11.14	0	0	70.67	195.08	0.3	0.03	25.73	26.59	12.05
276	132.79	11.96	0	0	68.76	194.66	0.31	0.03	25.8	26.65	11.1
279	130.45	6.53	0	0	104.1	194.4	0.26	0.03	25.36	26.19	19.96
282	129.07	11.68	0	0	55.11	194.19	0.24	0.03	25.67	26.51	11.05
285	130.64	8.62	0	0	62.87	193.75	0.2	0.03	25.65	26.48	15.15
288	127	9.72	0	0	59.55	193.65	0.22	0.03	25.43	26.24	13.07
291	128.27	11.73	0	0	54.99	193.16	0.25	0.03	25.37	26.18	10.94
294	124.97	8.93	0	0	54.07	192.98	0.19	0.03	25.19	25.97	14
297	127.28	11.27	0	0	60.03	192.59	0.26	0.03	25.65	26.44	11.29
300	125.61	8.3	0	0	86.02	192.34	0.27	0.03	25.58	26.36	15.14
303	123.53	10.36	0	0	49.67	192.06	0.2	0.03	25.32	26.07	11.93
306	127.88	7.4	0	0	84.71	191.74	0.23	0.03	25.93	26.7	17.29
309	123.73	12.12	0	0	51.27	191.57	0.24	0.03	25.62	26.38	10.21
312	122.45	9.4	0	0	65.61	191.07	0.24	0.03	25.3	26.05	13.02
315	123.77	3.15	0	0.01	227.6	191.03	0.27	0.03	25.64	26.38	39.3
318	122.32	10.1	0	0	60.18	190.79	0.23	0.03	25.48	26.22	12.12
321	121.55	8.97	0	0.01	41.68	190.47	0.14	0.03	25.72	26.46	13.55
324	120.87	9.6	0	0.01	59.97	190.25	0.22	0.03	25.44	26.17	12.59
327	119.28	6.38	0	0	56.39	189.92	0.14	0.03	25.77	26.5	18.7
330	119.88	8.02	0	0	76.75	189.83	0.24	0.03	25.38	26.1	14.94
333	118.93	14.97	0	0	38.84	189.4	0.22	0.03	25.83	26.56	7.94
336	121.04	12.27	0	0	40.92	189	0.19	0.03	25.78	26.5	9.86
339	117.34	7.06	0	0	75.66	188.69	0.2	0.03	25.61	26.31	16.63
342	116.87	6.91	0	0.01	77.87	188.54	0.21	0.03	25.14	25.85	16.91
345	116.91	7.4	0	0.01	51.43	188.26	0.14	0.03	25.77	26.49	15.81
348	121.62	10.81	0	0	43.07	188.08	0.17	0.03	26.02	26.74	11.25
351	117.98	7.56	0	0.01	60.38	187.66	0.17	0.03	25.74	26.46	15.61
354	115.31	7.92	0	0.01	47.82	187.6	0.15	0.03	25.36	26.07	14.55
357	116.75	8.77	0	0	62.5	187.18	0.21	0.03	25.33	26.05	13.32
360	116.72	10.37	0	0	37.9	187.07	0.15	0.03	25.66	26.38	11.26
363	117	10.04	0	0	33.41	186.57	0.13	0.03	25.79	26.51	11.65
366	118.01	7.71	0	0.01	53.01	186.48	0.15	0.03	25.97	26.69	15.31
369	118.07	8.28	0	0.01	36.74	186.09	0.11	0.03	26.19	26.91	14.26
372	110.71	10.34	0	0	24.96	185.97	0.1	0.02	24.77	25.44	10.71
375	117.58	8.44	0	0	41.29	185.5	0.13	0.03	25.83	26.54	13.92
378	112.79	5.92	0	0	26.7	185.47	0.06	0.03	25.49	26.18	19.05
381	115.17	10.44	0	0	28.08	185.09	0.11	0.03	25.42	26.11	11.03
384	113.3	8.82	0	0	34.84	184.88	0.12	0.03	25.6	26.3	12.85
387	116.39	6.81	0	0	25.86	184.57	0.07	0.03	25.78	26.48	17.1
390	110.8	8.03	0	0	20.46	184.45	0.06	0.03	25.47	26.16	13.8
393	116.66	9.76	0	0	20.15	184.09	0.07	0.03	26.28	26.98	11.95
396	111.24	6.29	0	0	14.59	183.9	0.04	0.03	25.38	26.06	17.68
399	112.28	11.94	0	0	10.39	183.65	0.05	0.03	25.75	26.44	9.4
402	109.35	6.91	0	0	0	183.25	0	0.03	25.45	26.13	15.83
405	110.48	6.24	0	0	4.44	183.21	0.01	0.03	25.56	26.23	17.71
408	110.23	7.75	0	0	8.78	182.86	0.03	0.03	25.76	26.42	14.23
411	107.96	10.91	0	0	7.25	182.73	0.03	0.03	25.54	26.18	9.9

414	111.51	10.87	0	0	5.65	182.23	0.02	0.03	25.82	26.48	10.26
417	107.03	7.5	0	0	7.72	182.11	0.02	0.03	25.44	26.09	14.27
420	109.22	5.32	0	0	13.24	181.77	0.03	0.03	25.32	25.96	20.54
423	108.33	6.21	0	0	5.4	181.76	0.01	0.03	25.61	26.25	17.45
426	109.1	11.07	0	0	6.24	181.37	0.03	0.03	25.75	26.39	9.86
429	104.45	10.83	0	0	0	181.14	0	0.03	25.23	25.86	9.64
432	107.71	7.03	0	0	20.6	180.75	0.05	0.03	25.71	26.34	15.32
435	104.47	6.13	0	0	9.73	180.69	0.02	0.03	25.73	26.37	17.04
438	108.15	9.31	0	0	0	180.35	0	0.03	25.84	26.49	11.62
441	106.94	4.95	0	0	8.75	180.18	0.02	0.03	26.08	26.72	21.6
444	105.61	10.32	0	0	7.33	179.99	0.03	0.03	25.68	26.31	10.24
447	101.54	6.51	0	0	19.2	179.62	0.05	0.03	25.54	26.16	15.59
450	103.77	6.15	0	0	1.12	179.58	0	0.03	25.39	26.02	16.88
453	101.99	9.58	0	0	4.49	179.22	0.02	0.03	25.52	26.15	10.65
456	103.16	7.99	0	0	3.12	179.04	0.01	0.03	25.72	26.35	12.91
459	101.11	8.38	0	0	8.76	178.73	0.03	0.03	25.88	26.51	12.07
462	102.23	8.19	0	0	13.8	178.54	0.04	0.03	25.71	26.32	12.48
465	101.83	5.35	0	0	14.38	178.26	0.03	0.03	25.94	26.57	19.02
468	98.24	6.8	0	0	7.02	178.19	0.02	0.03	25.13	25.74	14.44
471	100.73	9.66	0	0	9.53	177.84	0.04	0.03	25.6	26.22	10.43
474	98.89	9.27	0	0	0	177.63	0	0.03	25.53	26.14	10.67
477	98.76	8.42	0	0	6.76	177.29	0.02	0.03	25.36	25.97	11.73
480	95.83	7.44	0	0	0	177.13	0	0.03	25.16	25.76	12.88
483	102.55	7	0	0	0	176.84	0	0.03	26.38	27	14.65
486	98.23	6.43	0	0.01	0	176.71	0	0.03	26.1	26.71	15.28
489	98.81	7.26	0	0.01	0	176.44	0	0.03	25.86	26.46	13.61
492	95.51	10.14	0	0	0	176.26	0	0.03	25.42	26.03	9.42
495	98.94	8.3	0	0.01	0	175.87	0	0.03	25.67	26.27	11.92
498	95.3	3.58	0	0.01	0	175.78	0	0.03	25.18	25.77	26.61
501	97.78	9.31	0	0	0.86	175.59	0	0.03	25.91	26.52	10.5
504	96.05	4.92	0	0	0	175.28	0	0.03	25.56	26.14	19.53
507	99	7.52	0	0	0	175.25	0	0.03	26.43	27.03	13.16
510	93.54	9.42	0	0	0	174.84	0	0.03	25.17	25.73	9.93
513	94.99	7.95	0	0	0	174.71	0	0.03	25.74	26.31	11.94
516	96.86	7.81	0	0	0	174.35	0	0.03	25.77	26.34	12.4
519	93.43	5.14	0	0	0	174.25	0	0.03	25.15	25.71	18.18
522	93.87	7.89	0	0	0	174.01	0	0.03	25.48	26.05	11.91
525	94.1	10.36	0	0	0	173.78	0	0.03	26.09	26.67	9.08
528	95	7.04	0	0.01	0	173.43	0	0.03	25.73	26.31	13.49
531	92.64	5.45	0	0	0	173.34	0	0.03	25.92	26.5	17.01
534	93.44	10.57	0	0	0	173.05	0	0.03	25.56	26.14	8.84
537	91.38	7.26	0	0.01	0	172.77	0	0.03	25.74	26.33	12.59
540	93.7	6.48	0	0.01	0	172.61	0	0.03	25.59	26.17	14.46
543	89.67	4.88	0	0.01	0	172.38	0	0.03	25.08	25.65	18.39
546	93.46	7.7	0	0	0	172.28	0	0.03	25.91	26.51	12.13
549	91.81	6.7	0	0	0	171.94	0	0.03	25.88	26.46	13.71
552	93.34	8.61	0	0	0	171.86	0	0.03	25.87	26.44	10.85
555	91.42	9.3	0	0	0	171.43	0	0.03	26.09	26.67	9.83

558	89.96	8	0	0.01	0	171.32	0	0.03	25.44	26	11.24
561	89.06	7.07	0	0	0	170.95	0	0.03	25.27	25.83	12.6
564	89.81	4.96	0	0.01	0	170.9	0	0.03	25.29	25.87	18.1
567	91.18	5.62	0	0.01	0	170.63	0	0.03	25.74	26.32	16.23
570	89.7	6.77	0	0.01	0	170.56	0	0.03	25.75	26.34	13.26
573	91.22	6.87	0	0	0	170.23	0	0.03	25.79	26.37	13.29
576	88.38	8.26	0	0	0	170.14	0	0.03	25.55	26.12	10.7
579	89.55	11.05	0	0	0	169.73	0	0.03	25.63	26.19	8.11
582	86.41	8.18	0	0	0	169.52	0	0.03	25.36	25.93	10.56
585	91.08	5.19	0	0	0	169.25	0	0.03	25.84	26.43	17.56
588	89.04	2.41	0	0.02	0	169.2	0	0.03	25.88	26.47	37.01
591	88.83	8.92	0	0.01	0	169.03	0	0.03	25.67	26.24	9.96
594	87.69	11.14	0	0	0	168.69	0	0.03	25.68	26.25	7.87
597	87.24	6.93	0	0	0	168.42	0	0.03	25.51	26.08	12.59
600	88.87	5.94	0	0.01	0	168.26	0	0.03	25.74	26.31	14.97
603	87.21	8.31	0	0	0	168.04	0	0.03	25.59	26.15	10.5
606	89.63	3.96	0	0	0	167.8	0	0.03	25.9	26.47	22.64
609	87.08	6.09	0	0.01	0	167.76	0	0.03	25.96	26.53	14.3
612	88.29	5.41	0	0.01	0	167.45	0	0.03	25.72	26.28	16.32
615	86.88	7.37	0	0	0	167.41	0	0.03	26.31	26.88	11.78
618	87.43	9.35	0	0	0	167.01	0	0.03	25.76	26.32	9.35
621	85.03	8.51	0	0.01	0	166.87	0	0.03	25.42	25.96	9.99
624	85.57	8.54	0	0	0	166.49	0	0.03	25.66	26.21	10.02
627	85.56	7.36	0	0	0	166.37	0	0.03	25.91	26.47	11.63
630	81.9	6.08	0	0.01	0	166.06	0	0.03	25.15	25.69	13.48
633	84	2.16	0	0.01	0	166.02	0	0.03	24.83	25.35	38.88
636	83.49	9.33	0	0	0	165.85	0	0.03	25.48	26.01	8.95
639	86.34	7.91	0	0	0	165.51	0	0.03	25.47	26.01	10.91
642	85.71	7.01	0	0	0	165.38	0	0.03	25.91	26.46	12.23
645	86.49	7.02	0	0	0	165.08	0	0.03	26.35	26.92	12.32
648	86.03	7.99	0	0	0	164.95	0	0.03	25.71	26.26	10.76
651	81.77	0.01	-0.41	1.5	0	164.62	0	0.03	25.43	25.97	8176.63
654	85.81	0.01	-0.29	3.42	0	164.53	0	0.03	25.73	26.29	8580.91

Carpeting**Test 1**External Heat Flux 70 kW/m²

Test Results::

Time to Sustained Ignition (s):	22.00
Peak Heat Release Rate (kW/m ²):	374.82
Time to Peak Heat Release Rate (s):	64.00
Total Heat Release (MJ/m ²):	42.67
60 s Average Heat Release Rate (kW/m ²):	294.84
Total Mass Loss (g):	14.75
Average Mass Loss Rate (g/s):	0.083
Average Effective Heat of Combustion (MJ/kg):	28.94
Average Smoke Extinction Area (m ² /kg):	813.33
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0170

Specimen:

Initial mass (g):	28.2
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	79
Time to ignition (s):	22
Time to flameout (s):	199

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-0.27	0.01	-0.33	-0.03	75166.04	28.16	0.3	0.03	25.03	25.32	-27.43
4	0.31	0.01	-0.45	-0.03	97235.8	28.1	0.37	0.03	26	26.32	31.26
7	0.43	-3.16	0	0	-283.64	28.07	0.34	0.03	26.15	26.47	-0.14
10	1.64	-3.37	0	0	-267.22	28.25	0.35	0.03	25.34	25.65	-0.49
13	1.47	7.12	0	0	132.48	28.2	0.36	0.03	25.91	26.23	0.21
16	0.06	2.24	0	0	389.18	27.93	0.34	0.03	25.27	25.59	0.03
19	-0.24	-2.33	0	0	-486.57	28.07	0.45	0.03	24.93	25.25	0.1
22	3.97	4.41	0	0	442.81	27.99	0.76	0.03	25.45	25.77	0.9
25	32.62	8	0	0	208	27.82	0.67	0.02	24.31	24.83	4.08
28	99.66	15.06	0	0	142.55	27.49	0.88	0.02	23.57	24.46	6.62
31	186.12	14.68	0	0	154.6	26.97	0.92	0.02	23.43	24.64	12.68
34	256.03	9.55	0	0	309.47	26.64	1.21	0.02	23.01	24.43	26.81
37	301.21	14.67	0	0	262.49	26.33	1.53	0.02	23.56	25.2	20.53
40	329.92	14.08	0	0	361.47	25.8	1.95	0.02	24.23	26.08	23.44
43	334.15	9.05	0	0.01	570.29	25.52	2.01	0.02	23.8	25.73	36.94
46	346.45	11.38	0	0.01	490.45	25.21	2.13	0.02	24.2	26.23	30.45
49	354.29	13.18	0	0.01	508.38	24.83	2.54	0.02	24.24	26.34	26.87
52	359.94	13.66	0	0.01	578.96	24.42	2.99	0.02	24.31	26.47	26.35
55	358.34	17.52	0	0.01	519.81	23.99	3.5	0.02	23.88	26.03	20.45
58	361.66	18.46	0	0.01	427.83	23.4	3.04	0.02	23.8	25.95	19.59
61	371	7.7	0	0.04	1198.77	22.96	3.45	0.02	24.52	26.73	48.18
64	374.82	11.06	0	0.03	805.51	22.84	3.26	0.02	25.1	27.35	33.89
67	367.15	14.32	0	0.02	635.68	22.29	3.36	0.02	24.9	27.08	25.63
70	356.87	13.53	0	0.02	753.75	22.01	3.82	0.02	24.6	26.71	26.37
73	348.71	12.71	0	0.03	790.62	21.49	3.82	0.02	24.31	26.34	27.43
76	364.73	9.13	0	0.04	1258.98	21.26	4.15	0.02	25.61	27.7	39.94
79	346.36	15.05	0	0.02	646.38	20.88	3.64	0.02	24.76	26.74	23.02
82	337.73	11.81	0	0.03	845.09	20.42	3.71	0.02	24.98	26.92	28.6
85	322.71	12.61	0	0.02	833.02	20.15	3.97	0.02	24.63	26.48	25.59
88	311.75	8.16	0	0.04	1197.48	19.7	3.71	0.02	24.54	26.31	38.22
91	320.85	4.75	0	0.06	1954.24	19.65	3.34	0.02	25.96	27.79	67.55
94	301.72	11.22	0	0.02	737.63	19.34	3.09	0.02	25.13	26.82	26.89
97	289.31	9.32	0	0.02	886.94	19.03	3.07	0.02	25.25	26.89	31.05
100	276.8	5.83	0	0.04	1499.83	18.8	3.24	0.02	25.45	27.02	47.48
103	266.98	10.66	0	0.02	875.15	18.62	3.45	0.02	25.59	27.09	25.03
106	246.66	13.42	0	0.01	585.18	18.18	3.01	0.02	24.69	26.07	18.38
109	238.45	1.55	0	0.11	5696.04	17.91	3.37	0.02	24.87	26.21	153.76
112	233.36	5.33	0	0.03	1536.49	17.98	3.1	0.02	25.12	26.42	43.75
115	238.54	10.08	0	0.01	848.13	17.58	3.14	0.02	25.9	27.2	23.66
118	233.9	6.09	0	0.02	1604.44	17.43	3.63	0.02	25.66	26.9	38.4
121	225.77	13.34	0	0.01	572.51	17.15	2.87	0.02	25.41	26.59	16.92
124	220.34	7.26	0	0.01	1108.71	16.72	3.05	0.02	25.29	26.44	30.34

127	216.9	2.2	0	0.05	2569.84	16.71	2.13	0.02	25.41	26.54	98.57
130	215.65	8.73	0	0.01	846.85	16.51	2.73	0.02	25.95	27.08	24.72
133	209.34	4.26	0	0.02	1637.65	16.25	2.59	0.02	25.82	26.9	49.19
136	206.81	5.68	0	0.02	1276.86	16.21	2.66	0.02	26.2	27.27	36.39
139	195.24	11.93	0	0.01	621.92	15.88	2.81	0.02	25.42	26.43	16.37
142	194.73	5.34	0	0.02	1351.22	15.59	2.7	0.02	25.71	26.71	36.47
145	195.84	3.65	0	0.03	2317.24	15.53	3.16	0.02	25.8	26.81	53.59
148	195.86	7.92	0	0.01	1021.98	15.32	3	0.02	25.98	26.98	24.73
151	190.59	5.67	0	0.02	1263.5	15.1	2.76	0.02	25.01	25.97	33.62
154	199.08	6.07	0	0.02	1328.36	14.97	3.03	0.02	25.63	26.62	32.78
157	199.13	7.87	0	0.01	1004.79	14.72	3.02	0.02	25.22	26.2	25.29
160	203.56	7.1	0	0.02	1039.93	14.51	2.81	0.02	25.25	26.25	28.69
163	207.97	7.52	0	0.01	1022.07	14.29	2.88	0.02	25.7	26.71	27.66
166	206.56	7.86	0	0.01	982.22	14.07	2.88	0.02	25.73	26.76	26.29
169	204.14	1.4	0	0.07	5228.06	13.86	2.74	0.02	25.7	26.71	145.64
172	195.8	1.66	0	0.05	3586.76	13.93	2.27	0.02	25.38	26.36	117.61
175	190.49	7.07	0	0.01	850.69	13.73	2.24	0.02	25.91	26.89	26.93
178	179.46	2.29	0	0.01	1812.6	13.57	1.55	0.02	25.82	26.76	78.24
181	162.87	7.45	0	0	454.86	13.53	1.27	0.02	25.82	26.69	21.85
184	140.97	4.82	0	0	406.13	13.18	0.73	0.02	26.18	27	29.25
187	114.83	-2.81	0	0	-449.31	13.27	0.48	0.02	25.46	26.18	-40.85
190	95.07	2.18	0	0	226.34	13.26	0.19	0.02	25.9	26.55	43.62
193	76.5	1.48	0	0.01	275.71	13.18	0.15	0.02	25.86	26.42	51.53
196	61.42	-1.78	0	-0.03	-75.81	13.19	0.05	0.02	25.81	26.28	-34.44
199	46.96	0.65	0	0.1	317.02	13.24	0.08	0.02	26.1	26.51	72.43
202	41.46	5.73	0	0.01	17.26	13.14	0.04	0.02	25.97	26.34	7.23
205	34.09	-0.55	0.01	-0.12	-282.99	12.97	0.06	0.02	25.15	25.45	-61.45
208	32.9	1.76	0	0.04	74.74	13.12	0.05	0.03	26.2	26.47	18.67
211	30.26	0.87	0	0.09	0	12.89	0	0.03	26.38	26.63	34.59
214	27.12	-3.02	0	-0.03	-3.39	13.08	0	0.02	25.97	26.19	-8.98
217	25.95	2.42	0	0.03	0	13.01	0	0.03	26.18	26.39	10.7
220	25.25	-0.76	0.01	-0.11	0	12.99	0	0.03	25.94	26.13	-33.33
223	24.65	0.57	-0.01	0.15	0	13.03	0	0.03	25.95	26.14	43.27
226	24.25	2.4	0	0.03	0	12.95	0	0.03	25.83	26.01	10.1
229	23.32	0.02	-0.27	3.55	0	12.91	0	0.03	25.77	25.95	1464.59
232	21.24	1.28	0	0.04	0	12.93	0	0.02	25.62	25.8	16.65
235	20.45	3.21	0	0.02	0	12.83	0	0.02	25.45	25.63	6.37
238	19.4	-4.8	0	-0.01	0	12.8	0	0.03	25.62	25.8	-4.04
241	18.72	-2.46	0	-0.02	0	13.05	0	0.03	26.1	26.3	-7.61
244	18.21	3.9	0	0.01	0	12.92	0	0.03	25.86	26.07	4.67
247	16.49	0.01	-0.36	1.99	0	12.89	0	0.03	26.13	26.34	1649.25
250	16.38	0.01	-0.34	1.57	0	12.92	0	0.02	25.17	25.37	1638.11

Carpeting**Test 2**External Heat Flux 70 kW/m²

Test Results::

Time to Sustained Ignition (s):	23.00
Peak Heat Release Rate (kW/m ²):	358.71
Time to Peak Heat Release Rate (s):	67.00
Total Heat Release (MJ/m ²):	43.59
60 s Average Heat Release Rate (kW/m ²):	293.28
Total Mass Loss (g):	15.20
Average Mass Loss Rate (g/s):	0.087
Average Effective Heat of Combustion (MJ/kg):	28.67
Average Smoke Extinction Area (m ² /kg):	743.06
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0151

Specimen:

Initial mass (g):	28.8
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	94
Time to ignition (s):	23
Time to flameout (s):	198

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-1.95	0.01	-0.53	-0.03	0	29.03	0	0.03	25.93	26.28	-194.56
4	-1.78	0.01	-0.39	-0.03	0	29.05	0	0.03	25.36	25.71	-178.39
7	-1.13	4.91	0	0	6.37	29	0.01	0.03	25.55	25.91	-0.23
10	-1.78	0.61	-0.01	0	186.14	28.82	0.04	0.03	25.41	25.77	-2.94
13	-1.04	-1.16	0	0	-42.39	28.95	0.02	0.03	25.26	25.63	0.89
16	-1.42	3.18	0	0	43.58	28.84	0.05	0.03	25.35	25.73	-0.45
19	1.03	0.17	-0.02	0	3543.36	28.8	0.23	0.03	25.05	25.42	6.26
22	6.45	5.49	0	0	263.82	28.78	0.57	0.03	25.05	25.44	1.18
25	34.96	7.71	0	0	107.33	28.48	0.34	0.02	23.88	24.44	4.54
28	135.84	15.2	0	0	89.61	28.29	0.55	0.02	23.48	24.62	8.94
31	241.22	15.84	0	0	99.29	27.62	0.62	0.02	23.99	25.5	15.23
34	301.89	11.75	0	0	174.37	27.37	0.8	0.02	24.03	25.76	25.68
37	307.71	13.91	0	0	214.27	26.88	1.18	0.02	23.32	25.16	22.12
40	316.42	3.06	0	0.02	1062.82	26.61	1.26	0.02	23.74	25.71	103.52
43	318.37	14.68	0	0	276.27	26.55	1.57	0.02	23.71	25.75	21.69
46	330.11	15.45	0	0.01	318.61	25.8	1.88	0.02	24.06	26.18	21.37
49	332.47	9.09	0	0.01	592.89	25.67	2.03	0.02	24.33	26.49	36.57
52	334.7	17.23	0	0.01	339.39	25.16	2.19	0.02	24.53	26.71	19.43
55	335.3	13.75	0	0.01	531.15	24.71	2.75	0.02	24.39	26.58	24.39
58	347.14	10.6	0	0.02	885.53	24.34	3.45	0.02	24.99	27.22	32.75
61	344.84	16.31	0	0.02	569.84	24.02	3.48	0.02	24.52	26.7	21.15
64	347.56	12.34	0	0.02	698.68	23.42	3.22	0.02	24.59	26.75	28.17
67	358.71	15.06	0	0.02	607.92	23.24	3.31	0.02	25.42	27.62	23.82
70	356.9	15.53	0	0.02	711.67	22.53	4.06	0.02	25.09	27.23	22.98
73	352.02	9.07	0	0.04	1035.06	22.35	3.53	0.02	24.51	26.59	38.8
76	356.09	12.85	0	0.03	760.52	21.92	3.65	0.02	24.72	26.79	27.71
79	351.29	10.52	0	0.03	963.74	21.62	3.82	0.02	24.5	26.52	33.39
82	348.86	13.73	0	0.02	808.98	21.26	4.13	0.02	24.88	26.88	25.4
85	352.33	13.76	0	0.02	684.13	20.82	3.4	0.02	25.66	27.66	25.6
88	338.15	3.73	0	0.07	2663.19	20.5	3.65	0.02	25.26	27.18	90.72
91	325.71	8.27	0	0.03	1072.15	20.49	3.27	0.02	25.22	27.07	39.39
94	312.24	11.76	0	0.02	779.77	20	3.37	0.02	25.39	27.19	26.56
97	300.98	8.03	0	0.02	975.68	19.84	2.87	0.02	25.58	27.32	37.49
100	289.06	13.85	0	0.01	637.88	19.47	3.22	0.02	25.79	27.47	20.87
103	268.59	5.84	0	0.03	1291.26	19.1	2.84	0.02	24.98	26.53	45.96
106	258.97	4.74	0	0.03	1378.32	19.07	2.48	0.02	24.89	26.38	54.63
109	259.88	12.82	0	0.01	523.6	18.75	2.48	0.02	25.59	27.08	20.28
112	256.22	9.34	0	0.01	836.51	18.38	2.87	0.02	25.79	27.24	27.45
115	244.2	8.42	0	0.01	826.56	18.18	2.64	0.02	25.03	26.39	29.02
118	248.36	8.17	0	0.01	1001.71	17.87	3.01	0.02	25.81	27.17	30.4
121	239.84	4.47	0	0.03	1686.8	17.7	2.83	0.02	25.39	26.69	53.64
124	243.75	10.31	0	0.01	882.19	17.53	3.31	0.02	26.23	27.52	23.64

127	232.8	10.51	0	0.01	678.84	17.12	2.67	0.02	25.48	26.72	22.16
130	228.76	7.5	0	0.01	1041.99	16.93	2.95	0.02	25.29	26.49	30.51
133	228.17	7.38	0	0.01	1023.14	16.66	2.82	0.02	25.57	26.76	30.92
136	229.55	3.05	0	0.04	2561.25	16.51	2.86	0.02	26.15	27.34	75.31
139	221.31	7.95	0	0.01	848.2	16.41	2.54	0.02	25.38	26.52	27.84
142	222.05	10.42	0	0.01	746.99	16.05	2.91	0.02	25.62	26.76	21.3
145	223.2	5.76	0	0.02	1374.86	15.83	2.96	0.02	25.62	26.75	38.77
148	223.17	9.68	0	0.01	833.81	15.65	3.03	0.02	25.51	26.63	23.05
151	226.75	3.25	0	0.04	2144.41	15.32	2.61	0.02	25.6	26.73	69.81
154	228.81	2.48	0	0.05	3626.01	15.41	3.37	0.02	25.59	26.73	92.12
157	225.25	13.04	0	0.01	593	15.09	2.92	0.02	25.33	26.45	17.27
160	223.79	5.98	0	0.02	1251.19	14.75	2.79	0.02	25.71	26.85	37.39
163	213.12	3.65	0	0.02	1668.97	14.71	2.3	0.02	25.38	26.49	58.43
166	209.62	6.87	0	0.01	1007.7	14.49	2.55	0.02	26.06	27.18	30.53
169	194.72	3.51	0	0.02	1763.27	14.34	2.33	0.02	25.56	26.61	55.48
172	184.96	8.44	0	0.01	606.52	14.23	1.9	0.02	25.88	26.9	21.92
175	170.76	6.05	0	0.01	854.93	13.88	1.92	0.02	25.97	26.94	28.25
178	157.15	2.66	0	0.01	1466.72	13.88	1.45	0.02	25.89	26.81	59.14
181	135.66	1.13	0	0.01	2522.7	13.71	1.07	0.02	25.83	26.66	120.5
184	123.73	-0.29	0.01	0	-7542	13.81	0.8	0.02	26.49	27.27	-429.06
187	104.1	-0.57	0.01	0	-2933.62	13.71	0.63	0.02	25.85	26.54	-182.46
190	90.88	2.78	0	0	289.61	13.82	0.3	0.02	26.32	26.95	32.73
193	73.51	4.56	0	0	55	13.56	0.09	0.03	27.01	27.57	16.12
196	60.54	1.55	0	0.03	43.3	13.58	0.03	0.02	25.78	26.24	39.03
199	49.45	1.63	0	0.04	39.18	13.45	0.02	0.02	25.89	26.28	30.25
202	41.09	2.34	0	0.04	0	13.48	0	0.03	26.32	26.68	17.59
205	34.48	-0.49	0.01	-0.2	-17.28	13.33	0	0.02	25.9	26.21	-70.97
208	31.35	-6.86	0	-0.01	0	13.52	0	0.03	26.55	26.81	-4.57
211	28.87	2.45	0	0.04	0	13.64	0	0.03	26.95	27.2	11.8
214	24.69	2.92	0	0.03	0	13.43	0	0.02	25.38	25.6	8.46
217	25.22	-1.49	0	-0.05	0	13.5	0	0.03	26.59	26.81	-16.93
220	23.89	2.54	0	0.03	0	13.47	0	0.02	25.76	25.97	9.4
223	24.26	2.78	0	0.02	24.33	13.37	0.03	0.03	25.8	26	8.72
226	23.41	-1.83	0	-0.03	0	13.33	0	0.03	25.98	26.19	-12.81
229	23.1	0.71	-0.01	0.06	0	13.43	0	0.03	25.98	26.19	32.33
232	20.54	2.42	0	0.02	0	13.29	0	0.03	25.84	26.05	8.49
235	20.83	-2.56	0	-0.01	0	13.33	0	0.03	25.83	26.04	-8.15
238	17.33	0.29	-0.01	0.04	0	13.39	0	0.03	25.7	25.92	59.8
241	17.73	3.79	0	0	0	13.31	0	0.03	25.63	25.86	4.68
244	15.53	0.96	0	0.02	0	13.21	0	0.03	26.3	26.55	16.22
247	15.21	0.01	-0.43	0.85	0	13.25	0	0.03	25.78	26.03	1521.3
250	12.52	0.01	-0.35	0.22	0	13.27	0	0.02	25.14	25.4	1252.44

Carpeting**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	20.00
Peak Heat Release Rate (kW/m ²):	402.33
Time to Peak Heat Release Rate (s):	59.00
Total Heat Release (MJ/m ²):	43.87
60 s Average Heat Release Rate (kW/m ²):	314.87
Total Mass Loss (g):	15.08
Average Mass Loss Rate (g/s):	0.077
Average Effective Heat of Combustion (MJ/kg):	29.09
Average Smoke Extinction Area (m ² /kg):	672.66
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0166

Specimen:

Initial mass (g):	28.1
Thickness (mm):	4
Surface area (cm ²):	100
Test start time (s):	87
Time to ignition (s):	20
Time to flameout (s):	216

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.56	0.01	-0.33	-0.03	5124.43	27.89	0.02	0.03	24.78	25.14	55.62
5	1.18	0.01	-0.33	-0.03	6549.15	28.21	0.03	0.03	25.05	25.41	118.27
8	1.58	3.33	0	0	43.07	28.07	0.06	0.03	25.71	26.08	0.47
11	0.22	0.92	0	0	163.24	28.07	0.06	0.03	25.2	25.56	0.24
14	2.39	2.23	0	0	111.73	27.99	0.1	0.03	25.31	25.67	1.07
17	0.59	1.15	0	0	492.33	27.94	0.21	0.03	26.34	26.72	0.52
20	6.06	10.04	0	0	101.84	27.86	0.41	0.03	24.85	25.22	0.6
23	33.23	11.28	0	0	74.53	27.4	0.34	0.02	24.19	24.77	2.95
26	100.46	0.22	-0.01	0	5343.51	27.26	0.49	0.02	22.91	23.83	463.06
29	186.9	13.62	0	0	79.7	27.22	0.45	0.02	22.89	24.25	13.72
32	304.19	16.58	0	0	82.75	26.51	0.54	0.02	23.74	25.55	18.35
35	330.34	10.87	0	0	191.24	26.29	0.84	0.02	22.92	24.82	30.38
38	342.88	15.08	0	0	193.87	25.79	1.14	0.02	23.56	25.62	22.74
41	333.95	14	0	0	194	25.42	1.07	0.02	23.14	25.28	23.86
44	358.55	14.77	0	0.01	295.91	24.94	1.63	0.02	24.41	26.76	24.28
47	369.36	14.78	0	0.01	262.66	24.54	1.45	0.02	24.41	26.83	25
50	375.72	14.34	0	0.01	375.88	24.06	2.03	0.02	24.16	26.6	26.2
53	387.82	14.17	0	0.01	434.43	23.67	2.27	0.02	24.55	27.08	27.38
56	383.55	16.9	0	0.01	390.63	23.19	2.48	0.02	24.12	26.58	22.7
59	402.33	13.14	0	0.02	608.94	22.7	2.87	0.02	25.29	27.84	30.61
62	380.67	10.51	0	0.03	703.24	22.39	2.82	0.02	23.79	26.21	36.22
65	394.8	15.21	0	0.02	552.27	22.02	3.09	0.02	24.67	27.15	25.96
68	395.58	15.43	0	0.02	666.22	21.51	3.77	0.02	24.87	27.29	25.63
71	381.42	11.88	0	0.03	942.39	21.12	4.2	0.02	24.34	26.68	32.11
74	388.24	16.18	0	0.02	657.82	20.75	3.87	0.02	25.15	27.49	24
77	382.73	10.71	0	0.04	890.92	20.21	3.46	0.02	25.32	27.6	35.74
80	373.4	11.64	0	0.03	991.85	20.07	4.19	0.02	25.31	27.53	32.08
83	354.21	12.05	0	0.03	810.45	19.52	3.65	0.02	24.65	26.74	29.4
86	360.52	7.24	0	0.05	1437.23	19.38	3.72	0.02	25.89	28	49.79
89	332.9	11.72	0	0.03	645.77	19.02	2.82	0.02	24.9	26.86	28.41
92	323.21	7.33	0	0.04	1334.62	18.73	3.61	0.02	25.18	27.09	44.11
95	314.69	11.45	0	0.02	770.23	18.53	3.21	0.02	25.63	27.47	27.48
98	293.69	7.97	0	0.03	1030.71	18.09	3.07	0.02	25.01	26.73	36.84
101	284.34	8.1	0	0.03	1099.22	18.03	3.2	0.02	26.12	27.85	35.11
104	273.04	10.49	0	0.02	832.5	17.59	3.12	0.02	26.39	28	26.04
107	251.04	9.35	0	0.02	839.77	17.43	2.85	0.02	26.03	27.55	26.85
110	235.61	4.95	0	0.03	1272.58	17.05	2.33	0.02	25.73	27.12	47.55
113	218.9	8.18	0	0.01	818.24	17.08	2.54	0.02	25	26.29	26.78
116	207.52	6.97	0	0.02	902.24	16.59	2.37	0.02	25.36	26.59	29.77
119	203.96	0.47	-0.01	0.25	11183.14	16.69	1.93	0.02	25.81	27	437.67
122	196.77	7.22	0	0.02	874.35	16.47	2.35	0.02	25.8	26.93	27.25
125	194.65	8.52	0	0.01	687.21	16.3	2.16	0.02	26.07	27.17	22.84

128	190.03	4.09	0	0.03	1694.09	16	2.62	0.02	25.44	26.48	46.45
131	190.35	7	0	0.02	978.3	16	2.58	0.02	25.5	26.53	27.18
134	193.12	8.39	0	0.02	818.19	15.59	2.56	0.02	25.78	26.81	23.02
137	192.79	5.06	0	0.02	1170.32	15.53	2.24	0.02	25.44	26.45	38.13
140	195.83	9.2	0	0.01	780.2	15.24	2.72	0.02	25.39	26.4	21.28
143	198.51	6.18	0	0.02	1114.73	15.02	2.59	0.02	25.53	26.54	32.14
146	195.31	9.15	0	0.01	724.63	14.83	2.55	0.02	25.03	26.01	21.35
149	194.91	5.41	0	0.02	1239.87	14.52	2.54	0.02	25.39	26.39	36.03
152	187.97	1.29	0	0.09	4743.87	14.51	2.38	0.02	24.73	25.7	145.83
155	185.38	3.37	0	0.03	1684.75	14.39	2.21	0.02	24.79	25.76	54.95
158	186.39	10.3	0	0.01	441.65	14.28	1.72	0.02	25.53	26.51	18.09
161	184.56	6.63	0	0.01	692.96	13.85	1.69	0.02	26.15	27.14	27.86
164	174.06	1.56	0	0.04	3223.58	13.89	1.89	0.02	25.65	26.59	111.6
167	161.43	6.44	0	0.01	795.01	13.69	1.97	0.02	25.09	25.98	25.06
170	155.28	1.3	0	0.02	3004.78	13.56	1.46	0.02	25.73	26.6	119.85
173	142.26	3.53	0	0	924.15	13.57	1.23	0.02	25.61	26.43	40.35
176	132.29	1.84	0	0	1298.73	13.37	0.89	0.02	26.12	26.93	71.8
179	114.51	3.27	0	0	731.26	13.44	0.92	0.02	25.29	26	35
182	101.26	2.47	0	0	654.83	13.19	0.63	0.02	25.17	25.85	40.96
185	94.11	3.58	0	0	343.02	13.28	0.46	0.02	25.9	26.52	26.26
188	84.43	1.4	0	0	864.02	13	0.46	0.02	25.72	26.31	60.3
191	77.46	2.35	0	0	465.01	13.17	0.42	0.02	25.72	26.28	33
194	75.08	4.19	0	0	180.13	12.85	0.29	0.02	25.87	26.39	17.92
197	65.66	-1.76	0	0	-365.26	12.97	0.25	0.02	25.35	25.84	-37.26
200	62.27	1.39	0	0	437.28	12.9	0.23	0.02	25.94	26.41	44.74
203	56.86	2.07	0	0	113.94	12.9	0.09	0.02	26.06	26.5	27.53
206	49.65	-1.38	0	0	-111.69	12.8	0.06	0.02	25.7	26.09	-35.95
209	46.41	0.76	0	0.01	173.15	12.95	0.05	0.02	26.01	26.39	61.06
212	40.54	3.72	0	0	26.74	12.75	0.04	0.03	26.31	26.66	10.9
215	37.82	-1.14	0	-0.05	-34.22	12.78	0.01	0.03	26.43	26.76	-33.1
218	32.39	2.31	0	0.03	34.2	12.77	0.03	0.03	25.92	26.23	14.04
221	31.18	1.99	0	0.05	53	12.66	0.04	0.03	26.72	27.01	15.63
224	26.61	-1.79	0	-0.06	-40.5	12.67	0.03	0.03	25.84	26.13	-14.87
227	24.86	-1.34	0	-0.08	-59.6	12.74	0.03	0.02	25.47	25.73	-18.55
230	24.5	1.9	0	0.05	33.4	12.73	0.02	0.03	26.17	26.43	12.92
233	22.83	2.66	0	0.03	17.51	12.64	0.02	0.03	25.83	26.08	8.58
236	24.79	-1.54	0	-0.05	-29.33	12.6	0.02	0.03	25.94	26.2	-16.07
239	22.1	2.63	0	0.02	49.28	12.68	0.05	0.03	26.55	26.8	8.41
242	22.64	1.59	0	0.04	108.42	12.48	0.07	0.03	25.89	26.14	14.2
245	19.21	-1.43	0	-0.04	-147.37	12.6	0.08	0.03	25.66	25.9	-13.47
248	18.74	2.14	0	0.02	69.9	12.52	0.06	0.03	25.47	25.72	8.76
251	16.23	1.58	0	0.03	122.73	12.5	0.08	0.02	24.84	25.09	10.27
254	15.7	-1.09	0	-0.03	-70.19	12.44	0.03	0.03	25.46	25.73	-14.39
257	16.94	-1.02	0	-0.03	-119.15	12.55	0.05	0.03	25.38	25.65	-16.61
260	18.21	0.61	-0.01	0	145.29	12.49	0.03	0.03	25.84	26.13	29.67
263	17.12	0.01	-0.33	-0.03	19836.94	12.53	0.08	0.03	25.52	25.81	1712.31
266	14.97	0.01	-0.33	-0.03	20229.23	12.54	0.08	0.03	25.52	25.81	1497.1

Ceiling Tile (face-down)**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	11.00
Peak Heat Release Rate (kW/m ²):	45.04
Time to Peak Heat Release Rate (s):	28.00
Total Heat Release (MJ/m ²):	1.98
60 s Average Heat Release Rate (kW/m ²):	31.40
Total Mass Loss (g):	2.40
Average Mass Loss Rate (g/s):	0.040
Average Effective Heat of Combustion (MJ/kg):	8.23
Average Smoke Extinction Area (m ² /kg):	6.26
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0368

Specimen:

Initial mass (g):	76.1
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	76
Time to ignition (s):	11
Time to flameout (s):	72

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.75	0.01	-0.37	-0.03	0	76.18	0	0.03	25.45		75.11
4	1.09	0.01	-0.35	-0.03	0	76.24	0	0.03	25.92	26.39	109.37
7	-1.67	2.24	0	0	0	76.32	0	0.03	25.29	25.76	-0.74
10	-0.2	7.26	0	0.01	68.99	76.11	0.19	0.03	25.27	25.75	-0.03
13	7.54	3.61	0	0.02	0	75.95	0	0.03	25.29	25.8	2.09
16	14.6	7.6	0	0.01	0	75.85	0	0.03	25.28	25.84	1.92
19	30.34	8.84	0	0	0	75.51	0	0.03	25.24	25.85	3.43
22	41.67	-0.17	0.02	-0.17	0	75.39	0	0.03	25.03	25.7	-245.46
25	43.55	0.21	-0.02	0.16	0	75.45	0	0.03	25.27	25.97	207.9
28	45.04	8.6	0	0.01	0	75.32	0	0.03	24.99	25.69	5.24
31	44.75	10.78	0	0.01	0	74.99	0	0.03	24.97	25.67	4.15
34	43.04	-1.25	0	-0.13	0	74.77	0	0.03	25.92	26.65	-34.33
37	38.05	1.72	0	0.13	0	74.96	0	0.03	24.82	25.51	22.09
40	38.04	9.8	0	0.03	0	74.63	0	0.03	25.9	26.63	3.88
43	36.44	-0.95	0	-0.32	0	74.5	0	0.03	25.34	26.03	-38.41
46	33.71	2.92	0	0.1	0	74.59	0	0.03	25.38	26.06	11.56
49	33.85	7.24	0	0.04	0	74.32	0	0.03	25.53	26.19	4.67
52	34.14	0.58	-0.01	0.64	0	74.23	0	0.03	25.6	26.25	58.88
55	30.9	3.5	0	0.12	0	74.22	0	0.03	25.35	25.99	8.82
58	30.16	2.97	0	0.16	0	74.04	0	0.03	25.89	26.52	10.16
61	30.1	1.9	0	0.25	0	74.05	0	0.03	25.42	26.04	15.84
64	27.72	4.04	0	0.12	0	73.91	0	0.03	25.45	26.05	6.86
67	28.26	3.22	0	0.16	0	73.82	0	0.03	25.81	26.4	8.79
70	27.66	3.04	0	0.18	0	73.71	0	0.03	25.27	25.84	9.09
73	25.31	1.85	0	0.31	0	73.64	0	0.03	25.36	25.93	13.67
76	24.77	4.83	0	0.12	0	73.57	0	0.03	25.56	26.13	5.13
79	25.76	4.63	0	0.12	0	73.38	0	0.03	25.49	26.05	5.57
82	26.05	-0.37	0.02	-1.46	0	73.32	0	0.03	25.93	26.49	-70.22
85	24.19	5.82	0	0.1	0	73.33	0	0.03	25.39	25.94	4.16
88	21.84	4.11	0	0.13	0	73.03	0	0.03	24.84	25.37	5.31
91	23.97	-2.35	0	-0.23	0	73.11	0	0.03	26.05	26.6	-10.21
94	21.5	8.42	0	0.06	0	73.06	0	0.03	25.57	26.1	2.55
97	22.53	4.82	0	0.11	0	72.7	0	0.03	25.94	26.48	4.67
100	22.6	0.01	-0.61	52.14	0	72.79	0	0.03	24.78	25.28	2260.34
103	22.51	0.01	-0.5	53.36	0	72.68	0	0.03	26.02	26.55	2250.77

Ceiling Tile (face-down)**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	16.00
Peak Heat Release Rate (kW/m ²):	23.19
Time to Peak Heat Release Rate (s):	37.00
Total Heat Release (MJ/m ²):	0.94
60 s Average Heat Release Rate (kW/m ²):	17.41
Total Mass Loss (g):	1.62
Average Mass Loss Rate (g/s):	0.032
Average Effective Heat of Combustion (MJ/kg):	5.81
Average Smoke Extinction Area (m ² /kg):	0.00
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0513

Specimen:

Initial mass (g):	77.4
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	73
Time to ignition (s):	16
Time to flameout (s):	69

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-1.45	0.01	-0.39	-0.03	0	225.44	0	0.03	25.23	25.68	-145
4	-3.07	0.01	-0.45	-0.03	0	313.27	0	0.03	25.93	26.38	-306.82
7	-0.86	249.38	0	0	0	312.99	0	0.03	25.62	26.07	0
10	0.63	-0.34	0.01	0	-881.09	312.98	0.12	0.03	24.73	25.18	-1.84
13	0.86	3.48	0	0.01	0	312.94	0	0.03	24.31	24.76	0.25
16	3.98	5.49	0	0.02	0	312.78	0	0.03	25.05	25.51	0.73
19	7.91	5.17	0	0.04	0	312.63	0	0.03	25.29	25.78	1.53
22	8.91	3.63	0	0.04	0	312.48	0	0.03	25.37	25.89	2.45
25	14.01	3.39	0	0.05	0	312.4	0	0.03	24.71	25.24	4.13
28	20.61	3.74	0	0.05	0	312.27	0	0.03	25.56	26.12	5.51
31	22.97	2.44	0	0.08	0	312.19	0	0.03	25.42	26	9.4
34	21.83	2.57	0	0.08	0	312.12	0	0.03	25.21	25.79	8.51
37	23.19	1.31	0	0.17	0	312.04	0	0.03	26.56	27.19	17.76
40	21.9	1.08	0	0.22	0	312.03	0	0.03	25.63	26.23	20.28
43	19.57	3.19	0	0.08	0	311.96	0	0.03	25.58	26.17	6.13
46	20.15	4.36	0	0.06	0	311.85	0	0.03	25.59	26.18	4.62
49	18.04	1.98	0	0.13	0	311.73	0	0.03	25.04	25.62	9.11
52	19.34	2.23	0	0.12	0	311.71	0	0.03	25.6	26.19	8.66
55	19.29	4.77	0	0.05	0	311.58	0	0.03	25.18	25.76	4.04
58	19.29	0.72	-0.01	0.38	0	311.47	0	0.03	25.37	25.95	26.7
61	17.5	0.48	-0.01	0.67	0	311.51	0	0.03	25.84	26.41	36.64
64	17.63	6.79	0	0.05	0	311.4	0	0.03	25.53	26.09	2.6
67	17.4	4.33	0	0.09	0	311.16	0	0.03	25.83	26.38	4.02
70	17.88	-2.89	0	-0.15	0	311.17	0	0.03	25.74	26.29	-6.18
73	16.17	4.41	0	0.1	0	311.24	0	0.03	25.46	26.02	3.66
76	17.99	4.31	0	0.09	0	310.95	0	0.03	25.37	25.92	4.17
79	16.11	-0.02	0.2	-18.31	0	311.01	0	0.03	25.26	25.8	-735.85
82	14.07	6.36	0	0.06	0	310.88	0	0.03	25.44	25.98	2.21
85	14.83	0.01	-0.58	39.7	0	310.66	0	0.03	25	25.53	1482.82
88	16.17	0.01	-0.53	39.2	0	310.48	0	0.03	24.96	25.48	1617.48

Ceiling Tile (face-down)**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	6.00
Peak Heat Release Rate (kW/m ²):	38.92
Time to Peak Heat Release Rate (s):	22.00
Total Heat Release (MJ/m ²):	1.74
60 s Average Heat Release Rate (kW/m ²):	25.36
Total Mass Loss (g):	2.54
Average Mass Loss Rate (g/s):	0.039
Average Effective Heat of Combustion (MJ/kg):	6.86
Average Smoke Extinction Area (m ² /kg):	172.07
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0372

Specimen:

Initial mass (g):	84.3
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	91
Time to ignition (s):	6
Time to flameout (s):	72

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.42	0.01	-0.36	-0.03	47326.52	84.34	0.18	0.03	25.76	26.21	41.61
4	0.78	0.01	-0.35	-0.03	41792.68	84.28	0.16	0.03	25.25	25.69	78.36
7	2.22	3.5	0	0	332.89	84.39	0.45	0.03	25.18	25.61	0.64
10	4.29	14.29	0	0	47.93	84.04	0.26	0.03	25.69	26.18	0.3
13	17.27	3.75	0	0	164.17	83.68	0.24	0.03	25.21	25.77	4.6
16	32.21	3.93	0	0.01	195.73	83.75	0.3	0.03	25.48	26.08	8.2
19	37.63	8.34	0	0.01	82.04	83.41	0.26	0.03	25.36	25.98	4.51
22	38.92	-0.53	0.01	-0.21	-1265.39	83.34	0.26	0.03	24.99	25.62	-73.14
25	37.86	-0.65	0.01	-0.2	-732.83	83.39	0.18	0.03	25.5	26.15	-57.85
28	35.63	3.6	0	0.04	158.37	83.34	0.22	0.03	25.13	25.79	9.9
31	35.4	5.72	0	0.03	109.1	83.18	0.24	0.03	25.32	25.97	6.19
34	33.41	4.49	0	0.04	129.48	83.02	0.22	0.03	25.95	26.62	7.45
37	30.62	3.42	0	0.07	216.44	82.92	0.29	0.03	25.03	25.66	8.95
40	30.12	4.42	0	0.07	136.46	82.8	0.23	0.03	25.65	26.28	6.81
43	27.88	1.22	0	0.26	500.05	82.68	0.23	0.03	25.77	26.41	22.79
46	24.81	0.18	-0.03	1.8	3401.91	82.71	0.23	0.03	25.21	25.83	141
49	25.51	7.49	0	0.04	88.58	82.62	0.26	0.03	25.13	25.73	3.41
52	23.1	-1.04	0	-0.31	-675.55	82.37	0.27	0.03	25.38	25.98	-22.15
55	22.95	-0.23	0.02	-1.45	-3004.4	82.61	0.26	0.03	25.33	25.91	-101.98
58	24.95	13.83	0	0.03	38.01	82.29	0.2	0.03	25.5	26.09	1.8
61	22.08	2.89	0	0.13	156.46	81.95	0.18	0.03	25.06	25.63	7.63
64	24.92	-1.03	0.01	-0.42	-599.28	82.08	0.23	0.03	26.36	26.95	-24.17
67	25.19	7.33	0	0.07	78.82	81.93	0.22	0.03	25.61	26.17	3.43
70	23.64	0.69	-0.01	0.76	790.21	81.74	0.21	0.03	25.22	25.78	34.4
73	22.99	-3.27	0	-0.17	-180.64	81.87	0.22	0.03	25.69	26.24	-7.04
76	24.2	5.71	0	0.1	91	81.84	0.2	0.03	25.73	26.28	4.24
79	20.77	3.68	0	0.14	154.05	81.6	0.21	0.03	25.86	26.41	5.65
82	20.19	1.36	0	0.38	394.82	81.63	0.21	0.03	25.48	26.01	14.89
85	21.87	8.25	0	0.06	59.63	81.46	0.19	0.03	25.52	26.06	2.65
88	19.42	6.17	0	0.09	89.06	81.19	0.21	0.03	25.75	26.3	3.15
91	20.67	0.01	-0.57	52.87	64347.18	81.11	0.25	0.03	25.58	26.13	2066.92
94	21.38	0.01	-0.45	52.38	49233.42	81.09	0.19	0.03	25.59	26.13	2138.33

Ceiling Tile (face-up)**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	89.34
Time to Peak Heat Release Rate (s):	20.00
Total Heat Release (MJ/m ²):	3.04
60 s Average Heat Release Rate (kW/m ²):	52.16
Total Mass Loss (g):	2.85
Average Mass Loss Rate (g/s):	0.053
Average Effective Heat of Combustion (MJ/kg):	10.67
Average Smoke Extinction Area (m ² /kg):	2.91
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0014

Specimen:

Initial mass (g):	77.6
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	78
Time to ignition (s):	9
Time to flameout (s):	64

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	1.22	0.01	-0.33	-0.03	0	77.59	0	0.03	24.99	25.38	122.27
5	0.28	0.01	-0.42	-0.03	0	77.72	0	0.03	25.8	26.18	27.89
8	4.78	7.36	0	0	0.02	77.49	0	0.03	25.4	25.79	0.65
11	12.81	9.87	0	0	27.99	77.31	0.11	0.02	24.04	24.53	1.3
14	50.07	14	0	0	0	76.9	0	0.02	24.26	24.99	3.58
17	79.86	7.08	0	0	0	76.54	0	0.03	25.04	25.86	11.28
20	89.34	6.55	0	0	0	76.44	0	0.03	24.95	25.8	13.64
23	85.07	5.6	0	0	0	76.15	0	0.03	24.98	25.84	15.2
26	75.19	7.18	0	0	0	76.08	0	0.03	26	26.88	10.48
29	67.84	6.45	0	0	0	75.73	0	0.03	25.37	26.22	10.51
32	61	2.2	0	0	0	75.72	0	0.03	25.28	26.1	27.68
35	58	9.39	0	0	0	75.53	0	0.03	25.3	26.11	6.17
38	54.08	2.23	0	0	0	75.25	0	0.03	25.33	26.12	24.21
41	52.18	1.85	0	0.01	0	75.35	0	0.02	24.86	25.61	28.23
44	51.13	3.12	0	0.01	0	75.12	0	0.03	25.8	26.57	16.39
47	49.75	4.46	0	0.01	0	75.17	0	0.03	25.71	26.45	11.16
50	48.63	0.75	-0.01	0.06	0	74.88	0	0.03	25.53	26.24	65.11
53	44.6	2.41	0	0.03	0	75.09	0	0.03	25.15	25.82	18.5
56	45.44	6.6	0	0.01	0	74.72	0	0.03	25.63	26.3	6.88
59	42.14	0.1	-0.04	0.89	0	74.76	0	0.02	25.04	25.67	402.26
62	42.29	5.88	0	0.02	0	74.64	0	0.03	25.15	25.77	7.2
65	41.48	4.28	0	0.03	0	74.45	0	0.03	25.55	26.16	9.69
68	39.77	5.17	0	0.02	0	74.37	0	0.03	25.35	25.94	7.69
71	40.75	0.01	-0.43	11.36	0	74.16	0	0.03	25.57	26.16	4075.4
74	38.14	0.01	-0.36	12.89	0	74.19	0	0.03	25.62	26.2	3813.84

Ceiling Tile (face-up)**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	78.93
Time to Peak Heat Release Rate (s):	21.00
Total Heat Release (MJ/m ²):	3.28
60 s Average Heat Release Rate (kW/m ²):	46.90
Total Mass Loss (g):	3.22
Average Mass Loss Rate (g/s):	0.047
Average Effective Heat of Combustion (MJ/kg):	10.21
Average Smoke Extinction Area (m ² /kg):	87.16
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0059

Specimen:

Initial mass (g):	74.7
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	80
Time to ignition (s):	8
Time to flameout (s):	75

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-0.56	0.01	-0.34	-0.03	27201.46	74.7	0.11	0.03	25.35	25.76	-56.1
3	2.19	0.01	-0.26	-0.03	24521.74	74.69	0.1	0.03	25.35	25.76	219.43
6	-0.7	7.28	0	0	38.1	74.72	0.11	0.03	25.51	25.93	-0.1
9	5.86	9.33	0	0	147.03	74.31	0.53	0.03	25.69	26.11	0.63
12	18.96	4.24	0	0	95.08	74.21	0.16	0.03	24.75	25.32	4.47
15	57.1	10.27	0	0	25.1	73.98	0.1	0.03	25.01	25.77	5.56
18	73.58	4.81	0	0	50.25	73.67	0.09	0.03	24.98	25.79	15.31
21	78.93	5.92	0	0	37.38	73.66	0.08	0.03	25.5	26.32	13.32
24	74.23	6.72	0	0	34.98	73.32	0.09	0.03	26.22	27.07	11.05
27	67.25	1.19	0	0	258.46	73.29	0.11	0.03	26.08	26.91	56.31
30	60.6	4.84	0	0	53.5	73.18	0.1	0.03	25.57	26.38	12.53
33	57.27	6.05	0	0	51.1	73.01	0.12	0.03	25.56	26.36	9.46
36	54.3	5.18	0	0	57.77	72.84	0.11	0.03	25.41	26.19	10.48
39	50.79	3.87	0	0	91.66	72.71	0.14	0.03	25.52	26.28	13.11
42	50.81	2.62	0	0.01	147.76	72.6	0.15	0.03	25.87	26.61	19.36
45	45.95	6	0	0.01	69.81	72.52	0.16	0.03	26.03	26.76	7.65
48	44.82	2.66	0	0.03	140.34	72.29	0.15	0.03	24.97	25.65	16.86
51	43.93	2.04	0	0.04	180.74	72.34	0.14	0.03	26.07	26.77	21.51
54	41.71	9.26	0	0.01	42.24	72.12	0.15	0.03	25.01	25.66	4.5
57	40.32	-0.32	0.01	-0.32	-1309.22	71.9	0.16	0.03	25.31	25.95	-125.17
60	41.31	4.09	0	0.03	95.59	72.05	0.15	0.03	25.6	26.23	10.1
63	37.56	3.39	0	0.03	120.53	71.68	0.16	0.02	24.72	25.33	11.09
66	40.25	1.03	0	0.12	434.95	71.86	0.17	0.03	25.31	25.92	39.25
69	37.21	4.34	0	0.03	92.73	71.58	0.15	0.03	25.59	26.19	8.58
72	35.53	0.42	-0.01	0.35	952.11	71.64	0.16	0.03	25.12	25.7	83.61
75	36.62	4.23	0	0.04	92.58	71.51	0.15	0.03	25.58	26.17	8.65
78	36.29	4.06	0	0.04	110.96	71.41	0.17	0.03	26.09	26.67	8.93
81	36.06	5.52	0	0.03	75.64	71.25	0.16	0.03	25.38	25.94	6.53
84	35.73	6.16	0	0.03	80.93	71.08	0.19	0.03	26	26.57	5.8
87	36.18	4.08	0	0.04	111.76	70.9	0.17	0.03	26.41	27	8.86
90	34.33	3.88	0	0.05	130.06	70.83	0.19	0.03	25.89	26.46	8.84
93	34.6	5.95	0	0.03	75.86	70.66	0.18	0.03	25.17	25.73	5.81
96	33.13	0.01	-0.46	20.22	48752.03	70.51	0.19	0.03	25.32	25.87	3313.49
99	34.68	0.01	-0.53	22.07	54791.58	70.52	0.21	0.03	25.57	26.12	3467.77

Ceiling Tile (face-up)**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	91.44
Time to Peak Heat Release Rate (s):	20.00
Total Heat Release (MJ/m ²):	3.73
60 s Average Heat Release Rate (kW/m ²):	50.80
Total Mass Loss (g):	3.66
Average Mass Loss Rate (g/s):	0.049
Average Effective Heat of Combustion (MJ/kg):	10.18
Average Smoke Extinction Area (m ² /kg):	6.90
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0089

Specimen:

Initial mass (g):	77.8
Thickness (mm):	19
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	9
Time to flameout (s):	85

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.03	0.01	-0.38	-0.03	130.37	78.11	0	0.03	24.77	25.18	3.12
5	2.77	0.01	-0.43	-0.04	0	77.81	0	0.03	25.02	25.45	276.59
8	4.98	3.89	0	0	27.3	77.72	0.04	0.03	25.3	25.74	1.28
11	18.74	13.99	0	0	30.96	77.49	0.17	0.03	25.05	25.54	1.34
14	49.95	11.26	0	0	10.66	76.96	0.05	0.02	24.49	25.24	4.44
17	85.98	6.22	0	0	0	76.84	0	0.02	24.66	25.5	13.82
20	91.44	8.83	0	0	0	76.54	0	0.02	24.22	25.07	10.35
23	84.95	0.85	0	0	0	76.37	0	0.03	25.25	26.14	99.76
26	73.48	5.18	0	0	4.28	76.41	0.01	0.03	25.43	26.31	14.19
29	65.55	8.24	0	0	0	76.06	0	0.03	24.89	25.75	7.96
32	57.61	3.28	0	0	0	75.97	0	0.03	25.15	25.98	17.57
35	58.08	4.95	0	0.01	0	75.83	0	0.03	26.3	27.14	11.74
38	50.64	-0.09	0.04	-0.37	0	75.71	0	0.03	25.36	26.15	-536.88
41	48.01	4.34	0	0.01	2.85	75.77	0	0.03	25.36	26.12	11.07
44	47.9	7.01	0	0.01	0	75.47	0	0.03	25.72	26.49	6.83
47	45.98	-1.63	0	-0.05	0	75.42	0	0.03	25.88	26.62	-28.19
50	44.76	6.92	0	0.01	1.94	75.45	0.01	0.03	25.46	26.17	6.47
53	43.37	3.09	0	0.03	0	75.08	0	0.03	25.3	26	14.04
56	41.93	2.53	0	0.04	0	75.25	0	0.03	25.49	26.18	16.6
59	42.28	7.41	0	0.01	0	74.9	0	0.03	25.8	26.49	5.7
62	37.82	-3.63	0	-0.03	0	74.9	0	0.03	25.13	25.76	-10.41
65	36.74	6.29	0	0.02	0	74.98	0	0.02	24.51	25.13	5.84
68	36.64	6.71	0	0.02	0	74.59	0	0.03	25.4	26.02	5.46
71	35.94	2.41	0	0.06	17.14	74.62	0.02	0.03	25.42	26.02	14.89
74	36.03	5.27	0	0.03	15.82	74.4	0.03	0.03	25.85	26.46	6.84
77	33.87	-0.87	0	-0.18	0	74.35	0	0.03	25.82	26.42	-39.01
80	35.5	5.83	0	0.03	0	74.37	0	0.03	25.19	25.76	6.09
83	34.15	4.09	0	0.04	2.5	74.06	0	0.03	25.36	25.94	8.35
86	35.1	2.69	0	0.08	0	74.12	0	0.03	25.92	26.5	13.04
89	34.36	8	0	0.02	0	73.86	0	0.03	25.38	25.95	4.3
92	31.96	-3.31	0	-0.06	0	73.75	0	0.03	25.57	26.14	-9.66
95	32.88	3.5	0	0.06	0	73.94	0	0.03	25.77	26.33	9.4
98	31.02	5.91	0	0.04	0	73.56	0	0.03	25.48	26.04	5.25
101	31.01	-2.14	0	-0.1	-14.75	73.65	0.01	0.03	25.47	26.03	-14.49
104	31.99	5.39	0	0.04	5.09	73.59	0.01	0.03	25.19	25.75	5.93
107	29.74	0.01	-0.43	23.52	0	73.38	0	0.03	25.13	25.69	2973.94
110	30.47	0.01	-0.45	23.39	2922.03	73.35	0.01	0.03	25.34	25.89	3047.36

Computer Monitor Case**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	18.00
Peak Heat Release Rate (kW/m ²):	512.61
Time to Peak Heat Release Rate (s):	109.00
Total Heat Release (MJ/m ²):	42.12
60 s Average Heat Release Rate (kW/m ²):	372.50
Total Mass Loss (g):	32.61
Average Mass Loss Rate (g/s):	0.329
Average Effective Heat of Combustion (MJ/kg):	12.91
Average Smoke Extinction Area (m ² /kg):	2297.85
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1161

Specimen:

Initial mass (g):	37.5
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	76
Time to ignition (s):	18
Time to flameout (s):	115

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.21	0.01	-0.31	-0.03	68706.9	37.55	0.27	0.03	25.21	25.58	21
4	0.46	0.01	-0.31	-0.03	62277.68	37.56	0.25	0.03	24.88	25.24	46.27
7	-1.14	-1.18	0	0	-506.29	37.55	0.23	0.03	25.19	25.55	0.96
10	0.11	3.28	0	0	252.41	37.6	0.32	0.03	25.5	25.86	0.03
13	2.54	-0.87	0	0	-1345.07	37.4	0.45	0.03	25.35	25.71	-2.92
16	2.52	7.7	0	0.06	341.38	37.56	1.03	0.03	25.29	25.64	0.33
19	26.82	19.1	0	0.12	1598.1	36.92	12.18	0.03	24.58	25.06	1.4
22	93.92	24.59	0	0.12	1941.07	36.45	19.51	0.02	23.87	24.47	3.82
25	153.89	29.83	0	0.12	2246.69	35.45	27.26	0.02	23.73	24.58	5.16
28	250.89	29.05	0	0.13	2532.04	34.7	29.54	0.02	23.84	24.91	8.64
31	330.12	39.93	0	0.11	1645.33	33.64	25.93	0.02	24.05	25.33	8.27
34	369.24	37.36	0	0.11	1998.96	32.4	29.02	0.02	24.25	25.74	9.88
37	408.84	30.47	0	0.15	2873.43	31.43	33.43	0.02	24.58	26.19	13.42
40	427.87	37.89	0	0.12	2002.73	30.48	29.39	0.02	24.07	25.82	11.29
43	457.14	34.56	0	0.14	2523.74	29.22	32.54	0.02	24.89	26.8	13.23
46	469.47	32	0	0.15	2640.59	28.4	32.02	0.02	24.45	26.39	14.67
49	483.63	43	0	0.11	1724.61	27.21	27.82	0.02	24.62	26.65	11.25
52	483.11	37.36	0	0.13	2265.35	25.93	31.73	0.02	24.6	26.67	12.93
55	465.06	31.62	0	0.15	2675.53	24.97	32.75	0.02	23.82	25.83	14.71
58	474.02	46.72	0	0.1	1949.68	23.9	34.16	0.02	24.58	26.66	10.15
61	457.48	35.27	0	0.13	2465.64	22.34	33.53	0.02	23.96	25.94	12.97
64	490.89	32.74	0	0.15	2684.02	21.73	31.72	0.02	25.58	27.71	14.99
67	476.52	42.76	0	0.12	2340.61	20.29	37.77	0.02	24.46	26.5	11.14
70	497.41	35.21	0	0.14	2763.15	19.27	35.85	0.02	25.04	27.14	14.13
73	497.16	47.47	0	0.1	1905.1	18.05	34.03	0.02	24.54	26.58	10.47
76	506.39	46.17	0	0.11	1924.65	16.51	32.97	0.02	24.9	26.95	10.97
79	501.28	35.88	0	0.15	2911.69	15.35	39.08	0.02	24.68	26.73	13.97
82	501.4	43	0	0.12	2280.96	14.24	36.59	0.02	24.77	26.81	11.66
85	491.42	48.89	0	0.1	1917.25	12.78	35.21	0.02	24.62	26.62	10.05
88	479.95	34.96	0	0.14	2864.45	11.45	37.74	0.02	24.57	26.53	13.73
91	472.24	33.44	0	0.14	2733.11	10.6	34.12	0.02	24.84	26.79	14.12
94	471.33	33.86	0	0.15	2698.98	9.42	33.73	0.02	25.17	27.1	13.92
97	474.25	28.79	0	0.15	3064.73	8.6	32.31	0.02	25.39	27.31	16.47
100	466.94	32.29	0	0.12	2374.65	7.64	28.55	0.02	25.01	26.85	14.46
103	482.38	27.2	0	0.1	2303.77	6.73	23.15	0.02	25.19	27.07	17.74
106	496.14	19.77	0	0.11	2508.25	6.03	18.48	0.02	24.93	26.83	25.09
109	512.61	11.99	0	0.13	3143.26	5.54	13.83	0.02	25.32	27.24	42.76
112	476.9	10.41	0	0.08	1600.07	5.27	6.1	0.02	25.48	27.3	45.8
115	389.64	4.11	0	0.15	1020.94	4.95	1.47	0.02	26.78	28.52	94.88
118	257.58	0.09	-0.06	5.2	33769.76	5.01	1.11	0.02	26.42	27.85	2816.49
121	174.61	-1.78	0	-0.21	-1537.1	4.92	0.99	0.02	26.56	27.75	-98.02
124	122.93	2.68	0	0.14	1066.82	5.06	1.01	0.02	27.24	28.32	45.88

127	92.31	7.87	0	0.05	358.04	4.76	1.03	0.02	26.57	27.45	11.73
130	79.75	-2.97	0	-0.13	-993.47	4.7	1.08	0.02	26.46	27.22	-26.87
133	74.19	1.1	0	0.35	2446.66	4.84	0.98	0.02	26.63	27.3	67.6
136	69.52	5.7	0	0.07	439.91	4.62	0.92	0.02	26.56	27.14	12.2
139	62.73	3.24	0	0.11	803.77	4.54	0.97	0.02	26.21	26.7	19.38
142	62.7	1.58	0	0.23	1657.01	4.43	0.97	0.03	26.7	27.16	39.58
145	60.65	1.95	0	0.18	1404.52	4.44	1.01	0.03	26.73	27.13	31.13
148	57.85	-1.79	0	-0.17	-1101.99	4.33	0.74	0.02	26.15	26.5	-32.39
151	56.54	1.17	0	0.25	1528.1	4.5	0.66	0.03	26.67	26.99	48.31
154	52.96	5.24	0	0.05	357.54	4.26	0.71	0.02	26.12	26.41	10.11
157	52.52	-0.07	0.04	-3.85	-25192.53	4.25	0.66	0.03	26.63	26.91	-749.02
160	48.37	2.32	0	0.1	635.3	4.22	0.57	0.02	25.7	25.96	20.81
163	44.31	0.01	-0.37	24.23	0	4.15	0.49	0.02	25.81	26.06	4430.95
166	43.88	0.01	-0.3	23.19	0	4.31	0.44	0.02	25.52	25.79	4387.95

Computer Monitor Case**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	15.00
Peak Heat Release Rate (kW/m ²):	479.51
Time to Peak Heat Release Rate (s):	85.00
Total Heat Release (MJ/m ²):	42.67
60 s Average Heat Release Rate (kW/m ²):	342.11
Total Mass Loss (g):	31.88
Average Mass Loss Rate (g/s):	0.287
Average Effective Heat of Combustion (MJ/kg):	13.39
Average Smoke Extinction Area (m ² /kg):	2338.73
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1222

Specimen:

Initial mass (g):	36.7
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	15
Time to flameout (s):	124

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-0.42	0.01	-0.3	-0.04	8216.91	36.69	0.03	0.03	25.65	26.02	-41.78
4	1.91	0.01	-0.32	-0.04	4218.18	36.76	0.02	0.03	25.92	26.29	191.42
7	0.33	2.98	0	0	14.87	36.66	0.02	0.03	25.24	25.6	0.11
10	-0.08	-2.15	0	0	-94.9	36.63	0.08	0.03	25.4	25.77	0.04
13	0.1	0.09	-0.04	0	7067.16	36.73	0.23	0.03	25.72	26.08	1.11
16	8.73	11.21	0	0.07	138.59	36.55	0.6	0.03	25.44	25.8	0.78
19	36.34	23.8	0	0.1	1680.89	36.04	16.17	0.02	24.27	24.74	1.53
22	108.24	27.43	0	0.13	2693.51	35.19	29.32	0.02	24.49	25.19	3.95
25	208.03	27.34	0	0.14	2260.29	34.43	24.98	0.02	23.84	24.74	7.61
28	295.72	31.43	0	0.13	2015	33.53	25.06	0.02	24.17	25.27	9.41
31	350.84	34	0	0.12	1965.33	32.56	25.87	0.02	24.56	25.83	10.32
34	382.71	35.87	0	0.11	2070.58	31.5	28.67	0.02	24.52	25.91	10.67
37	386.94	28.02	0	0.16	2637.35	30.47	29.42	0.02	23.66	25.12	13.81
40	408.74	33.42	0	0.13	2276.08	29.73	29.92	0.02	23.87	25.42	12.23
43	429.02	39.5	0	0.11	1975.77	28.46	30.09	0.02	24.28	25.94	10.86
46	437.51	33.39	0	0.13	2508.83	27.44	31.95	0.02	24.5	26.22	13.1
49	440.14	37.83	0	0.12	2307.45	26.39	33.6	0.02	24.24	25.98	11.64
52	453.96	34.78	0	0.14	2660.92	25.22	34.83	0.02	24.73	26.56	13.05
55	445.33	32.74	0	0.14	2450.79	24.29	31.24	0.02	23.89	25.68	13.6
58	461.03	41.85	0	0.12	2027.12	23.17	32.17	0.02	24.52	26.37	11.02
61	476.03	44.1	0	0.11	1931.81	21.83	31.18	0.02	25.39	27.32	10.79
64	463.02	36.21	0	0.13	2424.13	20.61	32.77	0.02	24.91	26.79	12.79
67	462.57	35.27	0	0.13	2577.77	19.61	33.84	0.02	24.99	26.87	13.11
70	464.89	41.34	0	0.11	2248.94	18.44	34.8	0.02	24.85	26.72	11.24
73	464.42	38.93	0	0.12	2230.18	17.19	32.81	0.02	24.62	26.46	11.93
76	473.51	34.06	0	0.15	2570.86	16.12	32.78	0.02	24.84	26.71	13.9
79	476.09	37.81	0	0.13	2394.9	15.08	33.87	0.02	24.87	26.73	12.59
82	472.52	41.66	0	0.12	2415.77	13.85	37.81	0.02	24.78	26.62	11.34
85	479.51	39.07	0	0.13	2456.87	12.63	35.13	0.02	25.45	27.32	12.27
88	461.27	37.62	0	0.13	2420.41	11.51	34.19	0.02	24.84	26.64	12.26
91	466.43	28.55	0	0.16	2955.29	10.42	31.06	0.02	25.36	27.17	16.34
94	456.15	27.55	0	0.16	2968.13	9.73	30.86	0.02	24.75	26.49	16.56
97	468.58	34.03	0	0.12	2242.34	8.72	28.14	0.02	25.35	27.11	13.77
100	455.2	27.16	0	0.14	2648.54	7.79	26.98	0.02	24.95	26.67	16.76
103	437.6	20.93	0	0.14	2802.36	7.09	22.1	0.02	24.86	26.54	20.91
106	419.8	16.41	0	0.13	2784.25	6.52	17.32	0.02	24.74	26.39	25.58
109	418.68	15.74	0	0.11	2380.44	6.08	13.58	0.02	25.92	27.59	26.59
112	384.29	12.67	0	0.1	2187.82	5.59	10.24	0.02	25.47	27.08	30.33
115	358.7	9.41	0	0.12	2671.7	5.32	9.17	0.02	25.85	27.43	38.12
118	326.35	10.64	0	0.08	1639.88	5	6.32	0.02	26.08	27.61	30.67
121	282.92	1.84	0	0.36	4142.31	4.75	2.77	0.02	26.16	27.58	153.63
124	202.12	-2.72	0	-0.19	-912.7	4.85	0.91	0.02	26.08	27.34	-74.24

127	155.46	4.48	0	0.09	428.92	4.83	0.68	0.02	26.96	28.11	34.74
130	116.49	3.41	0	0.1	536.24	4.64	0.64	0.03	27.71	28.76	34.15
133	85.29	-0.34	0.01	-0.91	-4677.95	4.65	0.58	0.02	27.02	27.94	-248.1
136	69.45	0.28	-0.02	1.11	6141.41	4.62	0.63	0.02	26.46	27.26	247.29
139	62.62	3.68	0	0.08	424.41	4.61	0.58	0.02	26.43	27.14	17
142	56.94	3.46	0	0.09	456.42	4.43	0.59	0.02	26.25	26.88	16.46
145	58.91	3.97	0	0.08	392.7	4.4	0.57	0.03	26.88	27.48	14.84
148	55.51	-2.62	0	-0.11	-622.73	4.24	0.6	0.03	26.51	27.04	-21.16
151	51.93	-1.48	0	-0.2	-951.12	4.5	0.53	0.02	26.05	26.53	-35.07
154	48.62	9.01	0	0.03	164.48	4.26	0.56	0.02	26.09	26.55	5.39
157	47.3	1.45	0	0.19	906.35	4.09	0.49	0.03	26.4	26.82	32.66
160	45.07	-3.13	0	-0.09	-425.11	4.16	0.5	0.03	26.2	26.58	-14.39
163	47.09	-1.57	0	-0.17	-801.33	4.22	0.47	0.03	26.29	26.64	-29.94
166	44.15	8.22	0	0.03	137.97	4.2	0.43	0.03	26.02	26.36	5.37
169	41.12	2.17	0	0.12	545.57	3.84	0.46	0.02	25.7	26.03	18.92
172	38.4	0.01	-0.41	24.72	93840.84	4.09	0.36	0.03	26.1	26.43	3840.07
175	40.55	0.01	-0.48	21.69	90314.7	4.08	0.34	0.03	26.2	26.52	4055.13

Computer Monitor Case**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	15.00
Peak Heat Release Rate (kW/m ²):	482.91
Time to Peak Heat Release Rate (s):	78.00
Total Heat Release (MJ/m ²):	43.91
60 s Average Heat Release Rate (kW/m ²):	361.16
Total Mass Loss (g):	32.27
Average Mass Loss Rate (g/s):	0.283
Average Effective Heat of Combustion (MJ/kg):	13.61
Average Smoke Extinction Area (m ² /kg):	2351.71
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.1240

Specimen:

Initial mass (g):	37.1
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	83
Time to ignition (s):	15
Time to flameout (s):	131

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	1.89	0.01	-0.31	-0.03	0	37.15	0.41	0.03	25.28	25.65	189.37
3	1.45	0.01	-0.32	-0.03	0	37.05	0.4	0.03	25.54	25.92	144.79
6	1.63	-0.69	0.01	0	-1521.47	37.13	0.4	0.03	25.92	26.32	-2.34
9	1.29	0.66	0	0	2046.59	37.07	0.51	0.03	26.07	26.46	1.96
12	1.27	-2.8	0	0	-612.62	37.11	0.66	0.03	25.59	25.97	-0.45
15	7.18	8.92	0	0.02	531.46	37.12	1.83	0.03	25.54	25.94	0.81
18	40.55	24.57	0	0.11	1492.86	36.54	14.51	0.03	24.83	25.27	1.65
21	105.01	29.44	0	0.12	2020.02	35.73	23.42	0.03	24.77	25.4	3.57
24	177.46	28.39	0	0.13	2200.79	34.82	26.32	0.02	22.98	23.73	6.25
27	294.87	34.42	0	0.12	2155.16	33.99	29.8	0.02	23.92	24.89	8.57
30	346.15	30.21	0	0.14	2187.07	32.82	26.51	0.02	23.78	24.92	11.46
33	386.42	32.34	0	0.13	2506.44	32.14	32.17	0.02	23.95	25.2	11.95
36	407.98	35.21	0	0.12	2154.2	30.88	29.59	0.02	24.26	25.63	11.59
39	431.74	31.9	0	0.14	2206.73	30.07	26.25	0.02	25.27	26.81	13.54
42	416.93	34.57	0	0.12	2391.09	28.93	32.46	0.02	23.94	25.46	12.06
45	427.77	30.87	0	0.14	2598.14	28.03	31.16	0.02	24.16	25.74	13.86
48	432.57	37.77	0	0.11	2184.69	27.01	31.86	0.02	24.27	25.89	11.45
51	437.58	38.09	0	0.12	2169.33	25.81	31.7	0.02	24.39	26.06	11.49
54	446.3	35.58	0	0.13	2311.73	24.74	31.48	0.02	24.42	26.13	12.54
57	456.5	35.31	0	0.13	2560.33	23.66	33.99	0.02	24.83	26.6	12.93
60	448.8	36.66	0	0.13	2315.77	22.61	32.73	0.02	24.2	25.94	12.24
63	448.86	39.95	0	0.12	2238.8	21.44	34.85	0.02	23.93	25.67	11.24
66	461.69	39.11	0	0.12	2171.46	20.25	32.6	0.02	24.27	26.05	11.8
69	473.33	33.32	0	0.15	2742.42	19.13	34.19	0.02	24.89	26.72	14.21
72	466.33	33.18	0	0.14	2676.65	18.21	33.72	0.02	24.55	26.34	14.05
75	470.4	36.07	0	0.14	2237.28	17.12	30.07	0.02	25.02	26.84	13.04
78	482.91	37.18	0	0.13	2215.76	16.05	29.67	0.02	25.89	27.76	12.99
81	463.48	40.21	0	0.12	2195.68	14.88	32.66	0.02	25.22	27.03	11.53
84	451.6	37.5	0	0.13	2396.25	13.68	33.77	0.02	24.86	26.61	12.04
87	458.84	32.29	0	0.15	2646.08	12.65	31.34	0.02	25.47	27.27	14.21
90	442.18	31.4	0	0.14	2576	11.71	30.43	0.02	24.83	26.58	14.08
93	431.84	33.33	0	0.13	2539.79	10.74	32.11	0.02	24.65	26.36	12.96
96	430.7	29.83	0	0.14	2504.16	9.75	27.87	0.02	25.08	26.8	14.44
99	426.79	27.59	0	0.14	2514.7	8.95	26.06	0.02	24.94	26.62	15.47
102	430.5	27.1	0	0.12	2403.75	8.09	24.35	0.02	25.05	26.76	15.88
105	438.47	20.32	0	0.14	2753.31	7.36	20.77	0.02	25.23	26.94	21.58
108	443.01	21.45	0	0.13	2478.56	6.82	19.29	0.02	25.82	27.55	20.66
111	413.94	17.17	0	0.11	2771.57	6.11	17.88	0.02	24.95	26.61	24.11
114	391.05	7.91	0	0.19	3915.41	5.82	11.3	0.02	25.75	27.39	49.47
117	354.36	8.29	0	0.14	2829.07	5.57	8.43	0.02	26.23	27.85	42.72
120	314.47	8.84	0	0.1	2257.91	5.32	7.16	0.02	26.35	27.88	35.56
123	269.87	5.71	0	0.12	1985.17	5.07	4.11	0.02	26.13	27.57	47.26

126	223.15	3.27	0	0.18	2672.07	4.97	3.12	0.02	26.69	28.06	68.16
129	186.04	2.74	0	0.17	2214.81	4.85	2.18	0.02	26.56	27.8	67.94
132	146.5	2.33	0	0.18	1600.57	4.8	1.35	0.02	26.46	27.58	62.76
135	113.06	1.28	0	0.31	2946.8	4.72	1.36	0.02	26.56	27.6	88.58
138	93.58	4.63	0	0.08	772.06	4.7	1.27	0.02	27.11	28.07	20.19
141	74.9	1.33	0	0.27	2856.71	4.49	1.39	0.02	26.56	27.39	56.24
144	66.91	-3.51	0	-0.1	-1054.69	4.63	1.37	0.02	26.3	27.05	-19.09
147	62.77	1.42	0	0.25	2616.68	4.63	1.34	0.03	26.98	27.68	44.22
150	59.1	2.98	0	0.12	1254.09	4.56	1.39	0.02	26.27	26.89	19.82
153	57	0.45	-0.01	0.71	7776	4.47	1.31	0.02	26.38	26.95	125.39
156	57.07	4.7	0	0.07	797.26	4.49	1.41	0.02	26.14	26.66	12.13
159	53.95	7.39	0	0.05	498.24	4.21	1.39	0.02	25.97	26.46	7.3
162	54.83	1.26	0	0.27	2871.26	4.11	1.35	0.02	26.18	26.65	43.67
165	51.96	0.44	-0.01	0.74	7812.84	4.1	1.29	0.02	26.13	26.57	118.12
168	51.56	-2.72	0	-0.12	-1285.69	4.1	1.3	0.03	26.46	26.88	-18.99
171	48.31	-1.07	0	-0.28	-3072.09	4.23	1.22	0.03	26.54	26.94	-45.06
174	50.15	0.97	0	0.27	3381.58	4.15	1.22	0.03	26.49	26.87	51.55
177	44.87	4.1	0	0.06	790.85	4.16	1.23	0.03	25.97	26.32	10.96
180	45.06	2.46	0	0.1	1164.16	3.94	1.09	0.02	25.83	26.18	18.31
183	43.36	2.47	0	0.09	1142.86	4.01	1.04	0.03	26.72	27.08	17.56
186	39.71	0.01	-0.4	20.25	0	3.8	1.02	0.02	25.59	25.93	3970.61
189	37.91	0.01	-0.32	18.93	0	3.91	1.01	0.02	25.7	26.04	3790.8

Letter Tray**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	25.00
Peak Heat Release Rate (kW/m ²):	1272.24
Time to Peak Heat Release Rate (s):	75.00
Total Heat Release (MJ/m ²):	56.81
60 s Average Heat Release Rate (kW/m ²):	803.49
Total Mass Loss (g):	17.97
Average Mass Loss Rate (g/s):	0.240
Average Effective Heat of Combustion (MJ/kg):	31.61
Average Smoke Extinction Area (m ² /kg):	1497.15
Average CO ₂ yield (g/g):	0.95
Average CO yield (g/g):	0.0800

Specimen:

Initial mass (g):	20.5
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	77
Time to ignition (s):	25
Time to flameout (s):	100

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	2.91	0.01	-0.44	-0.04	2389.66	20.56	0.01	0.03	25.32	25.62	291.39
3	1.74	0.01	-0.38	-0.03	3348.38	20.37	0.01	0.03	26.14	26.47	173.99
6	0.08	-3.73	0	0	-37.33	20.5	0.05	0.03	26.3	26.61	-0.02
9	0.25	-0.04	0.12	0.01	-1824.21	20.53	0.03	0.03	26.58	26.89	-5.95
12	2.4	0.94	0	0	56.39	20.52	0.02	0.03	25.45	25.74	2.54
15	1.19	-1.45	0	0	-108.07	20.5	0.06	0.03	25.48	25.79	-0.82
18	1.35	0.36	-0.01	0	474.46	20.58	0.07	0.03	25.78	26.09	3.76
21	22.8	2.13	0	0	118.76	20.48	0.1	0.03	26.19	26.5	10.7
24	68.5	0.28	-0.01	0	2377.73	20.47	0.25	0.03	25.79	26.11	245.38
27	164.91	3.45	0	0.01	1349.34	20.42	1.81	0.03	25.27	25.7	47.82
30	235.29	10.53	0	0.03	1335.51	20.23	5.37	0.03	25.33	26.16	22.35
33	309.62	15.52	0	0.04	1085.45	19.81	6.58	0.02	24.44	25.62	19.95
36	402.8	14.71	0	0.05	1403.21	19.35	7.82	0.02	24.68	26.39	27.38
39	488.11	13.17	0	0.08	1878.42	18.94	9.22	0.02	24.66	26.82	37.07
42	556	10.35	0	0.13	2368.55	18.55	9.3	0.02	23.88	26.38	53.7
45	714.27	26.14	0	0.06	1259.95	18.19	12.25	0.02	23.92	26.89	27.33
48	776.86	28.96	0.23	0.07	1179.97	17.07	12.82	0.02	23.29	26.66	26.83
51	814.07	22.12	0.68	0.1	1724.94	16.52	14.36	0.02	22.58	26.58	36.8
54	910.49	29.36	0.61	0.08	1440.98	15.65	15.27	0.02	23.12	27.71	31.01
57	981.17	32.37	0.79	0.08	1281.83	14.78	15.19	0.02	22.51	27.32	30.31
60	1116.41	31.78	1.06	0.09	1413.75	13.74	15.47	0.02	23.62	29.04	35.13
63	1075.79	37.71	0.99	0.08	1209.37	12.84	17.06	0.02	21.42	26.73	28.53
66	1134.2	35.14	1.24	0.09	1398.83	11.53	17.75	0.02	21.85	27.7	32.27
69	1183.06	30.3	1.58	0.11	1774.57	10.74	18.78	0.02	22.35	28.64	39.04
72	1248.57	43.76	1.2	0.08	1321.61	9.59	19.55	0.02	22.94	29.58	28.53
75	1272.24	41.81	1.35	0.09	1334.88	8.22	18.72	0.02	23.02	29.8	30.43
78	1251.12	30.59	1.94	0.12	1757.66	7.15	17.98	0.02	22.97	29.92	40.89
81	1158.45	44.42	1.24	0.08	1250.57	6.22	18.73	0.02	22.74	29.65	26.08
84	1011.41	41.26	1.23	0.08	1369.77	4.61	18.49	0.02	23.55	30.57	24.51
87	789.53	20.82	1.54	0.11	2284.62	3.88	15.8	0.02	23.45	30.1	37.92
90	529.5	15.52	0.74	0.11	2456.08	3.25	11.94	0.02	25.4	31.92	34.12
93	361.84	13.94	0	0.06	1988.1	2.91	8.59	0.02	26.6	32.27	25.96
96	237.48	7.19	0	0.04	1593.13	2.46	3.58	0.02	27.67	32.05	33.01
99	145.08	-3.1	0	-0.05	-1225.63	2.5	1.23	0.02	27.85	30.89	-46.86
102	94.67	-3.58	0	-0.01	-41.63	2.57	0.05	0.02	28.97	30.85	-26.46
105	72.13	-0.22	0.02	-0.02	0	2.68	0	0.02	28.66	29.55	-331.17
108	55.4	2.52	0	0	0	2.58	0	0.02	28.22	28.53	22.01
111	46.52	3.51	0	0	0	2.54	0	0.02	28.43	28.26	13.24
114	39.79	1.02	0	0	0	2.4	0	0.02	27.98	27.35	39.04
117	36.79	-2.04	0	0	0	2.49	0	0.02	27.52	26.68	-18.06
120	34.38	-1.94	0	0	-80.24	2.5	0.06	0.02	27.83	26.79	-17.68
123	31.78	-0.79	0	0	0	2.59	0	0.02	27.4	26.25	-40.27

126	26.97	2.47	0	0	0	2.53	0	0.02	27.6	26.37	10.92
129	24.42	2.72	0	0	0	2.47	0	0.02	27.75	26.48	8.99
132	22.54	-0.52	0.01	0	0	2.39	0	0.03	28.26	26.95	-43.15
135	21.7	0.74	-0.01	0	0	2.47	0	0.02	27.28	26.04	29.36
138	20.44	-2.35	0	0	0	2.38	0	0.02	26.91	25.73	-8.69
141	19.32	-3.61	0	0	0	2.6	0	0.02	27.11	25.97	-5.35
144	15	0.34	-0.01	0	0	2.55	0	0.02	26.77	25.71	44.57
147	14.32	1.41	0	0	0	2.59	0	0.02	27.02	26	10.16
150	14.05	0.01	-0.45	-0.03	0	2.47	0	0.02	26.94	25.99	1405.42
153	14.39	0.01	-0.36	-0.03	0	2.46	0	0.03	27.02	26.13	1438.69

Letter Tray**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	20.00
Peak Heat Release Rate (kW/m ²):	1195.00
Time to Peak Heat Release Rate (s):	73.00
Total Heat Release (MJ/m ²):	57.11
60 s Average Heat Release Rate (kW/m ²):	724.04
Total Mass Loss (g):	18.07
Average Mass Loss Rate (g/s):	0.213
Average Effective Heat of Combustion (MJ/kg):	31.60
Average Smoke Extinction Area (m ² /kg):	1449.38
Average CO ₂ yield (g/g):	0.89
Average CO yield (g/g):	0.0826

Specimen:

Initial mass (g):	21.2
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	20
Time to flameout (s):	105

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
3	2.42	0.01	-0.38	-0.04	866.62	21.52	0	0.03	25.97	26.34	242.17
8	2.29	0.01	-0.33	-0.03	0	21.23	0	0.03	25.33	25.67	229.15
13	0.54	0.05	-0.07	-0.01	1184.16	21.1	0.02	0.03	26.43	26.77	10.62
18	27.25	-2.81	0	0	-24.28	21.19	0.03	0.03	26.55	26.89	-9.71
23	120.82	2.36	0	0	608.58	21.27	0.56	0.03	25.43	25.8	51.19
28	280.89	12.03	0	0.03	1174.94	20.9	5.59	0.02	24.48	25.27	23.36
33	376.1	14.68	0	0.05	1386.47	20.15	7.85	0.02	24.43	25.92	25.62
38	514.64	14.71	0	0.07	2068.01	19.46	11.5	0.02	24.33	26.46	34.98
43	651.84	20.06	0	0.09	1433	18.61	10.96	0.02	23.56	26.22	32.49
48	841.1	27.02	0.37	0.08	1240.86	17.43	12.5	0.02	23.35	26.81	31.13
53	979.76	31.86	0.72	0.08	1338.05	15.94	15.57	0.02	23.14	27.39	30.75
58	1048.59	31.09	1.03	0.09	1239.85	14.32	14.19	0.02	22.31	27.15	33.73
63	1169.2	35.47	1.24	0.09	1372.05	12.78	17.06	0.02	23.04	28.53	32.96
68	1167.14	38.47	1.28	0.09	1295.93	10.78	18.24	0.02	21.64	27.33	30.34
73	1195	39.97	1.39	0.09	1156.41	8.96	16.18	0.02	22.37	28.56	29.89
78	1040.17	36.36	1.3	0.09	1393.74	6.86	17.55	0.02	22.5	28.88	28.6
83	888.03	27.05	1.06	0.09	1719.01	5.41	15.26	0.02	24.15	30.47	32.83
88	559.88	18.94	0.4	0.09	2235.98	4.15	13.83	0.02	25.09	30.62	29.57
93	333.01	11.17	0	0.04	2257.71	3.51	8.06	0.02	26.98	31.28	29.8
98	144.92	3.5	0	0.04	1144.85	3.03	1.3	0.02	28.07	30.78	41.41
103	84.61	-2.57	0	-0.01	-199.68	3.12	0.18	0.02	27.84	29.08	-32.91
108	72.04	1.1	0	0	519.72	3.16	0.2	0.02	28.39	28.69	65.68
113	59.27	1.85	0	0	279.8	3.03	0.19	0.02	28.03	27.74	32.08
118	48.37	0.12	-0.03	0	1447.25	3.01	0.06	0.02	27.52	26.9	419.83
123	43.13	1.3	0	0	168.6	2.99	0.08	0.02	27.08	26.28	33.13
128	39.48	-0.04	0.11	0.01	-3820.41	2.9	0.06	0.02	27.01	26.13	0
133	32.55	-1.05	0	0	-39.67	2.99	0.02	0.02	27.03	26.15	-31.07
138	28.97	2.62	0	0	51.23	2.96	0.05	0.02	27.11	26.23	11.04
143	27.71	2.36	0	0	0	2.78	0	0.02	26.99	26.19	11.73
148	23.89	-3.29	0	0	-18.48	2.78	0.02	0.03	26.97	26.23	-7.25
153	17.78	-1.17	0	0	0	3.02	0	0.03	26.97	26.3	-15.14
158	15.97	2.63	0	0	0	2.88	0	0.03	26.97	26.37	6.07
163	16.91	0.01	-0.3	-0.04	0	2.83	0	0.03	26.71	26.19	1690.63
168	12.93	0.01	-0.27	-0.03	0	2.88	0	0.03	26.94	26.48	1292.92

Letter Tray**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	18.00
Peak Heat Release Rate (kW/m ²):	1028.36
Time to Peak Heat Release Rate (s):	89.00
Total Heat Release (MJ/m ²):	55.58
60 s Average Heat Release Rate (kW/m ²):	550.30
Total Mass Loss (g):	17.72
Average Mass Loss Rate (g/s):	0.197
Average Effective Heat of Combustion (MJ/kg):	31.37
Average Smoke Extinction Area (m ² /kg):	1614.38
Average CO ₂ yield (g/g):	0.59
Average CO yield (g/g):	0.0744

Specimen:

Initial mass (g):	20.3
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	18
Time to flameout (s):	108

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	1.83	0.01	-0.48	-0.04	2483.43	20.34	0.01	0.03	26.04	26.44	183.14
5	3.87	0.01	-0.41	-0.03	0	20.5	0	0.03	25.79	26.16	387.41
8	3.6	5.86	0	0	0	20.37	0	0.03	25.82	26.2	0.61
11	0.2	0.51	-0.01	0	0	20.23	0	0.03	26.15	26.53	0.4
14	0.18	0.89	-0.01	0	0	20.31	0	0.03	25.61	25.99	0.2
17	18.55	1.43	0	0	0	20.17	0	0.03	25.48	25.85	12.94
20	43.51	-1.37	0	0	0	20.24	0	0.03	25.99	26.37	-31.83
23	109.14	2.06	0	0.01	952.39	20.21	0.76	0.03	25.57	25.99	52.93
26	157.75	8.14	0	0.01	961.13	20.09	3.04	0.03	25.13	25.75	19.39
29	212.16	10.38	0	0.02	1225.13	19.75	4.91	0.03	25.03	25.88	20.45
32	259.18	8.03	0	0.04	1815.44	19.51	5.64	0.03	24.85	25.86	32.27
35	317.53	9.06	0	0.05	1924.88	19.24	6.73	0.02	24.55	25.92	35.03
38	381.2	11.79	0	0.05	1678.26	18.95	7.7	0.02	24.15	25.71	32.34
41	475.18	14.3	0	0.07	1610.75	18.54	8.76	0.02	24.37	26.28	33.23
44	550.15	18.49	0	0.07	1356.85	18.08	9.52	0.02	24.2	26.36	29.75
47	620.63	17.5	0	0.09	1597.65	17.46	10.56	0.02	23.83	26.48	35.46
50	681.82	20.56	0.03	0.08	1793.32	17	13.75	0.02	23.84	26.82	33.15
53	743.15	27.55	0.19	0.07	1167.09	16.2	11.9	0.02	23.76	27.02	26.98
56	768.36	26.86	0.33	0.07	1375.03	15.41	13.77	0.02	23.23	26.83	28.6
59	818.37	23.3	0.52	0.09	1689.58	14.61	14.48	0.02	23.32	27.19	35.13
62	862.48	24.32	0.64	0.09	1485.59	13.97	12.81	0.02	23.94	28.21	35.46
65	873.55	30.16	0.58	0.08	1518.76	13.12	16.52	0.02	23.4	27.73	28.96
68	894.77	29.12	0.69	0.08	1557.01	12.21	16.06	0.02	23.7	28.23	30.73
71	926.58	26.33	0.83	0.1	1921.41	11.39	17.46	0.02	24.24	28.98	35.19
74	932.92	31.46	0.73	0.08	1628.54	10.58	17.79	0.02	24.01	28.79	29.66
77	909.41	29.55	0.76	0.08	1470.1	9.55	15.59	0.02	23.17	27.87	30.77
80	930.72	26.07	0.95	0.09	1635.71	8.82	15.45	0.02	22.88	27.6	35.69
83	994.91	31.03	0.9	0.08	1631.58	7.92	17.66	0.02	23.75	28.67	32.06
86	980.5	38.16	0.83	0.07	1111.15	6.94	15.42	0.02	22.64	27.5	25.7
89	1028.36	31.78	1.12	0.08	1642.02	5.73	18.01	0.02	23.9	28.98	32.36
92	892.79	26.67	1.3	0.1	1724.88	5.03	16.46	0.02	22.91	27.95	33.47
95	779.7	34.33	0.81	0.07	1434.05	4.05	17.11	0.02	23.63	28.78	22.71
98	586.62	21.11	0.51	0.09	2204.56	3.12	15.27	0.02	25.34	30.47	27.79
101	400.22	7.51	0.2	0.16	4664.66	2.79	11.14	0.02	26.58	31.46	53.26
104	234.93	5.18	0	0.05	2884.11	2.58	4.7	0.02	27.87	31.82	45.33
107	141.83	5.46	0	0.03	1009.39	2.46	1.7	0.02	29.11	32.35	25.96
110	85.88	1.03	0	0.04	423.43	2.29	0.14	0.02	28.26	30.27	83.35
113	62.96	-3.94	0	0	0	2.4	0	0.02	28.45	29.84	-15.99
116	51.63	-4.37	0	0	0	2.48	0	0.02	27.78	28.46	-11.83
119	46.96	1.48	0	0	9.14	2.61	0	0.02	28.5	28.82	31.64
122	38.57	5.31	0	0	0	2.41	0	0.02	27.97	27.98	7.26
125	32.62	-1.23	0	0	0	2.37	0	0.02	27.76	27.46	-26.44
128	28.86	-3.71	0	0	0	2.46	0	0.02	27.52	27.01	-7.78
131	27.87	-1.56	0	0	0	2.55	0	0.02	28.05	27.39	-17.82
134	26.71	4.66	0	0	0	2.52	0	0.02	27.51	26.77	5.73
137	23.48	2.85	0	0	0	2.33	0	0.02	26.88	26.1	8.23

140	20.49	-2.75	0	0	0	2.38	0	0.03	27.44	26.61	-7.44
143	17.47	-0.41	0.01	0	0	2.44	0	0.03	27.38	26.54	-42.82
146	17.37	-0.3	0.01	0	0	2.42	0	0.02	26.95	26.14	-58.7
149	17.7	1.71	0	0	0	2.45	0	0.03	27.21	26.42	10.37
152	16.74	1.28	0	0	0	2.33	0	0.02	26.44	25.7	13.08
155	15.55	1.44	0	0	0	2.37	0	0.03	26.94	26.22	10.77
158	11.54	-3.45	0	0	0	2.28	0	0.02	26.43	25.77	-3.34
161	11.54	-5.29	0	0	0	2.55	0	0.03	26.96	26.34	-2.18
164	10.84	0.01	-0.36	-0.03	0	2.52	0	0.03	26.6	26.05	1084.31
167	13.84	0.01	-0.44	-0.03	0	2.43	0	0.03	26.63	26.11	1384.1

Office Chair**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	7.00
Peak Heat Release Rate (kW/m ²):	373.21
Time to Peak Heat Release Rate (s):	140.00
Total Heat Release (MJ/m ²):	170.37
60 s Average Heat Release Rate (kW/m ²):	220.57
Total Mass Loss (g):	98.75
Average Mass Loss Rate (g/s):	0.119
Average Effective Heat of Combustion (MJ/kg):	17.25
Average Smoke Extinction Area (m ² /kg):	226.29
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0126

Specimen:

Initial mass (g):	135.4
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	93
Time to ignition (s):	7
Time to flameout (s):	833

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	2.71	0.01	-0.23	-0.03	6011.65	135.41	0.02	0.03	25.24	25.73	271.46
5	4.06	0.01	-0.44	0.47	157696.4	135.24	0.61	0.03	25.17	25.65	406.35
8	33.82	7.79	0	0.04	941.42	135.05	2.92	0.02	24.45	25.12	4.34
11	81.11	17.42	0	0.03	411.49	134.72	2.89	0.02	23.94	24.81	4.66
14	161.46	17.31	0	0.04	549.5	134.08	3.83	0.02	23.7	24.82	9.33
17	211.91	9.52	0	0.07	928.81	133.74	3.57	0.02	23.48	24.79	22.26
20	246	13.37	0	0.05	659.45	133.43	3.47	0.02	23.94	25.39	18.4
23	268.58	16.7	0	0.04	638.16	132.94	4.11	0.02	24.34	25.94	16.08
26	271.75	15.98	0	0.04	686.57	132.46	4.17	0.02	24.63	26.3	17.01
29	264.14	11.07	0	0.06	925.14	132.01	3.91	0.02	24.49	26.19	23.87
32	257.78	14.33	0	0.04	647.39	131.74	3.57	0.02	24.28	25.98	17.99
35	251.63	15.54	0	0.04	660.21	131.16	3.94	0.02	24.37	26.07	16.19
38	252.56	13.34	0	0.04	737.84	130.84	3.73	0.02	24.69	26.41	18.94
41	245.69	12.82	0	0.04	763.79	130.35	3.8	0.02	24.1	25.77	19.16
44	248.61	11.42	0	0.05	925.51	130.07	4.02	0.02	24.56	26.27	21.77
47	254.72	15.68	0	0.04	734.12	129.63	4.34	0.02	24.82	26.55	16.24
50	260.09	11.27	0	0.06	1080.67	129.18	4.66	0.02	24.42	26.12	23.09
53	270.74	17.14	0	0.04	690.3	128.89	4.44	0.02	24.87	26.63	15.8
56	266.2	16.59	0	0.04	606.34	128.2	3.84	0.02	24.51	26.21	16.05
59	257.4	5.29	0	0.11	2200.98	127.96	4.5	0.02	24.22	25.87	48.62
62	267.18	15.46	0	0.04	611.96	127.74	3.46	0.02	25.63	27.36	17.28
65	256.56	16.28	0	0.04	685.04	127.09	4.12	0.02	25.39	27.07	15.75
68	248.5	12.49	0	0.04	828.84	126.8	3.88	0.02	25.07	26.69	19.89
71	234.63	13.55	0	0.04	892.54	126.31	4.7	0.02	24.19	25.74	17.32
74	245.72	16.38	0	0.04	617.67	125.97	3.76	0.02	25.34	26.93	15
77	243.17	19.36	0	0.03	577.14	125.33	4.21	0.02	24.99	26.55	12.56
80	247.39	10.54	0	0.06	1105.78	124.89	4.41	0.02	24.88	26.45	23.48
83	248.19	10.95	0	0.06	867.18	124.64	3.63	0.02	24.63	26.19	22.66
86	256.73	15.35	0	0.04	596.9	124.2	3.36	0.02	25.69	27.3	16.72
89	249.87	13.04	0	0.05	887.19	123.76	4.37	0.02	24.9	26.47	19.16
92	258.21	13.43	0	0.05	879.42	123.4	4.47	0.02	24.85	26.43	19.22
95	264	13.86	0	0.05	834.37	122.95	4.46	0.02	24.35	25.93	19.05
98	277.96	14.55	0	0.05	968.9	122.57	5.34	0.02	24.78	26.42	19.1
101	285.15	12.5	0	0.05	926.93	122.09	4.43	0.02	24.5	26.15	22.82
104	291.25	14.65	0	0.04	755.9	121.79	4.22	0.02	24.55	26.24	19.88
107	305.88	18.03	0	0.04	792.76	121.21	5.28	0.02	25.29	27.05	16.96
110	308.51	10.15	0	0.06	1139.49	120.78	4.32	0.02	25.02	26.79	30.4
113	307.44	12.62	0	0.05	1045.9	120.53	5.01	0.02	24.59	26.35	24.36
116	311.12	19.25	0	0.03	629.11	119.99	4.62	0.02	24.43	26.21	16.16
119	327.78	16.36	0	0.04	684.94	119.44	4.15	0.02	25.14	27	20.04
122	328.56	12.52	0	0.05	976.43	119.02	4.67	0.02	24.32	26.17	26.23
125	349.3	17.55	0	0.04	633.2	118.63	4.11	0.02	25.08	27.02	19.9

128	352.08	20.04	0	0.03	584.6	117.99	4.46	0.02	24.32	26.27	17.57
131	352.08	11.36	0	0.04	903.65	117.5	3.98	0.02	23.83	25.79	31
134	350.36	13.67	0	0.03	748.17	117.23	4	0.02	23.56	25.57	25.64
137	363.62	18.45	0	0.03	484.35	116.66	3.41	0.02	24.13	26.22	19.71
140	373.21	16.18	0	0.03	589.89	116.17	3.56	0.02	24.65	26.8	23.06
143	364.5	14.91	0	0.03	565.05	115.69	3.2	0.02	24.22	26.36	24.44
146	362.72	16.46	0	0.02	441.24	115.26	2.78	0.02	24.05	26.17	22.04
149	370.87	16.93	0	0.02	488.92	114.71	3.05	0.02	24.93	27.13	21.91
152	368.61	12.78	0	0.03	602.93	114.27	2.82	0.02	25.13	27.34	28.83
155	367.92	15.43	0	0.02	622.75	113.9	3.5	0.02	25.23	27.46	23.84
158	360.34	16.56	0	0.02	496.25	113.35	3.04	0.02	24.86	27.01	21.76
161	368.13	15.57	0	0.02	540.85	112.92	3.04	0.02	25.51	27.71	23.65
164	345.73	16.06	0	0.02	452.59	112.41	2.79	0.02	24.04	26.07	21.53
167	347.78	15.05	0	0.02	462.66	111.96	2.63	0.02	24.38	26.45	23.11
170	342.98	15.83	0	0.02	468.26	111.5	2.82	0.02	24.28	26.33	21.66
173	344.39	14.4	0	0.02	476.36	111.03	2.59	0.02	24.43	26.48	23.91
176	334.76	16.64	0	0.02	319.95	110.61	2.06	0.02	23.9	25.91	20.12
179	336.54	15.69	0	0.02	371.24	110.05	2.24	0.02	24.03	26.03	21.45
182	341.63	16.89	0	0.02	315.83	109.65	2.01	0.02	24.56	26.6	20.23
185	337.45	17.62	0	0.01	315.89	109.04	2.1	0.02	24.46	26.46	19.15
188	337.05	11.5	0	0.02	518.79	108.64	2.24	0.02	24.64	26.64	29.32
191	339.95	15.44	0	0.01	347.67	108.29	2.01	0.02	24.76	26.76	22.02
194	338.56	13.73	0	0.02	389.2	107.74	1.99	0.02	24.89	26.89	24.65
197	339.96	18.19	0	0.01	286.96	107.42	1.93	0.02	25.12	27.11	18.69
200	337.49	18.42	0	0.01	211.23	106.68	1.45	0.02	24.83	26.82	18.32
203	334.02	14.92	0	0.01	284.34	106.35	1.6	0.02	24.52	26.47	22.38
206	338.14	15.92	0	0.01	265.31	105.76	1.58	0.02	24.84	26.8	21.24
209	326.62	15.49	0	0.01	272.05	105.4	1.6	0.02	24.35	26.26	21.09
212	332.19	17.22	0	0.01	241.09	104.82	1.54	0.02	25.05	27.01	19.29
215	324.91	8.3	0	0.02	443.22	104.43	1.36	0.02	25.19	27.11	39.14
218	313.6	14.71	0	0.01	285.04	104.22	1.58	0.02	24.65	26.5	21.33
221	312.68	18.09	0	0.01	192.12	103.56	1.29	0.02	25.13	26.99	17.28
224	304.89	16	0	0.01	204.27	103.18	1.23	0.02	24.82	26.61	19.05
227	308.13	14.8	0	0.01	220.25	102.6	1.19	0.02	25.54	27.38	20.82
230	288.47	16.88	0	0.01	176.26	102.27	1.14	0.02	24.33	26.02	17.08
233	295.01	16.02	0	0.01	199.68	101.61	1.18	0.02	25.38	27.13	18.41
236	284.5	8.42	0	0.01	330.35	101.35	1.02	0.02	25.63	27.34	33.8
239	275.62	13.42	0	0.01	176.6	101.02	0.87	0.02	25.52	27.19	20.53
242	266.31	13.84	0	0.01	193.72	100.56	0.98	0.02	25.63	27.26	19.25
245	259.92	16.71	0	0	160.03	100.18	0.99	0.02	25.39	26.98	15.55
248	246.74	15.65	0	0	83.87	99.59	0.5	0.02	24.63	26.15	15.77
251	244.36	10.46	0	0.01	221.02	99.27	0.88	0.02	24.77	26.25	23.35
254	250.17	12.24	0	0.01	108.62	98.92	0.49	0.02	25.82	27.36	20.44
257	236.02	12.83	0	0.01	107.32	98.53	0.52	0.02	25.2	26.65	18.4
260	235.02	15.42	0	0	137.09	98.13	0.78	0.02	25.6	27.04	15.25
263	225.03	17.45	0	0	99.52	97.62	0.65	0.02	25.35	26.72	12.89
266	220.11	8.45	0	0.01	127.88	97.16	0.41	0.02	25.3	26.65	26.06
269	219.02	9.96	0	0.01	169.58	97.04	0.63	0.02	25.62	26.97	21.99

272	211.6	17.84	0	0	88.19	96.52	0.59	0.02	25.17	26.47	11.86
275	212.02	12.87	0	0	108.76	96.05	0.52	0.02	25.43	26.74	16.47
278	213.97	12.61	0	0	112.67	95.72	0.52	0.02	25.84	27.14	16.96
281	207.33	14.64	0	0	80.18	95.28	0.44	0.02	25.28	26.55	14.16
284	203.54	15.14	0	0	39.25	94.85	0.23	0.02	24.85	26.09	13.44
287	206.58	9.94	0	0	179.15	94.41	0.67	0.02	25.28	26.54	20.79
290	196.12	13.09	0	0	73.19	94.2	0.37	0.02	24.51	25.72	14.98
293	197.92	16.12	0	0	88.45	93.62	0.54	0.02	25.26	26.49	12.28
296	188.18	12.99	0	0	73.74	93.28	0.37	0.02	24.48	25.67	14.48
299	188.91	14.66	0	0	47.05	92.81	0.26	0.02	25.13	26.34	12.89
302	187.33	11.28	0	0	46.69	92.43	0.2	0.02	25.19	26.4	16.6
305	186.58	12.23	0	0	68.91	92.11	0.32	0.02	25.21	26.4	15.25
308	184.79	11.48	0	0	82.13	91.7	0.35	0.02	25.58	26.77	16.09
311	181.2	15.35	0	0	51.78	91.39	0.3	0.02	25.51	26.7	11.81
314	185.43	10.68	0	0	99.53	90.83	0.38	0.02	26.4	27.61	17.36
317	171.78	12.7	0	0	59.08	90.71	0.29	0.02	24.92	26.06	13.53
320	173.74	16.97	0	0	72.22	90.06	0.46	0.02	25.62	26.78	10.24
323	168.8	8.82	0	0	62.73	89.77	0.21	0.02	25.13	26.26	19.14
326	171.4	10.49	0	0	19.63	89.47	0.08	0.02	25.6	26.76	16.34
329	169.96	9.08	0	0	71.37	89.16	0.24	0.02	25.92	27.07	18.73
332	172.13	12.83	0	0	47.68	88.89	0.22	0.02	26.06	27.22	13.42
335	165.17	12.51	0	0	39.73	88.41	0.19	0.02	25.18	26.28	13.2
338	166.45	16.4	0	0	40.88	88.12	0.26	0.02	25.1	26.2	10.15
341	162.9	12.95	0	0	68.22	87.48	0.34	0.02	24.74	25.83	12.58
344	162.91	10.68	0	0	64.8	87.33	0.27	0.02	24.65	25.73	15.26
347	165.69	12.08	0	0	68.04	86.81	0.32	0.02	24.95	26.05	13.72
350	168.91	7.81	0	0	74.73	86.64	0.22	0.02	25.28	26.4	21.64
353	171.7	13.9	0	0	52.54	86.28	0.27	0.02	25.76	26.9	12.35
356	170.42	12.93	0	0	61.54	85.85	0.3	0.02	25.54	26.67	13.18
359	170.24	14.86	0	0	59.23	85.49	0.33	0.02	25.58	26.72	11.46
362	165.4	13.18	0	0	73.24	84.98	0.37	0.02	25.13	26.24	12.55
365	159.83	9.47	0	0	51.65	84.71	0.19	0.02	24.43	25.52	16.88
368	159.42	12.25	0	0	41.58	84.37	0.2	0.02	24.54	25.63	13.02
371	166.75	12.45	0	0	38.19	83.99	0.18	0.02	25.48	26.61	13.39
374	159.36	12.9	0	0	66.32	83.62	0.33	0.02	24.7	25.8	12.35
377	165.64	16.71	0	0	28.83	83.19	0.18	0.02	25.39	26.53	9.91
380	163.67	12.5	0	0	53.36	82.68	0.25	0.02	25.34	26.46	13.1
383	160.16	8.43	0	0	11.54	82.45	0.04	0.02	24.63	25.74	19.01
386	167.06	9.31	0	0	47.22	82.13	0.16	0.02	25.55	26.7	17.93
389	160.42	16.99	0	0	57.96	81.84	0.38	0.02	24.48	25.58	9.44
392	167.07	13.62	0	0	43.38	81.19	0.22	0.02	25.45	26.61	12.27
395	168.08	12.16	0	0	44.01	81.01	0.2	0.02	25.39	26.55	13.82
398	167.89	16.62	0	0	37.56	80.42	0.24	0.02	25.34	26.5	10.1
401	169.41	11.41	0	0	78.69	80.08	0.34	0.02	25.41	26.58	14.85
404	168.52	9.55	0	0	27.12	79.72	0.1	0.02	24.99	26.15	17.65
407	169.85	7.36	0	0	37.85	79.5	0.11	0.02	25.03	26.19	23.08
410	173.02	17.39	0	0	45.4	79.19	0.29	0.02	25.63	26.81	9.95
413	172	10.53	0	0	77.14	78.56	0.31	0.02	25.43	26.62	16.33

416	170.04	14.38	0	0	20.54	78.5	0.11	0.02	24.98	26.14	11.82
419	181.88	16.47	0	0	42.64	77.71	0.25	0.02	26.67	27.92	11.04
422	175.38	9.78	0	0	22.05	77.57	0.08	0.02	25.36	26.56	17.94
425	179.58	13.07	0	0	0	77.06	0	0.02	25.69	26.92	13.74
428	176.57	10.36	0	0	45.6	76.82	0.18	0.02	25.24	26.44	17.05
431	176.66	14.08	0	0	24.82	76.4	0.13	0.02	25.37	26.58	12.54
434	177.15	14.01	0	0	4.46	76	0.02	0.02	25.47	26.69	12.65
437	181.31	11.92	0	0	2.75	75.58	0.01	0.02	25.87	27.12	15.21
440	178.27	9.69	0	0	70.48	75.28	0.26	0.02	25.48	26.7	18.41
443	178.72	14.35	0	0	0	74.95	0	0.02	25.38	26.61	12.46
446	176.03	16.26	0	0	0	74.43	0	0.02	25.07	26.3	10.82
449	178.86	16.26	0	0	0	73.99	0	0.02	25.22	26.45	11
452	186.34	13.52	0	0	0	73.48	0	0.02	26.45	27.73	13.79
455	177.99	9.74	0	0	0	73.18	0	0.02	25.18	26.4	18.27
458	175.33	15.9	0	0	0	72.83	0	0.02	24.7	25.91	11.03
461	183.29	15.39	0	0	0	72.27	0	0.02	25.95	27.21	11.91
464	183.1	11.98	0	0	0	71.93	0	0.02	25.87	27.14	15.28
467	176.32	14.67	0	0	0	71.52	0	0.02	24.85	26.05	12.02
470	176.19	10.6	0	0	0	71.09	0	0.02	25.12	26.33	16.62
473	177.98	9.29	0	0	0	70.86	0	0.02	25.11	26.33	19.16
476	177.21	16.5	0	0	0	70.48	0	0.02	25.24	26.45	10.74
479	177.42	11.33	0	0	0	69.95	0	0.02	25.28	26.49	15.66
482	175.12	10.61	0	0	0	69.77	0	0.02	24.9	26.09	16.51
485	180.61	14.78	0	0	0	69.28	0	0.02	25.49	26.72	12.22
488	174.23	13.67	0	0	0	68.92	0	0.02	24.65	25.85	12.74
491	180.52	11.23	0	0	0	68.47	0	0.02	25.22	26.44	16.07
494	175.35	12.77	0	0	0	68.22	0	0.02	24.34	25.53	13.73
497	181.39	10.68	0	0	0	67.72	0	0.02	25.09	26.33	16.99
500	178.24	10.33	0	0	0	67.56	0	0.02	24.27	25.47	17.25
503	186.94	20.54	0	0	0	67.04	0	0.02	25.17	26.43	9.1
506	194.34	15.58	0	0	0	66.44	0	0.02	25.65	26.94	12.47
509	188.64	10.02	0	0	0	66.11	0	0.02	24.95	26.2	18.83
512	194.37	13.81	0	0	0	65.77	0	0.02	25.42	26.7	14.08
515	187.81	16.19	0	0	0	65.29	0	0.02	23.92	25.17	11.6
518	200.71	15.65	0	0	0	64.82	0	0.02	25.18	26.5	12.82
521	201.57	15.84	0	0	6.48	64.35	0.04	0.02	25.09	26.41	12.72
524	204.1	11.72	0	0	0	63.89	0	0.02	24.88	26.22	17.42
527	209.27	17.37	0	0	0	63.58	0	0.02	24.97	26.33	12.05
530	212.09	18.75	0	0	9.38	62.88	0.07	0.02	24.82	26.19	11.31
533	219.91	9.59	0	0.01	2.95	62.52	0.01	0.02	25.23	26.63	22.94
536	221.17	20.63	0	0	0	62.17	0	0.02	24.9	26.31	10.72
539	218.09	17.14	0	0	0	61.38	0	0.02	24.27	25.66	12.72
542	218.98	11.35	0	0.01	0	61.16	0	0.02	24.24	25.64	19.29
545	228.03	19.45	0	0	0	60.61	0	0.02	24.93	26.39	11.73
548	227.54	13.52	0	0.01	0	60.08	0	0.02	24.45	25.89	16.82
551	230.82	15.68	0	0	40.44	59.74	0.24	0.02	24.86	26.35	14.72
554	245.82	16.73	0	0	7.25	59.15	0.04	0.02	26.17	27.73	14.7
557	239.77	15.54	0	0	49.05	58.75	0.28	0.02	25.42	26.96	15.42

560	237.06	21.47	0	0	31.2	58.17	0.25	0.02	24.81	26.32	11.04
563	234.54	20.19	0	0	7.92	57.52	0.06	0.02	24.21	25.69	11.62
566	240.35	14.05	0	0	14.53	56.99	0.08	0.02	24.48	26	17.1
569	249.67	16.56	0	0	4.6	56.61	0.03	0.02	25	26.58	15.08
572	247.78	20.32	0	0	44.85	55.99	0.35	0.02	24.41	25.95	12.19
575	252.97	19.07	0	0.01	18.86	55.43	0.14	0.02	24.75	26.34	13.26
578	254.66	17.49	0	0.01	15.33	54.85	0.1	0.02	24.66	26.27	14.56
581	261.15	19.71	0	0	33.34	54.35	0.25	0.02	24.87	26.5	13.25
584	263.34	23.03	0	0	27.04	53.66	0.24	0.02	24.84	26.49	11.44
587	262.95	15.78	0	0.01	45.26	53.04	0.28	0.02	24.33	25.95	16.66
590	262.28	14.64	0	0.01	44.43	52.67	0.26	0.02	23.8	25.42	17.91
593	270.5	16.71	0	0.01	53.06	52.14	0.34	0.02	24.42	26.1	16.18
596	273.19	15.35	0	0.01	60.84	51.69	0.36	0.02	24.4	26.08	17.8
599	275.56	23.53	0	0	33.86	51.16	0.3	0.02	24.46	26.15	11.71
602	268.2	21.66	0	0	85.78	50.35	0.73	0.02	23.72	25.37	12.38
605	281.67	15.34	0	0.01	30.73	49.89	0.18	0.02	24.68	26.39	18.36
608	287.62	21.27	0	0	25.63	49.34	0.2	0.02	25.05	26.79	13.52
611	280.19	21.81	0	0	20.29	48.65	0.17	0.02	24.44	26.13	12.85
614	276.64	14.94	0	0	38.67	48.09	0.22	0.02	24.21	25.86	18.52
617	281.46	18.14	0	0	59.02	47.69	0.4	0.02	25.16	26.87	15.51
620	270.45	16.25	0	0	32.91	47.03	0.21	0.02	24.32	25.97	16.65
623	275.47	14.21	0	0.01	72.12	46.71	0.38	0.02	25.16	26.83	19.39
626	267.92	22.2	0	0	37.23	46.11	0.31	0.02	25.04	26.66	12.07
629	266.42	12.84	0	0.01	88.79	45.49	0.42	0.02	25.36	26.97	20.74
632	251.18	10.48	0	0.01	112.04	45.29	0.45	0.02	24.67	26.2	23.96
635	249.02	20.6	0	0	30.42	44.78	0.23	0.02	25.32	26.83	12.09
638	238.44	9.48	0	0.01	61.22	44.2	0.22	0.02	24.94	26.4	25.15
641	234.96	9.13	0	0.01	0	44.14	0	0.02	25.48	26.9	25.73
644	228.2	17.07	0	0	29.62	43.59	0.19	0.02	25.73	27.13	13.36
647	219.23	7.04	0	0.01	0	43.24	0	0.02	25.74	27.1	31.16
650	206.87	7.58	0	0.01	0.32	43.1	0	0.02	25.39	26.65	27.3
653	197.59	14.98	0	0	0	42.74	0	0.02	25.15	26.35	13.19
656	192.2	9.32	0	0	0	42.29	0	0.02	25.35	26.53	20.62
659	187.54	7.33	0	0	0	42.16	0	0.02	25.41	26.54	25.57
662	180.14	9.71	0	0	0	41.82	0	0.02	24.99	26.07	18.56
665	181.91	7.19	0	0	0	41.6	0	0.02	25.86	26.95	25.31
668	174.18	10.83	0	0	0	41.35	0	0.02	25.48	26.52	16.09
671	171.02	6.96	0	0	0	41	0	0.02	25.35	26.36	24.58
674	174.56	3.97	0	0.01	0	40.93	0	0.02	25.89	26.9	43.95
677	167.15	8.12	0	0	0	40.72	0	0.02	25.48	26.46	20.58
680	159.45	6.56	0	0	0	40.48	0	0.02	25.04	25.96	24.32
683	161.11	0.97	0	0	0	40.35	0	0.02	25.55	26.48	166.89
686	155.17	8.21	0	0	0	40.34	0	0.02	25.45	26.35	18.9
689	146.99	10.05	0	0	0	39.89	0	0.02	25.14	26	14.62
692	142.32	1.62	0	0	0	39.81	0	0.02	25.06	25.9	87.96
695	140.96	1.22	0	0	0	39.74	0	0.02	25.75	26.59	115.15
698	134.98	4.7	0	0	0	39.7	0	0.02	24.96	25.75	28.7
701	132.25	7.2	0	0	0	39.47	0	0.02	25.19	25.97	18.37

704	129.13	3.95	0	0	0	39.31	0	0.02	25.69	26.48	32.72
707	121.46	4.01	0	0	0	39.21	0	0.02	25.51	26.26	30.29
710	119.61	5.66	0	0	0	39.06	0	0.02	25.61	26.33	21.13
713	113.54	2.32	0	0	0	38.9	0	0.02	25.45	26.16	48.92
716	107.9	2.29	0	0	0	38.89	0	0.02	25.34	26.02	47.14
719	106.71	6.55	0	0	0	38.73	0	0.02	25.42	26.1	16.28
722	105.16	4.1	0	0	0	38.55	0	0.02	25.6	26.28	25.63
725	99.22	1.31	0	0	0	38.49	0	0.02	24.75	25.39	75.97
728	96.23	2.37	0	0	0	38.44	0	0.02	25.06	25.71	40.55
731	95.55	8.16	0	0	0	38.32	0	0.02	25.77	26.42	11.71
734	87	1.33	0	0	0	38.03	0	0.02	24.96	25.56	65.26
737	85.47	0.4	-0.01	0.01	0	38.2	0	0.02	25.84	26.44	214.8
740	81.44	5.5	0	0	0	37.97	0	0.02	25.84	26.43	14.81
743	77.46	-0.07	0.06	-0.24	0	37.94	0	0.02	26.36	26.95	0
746	72.92	3.59	0	0	0	37.91	0	0.02	25.82	26.36	20.31
749	71.37	3.61	0	0	0	37.75	0	0.02	26.22	26.77	19.79
752	66.24	2.07	0	0.02	0	37.71	0	0.02	25.44	25.96	32
755	65.45	1.88	0	0.01	0	37.62	0	0.02	25.33	25.83	34.88
758	64.61	0.79	0	0.02	0	37.6	0	0.02	25.99	26.49	81.84
761	57.59	0.47	-0.01	0.06	0	37.56	0	0.02	25.42	25.89	121.29
764	56.84	5.87	0	0.01	0	37.54	0	0.02	25.48	25.95	9.68
767	55.67	3.03	0	0.01	0	37.27	0	0.02	25.4	25.86	18.38
770	56.02	-4.15	0	0	0	37.39	0	0.02	25.68	26.15	-13.51
773	55.93	2.23	0	0	0	37.42	0	0.02	25.97	26.43	25.08
776	51.51	2.61	0	0.01	0	37.29	0	0.02	25.35	25.79	19.72
779	49.12	-0.8	0.01	-0.04	0	37.29	0	0.02	25.32	25.75	-61.35
782	50.46	1.4	0	0.02	0	37.3	0	0.02	25.99	26.45	35.93
785	48.22	2.83	0	0.01	0	37.21	0	0.02	25.68	26.12	17.07
788	47.05	0.38	-0.01	0.1	0	37.15	0	0.02	25.9	26.35	124.78
791	46.66	2.67	0	0.01	0	37.16	0	0.02	25.54	25.98	17.47
794	45.49	2.62	0	0.02	0	37.01	0	0.02	25.6	26.04	17.37
797	45.06	0.56	-0.01	0.05	0	37.02	0	0.02	25.48	25.92	79.91
800	44.32	4.96	0	0.01	0	36.93	0	0.02	25.5	25.94	8.93
803	44.29	2.88	0	0.01	0	36.76	0	0.02	25.1	25.54	15.37
806	42.56	-1.75	0	-0.01	0	36.78	0	0.02	25.15	25.58	-24.38
809	40.72	1.27	0	0.03	0	36.81	0	0.02	25.11	25.56	32.18
812	41.39	4.04	0	0.01	0	36.7	0	0.02	25.23	25.68	10.25
815	41.72	2.63	0	0.02	0	36.6	0	0.02	25.67	26.12	15.88
818	40	0.82	0	0.02	0	36.55	0	0.02	25.39	25.83	48.8
821	38.46	0.06	-0.06	0.01	0	36.54	0	0.02	24.97	25.41	617.2
824	38.44	1.54	0	0.01	0	36.53	0	0.02	25.49	25.94	25.01
827	37.38	1.48	0	0.03	0	36.46	0	0.02	25.92	26.37	25.23
830	36.38	-0.72	0	-0.07	0	36.46	0	0.02	25.56	26	-50.52
833	36.66	-1.45	0	-0.05	0	36.49	0	0.02	25.06	25.51	-25.22
836	38.34	1.6	0	0.04	0	36.52	0	0.02	25.56	26.03	23.97
839	37.94	1.77	0	0.03	0	36.42	0	0.02	25.49	25.95	21.45
842	36.64	3.2	0	0.02	0	36.41	0	0.02	25.26	25.72	11.45
845	38.71	2.57	0	0.02	0	36.24	0	0.03	26.12	26.6	15.04

848	38.19	-1.66	0	-0.03	0	36.27	0	0.02	25.72	26.19	-23.02
851	37.13	1.16	0	0.04	0	36.29	0	0.02	25.77	26.23	31.88
854	37.32	0.24	-0.02	0.21	0	36.23	0	0.02	25.41	25.87	154.83
857	37.12	-0.16	0.02	-0.38	0	36.27	0	0.02	25.61	26.07	-231.33
860	36.69	3.77	0	0.02	0	36.21	0	0.03	25.97	26.44	9.73
863	36.67	4.6	0	0.01	0	36.07	0	0.03	26.06	26.54	7.97
866	37.38	0.5	0	0.14	0	35.97	0	0.02	25.5	25.96	74.14
869	35.99	-0.41	0.01	-0.17	0	36.02	0	0.02	25.71	26.19	-88
872	35.99	2.79	0	0.02	0	35.96	0	0.02	25.31	25.78	12.9
875	35.98	-1.37	0	-0.05	0	35.9	0	0.02	25.44	25.92	-26.29
878	35.29	-1.26	0	-0.03	0	36.02	0	0.02	24.81	25.28	-27.97
881	35.99	0.01	-0.41	5.26	0	35.95	0	0.02	25.29	25.78	3599.19
884	34.13	0.01	-0.43	4.37	0	35.9	0	0.02	24.99	25.46	3412.67

Office Chair**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	5.00
Peak Heat Release Rate (kW/m ²):	335.31
Time to Peak Heat Release Rate (s):	225.00
Total Heat Release (MJ/m ²):	179.73
60 s Average Heat Release Rate (kW/m ²):	182.68
Total Mass Loss (g):	101.95
Average Mass Loss Rate (g/s):	0.116
Average Effective Heat of Combustion (MJ/kg):	17.63
Average Smoke Extinction Area (m ² /kg):	206.06
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0104

Specimen:

Initial mass (g):	139.3
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	83
Time to ignition (s):	5
Time to flameout (s):	880

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-0.52	0.01	-0.44	-0.03	0	139.39	0	0.03	25.76	26.14	-51.79
3	-0.44	0.01	-0.38	-0.03	0	139.47	0	0.03	25.09	25.45	-44.34
6	8.75	10.02	0	0	298.15	139.19	1.18	0.03	24.85	25.26	0.87
9	33.87	9.99	0	0.04	718.33	138.91	2.85	0.02	24.53	25.18	3.39
12	92.28	16.74	0	0.03	386.27	138.55	2.63	0.02	23.75	24.62	5.51
15	159.53	15.22	0	0.04	490.66	137.97	3	0.02	23.87	24.94	10.48
18	201.51	8.81	0	0.07	955.85	137.67	3.33	0.02	24.06	25.25	22.88
21	221.97	12.72	0	0.04	717.93	137.37	3.52	0.02	24.65	25.96	17.44
24	226.73	12.63	0	0.04	713.18	136.93	3.41	0.02	25.06	26.41	17.96
27	220.64	13.09	0	0.04	681.62	136.62	3.44	0.02	24.62	25.98	16.85
30	216.87	9.56	0	0.05	854.69	136.18	3.16	0.02	24.49	25.88	22.69
33	223.59	2.53	0	0.17	3785.59	136.06	3.57	0.02	25.38	26.84	88.37
36	219.87	12.68	0	0.04	678.2	135.9	3.23	0.02	25.17	26.62	17.35
39	213.72	15.47	0	0.03	520.53	135.34	3.12	0.02	24.43	25.84	13.82
42	214.65	11.36	0	0.04	734.93	135.03	3.21	0.02	24.57	26	18.9
45	217.29	15.3	0	0.03	573.22	134.61	3.37	0.02	24.6	26.03	14.2
48	216.75	13.11	0	0.03	741.18	134.15	3.77	0.02	24.37	25.8	16.53
51	225.68	10.37	0	0.05	986.73	133.83	3.86	0.02	25.05	26.52	21.77
54	226.26	10.4	0	0.05	867.33	133.51	3.45	0.02	24.69	26.15	21.75
57	226.48	11.09	0	0.04	747.85	133.2	3.23	0.02	24.26	25.69	20.43
60	233.71	13.67	0	0.04	621.45	132.83	3.25	0.02	24.66	26.12	17.09
63	236.5	12.13	0	0.04	868.36	132.41	3.98	0.02	24.99	26.46	19.49
66	229.19	11.36	0	0.04	900.13	132.1	3.93	0.02	24.59	26.02	20.17
69	224.19	13.95	0	0.03	661.04	131.71	3.55	0.02	24.55	25.96	16.08
72	220.08	10.04	0	0.05	825.73	131.3	3.22	0.02	24.37	25.77	21.91
75	227.03	12.88	0	0.04	645.61	131.06	3.17	0.02	24.86	26.28	17.62
78	239.98	16.34	0	0.03	594.12	130.53	3.57	0.02	25.74	27.22	14.69
81	233.81	11.69	0	0.04	747.47	130.13	3.35	0.02	24.66	26.07	20.01
84	235.46	12.28	0	0.04	720.68	129.79	3.35	0.02	25.03	26.43	19.18
87	227.29	12.42	0	0.04	760.92	129.4	3.65	0.02	24.55	25.92	18.3
90	232	13.39	0	0.04	746.72	129.04	3.73	0.02	25.39	26.79	17.33
93	229.71	11.96	0	0.04	878.75	128.61	3.94	0.02	25.29	26.69	19.21
96	231.29	10.95	0	0.04	923.76	128.32	3.74	0.02	25.62	27.01	21.12
99	231.35	14.6	0	0.03	498.81	127.92	2.71	0.02	25.51	26.88	15.85
102	221.13	9.48	0	0.05	869.68	127.5	3.2	0.02	24.5	25.82	23.31
105	239.75	10.32	0	0.05	901.91	127.31	3.32	0.02	26.67	28.07	23.22
108	221.68	15.43	0	0.03	560.68	126.85	3.29	0.02	25.01	26.32	14.37
111	229.81	9.32	0	0.05	899.67	126.46	3.06	0.02	26.02	27.38	24.65
114	226.84	13.81	0	0.03	676.9	126.23	3.46	0.02	25.63	26.97	16.43
117	225.64	14.34	0	0.03	555.56	125.66	2.98	0.02	25.43	26.76	15.74
120	220.34	7.97	0	0.05	979.84	125.41	2.98	0.02	24.96	26.26	27.63
123	221.55	10.37	0	0.04	807.67	125.12	3.17	0.02	25.09	26.39	21.37
126	225.69	16.53	0	0.03	531.52	124.76	3.33	0.02	25.05	26.37	13.66
129	236.95	17.45	0	0.03	578.28	124.17	3.8	0.02	25.22	26.56	13.58
132	246.25	11.02	0	0.04	850.33	123.77	3.53	0.02	25.19	26.55	22.34
135	253.93	7.27	0	0.07	1379.6	123.49	3.82	0.02	24.91	26.28	34.94

138	258.3	11.43	0	0.04	976.36	123.28	4.29	0.02	24.63	26.03	22.59
141	265.32	11.11	0	0.04	904.86	122.83	3.79	0.02	25.1	26.53	23.88
144	258.53	12.99	0	0.03	665.48	122.6	3.33	0.02	24.56	25.96	19.9
147	261.78	14.49	0	0.03	568.7	122.05	3.11	0.02	25.02	26.47	18.07
150	263.71	13.4	0	0.03	688.8	121.75	3.49	0.02	24.95	26.41	19.68
153	272.89	15.87	0	0.03	571.32	121.23	3.33	0.02	25.75	27.26	17.19
156	257.72	8.23	0	0.05	1134.65	120.86	3.66	0.02	24.09	25.52	31.33
159	271.29	11.14	0	0.04	712.05	120.66	3.01	0.02	24.82	26.31	24.35
162	273.33	13.93	0	0.03	528.16	120.19	2.86	0.02	24.21	25.69	19.62
165	290.12	8.03	0	0.06	1030.51	119.88	3.12	0.02	24.95	26.52	36.15
168	290.95	14.4	0	0.03	500.84	119.63	2.79	0.02	24.24	25.8	20.21
171	303.41	16.03	0	0.02	513.18	119.05	3.11	0.02	24.85	26.48	18.93
174	307.38	15.69	0	0.02	495.53	118.68	2.95	0.02	24.67	26.32	19.6
177	311.83	15.58	0	0.02	376.84	118.11	2.22	0.02	24.76	26.44	20.01
180	308.24	11.96	0	0.03	628.5	117.77	2.89	0.02	24.33	25.98	25.78
183	309.57	12.53	0	0.03	490.57	117.36	2.37	0.02	24.31	25.98	24.71
186	328.79	11.51	0	0.03	503.45	117.02	2.12	0.02	25.59	27.35	28.56
189	313.2	20.76	0	0.01	282.21	116.61	2.24	0.02	24.4	26.1	15.09
192	320.45	17.33	0	0.01	345.37	115.86	2.22	0.02	25.19	26.98	18.49
195	317.2	11.77	0	0.02	440.37	115.59	1.93	0.02	25.02	26.79	26.95
198	310.91	12.55	0	0.02	331.07	115.11	1.57	0.02	24.72	26.48	24.77
201	304.21	14.99	0	0.01	313.51	114.82	1.82	0.02	24.12	25.87	20.29
204	316.85	17.23	0	0.01	250.85	114.22	1.61	0.02	25.05	26.85	18.39
207	314.79	9.55	0	0.02	437.5	113.85	1.56	0.02	24.94	26.76	32.97
210	317.23	14.4	0	0.01	300.66	113.56	1.62	0.02	24.86	26.69	22.03
213	332.12	16.47	0	0.01	226.34	113	1.37	0.02	25.43	27.31	20.16
216	317.2	10.72	0	0.01	313.96	112.63	1.29	0.02	24.21	26.02	29.6
219	327.9	15.69	0	0.01	207.76	112.29	1.21	0.02	25.12	26.98	20.9
222	316.08	19.2	0	0.01	122.75	111.69	0.9	0.02	24.34	26.14	16.46
225	335.31	16.5	0	0.01	196.65	111.18	1.17	0.02	25.88	27.79	20.32
228	315.96	14.76	0	0.01	193.53	110.7	1.09	0.02	24.39	26.2	21.4
231	326.62	15.19	0	0.01	207.26	110.28	1.16	0.02	25.25	27.14	21.5
234	311.65	17.02	0	0.01	130.19	109.78	0.85	0.02	24.12	25.94	18.32
237	315.27	11.73	0	0.01	208.73	109.3	0.93	0.02	24.37	26.2	26.88
240	332.39	19.73	0	0	103.39	108.99	0.74	0.02	25.77	27.7	16.85
243	317.56	19.31	0	0	88.97	108.17	0.64	0.02	24.84	26.72	16.45
246	321.65	9.6	0	0.01	225.18	107.89	0.79	0.02	25.35	27.23	33.52
249	321.89	14.96	0	0.01	140.74	107.5	0.76	0.02	25.9	27.8	21.52
252	299.87	15.01	0	0.01	104.79	107.03	0.59	0.02	24.89	26.67	19.98
255	286.89	11.6	0	0.01	118.61	106.62	0.52	0.02	24.51	26.23	24.74
258	287.62	13.03	0	0.01	90.33	106.3	0.44	0.02	25.18	26.91	22.08
261	278.51	13.92	0	0.01	111.98	105.84	0.58	0.02	24.97	26.65	20.01
264	281.12	15.44	0	0.01	22.43	105.46	0.13	0.02	25.52	27.19	18.21
267	271.34	18.94	0	0	47.59	104.91	0.34	0.02	24.85	26.46	14.33
270	274.37	14.05	0	0	103.55	104.38	0.54	0.02	25.18	26.78	19.53
273	273.14	13.07	0	0	6.68	104.04	0.03	0.02	25.13	26.74	20.91
276	273.41	17.75	0	0	52.56	103.56	0.35	0.02	25.12	26.7	15.4
279	273.49	14.73	0	0	15.99	103.02	0.09	0.02	25.18	26.76	18.56
282	264.61	15.5	0	0	6.97	102.65	0.04	0.02	25.03	26.56	17.07
285	258.13	19.76	0	0	11.95	102.07	0.09	0.02	24.93	26.45	13.06
288	257.35	11.68	0	0	0	101.55	0	0.02	25.19	26.7	22.04
291	250.38	10.75	0	0	33.88	101.33	0.14	0.02	24.85	26.29	23.29

294	245.16	8.91	0	0.01	0	100.89	0	0.02	25.39	26.83	27.51
297	234.68	17.16	0	0	0	100.72	0	0.02	24.53	25.9	13.68
300	240.4	21.45	0	0	0	99.9	0	0.02	25.16	26.57	11.21
303	238.87	8.05	0	0	0	99.55	0	0.02	25.15	26.52	29.66
306	233.62	13	0	0	0	99.29	0	0.02	24.91	26.25	17.97
309	231.77	18.31	0	0	0	98.77	0	0.02	24.64	26	12.66
312	233.06	13.96	0	0	6.06	98.26	0.03	0.02	24.95	26.31	16.7
315	231.67	13.47	0	0	0	97.91	0	0.02	25.2	26.56	17.2
318	230.69	12.85	0	0	0	97.45	0	0.02	25.47	26.82	17.96
321	217.34	11.52	0	0	0	97.14	0	0.02	24.67	25.94	18.87
324	221.46	17.49	0	0	0	96.72	0	0.02	25.74	27.04	12.67
327	216.81	15.2	0	0	0	96.14	0	0.02	25.52	26.81	14.26
330	210.45	10.43	0	0	0	95.82	0	0.02	25.09	26.34	20.17
333	215.17	14.5	0	0	0	95.46	0	0.02	26.14	27.4	14.84
336	202.73	17.34	0	0	0	94.96	0	0.02	25.48	26.69	11.69
339	201.43	7.49	0	0	0	94.5	0	0.02	25.25	26.47	26.89
342	202.29	15.42	0	0	0	94.39	0	0.02	25.59	26.8	13.12
345	199.42	18.45	0	0	0	93.61	0	0.02	25.79	26.97	10.81
348	189.2	8.48	0	0	0	93.38	0	0.02	25.26	26.4	22.31
351	186.42	6.92	0	0	0	93.04	0	0.02	25.31	26.45	26.93
354	183.41	8.51	0	0	0	92.93	0	0.02	25.27	26.39	21.54
357	185.9	17.58	0	0	0	92.48	0	0.02	25.9	27.03	10.58
360	180.91	14.55	0	0	0	91.96	0	0.02	25.47	26.58	12.43
363	180	9.22	0	0	0	91.63	0	0.02	25.85	26.95	19.52
366	175.81	11.69	0	0	0	91.35	0	0.02	25.37	26.44	15.04
369	178.61	15.19	0	0	0	90.92	0	0.02	25.53	26.61	11.76
372	172.69	13.99	0	0	0	90.47	0	0.02	24.99	26.06	12.34
375	177.71	13.72	0	0	0	90.08	0	0.02	25.8	26.87	12.95
378	175.43	12.95	0	0	0	89.66	0	0.02	25.54	26.6	13.54
381	172.72	7.14	0	0	0	89.33	0	0.02	25.29	26.34	24.18
384	171.34	13.95	0	0	0	89.14	0	0.02	25.18	26.24	12.28
387	170.56	15.06	0	0	0	88.53	0	0.02	25.04	26.07	11.32
390	170.75	9.24	0	0	0	88.29	0	0.02	25.4	26.46	18.48
393	170.03	11.45	0	0	0	87.92	0	0.02	25.29	26.33	14.84
396	168.1	16.45	0	0	0	87.58	0	0.02	24.74	25.76	10.22
399	168.52	15.37	0	0	0	86.98	0	0.02	24.99	26.04	10.97
402	173.72	8.86	0	0	0	86.7	0	0.02	25.87	26.96	19.61
405	171.81	11.5	0	0	0	86.38	0	0.02	25.39	26.46	14.94
408	170.14	13.64	0	0	0	86.01	0	0.02	25.55	26.62	12.48
411	165.16	12.74	0	0	0	85.59	0	0.02	24.78	25.81	12.96
414	169.72	12.12	0	0	0	85.24	0	0.02	25.35	26.43	14.01
417	170.11	11.57	0	0	0	84.86	0	0.02	25.22	26.28	14.7
420	168.36	14.02	0	0	0	84.53	0	0.02	25.12	26.19	12.01
423	175.78	16.07	0	0	0	84.02	0	0.02	25.83	26.94	10.94
426	174.73	9.93	0	0	0	83.62	0	0.02	25.44	26.54	17.6
429	167.09	8.19	0	0	0	83.39	0	0.02	24.5	25.57	20.41
432	172.99	13.96	0	0	0	83.07	0	0.02	25.08	26.17	12.39
435	175.64	19.27	0	0	0	82.56	0	0.02	25.31	26.41	9.11
438	175.29	12.66	0	0	0	82	0	0.02	25.05	26.17	13.85
441	177.19	7.4	0	0	0	81.79	0	0.02	25.18	26.3	23.95
444	179.26	14.33	0	0	0	81.47	0	0.02	25.07	26.21	12.51
447	185.9	17.4	0	0	0	80.96	0	0.02	25.65	26.85	10.68

450	184.77	13.01	0	0	0	80.48	0	0.02	24.78	25.97	14.2
453	187.49	11.75	0	0	0	80.16	0	0.02	24.9	26.1	15.95
456	184.93	17.34	0	0	0	79.73	0	0.02	24.56	25.76	10.66
459	192.67	13.02	0	0	23.48	79.18	0.11	0.02	25.39	26.62	14.8
462	195.59	12.1	0	0	0	78.93	0	0.02	25.41	26.67	16.17
465	199.19	16.86	0	0	0	78.42	0	0.02	25.43	26.69	11.82
468	204.5	12.94	0	0	0	77.97	0	0.02	25.92	27.23	15.8
471	199.39	13.34	0	0	14.1	77.62	0.07	0.02	25.07	26.36	14.95
474	206.47	11.77	0	0	41.61	77.18	0.18	0.02	25.55	26.86	17.54
477	204.44	12.58	0	0	43.04	76.89	0.2	0.02	25.19	26.49	16.25
480	206.93	21.23	0	0	2.15	76.38	0.02	0.02	25.36	26.68	9.74
483	208.2	14.01	0	0	26.24	75.72	0.14	0.02	24.89	26.21	14.86
486	216.23	9.91	0	0	61.12	75.51	0.23	0.02	25.51	26.86	21.81
489	222.3	20.36	0	0	20.37	75.03	0.15	0.02	25.56	26.95	10.92
492	224.82	16.43	0	0	49.66	74.39	0.3	0.02	25.52	26.89	13.69
495	220.53	13.54	0	0	92.36	74.04	0.48	0.02	24.58	25.97	16.28
498	238.26	18.61	0	0	44.59	73.52	0.3	0.02	25.75	27.22	12.8
501	240.56	13.96	0	0	49.06	72.98	0.26	0.02	25.34	26.81	17.23
504	250.66	16.97	0	0	99.29	72.64	0.62	0.02	25.57	27.07	14.77
507	247.2	16.76	0	0	53.08	71.98	0.34	0.02	24.73	26.23	14.75
510	254.63	18.98	0	0	48.9	71.62	0.35	0.02	24.94	26.48	13.41
513	249.89	19.88	0	0	19.91	70.86	0.15	0.02	24.3	25.78	12.57
516	260.11	8.26	0	0	115.6	70.5	0.36	0.02	24.93	26.5	31.48
519	259.21	17.26	0	0	69.5	70.23	0.45	0.02	24.9	26.47	15.02
522	266.43	19.43	0	0	62.79	69.51	0.45	0.02	25.52	27.13	13.71
525	257.03	10.74	0	0	96.43	69.13	0.39	0.02	24.79	26.36	23.94
528	255.03	16.27	0	0	68.9	68.77	0.43	0.02	24.48	26.04	15.68
531	258.96	21.08	0	0	35.98	68.16	0.29	0.02	24.43	26.03	12.29
534	270.08	18.44	0	0	43.75	67.56	0.3	0.02	25.17	26.8	14.65
537	267.16	17.35	0	0	63.83	67.05	0.42	0.02	24.83	26.45	15.39
540	269.59	12.4	0	0	117.43	66.54	0.54	0.02	25.09	26.72	21.75
543	272.07	17.91	0	0	65.59	66.23	0.43	0.02	25.45	27.08	15.19
546	271.1	19.6	0	0	80.21	65.49	0.58	0.02	25.3	26.91	13.83
549	270.9	17.19	0	0	82.21	65.09	0.53	0.02	25.26	26.87	15.76
552	269.02	21.64	0	0	44.76	64.42	0.37	0.02	24.84	26.46	12.43
555	272.13	11.42	0	0	64.39	63.89	0.28	0.02	24.86	26.5	23.82
558	279.53	9.25	0	0	147.85	63.67	0.5	0.02	25.61	27.28	30.22
561	277.01	22.39	0	0	43.71	63.22	0.36	0.02	25.37	27.03	12.37
564	271.39	22.26	0	0	65	62.42	0.55	0.02	24.82	26.43	12.19
567	266.05	16.55	0	0	97.76	61.93	0.63	0.02	24.29	25.88	16.07
570	275.15	18.34	0	0	62.26	61.38	0.43	0.02	24.85	26.51	15.01
573	279.67	15.52	0	0	120.67	60.85	0.7	0.02	25.12	26.78	18.02
576	274.98	18.84	0	0	111.73	60.41	0.8	0.02	24.7	26.32	14.6
579	272.11	19.08	0	0	82.88	59.74	0.61	0.02	24.37	25.97	14.26
582	288.45	17.36	0	0	133.39	59.28	0.84	0.02	25.7	27.41	16.61
585	283.32	22.34	0	0	92.09	58.66	0.77	0.02	24.93	26.6	12.68
588	283.22	13.59	0	0.01	154.84	58.02	0.8	0.02	24.78	26.43	20.84
591	289.78	20.69	0	0	105.14	57.74	0.82	0.02	24.98	26.66	14
594	294.89	25.32	0	0	76.43	56.8	0.72	0.02	25.29	27.01	11.65
597	289.69	10.42	0	0.01	186.43	56.35	0.73	0.02	24.83	26.51	27.81
600	295.68	23.47	0	0	90.89	55.99	0.8	0.02	25	26.69	12.6
603	298.47	21.47	0	0	86.92	55.04	0.7	0.02	25.13	26.85	13.9

606	294.42	12.08	0	0.01	230.36	54.76	1.05	0.02	24.81	26.48	24.37
609	302.49	22.28	0	0	96.44	54.18	0.79	0.02	25.31	27.03	13.58
612	295.53	20.03	0	0	95.68	53.5	0.72	0.02	24.76	26.45	14.75
615	303.63	18.68	0	0	104.74	52.98	0.72	0.02	25.56	27.27	16.25
618	291.34	20.89	0	0	79.75	52.35	0.63	0.02	24.69	26.35	13.94
621	297.56	18.44	0	0	79.01	51.76	0.54	0.02	25.25	26.95	16.13
624	285.36	19.77	0	0	86.56	51.23	0.66	0.02	24.35	25.96	14.43
627	277.05	14	0	0	104.04	50.61	0.56	0.02	24.29	25.88	19.79
630	282.28	19.16	0	0	79.42	50.31	0.57	0.02	24.99	26.6	14.73
633	280.98	22.18	0	0	94.67	49.48	0.79	0.02	25.04	26.63	12.67
636	281.77	7.37	0	0.01	278.73	49.1	0.75	0.02	25.61	27.22	38.24
639	269.88	17.73	0	0	70.79	48.87	0.48	0.02	24.8	26.32	15.23
642	271.24	19.93	0	0	94.63	48.09	0.69	0.02	25.78	27.3	13.61
645	257.67	8.64	0	0	173.28	47.77	0.57	0.02	25.05	26.5	29.82
648	261.09	15.34	0	0	75.37	47.45	0.42	0.02	25.81	27.28	17.02
651	250.4	16.16	0	0	103.08	46.88	0.62	0.02	25.32	26.75	15.5
654	242.94	14.39	0	0	94.88	46.5	0.51	0.02	25.17	26.55	16.88
657	239.46	12.12	0	0	96.63	46.03	0.44	0.02	25.51	26.86	19.75
660	228.13	7.73	0	0	146.22	45.79	0.42	0.02	25.59	26.89	29.51
663	220	12.31	0	0	112.84	45.5	0.52	0.02	25.42	26.66	17.87
666	217.42	14.52	0	0	52.33	45.06	0.28	0.02	25.92	27.17	14.97
669	206.86	10.82	0	0	30.8	44.67	0.13	0.02	25.17	26.34	19.12
672	205	7.24	0	0	79.75	44.41	0.21	0.02	25.77	26.93	28.31
675	193.98	13.43	0	0	43.81	44.17	0.22	0.02	25.2	26.29	14.44
678	201.41	11.79	0	0	37.08	43.66	0.16	0.02	26.61	27.72	17.08
681	194.98	4.98	0	0	193.96	43.5	0.35	0.02	26.34	27.42	39.15
684	192.88	9.74	0	0	23.23	43.28	0.08	0.02	26.02	27.08	19.81
687	186.25	9.06	0	0	78.49	42.95	0.27	0.02	25.55	26.55	20.56
690	175.75	5.41	0	0	66.75	42.76	0.14	0.02	25	25.95	32.5
693	173.71	7.45	0	0	28.25	42.59	0.08	0.02	25.35	26.29	23.33
696	172.8	5.17	0	0	80.58	42.34	0.16	0.02	25.89	26.83	33.43
699	164.48	5.77	0	0	32.51	42.26	0.07	0.02	25.47	26.37	28.53
702	160.09	7.24	0	0	0	41.99	0	0.02	25.55	26.43	22.12
705	154.51	6.22	0	0	74.99	41.84	0.18	0.02	25.35	26.2	24.83
708	151.27	7.4	0	0	3.7	41.6	0.01	0.02	25.78	26.61	20.43
711	148.25	5.48	0	0	0	41.42	0	0.02	25.84	26.65	27.05
714	141.81	4.19	0	0	0	41.27	0	0.02	25.3	26.08	33.86
717	137.49	3.96	0	0	0	41.16	0	0.02	24.92	25.69	34.7
720	136.32	4.86	0	0	0	41.02	0	0.02	24.94	25.69	28.07
723	139.68	6.76	0	0	0	40.86	0	0.02	25.46	26.23	20.66
726	141.52	2.51	0	0	0	40.65	0	0.02	25.71	26.49	56.39
729	137.7	7.16	0	0	0	40.66	0	0.02	25.4	26.18	19.23
732	135.28	5.35	0	0	0	40.27	0	0.02	25.33	26.09	25.3
735	135.45	-3.16	0	0	0	40.37	0	0.02	26.18	26.95	-42.83
738	124.85	8.35	0	0	0	40.33	0	0.02	25.67	26.39	14.95
741	120.8	5.05	0	0	0	39.97	0	0.02	25.55	26.24	23.91
744	114.87	-0.53	0.01	0	0	40.04	0	0.02	25.31	25.99	-216.35
747	112.8	8.06	0	0	0	39.91	0	0.02	26.14	26.84	14
750	107.32	4.59	0	0	0	39.64	0	0.02	25.95	26.61	23.39
753	100.48	0.81	0	0	0	39.64	0	0.02	26.1	26.74	124.57
756	94.32	4.28	0	0	0	39.54	0	0.02	25.38	25.98	22.01
759	88.94	3.28	0	0	0	39.41	0	0.02	25.73	26.3	27.08

762	80.5	1.66	0	0	0	39.35	0	0.02	25.38	25.93	48.37
765	76.86	1.09	0	0	0	39.3	0	0.02	25.59	26.1	70.36
768	68.92	5.98	0	0	0	39.25	0	0.02	25.39	25.88	11.52
771	69.76	2.28	0	0	0	39	0	0.02	26.23	26.72	30.6
774	66.77	-3.98	0	0	0	39.12	0	0.02	26.36	26.82	-16.79
777	62.9	6.52	0	0	0	39.13	0	0.02	25.82	26.26	9.64
780	61.63	3.34	0	0	0	38.82	0	0.02	25.96	26.39	18.43
783	57.24	0.27	-0.01	0.02	0	38.93	0	0.02	25.47	25.88	210.93
786	58.48	5.99	0	0	0	38.75	0	0.02	25.67	26.08	9.76
789	55.78	0.26	-0.01	0.05	0	38.64	0	0.02	25.54	25.95	213.59
792	54.22	0.34	-0.01	0	0	38.7	0	0.02	25.45	25.86	159.83
795	52.16	2.7	0	0	0	38.61	0	0.02	25.26	25.66	19.34
798	49.57	-0.41	0.01	-0.04	0	38.57	0	0.02	25.61	26	-120.5
801	51.43	2.09	0	0.02	0	38.59	0	0.02	25.93	26.32	24.61
804	51.26	2.3	0	0.01	0	38.46	0	0.02	26.13	26.53	22.25
807	49.01	0.09	-0.04	0.02	0	38.47	0	0.02	25.25	25.64	525.47
810	49.69	1.34	0	0	0	38.43	0	0.02	25.65	26.04	37.11
813	49.43	-0.68	0	-0.04	0	38.41	0	0.02	26.34	26.76	-72.48
816	50.48	2.61	0	0.01	0	38.44	0	0.02	26.28	26.7	19.31
819	47.05	2.07	0	0.01	0	38.28	0	0.02	25.6	26.01	22.72
822	46.75	-0.29	0.01	-0.03	0	38.33	0	0.02	26.14	26.55	-160.03
825	45.28	2.68	0	0	0	38.26	0	0.02	26.2	26.6	16.87
828	41.09	-0.03	0.12	0	0	38.2	0	0.02	25.39	25.78	0
831	40.78	1.21	0	0	0	38.24	0	0.02	25.86	26.25	33.58
834	40.14	2.05	0	0	0	38.13	0	0.03	26.22	26.62	19.55
837	38.08	2.29	0	0	0	38.12	0	0.02	25.61	26	16.64
840	38.18	4.49	0	0	0	37.98	0	0.02	25.29	25.68	8.51
843	39.16	-2.42	0	0	0	37.91	0	0.02	25.4	25.8	-16.19
846	36.99	0.15	-0.02	0	0	38.06	0	0.02	25.46	25.86	251.1
849	38.34	4.01	0	0	0	37.89	0	0.02	25.59	26	9.55
852	38.5	-1.66	0	-0.01	0	37.89	0	0.02	25.76	26.18	-23.21
855	38.5	0.87	0	0	0	37.94	0	0.02	25.57	25.98	44.2
858	38.39	2.64	0	0	0	37.84	0	0.02	25.46	25.87	14.56
861	38.14	0.43	-0.01	0	0	37.81	0	0.02	26	26.41	88.1
864	35.89	-2	0	0	0	37.81	0	0.02	25.49	25.9	-17.95
867	35.27	3.07	0	0	0	37.88	0	0.02	25.26	25.67	11.49
870	36.76	2.41	0	0	0	37.67	0	0.03	26.2	26.63	15.27
873	34.73	-1.52	0	-0.01	0	37.76	0	0.02	25.77	26.2	-22.79
876	35.75	5.48	0	0.01	0	37.69	0	0.02	25.63	26.06	6.52
879	33.65	-2.31	0	-0.01	0	37.52	0	0.02	24.96	25.39	-14.6
882	34.9	-2.55	0	-0.01	0	37.78	0	0.02	25.61	26.05	-13.66
885	35.35	5.33	0	0.01	0	37.62	0	0.02	25.66	26.1	6.63
888	32.2	0.15	-0.02	0.16	0	37.54	0	0.02	25.54	25.98	220.98
891	33.94	-0.59	0.01	-0.04	0	37.58	0	0.02	25.65	26.09	-57.16
894	32.07	2.49	0	0	0	37.55	0	0.02	25.08	25.51	12.9
897	33	0.07	-0.04	0.29	0	37.47	0	0.02	25.37	25.8	455.78
900	33.17	1.62	0	0.01	0	37.52	0	0.02	25.78	26.21	20.5
903	33.82	4.25	0	0	0	37.37	0	0.03	25.94	26.37	7.96
906	30.03	-5.33	0	0	0	37.35	0	0.02	25.14	25.56	-5.63
909	32.93	1.08	0	0.01	0	37.58	0	0.02	25.73	26.16	30.38
912	31.44	4.58	0	0	0	37.29	0	0.02	25.41	25.84	6.87
915	29.97	1.94	0	0.02	0	37.35	0	0.02	25.62	26.06	15.46

918	33.32	1.37	0	0.02	0	37.17	0	0.02	25.57	26.01	24.3
921	30.74	-0.19	0.02	-0.07	0	37.28	0	0.02	25.05	25.48	-163.29
924	30.58	3.33	0	0	0	37.15	0	0.02	25.33	25.75	9.17
927	28.8	-3.98	0	0	0	37.14	0	0.02	25.29	25.73	-7.24
930	29.25	-0.33	0.01	-0.06	0	37.32	0	0.02	25.33	25.77	-88.55
933	26.86	0.01	-0.37	1.6	0	37.17	0	0.02	25.2	25.64	2686.3
936	28.85	0.01	-0.4	1.07	0	37.26	0	0.02	25.64	26.08	2885.47

Office Chair**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	4.00
Peak Heat Release Rate (kW/m ²):	354.70
Time to Peak Heat Release Rate (s):	172.00
Total Heat Release (MJ/m ²):	171.06
60 s Average Heat Release Rate (kW/m ²):	178.68
Total Mass Loss (g):	98.11
Average Mass Loss Rate (g/s):	0.117
Average Effective Heat of Combustion (MJ/kg):	17.44
Average Smoke Extinction Area (m ² /kg):	257.28
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0096

Specimen:

Initial mass (g):	135.1
Thickness (mm):	92
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	4
Time to flameout (s):	842

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-1.49	0.01	-0.43	-0.03	0	135.14	0	0.03	24.82	25.17	-148.78
4	2.09	0.01	-0.44	-0.03	8001.97	135.2	0.03	0.03	25.52	25.87	208.59
7	13.55	9.04	0	0.01	385.79	135.12	1.4	0.02	24.45	24.85	1.5
10	61.99	12.06	0	0.03	571.98	134.71	2.77	0.02	24.31	24.95	5.14
13	110.21	10.25	0	0.04	806.69	134.43	3.31	0.02	24.17	24.96	10.75
16	151.27	12.04	0	0.04	634.75	134.07	2.96	0.02	24.87	25.84	12.57
19	182.09	10.8	0	0.05	732.58	133.73	3.02	0.02	25.13	26.21	16.86
22	188	11.39	0	0.04	647.53	133.41	2.86	0.02	24.66	25.79	16.51
25	193.44	12.86	0	0.04	548.03	133.04	2.71	0.02	24.76	25.99	15.04
28	196.57	9.64	0	0.05	827.77	132.67	3.07	0.02	24.72	25.98	20.4
31	199.32	12.26	0	0.04	721.43	132.43	3.37	0.02	24.98	26.29	16.25
34	197.02	11.01	0	0.04	724.58	131.96	3.11	0.02	24.34	25.65	17.89
37	203.26	8.71	0	0.05	820.69	131.77	2.71	0.02	25.03	26.38	23.34
40	201.58	10.94	0	0.04	711.22	131.41	3.03	0.02	24.35	25.69	18.42
43	205.29	12.08	0	0.04	729.79	131.12	3.41	0.02	24.47	25.83	16.99
46	216.65	11.39	0	0.04	745.56	130.69	3.28	0.02	24.51	25.91	19.03
49	229.55	14.57	0	0.04	609.84	130.42	3.35	0.02	25.02	26.5	15.76
52	241.65	11.86	0	0.05	755.03	129.86	3.34	0.02	25.34	26.82	20.38
55	245.49	7.42	0	0.08	1452.56	129.71	4.01	0.02	25.33	26.86	33.11
58	239.36	17.04	0	0.03	585.41	129.32	3.83	0.02	24.53	26.01	14.05
61	239.25	13.57	0	0.04	697.25	128.78	3.64	0.02	24.53	26.01	17.64
64	234.69	11.53	0	0.05	810.93	128.5	3.63	0.02	24.3	25.76	20.35
67	234.71	16.47	0	0.03	624.47	128.04	3.91	0.02	24.88	26.34	14.25
70	230.98	7.68	0	0.06	1226.31	127.6	3.56	0.02	25.04	26.48	30.06
73	222.98	12.38	0	0.04	642.76	127.49	3.04	0.02	24.76	26.17	18.01
76	217.19	14.54	0	0.03	696.58	126.87	3.91	0.02	24.53	25.92	14.93
79	220.99	10.83	0	0.04	787.3	126.66	3.22	0.02	25.12	26.51	20.41
82	218.19	13.92	0	0.03	707.36	126.18	3.77	0.02	24.8	26.15	15.67
85	222.31	12.53	0	0.04	804.57	125.85	3.79	0.02	25.26	26.6	17.74
88	222.31	11.7	0	0.04	830.06	125.42	3.67	0.02	25.14	26.49	19
91	219.88	16.59	0	0.03	570.5	125.11	3.63	0.02	24.77	26.08	13.26
94	220.96	13.64	0	0.04	806.36	124.49	4.27	0.02	24.47	25.77	16.2
97	229	4.55	0	0.12	2266.47	124.33	3.92	0.02	24.96	26.29	50.34
100	232.28	14.93	0	0.03	691.08	124.08	3.99	0.02	24.55	25.88	15.56
103	240.58	12.4	0	0.04	944.73	123.52	4.45	0.02	24.97	26.34	19.4
106	245.96	11.47	0	0.05	1050.56	123.33	4.61	0.02	24.78	26.16	21.44
109	250.15	13.91	0	0.04	793.12	122.81	4.22	0.02	24.76	26.16	17.99
112	253.78	8.62	0	0.06	1158.26	122.55	3.81	0.02	24.78	26.18	29.45
115	251.56	12.28	0	0.04	846.56	122.23	3.99	0.02	24.65	26.04	20.49
118	250.84	17.26	0	0.03	737.83	121.8	4.95	0.02	24.36	25.75	14.53
121	258.13	12.49	0	0.04	825.66	121.26	3.95	0.02	24.69	26.09	20.67
124	255.02	9.56	0	0.05	964.9	121.04	3.59	0.02	24.32	25.71	26.68
127	265.51	14.86	0	0.03	827.85	120.63	4.61	0.02	25.26	26.72	17.87
130	268.88	13.25	0	0.04	761.97	120.19	3.84	0.02	24.85	26.29	20.3
133	276.1	10.12	0	0.05	939.94	119.85	3.57	0.02	25.13	26.63	27.28
136	268.57	13.1	0	0.04	744.1	119.54	3.88	0.02	23.65	25.09	20.51

139	281.56	19.06	0	0.03	503.29	119.04	3.73	0.02	24.2	25.71	14.77
142	301.08	14.58	0	0.04	661.69	118.47	3.69	0.02	24.55	26.14	20.65
145	316.25	9.67	0	0.05	857.68	118.17	3.13	0.02	24.84	26.51	32.71
148	319.87	16.26	0	0.02	518.53	117.81	3.21	0.02	24.6	26.28	19.67
151	327.21	15.79	0	0.02	616.91	117.24	3.62	0.02	25.12	26.89	20.73
154	320.99	14.45	0	0.02	548.11	116.87	3.01	0.02	24.56	26.31	22.22
157	336.31	15.5	0	0.02	467.17	116.36	2.67	0.02	25.32	27.14	21.7
160	341.68	15.06	0	0.02	480.9	115.95	2.67	0.02	25.28	27.17	22.69
163	341.3	18.26	0	0.02	384.16	115.44	2.61	0.02	24.98	26.89	18.69
166	351.24	9.8	0	0.03	612.29	114.93	2.2	0.02	25.3	27.28	35.83
169	346.99	15.21	0	0.02	396.55	114.75	2.25	0.02	24.85	26.82	22.81
172	354.7	20.33	0	0.01	274.8	114.02	2.05	0.02	25.18	27.2	17.45
175	337.68	13.7	0	0.01	389.26	113.62	2.05	0.02	24.12	26.06	24.65
178	345.28	15.83	0	0.01	315.96	113.14	1.85	0.02	25	27	21.81
181	337.58	15.77	0	0.01	307.56	112.68	1.8	0.02	24.95	26.94	21.41
184	336.14	12.52	0	0.01	443.84	112.21	2.06	0.02	24.94	26.94	26.85
187	336.34	15.44	0	0.01	333.63	111.88	1.9	0.02	25.16	27.14	21.78
190	337.26	16.54	0	0.01	295.15	111.3	1.78	0.02	25.43	27.42	20.39
193	336.7	14.16	0	0.01	378.02	110.91	1.93	0.02	25.69	27.69	23.77
196	326.32	18.2	0	0.01	287.82	110.41	1.94	0.02	25.03	26.95	17.93
199	335.3	17.34	0	0.01	249.04	109.85	1.55	0.02	25.81	27.79	19.33
202	331.38	18.14	0	0.01	212.89	109.36	1.4	0.02	25.61	27.58	18.27
205	315.59	13.39	0	0.01	344.09	108.8	1.76	0.02	24.33	26.18	23.57
208	322.89	14.71	0	0.01	321.32	108.52	1.75	0.02	25.12	27	21.95
211	317.59	16.87	0	0.01	227.4	107.91	1.44	0.02	24.76	26.61	18.83
214	328.47	11.92	0	0.01	364.09	107.55	1.58	0.02	25.61	27.51	27.55
217	316.81	14.86	0	0.01	256.17	107.14	1.43	0.02	24.74	26.56	21.32
220	326.01	18.07	0	0.01	251.1	106.66	1.66	0.02	25.41	27.28	18.04
223	318.19	15.22	0	0.01	238.32	106.1	1.36	0.02	24.89	26.7	20.9
226	321.47	19.57	0	0.01	175.47	105.7	1.28	0.02	25.03	26.88	16.43
229	323.08	19.09	0	0.01	166.81	104.96	1.18	0.02	25.24	27.08	16.93
232	322.42	16.53	0	0	177.58	104.57	1.07	0.02	25.53	27.37	19.51
235	311.4	15.94	0	0.01	223.31	103.95	1.3	0.02	25.54	27.36	19.54
238	302.37	13.65	0	0.01	195.43	103.62	0.99	0.02	25.28	27.07	22.15
241	293.21	15.79	0	0	172.35	103.1	1.01	0.02	25.16	26.89	18.57
244	291.84	16.28	0	0	202.7	102.69	1.2	0.02	25.65	27.39	17.93
247	286.48	12.66	0	0	184.37	102.15	0.86	0.02	25.38	27.08	22.63
250	287.38	15.99	0	0	131.31	101.88	0.77	0.02	25.71	27.41	17.97
253	287.7	16.4	0	0	115.21	101.21	0.68	0.02	25.93	27.63	17.54
256	275.36	12.78	0	0	217.93	100.92	1.03	0.02	25.39	27.01	21.54
259	266.27	17.2	0	0	133.01	100.4	0.86	0.02	25.18	26.76	15.48
262	264.88	14.33	0	0	132.76	99.94	0.7	0.02	25.72	27.3	18.49
265	251.22	16.82	0	0	121.37	99.5	0.77	0.02	25.08	26.59	14.94
268	245.58	17.12	0	0	77.85	98.94	0.5	0.02	25.19	26.66	14.35
271	244.9	14.73	0	0	95.47	98.5	0.52	0.02	25.56	27.04	16.62
274	233.27	14.36	0	0	126.26	98.04	0.68	0.02	25.27	26.68	16.25
277	232.01	14.13	0	0	99.53	97.63	0.52	0.02	25.73	27.13	16.42
280	221.24	11.55	0	0	114.9	97.21	0.5	0.02	25.36	26.69	19.15
283	218.63	16.33	0	0	97.63	96.89	0.6	0.02	25.48	26.78	13.39
286	212.34	18.99	0	0	60.46	96.25	0.43	0.02	25.33	26.59	11.18
289	214.12	9.86	0	0	108.47	95.83	0.39	0.02	25.82	27.1	21.72
292	209.36	17.12	0	0	70.12	95.55	0.45	0.02	25.66	26.9	12.23

295	205.51	13.43	0	0	59.58	94.87	0.3	0.02	25.4	26.64	15.3
298	208.65	11.72	0	0	91.17	94.73	0.4	0.02	25.56	26.78	17.81
301	212.89	15.93	0	0	72.19	94.12	0.42	0.02	25.9	27.14	13.36
304	206.79	11.95	0	0	104	93.83	0.48	0.02	24.78	25.98	17.31
307	216.73	18.48	0	0	88.28	93.34	0.61	0.02	25.35	26.6	11.73
310	223.29	13.47	0	0	108.26	92.79	0.53	0.02	25.99	27.28	16.58
313	222.25	13.79	0	0	92.95	92.51	0.47	0.02	25.79	27.08	16.11
316	222.38	14.55	0	0	94.27	91.96	0.49	0.02	26.42	27.73	15.28
319	205.82	14.35	0	0	92.21	91.64	0.5	0.02	25.2	26.43	14.34
322	205.75	14.74	0	0	66.61	91.09	0.37	0.02	25.5	26.73	13.96
325	201.62	13.87	0	0	70.81	90.76	0.37	0.02	25.47	26.69	14.53
328	197.78	13.73	0	0	99.42	90.26	0.52	0.02	25.2	26.39	14.4
331	192.28	12	0	0	91.98	89.95	0.42	0.02	25.06	26.24	16.02
334	192.97	15.67	0	0	66.97	89.5	0.39	0.02	25.46	26.64	12.31
337	192.92	14.53	0	0	100.14	89.04	0.55	0.02	25.42	26.58	13.28
340	188.23	11.21	0	0	73.49	88.65	0.31	0.02	25.24	26.4	16.79
343	186.13	15.07	0	0	56.87	88.32	0.33	0.02	24.83	25.97	12.35
346	181.57	12.76	0	0	91.88	87.78	0.46	0.02	24.44	25.57	14.23
349	188.83	9.81	0	0	108.92	87.55	0.4	0.02	25.68	26.84	19.25
352	188.74	17.56	0	0	64.71	87.12	0.43	0.02	25.39	26.54	10.75
355	187.91	12.02	0	0	121.87	86.59	0.55	0.02	25.33	26.47	15.63
358	192.63	14.06	0	0	101.71	86.36	0.53	0.02	25.96	27.12	13.71
361	187.94	12.83	0	0	91.18	85.76	0.44	0.02	25.33	26.48	14.65
364	190.47	10.19	0	0	117.48	85.59	0.45	0.02	25.53	26.68	18.68
367	184.39	17.19	0	0	71.73	85.09	0.48	0.02	24.43	25.54	10.73
370	195.28	11.53	0	0	112.15	84.65	0.48	0.02	25.76	26.94	16.93
373	192.12	12.67	0	0	71.05	84.35	0.34	0.02	25.34	26.52	15.17
376	195.65	16.85	0	0	93.53	83.86	0.59	0.02	25.56	26.75	11.61
379	198.47	14.96	0	0	84.62	83.39	0.47	0.02	25.83	27.07	13.27
382	199.49	12.97	0	0	126.1	82.97	0.62	0.02	25.14	26.35	15.38
385	199.5	15.6	0	0	110.02	82.58	0.66	0.02	24.91	26.12	12.79
388	210.26	13.22	0	0	113.74	82.06	0.55	0.02	26.28	27.58	15.91
391	203.61	15.57	0	0	87.49	81.75	0.51	0.02	25.25	26.51	13.08
394	201.63	15.88	0	0	94.14	81.14	0.57	0.02	25.14	26.39	12.7
397	201.41	12.43	0	0	128.64	80.83	0.61	0.02	25.17	26.42	16.2
400	205.69	12.72	0	0	141.77	80.37	0.67	0.02	25.5	26.76	16.17
403	197	14.94	0	0	85.04	80.04	0.5	0.02	24.35	25.58	13.18
406	210.91	21.58	0	0	51.14	79.45	0.41	0.02	25.48	26.79	9.77
409	206.01	14.2	0	0	85.51	78.85	0.47	0.02	24.79	26.07	14.51
412	210.54	10.15	0	0	130.48	78.58	0.49	0.02	25.55	26.85	20.73
415	205.14	14.2	0	0	119.76	78.18	0.65	0.02	24.91	26.18	14.45
418	207.31	15.13	0	0	81.86	77.74	0.46	0.02	25.4	26.71	13.7
421	201.42	14.32	0	0	110.17	77.29	0.61	0.02	24.51	25.78	14.07
424	205.25	10.67	0	0	116.7	76.9	0.48	0.02	24.74	26.02	19.24
427	208.56	15.94	0	0	91.26	76.59	0.55	0.02	25.04	26.35	13.09
430	212.66	14.31	0	0	112.77	75.99	0.6	0.02	25.47	26.8	14.86
433	209.46	10.93	0	0	107.75	75.74	0.45	0.02	24.98	26.29	19.17
436	208.9	22.81	0	0	75.25	75.24	0.65	0.02	25.1	26.41	9.16
439	209.22	14.98	0	0	124.44	74.5	0.71	0.02	24.88	26.2	13.96
442	208.96	9.75	0	0	186.77	74.32	0.7	0.02	24.65	25.97	21.43
445	219.13	18.46	0	0	74.9	73.82	0.52	0.02	25.31	26.68	11.87
448	228.58	15.2	0	0	139.77	73.29	0.78	0.02	25.66	27.07	15.04

451	224.75	14.62	0	0	102.48	72.89	0.57	0.02	24.94	26.33	15.37
454	235.61	18.02	0	0	104.78	72.39	0.7	0.02	25.61	27.06	13.07
457	232.97	16.65	0	0	114.89	71.85	0.73	0.02	24.95	26.38	13.99
460	238.84	14.96	0	0	141.68	71.39	0.79	0.02	25.38	26.84	15.97
463	244.34	17.53	0	0	170.24	70.92	1.1	0.02	25.54	27.03	13.94
466	242.24	18.05	0	0	143.45	70.35	0.98	0.02	25	26.45	13.42
469	256.03	14.28	0	0	214.14	69.87	1.1	0.02	26.33	27.89	17.93
472	242.86	13.52	0	0	191.39	69.47	0.99	0.02	24.61	26.07	17.97
475	252.1	15.3	0	0	182.45	69.03	1.04	0.02	25.33	26.85	16.48
478	249.2	18.28	0	0	132.31	68.55	0.92	0.02	24.78	26.29	13.63
481	252.95	18.08	0	0	184.98	67.96	1.26	0.02	24.99	26.52	13.99
484	255.27	15.35	0	0	180.47	67.48	1.03	0.02	25.29	26.8	16.63
487	250.6	17.96	0	0	164.34	67.01	1.12	0.02	24.87	26.41	13.95
490	257.57	16.22	0	0	189.47	66.43	1.14	0.02	25.33	26.87	15.88
493	257.24	14.94	0	0	213.33	66.03	1.18	0.02	25.43	26.98	17.22
496	246.09	13.17	0	0	204.4	65.53	1.04	0.02	24.33	25.82	18.69
499	252.65	16.43	0	0	180.7	65.2	1.13	0.02	24.82	26.33	15.37
502	261.43	21.33	0	0	160.48	64.54	1.26	0.02	25.61	27.18	12.25
505	251.24	14.45	0	0	199.58	64.01	1.11	0.02	24.54	26.03	17.38
508	257.18	14.61	0	0	207.91	63.63	1.14	0.02	25.16	26.69	17.61
511	256.79	19.86	0	0	151.48	63.09	1.13	0.02	25.15	26.68	12.93
514	254.18	16.06	0	0	169.28	62.5	1.03	0.02	24.89	26.41	15.83
517	264.82	12.9	0	0	229.23	62.13	1.09	0.02	25.58	27.16	20.53
520	264.9	15.59	0	0	177.45	61.68	1.04	0.02	25.05	26.6	17
523	256.71	21.56	0	0	123.23	61.17	1.03	0.02	24.19	25.72	11.9
526	268.59	23.25	0	0	115.33	60.42	1.01	0.02	24.94	26.53	11.55
529	272.19	14.07	0	0	224.17	59.85	1.18	0.02	25.09	26.7	19.34
532	267.74	15.39	0	0	211.4	59.5	1.23	0.02	24.76	26.35	17.4
535	271.69	19.68	0	0	154.32	58.9	1.15	0.02	24.86	26.48	13.81
538	274.32	19.54	0	0	190.99	58.35	1.41	0.02	24.85	26.48	14.04
541	280.7	19.66	0	0	165.77	57.73	1.21	0.02	25.23	26.89	14.28
544	281.53	17.57	0	0	171.43	57.18	1.12	0.02	25.14	26.8	16.03
547	275.59	24.38	0	0	125.01	56.62	1.17	0.02	24.4	26.01	11.31
550	285.15	19.56	0	0	148.47	55.8	1.09	0.02	25	26.65	14.58
553	281.43	15.62	0	0	157.7	55.44	0.95	0.02	24.42	26.06	18.02
556	285.5	19.96	0	0	137.91	54.81	1.06	0.02	24.25	25.92	14.3
559	287.64	16.79	0	0	113.83	54.29	0.74	0.02	24.25	25.94	17.13
562	288.61	23.13	0	0	104.12	53.74	0.93	0.02	24.1	25.8	12.48
565	291.55	19.86	0	0	106.64	52.96	0.82	0.02	24.17	25.9	14.68
568	301.09	16.81	0	0	118.83	52.55	0.75	0.02	24.88	26.65	17.91
571	300.05	22.07	0	0	84.19	51.9	0.7	0.02	24.68	26.46	13.59
574	303.26	17.82	0	0	128.02	51.29	0.85	0.02	24.93	26.73	17.02
577	294.51	17	0	0	103.8	50.81	0.68	0.02	24.18	25.9	17.32
580	300.63	23.62	0	0	100.49	50.22	0.89	0.02	24.94	26.69	12.73
583	307.53	19.41	0	0	99.41	49.47	0.7	0.02	25.83	27.65	15.84
586	293.2	11.79	0	0.01	206.11	49.08	0.91	0.02	24.88	26.59	24.87
589	285.91	19.29	0	0	105.34	48.65	0.77	0.02	24.78	26.44	14.82
592	290.73	21.38	0	0	92.01	47.95	0.72	0.02	25.55	27.26	13.6
595	281.17	20.13	0	0	111.98	47.4	0.85	0.02	25.04	26.67	13.96
598	281.04	15.43	0	0	143.95	46.77	0.81	0.02	25.74	27.38	18.21
601	270.14	13.6	0	0	138.31	46.45	0.7	0.02	25.39	26.94	19.86
604	262.84	16.07	0	0	105.69	45.92	0.63	0.02	25.56	27.09	16.36

607	258.03	15.85	0	0	71.37	45.51	0.41	0.02	25.99	27.49	16.28
610	245.07	14.69	0	0	61.03	44.98	0.33	0.02	25.42	26.82	16.68
613	236.07	7.93	0	0	113.54	44.66	0.33	0.02	25.6	26.95	29.78
616	229.72	10.51	0	0	96.32	44.44	0.37	0.02	25.86	27.18	21.86
619	215.03	12.22	0	0	53.88	44.03	0.25	0.02	25.45	26.68	17.59
622	205.9	11.76	0	0	52.53	43.73	0.23	0.02	25.84	27.05	17.51
625	200.15	8.12	0	0	39.87	43.35	0.12	0.02	25.77	26.91	24.65
628	191.29	9.6	0	0	35.68	43.2	0.13	0.02	25.86	26.95	19.93
631	184.72	11.46	0	0	19.85	42.77	0.08	0.02	26.15	27.22	16.12
634	180.52	6.91	0	0	33.29	42.56	0.09	0.02	25.97	26.98	26.11
637	173.82	6.74	0	0	0	42.33	0	0.02	25.57	26.53	25.78
640	170.25	6.08	0	0	0	42.15	0	0.02	26.15	27.11	28.01
643	165.73	8.41	0	0	3.61	41.94	0.01	0.02	26.06	26.96	19.7
646	161.73	5.91	0	0	0	41.68	0	0.02	26.65	27.58	27.38
649	150.78	4.22	0	0	0	41.59	0	0.02	25.97	26.8	35.71
652	144.63	2.14	0	0	0	41.43	0	0.02	25.82	26.61	67.43
655	139.46	4.01	0	0	0	41.43	0	0.02	25.68	26.45	34.75
658	135.1	7.86	0	0	0	41.17	0	0.02	25.78	26.52	17.2
661	131.94	6.99	0	0	0	40.99	0	0.02	25.56	26.28	18.87
664	130.89	5.36	0	0	0	40.76	0	0.02	25.74	26.46	24.44
667	128.41	1.82	0	0	0	40.68	0	0.02	25.64	26.36	70.69
670	129.38	6.97	0	0	0	40.6	0	0.02	26.05	26.75	18.56
673	124.83	5.68	0	0	0	40.3	0	0.02	25.55	26.24	21.98
676	122.05	0.99	0	0	0	40.28	0	0.02	25.95	26.63	122.78
679	119.18	5.88	0	0	0	40.18	0	0.02	26.3	26.97	20.28
682	111.47	3.12	0	0	0	39.97	0	0.02	25.59	26.22	35.72
685	110.23	4.51	0	0	0	39.97	0	0.02	26.09	26.72	24.46
688	105.97	6.97	0	0	0	39.7	0	0.02	26.26	26.88	15.2
691	103.09	1.64	0	0	0	39.61	0	0.02	26.11	26.72	62.7
694	100.41	-2.7	0	0	0	39.59	0	0.02	26.63	27.23	-37.25
697	96.3	6.57	0	0	0	39.67	0	0.02	26.36	26.94	14.65
700	94.58	9.69	0	0	0	39.24	0	0.02	26.28	26.85	9.76
703	89.09	-1.73	0	0	0	39.19	0	0.02	25.96	26.5	-51.37
706	82.41	-0.17	0.02	0	0	39.26	0	0.02	25.43	25.95	-488.06
709	80.95	3.17	0	0	0	39.18	0	0.02	25.8	26.31	25.51
712	78.43	2.57	0	0	0	39.09	0	0.02	25.43	25.92	30.52
715	79.07	0.52	-0.01	0	0	39.04	0	0.02	26.36	26.86	153.28
718	78.91	5.74	0	0	0	39.02	0	0.02	26.34	26.83	13.74
721	71.04	4.16	0	0	0	38.74	0	0.02	25.45	25.94	17.06
724	69.49	-4.27	0	0	0	38.81	0	0.02	26.26	26.74	-16.27
727	67.8	-0.03	0.1	0.01	0	38.91	0	0.02	25.78	26.23	0
730	65.53	5.18	0	0	0	38.8	0	0.02	26.01	26.46	12.66
733	60.49	3.26	0	0	0	38.65	0	0.02	25.7	26.13	18.54
736	58.05	2.76	0	0	0	38.6	0	0.02	25.83	26.26	21.06
739	56.06	0.66	0	0	0	38.49	0	0.02	25.4	25.82	85.29
742	54.47	0.79	0	0	0	38.55	0	0.02	25.58	25.98	69.33
745	50.81	4.53	0	0	0	38.42	0	0.02	25.44	25.83	11.22
748	52.22	-0.8	0	0	0	38.34	0	0.02	26.33	26.72	-64.94
751	48.86	-1.52	0	0	0	38.44	0	0.02	25.53	25.91	-32.11
754	48.16	1.92	0	0	0	38.39	0	0.02	26.24	26.64	25.05
757	47.64	3.36	0	0	0	38.34	0	0.02	25.45	25.84	14.19
760	47.83	2.75	0	0	0	38.21	0	0.02	25.81	26.19	17.38

763	45.66	-0.23	0.01	0	0	38.19	0	0.02	25.46	25.84	-202.62
766	44.79	3	0	0	0	38.18	0	0.02	25.89	26.28	14.91
769	44.62	0.34	-0.01	0	0	38.05	0	0.03	26.4	26.78	132.37
772	44.98	-1.78	0	0	0	38.16	0	0.02	25.74	26.12	-25.21
775	44.31	6.74	0	0	0	38.08	0	0.02	25.4	25.78	6.57
778	41.75	3.39	0	0	0	37.84	0	0.02	25.33	25.72	12.32
781	40.99	-5.45	0	0	0	37.92	0	0.02	25.04	25.42	-7.51
784	42.15	3.57	0	0	0	38.04	0	0.02	25.8	26.19	11.8
787	40.86	7.32	0	0	0	37.74	0	0.02	25.92	26.31	5.58
790	39.85	-2.49	0	0	0	37.7	0	0.02	26.16	26.56	-15.98
793	42.1	-0.11	0.04	0	0	37.81	0	0.02	26.05	26.45	-382.61
796	39.91	3.2	0	0	0	37.69	0	0.02	25.86	26.25	12.49
799	39.05	-1.56	0	0	0	37.67	0	0.02	25.42	25.81	-25.03
802	37.59	-1.25	0	0	0	37.75	0	0.02	25.19	25.57	-30.09
805	38.95	3.01	0	0	0	37.71	0	0.02	25.93	26.33	12.94
808	38.79	4.98	0	0	0	37.59	0	0.02	25.48	25.88	7.79
811	36.87	-0.95	0	0	0	37.47	0	0.02	25.33	25.73	-38.8
814	37.68	-2.25	0	0	0	37.61	0	0.02	25.36	25.76	-16.72
817	38.56	5.87	0	0	0	37.54	0	0.02	25.57	25.96	6.57
820	35.64	2.92	0	0	0	37.34	0	0.02	25.2	25.6	12.23
823	34.8	-2.08	0	0	0	37.39	0	0.02	25.23	25.63	-16.71
826	37.84	0.97	0	0	0	37.4	0	0.03	26.35	26.76	38.82
829	36.12	2.29	0	0	0	37.34	0	0.02	25.57	25.98	15.8
832	34.2	0.78	-0.01	0	0	37.29	0	0.02	25.46	25.87	44.11
835	36.22	0.92	0	0	0	37.28	0	0.02	25.59	26.01	39.23
838	37.29	3.77	0	0	0	37.22	0	0.02	25.03	25.44	9.9
841	35.74	0.13	-0.02	0	0	37.09	0	0.02	25.42	25.83	277.69
844	34.23	0.73	0	0	0	37.18	0	0.02	25.22	25.63	46.92
847	34.32	4.08	0	0	0	37.03	0	0.02	25.2	25.6	8.42
850	35.15	-2.41	0	0	0	37	0	0.02	25.46	25.87	-14.59
853	34.09	-0.66	0	0	0	37.12	0	0.02	25.77	26.19	-51.55
856	32.43	1.42	0	0	0	37.03	0	0.02	25.72	26.14	22.84
859	32.28	-1.53	0	0	0	37.07	0	0.02	25.18	25.59	-21.17
862	34.76	3.5	0	0	0	37.08	0	0.02	25.34	25.75	9.94
865	33.34	1.9	0	0	0	36.91	0	0.02	25.55	25.97	17.57
868	31.81	-3.81	0	0	0	36.99	0	0.02	25.34	25.76	-8.36
871	32.69	2.11	0	0.01	0	37.05	0	0.02	25.71	26.14	15.5
874	32.86	6.39	0	0.01	0	36.87	0	0.02	25.47	25.9	5.14
877	32.75	-0.98	0	0	0	36.75	0	0.03	25.94	26.38	-33.51
880	31.37	-3.62	0	0	0	36.9	0	0.02	25.51	25.93	-8.66
883	32.97	3.9	0	0	0	36.9	0	0.02	25.3	25.71	8.46
886	34.58	3.27	0	0.01	0	36.72	0	0.03	26.24	26.67	10.58
889	33.18	-1.77	0	-0.02	0	36.74	0	0.03	25.97	26.39	-18.71
892	34.84	0.01	-0.43	2.25	0	36.78	0	0.03	26.25	26.69	3483.53
895	34.75	0.01	-0.38	2.7	552.1	36.71	0	0.03	26.02	26.46	3475.07

Paper (stacked flat)**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	4.00
Peak Heat Release Rate (kW/m ²):	336.38
Time to Peak Heat Release Rate (s):	18.00
Total Heat Release (MJ/m ²):	91.68
60 s Average Heat Release Rate (kW/m ²):	225.86
Total Mass Loss (g):	71.25
Average Mass Loss Rate (g/s):	0.094
Average Effective Heat of Combustion (MJ/kg):	12.87
Average Smoke Extinction Area (m ² /kg):	1.11
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0129

Specimen:

Initial mass (g):	396.1
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	89
Time to ignition (s):	4
Time to flameout (s):	762

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	1.74	0.01	-0.4	-0.03	0	396.12	0	0.03	25.27	25.67	173.84
3	4.35	0.01	-0.32	-0.04	0	395.96	0	0.03	25.6	26.02	434.75
6	19.98	15.24	0	0	0	395.79	0	0.03	25.07	25.5	1.31
9	109.75	25.67	0	0	66.24	395.05	0.7	0.02	23.62	24.38	4.28
12	220.36	25.21	0	0	14.29	394.34	0.14	0.02	23.71	24.91	8.74
15	329.04	16.01	0	0	0.11	393.61	0	0.02	23.57	24.99	20.55
18	336.38	15.63	0	0	0	393.32	0	0.02	24.05	25.61	21.53
21	317.81	18.42	0	0	0	392.64	0	0.02	24.21	25.87	17.25
24	274.73	17.92	0	0.01	0	392.23	0	0.02	24.65	26.36	15.33
27	249.35	18.17	0	0.01	0	391.57	0	0.02	24.52	26.24	13.73
30	228.27	12.78	0	0.01	0	391.18	0	0.02	24.65	26.36	17.86
33	221.4	17.96	0	0.01	0	390.73	0	0.02	25.2	26.95	12.33
36	216.36	20.54	0	0.01	0	390.12	0	0.02	24.74	26.47	10.53
39	227.74	16.82	0	0.01	0	389.54	0	0.02	24.95	26.73	13.54
42	234.39	22.29	0	0.01	0	389.05	0	0.02	24.31	26.07	10.52
45	248.52	16.94	0	0.01	0	388.27	0	0.02	24.27	26.08	14.67
48	262.24	18.2	0	0.02	0	387.99	0	0.02	24.67	26.52	14.41
51	263.89	22.18	0	0.02	0	387.16	0	0.02	24.71	26.57	11.9
54	260.19	16.4	0	0.02	0	386.73	0	0.02	25	26.87	15.87
57	252.5	15.12	0	0.02	0	386.15	0	0.02	25.14	27	16.7
60	236.65	14.47	0	0.01	9.81	385.81	0.05	0.02	24.79	26.59	16.35
63	229.08	18.94	0	0.01	13.17	385.25	0.09	0.02	24.94	26.73	12.1
66	228.43	16.41	0	0.01	4.65	384.72	0.03	0.02	25.68	27.46	13.92
69	217.08	12.95	0	0.01	5.98	384.27	0.03	0.02	25.27	26.98	16.76
72	215.71	18.29	0	0.01	2.13	383.89	0.01	0.02	25.73	27.44	11.8
75	211.73	16.18	0	0.01	0	383.22	0	0.02	25.93	27.61	13.09
78	205.55	11	0	0.01	0	382.94	0	0.02	25.86	27.5	18.68
81	195.04	13.68	0	0	0	382.51	0	0.02	25.35	26.9	14.25
84	193.58	12.22	0	0.01	0	382.14	0	0.02	26.06	27.62	15.85
87	180.65	11.14	0	0.01	0	381.77	0	0.02	24.99	26.45	16.21
90	180.85	10.99	0	0.01	0	381.46	0	0.02	25.7	27.17	16.45
93	187.28	15.9	0	0.01	0	381.08	0	0.03	27.29	28.78	11.78
96	170.22	16.84	0	0.01	0	380.54	0	0.02	25.83	27.2	10.11
99	167.79	13.67	0	0.01	0	380.1	0	0.02	25.68	27.02	12.27
102	159.43	9.1	0	0.01	0	379.72	0	0.02	25.66	26.93	17.52
105	161.58	14.64	0	0	0	379.49	0	0.02	26.36	27.63	11.04
108	154.65	9.72	0	0.01	0	378.91	0	0.02	26.33	27.56	15.9
111	148.28	7.35	0	0.01	0	378.89	0	0.02	25.56	26.72	20.18
114	147.25	15.94	0	0	0	378.39	0	0.02	26.11	27.25	9.24
117	145.8	15.35	0	0	0	377.99	0	0.02	26.3	27.43	9.5
120	140.16	11.95	0	0.01	0	377.5	0	0.02	25.57	26.65	11.73
123	141.62	14.05	0	0	0	377.24	0	0.02	25.99	27.05	10.08
126	141.42	13.07	0	0.01	0	376.68	0	0.02	25.79	26.83	10.82
129	137.53	5.74	0	0.01	0	376.49	0	0.02	25.18	26.17	23.98
132	141.68	14.64	0	0	0	376.22	0	0.02	25.75	26.76	9.68
135	138.52	15.29	0	0	0	375.67	0	0.02	25.59	26.58	9.06

138	139.84	7.62	0	0.01	0	375.37	0	0.02	26.05	27.05	18.36
141	134.13	7.81	0	0.01	0	375.16	0	0.02	25.28	26.23	17.18
144	133.87	12.13	0	0.01	0	374.87	0	0.02	25.82	26.78	11.03
147	134.12	14.13	0	0.01	0	374.45	0	0.02	25.78	26.74	9.49
150	130.09	13.14	0	0.01	0	374.04	0	0.02	25.72	26.67	9.9
153	134.05	13.38	0	0	0	373.65	0	0.02	26.32	27.28	10.02
156	132.57	12.49	0	0	0	373.25	0	0.02	26.38	27.33	10.62
159	133.37	10.35	0	0.01	0	372.91	0	0.02	26.45	27.39	12.89
162	128.04	8.67	0	0.01	0	372.62	0	0.02	25.58	26.47	14.76
165	128.34	6.86	0	0.01	0	372.39	0	0.02	25.7	26.61	18.72
168	127.07	7.79	0	0.01	0	372.19	0	0.02	25.44	26.33	16.32
171	126.11	8.93	0	0.01	0	371.93	0	0.02	25.47	26.36	14.12
174	124.44	4.87	0	0.02	0	371.69	0	0.02	25.41	26.3	25.53
177	125.94	5.43	0	0.01	0	371.6	0	0.02	26.13	27.02	23.18
180	122.93	14.64	0	0.01	0	371.31	0	0.02	25.94	26.83	8.4
183	121.2	8.2	0	0.01	0	370.83	0	0.02	26.46	27.35	14.77
186	118.23	0.36	-0.01	0.31	0	370.83	0	0.02	25.76	26.63	332.08
189	116.59	2.66	0	0.04	0	370.73	0	0.02	26.16	27.03	43.82
192	117.76	9.42	0	0.01	0	370.64	0	0.02	25.98	26.85	12.5
195	116.47	7.57	0	0.01	0	370.22	0	0.02	26.09	26.94	15.38
198	114.49	8.28	0	0.01	0	370.16	0	0.02	25.42	26.25	13.83
201	113.33	14.35	0	0.01	0	369.69	0	0.02	25.87	26.7	7.89
204	113.62	15.17	0	0.01	0	369.35	0	0.02	26.09	26.93	7.49
207	107.79	7.97	0	0.01	0	368.84	0	0.02	25.18	25.99	13.52
210	111.33	5.65	0	0.02	0	368.83	0	0.02	26.09	26.93	19.69
213	111.28	12.45	0	0.01	0	368.44	0	0.02	25.99	26.81	8.94
216	111.8	5.16	0	0.02	0	368.18	0	0.03	26.38	27.21	21.68
219	113.1	3.16	0	0.03	0	368.09	0	0.02	26.21	27.04	35.78
222	110.61	8.45	0	0.01	0	367.93	0	0.02	25.89	26.7	13.09
225	110.44	11.88	0	0.01	0	367.6	0	0.02	25.78	26.6	9.29
228	109.24	7.47	0	0.01	0	367.27	0	0.02	25.8	26.61	14.63
231	106.38	8.52	0	0.01	0	367.12	0	0.02	25.27	26.06	12.49
234	110.91	8.95	0	0.01	0	366.77	0	0.02	26.24	27.06	12.39
237	109.43	7.05	0	0.02	0	366.6	0	0.02	26.18	27.01	15.52
240	108.41	3.81	0	0.03	0	366.35	0	0.02	25.99	26.81	28.49
243	108.34	7.2	0	0.02	0	366.32	0	0.02	25.82	26.63	15.04
246	109.02	10.05	0	0.01	0	365.92	0	0.02	25.81	26.63	10.85
249	110.47	5.35	0	0.02	0	365.77	0	0.02	25.99	26.8	20.65
252	108.11	8.56	0	0.01	0	365.54	0	0.02	25.61	26.42	12.63
255	111.33	18.18	0	0.01	0	365.21	0	0.02	26.04	26.87	6.13
258	107.59	23.54	0	0.01	0	364.49	0	0.02	25.71	26.52	4.57
261	106.79	12.12	0	0.01	0	363.92	0	0.02	25.52	26.33	8.81
264	108.19	11.23	0	0.01	0	363.7	0	0.02	25.92	26.74	9.63
267	108.1	13.89	0	0.01	0	363.21	0	0.02	25.46	26.27	7.78
270	109.8	8.04	0	0.02	0	362.92	0	0.02	25.47	26.28	13.66
273	110.22	10.75	0	0.01	0	362.68	0	0.02	25.62	26.45	10.25
276	111.36	8.74	0	0.02	0	362.3	0	0.02	25.38	26.19	12.74
279	112.92	9.72	0	0.01	0	362.14	0	0.02	25.95	26.79	11.62
282	113.5	6.36	0	0.02	0	361.74	0	0.02	25.84	26.66	17.84
285	114.57	9.53	0	0.01	0	361.71	0	0.02	25.91	26.73	12.02
288	113.48	11.8	0	0.01	0	361.17	0	0.02	25.65	26.48	9.61
291	116.85	10.6	0	0.01	0	361.03	0	0.02	25.77	26.61	11.02

294	112.05	8.89	0	0.01	0	360.54	0	0.02	25.07	25.9	12.61
297	118.7	6.92	0	0.02	0	360.49	0	0.02	25.91	26.77	17.15
300	116.24	11.09	0	0.01	0	360.09	0	0.02	25.55	26.4	10.48
303	120.44	4.01	0	0.03	0	359.9	0	0.02	25.77	26.63	30.07
306	119.22	7.19	0	0.02	0	359.79	0	0.02	25.57	26.42	16.59
309	117.68	4.09	0	0.03	0	359.5	0	0.02	25.41	26.27	28.8
312	120.4	11.81	0	0.01	0	359.47	0	0.02	25.84	26.71	10.2
315	116.22	15.35	0	0.01	0	358.82	0	0.02	25.65	26.52	7.57
318	117.19	6.28	0	0.02	0	358.63	0	0.02	25.58	26.43	18.66
321	118.3	11.65	0	0.01	0	358.35	0	0.02	26.18	27.05	10.15
324	115.74	12.22	0	0.01	0	357.97	0	0.02	25.67	26.53	9.47
327	117.6	6.63	0	0.02	0	357.67	0	0.02	26.06	26.94	17.72
330	115	-2.31	0	-0.06	0	357.59	0	0.02	25.52	26.39	-49.78
333	116.6	3.96	0	0.03	0	357.7	0	0.02	25.69	26.55	29.47
336	115.32	5.3	0	0.02	0	357.38	0	0.02	25.6	26.45	21.74
339	116.17	1.14	0	0.1	0	357.42	0	0.02	25.49	26.33	101.46
342	116.27	5.42	0	0.02	0	357.25	0	0.02	25.5	26.35	21.47
345	118.17	5.46	0	0.02	0	357.12	0	0.02	25.75	26.62	21.65
348	120.65	6.54	0	0.02	0	356.92	0	0.02	25.9	26.76	18.44
351	117.86	4.94	0	0.03	0	356.75	0	0.02	25.92	26.79	23.88
354	116.83	5.56	0	0.03	0	356.61	0	0.02	25.93	26.78	21.02
357	112.97	9.85	0	0.01	0	356.39	0	0.02	25.58	26.43	11.47
360	112.45	6.37	0	0.02	0	356.07	0	0.02	25.74	26.58	17.66
363	113.6	9.83	0	0.01	0	355.96	0	0.02	25.75	26.6	11.56
366	113.29	14.27	0	0.01	0	355.47	0	0.02	25.75	26.59	7.94
369	113.17	14	0	0.01	0	355.14	0	0.02	25.87	26.71	8.08
372	112.84	11.17	0	0.01	0	354.65	0	0.02	25.74	26.57	10.1
375	110.98	8.96	0	0.01	0	354.47	0	0.02	25.94	26.77	12.38
378	113.68	10.33	0	0.01	0	354.09	0	0.02	25.85	26.67	11
381	112.27	8.33	0	0.02	0	353.87	0	0.02	25.86	26.67	13.48
384	111.97	8.98	0	0.01	0	353.57	0	0.02	25.56	26.37	12.47
387	113.8	11.16	0	0.01	0	353.32	0	0.02	25.93	26.75	10.2
390	110.37	9.67	0	0.01	0	352.93	0	0.02	25.54	26.36	11.41
393	109.37	8.83	0	0.01	0	352.74	0	0.02	25.12	25.93	12.39
396	111.07	3.4	0	0.04	0	352.42	0	0.02	25.98	26.79	32.68
399	108.27	8.03	0	0.02	0	352.47	0	0.02	25.37	26.16	13.49
402	110.67	8.86	0	0.02	0	351.96	0	0.02	25.54	26.35	12.49
405	108.94	5.51	0	0.02	0	351.96	0	0.02	25.48	26.28	19.76
408	113.24	15.19	0	0.01	0	351.55	0	0.03	26.24	27.07	7.45
411	110.37	9.83	0	0.02	0	351.14	0	0.02	25.75	26.56	11.23
414	111.74	12.42	0	0.01	0	350.92	0	0.02	25.87	26.68	8.99
417	113.49	6.31	0	0.02	0	350.46	0	0.02	26.12	26.93	17.98
420	112.39	2.7	0	0.05	0	350.52	0	0.02	26.18	26.99	41.65
423	107.86	14.36	0	0.01	0	350.19	0	0.02	25.35	26.14	7.51
426	112.46	12.58	0	0.01	0	349.75	0	0.03	26.32	27.14	8.94
429	107.91	8.22	0	0.02	0	349.46	0	0.02	26.02	26.82	13.13
432	110.14	8.63	0	0.02	0	349.22	0	0.02	25.9	26.7	12.76
435	109.03	6.95	0	0.02	0	348.95	0	0.02	25.85	26.64	15.69
438	107.89	4.92	0	0.03	0	348.81	0	0.02	25.87	26.66	21.95
441	108.32	4.53	0	0.03	0	348.64	0	0.02	25.82	26.61	23.89
444	105.95	6.34	0	0.03	0	348.52	0	0.02	25.38	26.14	16.72
447	107.64	8.26	0	0.02	0	348.27	0	0.02	25.91	26.69	13.04

450	104.82	4.54	0	0.04	0	348.06	0	0.02	25.34	26.11	23.08
453	104.85	6.75	0	0.02	0	347.95	0	0.02	25.92	26.68	15.54
456	105.71	12.58	0	0.01	0	347.63	0	0.02	25.91	26.67	8.4
459	103.35	4.35	0	0.04	0	347.29	0	0.02	25.9	26.66	23.76
462	101.62	6.03	0	0.03	0	347.31	0	0.02	25.28	26.03	16.85
465	103.78	9.7	0	0.02	0	346.91	0	0.02	25.69	26.45	10.7
468	102.88	9.38	0	0.02	0	346.75	0	0.03	26.27	27.04	10.97
471	99.97	12.86	0	0.01	0	346.33	0	0.02	25.64	26.39	7.78
474	101.88	2.91	0	0.06	0	346.07	0	0.02	25.79	26.54	34.99
477	99.36	6.76	0	0.03	0	346.07	0	0.02	25.52	26.27	14.7
480	101.34	9.51	0	0.02	0	345.67	0	0.02	25.33	26.07	10.65
483	101.3	1.79	0	0.1	0	345.56	0	0.03	26.12	26.88	56.7
486	97.8	7.32	0	0.03	0	345.48	0	0.02	25.87	26.63	13.37
489	100.45	3.86	0	0.05	0	345.18	0	0.02	25.83	26.57	25.99
492	98.07	5.35	0	0.04	0	345.21	0	0.02	25.86	26.6	18.33
495	100.22	11.45	0	0.02	0	344.83	0	0.02	25.51	26.24	8.75
498	99.39	4.65	0	0.04	0	344.61	0	0.02	25.47	26.2	21.38
501	98.08	12.52	0	0.02	0	344.46	0	0.02	25.45	26.19	7.84
504	100.02	5.29	0	0.04	0	343.95	0	0.02	25.63	26.37	18.92
507	100.87	1	0	0.18	0	344.13	0	0.03	26.59	27.34	100.6
510	98.65	6.55	0	0.03	0	343.82	0	0.03	26.14	26.88	15.06
513	93.9	8.99	0	0.02	0	343.75	0	0.02	24.87	25.57	10.44
516	95.97	11.76	0	0.01	0	343.29	0	0.02	25.69	26.42	8.16
519	97.43	5.1	0	0.03	0	343.11	0	0.02	26.01	26.75	19.11
522	96.9	7.37	0	0.02	0	342.92	0	0.02	25.82	26.55	13.15
525	94.99	8.5	0	0.02	0	342.67	0	0.02	25.74	26.47	11.18
528	95.41	6.59	0	0.03	0	342.44	0	0.02	25.71	26.44	14.47
531	94.75	5.44	0	0.03	0	342.27	0	0.02	25.91	26.64	17.41
534	91.31	8.3	0	0.02	0	342.08	0	0.02	24.96	25.67	11
537	94.35	9.57	0	0.02	0	341.78	0	0.02	25.55	26.27	9.86
540	94.28	7.48	0	0.02	0	341.53	0	0.02	25.76	26.5	12.6
543	94.83	12.92	0	0.01	0	341.28	0	0.02	25.62	26.36	7.34
546	95.24	9.83	0	0.01	0	340.81	0	0.02	25.68	26.41	9.69
549	94.65	7	0	0.02	0	340.69	0	0.02	25.93	26.67	13.53
552	93.96	12.52	0	0.01	0	340.34	0	0.02	25.85	26.59	7.5
555	93.1	5.14	0	0.03	0	340.02	0	0.02	25.48	26.21	18.12
558	93.82	11.86	0	0.01	0	339.94	0	0.02	25.69	26.43	7.91
561	91.72	5.61	0	0.02	0	339.39	0	0.02	25.13	25.86	16.36
564	95.62	4.44	0	0.03	0	339.57	0	0.03	26.14	26.88	21.55
567	94.25	12.54	0	0.01	0	339.06	0	0.03	26	26.74	7.52
570	93.98	4.57	0	0.03	0	338.92	0	0.02	25.4	26.12	20.57
573	92.16	9.74	0	0.02	0	338.71	0	0.02	25.52	26.25	9.46
576	96.45	4.37	0	0.04	0	338.4	0	0.03	26.31	27.08	22.09
579	95.12	8.05	0	0.02	0	338.39	0	0.02	25.9	26.65	11.82
582	95.15	12.38	0	0.01	0	337.91	0	0.02	25.96	26.71	7.68
585	97.04	4.74	0	0.03	0	337.73	0	0.03	26	26.75	20.49
588	93.26	10.74	0	0.01	0	337.54	0	0.02	25.61	26.34	8.68
591	91.69	10.92	0	0.01	0	337.12	0	0.02	25.16	25.88	8.4
594	94.05	2.32	0	0.05	0	336.95	0	0.02	25.97	26.7	40.59
597	90.86	6.42	0	0.02	0	336.89	0	0.02	25.2	25.92	14.15
600	92.35	11.82	0	0.01	0	336.55	0	0.02	25.28	26.01	7.81
603	95.15	6.02	0	0.02	0	336.26	0	0.02	25.72	26.46	15.81

606	95.22	6.81	0	0.02	0	336.15	0	0.02	25.87	26.61	13.97
609	94.57	7.13	0	0.02	0	335.85	0	0.02	25.89	26.63	13.26
612	93.27	7.7	0	0.02	0	335.72	0	0.02	25.86	26.59	12.11
615	92.98	8.86	0	0.01	0	335.39	0	0.02	25.93	26.67	10.5
618	94.7	1.26	0	0.1	0	335.24	0	0.03	26.04	26.79	75.14
621	93.92	10.98	0	0.01	0	335.2	0	0.03	25.99	26.74	8.56
624	93.65	9.93	0	0.01	0	334.66	0	0.02	25.85	26.59	9.43
627	92.98	-0.96	0	-0.13	0	334.67	0	0.02	25.9	26.64	-96.71
630	94.89	13	0	0.01	0	334.55	0	0.03	26.15	26.9	7.3
633	95.54	11.88	0	0.01	0	333.99	0	0.03	26.25	26.99	8.04
636	92.23	3.22	0	0.04	0	333.89	0	0.02	25.46	26.18	28.63
639	92.02	6.04	0	0.02	0	333.71	0	0.02	25.26	25.98	15.23
642	92.15	8.92	0	0.01	0	333.52	0	0.02	25.82	26.56	10.33
645	92.24	12.09	0	0.01	0	333.19	0	0.02	25.91	26.65	7.63
648	90.52	2.93	0	0.04	0	332.88	0	0.02	25.33	26.07	30.87
651	91.56	5.65	0	0.02	0	332.93	0	0.02	25.84	26.58	16.19
654	96	14.78	0	0.01	0	332.5	0	0.03	26.74	27.5	6.5
657	92.41	5.93	0	0.02	0	332.16	0	0.02	25.76	26.5	15.58
660	89.74	7.39	0	0.01	0	332.08	0	0.02	25.6	26.32	12.15
663	90.65	9.09	0	0.01	0	331.71	0	0.02	25.42	26.15	9.97
666	88.27	4.05	0	0.02	0	331.58	0	0.02	25.38	26.11	21.79
669	87.34	7.98	0	0.01	0	331.41	0	0.02	25.47	26.2	10.94
672	91.5	7.82	0	0.01	0	331.12	0	0.03	26.28	27.04	11.7
675	88.71	7.94	0	0.01	0	330.94	0	0.03	26.18	26.93	11.17
678	90.72	10.38	0	0.01	0	330.63	0	0.02	25.85	26.59	8.74
681	89.41	5.17	0	0.02	0	330.37	0	0.03	26.07	26.81	17.28
684	88.77	8.72	0	0.01	0	330.26	0	0.02	25.9	26.63	10.18
687	89.88	10.89	0	0.01	0	329.85	0	0.02	25.6	26.32	8.26
690	87.44	1.91	0	0.05	0	329.68	0	0.02	25.41	26.13	45.82
693	85.55	11.11	0	0.01	0	329.62	0	0.02	25.29	26.01	7.7
696	87.37	8.06	0	0.01	0	329.09	0	0.02	25.71	26.44	10.84
699	86.64	2.96	0	0.03	0	329.15	0	0.03	25.97	26.71	29.25
702	88.44	14	0	0.01	0	328.81	0	0.03	26.24	26.99	6.32
705	87.84	7.5	0	0.01	0	328.42	0	0.02	25.73	26.44	11.71
708	86.45	7.44	0	0.01	0	328.32	0	0.02	25.89	26.62	11.62
711	86.96	11.26	0	0.01	0	327.95	0	0.02	25.68	26.4	7.72
714	85.19	4.36	0	0.02	0	327.72	0	0.02	25.28	25.99	19.55
717	87.44	5.67	0	0.02	0	327.64	0	0.03	26.03	26.77	15.43
720	88.18	7.12	0	0.01	0	327.37	0	0.03	25.94	26.67	12.39
723	86.7	6.26	0	0.02	0	327.23	0	0.02	25.91	26.64	13.86
726	87.11	9.2	0	0.01	0	326.97	0	0.03	25.94	26.68	9.47
729	85.43	4.94	0	0.02	0	326.72	0	0.02	25.66	26.38	17.29
732	84.56	4.6	0	0.02	0	326.65	0	0.02	25.54	26.26	18.37
735	88.73	9.53	0	0.01	0	326.41	0	0.03	26.29	27.02	9.31
738	86.04	7.11	0	0.01	0	326.13	0	0.02	25.8	26.52	12.1
741	87.65	4.15	0	0.02	0	325.99	0	0.03	26.11	26.84	21.11
744	87.05	8.83	0	0.01	0	325.83	0	0.03	25.93	26.66	9.86
747	87.06	9.56	0	0.01	0	325.48	0	0.03	25.99	26.72	9.1
750	87.78	3.97	0	0.02	0	325.3	0	0.02	25.63	26.36	22.11
753	88.51	4.73	0	0.02	0	325.2	0	0.03	26.34	27.08	18.71
756	89.32	0.01	-0.4	10.52	0	324.99	0	0.03	26.12	26.84	8931.96
759	87.69	0.01	-0.34	9.43	0	324.71	0	0.03	26.24	26.97	8768.7

Paper (stacked flat)**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	4.00
Peak Heat Release Rate (kW/m ²):	340.53
Time to Peak Heat Release Rate (s):	17.00
Total Heat Release (MJ/m ²):	90.49
60 s Average Heat Release Rate (kW/m ²):	230.93
Total Mass Loss (g):	73.04
Average Mass Loss Rate (g/s):	0.096
Average Effective Heat of Combustion (MJ/kg):	12.39
Average Smoke Extinction Area (m ² /kg):	2.69
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0132

Specimen:

Initial mass (g):	378.2
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	4
Time to flameout (s):	762

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	-1.35	0.01	-0.41	-0.04	0	378.27	0	0.03	25.49	25.91	-134.85
5	18.58	0.01	-0.35	-0.04	0	378.12	0	0.03	26.69	27.13	1858.01
8	80.44	29.49	0	0	0	377.37	0	0.02	22.65	23.27	2.73
11	204.04	22.97	0	0	45.67	376.51	0.45	0.02	22.12	23.25	8.88
14	324.45	17.84	0	0	0	375.99	0	0.02	23.41	24.84	18.19
17	340.53	19.38	0	0	0	375.39	0	0.02	23.77	25.33	17.57
20	312.8	18.5	0	0.01	0	374.84	0	0.02	24.51	26.21	16.91
23	285.6	19.82	0	0.01	0	374.27	0	0.02	24.92	26.7	14.41
26	267.93	17.29	0	0.01	0	373.67	0	0.02	24.63	26.42	15.5
29	260.28	22.16	0	0.01	0	373.19	0	0.02	24.45	26.26	11.74
32	261.08	23	0	0.01	0	372.38	0	0.02	24.49	26.35	11.35
35	263.31	14.42	0	0.02	0	371.87	0	0.02	24.06	25.94	18.27
38	270.7	18.04	0	0.01	0	371.43	0	0.02	23.6	25.49	15.01
41	284.21	20.6	0	0.01	0	370.8	0	0.02	24.66	26.65	13.8
44	278.86	11.78	0	0.02	0	370.27	0	0.02	25.12	27.11	23.67
47	262.95	17.35	0	0.01	0	369.99	0	0.02	25.33	27.31	15.15
50	252.58	18.04	0	0.01	0	369.25	0	0.02	25.68	27.63	14
53	231.76	18.68	0	0.01	0	368.91	0	0.02	24.92	26.75	12.41
56	226.14	19.95	0	0.01	0	368.13	0	0.02	25.45	27.27	11.34
59	214.1	15.04	0	0.02	0	367.76	0	0.02	25.33	27.07	14.23
62	210.63	19.29	0	0.01	0	367.17	0	0.02	25.57	27.3	10.92
65	205.37	9.65	0	0.02	0	366.69	0	0.02	25.33	27	21.29
68	205.56	11.05	0	0.02	0	366.52	0	0.02	25.69	27.34	18.6
71	206.82	20.5	0	0.01	0	365.97	0	0.02	26.29	27.95	10.09
74	197.6	12.98	0	0.02	0	365.4	0	0.02	25.75	27.31	15.23
77	190.55	12.97	0	0.02	0	365.14	0	0.02	25.96	27.49	14.69
80	186.6	15.95	0	0.02	0	364.6	0	0.02	26.68	28.2	11.7
83	170.95	10.61	0	0.02	0	364.24	0	0.02	25.57	26.96	16.12
86	164.51	12.59	0	0.01	0	363.92	0	0.02	25.66	27.02	13.06
89	161.85	17.07	0	0.01	0	363.47	0	0.02	25.69	27.01	9.48
92	157.43	12.71	0	0.02	0	362.96	0	0.02	25.57	26.85	12.39
95	155	7.22	0	0.03	0	362.72	0	0.02	25.64	26.89	21.48
98	149.21	9.82	0	0.02	0	362.46	0	0.02	25.49	26.7	15.2
101	144.41	12.82	0	0.01	0	362.12	0	0.02	25.72	26.92	11.26
104	141.51	8.46	0	0.02	0	361.74	0	0.02	25.76	26.92	16.72
107	142.84	10.77	0	0.01	0	361.57	0	0.02	26.47	27.63	13.27
110	139.4	12.94	0	0.01	0	361.1	0	0.02	26.41	27.53	10.77
113	136.15	5.98	0	0.03	0	360.85	0	0.02	26.11	27.21	22.77
116	132.79	12.13	0	0.01	0	360.66	0	0.02	25.84	26.91	10.95
119	129.42	9.75	0	0.02	0	360.18	0	0.02	25.46	26.49	13.27
122	132.45	8.29	0	0.02	0	360.07	0	0.02	25.8	26.82	15.98
125	132.02	12.66	0	0.02	0	359.64	0	0.02	25.99	27.01	10.42

128	132.5	6.91	0	0.03	0	359.37	0	0.02	25.68	26.67	19.18
131	136.45	14.76	0	0.01	0	359.14	0	0.02	26.21	27.21	9.24
134	133.39	12.33	0	0.01	0	358.55	0	0.02	25.82	26.8	10.82
137	132.2	2.39	0	0.05	0	358.45	0	0.02	25.98	26.96	55.32
140	131.41	15.03	0	0.01	0	358.26	0	0.02	25.42	26.37	8.75
143	133.68	12.32	0	0.01	0	357.65	0	0.02	26.17	27.15	10.85
146	130.21	2.08	0	0.03	0	357.58	0	0.02	25.74	26.69	62.5
149	129.58	4.46	0	0.02	0	357.44	0	0.02	25.78	26.73	29.05
152	130.61	2.11	0	0.04	0	357.33	0	0.02	25.9	26.84	61.76
155	127.94	12.49	0	0.01	0	357.23	0	0.02	25.9	26.82	10.24
158	129.2	11.8	0	0.01	0	356.66	0	0.02	26.38	27.31	10.95
161	124.27	0.06	-0.05	0.98	0	356.6	0	0.02	25.55	26.45	2011.49
164	119.51	10.07	0	0.01	0	356.51	0	0.02	25.31	26.18	11.86
167	119.51	13.32	0	0	0	356.04	0	0.02	25.6	26.48	8.97
170	122.43	3.66	0	0.01	0	355.8	0	0.02	26.1	26.99	33.48
173	117.74	9.32	0	0	0	355.71	0	0.02	25.59	26.44	12.64
176	119.57	14.38	0	0	0	355.24	0	0.02	26.07	26.93	8.31
179	115.98	8.56	0	0.01	0	354.93	0	0.02	25.4	26.23	13.54
182	113.43	8.05	0	0.01	0	354.69	0	0.02	25.35	26.18	14.08
185	114.33	8.01	0	0.01	0	354.43	0	0.02	25.79	26.63	14.28
188	115.04	12.55	0	0.01	0	354.18	0	0.02	25.84	26.68	9.16
191	116.24	8.96	0	0.01	0	353.73	0	0.02	26.18	27.01	12.97
194	111.27	9.91	0	0.01	0	353.62	0	0.02	25.63	26.43	11.22
197	108.95	15.7	0	0.01	0	353.11	0	0.02	25.38	26.19	6.94
200	109.85	7.89	0	0.01	0	352.76	0	0.02	25.32	26.13	13.92
203	106.64	11.63	0	0.01	0	352.56	0	0.02	25.2	26	9.17
206	109.31	12.22	0	0.01	0	352.09	0	0.02	25.75	26.56	8.95
209	109.39	4.91	0	0.02	0	351.88	0	0.02	25.74	26.54	22.26
212	104.91	12.51	0	0.01	0	351.69	0	0.02	25.55	26.36	8.39
215	106.01	7.99	0	0.01	0	351.2	0	0.02	25.74	26.55	13.27
218	108.14	18.73	0	0	0	351.12	0	0.02	26.12	26.94	5.77
221	107.94	21.9	0	0.01	0	350.13	0	0.03	26.38	27.2	4.93
224	103	10.62	0	0.02	0	349.91	0	0.02	25.57	26.36	9.7
227	101.32	10.26	0	0.02	0	349.43	0	0.02	25.01	25.8	9.87
230	106.61	-0.11	0.04	-1.51	0	349.34	0	0.02	25.7	26.52	0
233	106.07	10.3	0	0.02	0	349.29	0	0.02	25.91	26.73	10.3
236	106.53	16.74	0	0.01	0	348.75	0	0.02	25.92	26.73	6.36
239	106.52	3.49	0	0.05	0	348.43	0	0.02	25.95	26.75	30.55
242	102.59	5.27	0	0.04	0	348.44	0	0.02	25.36	26.15	19.47
245	102.6	12.39	0	0.01	0	348.07	0	0.02	25.4	26.21	8.28
248	106.8	6.2	0	0.03	0	347.79	0	0.02	25.71	26.51	17.22
251	103.42	6.88	0	0.03	0	347.65	0	0.02	25.44	26.23	15.03
254	106.34	8.99	0	0.02	0	347.36	0	0.02	25.71	26.52	11.83
257	106.86	6.21	0	0.03	0	347.15	0	0.02	25.6	26.41	17.21
260	108.31	6.36	0	0.03	0	346.97	0	0.02	25.94	26.76	17.03
263	109.29	11.51	0	0.02	0	346.73	0	0.03	26.46	27.31	9.5
266	106.96	7.5	0	0.03	0	346.34	0	0.02	25.81	26.63	14.26
269	108.19	5.45	0	0.04	0	346.27	0	0.02	25.89	26.72	19.86

272	106.91	16.19	0	0.01	0	345.93	0	0.02	25.63	26.45	6.6
275	105.58	8.04	0	0.02	0	345.42	0	0.02	25.12	25.95	13.14
278	105.88	2.52	0	0.07	0	345.43	0	0.02	25.34	26.17	42.03
281	106.44	13.04	0	0.01	0	345.16	0	0.02	25.73	26.56	8.16
284	110.43	12.41	0	0.01	0	344.73	0	0.03	26.7	27.57	8.9
287	109.44	6.84	0	0.02	0	344.46	0	0.02	26.08	26.93	16
290	108.38	5.54	0	0.02	0	344.28	0	0.02	26.15	27.01	19.55
293	108.51	8.15	0	0.02	0	344.09	0	0.02	26.07	26.94	13.32
296	108.74	11.46	0	0.01	0	343.79	0	0.02	25.83	26.68	9.49
299	107.32	4.83	0	0.02	0	343.47	0	0.02	25.72	26.56	22.21
302	108.41	5.96	0	0.01	0	343.45	0	0.02	26.28	27.14	18.18
305	107.6	10.65	0	0.01	0	343.09	0	0.02	25.44	26.27	10.1
308	109.78	7.22	0	0.01	0	342.87	0	0.02	25.65	26.48	15.21
311	104.33	7.8	0	0.01	0	342.63	0	0.02	24.96	25.78	13.38
314	108.34	7.05	0	0.01	0	342.4	0	0.02	25.81	26.65	15.36
317	108.85	8.29	0	0.01	0	342.19	0	0.02	25.61	26.44	13.14
320	106.8	13.1	0	0.01	0	341.89	0	0.02	25.84	26.68	8.15
323	108.32	5.39	0	0.02	0	341.49	0	0.02	25.75	26.59	20.11
326	109.65	8.25	0	0.01	0	341.49	0	0.02	25.74	26.56	13.29
329	111.39	25.04	0	0	0	340.9	0	0.02	26.23	27.08	4.45
332	109.36	14.83	0	0.01	0	340.18	0	0.02	26.05	26.89	7.37
335	111.84	1.39	0	0.07	0	340.04	0	0.02	26.12	26.97	80.55
338	115.63	8.83	0	0.01	0	339.94	0	0.03	26.87	27.73	13.09
341	107.37	12.47	0	0.01	0	339.53	0	0.02	25.14	25.94	8.61
344	110.27	3.43	0	0.03	0	339.28	0	0.02	25.67	26.5	32.13
347	109.67	6.29	0	0.02	0	339.24	0	0.02	25.25	26.07	17.44
350	110.65	16.6	0	0.01	0	338.86	0	0.02	25.93	26.78	6.67
353	111.71	7.33	0	0.02	0	338.38	0	0.02	25.98	26.83	15.24
356	115.17	5.52	0	0.02	0	338.36	0	0.02	26.12	26.97	20.88
359	111.4	25.6	0	0.01	0	337.9	0	0.02	25.68	26.51	4.35
362	114.22	23.15	0	0.01	0	336.99	0	0.02	25.52	26.35	4.93
365	121.77	6.01	0	0.05	0	336.63	0	0.02	25.73	26.57	20.27
368	124.41	4.57	0	0.05	0	336.51	0	0.02	25.4	26.23	27.25
371	122.51	11.18	0	0.02	0	336.29	0	0.02	25.6	26.43	10.96
374	122.93	9.77	0	0.02	0	335.9	0	0.02	25.6	26.42	12.58
377	121.41	5.54	0	0.03	0	335.72	0	0.02	25.89	26.73	21.93
380	116.44	7.74	0	0.02	0	335.52	0	0.02	25.71	26.55	15.04
383	114.27	10.94	0	0.02	0	335.25	0	0.02	25.86	26.7	10.45
386	116	7.65	0	0.02	0	334.91	0	0.03	26.34	27.2	15.16
389	110.49	10.1	0	0.02	0	334.75	0	0.02	25.64	26.47	10.94
392	110.27	9.75	0	0.02	0	334.32	0	0.02	25.63	26.46	11.31
395	109.69	2.77	0	0.05	0	334.21	0	0.02	25.35	26.17	39.64
398	107.51	13.93	0	0.01	0	334.03	0	0.02	25.04	25.85	7.72
401	109.16	14.75	0	0.01	0	333.44	0	0.02	25.5	26.33	7.4
404	111.52	2.44	0	0.06	0	333.24	0	0.02	25.86	26.7	45.63
407	111	9.31	0	0.02	0	333.17	0	0.02	25.8	26.63	11.93
410	110.64	14.95	0	0.01	0	332.69	0	0.02	25.82	26.66	7.4
413	111.44	5.99	0	0.03	0	332.37	0	0.02	25.78	26.61	18.59

416	110.98	3.49	0	0.05	0	332.28	0	0.02	25.45	26.27	31.83
419	113.65	10.32	0	0.02	0	332.09	0	0.02	26.18	27.03	11.02
422	113.78	12.92	0	0.01	0	331.7	0	0.02	26.1	26.95	8.81
425	107.25	5.14	0	0.03	0	331.39	0	0.02	25.14	25.94	20.85
428	107.74	4.4	0	0.03	0	331.34	0	0.02	25.29	26.1	24.47
431	110.94	13.28	0	0.01	0	331.06	0	0.02	25.85	26.69	8.35
434	110.59	6.97	0	0.02	0	330.64	0	0.02	25.9	26.75	15.87
437	109.53	0.8	0	0.17	0	330.64	0	0.02	25.83	26.67	136.45
440	107.29	15.11	0	0.01	0	330.46	0	0.02	25.35	26.17	7.1
443	109.48	11.96	0	0.01	0	329.85	0	0.02	25.62	26.44	9.15
446	105.37	2.76	0	0.04	0	329.78	0	0.02	25.07	25.87	38.22
449	109.89	12.19	0	0.01	0	329.56	0	0.02	25.91	26.73	9.02
452	110.92	18.82	0	0.01	0	329.07	0	0.02	26.04	26.87	5.89
455	107.86	7.04	0	0.02	0	328.56	0	0.02	25.71	26.53	15.32
458	106.14	10.11	0	0.01	0	328.56	0	0.02	25.27	26.08	10.5
461	109.76	11.1	0	0.01	0	327.96	0	0.02	25.54	26.35	9.89
464	111.53	0.36	-0.01	0.29	0	327.96	0	0.02	26.26	27.09	310.35
467	109.44	11.33	0	0.01	0	327.8	0	0.02	26.16	26.99	9.66
470	106.39	7.87	0	0.01	0	327.37	0	0.02	25.41	26.21	13.52
473	108.84	5.76	0	0.02	0	327.32	0	0.02	26.17	26.98	18.89
476	105.47	17.45	0	0	0	326.94	0	0.02	25.82	26.62	6.04
479	103.16	8.17	0	0.01	0	326.41	0	0.02	25.22	26.01	12.62
482	106.05	1.44	0	0.07	0	326.43	0	0.02	25.64	26.44	73.46
485	104.24	15.04	0	0.01	0	326.19	0	0.02	25.56	26.35	6.93
488	106.14	8.8	0	0.01	0	325.66	0	0.02	26.09	26.89	12.07
491	106.21	2.61	0	0.03	0	325.66	0	0.02	25.89	26.68	40.68
494	105.76	15.09	0	0.01	0	325.38	0	0.03	26.26	27.06	7.01
497	101.78	9.22	0	0.01	0.52	324.88	0	0.02	25.84	26.63	11.04
500	100.59	1.83	0	0.06	14.72	324.84	0.01	0.02	25.31	26.07	55.03
503	102.29	13.07	0	0.01	0.28	324.64	0	0.02	25.55	26.32	7.83
506	105.6	17.44	0	0.01	0	324.1	0	0.03	26.55	27.36	6.05
509	99.98	5.97	0	0.02	0	323.71	0	0.02	25.68	26.46	16.76
512	102.28	2.54	0	0.04	3.61	323.69	0	0.02	25.9	26.67	40.2
515	102.55	8.86	0	0.01	11.65	323.48	0.04	0.02	25.92	26.69	11.57
518	98.07	8.72	0	0.01	5.91	323.2	0.02	0.02	25.18	25.93	11.25
521	100.62	4.78	0	0.02	3.04	322.99	0.01	0.03	26.19	26.96	21.06
524	97.24	3.16	0	0.03	9.07	322.89	0.01	0.02	25.67	26.44	30.74
527	96.81	10.83	0	0.01	8.41	322.73	0.03	0.02	25.65	26.41	8.94
530	95.41	12.61	0	0.01	9.37	322.29	0.04	0.02	25.84	26.59	7.57
533	95.65	1.55	0	0.05	117.35	322.07	0.07	0.02	25.61	26.35	61.62
536	100.31	4.71	0	0.02	20.46	322.09	0.04	0.03	26.45	27.22	21.3
539	95.49	13.79	0	0.01	10.24	321.74	0.05	0.02	25.58	26.33	6.92
542	93.38	5.1	0	0.02	35.27	321.39	0.07	0.02	25.08	25.8	18.3
545	97.35	4.44	0	0.03	37.62	321.38	0.06	0.02	26.02	26.78	21.91
548	97.46	10.12	0	0.01	15.44	321.08	0.06	0.02	26.05	26.81	9.63
551	97.86	5.79	0	0.02	33.51	320.84	0.07	0.03	26.43	27.19	16.92
554	97.2	6.39	0	0.01	24.7	320.7	0.06	0.03	26.19	26.93	15.22
557	96.82	8.93	0	0.01	12.41	320.45	0.04	0.03	26.2	26.95	10.84

560	95.45	5.66	0	0.02	23.5	320.2	0.05	0.02	25.91	26.65	16.88
563	93.78	9.24	0	0.01	12.85	320.06	0.05	0.02	25.56	26.29	10.15
566	95.82	10.81	0	0.01	14.23	319.66	0.06	0.02	25.87	26.6	8.87
569	95.72	3.79	0	0.03	26.31	319.47	0.04	0.03	26.33	27.07	25.27
572	91.3	5.71	0	0.02	37.8	319.37	0.08	0.02	25.35	26.07	15.99
575	92.16	11.9	0	0.01	9	319.1	0.04	0.02	25.61	26.33	7.74
578	96.69	7.57	0	0.01	16.07	318.73	0.05	0.03	26.2	26.95	12.77
581	94.8	4.68	0	0.02	0.31	318.64	0	0.03	26.19	26.94	20.25
584	91.54	8.42	0	0.01	5.87	318.4	0.02	0.02	25.89	26.62	10.88
587	90.81	6.78	0	0.01	4.45	318.16	0.01	0.02	25.87	26.59	13.38
590	90.81	7.5	0	0.02	10.9	317.98	0.03	0.02	25.53	26.24	12.11
593	90.86	11.84	0	0.01	0	317.69	0	0.02	25.51	26.24	7.68
596	91.29	6.62	0	0.02	0.58	317.34	0	0.02	25.46	26.18	13.78
599	94.26	4.41	0	0.03	2.36	317.27	0	0.02	25.94	26.68	21.36
602	92.99	13.34	0	0.01	0	317	0	0.02	25.59	26.31	6.97
605	89.96	9.54	0	0.01	0	316.56	0	0.02	25.66	26.38	9.43
608	90.29	3.01	0	0.03	0	316.45	0	0.02	25.3	26.01	30.05
611	92.81	7.82	0	0.01	2.83	316.3	0.01	0.02	25.71	26.43	11.86
614	93.62	6.9	0	0.02	0	316.01	0	0.02	25.8	26.53	13.58
617	92.63	0.76	0	0.13	0	315.92	0	0.02	25.59	26.31	122.63
620	92.18	10.71	0	0.01	0	315.86	0	0.02	25.77	26.5	8.6
623	94.38	10.24	0	0.01	0	315.35	0	0.02	26	26.73	9.22
626	93.55	4.09	0	0.02	0	315.29	0	0.02	25.78	26.5	22.89
629	93.48	10.88	0	0.01	0	315.01	0	0.02	26.01	26.74	8.59
632	89.03	11.04	0	0.01	0	314.68	0	0.02	25.41	26.12	8.07
635	92.95	4.48	0	0.03	0	314.4	0	0.02	25.58	26.3	20.74
638	90.72	5.3	0	0.02	0	314.35	0	0.02	25.64	26.37	17.12
641	88.5	13.14	0	0.01	0	314.04	0	0.02	25.45	26.17	6.74
644	89.57	8.54	0	0.01	0	313.65	0	0.02	25.63	26.34	10.48
647	89.64	4.79	0	0.02	0	313.52	0	0.02	25.46	26.17	18.71
650	88.97	6.61	0	0.02	0	313.33	0	0.02	25.23	25.94	13.45
653	88.78	4.55	0	0.03	0	313.14	0	0.02	25.36	26.08	19.51
656	89.03	8.96	0	0.01	0	313.01	0	0.02	25.43	26.15	9.93
659	90.49	13.93	0	0.01	0	312.61	0	0.02	25.75	26.48	6.5
662	89.35	3.33	0	0.03	0	312.28	0	0.02	25.34	26.05	26.82
665	88.04	7.03	0	0.01	0	312.31	0	0.02	25.45	26.16	12.53
668	91.43	13.99	0	0.01	0	311.83	0	0.03	26.04	26.77	6.53
671	93.31	3.98	0	0.03	0	311.59	0	0.03	26.31	27.06	23.47
674	89.52	6.39	0	0.02	0	311.51	0	0.02	25.47	26.19	14.01
677	87.31	10.67	0	0.01	0	311.19	0	0.02	25.69	26.41	8.18
680	89.84	7.45	0	0.01	0	310.92	0	0.02	25.81	26.53	12.07
683	89.56	6.91	0	0.02	2.28	310.72	0.01	0.02	25.97	26.69	12.97
686	86.24	8.28	0	0.01	1.39	310.5	0	0.02	25.18	25.88	10.41
689	86.71	4.16	0	0.03	1.07	310.26	0	0.02	25.31	26.02	20.83
692	89.36	6.99	0	0.02	0	310.2	0	0.03	26.04	26.78	12.79
695	88.59	7.14	0	0.01	4.93	309.86	0.01	0.02	25.95	26.67	12.41
698	85.44	4.37	0	0.03	5.88	309.79	0.01	0.02	25.39	26.1	19.55
701	86.33	8.84	0	0.01	0.08	309.55	0	0.02	25.82	26.53	9.76

704	85.68	12.31	0	0.01	3.42	309.27	0.02	0.02	25.15	25.85	6.96
707	87.59	3.28	0	0.04	14.57	308.89	0.02	0.02	25.3	26.01	26.69
710	87.52	3.78	0	0.03	17.31	309.01	0.02	0.02	25.5	26.22	23.13
713	85.27	12.43	0	0.01	1.39	308.61	0.01	0.02	25.37	26.07	6.86
716	85.8	6.63	0	0.02	1.75	308.36	0	0.02	25.53	26.24	12.95
719	85.35	5.02	0	0.02	16.93	308.19	0.03	0.02	25.24	25.94	17
722	83.21	7.48	0	0.01	25.21	308.03	0.07	0.02	25.18	25.87	11.13
725	83.5	4.89	0	0.02	29.18	307.77	0.05	0.02	25.46	26.17	17.08
728	85.65	3.99	0	0.03	51.16	307.72	0.08	0.02	25.47	26.17	21.49
731	85.12	9.74	0	0.01	16.53	307.49	0.06	0.02	25.61	26.3	8.74
734	84.8	6.46	0	0.02	21.77	307.2	0.05	0.02	25.7	26.4	13.13
737	83.24	3.32	0	0.04	39.14	307.1	0.05	0.02	25.17	25.85	25.05
740	87.8	9.41	0	0.01	12.78	306.94	0.05	0.02	25.9	26.61	9.33
743	86.37	7.33	0	0.02	21.36	306.59	0.06	0.02	25.67	26.38	11.79
746	85.55	2.97	0	0.04	59.2	306.51	0.07	0.02	25.53	26.24	28.79
749	86.08	9.68	0	0.01	17.85	306.33	0.07	0.02	25.43	26.13	8.89
752	85.39	16.02	0	0.01	6.03	305.94	0.04	0.02	25.5	26.19	5.33
755	83.27	6.96	0	0.02	12.99	305.48	0.03	0.02	25.29	25.98	11.96
758	81.59	0.01	-0.29	12.13	22826.45	305.49	0.09	0.02	25.2	25.87	8158.96
761	84.34	0.01	-0.38	13.69	13182.69	305.23	0.05	0.02	25.66	26.36	8434.37

Paper (stacked flat)**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	4.00
Peak Heat Release Rate (kW/m ²):	329.49
Time to Peak Heat Release Rate (s):	17.00
Total Heat Release (MJ/m ²):	75.93
60 s Average Heat Release Rate (kW/m ²):	221.35
Total Mass Loss (g):	61.26
Average Mass Loss Rate (g/s):	0.080
Average Effective Heat of Combustion (MJ/kg):	12.39
Average Smoke Extinction Area (m ² /kg):	1.28
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0183

Specimen:

Initial mass (g):	400.7
Thickness (mm):	51
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	4
Time to flameout (s):	765

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	2.13	0.01	-0.31	-0.04	0	400.84	0	0.03	24.88	25.26	213.1
5	15.18	0.01	-0.39	0.71	0	400.61	0	0.03	24.45	24.83	1518.16
8	75.18	22.8	0	0	1.74	399.96	0.02	0.02	22.66	23.32	3.3
11	201.72	25.09	0	0	0.27	399.28	0	0.02	22.03	23.17	8.04
14	306.39	27.66	0	0	0	398.47	0	0.02	23.21	24.63	11.08
17	329.49	16.23	0	0.01	0	397.72	0	0.02	23.54	25.14	20.31
20	322.94	16.45	0	0.01	0	397.41	0	0.02	23.79	25.48	19.63
23	312.6	28.27	0	0.01	0	396.65	0	0.02	24	25.82	11.06
26	305.35	24.74	0	0.01	0	395.83	0	0.02	24.32	26.23	12.34
29	291.14	16.64	0	0.01	0	395.21	0	0.02	24.16	26.09	17.5
32	282.09	13.94	0	0.01	0	394.79	0	0.02	24.94	26.9	20.24
35	265.03	16.1	0	0.01	0	394.33	0	0.02	25.26	27.24	16.46
38	246.74	15.57	0	0.01	0	393.84	0	0.02	25.2	27.14	15.85
41	238.27	11.75	0	0.01	0	393.42	0	0.02	25.22	27.12	20.27
44	223.23	15.4	0	0.01	0	393.08	0	0.02	25.12	26.96	14.49
47	223.46	22.32	0	0.01	0	392.47	0	0.02	26.24	28.12	10.01
50	207.74	16.02	0	0.01	0	391.84	0	0.02	24.99	26.74	12.97
53	201.1	10.92	0	0.01	0	391.51	0	0.02	25.17	26.89	18.42
56	209.49	13.84	0	0.01	0	391.12	0	0.02	26.7	28.46	15.14
59	199.98	14.62	0	0.01	0	390.69	0	0.02	26.17	27.86	13.68
62	189.2	11.72	0	0.01	0	390.27	0	0.02	25.73	27.33	16.14
65	174.32	9.71	0	0.01	0	389.98	0	0.02	24.73	26.22	17.94
68	176.9	10.73	0	0.01	0	389.67	0	0.02	26	27.54	16.48
71	167.9	12.77	0	0.01	0	389.33	0	0.02	25.61	27.06	13.14
74	161.86	14.65	0	0	0	388.9	0	0.02	25.65	27.06	11.05
77	156.71	16.07	0	0	0	388.45	0	0.02	25.27	26.61	9.75
80	155.28	15.71	0	0	0	387.95	0	0.02	25.28	26.59	9.89
83	156.03	12.73	0	0.01	0	387.53	0	0.02	25.66	26.96	12.26
86	156.48	9.34	0	0.01	0	387.19	0	0.02	25.35	26.63	16.75
89	160.5	9.38	0	0.02	0	386.94	0	0.02	25.45	26.71	17.1
92	160.34	13.05	0	0.01	0	386.6	0	0.02	25.53	26.76	12.28
95	162.36	14.53	0	0.01	0	386.18	0	0.02	26.1	27.33	11.18
98	159.49	12.96	0	0.01	0	385.75	0	0.02	26.11	27.31	12.31
101	153.36	10.78	0	0.01	0	385.4	0	0.02	25.67	26.83	14.22
104	147.9	11.04	0	0.01	0	385.09	0	0.02	25.75	26.88	13.39
107	148.57	12.18	0	0.01	0	384.73	0	0.02	26.43	27.57	12.2
110	148.05	13	0	0.01	0	384.36	0	0.02	26.06	27.15	11.39
113	142.83	11.28	0	0.01	0	383.97	0	0.02	25.79	26.85	12.66
116	137.78	8.08	0	0.01	0	383.69	0	0.02	25.41	26.46	17.06
119	135.46	11.17	0	0.01	0	383.45	0	0.02	25.53	26.54	12.12
122	133.55	9.95	0	0.01	0	383.05	0	0.02	25.45	26.44	13.42
125	133.01	7.09	0	0.02	0	382.86	0	0.02	26.11	27.1	18.76

128	131.5	9.56	0	0.01	0	382.59	0	0.02	25.73	26.69	13.76
131	131.15	11.85	0	0.01	0	382.29	0	0.02	26.04	26.99	11.07
134	125.96	8.16	0	0.01	0	381.92	0	0.02	25.61	26.54	15.43
137	124.75	4.79	0	0.02	0	381.79	0	0.02	25.84	26.76	26.06
140	122.88	13.27	0	0.01	0	381.55	0	0.02	25.82	26.71	9.26
143	119.4	12.67	0	0.01	0	381.06	0	0.02	25.81	26.69	9.42
146	115.29	6.35	0	0.02	0	380.84	0	0.02	25.36	26.21	18.17
149	115.28	5.19	0	0.03	0	380.64	0	0.02	25.69	26.53	22.19
152	110.72	9.23	0	0.02	0	380.49	0	0.02	25.41	26.23	11.99
155	108.25	7	0	0.03	0	380.13	0	0.02	25.72	26.55	15.46
158	108.11	5.5	0	0.04	0	380.06	0	0.02	25.8	26.6	19.66
161	104.66	10.7	0	0.02	0	379.75	0	0.02	25.12	25.88	9.78
164	105.63	10.01	0	0.02	0	379.46	0	0.02	25.53	26.3	10.55
167	105.55	8.75	0	0.03	0	379.16	0	0.02	25.88	26.64	12.07
170	105.76	6.56	0	0.04	0	378.94	0	0.02	26.11	26.88	16.13
173	100.56	7.96	0	0.03	0	378.74	0	0.02	25.78	26.53	12.63
176	97.53	6.65	0	0.04	0	378.48	0	0.02	25.86	26.59	14.66
179	95.7	2.42	0	0.1	0	378.36	0	0.02	25.54	26.25	39.49
182	96.17	6.49	0	0.04	0	378.27	0	0.02	25.85	26.56	14.83
185	92.1	16.43	0	0.01	0	377.94	0	0.02	25.69	26.4	5.6
188	88.32	8.69	0	0.03	0	377.41	0	0.02	25.27	25.96	10.16
191	91.55	0.73	0	0.33	0	377.42	0	0.02	25.77	26.47	124.8
194	89.36	10.27	0	0.02	0	377.25	0	0.02	25.75	26.45	8.7
197	87.04	7.19	0	0.03	0	376.89	0	0.02	25.46	26.15	12.11
200	91.36	-1.73	0	-0.12	0	376.86	0	0.03	26.1	26.81	-52.96
203	91.32	6.47	0	0.03	0	376.86	0	0.02	25.73	26.42	14.12
206	90.41	16.67	0	0.01	0	376.46	0	0.02	25.78	26.48	5.42
209	87.47	6.39	0	0.03	0	376.01	0	0.02	25.58	26.27	13.68
212	88.8	0.67	0	0.25	0	376.04	0	0.02	25.48	26.16	131.74
215	88.35	13.35	0	0.01	0	375.84	0	0.02	25.65	26.34	6.62
218	88.05	8.38	0	0.02	0	375.36	0	0.02	25.89	26.6	10.51
221	87.9	-1.78	0	-0.1	0	375.38	0	0.02	25.93	26.63	-49.35
224	88.29	6.32	0	0.03	0	375.34	0	0.02	25.68	26.38	13.96
227	88.45	11.26	0	0.02	0	375.02	0	0.02	25.59	26.29	7.86
230	88.53	8.42	0	0.02	0	374.72	0	0.02	25.89	26.6	10.52
233	87.52	5.48	0	0.03	0	374.52	0	0.02	25.6	26.31	15.98
236	85.9	4.93	0	0.03	0	374.37	0	0.02	25.17	25.87	17.41
239	86.45	6.18	0	0.03	0	374.2	0	0.02	25.64	26.36	13.98
242	84.34	6.82	0	0.02	0	374.01	0	0.02	25.62	26.33	12.37
245	84.5	6.63	0	0.02	0	373.8	0	0.03	25.97	26.68	12.74
248	86.68	8.61	0	0.02	0	373.59	0	0.03	26.1	26.82	10.07
251	86.5	9.05	0	0.02	0	373.3	0	0.02	25.86	26.57	9.55
254	82.7	4.24	0	0.04	0	373.09	0	0.02	25.24	25.94	19.5
257	82.9	5.99	0	0.03	0	373	0	0.02	25.09	25.78	13.84
260	86.93	9.13	0	0.02	0	372.72	0	0.03	25.94	26.67	9.52
263	85.38	6.61	0	0.03	0	372.49	0	0.02	25.6	26.31	12.91
266	82.78	1.97	0	0.08	0	372.33	0	0.02	25.64	26.37	42.01
269	81.53	3.91	0	0.04	0	372.32	0	0.02	25.46	26.18	20.87

272	84.01	14.78	0	0.01	0	372.04	0	0.02	25.63	26.35	5.68
275	83.8	8.5	0	0.02	0	371.56	0	0.02	25.53	26.25	9.86
278	81.47	1.15	0	0.11	0	371.54	0	0.02	25.38	26.09	70.82
281	84.71	10.6	0	0.01	0	371.37	0	0.02	25.86	26.58	7.99
284	82.46	10.82	0	0.01	0	370.97	0	0.02	25.04	25.74	7.62
287	81.49	0.25	-0.02	0.58	0	370.8	0	0.02	25.39	26.1	327.12
290	81.03	0.6	-0.01	0.22	0	370.87	0	0.02	25.56	26.28	134.49
293	82.59	12.37	0	0.01	0	370.68	0	0.03	25.9	26.63	6.68
296	81.75	9.3	0	0.01	0	370.24	0	0.02	25.6	26.32	8.79
299	79.76	0.52	-0.01	0.27	0	370.16	0	0.02	25.54	26.25	154.26
302	83.03	8.37	0	0.02	0	370.09	0	0.03	26.43	27.16	9.92
305	79.55	13.08	0	0.01	0	369.68	0	0.02	25.55	26.25	6.08
308	79.62	4.4	0	0.04	0	369.4	0	0.02	25.84	26.55	18.11
311	77.62	2.35	0	0.06	25.41	369.37	0.02	0.02	25.75	26.46	33.05
314	77.26	8.39	0	0.02	8.93	369.2	0.03	0.02	25.16	25.85	9.2
317	82.78	7.63	0	0.02	0	368.92	0	0.03	26.1	26.82	10.85
320	80.9	3.41	0	0.04	21.05	368.77	0.03	0.02	25.66	26.37	23.76
323	78.13	7.2	0	0.02	5.89	368.66	0.02	0.02	25.13	25.82	10.85
326	78.91	10.07	0	0.01	7	368.34	0.03	0.02	25.48	26.19	7.84
329	79.71	5.51	0	0.02	1.67	368.1	0	0.02	25.52	26.22	14.47
332	80.46	5.55	0	0.02	5.97	367.98	0.01	0.02	25.61	26.3	14.49
335	80.21	7.96	0	0.01	2.96	367.75	0.01	0.03	25.96	26.67	10.08
338	78.2	5.19	0	0.02	2.13	367.54	0	0.02	25.63	26.33	15.06
341	79.98	6.73	0	0.02	4.79	367.42	0.01	0.03	25.85	26.56	11.89
344	80.58	5.95	0	0.02	19.73	367.15	0.04	0.03	26	26.71	13.54
347	77.63	5.61	0	0.03	13.92	367.05	0.03	0.02	25.73	26.44	13.85
350	76.86	8.22	0	0.02	4.52	366.79	0.01	0.02	25.79	26.5	9.35
353	78.03	6.73	0	0.02	13.5	366.59	0.03	0.02	25.76	26.46	11.59
356	79.23	6.93	0	0.02	15.66	366.38	0.04	0.02	25.78	26.48	11.43
359	78.22	4.38	0	0.03	10.13	366.19	0.02	0.03	25.9	26.59	17.88
362	77.3	9.69	0	0.01	1.61	366.06	0.01	0.03	26.05	26.75	7.98
365	76.93	8.28	0	0.02	3.18	365.65	0.01	0.03	25.84	26.53	9.29
368	76.69	1.97	0	0.08	92.62	365.6	0.07	0.02	25.42	26.09	38.84
371	76.95	7.74	0	0.02	9.58	365.45	0.03	0.02	25.35	26.03	9.94
374	76.67	12.79	0	0.01	14.31	365.14	0.07	0.02	25.48	26.17	6
377	76.26	7.67	0	0.02	18.87	364.76	0.05	0.02	25.69	26.38	9.95
380	75.2	-3.11	0	-0.05	-32.13	364.72	0.04	0.02	25.38	26.06	-24.18
383	77	1.99	0	0.07	41.43	364.83	0.03	0.02	25.53	26.21	38.63
386	76.96	16.54	0	0.01	6.63	364.53	0.04	0.03	26.17	26.87	4.65
389	77.58	11.83	0	0.01	6.63	363.98	0.03	0.03	26.31	27.01	6.56
392	74.74	0.41	-0.01	0.36	206.47	363.87	0.03	0.02	25.1	25.77	183.59
395	77.33	5.87	0	0.03	45.07	363.83	0.1	0.03	25.81	26.51	13.18
398	78.52	8.71	0	0.02	7.72	363.53	0.03	0.03	26.14	26.85	9.01
401	75.72	2.67	0	0.06	35.36	363.37	0.04	0.02	25.6	26.3	28.34
404	75.89	4.39	0	0.03	4.65	363.32	0.01	0.03	25.79	26.49	17.3
407	76.77	10.63	0	0.02	0.55	363.08	0	0.03	25.83	26.51	7.22
410	75.34	8.23	0	0.02	10.94	362.74	0.03	0.02	25.55	26.23	9.16
413	72.67	4.81	0	0.03	0	362.59	0	0.02	25.2	25.87	15.12

416	75.09	8.25	0	0.02	0	362.4	0	0.02	25.68	26.38	9.11
419	77.93	12.29	0	0.01	0	362.1	0	0.03	25.87	26.57	6.34
422	80.51	5.21	0	0.03	0	361.75	0	0.03	26.35	27.07	15.45
425	76.55	2.53	0	0.06	0	361.75	0	0.02	25.32	26	30.21
428	75.57	9.2	0	0.02	1.24	361.53	0	0.02	25.41	26.09	8.21
431	77.71	4.99	0	0.03	0	361.28	0	0.03	25.85	26.55	15.56
434	77.73	-0.84	0	-0.17	0	361.24	0	0.02	25.17	25.85	-92.81
437	80.48	6.02	0	0.02	0	361.23	0	0.03	26.1	26.81	13.37
440	77.95	14.72	0	0.01	0	360.87	0	0.02	25.3	26	5.3
443	77.62	8.52	0	0.01	0	360.46	0	0.02	25.22	25.91	9.11
446	80.94	-0.36	0.01	-0.33	0	360.38	0	0.02	25.42	26.13	-225.96
449	81.7	3.46	0	0.03	0	360.39	0	0.03	25.94	26.65	23.58
452	79.72	10.59	0	0.01	0	360.14	0	0.03	25.89	26.61	7.53
455	77.07	4.42	0	0.03	0	359.84	0	0.02	25.62	26.33	17.45
458	78.02	3.94	0	0.04	0	359.84	0	0.02	25.5	26.2	19.78
461	77.9	12.84	0	0.01	0	359.54	0	0.02	25.38	26.08	6.07
464	80.61	11.78	0	0.01	0	359.14	0	0.02	25.63	26.34	6.85
467	80.13	4.5	0	0.03	0	358.88	0	0.02	25.67	26.38	17.8
470	80.57	3.41	0	0.04	0	358.83	0	0.03	25.8	26.5	23.64
473	79.4	6.32	0	0.02	0	358.64	0	0.03	25.96	26.67	12.57
476	77.01	9.99	0	0.02	0	358.44	0	0.02	25.34	26.02	7.71
479	77.86	11.65	0	0.01	0	358.06	0	0.02	25.48	26.17	6.68
482	79.29	7.63	0	0.02	0	357.79	0	0.02	25.36	26.05	10.4
485	79.03	0.96	0	0.17	0	357.63	0	0.02	25.48	26.18	82.55
488	78.25	-2.01	0	-0.09	0	357.69	0	0.02	25.41	26.12	-38.97
491	78.68	7.72	0	0.02	0	357.65	0	0.02	25.55	26.26	10.19
494	81.01	13.64	0	0.01	0	357.26	0	0.03	25.8	26.52	5.94
497	80.32	8.63	0	0.02	0	356.92	0	0.02	25.38	26.08	9.31
500	81.23	0.03	-0.14	6.06	0	356.77	0	0.03	25.77	26.48	2839.86
503	77.86	0.81	0	0.19	0	356.84	0	0.02	25.42	26.12	95.87
506	78.18	12.61	0	0.01	0	356.64	0	0.02	25.62	26.33	6.2
509	77.27	14.36	0	0.01	0	356.16	0	0.02	25.55	26.25	5.38
512	79.06	7.37	0	0.02	0	355.85	0	0.03	25.89	26.6	10.73
515	80.11	4.08	0	0.04	0	355.7	0	0.02	25.65	26.35	19.62
518	80	1.96	0	0.08	0	355.59	0	0.02	25.71	26.41	40.8
521	78.19	3.26	0	0.05	0	355.55	0	0.03	25.8	26.5	24
524	77.47	7.82	0	0.02	0	355.37	0	0.02	25.7	26.39	9.91
527	81.3	8.57	0	0.02	0	355.11	0	0.03	26.38	27.09	9.49
530	79.22	7.01	0	0.02	0	354.88	0	0.02	25.53	26.21	11.3
533	76.55	1.77	0	0.09	0	354.71	0	0.02	25.2	25.88	43.15
536	76.76	0.29	-0.01	0.53	0	354.74	0	0.03	25.75	26.44	268.47
539	77.61	10.2	0	0.01	0	354.61	0	0.02	25.57	26.26	7.61
542	77.56	16.35	0	0.01	0	354.15	0	0.02	25.43	26.11	4.74
545	79.92	9.6	0	0.01	0	353.73	0	0.03	26.02	26.71	8.32
548	78.01	2.09	0	0.07	0	353.59	0	0.02	25.44	26.13	37.4
551	75.94	1.98	0	0.07	0	353.54	0	0.02	24.98	25.66	38.4
554	79.31	8.68	0	0.02	0	353.42	0	0.03	26.11	26.82	9.14
557	77.98	11.84	0	0.01	0	353.05	0	0.02	25.27	25.95	6.59

560	78.28	3.8	0	0.04	0	352.78	0	0.02	25.3	25.99	20.6
563	78.29	6.42	0	0.03	0	352.75	0	0.02	25.57	26.26	12.19
566	79.44	10.81	0	0.01	0	352.38	0	0.03	25.94	26.64	7.35
569	79.16	5.26	0	0.03	0	352.17	0	0.03	25.98	26.69	15.04
572	76.9	5.96	0	0.03	0	352.03	0	0.02	25.49	26.19	12.9
575	76.1	9.03	0	0.02	0	351.79	0	0.02	25.19	25.88	8.42
578	78.13	10.37	0	0.02	0	351.5	0	0.03	25.76	26.46	7.53
581	79.52	4.56	0	0.03	0	351.22	0	0.02	25.65	26.35	17.43
584	79.32	2.59	0	0.06	0	351.2	0	0.02	25.48	26.18	30.59
587	77.61	8.59	0	0.02	0	351.01	0	0.02	25.23	25.93	9.03
590	77.47	11.03	0	0.01	0	350.71	0	0.03	25.77	26.49	7.02
593	75.74	9.04	0	0.02	0	350.39	0	0.02	25.41	26.12	8.38
596	77.81	3.56	0	0.04	0	350.19	0	0.02	25.65	26.36	21.83
599	78.08	1.72	0	0.08	0	350.14	0	0.02	25.67	26.37	45.28
602	79.53	7.67	0	0.02	0	350.03	0	0.03	26.17	26.89	10.37
605	76.41	6.94	0	0.02	0	349.73	0	0.02	25.4	26.1	11.01
608	75.04	3.71	0	0.04	0	349.63	0	0.02	25.06	25.75	20.24
611	78.1	8.14	0	0.02	0	349.45	0	0.02	25.61	26.32	9.6
614	77.9	11.46	0	0.01	0	349.15	0	0.02	25.56	26.27	6.8
617	76.56	9.51	0	0.02	0	348.81	0	0.02	25.63	26.34	8.05
620	77.93	1.26	0	0.12	0	348.63	0	0.03	25.91	26.63	61.84
623	78.7	0.21	-0.02	0.76	0	348.67	0	0.03	26.03	26.74	367.16
626	78.29	10.3	0	0.02	0	348.53	0	0.03	25.76	26.47	7.6
629	76.53	13.09	0	0.01	0	348.11	0	0.02	25.73	26.44	5.85
632	75.22	5.66	0	0.03	0	347.83	0	0.02	25.4	26.09	13.29
635	75.09	-1.07	0	-0.14	0	347.77	0	0.02	25.18	25.86	-70.07
638	76.77	2.17	0	0.08	0	347.81	0	0.02	25.66	26.36	35.34
641	76.2	7.72	0	0.02	0	347.61	0	0.02	25.5	26.19	9.87
644	79.76	11.88	0	0.01	0	347.36	0	0.03	26.29	27.01	6.72
647	77.32	12.01	0	0.01	0	346.94	0	0.03	25.83	26.54	6.44
650	75.79	4.04	0	0.04	0	346.7	0	0.02	25.72	26.42	18.76
653	74.87	1.23	0	0.13	0	346.65	0	0.02	25.42	26.11	60.82
656	78.28	8.11	0	0.02	0	346.56	0	0.03	25.95	26.66	9.65
659	77.57	10.06	0	0.01	0	346.2	0	0.03	25.83	26.53	7.71
662	74.72	1.78	0	0.08	14.29	346.02	0.01	0.02	25.22	25.9	41.95
665	73.4	4.62	0	0.03	0	346.02	0	0.02	25.15	25.84	15.9
668	73.56	11.95	0	0.01	0	345.71	0	0.02	25.55	26.25	6.16
671	75.89	9.9	0	0.01	0	345.37	0	0.02	25.52	26.22	7.67
674	77.22	1.99	0	0.07	0	345.17	0	0.02	25.52	26.21	38.85
677	76.34	-0.22	0.02	-0.59	0	345.21	0	0.02	25.68	26.37	-342.41
680	74.55	6.94	0	0.02	0	345.1	0	0.03	25.78	26.47	10.74
683	73.1	12.63	0	0.01	0	344.8	0	0.02	25.65	26.34	5.79
686	73.04	11.9	0	0.01	0	344.4	0	0.02	25.35	26.04	6.14
689	74.76	5.57	0	0.03	0	344.13	0	0.02	25.5	26.19	13.43
692	77.68	-0.14	0.03	-1.08	0	344.06	0	0.03	25.96	26.66	-551.17
695	75.78	1.8	0	0.08	0	344.08	0	0.03	25.99	26.68	41.99
698	74.5	9.55	0	0.02	0	343.91	0	0.02	25.67	26.36	7.8
701	72.47	12.04	0	0.01	0	343.55	0	0.02	25.14	25.81	6.02

704	74.64	4.84	0	0.03	0	343.26	0	0.02	25.51	26.2	15.42
707	75.36	-0.89	0	-0.16	0	343.25	0	0.03	25.93	26.63	-84.85
710	74.35	4.85	0	0.03	0	343.23	0	0.03	26.12	26.81	15.33
713	72.4	9.38	0	0.02	0	342.96	0	0.03	25.73	26.41	7.72
716	72.47	7.24	0	0.02	0	342.71	0	0.02	25.31	25.98	10.01
719	74.47	6.85	0	0.02	0	342.51	0	0.02	25.56	26.23	10.88
722	73.72	10.38	0	0.01	0	342.28	0	0.02	25.68	26.35	7.1
725	72.12	8.52	0	0.02	0	341.93	0	0.03	25.73	26.4	8.47
728	71.4	1.19	0	0.12	0	341.8	0	0.02	25.47	26.15	60.23
731	72.97	6.14	0	0.02	0	341.78	0	0.02	25.45	26.14	11.89
734	73.01	10.37	0	0.01	0	341.44	0	0.02	25.31	25.99	7.04
737	74.17	4.49	0	0.03	0	341.23	0	0.02	25.6	26.28	16.54
740	74.13	0.47	-0.01	0.26	0	341.15	0	0.03	25.8	26.48	156.56
743	71.77	8.03	0	0.01	0	341.11	0	0.03	25.86	26.53	8.94
746	69.93	15.65	0	0.01	0	340.68	0	0.02	25.07	25.74	4.47
749	72.23	6.49	0	0.02	0	340.3	0	0.02	25.47	26.15	11.13
752	75.09	-0.56	0.01	-0.22	0	340.27	0	0.03	25.99	26.7	-135.09
755	75.63	5.15	0	0.02	0	340.23	0	0.03	26.18	26.87	14.69
758	72.84	8.98	0	0.01	0	339.97	0	0.03	25.85	26.54	8.11
761	72.18	0.01	-0.31	10.39	0	339.74	0	0.03	25.76	26.44	7218.47
764	73.27	0.01	-0.29	10	0	339.58	0	0.03	26.04	26.73	7327.35

Paper (stacked on edge)**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	3.00
Peak Heat Release Rate (kW/m ²):	289.77
Time to Peak Heat Release Rate (s):	16.00
Total Heat Release (MJ/m ²):	65.17
60 s Average Heat Release Rate (kW/m ²):	150.61
Total Mass Loss (g):	34.66
Average Mass Loss Rate (g/s):	0.050
Average Effective Heat of Combustion (MJ/kg):	9.40
Average Smoke Extinction Area (m ² /kg):	56.61
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0003

Specimen:

Initial mass (g):	385
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	91
Time to ignition (s):	3
Time to flameout (s):	690

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	10.79	0.01	-0.83	-0.07	0	385.07	0	0.03	25.37	25.81	1078.84
4	13.54	0.01	-0.87	-0.08	0	385.14	0	0.03	26.35	26.8	1354.38
7	46.61	29.25	0	0	3.76	384.86	0.02	0.03	25.82	26.29	1.59
10	130.95	25.47	0	0	66.41	384.37	0.35	0.02	23.57	24.21	5.14
13	244.55	6.47	0	0.01	262.17	384.16	0.33	0.03	24.87	25.7	37.8
16	289.77	-0.9	0.01	-0.05	-825.04	384.13	0.14	0.03	26.03	26.93	-320.19
19	239.99	5.57	0	0.02	0	384.13	0	0.03	25.29	26.16	43.09
22	180.64	12.72	0	0.01	0	383.96	0	0.03	25.39	26.24	14.2
25	131.67	10.1	0	0.02	0	383.79	0	0.03	25.46	26.28	13.04
28	100.04	1.49	0	0.14	0	383.68	0	0.03	25.72	26.52	67.03
31	84.26	4.53	0	0.02	0	383.69	0	0.03	25.21	25.97	18.58
34	90.67	23.26	0	0	0	383.49	0	0.03	25.07	25.86	3.9
37	115.56	27.06	0	0	0	383.05	0	0.03	25.2	26.02	4.27
40	144.92	16.82	0	0	0	382.73	0	0.02	24.92	25.78	8.61
43	167.78	12.35	0	0	0	382.53	0	0.02	24.64	25.53	13.58
46	183.71	22.52	0	0	1.46	382.31	0.01	0.02	25.14	26.09	8.16
49	195.92	25.79	0	0	0	381.88	0	0.03	25.41	26.38	7.6
52	201.03	11.27	0	0	0	381.6	0	0.02	25.35	26.34	17.84
55	197.81	3.12	0	0.01	20.69	381.52	0.01	0.02	25.17	26.17	63.43
58	196.63	11.66	0	0	0	381.44	0	0.02	24.96	25.97	16.86
61	195.99	24.71	0	0	0	381.14	0	0.02	25.13	26.14	7.93
64	187.72	28.41	0	0	0	380.74	0	0.02	24.84	25.85	6.61
67	180.04	21.75	0	0	0	380.34	0	0.02	25.03	26.04	8.28
70	181.89	12.08	0	0	0	380.1	0	0.03	25.7	26.73	15.05
73	179.59	10.18	0	0	0	379.94	0	0.03	25.97	27	17.64
76	169.11	19.34	0	0	0	379.75	0	0.02	25.41	26.41	8.75
79	165.24	19.75	0	0	0	379.39	0	0.02	25.42	26.4	8.37
82	160.74	10.49	0	0	0	379.19	0	0.02	24.97	25.92	15.33
85	163.86	7.95	0	0	0	379.06	0	0.03	25.84	26.8	20.61
88	153.15	9.61	0	0	0	378.93	0	0.02	24.88	25.8	15.93
91	150.21	20.76	0	0	0	378.73	0	0.02	25.45	26.38	7.24
94	148.38	25.11	0	0	0	378.34	0	0.02	25.42	26.33	5.91
97	147.19	19.48	0	0	0	378.02	0	0.03	25.96	26.88	7.56
100	138.76	9.42	0	0	0	377.77	0	0.03	25.69	26.58	14.74
103	137.26	9.41	0	0	0	377.7	0	0.03	26.42	27.33	14.59
106	134.23	20.58	0	0	0	377.45	0	0.03	25.69	26.56	6.52
109	132.57	14.9	0	0	0	377.14	0	0.02	25.56	26.41	8.9
112	128.67	7.47	0	0	0	377.01	0	0.03	25.72	26.56	17.22
115	126.9	1.44	-0.01	0	0	376.91	0	0.02	25.22	26.03	88.03
118	128.86	7.78	0	0	0	376.92	0	0.02	25.48	26.28	16.56
121	128.67	22.11	0	0	0	376.65	0	0.03	25.74	26.54	5.82
124	123.71	20.01	0	0	0	376.32	0	0.02	25.25	26.03	6.18
127	124.41	7.59	0	0	0	376.09	0	0.02	25.23	26.01	16.4
130	126.12	9.61	0	0	0	376.04	0	0.03	25.96	26.75	13.13
133	119.69	21.98	0	0	0	375.76	0	0.02	25.48	26.24	5.45
136	119.8	20.8	0	0	0	375.43	0	0.03	25.72	26.49	5.76

139	115.81	8.52	0	0	0	375.18	0	0.02	25.2	25.94	13.6
142	115.67	1.76	0	0	0	375.15	0	0.03	26.1	26.86	65.67
145	113.63	6.5	0	0	0	375.08	0	0.03	25.68	26.42	17.47
148	117.51	16.76	0	0	0	374.94	0	0.03	26.01	26.75	7.01
151	116.78	16.88	0	0	0	374.62	0	0.03	25.63	26.36	6.92
154	119.06	2.45	0	0	0	374.48	0	0.03	26.04	26.78	48.53
157	113.65	6.21	0	0	0	374.48	0	0.03	25.66	26.38	18.29
160	107.1	21.37	0	0	0	374.25	0	0.02	25.24	25.96	5.01
163	108.29	22.74	0	0	0	373.89	0	0.03	25.74	26.47	4.76
166	107.97	12.67	0	0	0	373.62	0	0.03	25.73	26.44	8.52
169	108.13	5.43	0	0	0	373.5	0	0.03	25.55	26.26	19.9
172	110.26	11.35	0	0	0	373.4	0	0.03	26.18	26.92	9.71
175	106.52	16.06	0	0	0	373.16	0	0.02	25.43	26.13	6.63
178	104.27	8.08	0	0	0	372.97	0	0.02	25.23	25.92	12.9
181	105.92	3.86	0	0	0	372.91	0	0.03	25.52	26.22	27.47
184	101.63	1.95	0	0	0	372.83	0	0.03	25.53	26.22	52.01
187	99.86	13.78	0	0	0	372.8	0	0.03	25.63	26.31	7.25
190	96.65	22.7	0	0	0	372.43	0	0.02	25.21	25.89	4.26
193	98.7	13.14	0	0	0	372.19	0	0.02	25.07	25.75	7.51
196	107.29	6.09	0	0	0	372.04	0	0.03	26.22	26.93	17.62
199	104.61	4.72	0	0	0	371.98	0	0.03	25.65	26.34	22.17
202	97.53	14.9	0	0	0	371.85	0	0.02	25.27	25.95	6.55
205	93.06	14.62	0	0	0	371.57	0	0.02	25.22	25.89	6.37
208	94.54	1.66	0	0	0	371.46	0	0.03	25.58	26.26	56.82
211	95.6	1.77	0	0	0	371.47	0	0.03	25.5	26.17	54.16
214	97.82	16.42	0	0	0	371.35	0	0.03	25.63	26.31	5.96
217	97.89	24.51	0	0	0	371	0	0.02	25.37	26.03	3.99
220	96.32	13.95	0	0	0	370.69	0	0.03	25.44	26.11	6.91
223	95.16	2.83	0	0	0	370.59	0	0.02	25	25.67	33.68
226	98.04	4.17	0	0	0	370.56	0	0.03	25.56	26.24	23.53
229	94.15	5.92	0	0	0	370.46	0	0.03	25.51	26.18	15.9
232	90.99	9.36	0	0	0	370.37	0	0.03	25.58	26.24	9.72
235	91.94	15.29	0	0	0	370.17	0	0.02	25.39	26.05	6.01
238	90.25	14.84	0	0	0	369.94	0	0.02	25.22	25.88	6.08
241	89.53	10.22	0	0	0	369.74	0	0.03	25.51	26.18	8.76
244	89.36	7.22	0	0	0	369.62	0	0.02	25.36	26.02	12.38
247	89.86	9.98	0	0	0	369.5	0	0.02	25.03	25.68	9.01
250	90.81	13.29	0	0	0	369.32	0	0.03	25.43	26.09	6.83
253	92.81	6.59	0	0	0	369.14	0	0.03	25.74	26.4	14.07
256	94.69	1.12	-0.01	0	0	369.12	0	0.03	25.96	26.63	84.6
259	91.47	9.27	0	0	0	369.05	0	0.03	25.71	26.37	9.86
262	86.73	18.49	0	0	0	368.84	0	0.03	25.5	26.15	4.69
265	84.88	20.32	0	0	0	368.53	0	0.02	25.17	25.81	4.18
268	85.86	8.8	0	0	0	368.28	0	0.03	25.41	26.06	9.76
271	91.46	-4.86	0	0	0	368.27	0	0.03	25.87	26.54	-18.83
274	93.9	3.18	0	0	0	368.34	0	0.03	25.83	26.49	29.49
277	90.17	17.35	0	0	0	368.15	0	0.03	25.57	26.21	5.2
280	88.19	12.82	0	0	0	367.89	0	0.03	25.74	26.39	6.88
283	84.68	6.42	0	0	0	367.78	0	0.03	25.56	26.2	13.19
286	84.48	10.42	0	0	0	367.66	0	0.03	25.95	26.62	8.11
289	83.96	12.65	0	0	0	367.47	0	0.02	25.29	25.93	6.64
292	87.11	8.64	0	0	0	367.3	0	0.03	25.46	26.11	10.09

295	85.54	6.18	0	0	0	367.2	0	0.02	25.13	25.76	13.85
298	86.15	16.72	0	0	0	367.07	0	0.02	25.06	25.69	5.15
301	88.53	20.25	0	0	0	366.73	0	0.03	25.62	26.27	4.37
304	85.73	1.53	0	0	0	366.55	0	0.03	25.62	26.27	56.01
307	84.25	-4.97	0	0	0	366.64	0	0.03	25.88	26.53	-16.94
310	86.46	6.42	0	0	0	366.62	0	0.03	25.82	26.46	13.47
313	89.24	19.76	0	0	0	366.44	0	0.03	25.87	26.52	4.52
316	86	15.34	0	0	0	366.1	0	0.03	25.59	26.23	5.61
319	82.63	6.1	0	0	0	366	0	0.03	26.24	26.91	13.54
322	77.59	6.49	0	0	0	365.88	0	0.02	25.31	25.95	11.95
325	78.06	4.32	0	0	0	365.81	0	0.02	25.29	25.92	18.08
328	82.67	10.92	0	0	0	365.72	0	0.03	25.4	26.03	7.57
331	85.68	8.83	0	0	0	365.51	0	0.03	25.9	26.54	9.7
334	79.53	6.45	0	0	0	365.46	0	0.02	24.69	25.3	12.32
337	86.12	8.51	0	0	0	365.3	0	0.03	25.69	26.32	10.12
340	84.96	10.39	0	0	0	365.2	0	0.03	25.6	26.23	8.17
343	82.49	14.75	0	0	0	364.98	0	0.03	25.52	26.16	5.59
346	81.28	12.5	0	0	0	364.79	0	0.03	25.37	26.01	6.5
349	79.63	7.4	0	0	0	364.62	0	0.03	25.65	26.29	10.77
352	79.68	2.24	0	0	0	364.56	0	0.03	25.76	26.39	35.6
355	75.15	1.72	0	0	0	364.54	0	0.02	25.19	25.82	43.69
358	74.97	7.24	0	0	0	364.49	0	0.03	25.37	26	10.36
361	79.32	15.87	0	0	0	364.31	0	0.03	25.86	26.5	5
364	79.77	13.8	0	0	0	364.05	0	0.03	25.9	26.54	5.78
367	76.14	6.66	0	0	0	363.92	0	0.03	25.52	26.15	11.44
370	80.04	7.57	0	0	0	363.82	0	0.03	25.69	26.33	10.58
373	78.93	8.19	0	0	0	363.68	0	0.03	26.19	26.84	9.63
376	75.86	11.36	0	0	3.92	363.57	0.01	0.03	26.04	26.68	6.68
379	73.99	16.13	0	0	8.75	363.34	0.03	0.03	25.77	26.4	4.59
382	78.5	12.84	0	0	9.51	363.11	0.02	0.03	25.79	26.43	6.11
385	78.29	10.7	0	0	13.52	362.96	0.03	0.03	25.59	26.23	7.32
388	78.58	5.14	0	0	73.74	362.81	0.07	0.03	25.78	26.41	15.3
391	80.4	1.21	-0.01	0	322.11	362.79	0.07	0.03	25.63	26.26	66.71
394	80.91	4.97	0	0	74.97	362.74	0.07	0.03	25.9	26.55	16.28
397	80.99	5.43	0	0	108.45	362.65	0.11	0.03	26.14	26.78	14.92
400	74.98	9.97	0	0	87.66	362.57	0.17	0.03	25.48	26.1	7.52
403	73.95	9.19	0	0	94.55	362.37	0.17	0.03	25.44	26.07	8.05
406	77.03	3.12	0	0	252.15	362.31	0.15	0.03	25.93	26.57	24.69
409	75.46	7.82	0	0	107.67	362.24	0.16	0.03	25.53	26.16	9.65
412	70.87	13.5	0	0	86.68	362.07	0.23	0.02	24.46	25.06	5.25
415	76.44	15.09	0	0	83.8	361.85	0.24	0.03	25.76	26.4	5.06
418	76.12	8.08	0	0	151.41	361.65	0.23	0.03	25.57	26.2	9.43
421	72.81	3.61	0	0	349.94	361.6	0.24	0.03	25.35	25.97	20.15
424	73.11	13.29	0	0	93.45	361.49	0.24	0.03	25.41	26.04	5.5
427	74.97	9.88	0	0	137.55	361.24	0.26	0.03	25.55	26.18	7.59
430	81.19	6.38	0	0	253.12	361.2	0.3	0.03	26.02	26.65	12.73
433	79.91	10.56	0	0	143.26	361.03	0.29	0.03	25.35	25.96	7.57
436	76.51	10.61	0	0	139.78	360.89	0.29	0.02	25.21	25.83	7.21
439	78.4	12.21	0	0	134.84	360.71	0.31	0.03	25.77	26.41	6.42
442	79.45	10.19	0	0	180.43	360.54	0.35	0.03	25.79	26.42	7.79
445	76.5	5.54	0	0	338.86	360.41	0.36	0.02	25.2	25.81	13.8
448	73.03	3.05	0	0	560.35	360.36	0.32	0.03	25.73	26.36	23.97

451	80.15	3.54	0	0	506.86	360.31	0.34	0.03	25.61	26.24	22.62
454	80.55	5.55	0	0	315.61	360.25	0.33	0.03	25.75	26.38	14.52
457	76.46	9.13	0	0	184.56	360.13	0.32	0.03	25.8	26.42	8.38
460	73.41	15.6	0	0	114.83	359.97	0.34	0.03	25.63	26.26	4.7
463	74.52	16.65	0	0	101.48	359.69	0.32	0.03	25.97	26.62	4.48
466	72.95	7.06	0	0	240.12	359.51	0.33	0.03	25.41	26.04	10.33
469	73.16	4.76	0	0	397.3	359.45	0.36	0.03	25.57	26.2	15.36
472	73.9	7.23	0	0	234.93	359.34	0.33	0.03	25.41	26.04	10.22
475	75.38	9.47	0	0	180.45	359.23	0.33	0.03	25.5	26.13	7.96
478	78.52	10.58	0	0	166.36	359.06	0.33	0.03	25.91	26.55	7.42
481	75.93	13.91	0	0	113.68	358.91	0.3	0.03	25.52	26.14	5.46
484	74.59	10.89	0	0	156.71	358.67	0.32	0.03	25.7	26.34	6.85
487	71.26	1.35	-0.01	0	1334.36	358.61	0.34	0.03	25.5	26.13	52.93
490	72.12	0.15	-0.04	0	11514.98	358.6	0.34	0.03	25.75	26.38	466.2
493	75.29	3.93	0	0	449.16	358.58	0.34	0.03	25.51	26.14	19.14
496	73.23	10.44	0	0	138.14	358.47	0.28	0.02	24.86	25.47	7.01
499	70.99	12.87	0	0	126.74	358.28	0.31	0.03	25.66	26.28	5.52
502	68.96	15.42	0	0	90.48	358.09	0.27	0.02	25.04	25.65	4.47
505	69.61	13.88	0	0	96.72	357.84	0.26	0.02	25.23	25.85	5.01
508	70.31	4.25	0	0	287.86	357.7	0.24	0.02	24.98	25.6	16.54
511	73.15	0	2.66	0.2	0	357.69	0.24	0.03	25.37	26	0
514	76	1.24	-0.01	0	914.2	357.67	0.21	0.03	26.24	26.88	61.37
517	76.24	11.18	0	0	98.75	357.62	0.21	0.02	25.2	25.82	6.82
520	75.65	18.57	0	0	59.17	357.35	0.21	0.02	25.22	25.85	4.07
523	71.77	16.05	0	0	67.12	357.1	0.21	0.03	25.35	25.98	4.47
526	70.47	8.37	0	0	131.39	356.89	0.21	0.03	25.49	26.12	8.42
529	70.14	2.57	0	0	477.91	356.84	0.23	0.03	25.74	26.37	27.31
532	72.38	3.82	0	0	328.52	356.79	0.24	0.03	25.71	26.34	18.97
535	69.33	0.16	-0.05	0	7907.89	356.74	0.24	0.02	24.91	25.52	445.37
538	71.46	3.83	0	0	336.91	356.76	0.25	0.03	25.31	25.93	18.64
541	72.19	11.82	0	0	115.73	356.61	0.26	0.03	25.79	26.42	6.11
544	70.07	23.02	0	0	61.96	356.39	0.27	0.03	25.77	26.4	3.04
547	69.15	19.34	0	0	75.57	355.98	0.27	0.03	26.02	26.66	3.58
550	68.31	-2.37	0	0	-662.6	355.88	0.3	0.03	25.95	26.6	-28.82
553	71.49	5.98	0	0	261.76	355.94	0.3	0.03	25.41	26.04	11.96
556	73	15.82	0	0	96.3	355.69	0.29	0.02	25.27	25.88	4.61
559	73.84	7.34	0	0	219.35	355.53	0.31	0.03	25.64	26.27	10.06
562	70.73	3.51	0	0	475.65	355.45	0.32	0.02	25.26	25.89	20.17
565	74.26	5.3	0	0	345.4	355.4	0.34	0.03	25.97	26.61	14.01
568	74	10.72	0	0	165.16	355.28	0.34	0.03	25.74	26.36	6.9
571	73.9	10.64	0	0	161.07	355.1	0.33	0.03	25.39	26	6.94
574	70.56	5.77	0	0	300.74	354.98	0.33	0.03	25.44	26.06	12.22
577	71.12	-1.53	0	0	-1096.15	354.94	0.32	0.03	25.85	26.48	-46.36
580	70.68	-0.11	0.06	0.01	-15223.29	354.99	0.32	0.03	26.32	26.95	-619.79
583	68.11	13.03	0	0	118.65	354.9	0.3	0.03	25.5	26.11	5.23
586	69.04	15.43	0	0	114.88	354.64	0.34	0.03	25.55	26.18	4.48
589	68.91	7.43	0	0	231.56	354.48	0.33	0.03	25.74	26.37	9.28
592	69.01	8.14	0	0	207.08	354.39	0.33	0.02	25.25	25.86	8.48
595	70.22	9.01	0	0	186.45	354.23	0.33	0.02	24.66	25.26	7.79
598	71.61	7.69	0	0	227.59	354.12	0.34	0.03	25.44	26.06	9.31
601	73.76	12.42	0	0	128.77	353.98	0.3	0.03	25.98	26.61	5.94
604	72.39	14.71	0	0	116.45	353.76	0.33	0.03	25.31	25.93	4.92

607	68.59	14.66	0	0	112.03	353.55	0.32	0.02	25.09	25.7	4.68
610	64.69	5.76	0	0	266.5	353.35	0.3	0.02	25.18	25.81	11.24
613	65.79	-3.08	0	0	-581.88	353.37	0.34	0.03	25.38	26.02	-21.39
616	68.64	-3.32	0	0	-479.63	353.41	0.3	0.03	25.73	26.37	-20.7
619	68.92	16.44	0	0	93.4	353.4	0.29	0.03	25.45	26.07	4.19
622	67.71	14.6	0	0	106.82	352.99	0.3	0.02	25.11	25.73	4.64
625	71.83	-0.43	0.02	0	-3638.85	353.01	0.29	0.03	26.03	26.67	-166.97
628	68.22	9.99	0	0	142.16	352.92	0.27	0.03	25.54	26.17	6.83
631	71.82	11.44	0	0	112.72	352.74	0.24	0.03	25.88	26.51	6.28
634	69.86	10.68	0	0	97.45	352.59	0.2	0.02	24.89	25.49	6.54
637	71.62	10.78	0	0	85.63	352.42	0.18	0.03	25.65	26.28	6.64
640	67.64	6.95	0	0	131.26	352.28	0.17	0.03	25.85	26.49	9.74
643	62.74	6.25	0	0	130.16	352.2	0.16	0.03	25.5	26.13	10.04
646	64.82	10.02	0	0	74.38	352.07	0.14	0.03	25.84	26.47	6.47
649	69.79	11.62	0	0	43.68	351.91	0.1	0.03	25.57	26.18	6.01
652	68.45	10.61	0	0	43.86	351.73	0.09	0.03	25.75	26.36	6.45
655	64.4	5.98	0	0	69.39	351.6	0.08	0.03	25.87	26.5	10.77
658	65.49	2.47	0	0	151.44	351.55	0.07	0.03	25.51	26.13	26.54
661	68.39	-0.25	0.02	0	-481.89	351.52	0.02	0.03	25.61	26.23	-277.95
664	69.48	8.46	0	0	16.99	351.51	0.03	0.03	25.68	26.3	8.21
667	69.95	19.31	0	0	7.33	351.26	0.03	0.03	26.21	26.85	3.62
670	65.81	15.76	0	0	0.42	350.99	0	0.03	25.66	26.27	4.18
673	63.88	7.47	0	0	12.06	350.81	0.02	0.03	25.6	26.23	8.56
676	65.06	0.7	-0.01	0	44.95	350.76	0.01	0.03	25.88	26.51	93.49
679	65.43	10.75	0	0	0	350.73	0	0.03	25.95	26.58	6.09
682	66.68	10.35	0	0	0	350.47	0	0.03	25.72	26.34	6.44
685	63.8	0.01	-0.68	-0.07	0	350.45	0	0.03	25.55	26.16	6380.38
688	63.77	0.01	-0.77	-0.06	0	350.42	0	0.03	25.64	26.26	6377.04

Paper (stacked on edge)**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	3.00
Peak Heat Release Rate (kW/m ²):	225.63
Time to Peak Heat Release Rate (s):	45.00
Total Heat Release (MJ/m ²):	73.86
60 s Average Heat Release Rate (kW/m ²):	160.89
Total Mass Loss (g):	36.94
Average Mass Loss Rate (g/s):	0.054
Average Effective Heat of Combustion (MJ/kg):	10.00
Average Smoke Extinction Area (m ² /kg):	448.70
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	-0.0000

Specimen:

Initial mass (g):	389.2
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	116
Time to ignition (s):	3
Time to flameout (s):	690

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	14.31	0.01	-0.64	-0.06	0	389.26	0.48	0.03	24.92	25.34	1430.63
3	12.77	0.01	-0.74	-0.08	0	389.49	0.49	0.03	25.56	25.98	1277.38
6	33.36	17.45	0	0	150.41	389.41	0.51	0.03	25.17	25.63	1.91
9	87.84	23.93	0	0	172.51	389.04	0.8	0.03	25.16	25.74	3.67
12	142.63	11.11	0	0	312.54	388.77	0.67	0.03	25.31	25.95	12.84
15	149.7	1.32	0	0.05	2319.71	388.7	0.59	0.03	25.32	25.96	113.08
18	100.51	8.31	0	0.01	364.57	388.66	0.58	0.03	25.29	25.92	12.09
21	99.63	13.46	0	0	218.46	388.45	0.57	0.03	25.23	25.91	7.4
24	118.78	13.13	0	0	239.82	388.28	0.61	0.03	25	25.73	9.05
27	147.19	21.52	0	0	149.85	388.03	0.63	0.02	24.8	25.59	6.84
30	179.82	19.28	0	0	176.85	387.67	0.67	0.02	24.67	25.52	9.33
33	207.05	14.58	0	0	255.97	387.46	0.73	0.02	24.84	25.74	14.2
36	221.67	23.7	0	0	178.68	387.18	0.81	0.02	25.12	26.09	9.36
39	219.62	29.72	0	0	140.67	386.76	0.81	0.02	24.79	25.78	7.39
42	218.72	19.25	0	0	218.41	386.35	0.83	0.02	24.44	25.45	11.36
45	225.63	11.25	0	0	386.38	386.18	0.83	0.02	25.22	26.28	20.05
48	220.16	16.51	0	0	268.93	385.97	0.84	0.02	25.37	26.44	13.33
51	212.1	14.46	0	0	307.15	385.7	0.85	0.02	25.17	26.22	14.67
54	206.67	21.25	0	0	203.95	385.5	0.83	0.02	25.14	26.19	9.72
57	203.18	26.5	0	0	170.12	385.07	0.85	0.03	25.58	26.65	7.67
60	189.59	21.56	0	0	212.84	384.75	0.86	0.02	25.48	26.54	8.79
63	182.13	13.47	0	0	323.14	384.44	0.83	0.02	25.05	26.08	13.52
66	182.77	9.26	0	0	483.83	384.33	0.85	0.02	25.29	26.33	19.74
69	179.44	13.45	0	0	334.18	384.12	0.85	0.02	25.34	26.36	13.34
72	175.73	16.66	0	0	274.87	383.92	0.86	0.02	25.66	26.67	10.55
75	172.02	22.31	0	0	212.09	383.62	0.89	0.02	25.5	26.49	7.71
78	167.28	20.84	0	0	215.79	383.28	0.85	0.02	25.6	26.58	8.03
81	160.39	19.67	0	0	231.3	383	0.86	0.02	25.53	26.49	8.15
84	156.8	15.32	0	0	302.85	382.7	0.88	0.02	25.49	26.43	10.24
87	155.26	8.83	0	0	510.58	382.54	0.85	0.02	25.64	26.58	17.58
90	155.37	11.54	0	0	392.74	382.41	0.85	0.03	25.83	26.77	13.47
93	152.91	11.82	0	0	379.53	382.2	0.84	0.02	25.67	26.57	12.94
96	146.95	13.62	0	0	322.73	382.04	0.84	0.02	25.17	26.05	10.79
99	149.2	19.87	0	0	228.05	381.78	0.85	0.03	25.82	26.71	7.51
102	139.46	18.8	0	0	241.51	381.48	0.86	0.02	25.54	26.41	7.42
105	139.69	10.03	0	0	439.14	381.24	0.84	0.02	25.52	26.38	13.92
108	138.28	11.37	0	0	389.35	381.14	0.84	0.02	25.36	26.2	12.17
111	137.3	14.84	0	0	296.98	380.89	0.83	0.03	25.8	26.66	9.26
114	140.03	10.86	0	0	417.85	380.72	0.83	0.03	26.38	27.23	12.9
117	130.18	12.2	0	0	352.07	380.55	0.82	0.02	25.38	26.2	10.67
120	130.3	17.52	0	0	250.71	380.34	0.82	0.03	25.88	26.71	7.44
123	131.58	13.2	0	0	339.2	380.06	0.82	0.03	26.4	27.24	9.97
126	125.87	5.65	0	0	782.93	379.96	0.84	0.02	25.55	26.35	22.29
129	120.32	6.45	0	0	657.13	379.86	0.82	0.02	24.97	25.74	18.67
132	130.19	15.71	0	0	273.06	379.73	0.81	0.03	25.81	26.6	8.29
135	125.46	14.8	0	0	287.72	379.42	0.82	0.02	25.2	25.96	8.48

138	120.82	11.45	0	0	358.24	379.3	0.79	0.02	25.25	26.02	10.55
141	122.18	16.97	0	0	250.03	379.05	0.8	0.03	25.7	26.47	7.2
144	120.08	14.83	0	0	282.23	378.82	0.79	0.03	25.63	26.39	8.1
147	121.98	10.47	0	0	401.49	378.61	0.8	0.03	25.67	26.42	11.65
150	124.1	7.26	0	0	573.27	378.5	0.79	0.02	25.48	26.24	17.08
153	124.03	6.45	0	0	668.31	378.38	0.82	0.03	25.61	26.36	19.23
156	121.26	6.44	0	0	632.49	378.3	0.77	0.03	25.63	26.38	18.82
159	118.19	15.94	0	0	254.05	378.16	0.77	0.02	25.5	26.24	7.42
162	115.33	17.18	0	0	233.21	377.85	0.76	0.03	25.78	26.52	6.71
165	112.72	9.17	0	0	438.11	377.68	0.77	0.02	25.35	26.07	12.3
168	115.36	8.66	0	0	482.13	377.55	0.79	0.03	25.62	26.35	13.32
171	117.67	10.26	0	0	401.17	377.41	0.78	0.03	25.81	26.53	11.46
174	119.12	5.53	0	0	727.14	377.26	0.75	0.03	26	26.74	21.53
177	111.35	5.76	0	0	661.99	377.22	0.72	0.03	25.6	26.32	19.32
180	112.04	21.49	0	0	179.75	377.04	0.73	0.03	25.66	26.39	5.21
183	109.24	17.3	0	0	237.69	376.65	0.78	0.03	25.73	26.45	6.31
186	108.86	7.29	0	0	555.37	376.54	0.77	0.03	25.7	26.42	14.94
189	112.94	9.05	0	0	458.44	376.39	0.78	0.03	25.88	26.6	12.49
192	106.35	17.67	0	0	226.8	376.24	0.77	0.02	25.23	25.93	6.02
195	105.59	22.78	0	0	176.12	375.87	0.77	0.02	25.5	26.21	4.64
198	110.16	10.36	0	0	389.61	375.62	0.75	0.03	26.32	27.05	10.63
201	109.47	1.2	-0.01	0	3548.29	375.55	0.81	0.03	25.82	26.53	90.92
204	106.69	7.14	0	0	559.94	375.53	0.77	0.02	25.19	25.89	14.94
207	107.25	14.78	0	0	282.23	375.33	0.79	0.03	25.56	26.27	7.26
210	104.95	11.23	0	0	368.91	375.12	0.79	0.03	25.54	26.23	9.35
213	106.24	14.28	0	0	279.88	374.97	0.75	0.03	25.92	26.62	7.44
216	104.44	14.61	0	0	271.54	374.71	0.76	0.03	25.57	26.27	7.15
219	105.37	5.14	0	0	789.81	374.57	0.78	0.02	25.27	25.96	20.49
222	107.8	9.85	0	0	404.84	374.51	0.77	0.02	25.24	25.93	10.94
225	104.88	3.5	0	0	1151.97	374.3	0.77	0.03	25.5	26.2	29.95
228	102.72	8.29	0	0	513.31	374.36	0.81	0.03	25.71	26.41	12.39
231	100.66	23.27	0	0	173.79	374.02	0.77	0.03	25.51	26.2	4.33
234	103.06	12.09	0	0	350.94	373.76	0.8	0.03	25.72	26.42	8.52
237	104.52	4.32	0	0	960	373.65	0.79	0.02	25.47	26.16	24.19
240	104.29	6.63	0	0	638.04	373.59	0.81	0.02	25.47	26.16	15.73
243	106.04	4.48	0	0	960.65	373.46	0.82	0.03	25.69	26.38	23.67
246	104.65	7.99	0	0	546.05	373.43	0.82	0.03	25.95	26.65	13.1
249	99.2	18.26	0	0	236.31	373.2	0.83	0.02	25.43	26.12	5.43
252	103.84	16.27	0	0	264.44	372.93	0.83	0.02	25.28	25.96	6.38
255	105.13	7.44	0	0	591.74	372.74	0.83	0.03	25.83	26.53	14.13
258	103.28	8.68	0	0	506.82	372.67	0.84	0.03	25.49	26.18	11.9
261	105.21	9.09	0	0	480.16	372.48	0.83	0.03	25.66	26.34	11.58
264	100.65	3.26	0	0	1344.71	372.42	0.86	0.02	24.85	25.51	30.92
267	98.74	9.9	0	0	451.55	372.34	0.86	0.02	25.26	25.94	9.98
270	100.01	14.65	0	0	314.58	372.13	0.88	0.03	25.46	26.14	6.83
273	101.98	13.06	0	0	355.92	371.92	0.89	0.03	25.51	26.18	7.81
276	102.38	12.79	0	0	369.21	371.74	0.9	0.03	25.53	26.21	8
279	100.75	8.2	0	0	580.67	371.56	0.91	0.03	25.51	26.18	12.29
282	100.51	-0.19	0.04	0	-26114.96	371.5	0.94	0.02	25.4	26.06	-538.05
285	99.86	15.94	0	0	295.01	371.48	0.9	0.03	25.59	26.26	6.26
288	101.38	17.97	0	0	277.72	371.07	0.94	0.03	25.88	26.56	5.64
291	101.91	6.79	0	0	752.7	370.99	0.97	0.03	25.79	26.46	15.01

294	99.86	11.38	0	0	431.98	370.81	0.94	0.03	25.57	26.23	8.77
297	96.68	7.51	0	0	657.76	370.67	0.95	0.02	25.28	25.95	12.87
300	96.5	14.92	0	0	342.81	370.55	0.95	0.03	26.14	26.82	6.47
303	97.31	19.01	0	0	273.29	370.23	0.99	0.03	25.58	26.24	5.12
306	101.94	8.93	0	0	572.3	370.03	0.96	0.03	25.9	26.58	11.42
309	99.97	2.87	0	0	1808.77	369.95	0.99	0.03	25.58	26.25	34.82
312	99.12	3.62	0	0	1455.75	369.92	0.99	0.03	25.93	26.6	27.42
315	94.77	7.59	0	0	713.59	369.83	1.02	0.03	25.77	26.44	12.48
318	93.97	16.12	0	0	331.13	369.67	1.03	0.02	25.35	26.01	5.83
321	96.96	19.92	0	0	269.58	369.37	1.01	0.03	25.92	26.59	4.87
324	96.5	11.29	0	0	487.5	369.13	1.05	0.03	25.47	26.14	8.55
327	97.3	-0.94	0.01	0	-5977.42	369.04	1.08	0.02	25.27	25.93	-103.99
330	94.47	6.4	0	0	866.93	369.08	1.06	0.03	25.58	26.25	14.77
333	92.33	16.15	0	0	343.19	368.84	1.06	0.02	25.4	26.06	5.72
336	94.21	7.83	0	0	709.82	368.66	1.05	0.03	25.87	26.54	12.03
339	96.06	11.77	0	0	486	368.56	1.1	0.02	25.35	26.02	8.16
342	96.51	10.88	0	0	542.14	368.32	1.11	0.03	25.83	26.5	8.87
345	88.48	6.67	0	0	887.28	368.25	1.11	0.03	25.92	26.59	13.26
348	93.38	13.2	0	0	446.34	368.08	1.11	0.03	25.83	26.5	7.07
351	97.83	11.81	0	0	489.45	367.88	1.09	0.03	25.74	26.42	8.28
354	96.8	6.16	0	0	944.52	367.75	1.12	0.02	25.34	26.01	15.7
357	95.72	5.75	0	0	1054.57	367.67	1.14	0.03	26	26.67	16.65
360	88.42	13.38	0	0	424.87	367.55	1.11	0.02	24.89	25.53	6.61
363	96.26	8.93	0	0	653.73	367.31	1.1	0.03	25.88	26.56	10.78
366	97.63	7.7	0	0	748.02	367.27	1.09	0.03	25.76	26.43	12.67
369	92.06	10.65	0	0	537.42	367.07	1.12	0.02	24.93	25.58	8.65
372	90.62	4.09	0	0	1404.53	366.98	1.13	0.02	24.84	25.49	22.17
375	92.46	3.52	0	0	1709.94	366.92	1.14	0.03	25.64	26.31	26.29
378	92.77	9.49	0	0	632.32	366.85	1.16	0.02	25.32	25.97	9.77
381	93.87	20.9	0	0	284.04	366.62	1.13	0.03	25.56	26.22	4.49
384	93.35	19.6	0	0	305.01	366.27	1.14	0.03	25.61	26.28	4.76
387	97.1	5.14	0	0	1177.35	366.08	1.16	0.03	25.39	26.06	18.89
390	93.72	1.03	0	0	5924.77	366.08	1.17	0.03	25.49	26.15	91.03
393	93.33	7.57	0	0	808.34	366.01	1.17	0.03	25.4	26.06	12.33
396	95.01	9.81	0	0	620.9	365.86	1.16	0.03	25.58	26.25	9.69
399	97.84	13.32	0	0	464.6	365.71	1.17	0.03	25.71	26.38	7.35
402	97.64	16.35	0	0	383.61	365.47	1.19	0.03	25.66	26.32	5.97
405	92.04	9.36	0	0	644.4	365.26	1.16	0.02	25.31	25.96	9.83
408	91.42	8.23	0	0	723.03	365.17	1.14	0.03	25.49	26.15	11.11
411	93.83	10.2	0	0	583.85	365	1.13	0.03	25.72	26.37	9.2
414	96.64	6.57	0	0	902.97	364.88	1.13	0.03	25.67	26.33	14.7
417	97.02	7.92	0	0	737.55	364.78	1.1	0.03	25.92	26.59	12.24
420	91.78	11.83	0	0	478.45	364.63	1.09	0.02	25.31	25.97	7.76
423	94.58	9.09	0	0	631.27	364.45	1.09	0.03	25.65	26.31	10.4
426	91.75	11.37	0	0	490.31	364.34	1.07	0.03	25.43	26.08	8.07
429	92.99	13.72	0	0	412.45	364.11	1.09	0.03	25.4	26.05	6.78
432	94.65	8.82	0	0	627.79	363.96	1.06	0.03	25.53	26.19	10.74
435	96.65	1.4	0	0	3932.14	363.85	1.03	0.03	26.04	26.71	69.13
438	93.36	8.57	0	0	651.51	363.87	1.05	0.03	26.03	26.68	10.9
441	91.61	12.86	0	0	404.62	363.6	0.99	0.03	25.52	26.17	7.13
444	95.51	7.95	0	0	653.76	363.51	0.98	0.03	25.73	26.39	12.01
447	95.14	18.11	0	0	287.13	363.32	0.99	0.03	25.72	26.37	5.25

450	92.56	12.45	0	0	412.02	363.02	0.98	0.03	25.45	26.09	7.44
453	88.35	5.03	0	0	1010.22	362.95	0.97	0.03	25.53	26.17	17.57
456	91.91	8.93	0	0	569.07	362.83	0.96	0.03	25.8	26.46	10.29
459	93.8	8.01	0	0	629.61	362.7	0.95	0.03	25.8	26.46	11.71
462	92.5	6.46	0	0	764.42	362.59	0.94	0.03	25.71	26.36	14.32
465	87.51	12.58	0	0	386.48	362.48	0.93	0.03	25.37	26.02	6.96
468	86.59	4.56	0	0	1072.12	362.26	0.96	0.02	24.75	25.39	18.97
471	89.92	6.84	0	0	725.47	362.31	0.95	0.03	25.46	26.12	13.14
474	90.71	19.74	0	0	254.42	362.02	0.96	0.03	25.62	26.28	4.59
477	89.09	14.31	0	0	353.4	361.78	0.97	0.03	25.39	26.06	6.23
480	88.81	1.4	0	0	3762.06	361.62	0.99	0.03	25.7	26.38	63.66
483	88.31	3.03	0	0	1835.07	361.69	1.04	0.03	25.94	26.61	29.15
486	87.85	15.25	0	0	361.21	361.49	1.04	0.03	25.78	26.44	5.76
489	88.83	8.66	0	0	637.61	361.29	1.05	0.03	25.7	26.37	10.26
492	88.73	9.19	0	0	613.1	361.21	1.06	0.03	25.8	26.47	9.65
495	90.67	8.18	0	0	688.77	361.02	1.09	0.02	25.26	25.91	11.09
498	91.28	3.89	0	0	1498.4	360.97	1.12	0.02	25.32	25.97	23.46
501	87.81	11.26	0	0	511.59	360.86	1.1	0.03	25.47	26.12	7.8
504	86.09	16.5	0	0	358.45	360.64	1.11	0.03	25.91	26.57	5.22
507	87.75	14.89	0	0	395.52	360.4	1.12	0.03	25.58	26.22	5.89
510	92	6.69	0	0	870.46	360.22	1.12	0.03	25.42	26.07	13.74
513	91.53	-1.66	0	0	-3515.87	360.2	1.11	0.03	25.69	26.35	-55.01
516	90.22	3.42	0	0	1725.26	360.22	1.13	0.02	25.37	26.01	26.41
519	90.09	11.74	0	0	512.64	360.08	1.15	0.03	25.42	26.06	7.67
522	90.35	14.94	0	0	397	359.89	1.12	0.03	25.81	26.48	6.05
525	92.98	13.67	0	0	426.42	359.65	1.12	0.03	25.44	26.09	6.8
528	94.84	5.14	0	0	1161.34	359.5	1.14	0.03	25.43	26.08	18.45
531	91.58	5.79	0	0	1033.42	359.46	1.14	0.03	25.48	26.12	15.83
534	90.69	6.74	0	0	887.95	359.33	1.13	0.03	25.77	26.42	13.46
537	91.68	3.98	0	0	1509.78	359.27	1.14	0.03	25.73	26.38	23.04
540	91.15	8.31	0	0	715.25	359.18	1.12	0.03	25.77	26.44	10.96
543	91.59	14.96	0	0	405.81	359.02	1.14	0.03	25.86	26.52	6.12
546	92.2	5.78	0	0	1018.1	358.79	1.11	0.03	25.83	26.49	15.95
549	89.92	5.8	0	0	986.97	358.81	1.11	0.02	25.16	25.8	15.5
552	89.67	18.45	0	0	313.57	358.57	1.1	0.03	25.66	26.32	4.86
555	87.51	15.31	0	0	375.63	358.31	1.09	0.03	25.71	26.37	5.72
558	85.28	10.42	0	0	558.27	358.12	1.11	0.03	25.64	26.3	8.18
561	83.88	5.04	0	0	1132.58	358	1.09	0.03	25.54	26.2	16.66
564	87.42	2.22	0	0	2541.05	357.96	1.08	0.03	25.55	26.2	39.39
567	90.64	5.88	0	0	938.16	357.91	1.04	0.03	25.76	26.41	15.42
570	88.94	13.55	0	0	397.39	357.77	1.06	0.02	24.88	25.51	6.56
573	91.54	17.02	0	0	311.12	357.52	1.02	0.02	25.24	25.88	5.38
576	86.36	14.9	0	0	344.18	357.28	0.99	0.02	25.26	25.9	5.8
579	85.08	6.47	0	0	782.53	357.1	0.98	0.02	25.1	25.74	13.15
582	88.06	2.04	0	0	2459.84	357.07	0.97	0.02	25.22	25.86	43.21
585	91.16	8.85	0	0	572.37	356.99	0.95	0.03	25.92	26.58	10.3
588	92.56	11.66	0	0	425.28	356.82	0.94	0.03	25.72	26.37	7.94
591	94.49	6.6	0	0	740.94	356.67	0.93	0.03	25.58	26.24	14.32
594	93.38	9.15	0	0	521.62	356.59	0.91	0.03	25.68	26.33	10.21
597	87.89	17.86	0	0	261.5	356.38	0.9	0.03	25.39	26.04	4.92
600	87.2	3.97	0	0	1176.57	356.13	0.9	0.02	25.33	25.98	21.94
603	85.88	4.85	0	0	950.47	356.21	0.89	0.02	25.32	25.97	17.69

606	88.06	11.91	0	0	381.06	355.97	0.87	0.02	25.34	25.98	7.39
609	90.2	-0.71	0.01	0	-6429.21	355.92	0.87	0.03	25.59	26.24	-126.39
612	91.19	2.83	0	0	1637.5	355.93	0.87	0.03	25.98	26.64	32.24
615	85.13	15.22	0	0	304.79	355.8	0.88	0.03	25.58	26.22	5.59
618	85.08	18.64	0	0	242.41	355.51	0.87	0.03	25.44	26.09	4.56
621	86.4	13.76	0	0	319	355.27	0.84	0.03	25.46	26.11	6.28
624	84.42	10.15	0	0	427.55	355.1	0.83	0.03	25.39	26.04	8.32
627	88.85	3.41	0	0	1298.61	354.98	0.85	0.03	25.48	26.13	26.07
630	87.12	1.51	-0.01	0	2895.89	354.97	0.83	0.03	25.5	26.15	57.8
633	80.55	13.23	0	0	300.41	354.88	0.79	0.02	24.63	25.25	6.09
636	80.65	13.3	0	0	305.23	354.61	0.79	0.02	25.02	25.67	6.06
639	86.43	7.25	0	0	579.52	354.51	0.8	0.03	25.73	26.38	11.91
642	88.7	12.25	0	0	353.12	354.36	0.82	0.03	25.57	26.22	7.24
645	90.63	5.62	0	0	740.05	354.18	0.79	0.03	25.55	26.19	16.13
648	92.62	5.2	0	0	913.95	354.17	0.9	0.03	25.66	26.31	17.81
651	87.36	16	0	0	253.99	353.98	0.78	0.02	25.26	25.89	5.46
654	86.52	15.29	0	0	263.3	353.73	0.76	0.03	25.68	26.34	5.66
657	84.83	5.7	0	0	692.98	353.56	0.77	0.02	25.15	25.78	14.88
660	88.93	-0.06	0.11	0.01	-70558.91	353.55	0.79	0.03	25.77	26.41	0
663	89.15	1.55	0	0	2685.18	353.53	0.79	0.03	25.79	26.43	57.54
666	88.93	5.47	0	0	760.26	353.49	0.79	0.03	25.69	26.33	16.26
669	89.51	13.62	0	0	301.3	353.35	0.79	0.03	25.46	26.09	6.57
672	88.87	19.66	0	0	205.33	353.09	0.77	0.03	25.44	26.08	4.52
675	90.07	15.25	0	0	270.93	352.8	0.78	0.03	25.79	26.44	5.91
678	88.83	5.38	0	0	767.29	352.66	0.79	0.03	25.46	26.09	16.5
681	89.94	1.21	-0.01	0	3533.37	352.62	0.81	0.03	25.61	26.26	74.27
684	89.42	0.01	-0.62	-0.06	0	352.6	0.82	0.03	25.58	26.22	8941.66
687	86.71	0.01	-0.81	-0.06	0	352.56	0.83	0.03	25.67	26.31	8670.57

Paper (stacked on edge)**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	6.00
Peak Heat Release Rate (kW/m ²):	235.52
Time to Peak Heat Release Rate (s):	41.00
Total Heat Release (MJ/m ²):	73.41
60 s Average Heat Release Rate (kW/m ²):	158.04
Total Mass Loss (g):	37.83
Average Mass Loss Rate (g/s):	0.052
Average Effective Heat of Combustion (MJ/kg):	9.70
Average Smoke Extinction Area (m ² /kg):	101.43
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0001

Specimen:

Initial mass (g):	394.4
Thickness (mm):	100
Surface area (cm ²):	50
Test start time (s):	87
Time to ignition (s):	6
Time to flameout (s):	732

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	9.47	0.01	-0.58	-0.08	6470.23	394.35	0.01	0.03	25.72	26.1	947.44
5	9.89	0.01	-0.63	-0.06	5080.27	394.36	0.01	0.03	25.29	25.68	988.66
8	40.56	22.17	0	0	61.97	394.25	0.27	0.03	24.63	25.04	1.83
11	101.7	17.06	0	0	134.95	393.79	0.46	0.03	24.63	25.18	5.96
14	141.85	0.95	-0.01	0.11	0	393.78	0	0.03	25.31	25.93	149.16
17	127.75	5.27	0	0.04	39.13	393.69	0.04	0.03	26	26.63	24.25
20	88.92	8.44	0	0.01	0	393.62	0	0.03	25.13	25.72	10.54
23	78.74	7.79	0	0	0	393.45	0	0.03	25.24	25.84	10.11
26	91.65	18.94	0	0	0	393.35	0	0.03	25.43	26.11	4.84
29	123.57	30.1	0	0	0	392.88	0	0.02	24.88	25.61	4.11
32	161.04	17.92	0	0	0	392.53	0	0.02	24.27	25.07	8.98
35	214.86	11.33	0	0	0	392.33	0	0.02	24.98	25.88	18.96
38	231.57	13.49	0	0	0	392.15	0	0.02	24.97	25.92	17.17
41	235.52	18.34	0	0	0	391.91	0	0.02	25.11	26.1	12.84
44	227.75	21.03	0	0	0	391.61	0	0.02	24.82	25.83	10.83
47	225.42	28.06	0	0	0	391.27	0	0.02	25.39	26.44	8.03
50	221.07	20.61	0	0	0.28	390.82	0	0.02	25.48	26.54	10.72
53	210.19	16.03	0	0	0	390.65	0	0.02	24.88	25.93	13.11
56	204.91	15.14	0	0	0	390.32	0	0.02	25.34	26.4	13.53
59	201.76	11.31	0	0	15.61	390.2	0.03	0.03	25.7	26.76	17.84
62	193.17	16.25	0	0	8.79	389.95	0.03	0.03	25.79	26.84	11.88
65	187.05	17.39	0	0	9.27	389.72	0.03	0.02	25.5	26.54	10.76
68	182.54	19.49	0	0	0	389.43	0	0.02	25.62	26.65	9.37
71	177.41	18.45	0	0	0	389.15	0	0.02	25.63	26.64	9.62
74	175.68	19.98	0	0	0	388.87	0	0.03	25.87	26.88	8.79
77	167.22	9.36	0	0	0	388.58	0	0.03	25.97	26.96	17.86
80	159.02	26.73	0	0	0	388.5	0	0.02	25.48	26.43	5.95
83	157.5	23.83	0	0	0	387.85	0	0.02	25.25	26.18	6.61
86	157.58	2.15	0	0	0	387.85	0	0.03	25.82	26.76	73.39
89	149.76	11.63	0	0	0	387.68	0	0.02	25.25	26.15	12.88
92	143.48	11	0	0	0	387.53	0	0.02	25.47	26.36	13.04
95	143.03	17.27	0	0	0	387.33	0	0.02	25.45	26.32	8.28
98	142.14	23.08	0	0	0	387.01	0	0.02	25.57	26.44	6.16
101	140.12	15.14	0	0	0	386.69	0	0.02	25.44	26.29	9.26
104	134.24	7.71	0	0	0	386.56	0	0.02	25.01	25.84	17.42
107	133.82	6.7	0	0	0	386.43	0	0.02	25.48	26.31	19.98
110	133.99	14.35	0	0	0	386.32	0	0.02	25.68	26.5	9.34
113	128.84	17.62	0	0	0	386.02	0	0.02	25.41	26.21	7.31
116	131.05	17.07	0	0	0	385.81	0	0.02	25.63	26.44	7.68
119	127.54	18.06	0	0	0	385.5	0	0.03	25.72	26.52	7.06
122	121.04	10.11	0	0	0	385.3	0	0.02	25.41	26.18	11.98
125	121.65	5.06	0	0	0	385.19	0	0.02	25.18	25.94	24.06
128	125.57	5.96	0	0	0	385.12	0	0.03	25.71	26.48	21.06
131	125.26	13.05	0	0	0	384.99	0	0.03	25.96	26.72	9.6
134	121.25	20.26	0	0	0	384.74	0	0.02	25.57	26.32	5.98
137	121.73	7.1	0	0	0.83	384.45	0	0.03	25.86	26.62	17.15

140	123.18	5.15	0	0	5.67	384.48	0.01	0.03	26.56	27.35	23.9
143	113.37	17.93	0	0	8.54	384.24	0.03	0.02	25.26	25.99	6.32
146	118	13.53	0	0	0	384	0	0.03	26.1	26.84	8.72
149	121.52	12.12	0	0	0	383.83	0	0.03	25.84	26.59	10.03
152	114.19	8.77	0	0	13.99	383.65	0.02	0.02	25.26	25.99	13.02
155	113.59	4.83	0	0	63.07	383.57	0.06	0.02	25.48	26.2	23.52
158	111.8	9.13	0	0	27.24	383.47	0.05	0.02	25.41	26.12	12.25
161	112.71	20.4	0	0	13.66	383.27	0.05	0.03	25.74	26.47	5.53
164	115.11	21.39	0	0	12.21	382.9	0.05	0.03	26.09	26.82	5.38
167	115.16	9.31	0	0	18.98	382.68	0.03	0.03	25.79	26.5	12.37
170	115	2.19	0	0	122.08	382.6	0.05	0.02	25.52	26.23	52.54
173	112.01	3.03	0	0	88.02	382.58	0.05	0.03	25.79	26.49	36.95
176	109.52	12.47	0	0	23.09	382.48	0.05	0.03	25.61	26.3	8.78
179	114.64	17.34	0	0	18.97	382.22	0.06	0.02	25.42	26.12	6.61
182	116.13	10.91	0	0	37.59	382	0.08	0.03	26.04	26.76	10.65
185	110.57	7.03	0	0	73.32	381.89	0.1	0.02	25.54	26.23	15.73
188	106.98	10.74	0	0	31.13	381.76	0.06	0.02	25.42	26.1	9.96
191	111.13	10.16	0	0	50.89	381.58	0.1	0.03	25.97	26.66	10.94
194	106.67	10.58	0	0	39.92	381.45	0.08	0.02	25.42	26.1	10.08
197	109.09	17.4	0	0	32.46	381.24	0.11	0.03	25.62	26.3	6.27
200	112.03	8.08	0	0	80.11	380.99	0.12	0.03	25.73	26.41	13.86
203	108.47	2.08	0	0	322.87	380.99	0.13	0.03	25.56	26.24	52.05
206	106.23	13.14	0	0	51.92	380.86	0.13	0.03	25.89	26.58	8.08
209	106.62	22.82	0	0	28.43	380.6	0.12	0.03	25.89	26.57	4.67
212	108.14	20.46	0	0	29.47	380.23	0.11	0.03	25.75	26.43	5.29
215	106.61	5.02	0	0	137.32	380.03	0.13	0.02	25.46	26.13	21.25
218	106.87	0.07	-0.1	-0.01	11668.06	380.04	0.15	0.03	26.09	26.77	1542.74
221	101.7	1.63	0	0	536.58	380	0.16	0.03	25.89	26.56	62.45
224	98.39	11.22	0	0	65.05	379.96	0.14	0.02	25.41	26.08	8.77
227	100.43	22.73	0	0	36.95	379.66	0.16	0.03	25.88	26.56	4.42
230	101.19	14.42	0	0	61.96	379.35	0.17	0.03	25.72	26.38	7.02
233	99.33	9.19	0	0	91.1	379.22	0.16	0.02	25.3	25.96	10.8
236	97.3	6.49	0	0	142.55	379.06	0.18	0.03	25.57	26.24	15
239	97.4	14.75	0	0	64.91	378.99	0.18	0.02	25.4	26.06	6.6
242	96.92	17.67	0	0	37.82	378.64	0.13	0.02	25.32	25.97	5.48
245	94.47	1.97	0	0	399.56	378.52	0.15	0.02	25.35	26.01	48
248	98.25	2.18	0	0	351.16	378.52	0.14	0.03	26.42	27.1	45.12
251	98.39	11.06	0	0	76.77	378.42	0.17	0.02	24.95	25.59	8.9
254	98.23	16.19	0	0	39.73	378.2	0.12	0.03	25.64	26.29	6.07
257	98.5	16.57	0	0	40	377.96	0.13	0.02	25.42	26.08	5.94
260	98.34	10.82	0	0	61.24	377.73	0.13	0.03	25.58	26.24	9.09
263	97.7	3.82	0	0	160.28	377.63	0.11	0.03	26.02	26.69	25.57
266	99.17	6.21	0	0	90.36	377.58	0.11	0.03	25.98	26.66	15.96
269	96.43	3.6	0	0	173.69	377.46	0.12	0.02	25.26	25.92	26.76
272	95.98	5.03	0	0	113.4	377.46	0.11	0.03	25.48	26.14	19.09
275	94.73	18.17	0	0	26.1	377.27	0.09	0.02	25.01	25.67	5.21
278	94.04	13.92	0	0	44.41	376.97	0.12	0.03	25.97	26.64	6.76
281	94.03	7.26	0	0	92.57	376.87	0.13	0.03	25.48	26.14	12.95
284	94.27	10.24	0	0	68.54	376.72	0.13	0.03	25.72	26.39	9.2
287	92.96	5.59	0	0	130.86	376.58	0.13	0.03	26.46	27.15	16.62
290	92.97	4.86	0	0	138.58	376.54	0.13	0.03	25.94	26.61	19.14
293	93.09	11.74	0	0	60.14	376.41	0.14	0.02	25.04	25.69	7.93

296	96.22	15.86	0	0	53.4	376.2	0.16	0.03	25.57	26.23	6.07
299	96.99	17.23	0	0	39.12	375.95	0.13	0.03	25.59	26.25	5.63
302	97.37	10.71	0	0	70.32	375.71	0.14	0.03	25.67	26.34	9.09
305	97.35	6.51	0	0	127.42	375.62	0.16	0.03	25.8	26.46	14.95
308	92.83	5.99	0	0	139.62	375.5	0.16	0.03	25.51	26.16	15.5
311	89.98	6.21	0	0	148.38	375.43	0.17	0.03	25.7	26.36	14.48
314	90.7	10.55	0	0	87.57	375.3	0.18	0.03	25.61	26.26	8.6
317	91.31	5.79	0	0	150.78	375.15	0.17	0.02	25.4	26.05	15.76
320	91.03	4.44	0	0	197.27	375.11	0.17	0.02	25.4	26.05	20.48
323	92.28	19.97	0	0	47.85	374.96	0.18	0.03	25.59	26.23	4.62
326	88.85	8.56	0	0	113.49	374.61	0.19	0.02	24.89	25.52	10.39
329	90.08	-0.11	0.04	0.01	-11436.31	374.69	0.24	0.03	25.69	26.35	-800.75
332	90.11	15.7	0	0	96.81	374.53	0.29	0.03	25.44	26.07	5.74
335	89.85	9.92	0	0	138.76	374.29	0.26	0.03	26.01	26.67	9.05
338	92.45	3	0	0	403.38	374.23	0.23	0.03	25.82	26.47	30.83
341	90.77	15.56	0	0	79.45	374.13	0.24	0.02	25.13	25.77	5.83
344	90.1	23.38	0	0	57.07	373.79	0.26	0.02	25.29	25.93	3.85
347	91.63	8.02	0	0	175.94	373.52	0.27	0.03	25.68	26.33	11.42
350	90.6	-2.8	0	0	-497.86	373.53	0.26	0.03	26.07	26.72	-32.4
353	87.96	7.47	0	0	194.43	373.53	0.28	0.02	25.26	25.9	11.78
356	88.84	6.18	0	0	232.76	373.34	0.27	0.03	26.16	26.81	14.36
359	84.01	2.34	0	0	556.4	373.35	0.25	0.02	25.07	25.69	35.84
362	88.06	10.98	0	0	133.73	373.23	0.28	0.02	25.27	25.9	8.02
365	88.1	17	0	0	91.04	373.03	0.29	0.03	26.24	26.89	5.18
368	89.28	14.97	0	0	100.3	372.75	0.29	0.03	25.67	26.3	5.96
371	91.17	8.81	0	0	201.75	372.6	0.33	0.03	25.9	26.54	10.35
374	88.48	9.86	0	0	161.96	372.46	0.3	0.03	25.73	26.36	8.97
377	86.17	8.52	0	0	180.62	372.31	0.3	0.02	25.1	25.72	10.12
380	88.57	3.9	0	0	411.18	372.21	0.3	0.03	25.92	26.55	22.69
383	87.98	14.74	0	0	112.63	372.14	0.32	0.03	25.56	26.19	5.97
386	87.53	12.54	0	0	123.74	371.82	0.29	0.03	25.98	26.63	6.98
389	83.35	2.18	0	0	728.69	371.79	0.3	0.03	25.42	26.05	38.32
392	89.71	9.58	0	0	178.94	371.69	0.33	0.03	25.66	26.3	9.36
395	89.05	10.76	0	0	158.15	371.52	0.32	0.03	25.8	26.44	8.27
398	89.58	6.57	0	0	272.36	371.39	0.34	0.03	25.77	26.41	13.64
401	90.04	10.37	0	0	188.97	371.3	0.37	0.03	25.57	26.2	8.68
404	88.09	16.22	0	0	109.02	371.07	0.34	0.02	25.1	25.71	5.43
407	88.85	6.39	0	0	294.82	370.87	0.35	0.03	26.12	26.77	13.9
410	83.18	1.6	0	0	1169.89	370.86	0.36	0.02	25.31	25.93	51.91
413	83.31	12.7	0	0	151.49	370.76	0.37	0.03	25.42	26.04	6.56
416	84.69	12.08	0	0	159.02	370.52	0.37	0.03	25.46	26.1	7.01
419	82.48	3.44	0	0	549.99	370.43	0.37	0.02	25.1	25.72	23.99
422	87.07	10.22	0	0	191.06	370.36	0.38	0.02	25.32	25.95	8.52
425	86.95	14.35	0	0	133.79	370.13	0.36	0.03	25.71	26.35	6.06
428	89.88	9.61	0	0	212.39	369.96	0.38	0.03	26.19	26.83	9.36
431	89.13	11.25	0	0	192.98	369.82	0.4	0.03	26.24	26.89	7.92
434	83.69	9.2	0	0	219.72	369.64	0.39	0.02	25.29	25.9	9.1
437	82.91	0.69	-0.01	0	3038.43	369.56	0.41	0.02	25.23	25.86	119.39
440	83.97	13.03	0	0	171.64	369.55	0.43	0.03	25.56	26.19	6.44
443	84.93	13.65	0	0	150.58	369.21	0.39	0.03	25.49	26.12	6.22
446	83.48	2.02	0	0	1076.69	369.18	0.42	0.03	25.49	26.13	41.33
449	84.31	10.89	0	0	200.59	369.08	0.42	0.02	25.34	25.97	7.75

452	86.69	12.09	0	0	176.18	368.88	0.41	0.03	25.58	26.21	7.17
455	84.85	8.85	0	0	250.7	368.74	0.42	0.03	25.61	26.25	9.59
458	84.99	9.71	0	0	234.88	368.6	0.44	0.03	25.35	25.98	8.75
461	86.6	6.47	0	0	354	368.46	0.43	0.03	25.87	26.51	13.38
464	86.23	2.08	0	0	1056.73	368.4	0.42	0.03	25.69	26.32	41.5
467	84.47	14.32	0	0	151.2	368.34	0.41	0.03	25.69	26.32	5.9
470	84.42	14.71	0	0	139.2	368.02	0.39	0.03	25.68	26.32	5.74
473	85.45	5.17	0	0	402.43	367.93	0.39	0.03	25.7	26.34	16.53
476	86.8	12.45	0	0	155.76	367.8	0.37	0.03	25.8	26.44	6.97
479	83.55	13.73	0	0	147.76	367.58	0.39	0.02	25.31	25.94	6.09
482	86	9.22	0	0	227.27	367.42	0.4	0.03	25.44	26.07	9.33
485	86.68	5.65	0	0	372.32	367.3	0.4	0.03	25.58	26.2	15.35
488	85.92	1.17	-0.01	0	1650.99	367.25	0.37	0.03	25.64	26.27	73.64
491	83.63	-0.86	0.01	0	-2371.1	367.25	0.38	0.03	25.76	26.4	-97.68
494	77.99	14.56	0	0	130.91	367.21	0.37	0.02	24.99	25.6	5.36
497	81.14	16.81	0	0	107.64	366.86	0.34	0.03	25.65	26.28	4.83
500	83.7	10.18	0	0	176.76	366.74	0.34	0.03	25.68	26.31	8.22
503	82.6	12.94	0	0	147.11	366.53	0.36	0.03	26.06	26.7	6.39
506	85.58	4.67	0	0	400.6	366.39	0.36	0.03	25.58	26.21	18.33
509	84.51	6.81	0	0	295.83	366.35	0.38	0.03	25.93	26.57	12.4
512	82.74	9.06	0	0	226.49	366.18	0.39	0.03	25.61	26.24	9.13
515	86.6	4.97	0	0	418.54	366.1	0.39	0.03	26.18	26.83	17.42
518	83.44	4.99	0	0	401.04	366.02	0.38	0.03	25.54	26.18	16.72
521	84.81	12.92	0	0	164.51	365.92	0.4	0.03	25.68	26.31	6.56
524	84.39	18.12	0	0	114.94	365.64	0.4	0.03	25.57	26.21	4.66
527	80.93	14.42	0	0	141.5	365.42	0.39	0.03	25.4	26.03	5.61
530	84.07	9.07	0	0	214.86	365.22	0.37	0.03	25.5	26.13	9.27
533	80.53	2.71	0	0	724.36	365.14	0.37	0.03	25.75	26.39	29.68
536	81.43	4.95	0	0	433.88	365.11	0.41	0.03	25.73	26.38	16.47
539	82.19	6.15	0	0	340.34	365	0.4	0.02	25.31	25.94	13.37
542	78.58	2.64	0	0	791.56	364.94	0.41	0.02	25.01	25.63	29.76
545	81.55	8.03	0	0	267.49	364.89	0.41	0.02	25.32	25.95	10.16
548	85.47	12.91	0	0	162.38	364.69	0.39	0.03	26.13	26.77	6.62
551	84.03	15.22	0	0	129.54	364.51	0.37	0.03	25.74	26.37	5.52
554	85.86	14.28	0	0	156.74	364.25	0.43	0.03	25.57	26.21	6.01
557	82.25	8.5	0	0	254.22	364.1	0.42	0.02	24.89	25.51	9.68
560	83.87	1.75	0	0	1284.35	364	0.42	0.03	25.89	26.53	47.85
563	79.19	1.77	0	0	1186.32	364.02	0.4	0.03	25.35	25.98	44.85
566	78.23	9.08	0	0	228.98	363.92	0.4	0.02	25.21	25.83	8.62
569	79.42	15.4	0	0	136.6	363.75	0.4	0.03	25.77	26.41	5.16
572	77.81	13.43	0	0	146.17	363.49	0.37	0.03	25.66	26.28	5.79
575	80.88	7.83	0	0	245.73	363.37	0.37	0.03	25.48	26.1	10.33
578	83.11	3.6	0	0	531.07	363.25	0.36	0.03	25.87	26.51	23.07
581	81.59	6.58	0	0	287.95	363.23	0.37	0.02	24.98	25.59	12.41
584	83.42	7.86	0	0	248.7	363.05	0.37	0.03	25.9	26.54	10.61
587	79.56	6.69	0	0	312.29	363	0.4	0.03	25.75	26.38	11.9
590	84.44	9.59	0	0	197.25	362.84	0.36	0.03	25.79	26.42	8.8
593	81.12	12.87	0	0	141.23	362.71	0.34	0.03	25.79	26.43	6.3
596	82.49	17.64	0	0	99.76	362.45	0.34	0.03	25.51	26.14	4.68
599	84.61	11.38	0	0	143.91	362.23	0.31	0.03	25.91	26.55	7.43
602	82.4	5.38	0	0	309.45	362.11	0.31	0.03	26.24	26.89	15.32
605	76.15	4.32	0	0	356.28	362.05	0.3	0.02	25.24	25.86	17.64

608	79.7	0.38	-0.02	0	4313.37	361.99	0.31	0.03	25.67	26.31	211.84
611	77.71	2.19	0	0	809.96	362.01	0.34	0.02	25.11	25.73	35.53
614	78.39	12.44	0	0	129.5	361.89	0.3	0.03	25.9	26.54	6.3
617	84.94	12.93	0	0	133.17	361.67	0.32	0.03	26.07	26.71	6.57
620	79.98	2.93	0	0	571.46	361.54	0.32	0.03	25.48	26.1	27.32
623	81.25	8.86	0	0	172.86	361.53	0.29	0.03	25.53	26.15	9.17
626	81.91	13.71	0	0	105.6	361.28	0.27	0.03	25.9	26.54	5.97
629	81.19	6.55	0	0	216	361.16	0.27	0.03	25.54	26.17	12.4
632	81.26	9.51	0	0	145.94	361.05	0.26	0.03	25.58	26.21	8.55
635	81.41	12.31	0	0	111.66	360.87	0.27	0.02	25.21	25.83	6.61
638	81.78	12.62	0	0	106.78	360.69	0.26	0.03	25.56	26.18	6.48
641	79.81	12.31	0	0	115.67	360.5	0.27	0.03	25.76	26.39	6.49
644	78.69	8.47	0	0	168.1	360.34	0.27	0.03	25.83	26.45	9.29
647	81.24	2.71	0	0	508.9	360.25	0.26	0.03	25.79	26.42	29.94
650	77.95	1.8	0	0	741.84	360.24	0.26	0.03	25.37	25.98	43.19
653	78.21	2.28	0	0	483.87	360.19	0.21	0.03	25.61	26.24	34.31
656	77.34	7.86	0	0	139.72	360.15	0.21	0.03	26.07	26.7	9.84
659	77.67	14.83	0	0	77.86	359.95	0.22	0.03	25.37	25.98	5.24
662	76.84	11.54	0	0	95.1	359.74	0.21	0.02	25.24	25.85	6.66
665	78.15	12.46	0	0	77.72	359.59	0.19	0.02	24.96	25.56	6.27
668	79.82	13.26	0	0	53.33	359.37	0.14	0.02	25.08	25.69	6.02
671	80.32	7.1	0	0	107.78	359.22	0.15	0.03	25.38	25.99	11.32
674	78.26	2.62	0	0	272.99	359.15	0.14	0.03	25.53	26.15	29.87
677	80.63	9.99	0	0	82.86	359.1	0.16	0.03	25.51	26.13	8.07
680	81.08	9.2	0	0	74.8	358.87	0.13	0.03	25.38	26	8.81
683	82.6	6.03	0	0	104.42	358.83	0.12	0.03	25.52	26.13	13.71
686	79.66	7.55	0	0	84.47	358.68	0.12	0.03	25.47	26.09	10.56
689	74.15	4.31	0	0	142.72	358.62	0.12	0.02	24.93	25.53	17.2
692	76.86	14.04	0	0	43.83	358.5	0.12	0.03	25.8	26.43	5.47
695	78.07	17.8	0	0	36.54	358.22	0.13	0.02	25.29	25.9	4.39
698	80.18	8.97	0	0	55.03	358.02	0.09	0.03	25.79	26.42	8.94
701	78.7	4.68	0	0	122.37	357.94	0.11	0.02	25.24	25.85	16.82
704	77.04	0.38	-0.02	0	1367.89	357.87	0.1	0.03	25.35	25.97	201.13
707	77.23	-0.57	0.01	0	-704.29	357.91	0.08	0.02	25.27	25.89	-135.87
710	81.76	10.52	0	0	32.99	357.84	0.07	0.03	25.68	26.31	7.77
713	84.76	16.13	0	0	21.66	357.61	0.07	0.03	25.52	26.14	5.26
716	82.96	11.65	0	0	32.32	357.4	0.07	0.03	25.7	26.33	7.12
719	81.72	9.74	0	0	26.45	357.26	0.05	0.03	25.72	26.36	8.39
722	76.1	11.56	0	0	15.88	357.09	0.04	0.03	25.39	26.03	6.59
725	76.68	14.98	0	0	17.66	356.91	0.05	0.02	24.86	25.47	5.12
728	81.01	0.01	-0.61	-0.06	24723.91	356.67	0.05	0.03	25.46	26.1	8100.57
731	81.44	0.01	-0.62	-0.08	11170.85	356.54	0.02	0.03	25.82	26.46	8144.44

Paper (stacked flat - covered with cardboard)**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	7.00
Peak Heat Release Rate (kW/m ²):	505.05
Time to Peak Heat Release Rate (s):	10.00
Total Heat Release (MJ/m ²):	92.02
60 s Average Heat Release Rate (kW/m ²):	311.21
Total Mass Loss (g):	73.97
Average Mass Loss Rate (g/s):	0.098
Average Effective Heat of Combustion (MJ/kg):	12.44
Average Smoke Extinction Area (m ² /kg):	12.23
Average CO ₂ yield (g/g):	0.01
Average CO yield (g/g):	0.0111

Specimen:

Initial mass (g):	395.1
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	94
Time to ignition (s):	7
Time to flameout (s):	762

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	131.71	0.01	-0.45	-0.04	31928.23	395.19	0.13	0.02	24.09	24.54	0
4	323.98	0.01	-0.43	1.06	45845.58	395.3	0.18	0.03	24.51	24.97	0
7	474.81	36.03	0.08	0	33.38	394.23	0.54	0.02	21.68	22.36	13.18
10	505.05	43.6	0.18	0	63.94	393.24	1.22	0.02	21.45	22.77	11.58
13	475.18	41.64	0.33	0	77.06	391.71	1.4	0.02	21.19	22.86	11.41
16	439.17	28.67	0.12	0	76.59	390.84	0.93	0.02	21.71	23.73	15.32
19	430.1	14.81	0	0.01	72.12	390	0.43	0.02	22.82	25.12	29.04
22	402.28	2.51	0	0.02	130.63	389.91	0.13	0.02	22.91	25.35	160.03
25	365.61	24.71	0	0	34.78	389.6	0.35	0.02	21.92	24.32	14.79
28	346.36	35.22	0	0	18.88	388.51	0.26	0.02	23.38	25.98	9.83
31	316.79	18.44	0	0	32.44	387.69	0.23	0.02	23.48	26.07	17.18
34	282.81	20	0	0	33.23	387.28	0.25	0.02	23.62	26.15	14.14
37	264.22	27.05	0	0	13.41	386.45	0.14	0.02	23.79	26.25	9.77
40	253.41	15.6	0	0	32.39	385.79	0.19	0.02	24.08	26.49	16.25
43	243.46	11.12	0	0.01	38.79	385.47	0.16	0.02	24.49	26.8	21.9
46	235.78	14.41	0	0.01	10.36	385.06	0.06	0.02	24.41	26.63	16.36
49	230.74	13.37	0	0.01	38.39	384.62	0.19	0.02	24.44	26.55	17.26
52	230.82	21.02	0	0	21.56	384.2	0.17	0.02	24.71	26.76	10.98
55	225.97	24.79	0	0	12.3	383.4	0.11	0.02	24.75	26.71	9.12
58	220.21	8.68	0	0.01	55.74	382.85	0.18	0.02	25.25	27.21	25.36
61	212.53	10.81	0	0.01	54.31	382.75	0.21	0.02	25.73	27.66	19.67
64	189.95	16.27	0	0	10.98	382.17	0.07	0.02	24.84	26.63	11.68
67	190.2	11.98	0	0.01	25.46	381.85	0.11	0.02	25.61	27.39	15.88
70	179.21	8.71	0	0.01	17.81	381.44	0.06	0.02	24.62	26.25	20.58
73	179.13	17.59	0	0	3.3	381.24	0.02	0.02	24.91	26.49	10.18
76	174.72	16.82	0	0	28.49	380.46	0.19	0.02	24.36	25.86	10.39
79	174.38	3.46	0	0.02	83.22	380.32	0.11	0.02	24.85	26.31	50.44
82	165.59	10.97	0	0.01	15.14	380.11	0.07	0.02	24.08	25.47	15.09
85	162	13.77	0	0	21.28	379.68	0.11	0.02	24.71	26.08	11.76
88	162.5	17.8	0	0	22.52	379.28	0.15	0.02	25.54	26.92	9.13
91	153.77	12.53	0	0.01	25.82	378.69	0.12	0.02	25.02	26.32	12.28
94	150.41	-3.57	0	-0.02	-61.83	378.6	0.08	0.02	25.05	26.32	-42.16
97	149.24	6.84	0	0.01	0	378.71	0	0.02	25.29	26.54	21.83
100	143.52	10.68	0	0.01	19.83	378.22	0.08	0.02	25.2	26.4	13.43
103	139.7	9.76	0	0	52.47	378.11	0.2	0.02	24.88	26.03	14.32
106	140.15	14.68	0	0	32.39	377.59	0.18	0.02	25.17	26.3	9.54
109	139.67	19.65	0	0	32.36	377.23	0.24	0.02	25.38	26.49	7.11
112	134.69	16.9	0	0	18.77	376.48	0.12	0.02	24.72	25.78	7.97
115	133.02	4.57	0	0.02	35.24	376.28	0.06	0.02	24.67	25.7	29.12
118	132.79	4.71	0	0.02	33.04	376.12	0.06	0.02	25.03	26.06	28.17
121	130.24	11.47	0	0.01	27.03	375.94	0.12	0.02	25.18	26.18	11.35
124	127.16	14.79	0	0.01	31.21	375.45	0.18	0.02	25.05	26.04	8.6
127	122.22	10.99	0	0.01	17.22	375.11	0.07	0.02	24.44	25.38	11.13
130	124.3	13.3	0	0.01	43.71	374.76	0.22	0.02	24.96	25.9	9.34
133	120.89	12.26	0	0.01	17.59	374.33	0.08	0.02	24.6	25.53	9.86
136	122.87	10.45	0	0.01	36.06	374.03	0.14	0.02	25.27	26.2	11.76

139	123.33	13.23	0	0.01	29.84	373.67	0.15	0.02	25.38	26.29	9.32
142	118.15	11.13	0	0.01	53.5	373.26	0.23	0.02	24.64	25.53	10.62
145	119.6	12.99	0	0.01	32.8	372.98	0.16	0.02	25.02	25.91	9.21
148	118.56	11.96	0	0.01	23.62	372.51	0.11	0.02	24.89	25.77	9.91
151	120.39	5.69	0	0.02	38.57	372.3	0.08	0.02	25.08	25.95	21.15
154	118.12	5.97	0	0.02	30.36	372.12	0.07	0.02	24.38	25.22	19.79
157	121.29	6.72	0	0.02	34.51	371.93	0.09	0.02	24.83	25.68	18.05
160	120.77	15.6	0	0.01	23.44	371.66	0.14	0.02	24.96	25.82	7.74
163	123.16	15.72	0	0.01	16.76	371.06	0.1	0.02	25.23	26.1	7.83
166	121.15	10.37	0	0.01	42.95	370.76	0.17	0.02	24.8	25.65	11.68
169	120.55	11.1	0	0.01	16.18	370.39	0.07	0.02	25.16	26.02	10.86
172	116.26	10.15	0	0.01	28.3	370.1	0.11	0.02	24.6	25.44	11.46
175	120.56	9.25	0	0.01	37.16	369.78	0.13	0.02	25.55	26.42	13.03
178	117.04	10.52	0	0.01	21.07	369.53	0.09	0.02	25.03	25.89	11.12
181	116.83	13.23	0	0.01	12.49	369.14	0.06	0.02	25.32	26.18	8.83
184	113.28	12.42	0	0.01	22.24	368.76	0.11	0.02	24.73	25.56	9.12
187	112.52	12.19	0	0.01	12.69	368.4	0.06	0.02	24.8	25.63	9.23
190	113.33	9.67	0	0.01	16.34	368.05	0.06	0.02	25.33	26.17	11.71
193	110	5.21	0	0.02	15.9	367.83	0.03	0.02	25.03	25.86	21.11
196	109.69	11.99	0	0.01	0	367.66	0	0.02	25.16	25.99	9.15
199	106.57	11.34	0	0.01	2.48	367.15	0.01	0.02	24.76	25.57	9.4
202	109.46	8.18	0	0.01	0	367	0	0.02	25.53	26.36	13.39
205	105.91	10.22	0	0.01	0	366.63	0	0.02	24.86	25.68	10.36
208	105.25	5.62	0	0.02	0	366.42	0	0.02	24.66	25.46	18.71
211	108.3	10.02	0	0.01	0	366.24	0	0.02	25.06	25.87	10.8
214	108.73	10.12	0	0.01	0	365.84	0	0.02	25.02	25.83	10.74
217	108.37	14.65	0	0.01	0	365.6	0	0.02	24.97	25.77	7.4
220	106.2	15.43	0	0.01	0	365	0	0.02	24.7	25.49	6.88
223	106.29	9.2	0	0.01	0	364.73	0	0.02	24.83	25.63	11.55
226	104.44	8.72	0	0.01	0	364.4	0	0.02	24.96	25.76	11.98
229	105.29	11.77	0	0.01	0	364.18	0	0.02	25.17	25.98	8.95
232	104.5	6.73	0	0.02	0	363.76	0	0.02	25.22	26.02	15.54
235	102.41	-0.54	0.01	-0.22	0	363.78	0	0.02	24.9	25.7	-188.14
238	102.81	12.53	0	0.01	0	363.65	0	0.02	24.78	25.58	8.2
241	103.95	13.46	0	0.01	0	363.11	0	0.02	24.98	25.78	7.72
244	101.56	6.32	0	0.01	0	362.9	0	0.02	24.43	25.22	16.06
247	102.15	10.35	0	0.01	0	362.66	0	0.02	24.47	25.26	9.87
250	103.9	8.46	0	0.01	0	362.31	0	0.02	24.79	25.59	12.29
253	103.77	10.1	0	0.01	0	362.13	0	0.02	25	25.8	10.28
256	104.04	10.07	0	0.01	0	361.72	0	0.02	24.95	25.75	10.34
259	101.29	5	0	0.02	0	361.56	0	0.02	24.37	25.14	20.27
262	102.08	5.37	0	0.02	0	361.39	0	0.02	24.91	25.71	19
265	100.29	4.78	0	0.02	0	361.24	0	0.02	24.7	25.5	20.98
268	100.97	8.5	0	0.01	0	361.07	0	0.02	24.72	25.52	11.88
271	100.94	9.97	0	0.01	0	360.74	0	0.02	24.62	25.41	10.12
274	105.19	11	0	0.01	0	360.48	0	0.02	25.35	26.17	9.56
277	105.2	10.47	0	0.01	0	360.1	0	0.02	25.1	25.91	10.05
280	101.86	10.05	0	0.01	0	359.85	0	0.02	24.31	25.1	10.13
283	104.62	10.41	0	0.01	0	359.49	0	0.02	24.97	25.78	10.05
286	102.85	12.41	0	0.01	0	359.21	0	0.02	24.59	25.39	8.29
289	101.76	11.09	0	0.01	0	358.77	0	0.02	24.59	25.38	9.17
292	102.49	5.02	0	0.02	0	358.58	0	0.02	24.99	25.79	20.44

295	100.1	6.07	0	0.02	0	358.42	0	0.02	24.6	25.39	16.48
298	101.76	6.74	0	0.02	0	358.21	0	0.02	25.23	26.04	15.11
301	102.81	10.07	0	0.01	0	358	0	0.02	25.34	26.15	10.22
304	99.49	8.94	0	0.01	0	357.64	0	0.02	24.73	25.53	11.13
307	99.91	6.61	0	0.02	0	357.47	0	0.02	25.05	25.86	15.13
310	101.67	9.12	0	0.01	0	357.21	0	0.02	25.3	26.12	11.15
313	98.58	8.58	0	0.01	0	356.94	0	0.02	24.51	25.31	11.49
316	97.34	10.05	0	0.01	0	356.69	0	0.02	24.53	25.32	9.68
319	99.98	8.1	0	0.02	0	356.36	0	0.02	24.86	25.66	12.34
322	102.77	11.27	0	0.01	0	356.17	0	0.02	25.3	26.11	9.12
325	98.46	12.49	0	0.01	0	355.7	0	0.02	24.58	25.37	7.88
328	97.29	5.52	0	0.02	0	355.48	0	0.02	24.55	25.33	17.63
331	97.65	4.36	0	0.03	0	355.33	0	0.02	24.94	25.73	22.4
334	95.93	4.72	0	0.03	0	355.19	0	0.02	24.85	25.65	20.3
337	95.24	8.13	0	0.01	0	355.02	0	0.02	24.69	25.47	11.71
340	98.25	8.63	0	0.02	0	354.73	0	0.02	25.09	25.89	11.38
343	98.14	9.07	0	0.01	0	354.51	0	0.02	24.74	25.52	10.82
346	99.44	9.19	0	0.01	0	354.18	0	0.02	24.95	25.74	10.82
349	97.27	9.18	0	0.02	0	353.96	0	0.02	24.46	25.23	10.59
352	97.84	9.13	0	0.01	0	353.64	0	0.02	24.65	25.43	10.72
355	98.63	6.33	0	0.02	0	353.43	0	0.02	24.81	25.59	15.58
358	96.65	9.8	0	0.01	0	353.21	0	0.02	24.56	25.33	9.86
361	97.15	13.82	0	0.01	0	352.84	0	0.02	24.75	25.53	7.03
364	95.84	9.09	0	0.01	0	352.45	0	0.02	24.71	25.49	10.54
367	97.16	4.94	0	0.02	0	352.29	0	0.02	24.96	25.74	19.66
370	97.63	4.23	0	0.03	0	352.12	0	0.02	24.87	25.65	23.06
373	99.17	8.07	0	0.01	0	352	0	0.02	25.02	25.81	12.29
376	99.38	8.56	0	0.01	0	351.65	0	0.02	25.05	25.84	11.61
379	98.29	12.92	0	0.01	0	351.47	0	0.02	24.43	25.21	7.61
382	98.99	12.25	0	0.01	0	350.92	0	0.02	24.64	25.42	8.08
385	97.61	6.97	0	0.02	0	350.76	0	0.02	24.36	25.13	14
388	101.17	10.74	0	0.01	0	350.44	0	0.02	25	25.79	9.42
391	97.71	5.91	0	0.02	0	350.17	0	0.02	24.41	25.19	16.53
394	101.65	8.32	0	0.01	0	350.04	0	0.02	25.13	25.93	12.21
397	98.29	9.15	0	0.01	0	349.68	0	0.02	24.71	25.49	10.74
400	96.63	4.52	0	0.03	0	349.53	0	0.02	24.5	25.28	21.38
403	98.89	4.4	0	0.03	0	349.38	0	0.02	25.37	26.19	22.46
406	96.94	7.52	0	0.02	0	349.24	0	0.02	24.7	25.5	12.89
409	97.42	8.69	0	0.01	0	348.94	0	0.02	24.9	25.7	11.22
412	98.55	12.32	0	0.01	0	348.7	0	0.02	24.79	25.6	8
415	97.35	11.55	0	0.01	0	348.23	0	0.02	24.55	25.34	8.43
418	98.76	10.73	0	0.01	0	348.02	0	0.02	24.91	25.71	9.21
421	97.89	10.47	0	0.01	0	347.59	0	0.02	24.82	25.61	9.35
424	97.62	4.59	0	0.03	0	347.42	0	0.02	24.69	25.48	21.28
427	99.11	8.35	0	0.01	0	347.24	0	0.02	25.12	25.92	11.87
430	97.83	10.14	0	0.01	0	346.93	0	0.02	24.81	25.6	9.65
433	98.8	5.69	0	0.02	0	346.68	0	0.02	25.3	26.1	17.36
436	96.46	4.74	0	0.02	0	346.57	0	0.02	24.81	25.6	20.36
439	93.81	8.37	0	0.01	0	346.36	0	0.02	24.38	25.16	11.21
442	96.54	8.52	0	0.01	0	346.09	0	0.02	24.89	25.69	11.33
445	99.57	6.77	0	0.02	0	345.87	0	0.03	25.87	26.69	14.7
448	98	8.5	0	0.01	0	345.66	0	0.02	24.84	25.64	11.54

451	101.41	12.41	0	0.01	0	345.34	0	0.02	25.35	26.15	8.17
454	98.95	11.22	0	0.01	0	344.95	0	0.02	24.47	25.25	8.82
457	99.91	11.37	0	0.01	0	344.66	0	0.02	24.74	25.53	8.78
460	100.91	9.1	0	0.01	0	344.28	0	0.02	24.67	25.46	11.1
463	101.65	5.99	0	0.02	0	344.12	0	0.02	24.68	25.47	16.98
466	101.72	8.81	0	0.02	0	343.88	0	0.02	24.92	25.72	11.55
469	98.29	5.42	0	0.03	0	343.63	0	0.02	24.6	25.4	18.13
472	98.19	4.35	0	0.03	0	343.54	0	0.02	24.76	25.56	22.55
475	97.19	4.95	0	0.02	0	343.35	0	0.02	24.57	25.37	19.62
478	100.6	8.76	0	0.02	0	343.22	0	0.02	25.39	26.21	11.48
481	99.88	11.88	0	0.01	0	342.84	0	0.02	25.14	25.95	8.41
484	96.11	9.6	0	0.01	0	342.55	0	0.02	24.15	24.93	10.01
487	97.84	7.65	0	0.02	0	342.26	0	0.02	24.45	25.25	12.8
490	100.04	9.73	0	0.01	0	342.06	0	0.02	25.17	25.99	10.28
493	98.88	8.69	0	0.01	0	341.7	0	0.02	24.65	25.46	11.38
496	100.64	5.7	0	0.02	0	341.56	0	0.02	24.74	25.55	17.67
499	101.88	8.03	0	0.02	0	341.32	0	0.02	24.77	25.58	12.69
502	98.71	4.79	0	0.02	0	341.11	0	0.02	23.93	24.71	20.62
505	103.66	6.87	0	0.02	0	341	0	0.02	24.9	25.72	15.08
508	103.92	8.08	0	0.02	0	340.7	0	0.02	24.81	25.63	12.86
511	103.56	8.92	0	0.01	0	340.52	0	0.02	25.03	25.86	11.61
514	102.61	9.98	0	0.01	0	340.16	0	0.02	24.89	25.71	10.28
517	103.48	5.8	0	0.02	0	339.95	0	0.02	25.36	26.19	17.83
520	102.61	9.79	0	0.01	0	339.76	0	0.02	25.1	25.93	10.48
523	101.77	9.66	0	0.01	0	339.39	0	0.02	25.2	26.03	10.54
526	100.51	9.75	0	0.01	0	339.18	0	0.02	24.67	25.48	10.31
529	98.8	13.98	0	0.01	0	338.78	0	0.02	24.4	25.2	7.07
532	100.6	9.69	0	0.01	0	338.4	0	0.02	25.13	25.96	10.38
535	99.44	8.76	0	0.01	0	338.18	0	0.02	25.01	25.83	11.36
538	100.04	7.73	0	0.01	0	337.87	0	0.02	25.11	25.94	12.94
541	104.4	7.84	0	0.01	0	337.7	0	0.02	25.68	26.53	13.31
544	103.38	10.21	0	0.01	0	337.39	0	0.02	25.2	26.04	10.13
547	100.62	8.01	0	0.02	0	337.12	0	0.02	24.36	25.16	12.56
550	102.53	11.88	0	0.01	0	336.87	0	0.02	24.6	25.41	8.63
553	102.17	8.57	0	0.01	0	336.46	0	0.02	24.83	25.65	11.92
556	100.98	5.03	0	0.03	0	336.36	0	0.02	24.6	25.41	20.07
559	99.46	9.11	0	0.02	0	336.1	0	0.02	24.19	24.99	10.91
562	102.64	7.31	0	0.02	0	335.85	0	0.02	25.12	25.94	14.04
565	99.44	4.81	0	0.03	0	335.67	0	0.02	24.7	25.51	20.65
568	97.56	5.84	0	0.02	0	335.53	0	0.02	24.59	25.39	16.72
571	96.7	9.1	0	0.01	0	335.3	0	0.02	24.39	25.18	10.63
574	94.98	11.32	0	0.01	0	335	0	0.02	24.39	25.18	8.39
577	96.64	6.3	0	0.02	0	334.67	0	0.02	24.99	25.79	15.34
580	96.77	6.85	0	0.02	0	334.58	0	0.02	25.21	26.02	14.13
583	93.95	12.86	0	0.01	0	334.22	0	0.02	24.77	25.56	7.31
586	95.21	9.7	0	0.01	0	333.87	0	0.02	25.09	25.9	9.81
589	94.25	8.41	0	0.02	0	333.63	0	0.02	24.8	25.6	11.21
592	95	11.92	0	0.01	0	333.34	0	0.02	24.74	25.53	7.97
595	96.65	8.43	0	0.02	0	332.97	0	0.02	25.15	25.95	11.46
598	95.98	4.94	0	0.03	0	332.83	0	0.02	25.08	25.88	19.41
601	95.58	7.42	0	0.02	0	332.63	0	0.02	24.9	25.69	12.88
604	94.76	5.49	0	0.02	0	332.41	0	0.02	24.91	25.69	17.27

607	94.85	4.79	0	0.03	0	332.29	0	0.02	24.64	25.42	19.82
610	95.93	5.35	0	0.03	0	332.11	0	0.02	24.89	25.67	17.92
613	94.34	7.8	0	0.02	0	331.95	0	0.02	24.44	25.2	12.09
616	96.97	11.21	0	0.01	0	331.64	0	0.02	24.93	25.71	8.65
619	97.14	6.31	0	0.02	0	331.34	0	0.02	25.11	25.88	15.4
622	96.41	4.86	0	0.03	0	331.24	0	0.02	25.21	25.99	19.83
625	94.93	9.8	0	0.01	0	331	0	0.02	24.95	25.72	9.68
628	93.97	9.53	0	0.01	0	330.69	0	0.02	24.99	25.77	9.87
631	94.12	6	0	0.02	0	330.45	0	0.02	25.17	25.96	15.68
634	95.6	10.06	0	0.01	0	330.28	0	0.02	25.5	26.3	9.51
637	91.67	10.95	0	0.01	0	329.87	0	0.02	24.68	25.45	8.37
640	91.51	9.53	0	0.01	0	329.64	0	0.02	24.7	25.46	9.6
643	91.24	11.23	0	0.01	0	329.28	0	0.02	24.93	25.7	8.13
646	91.96	6.64	0	0.02	0	329.01	0	0.02	24.92	25.69	13.85
649	93.58	5.28	0	0.02	0	328.86	0	0.02	25	25.77	17.72
652	93.78	9.13	0	0.01	0	328.65	0	0.02	24.94	25.71	10.27
655	94.34	4.53	0	0.02	0	328.37	0	0.02	24.87	25.64	20.83
658	93.76	6.09	0	0.02	0	328.34	0	0.02	24.55	25.31	15.4
661	94.09	8.91	0	0.01	0	327.99	0	0.02	24.49	25.25	10.56
664	93.72	5.39	0	0.02	0	327.85	0	0.02	24.73	25.5	17.4
667	92.04	5.76	0	0.02	0	327.64	0	0.02	24.57	25.33	15.99
670	94.3	7.59	0	0.01	0	327.49	0	0.02	25.09	25.87	12.43
673	94.21	9.17	0	0.01	0	327.19	0	0.02	25.22	26	10.28
676	89.77	6.53	0	0.02	0	326.97	0	0.02	24.47	25.22	13.75
679	90.21	7.66	0	0.01	0	326.77	0	0.02	24.9	25.67	11.78
682	91.31	11.2	0	0.01	0	326.49	0	0.02	25.28	26.06	8.15
685	90.36	9.87	0	0.01	0	326.14	0	0.02	24.8	25.56	9.15
688	90.37	6.72	0	0.02	0	325.91	0	0.02	24.68	25.43	13.44
691	91.57	9.57	0	0.01	0	325.69	0	0.02	25.47	26.26	9.57
694	90.94	9.87	0	0.01	0	325.36	0	0.02	25.07	25.85	9.21
697	89.48	7.1	0	0.02	0	325.12	0	0.02	24.48	25.23	12.6
700	89	7	0	0.02	0	324.91	0	0.02	24.24	24.99	12.71
703	91.65	8.49	0	0.01	0	324.69	0	0.02	24.86	25.63	10.79
706	93.7	7.1	0	0.01	0	324.42	0	0.02	25.15	25.92	13.21
709	92.67	5.26	0	0.02	0	324.27	0	0.02	24.89	25.64	17.62
712	93.07	5.86	0	0.02	0	324.09	0	0.02	24.76	25.51	15.89
715	94.06	6.93	0	0.01	0	323.91	0	0.02	24.73	25.48	13.56
718	94.1	9.73	0	0.01	0	323.66	0	0.02	24.64	25.4	9.67
721	93	10.28	0	0.01	0	323.35	0	0.02	24.51	25.26	9.04
724	93.72	6.09	0	0.02	0	323.08	0	0.02	24.77	25.53	15.38
727	94.13	8.17	0	0.01	0	322.94	0	0.02	24.94	25.7	11.52
730	93.73	9.5	0	0.01	0	322.59	0	0.02	25.01	25.78	9.87
733	92.12	7.59	0	0.02	0	322.39	0	0.02	24.85	25.62	12.14
736	90.97	7.99	0	0.01	0	322.12	0	0.02	24.41	25.17	11.39
739	89.06	6.38	0	0.02	0	321.92	0	0.02	24.42	25.18	13.97
742	89.76	8.79	0	0.01	0	321.71	0	0.02	24.91	25.68	10.22
745	89.32	9.92	0	0.01	0	321.4	0	0.02	25.21	25.99	9
748	88.05	6.27	0	0.02	0	321.15	0	0.02	25.04	25.8	14.05
751	85.58	7.4	0	0.01	0	321	0	0.02	24.64	25.39	11.56
754	85.66	9.4	0	0.01	0	320.7	0	0.02	24.37	25.11	9.11
757	88.53	6.91	0	0.01	0	320.46	0	0.02	24.96	25.71	12.82
760	88.13	0.01	-0.39	10.66	0	320.26	0	0.02	24.75	25.5	8813.36

Paper (stacked flat - covered with cardboard)**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	407.04
Time to Peak Heat Release Rate (s):	7.00
Total Heat Release (MJ/m ²):	86.37
60 s Average Heat Release Rate (kW/m ²):	290.64
Total Mass Loss (g):	67.67
Average Mass Loss Rate (g/s):	0.090
Average Effective Heat of Combustion (MJ/kg):	12.76
Average Smoke Extinction Area (m ² /kg):	7.51
Average CO ₂ yield (g/g):	0.00
Average CO yield (g/g):	0.0130

Specimen:

Initial mass (g):	387.6
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	73
Time to ignition (s):	8
Time to flameout (s):	765

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	32.79	0.01	-0.34	-0.03	7109.68	387.68	0.03	0.03	25.15	25.53	0
4	213.63	0.01	-0.46	-0.03	17771.54	387.74	0.07	0.03	25.73	26.12	0
7	407.04	27.78	0	0	50.66	387.58	0.55	0.03	25.07	25.46	14.65
10	374.15	43.6	0.13	0	34.57	386.18	0.71	0.02	20.32	21.16	8.58
13	364.74	31.06	0	0.01	87.52	385.19	1.18	0.02	21.75	23.08	11.74
16	341.23	24.15	0	0.01	116.56	384.3	1.15	0.02	22.9	24.55	14.13
19	341.34	23.32	0	0	65.1	383.69	0.61	0.02	23.13	24.91	14.64
22	358.59	21.13	0	0	85.33	382.9	0.7	0.02	23.75	25.62	16.97
25	343.87	19.66	0	0	116.8	382.41	0.91	0.02	23.36	25.3	17.49
28	320.48	25.08	0	0	50.77	381.68	0.51	0.02	23.02	25.04	12.78
31	315.82	21.14	0	0	38.81	380.97	0.31	0.02	24.1	26.23	14.94
34	291.12	23.86	0	0	15.36	380.37	0.14	0.02	23.57	25.67	12.2
37	291.95	23.86	0	0	3.88	379.56	0.03	0.02	24.39	26.56	12.24
40	274.39	13.4	0	0	0	379.01	0	0.02	23.73	25.8	20.47
43	265.78	17.53	0	0	0	378.66	0	0.02	24	26.06	15.16
46	257.27	14.44	0	0	0.98	378	0.01	0.02	24.38	26.42	17.81
49	247.53	9.85	0	0	0	377.8	0	0.02	24.67	26.66	25.12
52	235.53	19.37	0	0	0	377.31	0	0.02	24.4	26.3	12.16
55	230.67	20.84	0	0	10.15	376.69	0.08	0.02	24.83	26.68	11.07
58	220.86	14.73	0	0	1.83	376.11	0.01	0.02	24.69	26.48	14.99
61	210.91	16.47	0	0	0	375.76	0	0.02	24.45	26.17	12.81
64	207.33	16.49	0	0	0	375.14	0	0.02	24.67	26.33	12.57
67	202.88	7.92	0	0	3.63	374.82	0.01	0.02	24.78	26.38	25.6
70	198.38	13.3	0	0	0	374.57	0	0.02	24.9	26.44	14.92
73	191.33	13.3	0	0	0	374.05	0	0.02	24.73	26.2	14.39
76	187.39	16.62	0	0	0	373.75	0	0.02	24.72	26.13	11.27
79	186.96	19	0	0	0	373.07	0	0.02	25.43	26.83	9.84
82	176.77	9.97	0	0	0	372.69	0	0.02	25.09	26.42	17.72
85	172.54	14.12	0	0	3.06	372.38	0.02	0.02	25.03	26.31	12.22
88	171.18	11.43	0	0	0	371.88	0	0.02	25	26.22	14.97
91	168.83	8.9	0	0	0	371.69	0	0.02	25.17	26.36	18.98
94	164.29	14.06	0	0	0	371.3	0	0.02	24.83	25.97	11.69
97	164.21	13.98	0	0	0	370.88	0	0.02	24.98	26.09	11.74
100	161.82	13.57	0	0	0	370.46	0	0.02	25.08	26.17	11.92
103	160	11.14	0	0	0	370.08	0	0.02	25.36	26.43	14.36
106	154.58	11.7	0	0.01	0	369.78	0	0.02	25.02	26.08	13.21
109	150.91	10.61	0	0	0	369.39	0	0.02	24.98	26	14.22
112	146.82	9.75	0	0.01	0	369.14	0	0.02	25.04	26.03	15.05
115	144.38	11.94	0	0.01	0	368.79	0	0.02	25.25	26.23	12.09
118	143.85	11.37	0	0.01	0	368.44	0	0.02	25.26	26.22	12.65
121	144.88	10.44	0	0.01	0	368.11	0	0.02	25.41	26.34	13.88
124	138.48	11.09	0	0.01	0	367.8	0	0.02	24.72	25.61	12.49
127	136.14	16.11	0	0.01	0	367.42	0	0.02	24.84	25.72	8.45
130	138.76	11.67	0	0.01	0	366.9	0	0.02	25.27	26.13	11.89
133	135.27	6.35	0	0.01	0	366.72	0	0.02	24.66	25.49	21.29
136	133.81	11.57	0	0.01	0	366.44	0	0.02	24.68	25.5	11.56

139	136.58	13.43	0	0.01	0.58	366.05	0	0.02	25.28	26.11	10.17
142	135.39	8.93	0	0.01	0	365.68	0	0.02	25.01	25.82	15.16
145	133.22	9.13	0	0.01	0	365.48	0	0.02	24.9	25.7	14.59
148	133.99	12.51	0	0.01	0	365.11	0	0.02	25.21	26.01	10.71
151	133.47	8.92	0	0.01	0	364.78	0	0.02	25.15	25.94	14.96
154	132.68	8.62	0	0.01	0	364.56	0	0.02	25.28	26.07	15.39
157	132.07	8.83	0	0.01	0	364.25	0	0.02	25.5	26.3	14.96
160	129.35	7.82	0	0.01	0	364.04	0	0.02	25.05	25.83	16.54
163	124.91	8.36	0	0.01	0	363.77	0	0.02	24.79	25.58	14.94
166	122.28	9.51	0	0.01	0	363.53	0	0.02	24.73	25.5	12.85
169	123.39	10.14	0	0.01	0	363.2	0	0.02	25.02	25.79	12.17
172	124.56	11.65	0	0.01	0	362.92	0	0.02	25.4	26.18	10.69
175	121.24	12.54	0	0.01	0	362.51	0	0.02	24.88	25.65	9.67
178	120.21	9.59	0	0.01	0	362.19	0	0.02	25.17	25.93	12.54
181	116.64	8.65	0	0.01	0	361.92	0	0.02	24.72	25.46	13.48
184	115.57	9.98	0	0.01	0	361.65	0	0.02	24.63	25.37	11.58
187	116.79	10.37	0	0.01	0	361.33	0	0.02	24.96	25.71	11.26
190	118	10.49	0	0.01	0	361.03	0	0.02	25.33	26.08	11.24
193	119.28	11.34	0	0.01	0	360.7	0	0.02	25.42	26.17	10.52
196	120.07	11.28	0	0.01	0	360.36	0	0.02	25.31	26.05	10.65
199	119.55	9.7	0	0.01	0	360.03	0	0.02	25.17	25.91	12.33
202	121.68	6.79	0	0.02	0	359.79	0	0.02	25.65	26.41	17.92
205	116.63	8.92	0	0.02	0	359.59	0	0.02	24.89	25.63	13.08
208	115.45	11.19	0	0.01	0	359.25	0	0.02	25.05	25.79	10.31
211	115.46	6.1	0	0.02	0	358.97	0	0.02	25.26	26.01	18.93
214	113.39	8.63	0	0.02	0	358.83	0	0.02	24.74	25.47	13.14
217	113.16	12.32	0	0.01	0	358.44	0	0.02	24.8	25.53	9.19
220	111.7	7.27	0	0.02	0	358.16	0	0.02	24.84	25.57	15.37
223	113.17	4.01	0	0.03	0	357.99	0	0.02	25.29	26.02	28.22
226	110.3	11.83	0	0.01	0	357.84	0	0.02	24.79	25.5	9.32
229	113.37	13.74	0	0.01	0	357.32	0	0.02	25	25.72	8.25
232	114.84	5.15	0	0.03	0	357.09	0	0.02	25.22	25.94	22.28
235	111.38	8.37	0	0.02	0	356.93	0	0.02	25	25.73	13.3
238	108.62	11.88	0	0.01	0	356.58	0	0.02	24.81	25.52	9.14
241	112.75	8.23	0	0.02	0	356.27	0	0.02	25.5	26.23	13.7
244	111.25	7.77	0	0.02	0	356.07	0	0.02	24.96	25.67	14.31
247	110.56	9.21	0	0.02	0	355.79	0	0.02	24.9	25.61	12
250	111.88	6.66	0	0.02	0	355.54	0	0.02	25.03	25.75	16.81
253	111.15	5.61	0	0.03	0	355.38	0	0.02	24.77	25.48	19.8
256	111.07	10.3	0	0.01	0	355.16	0	0.02	25.14	25.85	10.78
259	109.01	11.28	0	0.01	0	354.79	0	0.02	25	25.72	9.66
262	105.51	10.54	0	0.01	0	354.5	0	0.02	24.61	25.32	10.01
265	106.19	9.84	0	0.01	0	354.16	0	0.02	24.85	25.56	10.8
268	105.41	7.09	0	0.02	0	353.92	0	0.02	25.19	25.9	14.87
271	103.1	7.88	0	0.02	0	353.71	0	0.02	24.86	25.57	13.08
274	105.88	9.46	0	0.02	0	353.44	0	0.02	25.26	25.98	11.19
277	99.82	9.63	0	0.02	0	353.15	0	0.02	24.29	24.98	10.37
280	99.86	5.6	0	0.03	0	352.89	0	0.02	24.72	25.42	17.82
283	100.21	8.31	0	0.02	0	352.77	0	0.02	24.75	25.45	12.06
286	100.72	11.9	0	0.01	0	352.39	0	0.02	24.91	25.61	8.47
289	101.9	10.05	0	0.01	0	352.09	0	0.02	25.1	25.8	10.14
292	99.79	9.3	0	0.02	0	351.78	0	0.02	24.43	25.11	10.73

295	104.71	8.34	0	0.02	0	351.53	0	0.02	25.4	26.11	12.56
298	100.2	9.4	0	0.02	0	351.26	0	0.02	24.55	25.24	10.66
301	99.4	9.96	0	0.02	0	350.97	0	0.02	24.68	25.37	9.98
304	102.72	9.25	0	0.02	0	350.68	0	0.02	25.29	26	11.11
307	101.25	7.7	0	0.02	0	350.42	0	0.02	25.15	25.85	13.15
310	97.09	10.7	0	0.01	0	350.19	0	0.02	24.34	25.01	9.08
313	98.82	9.17	0	0.02	0	349.81	0	0.02	24.9	25.59	10.78
316	94.99	6.24	0	0.03	0	349.65	0	0.02	24.52	25.2	15.22
319	92.86	6.83	0	0.03	0	349.41	0	0.02	24.42	25.09	13.59
322	93.91	4.44	0	0.04	0	349.25	0	0.02	24.66	25.33	21.16
325	96.39	5.91	0	0.03	0	349.12	0	0.02	25.07	25.75	16.3
328	92.03	6.45	0	0.03	0	348.9	0	0.02	24.31	24.96	14.27
331	94.11	7.35	0	0.03	0	348.73	0	0.02	25.31	25.99	12.8
334	91.25	11.01	0	0.02	0	348.44	0	0.02	25.19	25.87	8.29
337	91.16	8.56	0	0.02	0	348.11	0	0.02	25.47	26.16	10.65
340	87.39	5.95	0	0.03	0	347.93	0	0.02	24.67	25.32	14.7
343	87.95	6.87	0	0.03	0	347.73	0	0.02	24.72	25.38	12.81
346	89.21	5.66	0	0.04	0	347.53	0	0.02	24.95	25.62	15.76
349	86.68	5.83	0	0.04	0	347.38	0	0.02	24.7	25.35	14.87
352	87.28	7.25	0	0.03	0	347.17	0	0.02	25.07	25.74	12.04
355	85.96	10.18	0	0.02	0	346.94	0	0.02	25.06	25.72	8.45
358	86.98	9.81	0	0.02	0	346.59	0	0.02	25.24	25.91	8.87
361	83.76	8.92	0	0.02	0	346.36	0	0.02	24.63	25.28	9.39
364	85.22	9.05	0	0.02	0	346.05	0	0.02	24.95	25.6	9.41
367	86.07	6.13	0	0.03	0	345.83	0	0.02	24.4	25.04	14.03
370	88.78	5.35	0	0.04	0	345.66	0	0.02	24.85	25.49	16.59
373	89.15	9.62	0	0.02	0	345.48	0	0.02	24.83	25.48	9.27
376	89.56	8.89	0	0.03	0	345.12	0	0.02	24.82	25.47	10.08
379	89.83	5.05	0	0.04	0	344.96	0	0.02	24.64	25.29	17.8
382	90.19	8.32	0	0.02	0	344.77	0	0.02	24.76	25.41	10.84
385	90.83	6.1	0	0.03	0	344.5	0	0.02	24.68	25.33	14.9
388	92.13	5.58	0	0.03	0	344.39	0	0.02	24.97	25.63	16.5
391	91.06	7.59	0	0.02	0	344.15	0	0.02	25.15	25.81	12
394	88.09	3.73	0	0.05	0	343.98	0	0.02	24.81	25.46	23.62
397	87.87	4.75	0	0.04	0	343.89	0	0.02	25.2	25.87	18.51
400	84.75	7.54	0	0.02	0	343.68	0	0.02	24.9	25.56	11.24
403	83.09	5.93	0	0.03	0	343.47	0	0.02	24.81	25.47	14
406	83.92	8.63	0	0.02	0	343.29	0	0.02	24.85	25.5	9.72
409	82.86	8.93	0	0.02	0	342.97	0	0.02	24.79	25.44	9.28
412	80.4	4.78	0	0.04	0	342.79	0	0.02	24.44	25.09	16.8
415	84.99	5.12	0	0.04	0	342.65	0	0.02	25.31	25.98	16.6
418	83.73	5.31	0	0.03	0	342.48	0	0.02	25.12	25.78	15.77
421	82.15	5.97	0	0.03	0	342.33	0	0.02	24.82	25.47	13.76
424	85.95	8.03	0	0.02	0	342.11	0	0.03	25.61	26.29	10.7
427	86.55	8.83	0	0.02	0	341.85	0	0.02	25.36	26.03	9.8
430	83.73	8.52	0	0.02	0	341.59	0	0.02	24.86	25.52	9.82
433	85.88	5.87	0	0.02	0	341.36	0	0.02	25.32	25.99	14.62
436	83.68	8.07	0	0.02	0	341.21	0	0.02	24.69	25.33	10.37
439	83.88	7.98	0	0.02	0	340.89	0	0.02	25.3	25.96	10.51
442	82.93	4.55	0	0.03	0	340.75	0	0.02	25.19	25.85	18.22
445	80.43	7.09	0	0.02	0	340.58	0	0.02	24.82	25.47	11.35
448	78.86	5.32	0	0.03	0	340.35	0	0.02	24.67	25.31	14.82

451	81.83	4.83	0	0.03	0	340.25	0	0.02	25.24	25.9	16.96
454	81.34	6.99	0	0.02	0	340.05	0	0.02	25.11	25.76	11.64
457	81.58	5.56	0	0.03	0	339.86	0	0.02	25.37	26.03	14.66
460	81.66	3.64	0	0.04	0	339.72	0	0.02	24.99	25.64	22.41
463	84.07	3.83	0	0.04	0	339.62	0	0.02	25.01	25.66	21.92
466	86.03	8.29	0	0.02	0	339.45	0	0.02	25.56	26.22	10.37
469	85.26	9.57	0	0.02	0	339.15	0	0.02	24.85	25.51	8.91
472	84.62	5.95	0	0.03	0	338.92	0	0.02	24.52	25.16	14.22
475	85.74	6.16	0	0.02	0	338.76	0	0.02	25.11	25.77	13.92
478	84.46	9.78	0	0.02	0	338.52	0	0.02	25.14	25.81	8.64
481	83.14	9.42	0	0.01	0	338.2	0	0.02	24.48	25.12	8.83
484	83.53	7.38	0	0.02	0	337.97	0	0.02	24.9	25.56	11.33
487	82.54	6.8	0	0.02	0	337.75	0	0.02	24.78	25.44	12.14
490	82.82	6.25	0	0.02	0	337.56	0	0.02	24.95	25.61	13.26
493	82.89	7.22	0	0.02	0	337.37	0	0.02	24.93	25.59	11.48
496	80.94	5.84	0	0.02	0	337.15	0	0.02	24.88	25.54	13.85
499	80.61	3.23	0	0.04	0	337.03	0	0.02	24.97	25.62	24.97
502	81.18	1.81	0	0.07	0	336.94	0	0.02	25.1	25.76	44.77
505	81.31	8.05	0	0.02	0	336.86	0	0.02	25.49	26.16	10.1
508	80.27	7.24	0	0.02	0	336.5	0	0.02	25.42	26.09	11.09
511	80.72	4.36	0	0.03	0	336.45	0	0.02	25.34	26.01	18.51
514	79.57	7.21	0	0.02	0	336.2	0	0.02	24.88	25.54	11.04
517	80.27	8	0	0.01	0	336.03	0	0.02	25.1	25.76	10.03
520	80.09	7.13	0	0.02	0	335.74	0	0.02	24.81	25.46	11.24
523	84.85	6.22	0	0.02	0	335.6	0	0.03	25.75	26.42	13.64
526	79.75	7.63	0	0.01	0	335.35	0	0.02	24.31	24.95	10.45
529	83.01	4.33	0	0.03	0	335.17	0	0.02	24.97	25.62	19.18
532	83.26	5.91	0	0.02	0	335.06	0	0.02	25.06	25.72	14.09
535	80.45	7.53	0	0.01	0	334.81	0	0.02	24.51	25.15	10.68
538	81.54	5.85	0	0.02	0	334.63	0	0.02	25.05	25.71	13.93
541	81.36	4.86	0	0.02	0	334.46	0	0.02	24.86	25.51	16.74
544	81.5	6.65	0	0.02	0	334.32	0	0.02	25.24	25.9	12.25
547	81.12	6.56	0	0.02	0	334.07	0	0.02	24.84	25.48	12.37
550	79.75	6.3	0	0.02	0	333.93	0	0.02	24.65	25.29	12.67
553	81.27	6.73	0	0.02	0	333.69	0	0.02	25.33	25.99	12.07
556	80.05	4.02	0	0.03	0	333.54	0	0.02	25.02	25.67	19.9
559	80.73	3.65	0	0.03	0	333.43	0	0.02	24.7	25.35	22.09
562	80.44	4.64	0	0.03	0	333.31	0	0.02	24.93	25.59	17.34
565	80.42	5.63	0	0.02	0	333.15	0	0.02	25.1	25.76	14.29
568	82.33	7.94	0	0.01	0	332.96	0	0.02	24.79	25.43	10.37
571	84.1	9.99	0	0.01	0	332.68	0	0.02	25.18	25.84	8.42
574	81.94	9.6	0	0.01	0	332.39	0	0.02	24.65	25.29	8.54
577	82.95	6.71	0	0.02	0	332.12	0	0.02	24.88	25.52	12.37
580	82.85	5.72	0	0.02	0	331.97	0	0.02	24.67	25.31	14.48
583	82.08	8.05	0	0.01	0	331.75	0	0.02	24.69	25.34	10.2
586	82.34	7.37	0	0.02	0	331.5	0	0.02	24.74	25.38	11.17
589	81.71	7.73	0	0.02	0	331.31	0	0.02	24.6	25.24	10.57
592	79.26	7.33	0	0.01	0	331.05	0	0.02	24.85	25.5	10.82
595	79.53	4.65	0	0.02	0	330.89	0	0.02	24.83	25.48	17.12
598	81.76	2.32	0	0.05	0	330.76	0	0.02	25.4	26.07	35.18
601	79.33	6.96	0	0.01	0	330.7	0	0.02	25.04	25.69	11.4
604	76.72	8.1	0	0.01	0	330.37	0	0.02	24.71	25.35	9.47

607	78.48	2.73	0	0.03	0	330.26	0	0.02	25.04	25.69	28.78
610	79.1	5.83	0	0.01	0	330.15	0	0.02	25.28	25.93	13.58
613	77.84	8.61	0	0.01	0	329.9	0	0.02	24.9	25.54	9.04
616	77.32	7.32	0	0.01	0	329.66	0	0.02	24.38	25.01	10.56
619	79.66	5.17	0	0.02	0	329.47	0	0.02	25.09	25.73	15.42
622	78.71	6.67	0	0.01	0	329.33	0	0.02	24.57	25.2	11.81
625	82.08	9.25	0	0.01	0	329.07	0	0.02	25.23	25.87	8.88
628	79.11	6.96	0	0.01	0	328.8	0	0.02	24.24	24.86	11.37
631	80.56	6.88	0	0.01	0	328.63	0	0.02	25.03	25.67	11.71
634	80.25	10.06	0	0.01	0	328.37	0	0.02	24.8	25.44	7.97
637	78.11	4.72	0	0.02	0	328.09	0	0.02	24.35	24.97	16.54
640	77.57	3.08	0	0.03	0	328.07	0	0.02	24.58	25.21	25.17
643	77.99	5.02	0	0.02	0	327.87	0	0.02	24.8	25.44	15.54
646	77.68	5.1	0	0.02	0	327.77	0	0.02	24.75	25.39	15.23
649	77.4	6.21	0	0.02	0	327.56	0	0.02	25.3	25.95	12.47
652	75.35	7.19	0	0.01	0	327.41	0	0.02	24.72	25.35	10.48
655	75.17	4.67	0	0.02	0	327.16	0	0.02	24.44	25.06	16.11
658	77.63	2.91	0	0.03	0	327.12	0	0.02	25.25	25.9	26.72
661	73.78	9.13	0	0.01	0	326.93	0	0.02	24.31	24.93	8.08
664	76.33	8.43	0	0.01	0	326.62	0	0.02	25.12	25.77	9.05
667	77.13	4.25	0	0.02	0	326.45	0	0.02	25.26	25.91	18.15
670	76.65	5.59	0	0.02	0	326.32	0	0.02	24.8	25.44	13.71
673	76.09	8.39	0	0.01	0	326.1	0	0.02	24.87	25.51	9.07
676	77.08	7.98	0	0.01	0	325.84	0	0.02	25.05	25.69	9.66
679	77.9	5.7	0	0.02	0	325.63	0	0.02	24.82	25.46	13.67
682	78.97	9.88	0	0.01	0	325.46	0	0.02	25.16	25.81	7.99
685	83.31	11.41	0	0.01	0	325.06	0	0.03	26.19	26.86	7.3
688	80.26	3.98	0	0.03	0	324.83	0	0.02	25.14	25.79	20.18
691	77.77	5.11	0	0.02	0	324.77	0	0.02	24.77	25.41	15.21
694	77.47	6.91	0	0.02	0	324.52	0	0.02	24.64	25.28	11.21
697	80.93	4.95	0	0.03	0	324.37	0	0.02	25.49	26.15	16.34
700	78.96	7.36	0	0.02	0	324.19	0	0.02	24.71	25.35	10.73
703	79.44	5.75	0	0.02	0	323.96	0	0.02	25.28	25.93	13.81
706	78.9	2.93	0	0.04	0	323.86	0	0.02	25.2	25.85	26.93
709	79.98	8.28	0	0.01	0	323.73	0	0.02	25.22	25.88	9.66
712	78.38	7.9	0	0.02	0	323.4	0	0.02	24.95	25.6	9.93
715	76.42	4.12	0	0.03	0	323.28	0	0.02	24.73	25.37	18.55
718	77.29	4.34	0	0.03	0	323.12	0	0.02	24.82	25.45	17.82
721	77.17	6.55	0	0.02	0	323	0	0.02	25.07	25.72	11.78
724	73.19	7.95	0	0.01	0	322.74	0	0.02	24.34	24.97	9.2
727	76.33	6.99	0	0.02	0	322.55	0	0.02	25.35	26	10.92
730	74.29	6.02	0	0.02	0	322.32	0	0.02	24.54	25.17	12.35
733	75.17	6.02	0	0.02	0	322.17	0	0.02	24.82	25.47	12.49
736	73.91	9.36	0	0.01	0	321.93	0	0.02	24.89	25.54	7.9
739	75.76	7.47	0	0.01	0	321.65	0	0.02	25.25	25.91	10.14
742	75.28	7.12	0	0.01	0	321.48	0	0.02	25.11	25.76	10.57
745	74.02	9.01	0	0.01	0	321.21	0	0.02	24.63	25.27	8.22
748	74.24	7.92	0	0.02	0	320.96	0	0.02	24.68	25.32	9.37
751	77.01	6.12	0	0.02	0	320.74	0	0.02	25.02	25.67	12.59
754	78.54	7.44	0	0.02	0	320.57	0	0.02	25.42	26.08	10.55
757	77.55	8.24	0	0.01	0	320.29	0	0.02	24.95	25.6	9.41
760	78.54	0.01	-0.35	12.53	0	320.09	0	0.02	24.9	25.54	7853.62

Paper (stacked flat - covered with cardboard)**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	454.88
Time to Peak Heat Release Rate (s):	24.00
Total Heat Release (MJ/m ²):	92.87
60 s Average Heat Release Rate (kW/m ²):	308.81
Total Mass Loss (g):	70.73
Average Mass Loss Rate (g/s):	0.094
Average Effective Heat of Combustion (MJ/kg):	13.13
Average Smoke Extinction Area (m ² /kg):	81.78
Average CO ₂ yield (g/g):	0.00
Average CO yield (g/g):	0.0155

Specimen:

Initial mass (g):	391.6
Thickness (mm):	56
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	8
Time to flameout (s):	765

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	10.83	0.01	-0.28	-0.03	0	391.56	0	0.03	25.55	25.92	1083.04
3	96.3	0.01	-0.45	-0.03	0	391.75	0	0.03	25.62	25.99	9629.53
6	354.24	15.65	0	0	19.98	391.73	0.12	0.03	24.99	25.37	22.64
9	412.53	29.56	0.12	0	20.6	390.86	0.27	0.02	22.26	22.87	13.96
12	421.1	31	0.06	0	87.84	390.05	1.18	0.02	21.89	23.09	13.59
15	399.04	37.58	0.05	0	68.22	388.98	1.07	0.02	22.54	24.01	10.62
18	397.79	28.91	0	0	66.74	387.91	0.77	0.02	23.09	24.93	13.76
21	453.1	22.25	0	0	48.21	387.24	0.42	0.02	23.53	25.46	20.37
24	454.88	23.5	0.05	0	60.24	386.52	0.59	0.02	22.14	24.07	19.35
27	408.45	16.26	0.2	0	61.93	385.9	0.42	0.02	21.93	24.2	25.11
30	373.56	-4.3	0	-0.01	-34.15	385.64	0.06	0.02	23.43	25.95	-86.89
33	305.93	-6.12	0	0	-20.16	386.01	0.05	0.02	23.68	26.19	-49.99
36	287.78	14.44	0	0	0	385.82	0	0.02	24.63	27.15	19.93
39	268.1	30.86	0	0	0	385.17	0	0.02	24.72	27.12	8.69
42	246.04	26.44	0	0	0	384.13	0	0.02	24.64	26.93	9.3
45	236.58	20.5	0	0	0	383.61	0	0.02	24.78	26.97	11.54
48	227.8	20.47	0	0	0	382.86	0	0.02	25	27.1	11.13
51	222.82	16.94	0	0	0	382.4	0	0.02	25.25	27.28	13.15
54	212.85	17.73	0	0	0	381.82	0	0.02	24.73	26.6	12
57	209.43	8.08	0	0	0	381.39	0	0.02	25.16	26.99	25.92
60	203.31	23.93	0	0	0	381.17	0	0.02	25.11	26.86	8.5
63	198.13	25.42	0	0	0	380.06	0	0.02	25.09	26.76	7.8
66	191.53	3.37	0	0.02	0	379.8	0	0.02	25.01	26.6	56.83
69	183.82	12.78	0	0.01	0	379.64	0	0.02	25.05	26.59	14.38
72	177.5	22.59	0	0	0	379.02	0	0.02	24.94	26.42	7.86
75	176.15	17.84	0	0	0	378.39	0	0.02	25.35	26.78	9.87
78	173.99	18.41	0	0	0	377.92	0	0.02	25.4	26.78	9.45
81	170.07	18.95	0	0	0	377.29	0	0.02	24.86	26.15	8.97
84	169.62	11.31	0	0	0	376.84	0	0.02	25.18	26.44	15
87	168.25	14.7	0	0	0	376.54	0	0.02	25.43	26.67	11.44
90	164.64	13.48	0	0	0	375.99	0	0.02	24.79	25.96	12.22
93	164.74	6.14	0	0.01	0	375.76	0	0.02	24.96	26.1	26.83
96	163.89	15.12	0	0	0	375.51	0	0.02	25.14	26.27	10.84
99	160.93	16.78	0	0	0	374.9	0	0.02	24.73	25.82	9.59
102	162.73	9.59	0	0.01	0	374.56	0	0.02	25.18	26.27	16.96
105	163.26	13.15	0	0.01	0	374.26	0	0.02	25.36	26.44	12.41
108	160.72	9.57	0	0.01	0	373.82	0	0.02	25.32	26.39	16.79
111	152.03	5.38	0	0.01	0	373.69	0	0.02	25.27	26.31	28.27
114	145.16	11.51	0	0.01	0	373.42	0	0.02	24.79	25.79	12.61
117	142.06	13.84	0	0	0	373.02	0	0.02	24.84	25.81	10.26
120	139.55	7.54	0	0.01	0	372.65	0	0.02	25.55	26.51	18.51
123	131.51	10.82	0	0.01	0	372.51	0	0.02	24.65	25.56	12.15
126	131.88	11.31	0	0.01	0	372.02	0	0.02	25.45	26.35	11.66
129	129.61	6.25	0	0.02	0	371.86	0	0.02	25.55	26.44	20.73
132	129.67	15.76	0	0.01	0	371.55	0	0.02	25.48	26.35	8.23
135	122.43	12.54	0	0.01	0	371	0	0.02	24.71	25.53	9.77

138	124.77	7.07	0	0.02	0	370.82	0	0.02	25.23	26.05	17.64
141	126.19	8.15	0	0.01	0	370.54	0	0.02	25.54	26.35	15.48
144	123.36	4.88	0	0.02	0	370.35	0	0.02	25.28	26.06	25.26
147	123.34	8.32	0	0.01	0	370.2	0	0.02	25.07	25.82	14.83
150	124.79	11.2	0	0.01	0	369.86	0	0.02	25.6	26.37	11.15
153	121.7	7.91	0	0.02	0	369.56	0	0.02	25.25	25.99	15.39
156	122.07	14.08	0	0.01	0	369.32	0	0.02	25.42	26.16	8.67
159	116.79	16.9	0	0.01	0	368.74	0	0.02	24.86	25.59	6.91
162	117.94	10.27	0	0.02	0	368.38	0	0.02	25.39	26.13	11.48
165	116.63	9.72	0	0.02	0	368.09	0	0.02	25.18	25.91	12
168	119.58	10.17	0	0.02	0	367.78	0	0.02	25.63	26.36	11.76
171	118.15	9.2	0	0.02	0	367.49	0	0.02	25.09	25.8	12.85
174	118.33	7.03	0	0.02	0	367.24	0	0.02	25.19	25.91	16.82
177	114.57	5.57	0	0.02	0	367.06	0	0.02	24.67	25.37	20.58
180	117.65	6.34	0	0.03	0	366.88	0	0.02	25.37	26.09	18.56
183	116.68	12.17	0	0.01	0	366.64	0	0.02	25.35	26.06	9.59
186	110.85	13.65	0	0.01	0	366.19	0	0.02	24.69	25.39	8.12
189	110.18	9.54	0	0.02	0	365.87	0	0.02	24.92	25.63	11.55
192	108.97	12.25	0	0.01	0	365.57	0	0.02	25.04	25.75	8.89
195	111.81	9.51	0	0.01	6.14	365.17	0.02	0.02	25.09	25.79	11.75
198	114.61	6.72	0	0.02	22.48	365	0.06	0.02	25.54	26.25	17.06
201	111.43	5.69	0	0.03	26.18	364.75	0.06	0.02	24.82	25.51	19.59
204	113.96	5.97	0	0.02	37.37	364.65	0.09	0.02	24.99	25.68	19.08
207	114.88	7.68	0	0.02	30.86	364.38	0.09	0.02	25.19	25.89	14.97
210	111.98	6.47	0	0.02	38.41	364.21	0.1	0.02	25.05	25.74	17.31
213	115	9.33	0	0.02	31.46	363.97	0.11	0.02	25.54	26.25	12.33
216	113.08	8	0	0.02	42.94	363.68	0.13	0.02	25.74	26.46	14.13
219	110.59	6.98	0	0.02	40.61	363.48	0.11	0.02	25.11	25.81	15.85
222	113.37	11.22	0	0.01	34.46	363.22	0.15	0.02	25.47	26.2	10.1
225	109.27	10.79	0	0.01	31.98	362.84	0.14	0.02	24.75	25.45	10.13
228	110.29	7.32	0	0.02	49.8	362.6	0.14	0.02	24.77	25.47	15.07
231	113.1	8.57	0	0.02	50.77	362.37	0.17	0.02	24.97	25.68	13.19
234	110.52	8.61	0	0.02	50.14	362.09	0.17	0.02	24.55	25.25	12.84
237	110.43	11.78	0	0.01	36.25	361.84	0.17	0.02	24.75	25.46	9.38
240	113.39	9.73	0	0.02	48.01	361.41	0.18	0.02	25.31	26.03	11.65
243	108.55	11.35	0	0.01	36.68	361.23	0.17	0.02	24.45	25.14	9.56
246	109.68	12.58	0	0.01	41.5	360.74	0.2	0.02	24.88	25.58	8.72
249	108.74	6.58	0	0.03	88.06	360.52	0.23	0.02	24.48	25.18	16.53
252	106.67	9.31	0	0.02	51.04	360.28	0.19	0.02	24.44	25.14	11.45
255	106.67	11.66	0	0.02	45.18	359.96	0.21	0.02	24.79	25.5	9.15
258	106.03	10.67	0	0.02	50.5	359.61	0.21	0.02	24.79	25.49	9.94
261	103.41	5.04	0	0.04	121.94	359.36	0.24	0.02	25	25.71	20.5
264	106.24	6.63	0	0.03	89.52	359.26	0.23	0.02	25.45	26.17	16.02
267	107.72	10.43	0	0.02	58.41	358.94	0.24	0.02	25.08	25.8	10.32
270	108.99	3.77	0	0.05	179.58	358.7	0.26	0.02	24.99	25.69	28.93
273	111.24	7.08	0	0.03	94.72	358.65	0.26	0.02	25.3	26.01	15.7
276	107.22	9.02	0	0.02	73.45	358.28	0.26	0.02	24.64	25.34	11.89
279	106.57	7.89	0	0.02	90.72	358.13	0.28	0.02	24.94	25.65	13.52
282	102.67	9.26	0	0.02	77.51	357.79	0.28	0.02	24.58	25.27	11.09
285	104.99	8.63	0	0.02	84.42	357.59	0.28	0.02	25.48	26.19	12.17
288	106.44	12.4	0	0.02	61.43	357.25	0.29	0.02	25.47	26.18	8.58
291	107.12	11.42	0	0.02	75.02	356.88	0.33	0.02	25.25	25.95	9.38

294	106.04	7.44	0	0.03	107.99	356.59	0.31	0.02	24.84	25.54	14.24
297	108.38	5.09	0	0.03	157.62	356.42	0.31	0.02	25.03	25.74	21.31
300	107.67	8.15	0	0.02	114.03	356.24	0.36	0.02	25.23	25.94	13.21
303	105.35	8.41	0	0.02	113.13	355.94	0.37	0.02	24.86	25.56	12.53
306	105.37	12.03	0	0.01	78.11	355.72	0.37	0.02	24.81	25.51	8.76
309	105.4	6.4	0	0.03	149.54	355.29	0.37	0.02	25.28	25.98	16.48
312	103.64	2.41	0	0.08	366.87	355.32	0.35	0.02	24.91	25.6	43.01
315	105.94	10.54	0	0.02	88.1	355.05	0.35	0.02	25.55	26.26	10.05
318	103.36	10.73	0	0.02	82.6	354.74	0.34	0.02	25.33	26.04	9.63
321	102.92	10.72	0	0.02	83.68	354.42	0.35	0.02	24.67	25.36	9.6
324	103.28	9.71	0	0.02	92.62	354.11	0.35	0.02	24.85	25.55	10.64
327	107.09	7.1	0	0.03	124.68	353.85	0.34	0.02	25.39	26.11	15.08
330	104.15	5.47	0	0.03	162.97	353.67	0.35	0.02	24.73	25.43	19.05
333	102.17	7.8	0	0.02	111.62	353.49	0.34	0.02	24.84	25.54	13.1
336	101.32	6.15	0	0.03	147.03	353.23	0.35	0.02	24.93	25.62	16.46
339	100.73	5.75	0	0.03	172.28	353.12	0.38	0.02	25.19	25.89	17.52
342	100.67	7.41	0	0.03	128.06	352.87	0.37	0.02	25.19	25.88	13.59
345	97.85	9.28	0	0.02	92.25	352.67	0.34	0.02	24.47	25.15	10.55
348	100.12	10.44	0	0.02	92.92	352.32	0.37	0.02	25.27	25.97	9.59
351	100.49	11.13	0	0.02	88.07	352.05	0.38	0.02	24.88	25.57	9.03
354	101.51	10.26	0	0.02	93.26	351.66	0.37	0.02	25.07	25.77	9.89
357	100.98	6.51	0	0.02	151.37	351.46	0.38	0.02	25.06	25.75	15.5
360	101.97	4.21	0	0.04	226.19	351.26	0.37	0.02	25.06	25.75	24.21
363	99.16	8.89	0	0.02	108.26	351.15	0.37	0.02	25.04	25.72	11.15
366	98.86	9.04	0	0.02	106.44	350.75	0.37	0.02	25.23	25.93	10.94
369	98.85	8.25	0	0.02	116.29	350.62	0.37	0.02	25.08	25.76	11.98
372	99.38	10.42	0	0.02	91.95	350.24	0.37	0.02	25.21	25.9	9.54
375	94.16	5.72	0	0.03	157.49	350.04	0.36	0.02	24.37	25.03	16.46
378	99.61	9.67	0	0.02	102.82	349.84	0.38	0.02	25.38	26.06	10.31
381	97.21	8.92	0	0.02	104.09	349.49	0.37	0.02	24.68	25.35	10.9
384	98.96	4.67	0	0.04	211.35	349.33	0.38	0.02	25.12	25.8	21.2
387	101.74	8.05	0	0.02	132.61	349.16	0.41	0.02	25.48	26.17	12.64
390	99.61	6.11	0	0.03	164.42	348.88	0.39	0.02	24.91	25.59	16.31
393	102.26	3.47	0	0.04	297.7	348.79	0.4	0.02	25.28	25.97	29.5
396	99.81	8.61	0	0.02	118.32	348.62	0.4	0.02	24.98	25.66	11.59
399	98.36	7.73	0	0.02	137.42	348.31	0.42	0.02	24.88	25.57	12.73
402	100.79	10.43	0	0.02	105.23	348.14	0.42	0.02	25.54	26.24	9.67
405	97.54	10.39	0	0.02	98.39	347.71	0.4	0.02	24.82	25.5	9.39
408	94.28	7.21	0	0.03	146.28	347.54	0.42	0.02	24.63	25.3	13.07
411	96.77	7.37	0	0.02	154.39	347.25	0.44	0.02	25.29	25.98	13.13
414	98.19	8.03	0	0.02	136.4	347.09	0.42	0.02	25.32	26	12.23
417	96.37	7.12	0	0.03	151.22	346.78	0.42	0.02	24.92	25.6	13.53
420	99.52	2.88	0	0.06	378.72	346.68	0.42	0.02	25.06	25.73	34.6
423	98.94	6.51	0	0.02	164.87	346.56	0.42	0.02	24.61	25.28	15.2
426	101.74	6.89	0	0.03	164.83	346.31	0.44	0.02	25.25	25.93	14.77
429	102.2	8.67	0	0.02	128.85	346.14	0.43	0.02	25.22	25.91	11.79
432	98.85	8.25	0	0.02	129.64	345.81	0.42	0.02	24.75	25.43	11.98
435	95.82	6.48	0	0.03	160.75	345.65	0.41	0.02	24.64	25.31	14.78
438	98.65	10.67	0	0.02	108.83	345.38	0.45	0.02	25.37	26.07	9.25
441	96.91	13.15	0	0.01	79.99	345.02	0.41	0.02	25.22	25.92	7.37
444	97.22	9.23	0	0.02	116.13	344.64	0.42	0.02	25.07	25.76	10.53
447	98.31	7.32	0	0.02	160.74	344.46	0.45	0.02	25.28	25.98	13.43

450	96.7	8.73	0	0.02	132.3	344.18	0.46	0.02	24.66	25.35	11.07
453	100	3.44	0	0.05	345.1	343.97	0.46	0.02	25.28	25.98	29.09
456	97.84	5.42	0	0.03	211.59	343.92	0.45	0.02	24.82	25.51	18.06
459	99.43	6.1	0	0.03	192.36	343.66	0.46	0.02	25	25.68	16.3
462	99.92	3.69	0	0.05	322.12	343.57	0.46	0.02	25.1	25.79	27.11
465	98.1	9.42	0	0.02	120.71	343.38	0.44	0.02	25.11	25.8	10.41
468	96.85	9.49	0	0.02	117.6	343.04	0.43	0.02	25.16	25.85	10.21
471	96.38	9.58	0	0.02	119.03	342.81	0.44	0.02	25.04	25.72	10.06
474	96.16	10.6	0	0.02	111.01	342.46	0.45	0.02	25.19	25.88	9.07
477	95.51	9.64	0	0.02	115.12	342.19	0.44	0.02	24.61	25.28	9.91
480	97.14	5.71	0	0.03	206.47	341.9	0.46	0.02	24.97	25.65	17.02
483	96.88	8.89	0	0.02	122.84	341.8	0.43	0.02	24.77	25.45	10.9
486	100.65	8.59	0	0.02	140.08	341.39	0.46	0.02	25.42	26.11	11.71
489	99.42	5.43	0	0.03	230.2	341.31	0.48	0.02	25.49	26.18	18.32
492	97.51	7.84	0	0.02	157.4	341.03	0.48	0.02	25.14	25.83	12.44
495	98.41	6.16	0	0.03	206.04	340.86	0.49	0.02	25.32	26.01	15.98
498	93.85	6.62	0	0.03	183.49	340.64	0.47	0.02	25.05	25.74	14.19
501	94.29	10.39	0	0.02	115.6	340.44	0.46	0.02	25.35	26.04	9.08
504	93.55	11.85	0	0.02	99	340.04	0.45	0.02	25.27	25.95	7.89
507	92.81	8.12	0	0.02	149.99	339.77	0.48	0.02	24.94	25.62	11.44
510	94.4	4.94	0	0.04	230.7	339.55	0.45	0.02	24.69	25.36	19.09
513	95.73	5.92	0	0.03	193.55	339.44	0.44	0.02	25.09	25.77	16.18
516	96.08	5.67	0	0.03	202.46	339.2	0.44	0.02	25.14	25.82	16.93
519	98.23	3.9	0	0.04	312.49	339.11	0.47	0.02	25.51	26.19	25.17
522	94.79	7.92	0	0.02	153.13	338.93	0.47	0.02	24.87	25.54	11.97
525	93.78	7.24	0	0.02	158.52	338.67	0.45	0.02	24.69	25.36	12.95
528	94.32	6.76	0	0.03	176.47	338.49	0.46	0.02	25.09	25.76	13.95
531	92.03	10.1	0	0.02	110.27	338.23	0.43	0.02	25.01	25.69	9.11
534	92.83	12.65	0	0.01	93.28	337.9	0.46	0.02	25.19	25.87	7.34
537	91.73	6.66	0	0.02	176.04	337.53	0.46	0.02	24.8	25.48	13.78
540	93.02	6.27	0	0.02	168.77	337.46	0.42	0.02	24.57	25.23	14.83
543	94.58	11.83	0	0.01	95.28	337.12	0.44	0.02	24.69	25.35	8
546	95.89	8.56	0	0.02	130.08	336.81	0.43	0.02	25.05	25.72	11.2
549	95.61	2.79	0	0.06	391.5	336.62	0.43	0.02	24.55	25.21	34.22
552	96.72	6.3	0	0.03	187.33	336.57	0.47	0.02	24.68	25.34	15.36
555	95.84	11.43	0	0.02	99.19	336.23	0.44	0.02	25.08	25.76	8.38
558	95.34	8.05	0	0.02	137.53	335.95	0.43	0.02	25.09	25.77	11.84
561	94.8	7.19	0	0.03	150.96	335.73	0.42	0.02	25.11	25.79	13.18
564	93.24	10.17	0	0.02	97.26	335.49	0.39	0.02	24.83	25.51	9.17
567	98.33	10.68	0	0.02	101.71	335.14	0.41	0.03	25.68	26.38	9.2
570	95.85	5.88	0	0.03	188.39	334.88	0.43	0.02	25.13	25.82	16.31
573	97.36	8.1	0	0.02	124.95	334.74	0.39	0.02	24.96	25.65	12.02
576	99.03	10.08	0	0.02	110.72	334.4	0.43	0.02	25.21	25.91	9.82
579	97.83	7.67	0	0.02	139.35	334.17	0.41	0.02	25.2	25.9	12.75
582	97.05	2.91	0	0.05	354.21	333.95	0.4	0.02	25.06	25.75	33.4
585	97.04	6.69	0	0.02	159.45	333.93	0.41	0.02	25.45	26.15	14.5
588	91.73	12.6	0	0.01	77.18	333.54	0.38	0.02	24.69	25.37	7.28
591	92.35	7.58	0	0.02	134.93	333.25	0.4	0.02	24.8	25.48	12.18
594	96.03	6.23	0	0.03	165.27	333.06	0.39	0.03	25.77	26.48	15.42
597	96.3	8.91	0	0.02	113.61	332.85	0.39	0.02	25.13	25.82	10.81
600	94.97	8.8	0	0.02	113.24	332.54	0.39	0.02	24.94	25.63	10.79
603	95.52	7.5	0	0.02	136.33	332.33	0.4	0.02	25.07	25.76	12.73

606	95.26	6.11	0	0.03	168.07	332.1	0.4	0.02	24.92	25.6	15.58
609	94.47	2.78	0	0.07	384.09	331.97	0.41	0.02	25.42	26.11	34.02
612	89.92	3.68	0	0.05	278.26	331.9	0.4	0.02	24.85	25.53	24.45
615	92.46	9.5	0	0.02	110.43	331.72	0.4	0.02	25.41	26.11	9.73
618	90.39	7.99	0	0.02	128.75	331.37	0.4	0.02	25.03	25.71	11.32
621	94.27	9.76	0	0.02	100.08	331.22	0.38	0.02	25.24	25.93	9.66
624	95.64	8.95	0	0.02	110.1	330.81	0.38	0.02	25.53	26.21	10.69
627	95.36	7.59	0	0.02	132.3	330.69	0.39	0.02	24.88	25.55	12.56
630	94.66	6.57	0	0.03	154.41	330.35	0.4	0.02	24.77	25.44	14.4
633	96.86	7.41	0	0.02	133.21	330.29	0.38	0.02	25.54	26.23	13.08
636	93.23	6.69	0	0.03	143.27	329.92	0.37	0.02	24.93	25.6	13.94
639	92.49	4.21	0	0.04	245.17	329.89	0.4	0.02	25.17	25.85	21.96
642	92.17	5.88	0	0.03	160.88	329.63	0.37	0.02	24.96	25.64	15.67
645	91.8	5.05	0	0.03	181.31	329.55	0.36	0.02	24.86	25.53	18.18
648	93.79	9.81	0	0.02	96.84	329.29	0.37	0.02	25	25.67	9.56
651	94.34	10.69	0	0.02	87.56	328.99	0.36	0.02	25	25.68	8.82
654	92.71	7.91	0	0.02	124.65	328.69	0.38	0.02	25.25	25.93	11.72
657	92.64	3.12	0	0.05	355.11	328.53	0.43	0.02	25.36	26.04	29.7
660	87.56	3.4	0	0.04	299.64	328.46	0.4	0.02	24.7	25.36	25.79
663	88.33	5.2	0	0.03	207.01	328.31	0.42	0.02	25.01	25.67	17
666	87	7.83	0	0.02	125.79	328.14	0.39	0.02	24.36	25.01	11.11
669	90.89	9.19	0	0.02	103.38	327.85	0.37	0.02	25.23	25.9	9.89
672	92.08	6.83	0	0.02	139.07	327.61	0.37	0.02	24.74	25.39	13.48
675	92.16	10.05	0	0.02	91.99	327.41	0.36	0.02	24.83	25.49	9.17
678	93.47	11.35	0	0.02	85.66	327.03	0.37	0.02	25.4	26.07	8.23
681	88.48	8.06	0	0.02	111.84	326.76	0.36	0.02	24.52	25.17	10.97
684	87.99	3.47	0	0.05	289.77	326.55	0.39	0.02	25.06	25.73	25.37
687	88.78	2.97	0	0.05	327.47	326.52	0.38	0.02	25.22	25.89	29.87
690	88.61	6.65	0	0.02	152.7	326.34	0.39	0.02	25.36	26.03	13.33
693	89.45	7.76	0	0.02	130.13	326.14	0.39	0.02	25.5	26.17	11.53
696	89.77	8.44	0	0.02	110.9	325.88	0.37	0.02	24.9	25.55	10.64
699	91.41	6.74	0	0.03	144.44	325.65	0.37	0.02	25.34	26	13.56
702	91.73	7.28	0	0.03	140.39	325.46	0.39	0.02	25.42	26.09	12.6
705	90.28	11.74	0	0.02	84.87	325.19	0.39	0.02	25.2	25.87	7.69
708	87.7	7.84	0	0.02	132.51	324.82	0.41	0.02	24.94	25.6	11.18
711	85.83	4.76	0	0.04	202.83	324.72	0.38	0.02	24.88	25.54	18.02
714	84.93	4.13	0	0.04	251.79	324.51	0.4	0.02	25.14	25.8	20.57
717	85.44	8.52	0	0.02	118.17	324.43	0.39	0.02	25.06	25.72	10.02
720	88.17	12.02	0	0.01	82.61	324	0.38	0.02	25.43	26.09	7.33
723	87.05	8	0	0.02	128.89	323.76	0.4	0.02	25.2	25.87	10.88
726	86.99	6.25	0	0.02	167.96	323.51	0.41	0.02	24.83	25.47	13.92
729	88.55	4.9	0	0.03	219.96	323.38	0.42	0.02	25.04	25.69	18.09
732	88.78	7.71	0	0.02	145.74	323.19	0.43	0.02	25.21	25.87	11.52
735	86.7	6.48	0	0.03	176.41	322.94	0.46	0.02	24.43	25.06	13.38
738	88.58	5.1	0	0.04	246.91	322.8	0.48	0.02	25.41	26.05	17.37
741	86.39	6.66	0	0.03	178.95	322.62	0.46	0.02	25.06	25.7	12.97
744	86.22	5.17	0	0.03	233.27	322.42	0.47	0.02	25.16	25.81	16.69
747	87.14	7.81	0	0.02	158.73	322.28	0.47	0.02	25.44	26.1	11.16
750	87.4	10.61	0	0.01	108.52	321.95	0.45	0.02	24.93	25.57	8.24
753	88.41	8.75	0	0.02	142.31	321.67	0.49	0.02	24.89	25.53	10.1
756	90.66	11.97	0	0.01	106.58	321.4	0.5	0.02	25.09	25.74	7.57
759	93.32	0.01	-0.38	15.3	0	321.02	0.51	0.02	25.11	25.76	9332.06

Plastic Wastebasket**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	21.00
Peak Heat Release Rate (kW/m ²):	3247.70
Time to Peak Heat Release Rate (s):	74.00
Total Heat Release (MJ/m ²):	124.03
60 s Average Heat Release Rate (kW/m ²):	1462.64
Total Mass Loss (g):	19.34
Average Mass Loss Rate (g/s):	0.230
Average Effective Heat of Combustion (MJ/kg):	64.15
Average Smoke Extinction Area (m ² /kg):	278.01
Average CO ₂ yield (g/g):	4.23
Average CO yield (g/g):	0.2392

Specimen:

Initial mass (g):	22.5
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	75
Time to ignition (s):	21
Time to flameout (s):	104

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.56	0.01	-0.37	-0.03	0	22.69	0	0.03	25.09	25.47	55.95
5	-1.25	0.01	-0.47	-0.02	0	22.6	0	0.03	25.41	25.78	-125.34
8	-1.74	1.72	0	0	0	22.58	0	0.03	24.69	25.05	-1.02
11	4.5	0.96	0	0	0	22.5	0	0.03	25.44	25.8	4.67
14	10.35	0.33	-0.01	0	0	22.52	0	0.03	24.78	25.14	31.34
17	28.73	2.02	0	0	0	22.46	0	0.03	25.22	25.57	14.23
20	54.46	3.57	0	0	0	22.4	0	0.02	23.91	24.26	15.24
23	112.01	0.85	0	0	0	22.28	0	0.02	24.23	24.62	131.69
26	166.14	-0.43	0.01	0	0	22.34	0	0.03	24.48	24.95	-386.95
29	270.73	6.4	0	0.01	252.38	22.24	0.64	0.03	24.49	25.06	42.3
32	320.53	9.92	0	0.01	380.42	21.97	1.56	0.02	23.52	24.26	32.31
35	415.47	10.89	0	0.02	414.07	21.67	1.83	0.02	23.72	24.67	38.17
38	478.51	8.87	0	0.03	570.46	21.35	2.11	0.02	22.82	23.97	53.93
41	559.12	6.3	0	0.04	839.31	21.14	2.18	0.02	22.95	24.21	88.73
44	694.01	14.42	0	0.02	440.21	20.89	2.66	0.02	22.25	23.91	48.12
47	816.34	22.15	0.24	0.02	295.34	20.28	2.76	0.02	21.73	23.68	36.85
50	1098.48	17.73	0.93	0.03	395.69	19.64	2.95	0.02	21.49	23.78	61.94
53	1419.76	21.53	1.59	0.05	422.36	19.16	3.8	0.02	21.04	23.9	65.95
56	1667.03	26.54	2.19	0.06	338.69	18.33	3.87	0.02	19.92	23.23	62.82
59	2001.76	38.85	2.44	0.07	235.3	17.52	4.04	0.02	18.59	22.61	51.52
62	2593.76	35.17	4.02	0.11	185.84	16.11	2.44	0.02	20.82	26.79	73.76
65	3173.26	36.14	5.53	0.2	208.66	15.38	2.66	0.02	21.11	28.31	87.8
68	2892.08	51.56	3.94	0.21	23.92	13.85	0.49	0.01	17.67	25.38	56.09
71	3146.46	43.43	4.86	0.28	16.82	12.44	0.25	0.01	19.18	29.77	72.44
74	3247.7	54.3	3.93	0.18	2.68	11.13	0.04	0.01	20.45	34.08	59.81
77	2986.79	49.21	4.06	0.21	20.58	9.29	0.28	0.01	20.21	35.69	60.69
80	2600.97	36.4	5.06	0.32	243.08	8.24	2.55	0.01	19.11	34.67	71.46
83	2566.52	41.89	5.11	0.32	166.91	6.99	1.71	0.01	22.87	40.95	61.27
86	2090.48	34.73	5.53	0.38	430.12	5.8	3.93	0.01	22.29	38.01	60.19
89	1607.52	26.98	4.33	0.44	521.89	4.92	3.74	0.01	23.52	37.61	59.58
92	1216.38	17.58	3.94	0.56	771.71	4.19	3.88	0.01	23.16	34.96	69.19
95	1039.96	18.59	1.59	0.69	724.35	3.8	3.78	0.01	25.73	35.59	55.93
98	838.33	13.63	1.06	1.08	835.22	3.12	3.24	0.02	27.96	35.11	61.49
101	706.7	-1.15	-2.05	-12.29	-7519.01	3.04	2.53	0.02	28.84	34.13	-614.91
104	561.13	0.7	-0.07	21.15	3854.43	3.07	0.83	0.02	29.68	32.4	805.66
107	505.9	6.3	-0.01	2.56	0	2.97	0	0.02	30.97	31.83	80.24
110	449.46	0.95	-0.05	16.9	0	2.77	0	0.02	30.86	30.05	475.44
113	395.02	-7.04	0.01	-1.81	0	2.93	0	0.02	30.81	28.71	-56.13
116	362.7	-1.38	0.03	-8.26	0	3.09	0	0.02	30.09	27.48	-262.19
119	334.93	5.87	-0.01	1.9	0	2.99	0	0.02	30.16	26.91	57.09
122	309.96	3.91	-0.01	2.73	0	2.81	0	0.02	29.69	26.2	79.25
125	296.62	-1.49	0.02	-7.05	0	2.79	0	0.02	29.76	26.08	-198.75

128	275.61	-5.48	0.01	-1.76	0	2.88	0	0.02	29.1	25.45	-50.3
131	269.13	-0.57	0.06	-16.68	0	3.05	0	0.02	29.46	25.77	-473.85
134	240.31	4.26	-0.01	2.08	0	2.91	0	0.02	28.77	25.23	56.41
137	221.84	3.01	-0.01	2.69	0	2.84	0	0.02	28.56	25.16	73.64
140	191.97	0.15	-0.16	43.36	0	2.75	0	0.02	28.2	24.97	1260.88
143	179.96	-2.99	0.01	-1.93	0	2.83	0	0.02	28.59	25.51	-60.28
146	166.66	-0.76	0.03	-7.04	0	2.89	0	0.02	28.28	25.36	-219.27
149	152.51	2.03	-0.01	2.41	0	2.87	0	0.02	28.14	25.39	75.12
152	137.36	0.01	-1.76	456.34	0	2.79	0	0.02	27.96	25.39	0
155	131.08	0.01	-1.65	417.44	0	2.78	0	0.02	28.07	25.61	0

Plastic Wastebasket**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	19.00
Peak Heat Release Rate (kW/m ²):	2447.86
Time to Peak Heat Release Rate (s):	61.00
Total Heat Release (MJ/m ²):	93.81
60 s Average Heat Release Rate (kW/m ²):	1233.32
Total Mass Loss (g):	18.61
Average Mass Loss Rate (g/s):	0.239
Average Effective Heat of Combustion (MJ/kg):	50.40
Average Smoke Extinction Area (m ² /kg):	442.37
Average CO ₂ yield (g/g):	2.87
Average CO yield (g/g):	0.0399

Specimen:

Initial mass (g):	21.3
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	19
Time to flameout (s):	98

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	0.76	0.01	-0.35	-0.04	0	21.18	0	0.03	25.92	26.27	76.37
4	-0.69	0.01	-0.54	-0.04	0	21.41	0	0.03	26.13	26.47	-68.82
7	-2.84	-0.06	0.07	0.01	0	21.37	0	0.03	25.98	26.28	47.1
10	3.42	1.08	0	0	0	21.43	0	0.03	25.17	25.46	3.18
13	9.69	0.06	-0.06	0	0	21.32	0	0.03	25.5	25.8	154.75
16	24.68	-0.23	0.02	-0.06	-458.3	21.41	0.04	0.03	25.68	26	-107.74
19	60.86	7.86	0	0	0	21.28	0	0.03	25.85	26.21	7.74
22	112.34	4.44	0	0	0	21.02	0	0.03	25.51	25.99	25.29
25	190.95	0.79	0	0	476.57	21.02	0.15	0.03	25.13	25.94	241.63
28	263.88	2.28	0	0.02	1438.65	20.93	1.24	0.03	25.14	26.49	115.6
31	334.91	6.73	0	0.01	654.62	20.86	1.7	0.02	24.2	25.91	49.78
34	416.04	11.02	0	0.01	454.48	20.53	1.86	0.02	24.39	26.88	37.77
37	483.03	12.21	0	0.02	540.11	20.22	2.42	0.02	24.26	27.22	39.56
40	620.1	15.4	0	0.01	380.06	19.79	2.19	0.02	23.4	26.76	40.26
43	780.69	9.96	0	0.03	755.82	19.35	2.74	0.02	23.39	27.47	78.36
46	996.77	14.01	0.75	0.03	653.69	19.12	3.35	0.02	22.4	27.31	71.15
49	1326.28	30.2	0.89	0.02	328.06	18.43	3.58	0.02	21.92	27.7	43.92
52	1658.24	25.77	2.25	0.04	488.03	17.45	4.4	0.02	21.38	28.6	64.35
55	1898.48	29.63	2.52	0.05	458.55	16.82	4.81	0.02	20.22	28.25	64.07
58	2208.97	51.19	2.34	0.03	230.93	15.55	4.05	0.02	19.65	29.17	43.15
61	2447.86	49	3.25	0.05	204.85	13.92	3.19	0.02	19.96	31.42	49.95
64	2336.54	42.53	4.09	0.06	307.25	12.65	4.06	0.01	19.49	32.19	54.94
67	2162.8	52.34	3.21	0.04	298.98	11.26	4.76	0.01	19.34	32.87	41.32
70	2109.75	45.5	3.44	0.04	357.27	9.63	4.77	0.01	20.44	34.09	46.37
73	1852.84	31.88	4.04	0.05	427.13	8.58	4.19	0.01	19.66	32.49	58.13
76	2038.5	42.66	3.28	0.04	355.01	7.55	3.95	0.02	24.15	38.32	47.78
79	1599.93	32.99	2.99	0.04	499.27	6.15	5.02	0.01	21.38	32.78	48.49
82	1584.22	23.16	4	0.06	758.53	5.57	4.96	0.02	23.7	35.39	68.4
85	1209.63	37.23	1.87	0.03	400.5	4.61	4.68	0.01	22.22	31.83	32.49
88	1019.22	25.76	1.62	0.03	650.12	3.52	4.93	0.02	24.59	33.99	39.56
91	759.74	5.16	3.54	0.11	3107.08	3.13	4.61	0.02	26.62	34.78	147.11
94	496.96	7.48	0	0.05	1900.32	3.04	4.06	0.02	28.72	35.03	66.44
97	300.36	10.09	0	0.01	458	2.67	1.36	0.02	30.05	34.06	29.76
100	190.33	-0.28	0	-0.14	0	2.53	0	0.02	30.27	32.59	-675.65
103	148.78	-4.41	0	0	0	2.64	0	0.02	30.21	30.6	-33.77
106	119.74	-1.68	0	0	0	2.74	0	0.02	29.82	28.91	-71.28
109	102.12	-0.58	0	-0.02	0	2.75	0	0.02	29.93	28.43	-174.72
112	86.48	1.65	0	0	0	2.77	0	0.02	29.69	27.56	52.54
115	74.98	1.85	0	0	0	2.66	0	0.02	29.09	26.68	40.62
118	67.17	3.61	0	0	0	2.65	0	0.02	28.86	26.27	18.62
121	65.32	0.64	0	0	0	2.49	0	0.02	29.16	26.37	102.4
124	60.78	-6.78	0	0	0	2.64	0	0.02	28.63	25.85	-8.97

127	53.91	-1.09	0	0	0	2.8	0	0.02	28.07	25.37	-49.35
130	46.67	3.73	0	0	0	2.71	0	0.02	27.45	24.87	12.52
133	43.75	-0.36	0.01	0	0	2.64	0	0.02	27.8	25.28	-120.53
136	41.38	3.03	0	0	0	2.68	0	0.02	27.67	25.26	13.65
139	40.9	2	0	0	0	2.49	0	0.02	27.97	25.63	20.41
142	37.15	-4.67	0	0	0	2.6	0	0.02	27.27	25.12	-7.96
145	34.03	0.01	-0.24	-0.03	0	2.7	0	0.02	27.44	25.42	3403.14
148	30.52	0.01	-0.25	-0.03	0	2.71	0	0.02	27.49	25.6	3052.44

Plastic Wastebasket**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	17.00
Peak Heat Release Rate (kW/m ²):	3199.33
Time to Peak Heat Release Rate (s):	70.00
Total Heat Release (MJ/m ²):	101.36
60 s Average Heat Release Rate (kW/m ²):	1345.84
Total Mass Loss (g):	19.30
Average Mass Loss Rate (g/s):	0.247
Average Effective Heat of Combustion (MJ/kg):	52.51
Average Smoke Extinction Area (m ² /kg):	312.33
Average CO ₂ yield (g/g):	3.49
Average CO yield (g/g):	0.0624

Specimen:

Initial mass (g):	21.9
Thickness (mm):	2
Surface area (cm ²):	100
Test start time (s):	88
Time to ignition (s):	17
Time to flameout (s):	94

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	2.65	0.01	-0.48	-0.04	0	21.9	0	0.03	25.92	26.26	265.36
4	3.88	0.01	-0.31	-0.03	0	22.17	0	0.03	25.7	26.03	388.21
7	2.76	-0.26	0.02	0	0	22.13	0	0.03	25.65	25.95	-10.66
10	2.28	0.5	-0.01	0	0	22.21	0	0.03	25.77	26.07	4.57
13	14.14	-0.46	0.01	0	-191.8	22.12	0.03	0.03	25.65	25.93	-30.95
16	41.07	-2.32	0	0	-196.96	22.24	0.18	0.03	25.65	25.95	-17.74
19	72.68	4.1	0	0	0	22.2	0	0.03	25.49	25.86	17.73
22	160.22	6.25	0	0	31.67	22.02	0.08	0.03	25.36	25.9	25.63
25	244.36	8.66	0	0	155.26	21.83	0.52	0.03	25.26	26.08	28.23
28	315.08	8.93	0	0.01	413.76	21.52	1.44	0.02	24.38	25.56	35.3
31	390.97	4.78	0	0.03	999.92	21.32	1.87	0.02	23.86	25.51	81.81
34	490.41	7.31	0	0.03	752.94	21.18	2.1	0.02	24.09	26.27	67.08
37	617.39	14.05	0	0.02	468.01	20.85	2.43	0.02	24.26	27.1	43.95
40	740.8	17.17	0	0.02	433.3	20.36	2.73	0.02	23.89	27.29	43.14
43	866.19	17.63	0.23	0.02	529.95	19.84	3.46	0.02	23	26.97	49.14
46	1034.99	16.8	0.95	0.03	587.92	19.31	3.64	0.02	22.31	27.14	61.62
49	1242.8	21.33	1.38	0.02	474.2	18.79	3.69	0.02	21.58	27.39	58.27
52	1487.79	30.95	1.53	0.02	339.17	18	3.87	0.02	20.57	27.13	48.07
55	1835.45	30.41	2.41	0.04	421.1	17	4.48	0.02	20.86	28.57	60.35
58	2144.42	34.34	3.23	0.05	385.67	16.14	4.47	0.02	20.65	29.65	62.44
61	2552.07	50.08	2.66	0.04	226.54	14.86	3.88	0.02	19.22	29.28	50.96
64	2750.78	52.08	3.53	0.03	167.94	13.23	2.99	0.01	18.33	29.21	52.81
67	3017.94	47.2	4.57	0.07	126.2	11.78	1.88	0.01	18.81	31.74	63.95
70	3199.33	56.62	3.9	0.09	19.94	10.31	0.31	0.01	20.25	36.31	56.5
73	2579.41	57.97	3.27	0.07	31.21	8.44	0.54	0.01	18.24	33.26	44.5
76	2478.42	50.37	4.22	0.09	91.88	6.9	1.2	0.01	21.32	38.46	49.2
79	1939.6	48.5	3.73	0.06	348.15	5.4	4.48	0.01	21.82	37.68	39.99
82	1348.97	33.75	3.29	0.05	607.31	4.09	5.72	0.01	22.06	35.86	39.98
85	902.1	9.01	4.84	0.09	1808.47	3.45	4.36	0.02	24.87	37.4	100.13
88	632.31	2.61	0.22	0.18	4303.4	3.41	2.91	0.02	29.53	38.65	242.28
91	405.59	9.42	0	0.03	696.83	3.18	1.87	0.02	29.28	35.06	43.04
94	296.08	2.75	0	0.05	0	2.93	0	0.02	30.82	33.87	107.52
97	218.68	-6.78	0	-0.01	0	3.04	0	0.02	31.14	31.79	-32.24
100	166.98	-2.61	0	-0.02	0	3.24	0	0.02	30.84	29.83	-63.92
103	141.85	6.27	0	0.01	0	3.16	0	0.02	30.31	28.39	22.62
106	124.36	3.08	0	0.01	0	2.95	0	0.02	29.97	27.38	40.44
109	108.23	-1.75	0	-0.02	0	2.99	0	0.02	29.43	26.41	-61.75
112	96.68	-4.46	0	0	0	3.03	0	0.02	29.15	25.88	-21.68
115	86.95	-0.55	0	-0.01	0	3.21	0	0.02	28.72	25.38	-156.89
118	82.1	5.44	0	0	0	3.05	0	0.02	29.04	25.63	15.1
121	74.85	2.96	0	0	0	2.95	0	0.02	28.36	25.07	25.27
124	69.74	-1.74	0	0	0	2.9	0	0.02	28.1	24.92	-40.08
127	64.2	-2.02	0	0	0	3.02	0	0.02	27.94	24.91	-31.81
130	58.63	-2.45	0	0	0	3.01	0	0.02	28.09	25.15	-23.9
133	53.44	0.34	-0.01	0	0	3.14	0	0.02	27.69	24.91	157.97
136	50.68	0.01	-0.24	-0.03	0	2.99	0	0.02	27.84	25.22	5067.95

Vinyl Blinds**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	21.00
Peak Heat Release Rate (kW/m ²):	164.15
Time to Peak Heat Release Rate (s):	28.00
Total Heat Release (MJ/m ²):	6.47
60 s Average Heat Release Rate (kW/m ²):	99.43
Total Mass Loss (g):	5.44
Average Mass Loss Rate (g/s):	0.082
Average Effective Heat of Combustion (MJ/kg):	11.89
Average Smoke Extinction Area (m ² /kg):	985.52
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0620

Specimen:

Initial mass (g):	12.4
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	85
Time to ignition (s):	21
Time to flameout (s):	87

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	4.3	0.01	-0.39	-0.03	0	12.53	0	0.03	24.96	25.39	430.35
4	5.74	0.01	-0.36	-0.03	0	12.61	0	0.03	25.3	25.73	573.74
7	3.44	1.75	0	0	0	12.64	0	0.03	25.47	25.9	1.96
10	0.94	9.57	0	0	0	12.49	0	0.03	25.32	25.75	0.1
13	2.32	5.62	0	0	542.86	12.14	1.21	0.03	24.83	25.26	0.41
16	5.24	17.52	0	0	476.18	12.03	3.22	0.03	25.48	25.94	0.3
19	21.47	37.04	0	0.03	343.19	11.04	4.99	0.03	24.87	25.47	0.58
22	73.31	27.9	0	0.05	857.91	10.03	9.54	0.02	24.24	25.08	2.63
25	135.5	16.59	0	0.08	1284.92	9.4	8.31	0.02	24.66	25.65	8.17
28	164.15	17.69	0	0.07	924.94	8.94	6.29	0.03	24.94	26	9.28
31	159.27	15.83	0	0.07	1011.79	8.36	6.18	0.02	24.85	25.92	10.06
34	155.79	8.55	0	0.11	1517.72	8.03	4.95	0.03	25.14	26.23	18.21
37	140.64	11.79	0	0.07	1018.6	7.77	4.54	0.03	25.36	26.46	11.93
40	130.38	16.48	0	0.05	653.15	7.31	4.03	0.03	25.59	26.68	7.91
43	120.51	12.44	0	0.05	786.44	6.84	3.76	0.02	24.99	26.04	9.69
46	114.78	5.33	0	0.1	1865.04	6.58	3.74	0.03	25.54	26.58	21.54
49	107.07	7.3	0	0.06	1222.45	6.46	3.38	0.03	25.38	26.38	14.67
52	102.83	7.91	0	0.05	993.81	6.15	2.98	0.03	25.4	26.37	13.01
55	99.62	3.13	0	0.09	1575.67	6.02	1.86	0.03	25.59	26.53	31.8
58	93.63	1.36	0	0.14	3031.28	5.94	1.56	0.03	25.59	26.5	68.65
61	88.13	1.93	0	0.06	1842.03	5.92	1.33	0.03	25.85	26.76	45.57
64	79.58	4.04	0	0.02	643.32	5.82	1.02	0.02	24.72	25.55	19.71
67	75.07	2.97	0	0.03	339.86	5.7	0.39	0.02	25.11	25.91	25.24
70	69.42	0.34	-0.01	0.18	0	5.65	0	0.03	26.09	26.88	203.72
73	60.23	1.32	0	0.04	0	5.66	0	0.03	25.97	26.72	45.76
76	53.12	2.41	0	0.03	0	5.57	0	0.03	26.34	27.07	22
79	43.55	-0.87	0	-0.08	0	5.54	0	0.03	25.93	26.6	-50.14
82	35.1	-1.49	0	-0.06	0	5.6	0	0.03	25.74	26.35	-23.61
85	34.67	2.22	0	0.04	0	5.6	0	0.03	25.47	26.04	15.65
88	30.32	2.11	0	0.05	0	5.5	0	0.03	25.71	26.27	14.39
91	27.17	0.28	-0.01	0.34	0	5.49	0	0.03	25.64	26.18	95.74
94	25.02	2.22	0	0.04	0	5.45	0	0.03	25.52	26.03	11.27
97	25.59	1.91	0	0.05	0	5.37	0	0.03	25.32	25.81	13.38
100	23.67	-1.47	0	-0.07	0	5.36	0	0.03	25.88	26.36	-16.06
103	23.97	-1.12	0	-0.08	0	5.43	0	0.03	25.89	26.36	-21.49
106	22.91	0.76	-0.01	0.12	0	5.42	0	0.03	26.53	26.99	30.31
109	20.02	0.88	0	0.1	0	5.4	0	0.03	25.68	26.11	22.8
112	17.88	-1.54	0	-0.05	0	5.38	0	0.03	25.15	25.58	-11.64
115	18.68	1.68	0	0.05	0	5.45	0	0.03	25.55	25.96	11.1
118	20.14	5.12	0	0.02	0	5.28	0	0.03	25.59	26.01	3.94
121	18.45	-0.09	0.04	-0.75	0	5.21	0	0.03	25.23	25.65	-211.7
124	19.37	-2.04	0	-0.01	0	5.26	0	0.03	25.81	26.24	-9.48
127	19.31	0.01	-0.33	5.52	0	5.28	0	0.03	25.22	25.64	1931.4
130	18.02	0.01	-0.34	5.26	0	5.14	0	0.03	25.76	26.2	1801.77

Vinyl Blinds**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	19.00
Peak Heat Release Rate (kW/m ²):	157.44
Time to Peak Heat Release Rate (s):	32.00
Total Heat Release (MJ/m ²):	6.52
60 s Average Heat Release Rate (kW/m ²):	98.65
Total Mass Loss (g):	6.12
Average Mass Loss Rate (g/s):	0.089
Average Effective Heat of Combustion (MJ/kg):	10.66
Average Smoke Extinction Area (m ² /kg):	985.64
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0515

Specimen:

Initial mass (g):	12.5
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	87
Time to ignition (s):	19

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	1.36	0.01	-0.25	-0.03	36589.44	12.57	0.14	0.03	25.05	25.49	136.27
5	2.23	0.01	-0.34	-0.03	48062.87	12.78	0.19	0.03	25.42	25.87	223.16
8	1.91	3.86	0	0	104.2	12.77	0.16	0.03	25.08	25.52	0.5
11	3.06	7.98	0	0	101.12	12.57	0.31	0.03	25.32	25.76	0.38
14	1.41	12.65	0	0	422.1	12.29	2.09	0.03	25.08	25.53	0.11
17	6.07	20.39	0	0.01	590.77	11.79	4.83	0.03	24.45	24.94	0.3
20	33.24	29.49	0	0.03	502.36	11.06	5.94	0.02	24.29	24.95	1.13
23	85.91	30.74	0	0.04	847.56	10.09	10.55	0.02	23.84	24.7	2.8
26	135.39	21.52	0	0.06	903.38	9.3	7.74	0.02	24.16	25.11	6.29
29	156.05	13.03	0	0.09	1067.47	8.8	5.41	0.02	24.7	25.73	11.97
32	157.44	11.87	0	0.08	870.87	8.46	3.95	0.03	25.07	26.18	13.27
35	149.36	15.15	0	0.06	627.86	8.04	3.62	0.03	25.14	26.29	9.86
38	148.41	20.69	0	0.04	643.88	7.54	4.96	0.03	25.66	26.88	7.17
41	140.81	12.99	0	0.06	1224.69	6.9	6.13	0.02	24.75	25.93	10.84
44	136.46	2.05	0	0.34	6550.23	6.79	5.06	0.03	25.31	26.49	66.65
47	126.32	8.84	0	0.06	1587.32	6.65	5.4	0.02	24.84	25.97	14.29
50	122.03	5.77	0	0.07	1985.58	6.31	4.32	0.03	25.43	26.55	21.14
53	113.37	2.83	0	0.11	3143.98	6.31	3.38	0.02	25.25	26.32	40.02
56	106.35	7.14	0	0.03	885.78	6.1	2.37	0.03	25.64	26.67	14.89
59	92.95	-0.18	0.02	-0.63	-23742.69	5.95	1.63	0.03	25.47	26.44	-511.91
62	81.01	2.63	0	0.02	1299.52	6.04	1.29	0.03	25.57	26.48	30.79
65	71.86	7.06	0	0.01	274.2	5.78	0.74	0.03	25.25	26.1	10.18
68	63.27	1.85	0	0.02	745.59	5.69	0.53	0.03	25.22	26.02	34.14
71	54.25	-1.97	0	-0.02	-224.95	5.66	0.17	0.03	25.65	26.41	-27.58
74	48.39	2.66	0	0.02	1.49	5.74	0	0.03	25.63	26.36	18.21
77	42.74	3.45	0	0.02	0	5.53	0	0.03	25.8	26.49	12.41
80	39.08	-4.3	0	-0.03	0	5.6	0	0.03	25.92	26.56	-9.1
83	34.16	-1.44	0	-0.09	0	5.72	0	0.03	25.65	26.25	-23.78
86	28.84	2.24	0	0.05	0	5.67	0	0.03	25.61	26.18	12.88
89	27.83	-0.01	0.29	-10.77	0	5.62	0	0.03	25.64	26.17	0
92	26.17	3.05	0	0.03	0	5.64	0	0.03	25.6	26.11	8.57
95	22.98	-1.14	0	-0.08	0	5.49	0	0.03	26.14	26.65	-20.09
98	22.75	-1.77	0	-0.04	0	5.68	0	0.03	25.36	25.85	-12.84
101	23.21	5.56	0	0.01	0	5.54	0	0.03	25.63	26.12	4.18
104	21.14	3.17	0	0.02	0	5.42	0	0.03	26.02	26.5	6.67
107	21.25	-0.96	0	-0.06	0	5.36	0	0.03	25.27	25.73	-22.07
110	18.14	0.01	-0.44	6.97	0	5.44	0	0.03	25.71	26.17	1814.28
113	19.23	0.01	-0.36	7.53	0	5.32	0	0.03	26.27	26.73	1923.22

Vinyl Blinds**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	19.00
Peak Heat Release Rate (kW/m ²):	153.64
Time to Peak Heat Release Rate (s):	32.00
Total Heat Release (MJ/m ²):	6.53
60 s Average Heat Release Rate (kW/m ²):	91.67
Total Mass Loss (g):	6.23
Average Mass Loss Rate (g/s):	0.077
Average Effective Heat of Combustion (MJ/kg):	10.48
Average Smoke Extinction Area (m ² /kg):	1032.35
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0537

Specimen:

Initial mass (g):	12.4
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	84
Time to ignition (s):	19
Time to flameout (s):	99

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.14	0.01	-0.39	-0.04	0	12.56	0	0.03	25.83	26.3	13.54
5	3.04	0.01	-0.43	-0.03	0	12.37	0	0.03	25.25	25.71	303.93
8	5.02	-4.61	0	0	0	12.46	0	0.03	25.29	25.75	-1.09
11	5.07	1.43	0	0	0	12.55	0	0.03	25.21	25.66	3.54
14	3.5	16.29	0	0	255.88	12.3	1.6	0.03	25.56	26.02	0.22
17	6.42	25.49	0	0	410.19	11.61	3.97	0.03	25.81	26.32	0.25
20	25.03	28.51	0	0.04	626.68	10.83	6.98	0.03	24.94	25.58	0.88
23	68.78	23.91	0	0.05	1236.56	9.97	11.94	0.02	23.92	24.76	2.88
26	120.28	16.65	0	0.07	1191.85	9.42	7.96	0.02	23.96	24.92	7.22
29	149.65	16.11	0	0.07	964.29	8.92	6.06	0.02	24.61	25.66	9.29
32	153.64	17.18	0	0.06	791.41	8.43	5.2	0.03	25.05	26.16	8.94
35	138.61	17.65	0	0.05	646.97	7.9	4.52	0.02	24.15	25.24	7.85
38	136.83	12.01	0	0.07	833.32	7.42	3.78	0.03	25.37	26.5	11.39
41	127.85	7.37	0	0.1	1423	7.17	3.95	0.03	25.39	26.53	17.34
44	119.18	8.72	0	0.07	1139.15	6.94	3.75	0.03	25.39	26.51	13.67
47	111.68	6.29	0	0.08	1410.53	6.67	3.34	0.03	25.53	26.61	17.75
50	102.82	3.8	0	0.12	2463.67	6.56	3.55	0.03	25.28	26.33	27.08
53	95.15	5.78	0	0.06	1802.04	6.41	4.01	0.02	25.01	26.02	16.45
56	90.85	9.19	0	0.03	1113.46	6.2	3.91	0.02	25.16	26.14	9.89
59	88.94	8.91	0	0.03	961.77	5.89	3.26	0.03	25.3	26.26	9.98
62	85.14	-0.09	0.05	-1.89	-57091.17	5.73	1.91	0.03	25.23	26.14	-975.36
65	77.88	-3.41	0	-0.04	-899.49	5.85	1.18	0.02	25.11	25.97	-22.83
68	68.09	2.61	0	0.04	828.86	5.86	0.83	0.03	25.23	26.05	26.13
71	57.82	4.79	0	0.01	388.1	5.72	0.7	0.03	25.66	26.45	12.08
74	53.1	4.65	0	0.01	363.22	5.6	0.63	0.03	26.1	26.86	11.43
77	47.25	1.3	0	0.04	1101.22	5.47	0.55	0.03	25.33	26.02	36.23
80	45.92	-1.75	0	-0.02	-897.01	5.51	0.6	0.03	25.52	26.18	-26.3
83	45.61	0.75	0	0.05	1372.29	5.53	0.38	0.03	26.28	26.95	60.44
86	38.17	0.68	0	0.05	761.67	5.48	0.2	0.03	25.32	25.93	56.53
89	33.93	1.74	0	0.02	27.9	5.48	0.02	0.03	25.37	25.96	19.52
92	32.56	2.42	0	0.01	0	5.38	0	0.03	25.82	26.4	13.46
95	29.21	-0.25	0.02	-0.2	0	5.36	0	0.03	25.91	26.48	-116.83
98	26.45	0.12	-0.03	0.61	0	5.38	0	0.03	26.08	26.63	218.43
101	25.51	0.89	0	0.09	0	5.35	0	0.03	26.08	26.6	28.66
104	25.12	-0.6	0.01	-0.13	0	5.34	0	0.03	25.78	26.28	-41.94
107	22.03	3.08	0	0.03	0	5.35	0	0.03	25.27	25.75	7.16
110	19.95	5.19	0	0.01	0	5.17	0	0.03	25.07	25.55	3.84
113	19.59	-2.37	0	-0.03	0	5.11	0	0.03	25.53	26.01	-8.25
116	19.09	-5.56	0	-0.01	0	5.28	0	0.03	25.52	25.99	-3.44
119	18.81	-0.09	0.03	-0.83	0	5.37	0	0.03	26.13	26.6	-212.49
122	16.46	5.42	0	0.01	0	5.28	0	0.03	25.28	25.72	3.04
125	16.02	3.25	0	0.01	0	5.11	0	0.03	25.51	25.96	4.93
128	17	-1.89	0	-0.03	0	5.11	0	0.03	25.96	26.42	-8.98
131	17.68	0.98	0	0.05	0	5.16	0	0.03	25.33	25.76	18.03
134	18.08	0.01	-0.44	4.75	0	5.05	0	0.03	25.49	25.93	1807.91
137	16.23	0.01	-0.37	4.17	0	4.97	0	0.03	25.91	26.37	1622.91

Wall Covering**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	7.00
Peak Heat Release Rate (kW/m ²):	481.65
Time to Peak Heat Release Rate (s):	17.00
Total Heat Release (MJ/m ²):	7.76
60 s Average Heat Release Rate (kW/m ²):	160.06
Total Mass Loss (g):	5.38
Average Mass Loss Rate (g/s):	0.224
Average Effective Heat of Combustion (MJ/kg):	14.43
Average Smoke Extinction Area (m ² /kg):	763.72
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0542

Specimen:

Initial mass (g):	11.1
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	93
Time to ignition (s):	7
Time to flameout (s):	30

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	25.81	0.01	-0.43	-0.03	2978.04	11.08	0.01	0.03	26.33	26.74	2580.77
5	112.1	0.01	-0.48	-0.04	9865.73	10.91	0.04	0.03	25.91	26.3	0
8	259.68	17.88	0	0.1	162.58	10.91	1.11	0.03	25.77	26.18	14.53
11	348.46	30.79	0	0.11	1026.91	9.86	12.65	0.02	24.15	24.99	11.32
14	467.5	30.7	0	0.12	820.7	9.15	9.54	0.03	25.04	26.41	15.23
17	481.65	41.83	0	0.07	549.57	7.96	9.04	0.02	23.44	25.44	11.52
20	397.2	36.28	0.01	0.06	676.72	6.77	9.54	0.02	23.27	25.75	10.95
23	259.91	21.53	0	0.04	973.94	5.87	7.83	0.02	23.74	26.79	12.07
26	161.33	4.18	0	0.09	1875.3	5.5	2.77	0.02	25.34	28.33	38.57
29	99.84	-1.42	0	-0.15	-542.27	5.53	0.27	0.03	26.46	29.06	-70.15
32	73.25	2.01	0	0.1	74.8	5.51	0.05	0.03	26.57	28.77	36.52
35	59.35	4.66	0	0.04	34.4	5.4	0.06	0.03	26.27	27.98	12.73
38	52.91	6.82	0	0.03	5.19	5.24	0.01	0.03	26.67	28.14	7.75
41	45.6	0.01	-0.27	9.38	10619	5.06	0.06	0.03	25.9	27.04	3207.28
44	41.4	-4.38	0	-0.03	-28.06	5.22	0.04	0.03	26.27	27.29	-9.46
47	39.08	-1	0	-0.11	-223.98	5.26	0.08	0.03	25.78	26.58	-39.23
50	39.05	4.13	0	0.02	14.7	5.26	0.02	0.03	26.25	26.98	9.46
53	37.95	4.57	0	0.02	23.93	5.05	0.04	0.03	25.76	26.33	8.31
56	34.26	0.01	-0.42	7.86	9668.6	5.05	0.04	0.03	26.26	26.78	3426.25
59	30.67	0.01	-0.27	5.82	23747.96	5.2	0.09	0.03	26.31	26.77	3067.35

Wall Covering**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	8.00
Peak Heat Release Rate (kW/m ²):	470.12
Time to Peak Heat Release Rate (s):	17.00
Total Heat Release (MJ/m ²):	7.41
60 s Average Heat Release Rate (kW/m ²):	145.93
Total Mass Loss (g):	5.35
Average Mass Loss Rate (g/s):	0.255
Average Effective Heat of Combustion (MJ/kg):	13.84
Average Smoke Extinction Area (m ² /kg):	754.37
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0554

Specimen:

Initial mass (g):	11.3
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	81
Time to ignition (s):	8
Time to flameout (s):	31

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	23.19	0.01	-0.47	-0.03	4940.69	11.3	0.02	0.03	25.98	26.41	2319.4
5	80.88	0.01	-0.41	-0.04	6924.99	11.41	0.03	0.03	25.97	26.39	8087.64
8	237.75	15.6	0	0.15	108.16	11.28	0.65	0.03	25.42	25.83	15.24
11	343.06	29.7	0	0.12	936.06	10.5	11.23	0.02	24	24.77	11.55
14	448.16	33.93	0	0.11	835.56	9.57	11.13	0.02	24.16	25.48	13.21
17	470.12	43.65	0	0.07	500.21	8.44	8.5	0.02	23.72	25.68	10.77
20	417.03	38.67	0	0.05	586.73	7.08	8.66	0.02	23.61	26.19	10.79
23	269.54	15.6	0	0.06	1350.3	6.26	8.05	0.02	23.27	26.15	17.28
26	166.61	3.89	0	0.11	2584.02	6.06	3.48	0.02	25.85	28.89	42.85
29	117.7	4.87	0	0.04	233.72	5.93	0.4	0.02	25.89	28.51	24.19
32	77.92	4.55	0	0.05	0	5.77	0	0.02	25.26	27.41	17.13
35	66.54	3.8	0	0.07	0	5.66	0	0.03	26.06	27.87	17.5
38	56.67	1.75	0	0.13	0	5.55	0	0.03	26.48	28.04	32.41
41	51.85	1.25	0	0.17	0	5.54	0	0.03	26.83	28.12	41.64
44	46.92	-0.69	0.01	-0.22	-78.81	5.48	0.02	0.03	26.06	27.15	-68.3
47	44.45	-3.37	0	-0.04	-15.51	5.58	0.02	0.03	26.03	26.92	-13.19
50	44.6	0.77	0	0.13	64.9	5.64	0.02	0.03	26.49	27.27	57.62
53	41.97	1.55	0	0.05	16.66	5.56	0.01	0.03	25.96	26.63	27.02
56	38.81	3.64	0	0.02	0	5.54	0	0.03	26.31	26.89	10.65
59	37.04	5.05	0	0.01	0	5.35	0	0.03	26.44	26.97	7.33
62	30.43	0.02	-0.15	2.46	4329.91	5.28	0.04	0.03	26.13	26.59	1246.98
65	29.84	-0.75	0	-0.05	-111.11	5.32	0.03	0.03	26.33	26.77	-40.04
68	27.56	-2.23	0	-0.01	0	5.32	0	0.03	26.61	27.03	-12.37
71	27.24	-1.19	0	-0.01	-92.14	5.43	0.04	0.03	26.75	27.13	-22.9
74	26.25	3.04	0	0	0	5.37	0	0.03	26.57	26.94	8.64
77	22.15	0.01	-0.37	0.72	3550.69	5.28	0.01	0.03	26.01	26.36	2214.82
80	19.01	0.01	-0.45	0.01	0	5.24	0	0.03	26.41	26.75	1900.95

Wall Covering**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	9.00
Peak Heat Release Rate (kW/m ²):	441.55
Time to Peak Heat Release Rate (s):	16.00
Total Heat Release (MJ/m ²):	7.25
60 s Average Heat Release Rate (kW/m ²):	153.25
Total Mass Loss (g):	5.45
Average Mass Loss Rate (g/s):	0.260
Average Effective Heat of Combustion (MJ/kg):	13.30
Average Smoke Extinction Area (m ² /kg):	729.72
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0531

Specimen:

Initial mass (g):	11.2
Thickness (mm):	1
Surface area (cm ²):	100
Test start time (s):	97
Time to ignition (s):	9
Time to flameout (s):	30

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	10.13	0.01	-0.47	-0.03	0	11.38	0	0.03	25.25	25.68	1013.48
4	83.65	0.01	-0.48	-0.04	0	11.33	0	0.03	25.88	26.33	8365.27
7	251.61	-2.29	0	-0.81	0	11.11	0	0.03	25.92	26.35	-109.94
10	342.43	28.05	0	0.13	780.63	11.19	8.68	0.03	24.58	25.23	12.21
13	429.34	53.94	0	0.07	604.25	9.46	13.25	0.02	23.57	24.6	7.96
16	441.55	42.88	0	0.06	557.05	8.24	9.74	0.02	22.71	24.54	10.3
19	393.11	33.5	0	0.06	707.54	6.92	9.35	0.02	23.07	25.35	11.73
22	256.42	13.32	0	0.07	1665.06	6.3	8.63	0.02	23.09	25.72	19.24
25	193.43	10.83	0	0.04	770.49	6	2.97	0.02	25.26	28.07	17.87
28	108.94	4.69	0	0.07	0	5.66	0	0.02	25.62	28.06	23.21
31	72.18	2.18	0	0.14	0	5.69	0	0.03	25.96	28.04	33.1
34	61.34	2.15	0	0.14	0	5.51	0	0.03	26.22	27.93	28.58
37	53.4	0.63	-0.01	0.4	0	5.57	0	0.03	26.34	27.82	84.3
40	48.4	0.93	-0.01	0.21	0	5.46	0	0.03	26.64	27.9	51.86
43	42.46	-3.96	0	-0.04	0	5.54	0	0.03	26.25	27.28	-10.72
46	39.97	1.75	0	0.09	0	5.62	0	0.03	26.11	27.03	22.85
49	38.34	6.28	0	0.02	0	5.44	0	0.03	25.78	26.56	6.11
52	40.34	3.11	0	0.04	0	5.3	0	0.03	26.41	27.11	12.95
55	35.63	0.05	-0.07	2.38	0	5.26	0	0.03	26.04	26.69	678.13
58	33.89	0.01	-0.42	8.16	0	5.29	0	0.03	26.48	27.07	3389.1
61	29.02	0.01	-0.39	7.07	0	5.34	0	0.03	26.09	26.61	2901.89

Workstation – Side Panel**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	14.00
Peak Heat Release Rate (kW/m ²):	218.85
Time to Peak Heat Release Rate (s):	234.00
Total Heat Release (MJ/m ²):	59.33
60 s Average Heat Release Rate (kW/m ²):	85.53
Total Mass Loss (g):	36.69
Average Mass Loss Rate (g/s):	0.063
Average Effective Heat of Combustion (MJ/kg):	16.17
Average Smoke Extinction Area (m ² /kg):	404.30
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0060

Specimen:

Initial mass (g):	75.7
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	83
Time to ignition (s):	14
Time to flameout (s):	593

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	1.4	0.01	-0.3	-0.04	0	75.78	1.11	0.03	25.92	26.45	140.31
3	1.33	0.01	-0.38	-0.04	0	76.02	1.13	0.03	25.97	26.5	133.11
6	10.42	17.84	0	0	160.85	76.3	1.11	0.03	25.46	25.97	0.58
9	28.03	13.82	0	0	233.37	75.19	1.22	0.03	25.87	26.41	2.03
12	70.48	-6.58	0	-0.01	-504.15	75.6	1.28	0.03	25.39	25.95	-10.72
15	124.67	8.77	0	0.02	642	75.34	2.15	0.03	25.56	26.17	14.21
18	142.82	10.84	0	0.02	726.99	75.14	3.04	0.03	25.18	25.97	13.17
21	151.42	11.93	0	0.03	803.38	74.72	3.73	0.03	24.64	25.67	12.7
24	144.3	3.82	0	0.09	1935.62	74.49	2.85	0.03	24.82	25.97	37.77
27	138.37	8.48	0	0.04	958.78	74.4	3.03	0.03	25.51	26.83	16.31
30	122.55	13.1	0	0.02	656.24	73.98	3.21	0.03	25.39	26.77	9.35
33	111.21	8.03	0	0.03	835.71	73.68	2.49	0.03	25.53	26.91	13.85
36	100.74	6.89	0	0.03	953.71	73.48	2.45	0.03	25.49	26.85	14.62
39	94.97	4.25	0	0.04	1486.5	73.28	2.31	0.03	26.07	27.41	22.34
42	85.87	2.37	0	0.06	2307.14	73.21	2.04	0.03	25.55	26.83	36.23
45	80.7	9.4	0	0.01	636.84	73.07	2.21	0.03	25.81	27.05	8.58
48	74.28	8.63	0	0.01	517.69	72.7	1.64	0.03	26	27.21	8.61
51	65.65	-0.24	0.02	-0.31	-15937.43	72.61	1.36	0.03	26.38	27.55	-278.43
54	53.19	-0.1	0.04	-0.6	-31848.8	72.65	1.22	0.03	26.16	27.27	-510.6
57	48.24	3.26	0	0.02	821.82	72.59	0.99	0.03	26.13	27.15	14.79
60	42.14	2.16	0	0.04	1128.74	72.49	0.89	0.03	26.27	27.22	19.53
63	40.96	5.72	0	0.02	419.35	72.44	0.87	0.03	26.63	27.54	7.17
66	37.57	4.92	0	0.03	471.81	72.18	0.85	0.03	26.33	27.16	7.64
69	35.35	-4.19	0	-0.04	-580.01	72.2	0.87	0.03	27.04	27.83	-8.43
72	30.74	-0.2	0.02	-0.84	-11476.88	72.34	0.84	0.03	26.3	27.03	-155.26
75	28.78	2.5	0	0.07	898.26	72.21	0.84	0.03	26	26.69	11.5
78	31.21	2.7	0	0.07	825.32	72.2	0.82	0.03	26.63	27.29	11.54
81	31.02	7.42	0	0.03	292.07	72.02	0.81	0.03	26.24	26.87	4.18
84	29.77	3.07	0	0.05	691.37	71.83	0.79	0.03	26.29	26.9	9.68
87	26.27	-3.9	0	-0.05	-514.45	71.86	0.77	0.03	25.56	26.14	-6.74
90	25.08	-1.29	0	-0.14	-1624.34	71.99	0.79	0.03	25.85	26.42	-19.41
93	23.2	4.65	0	0.04	427.04	71.91	0.75	0.03	25.89	26.45	4.99
96	25.95	3.66	0	0.05	532.2	71.76	0.73	0.03	26.11	26.66	7.1
99	25.72	3.07	0	0.06	640.32	71.69	0.73	0.03	26.25	26.8	8.38
102	24.99	3.54	0	0.06	574.88	71.57	0.75	0.03	26.41	26.96	7.06
105	20.83	-0.5	0.01	-0.38	-3830.3	71.5	0.74	0.03	25.61	26.14	-41.47
108	21.03	1.52	0	0.13	1324.79	71.55	0.75	0.03	26.18	26.73	13.85
111	21.29	6.57	0	0.03	296.99	71.39	0.74	0.03	26	26.54	3.24
114	24.61	4.71	0	0.05	407.03	71.21	0.72	0.03	26.25	26.8	5.22
117	23.28	5.11	0	0.05	382.24	71.1	0.74	0.03	25.82	26.37	4.56
120	22.27	1.1	0	0.23	1850.37	70.93	0.77	0.03	25.78	26.33	20.29
123	22.71	-3.26	0	-0.08	-619.51	71.03	0.77	0.03	25.59	26.14	-6.96
126	30.37	5.31	0	0.04	365.18	71.03	0.73	0.03	25.9	26.47	5.72
129	35.42	10.44	0	0.01	177.69	70.74	0.7	0.03	25.8	26.37	3.39
132	40	4.54	0	0.02	416.98	70.49	0.72	0.03	25.72	26.34	8.8
135	41.42	2.41	0	0.03	763.95	70.44	0.7	0.03	25.61	26.26	17.16

138	44.53	4.68	0	0.02	414.35	70.32	0.74	0.03	25.71	26.4	9.51
141	46.32	0.67	-0.01	0.08	2832.8	70.2	0.72	0.03	25.84	26.57	68.94
144	55.25	2.85	0	0.02	685.93	70.23	0.74	0.03	25.86	26.62	19.36
147	58.02	12.26	0	0	152.67	69.98	0.72	0.03	25.21	26	4.73
150	62.13	10.48	0	0	181.71	69.58	0.73	0.03	25.43	26.27	5.93
153	63.21	-2.99	0	0	-645.23	69.43	0.74	0.03	25.14	26.02	-21.14
156	72.53	2.44	0	0	813.58	69.62	0.75	0.03	25.52	26.44	29.71
159	82.24	12.34	0	0	162.31	69.25	0.75	0.03	25.63	26.6	6.67
162	88.66	8.32	0	0	237.47	68.98	0.75	0.03	25.36	26.38	10.66
165	92.08	9.15	0	0	216.6	68.72	0.76	0.02	24.99	26.03	10.06
168	101.18	8.67	0	0	253.43	68.44	0.84	0.03	25.17	26.27	11.67
171	113.36	4.24	0	0	516.93	68.23	0.82	0.03	25.5	26.69	26.71
174	121.37	6.81	0	0	367.95	68.13	0.94	0.03	25.55	26.79	17.82
177	126.14	12.85	0	0	187.07	67.79	0.92	0.02	24.94	26.21	9.82
180	137.05	11.45	0	0	215.14	67.42	0.91	0.03	25.71	27.08	11.97
183	144.91	9.58	0	0	295.89	67.12	1.04	0.03	25.78	27.23	15.13
186	149.96	8.11	0	0	351.48	66.84	1.05	0.03	25.61	27.09	18.5
189	159.63	7.68	0	0	386.36	66.61	1.11	0.02	25.32	26.84	20.78
192	166.61	14.42	0	0	211.1	66.32	1.12	0.02	25.53	27.11	11.56
195	166.28	17.91	0	0	190.57	65.78	1.29	0.02	24.84	26.44	9.29
198	176.33	9.84	0	0	357.36	65.34	1.31	0.02	25.12	26.75	17.92
201	188.18	7.05	0	0	519.27	65.15	1.36	0.02	25.22	26.91	26.7
204	189.4	13.87	0	0	250.18	64.84	1.31	0.02	24.68	26.38	13.66
207	193.28	15.25	0	0	242.69	64.35	1.4	0.02	24.67	26.4	12.67
210	197.83	16.06	0	0	236.67	63.93	1.42	0.02	24.97	26.76	12.32
213	203.76	18.98	0	0	215.04	63.38	1.52	0.02	25.04	26.86	10.74
216	208.83	9.96	0	0	413.39	62.88	1.53	0.02	25.13	26.97	20.97
219	210.78	8.08	0	0	483.61	62.73	1.44	0.02	25.21	27.06	26.1
222	210.89	21.12	0	0	204.35	62.29	1.6	0.02	25.19	27.03	9.98
225	210.98	19.77	0	0	208.83	61.56	1.52	0.02	25.26	27.11	10.67
228	211.73	10.49	0	0	405.72	61.16	1.58	0.02	25.1	26.96	20.19
231	212.76	11.02	0	0	395.93	60.86	1.63	0.02	24.92	26.75	19.3
234	218.85	15.11	0	0	284.52	60.47	1.57	0.02	25.44	27.3	14.49
237	209.83	18.8	0	0	211.57	59.96	1.49	0.02	24.86	26.66	11.16
240	214.62	15.62	0	0	292.03	59.39	1.67	0.02	25.44	27.28	13.74
243	216.29	8.14	0	0	531.63	59.05	1.57	0.02	25.7	27.53	26.57
246	211.54	12.61	0	0	335.41	58.82	1.55	0.02	25.47	27.26	16.78
249	206.16	18	0	0	228.81	58.29	1.51	0.02	25.56	27.36	11.46
252	203.76	13.93	0	0	307.94	57.81	1.58	0.02	25.41	27.15	14.63
255	204.05	13.18	0	0	333.94	57.43	1.59	0.02	25.89	27.62	15.48
258	199.28	13.61	0	0	269.02	57.01	1.34	0.02	25.59	27.27	14.65
261	196.31	10.75	0	0	324.67	56.64	1.27	0.02	25.75	27.41	18.26
264	188.79	14.74	0	0	259.84	56.31	1.42	0.02	25.37	26.98	12.8
267	184.5	19	0	0	202.76	55.76	1.42	0.02	25.62	27.19	9.71
270	182.01	8.1	0	0	476.31	55.28	1.42	0.02	25.55	27.09	22.48
273	182.81	6.44	0	0	538.15	55.21	1.28	0.02	25.65	27.16	28.38
276	177.33	14.66	0	0	231.88	54.82	1.27	0.02	25.35	26.8	12.1
279	177	14.5	0	0	210.87	54.38	1.12	0.02	25.89	27.35	12.21
282	172.75	11.83	0	0	236.02	53.98	1.02	0.02	25.85	27.27	14.6
285	175.25	6.95	0	0	415.4	53.69	1.04	0.02	26.29	27.71	25.23
288	176.81	5.89	0	0	462.53	53.52	0.97	0.02	26.62	28.03	30.02
291	167.39	16.61	0	0	130.02	53.25	0.81	0.02	25.34	26.68	10.08

294	163.67	16.59	0	0	144.16	52.6	0.89	0.02	25.6	26.92	9.87
297	159.96	7.35	0	0	351.81	52.33	0.97	0.02	25.42	26.72	21.77
300	162.49	8.58	0	0	302.18	52.09	0.96	0.02	25.79	27.09	18.95
303	163.91	12.59	0	0	180.63	51.79	0.84	0.02	25.69	26.96	13.02
306	163.11	10.35	0	0	202.44	51.38	0.76	0.02	26.19	27.48	15.76
309	159.03	10.25	0	0	202.21	51.15	0.76	0.02	25.92	27.2	15.52
312	158.38	12.72	0	0	177.66	50.75	0.83	0.02	25.92	27.18	12.45
315	153.63	8.32	0	0	266.82	50.44	0.84	0.02	25.22	26.42	18.46
318	150.89	8.37	0	0	293.55	50.22	0.92	0.02	25.5	26.7	18.02
321	145.06	12.9	0	0	145.4	49.9	0.71	0.02	25.3	26.48	11.25
324	144.46	13.27	0	0	118.89	49.48	0.59	0.02	25.52	26.69	10.89
327	147.09	5.12	0	0	285.93	49.17	0.54	0.02	26.08	27.25	28.71
330	147.54	4.91	0	0	298.54	49.11	0.54	0.02	26.07	27.22	30.07
333	144.02	9.88	0	0	166.33	48.83	0.61	0.02	25.93	27.05	14.57
336	143.87	9.91	0	0	165.64	48.55	0.6	0.02	26.19	27.3	14.51
339	142.76	13.32	0	0	102.35	48.22	0.51	0.02	25.75	26.84	10.71
342	141.56	9.5	0	0	139.9	47.8	0.51	0.02	24.88	25.94	14.9
345	147.42	2.72	0	0	401.83	47.67	0.41	0.02	25.71	26.81	54.26
348	147.92	9.23	0	0	167.43	47.54	0.57	0.02	26.21	27.32	16.03
351	144.12	16.07	0	0	72.39	47.11	0.43	0.02	25.71	26.82	8.97
354	146.12	9.33	0	0	125.11	46.68	0.43	0.02	25.94	27.05	15.67
357	148.45	2.88	0	0	562.37	46.55	0.6	0.02	26.04	27.16	51.56
360	146.91	8.32	0	0	125.71	46.42	0.39	0.02	25.87	26.98	17.65
363	145.51	16.9	0	0	61.66	46.03	0.38	0.02	25.97	27.09	8.61
366	141.82	10.48	0	0	94.23	45.51	0.37	0.02	25.92	27.04	13.53
369	138.76	1.87	0	0	776.34	45.42	0.54	0.02	25.72	26.83	74.28
372	139.28	7.14	0	0	167.04	45.3	0.43	0.02	26.35	27.49	19.5
375	133.93	11.55	0	0	87.14	44.99	0.37	0.02	25.8	26.9	11.6
378	126.74	11.34	0	0	65.95	44.65	0.28	0.02	25.63	26.7	11.18
381	123.3	8.07	0	0	121.37	44.34	0.37	0.02	25.7	26.78	15.28
384	121.76	1.39	0	0	637.38	44.18	0.33	0.02	25.78	26.83	87.47
387	121.23	3.88	0	0	193.5	44.18	0.28	0.02	25.62	26.64	31.28
390	122.19	10.45	0	0	85.32	43.92	0.33	0.02	26.08	27.09	11.7
393	113.01	9.66	0	0	111.09	43.61	0.4	0.02	25.89	26.91	11.7
396	104.47	3.19	0	0	87.12	43.38	0.1	0.02	26.4	27.4	32.75
399	98.62	-1.45	0	0	-684.8	43.4	0.37	0.02	26.21	27.17	-68
402	96.28	6.07	0	0	49.72	43.38	0.11	0.02	25.81	26.7	15.85
405	94.21	7.81	0	0	32.55	43.08	0.1	0.02	25.49	26.33	12.06
408	87.48	3.47	0	0	91.87	42.96	0.12	0.02	25.83	26.68	25.21
411	80.94	2.3	0	0	57.86	42.85	0.05	0.03	26.37	27.19	35.26
414	74.82	0.48	-0.01	0	494.02	42.82	0.09	0.02	26	26.75	157.11
417	73.16	1.34	0	0	120.83	42.8	0.06	0.02	25.81	26.51	54.71
420	72.4	7.24	0	0	22.2	42.71	0.06	0.03	26.2	26.87	10.01
423	70.01	4.38	0	0	59.17	42.43	0.1	0.03	26.16	26.8	15.99
426	65.27	-0.7	0	0	-613.8	42.47	0.16	0.03	26.49	27.1	-92.81
429	62.56	-3.74	0	0	-121.12	42.45	0.17	0.02	25.96	26.52	-16.75
432	61.98	0.29	-0.01	0	1207.89	42.64	0.13	0.03	26.37	26.93	210.47
435	60.24	7.03	0	0	77.09	42.42	0.2	0.03	25.95	26.47	8.57
438	59.72	2.78	0	0	174.17	42.29	0.18	0.03	26.59	27.1	21.5
441	56.11	3.04	0	0	170.07	42.23	0.2	0.02	25.77	26.25	18.44
444	55.66	-1.39	0	0	-488.93	42.14	0.26	0.03	26.08	26.55	-40.11
447	55.83	-5.33	0	0	-129.5	42.3	0.26	0.02	25.68	26.15	-10.48

450	56.83	5.68	0	0	136.91	42.35	0.29	0.03	25.92	26.39	10.01
453	55.97	10.2	0	0	79.89	42.01	0.31	0.03	26.13	26.6	5.49
456	52.72	-0.12	0.04	0	-7541.74	41.85	0.33	0.03	25.72	26.19	-455.79
459	55.06	-1.43	0	0	-716.08	41.96	0.39	0.02	25.62	26.09	-38.55
462	58.42	0.89	0	0	1360.28	41.9	0.46	0.03	25.75	26.24	65.9
465	62.7	1.7	0	0	705.82	41.91	0.45	0.03	25.9	26.41	36.98
468	61.94	4.54	0	0	279.92	41.79	0.48	0.03	25.98	26.52	13.65
471	61.33	5.06	0	0	293.12	41.66	0.56	0.03	25.78	26.33	12.13
474	61.15	-0.83	0	0	-2041.65	41.53	0.64	0.03	25.97	26.54	-73.87
477	64.85	-3.12	0	0	-565.43	41.68	0.66	0.03	26.14	26.73	-20.79
480	66.53	7.61	0	0	215.41	41.63	0.64	0.02	25.23	25.82	8.74
483	68.35	8.26	0	0	214.99	41.29	0.67	0.03	25.8	26.42	8.27
486	64.53	3.33	0	0	523.99	41.18	0.67	0.02	25.56	26.2	19.36
489	63.24	0.91	0	0	2233.85	41.08	0.76	0.03	25.95	26.61	69.42
492	62.73	-1.97	0	0	-1055.67	41.12	0.79	0.03	25.61	26.29	-31.8
495	66.09	1.29	0	0	1718.49	41.15	0.85	0.02	25.47	26.15	51.36
498	68.32	6.01	0	0	351.38	41.03	0.81	0.02	25.52	26.22	11.36
501	70.37	3.75	0	0	611.08	40.84	0.86	0.03	25.86	26.58	18.79
504	65.93	-0.89	0	0	-2830.64	40.83	0.97	0.02	25.26	25.97	-73.99
507	65.31	2.06	0	0	1230.37	40.84	0.93	0.03	26.56	27.32	31.7
510	66.02	7.03	0	0	381.16	40.69	0.98	0.03	26.45	27.2	9.4
513	64.48	5.04	0	0	570.25	40.47	1.08	0.03	25.85	26.58	12.81
516	66.12	1.75	0	0	1677.72	40.4	1.1	0.03	25.87	26.62	37.84
519	65.87	1.18	0	0	2532.56	40.34	1.13	0.03	25.7	26.45	55.78
522	67.59	-1.88	0	0	-1636.68	40.34	1.15	0.03	26.05	26.8	-36.01
525	69.66	0.43	-0.01	0	7343.21	40.41	1.18	0.03	25.85	26.59	162.87
528	66.67	7.77	0	0	408.95	40.28	1.21	0.03	25.6	26.34	8.59
531	65.4	5.04	0	0	663.3	40.02	1.25	0.03	26.1	26.85	12.97
534	61.66	1.8	0	0	1848.6	39.99	1.26	0.03	25.57	26.31	34.3
537	61.5	1	0	0	3312.54	39.9	1.24	0.03	26.08	26.83	61.23
540	60.66	0.02	-0.22	-0.02	0	39.92	1.18	0.03	25.93	26.66	3639.67
543	61.11	1.69	0	0	1857.87	39.87	1.18	0.03	25.91	26.63	36.09
546	60.69	7.57	0	0	403.63	39.8	1.17	0.02	25.45	26.16	8.02
549	58.09	6.3	0	0	494	39.47	1.18	0.03	25.59	26.3	9.22
552	55.8	-1.22	0	0	-2687.78	39.46	1.23	0.03	25.83	26.53	-45.89
555	54.1	1.15	0	0	2659.93	39.48	1.16	0.03	25.74	26.43	46.88
558	54.82	2.92	0	0	998.97	39.4	1.11	0.03	25.55	26.22	18.8
561	56.56	-2.84	0	0	-1069.09	39.35	1.14	0.03	26.01	26.7	-19.95
564	53.89	0.98	0	0	3136.71	39.5	1.16	0.03	25.76	26.44	55.24
567	52.17	4.68	0	0	632.59	39.29	1.11	0.03	26.01	26.69	11.16
570	48.94	1.85	0	0	1509.67	39.27	1.07	0.03	25.51	26.15	26.4
573	48.14	2.73	0	0	1097.38	39.16	1.12	0.03	26.03	26.68	17.66
576	47.48	2.43	0	0	1210.12	39.11	1.11	0.03	25.82	26.46	19.58
579	48.8	0.4	-0.01	0	7416.21	39.02	1.09	0.03	26.34	26.99	122.55
582	46.65	-0.5	0.01	0	-5989.73	39.08	1.14	0.03	25.82	26.44	-92.5
585	46.1	0.63	-0.01	0	4900.3	39.04	1.15	0.03	26.17	26.79	73.49
588	42.57	2.28	0	0	1343.73	39.03	1.15	0.03	26.05	26.65	18.67
591	41.34	3.59	0	0	830.79	38.91	1.12	0.03	26.05	26.64	11.53
594	40.67	1.34	0	0	2234.38	38.84	1.13	0.03	25.9	26.47	30.39
597	42.27	3.33	0	0	873.79	38.8	1.09	0.03	25.97	26.54	12.71
600	43.31	-1.45	0	0	-2197.86	38.69	1.19	0.03	26.22	26.81	-29.93
603	41.67	-3.35	0	0	-901.52	38.87	1.13	0.03	26.18	26.75	-12.43

606	40.15	2.37	0	0	1327.75	38.83	1.17	0.03	26.23	26.81	16.96
609	36.43	4.09	0	0	736.28	38.75	1.12	0.03	26.29	26.88	8.91
612	36.15	3.09	0	0	912.54	38.61	1.06	0.03	25.98	26.56	11.7
615	38.35	3.63	0	0	864.31	38.56	1.15	0.03	26.61	27.21	10.57
618	39.16	-2	0	0	-1460.87	38.44	1.12	0.03	25.6	26.17	-19.56
621	41.31	-6.93	0	0	-433.33	38.67	1.12	0.03	26.22	26.8	-5.96
624	39.78	-0.08	0.05	0	-35140.6	38.76	1.12	0.03	25.65	26.23	-475.04
627	38.31	5.83	0	0	532.05	38.68	1.17	0.03	25.94	26.52	6.58
630	35.15	4.74	0	0	622.42	38.47	1.13	0.03	25.57	26.14	7.42
633	37.39	1.98	0	0	1481.47	38.41	1.1	0.03	26.05	26.63	18.93
636	39.75	1.42	0	0	2077.83	38.34	1.1	0.03	26.11	26.69	28.02
639	42.9	-4.95	0	0	-610.5	38.36	1.13	0.03	26.08	26.67	-8.67
642	41.86	-4.43	0	0	-684.85	38.58	1.15	0.03	25.89	26.49	-9.45
645	41.34	3.51	0	0	856.94	38.57	1.13	0.03	25.98	26.57	11.76
648	37.68	0.01	-0.36	-0.03	295170.8	38.4	1.13	0.03	25.54	26.12	3768.01
651	38.32	0.01	-0.27	-0.03	0	38.14	1.08	0.03	25.39	25.98	3831.93

Workstation – Side Panel**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	25.00
Peak Heat Release Rate (kW/m ²):	225.30
Time to Peak Heat Release Rate (s):	271.00
Total Heat Release (MJ/m ²):	55.59
60 s Average Heat Release Rate (kW/m ²):	77.79
Total Mass Loss (g):	34.61
Average Mass Loss Rate (g/s):	0.060
Average Effective Heat of Combustion (MJ/kg):	16.06
Average Smoke Extinction Area (m ² /kg):	71.25
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0087

Specimen:

Initial mass (g):	75.3
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	25
Time to flameout (s):	602

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-1.17	0.01	-0.38	-0.03	14857.83	75.65	0.06	0.03	25.78	26.23	-116.89
4	2.14	0.01	-0.37	-0.03	22745.27	74.99	0.09	0.03	25.28	25.72	213.55
7	7.93	2.27	0	0	156.65	74.28	0.13	0.03	26.68	27.14	3.5
10	10.51	-19.59	0	0	-18.16	74.83	0.14	0.03	25.36	25.82	-0.54
13	11.43	-2.81	0	-0.04	-121.26	75.17	0.13	0.03	25.86	26.36	-4.07
16	14.26	6.13	0	0.03	224.91	75.03	0.52	0.03	25.92	26.43	2.33
19	36.67	2.6	0	0.11	954.05	74.9	0.93	0.03	25.98	26.51	14.12
22	94.75	4.48	0	0.09	782.46	74.84	1.34	0.03	25.66	26.21	21.15
25	157.65	12.84	0	0.04	508.31	74.59	2.49	0.03	25.61	26.24	12.28
28	170.43	11.32	0	0.04	684.48	74.14	3.03	0.03	24.71	25.58	15.06
31	171.1	6.17	0	0.07	1294.17	73.94	2.99	0.03	25.49	26.68	27.72
34	148.6	7.16	0	0.04	941.91	73.73	2.58	0.03	24.82	26.11	20.75
37	130.75	9.21	0	0.03	567.53	73.5	1.95	0.03	25.47	26.84	14.2
40	110.21	8.67	0	0.02	483.73	73.2	1.57	0.03	25.41	26.8	12.71
43	97.97	4.5	0	0.04	865.34	73	1.43	0.03	25.89	27.26	21.78
46	84.67	2.89	0	0.05	1159.98	72.9	1.23	0.03	25.86	27.18	29.31
49	73.68	7.62	0	0.01	329	72.79	0.93	0.03	25.7	26.96	9.67
52	67.7	6.01	0	0.02	344	72.49	0.76	0.03	26.01	27.21	11.26
55	62.11	3.11	0	0.04	406.69	72.43	0.47	0.03	25.77	26.92	19.99
58	52.72	7.81	0	0.01	72.91	72.26	0.21	0.03	25.68	26.76	6.75
61	45.99	-0.75	0.01	-0.15	-637.17	72.06	0.18	0.03	26.18	27.19	-61.06
64	39.19	-7.02	0	-0.02	-44.75	72.28	0.12	0.03	26.33	27.28	-5.58
67	36.49	2.39	0	0.05	148.1	72.36	0.13	0.03	25.92	26.78	15.27
70	35.07	8.6	0	0.02	38.18	72.16	0.12	0.03	25.84	26.64	4.08
73	35.18	3.77	0	0.04	158.48	71.93	0.22	0.03	26.22	26.98	9.32
76	32.45	-3.54	0	-0.05	-161.37	71.96	0.21	0.03	26.26	26.99	-9.16
79	30.24	-2.08	0	-0.08	-357.7	72.08	0.28	0.03	26.2	26.88	-14.5
82	25.74	2.85	0	0.05	231.43	72.05	0.25	0.03	25.42	26.05	9.05
85	25.73	6.3	0	0.02	96.4	71.92	0.22	0.03	26.4	27.02	4.08
88	27.18	4.69	0	0.04	122.46	71.71	0.22	0.03	25.9	26.48	5.79
91	28	-0.34	0.01	-0.44	-2287.24	71.67	0.29	0.03	26.7	27.26	-81.45
94	27.86	-2.6	0	-0.06	-301.16	71.71	0.29	0.03	26.19	26.73	-10.7
97	24.46	-0.39	0.01	-0.4	-1914.91	71.78	0.28	0.03	26.02	26.55	-62.96
100	23.94	3.38	0	0.04	215.88	71.72	0.28	0.03	25.99	26.52	7.08
103	20.74	3.7	0	0.04	169.98	71.6	0.24	0.03	25.5	26	5.61
106	21.61	6.15	0	0.03	112.45	71.49	0.26	0.03	26.42	26.94	3.51
109	22.98	4.12	0	0.04	174.08	71.27	0.27	0.03	26.33	26.84	5.57
112	23.24	-3.3	0	-0.05	-241.74	71.28	0.3	0.03	26.14	26.66	-7.04
115	21.75	-1.04	0.01	-0.15	-755.23	71.4	0.3	0.03	26	26.51	-20.89
118	18.75	5.53	0	0.03	135.34	71.31	0.28	0.03	26.15	26.67	3.39
121	18.35	5.35	0	0.03	128.71	71.11	0.26	0.03	26.06	26.58	3.43
124	17.02	2.9	0	0.05	181.74	71.01	0.2	0.03	26.01	26.54	5.87
127	19.42	2.37	0	0.06	274.18	70.93	0.25	0.03	25.75	26.27	8.19
130	20.52	0.49	-0.01	0.35	1415.16	70.87	0.26	0.03	26.22	26.74	41.69
133	20.1	-2.86	0	-0.06	-225.42	70.91	0.25	0.03	25.76	26.28	-7.02
136	19.89	1.71	0	0.1	341.77	70.99	0.21	0.03	26.76	27.3	11.62

139	16.27	8.68	0	0.02	42.6	70.79	0.14	0.03	26.06	26.6	1.87
142	16.14	5.18	0	0.04	29.47	70.54	0.06	0.03	25.78	26.3	3.12
145	16.19	1.26	0	0.16	0	70.49	0	0.03	25.76	26.27	12.82
148	18.98	0.17	-0.03	1.13	0	70.44	0	0.03	25.61	26.11	108.67
151	19.36	1.37	0	0.16	0	70.46	0	0.03	25.62	26.13	14.14
154	19.25	1.92	0	0.12	0	70.36	0	0.03	25.19	25.7	10.02
157	20.05	2.55	0	0.1	0	70.34	0	0.03	25.9	26.43	7.87
160	21.56	7	0	0.03	0	70.19	0	0.03	25.97	26.5	3.08
163	27	8.35	0	0.02	0	69.94	0	0.03	26.03	26.55	3.23
166	31.32	3.84	0	0.03	0	69.73	0	0.03	25.9	26.45	8.16
169	37.72	-0.22	0.02	-0.34	0	69.71	0	0.03	25.76	26.36	-172.44
172	42.68	-0.22	0.02	-0.33	0	69.71	0	0.03	25.64	26.27	-197.76
175	47.54	5.37	0	0.01	0	69.68	0	0.03	25.97	26.62	8.85
178	48.53	9.1	0	0.01	0	69.4	0	0.03	25.82	26.51	5.33
181	52.37	3.83	0	0.01	0	69.2	0	0.03	25.17	25.89	13.69
184	56.28	5	0	0.01	0	69.13	0	0.03	25.5	26.28	11.25
187	64.92	8.66	0	0	0	68.88	0	0.03	26.01	26.85	7.49
190	71.72	4.35	0	0	0	68.67	0	0.03	25.89	26.78	16.47
193	76.73	2.43	0	0.01	0	68.6	0	0.03	25.26	26.18	31.57
196	84.44	4.82	0	0.01	0	68.48	0	0.03	25.52	26.51	17.5
199	89.9	12.29	0	0	0	68.28	0	0.03	26.02	27.1	7.32
202	92.31	10.12	0	0	0	67.82	0	0.02	24.78	25.85	9.12
205	103.96	4.19	0	0	0	67.7	0	0.03	25.44	26.6	24.84
208	110.81	10.93	0	0	0	67.48	0	0.02	25	26.2	10.14
211	119.15	7.72	0	0	0	67.11	0	0.03	25.86	27.15	15.43
214	123.79	4.51	0	0	0	67.02	0	0.03	25.48	26.82	27.44
217	127.77	9.69	0	0	0	66.78	0	0.02	25.43	26.82	13.19
220	135.65	13.09	0	0	0	66.45	0	0.02	25.15	26.57	10.36
223	144.1	13.29	0	0	0	66.02	0	0.02	24.99	26.43	10.85
226	155.14	7.24	0	0	0	65.7	0	0.02	25.24	26.73	21.43
229	163.34	3.81	0	0	0	65.56	0	0.02	25.15	26.69	42.82
232	171.54	10.42	0	0	0	65.39	0	0.03	25.8	27.41	16.47
235	172.71	17.44	0	0	0	64.93	0	0.02	25.2	26.81	9.9
238	180.49	15.96	0	0	0	64.41	0	0.02	25.38	27.03	11.31
241	182.38	11.89	0	0	0	64	0	0.02	24.98	26.64	15.33
244	194.45	15.23	0	0	27.13	63.65	0.15	0.02	25.53	27.26	12.77
247	195.39	13.53	0	0	15.27	63.12	0.08	0.02	24.85	26.57	14.45
250	201.44	8.53	0	0	61.38	62.86	0.2	0.02	25	26.75	23.61
253	210.81	12.37	0	0	67.12	62.54	0.3	0.02	25.69	27.51	17.04
256	209.93	16.46	0	0	58.91	62.11	0.36	0.02	25.33	27.13	12.75
259	214.48	17.26	0	0	0	61.58	0	0.02	25.63	27.48	12.43
262	223.29	12.77	0	0	23.85	61.11	0.11	0.02	26	27.88	17.48
265	223.33	13.29	0	0	68.92	60.78	0.33	0.02	25.72	27.58	16.8
268	219.24	14.53	0	0	49.99	60.3	0.27	0.02	25.07	26.9	15.09
271	225.3	14.6	0	0	63.68	59.92	0.34	0.02	25.66	27.53	15.44
274	222.92	15.84	0	0	29.62	59.42	0.17	0.02	25.58	27.46	14.08
277	221.75	16.07	0	0	2.27	58.98	0.01	0.02	25.5	27.36	13.8
280	218.44	13.36	0	0	112.74	58.48	0.56	0.02	25.23	27.05	16.35
283	221.88	10.99	0	0	48.1	58.17	0.19	0.02	25.66	27.51	20.19
286	218.42	12.61	0	0	69.27	57.79	0.32	0.02	25.25	27.05	17.32
289	221.36	16.05	0	0	26.78	57.4	0.16	0.02	25.75	27.56	13.79
292	215.46	18.58	0	0	28.13	56.84	0.19	0.02	25.08	26.82	11.59

295	215.54	14.98	0	0	51.59	56.33	0.29	0.02	25.29	27.02	14.39
298	221.23	15.19	0	0	21.01	55.91	0.11	0.02	26.19	27.97	14.56
301	211.37	18.56	0	0	28.74	55.4	0.2	0.02	25.51	27.21	11.39
304	206.95	14.26	0	0	48.89	54.85	0.26	0.02	25.42	27.08	14.51
307	206.92	8.69	0	0	21.72	54.55	0.07	0.02	25.54	27.19	23.81
310	211.06	10.58	0	0	12.87	54.28	0.05	0.02	26.39	28.07	19.95
313	199.69	14.24	0	0	8.28	53.9	0.04	0.02	25.36	26.97	14.02
316	199.4	11.72	0	0	0	53.46	0	0.02	25.53	27.12	17.01
319	197.91	14.13	0	0	0	53.16	0	0.02	25.56	27.12	14.01
322	202.7	18.83	0	0	0	52.6	0	0.02	26.22	27.78	10.77
325	193.19	13.29	0	0	0	52.11	0	0.02	25.63	27.14	14.54
328	189.66	9.72	0	0	0	51.8	0	0.02	25.64	27.11	19.52
331	188.56	6.09	0	0	0	51.52	0	0.02	25.83	27.28	30.97
334	181.83	11.15	0	0	0	51.36	0	0.02	25.47	26.87	16.31
337	177.42	17.7	0	0	11.65	50.84	0.08	0.02	25.34	26.71	10.02
340	177.47	13.67	0	0	0	50.38	0	0.02	25.7	27.07	12.98
343	176.93	10.44	0	0	0	50.02	0	0.02	25.79	27.15	16.94
346	173.5	13.21	0	0	0	49.71	0	0.02	25.59	26.92	13.13
349	171.99	11.86	0	0	0	49.25	0	0.02	25.65	26.97	14.5
352	167.59	6.52	0	0	0	49.03	0	0.02	25.31	26.58	25.72
355	172.3	6.02	0	0	0	48.82	0	0.02	26.16	27.44	28.64
358	161.32	9.45	0	0	0	48.63	0	0.02	25.07	26.28	17.08
361	158.42	13.57	0	0	0	48.26	0	0.02	25.22	26.42	11.67
364	160.13	9.73	0	0	0	47.88	0	0.02	25.85	27.06	16.46
367	158.42	11.9	0	0	0	47.63	0	0.02	26.01	27.21	13.31
370	156.21	13.59	0	0	0	47.16	0	0.02	26.26	27.46	11.49
373	155.31	13.16	0	0	0	46.84	0	0.02	26.3	27.49	11.81
376	148.74	10.97	0	0	0	46.39	0	0.02	25.57	26.71	13.56
379	145.76	3.93	0	0	0	46.21	0	0.02	25.61	26.74	37.14
382	143.9	7.6	0	0	0	46.08	0	0.02	25.63	26.77	18.94
385	142.06	8.47	0	0	0	45.77	0	0.02	25.94	27.07	16.76
388	135.44	1.71	0	0	0	45.62	0	0.02	25.73	26.81	79.05
391	130.4	7.2	0	0	0	45.58	0	0.02	25.8	26.86	18.11
394	125.55	13.25	0	0	0	45.18	0	0.02	26.06	27.09	9.48
397	116.63	10.06	0	0	0	44.86	0	0.02	25.77	26.76	11.59
400	111.67	6.71	0	0	0	44.59	0	0.02	26.2	27.17	16.64
403	103.66	3.79	0	0	0	44.44	0	0.02	26.09	27	27.34
406	91.7	7.87	0	0	0	44.31	0	0.02	25.77	26.64	11.66
409	85.35	7.98	0	0	0	44	0	0.02	26.03	26.86	10.7
412	79.13	0.82	-0.01	0	0	43.89	0	0.02	25.8	26.56	96.42
415	75.56	0.39	-0.01	0	0	43.91	0	0.02	26.07	26.77	192.66
418	74.32	2.71	0	0	0	43.84	0	0.02	26.15	26.82	27.41
421	73.17	4.78	0	0	0	43.75	0	0.03	26.54	27.19	15.3
424	71.69	-0.07	0.06	0	0	43.6	0	0.03	26.5	27.09	-987.65
427	68.98	0.88	0	0	0	43.71	0	0.02	25.85	26.4	78.51
430	69.82	5.27	0	0	0	43.52	0	0.03	26.32	26.84	13.26
433	65.49	2.19	0	0	0	43.45	0	0.03	26.37	26.87	29.87
436	63.47	1.73	0	0	0	43.37	0	0.03	26.19	26.67	36.62
439	61	2.61	0	0	0	43.33	0	0.03	26.57	27.03	23.36
442	55.66	6.83	0	0	0	43.2	0	0.03	26.25	26.7	8.14
445	54.43	2.99	0	0	0	42.98	0	0.03	26.18	26.62	18.19
448	51.38	-0.47	0.01	0	0	43.02	0	0.02	25.85	26.27	-109.55

451	48.72	-1.48	0	0	0	42.98	0	0.02	25.45	25.86	-32.99
454	50.83	-0.51	0.01	0	0	43.09	0	0.03	26.26	26.68	-99.67
457	48.12	2.85	0	0	0	43	0	0.02	25.78	26.19	16.87
460	47.08	-1.88	0	0	0	42.97	0	0.03	25.99	26.41	-25.1
463	47.3	-0.22	0.02	0	0	43.07	0	0.02	25.77	26.18	-216.28
466	45.79	1.51	0	0	0	42.98	0	0.03	25.81	26.21	30.38
469	45.57	1.55	0	0	0	42.99	0	0.03	26.12	26.53	29.46
472	44.72	1.69	0	0	0	42.89	0	0.03	25.8	26.22	26.52
475	44.39	2.97	0	0	0	42.88	0	0.03	26.19	26.62	14.96
478	43.74	5.94	0	0	0	42.7	0	0.03	26.22	26.65	7.36
481	42.91	2.85	0	0	0	42.57	0	0.03	26.03	26.46	15.06
484	42.5	1.21	0	0	0	42.52	0	0.03	25.87	26.3	35.24
487	43.14	-2.62	0	0	0	42.51	0	0.03	25.78	26.24	-16.49
490	45.46	1.56	0	0	0	42.62	0	0.02	25.54	26.01	29.22
493	49.9	4.46	0	0	0	42.42	0	0.03	26.19	26.69	11.18
496	54.25	0.02	-0.24	-0.02	0	42.41	0	0.03	26.11	26.62	3530.57
499	58.75	-0.44	0.01	0	0	42.4	0	0.03	25.81	26.35	-134
502	63.07	-0.99	0	0	0	42.43	0	0.03	26.07	26.64	-63.71
505	64	4.36	0	0	0	42.41	0	0.02	25.31	25.91	14.66
508	65.07	7.1	0	0	0	42.18	0	0.02	25.35	25.97	9.17
511	64.15	7.42	0	0	0	42.01	0	0.02	25.33	25.97	8.65
514	65.66	2.19	0	0	0	41.78	0	0.03	25.89	26.57	30.03
517	66.03	3.12	0	0	0	41.84	0	0.03	25.69	26.39	21.16
520	66.57	5.45	0	0	0	41.58	0	0.03	25.84	26.56	12.22
523	69.06	-1.72	0	0	0	41.57	0	0.03	26.18	26.93	-40.16
526	69.83	3.07	0	0	0	41.61	0	0.03	25.98	26.74	22.77
529	70.23	5.04	0	0	0	41.4	0	0.03	26.13	26.92	13.93
532	72.5	3.09	0	0	0	41.33	0	0.03	25.88	26.67	23.47
535	71.38	1.85	0	0	0	41.22	0	0.02	25.52	26.31	38.55
538	69.79	-3.36	0	0	0	41.24	0	0.02	25.6	26.41	-20.79
541	70.4	2.39	0	0	0	41.34	0	0.03	26.19	27.01	29.45
544	66.45	8.16	0	0	0	41.1	0	0.02	25.62	26.44	8.14
547	64.6	5.09	0	0	0	40.92	0	0.02	25.65	26.46	12.69
550	60.39	1.58	0	0	0	40.8	0	0.02	25.57	26.38	38.15
553	58.3	1.52	0	0	0	40.79	0	0.03	25.91	26.71	38.43
556	52.66	5.7	0	0	0	40.68	0	0.02	25.19	25.96	9.25
559	51.61	3.56	0	0	0	40.5	0	0.03	25.92	26.68	14.49
562	48.49	1.17	0	0	0	40.47	0	0.02	25.37	26.1	41.42
565	48.15	-0.99	0	0	0	40.42	0	0.03	26.02	26.75	-48.73
568	47.76	-1.71	0	0	0	40.52	0	0.03	26.43	27.15	-27.93
571	46.76	1.8	0	0	0	40.5	0	0.03	26.43	27.13	25.95
574	44.65	2.38	0	0	0	40.43	0	0.03	26.34	27.01	18.79
577	42.05	2.81	0	0	0	40.36	0	0.03	25.71	26.35	14.95
580	41.08	0.4	-0.01	0	0	40.28	0	0.03	26.56	27.2	103.33
583	38.95	2.93	0	0	0	40.3	0	0.03	26.45	27.07	13.31
586	35.96	3.19	0	0	0	40.12	0	0.03	26.03	26.61	11.28
589	34.53	1.88	0	0	0	40.12	0	0.03	26.37	26.95	18.37
592	33.32	0.57	-0.01	0	0	40.01	0	0.03	27.01	27.58	58.65
595	30.91	-1.72	0	0	0	40.09	0	0.03	25.49	26.01	-17.97
598	31.84	2.92	0	0	0	40.06	0	0.03	25.89	26.42	10.89
601	32.93	-0.94	0	0	0	39.97	0	0.03	26.2	26.73	-34.93
604	34.74	-2.93	0	0	0	40.11	0	0.03	26.43	26.95	-11.86

607	34.44	-1.3	0	0	0	40.12	0	0.03	25.87	26.38	-26.47
610	35.08	1.68	0	0	0	40.18	0	0.03	26.22	26.73	20.88
613	35.34	4.36	0	0	0	40.03	0	0.03	25.75	26.26	8.1
616	35.59	-0.37	0.01	0	0	39.97	0	0.03	25.9	26.4	-96.44
619	33.62	-0.48	0.01	0	0	40.02	0	0.03	25.68	26.19	-69.6
622	33.55	3.16	0	0	0	39.96	0	0.03	25.52	26.02	10.62
625	33.11	4.78	0	0	0	39.84	0	0.03	25.68	26.19	6.92
628	30.91	3.99	0	0	0	39.7	0	0.03	25.84	26.35	7.75
631	30.92	-1.09	0	0	0	39.63	0	0.03	26.22	26.75	-28.44
634	32.34	-2.34	0	0	0	39.74	0	0.03	25.93	26.46	-13.85
637	31.52	-1.42	0	0	0	39.75	0	0.03	26.01	26.54	-22.17
640	31.89	2.42	0	0	0	39.8	0	0.03	25.81	26.35	13.16
643	32.56	1.57	0	0	0	39.64	0	0.03	25.48	26.03	20.75
646	32.37	-4.03	0	0	0	39.74	0	0.03	26.16	26.72	-8.02
649	31.54	-1.07	0	0	0	39.82	0	0.03	26.04	26.62	-29.37
652	33.12	1.24	0	0	0	39.81	0	0.03	26.09	26.67	26.78
655	33.78	2.3	0	0	0	39.76	0	0.03	26.44	27.03	14.71
658	33.16	3.4	0	0	0	39.67	0	0.03	25.4	25.96	9.74
661	34.33	2.31	0	0	0	39.57	0	0.03	25.52	26.08	14.89
664	32.45	2.63	0	0	0	39.52	0	0.03	25.57	26.13	12.34
667	32.59	2.81	0	0	0	39.42	0	0.03	26.04	26.61	11.61
670	32.86	0.66	-0.01	0	0	39.37	0	0.03	25.62	26.18	50.15
673	31.61	-2.49	0	0	0	39.38	0	0.03	25.75	26.32	-12.7
676	32.07	-0.76	0.01	0	0	39.48	0	0.03	26	26.57	-42.45
679	32.17	0.01	-0.37	-0.03	0	39.4	0	0.03	26.36	26.94	3216.62
682	30.28	0.01	-0.45	-0.03	0	39.25	0	0.03	26.11	26.68	3028.48

Workstation – Side Panel**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	20.00
Peak Heat Release Rate (kW/m ²):	250.74
Time to Peak Heat Release Rate (s):	253.00
Total Heat Release (MJ/m ²):	58.64
60 s Average Heat Release Rate (kW/m ²):	84.08
Total Mass Loss (g):	35.26
Average Mass Loss Rate (g/s):	0.059
Average Effective Heat of Combustion (MJ/kg):	16.63
Average Smoke Extinction Area (m ² /kg):	283.03
Average CO ₂ yield (g/g):	-0.00
Average CO yield (g/g):	0.0079

Specimen:

Initial mass (g):	73.8
Thickness (mm):	50
Surface area (cm ²):	100
Test start time (s):	82
Time to ignition (s):	20
Time to flameout (s):	621

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
1	-0.61	0.01	-0.37	-0.03	38011.4	73.97	0.15	0.03	25.54	25.99	-60.95
4	1.75	0.01	-0.31	-0.03	54134.63	73.92	0.21	0.03	25.6	26.05	175
7	4.47	6.44	0	0	109.63	73.31	0.27	0.03	25.38	25.82	0.69
10	8.39	-8.01	0	0	-85.5	73.59	0.26	0.03	26	26.47	-1.05
13	14.71	-1.88	0	-0.06	-320.01	73.64	0.23	0.03	25.74	26.22	-7.82
16	27.36	-1.12	0	-0.17	-867.22	73.72	0.38	0.03	25.08	25.56	-24.44
19	64.49	5.14	0	0.05	717.1	73.67	1.42	0.03	25.51	26.02	12.55
22	116.04	10.47	0	0.03	607.28	73.42	2.44	0.03	25.5	26.07	11.08
25	150.28	11.29	0	0.03	629.34	73.08	2.75	0.03	25.11	25.89	13.31
28	157.08	10.75	0	0.04	661.17	72.76	2.76	0.03	24.74	25.73	14.61
31	152.95	7.45	0	0.05	927.98	72.45	2.61	0.03	25.29	26.48	20.53
34	138.64	10.36	0	0.03	695.56	72.27	2.7	0.03	25.35	26.64	13.38
37	123.67	12.63	0	0.02	492.69	71.84	2.34	0.03	25.31	26.63	9.79
40	110.04	5.07	0	0.04	1074.9	71.58	2.07	0.03	25.03	26.32	21.68
43	102.27	1.82	0	0.1	2704.61	71.5	1.84	0.03	25.52	26.81	56.22
46	92.25	3.78	0	0.04	1061.22	71.43	1.51	0.03	25.26	26.52	24.42
49	85.2	6.11	0	0.02	661.99	71.27	1.5	0.03	25.68	26.92	13.94
52	74.3	6.82	0	0.02	453.88	71.07	1.17	0.03	25.4	26.57	10.89
55	66.41	3.05	0	0.03	845	70.9	0.93	0.03	26.43	27.58	21.81
58	58.13	-1.96	0	-0.04	-900.76	70.9	0.65	0.03	25.86	26.92	-29.71
61	51.79	0.77	-0.01	0.1	1498.95	70.96	0.44	0.03	25.26	26.23	66.96
64	47.62	3.41	0	0.03	365.56	70.85	0.46	0.03	25.97	26.9	13.97
67	42.18	3.95	0	0.03	268.26	70.77	0.4	0.03	25.77	26.62	10.68
70	39.04	2.03	0	0.08	480.85	70.63	0.37	0.03	25.92	26.72	19.21
73	34.42	-0.78	0.01	-0.23	-1316.24	70.65	0.39	0.03	25.59	26.33	-44.01
76	30.68	2.98	0	0.06	429.06	70.63	0.47	0.03	26.19	26.89	10.31
79	28.25	5.15	0	0.03	216.08	70.48	0.43	0.03	25.44	26.08	5.49
82	28.63	2.57	0	0.07	465.41	70.36	0.45	0.03	25.82	26.44	11.13
85	26.08	1.04	0	0.14	1021.5	70.33	0.41	0.03	25.55	26.13	25.07
88	25.15	0.2	-0.02	0.85	5594.27	70.29	0.42	0.03	26.29	26.88	126.01
91	25.02	1.51	0	0.11	662.1	70.29	0.38	0.03	26.12	26.68	16.56
94	24.31	7.03	0	0.02	170.52	70.17	0.45	0.03	25.84	26.37	3.46
97	23.43	3.48	0	0.05	311.6	69.94	0.41	0.03	25.91	26.43	6.74
100	23.67	-1.27	0	-0.12	-872.87	69.97	0.43	0.03	25.63	26.13	-18.59
103	23.29	2.37	0	0.07	472.01	69.95	0.42	0.03	25.94	26.44	9.82
106	22.94	4.38	0	0.04	267.87	69.84	0.44	0.03	26.11	26.62	5.24
109	21.93	3.95	0	0.04	298.29	69.71	0.45	0.03	25.87	26.36	5.55
112	22.01	1.83	0	0.08	653.69	69.62	0.45	0.03	26.11	26.59	11.99
115	21.77	-0.43	0.01	-0.33	-2879.39	69.6	0.47	0.03	26.22	26.7	-50.31
118	21.93	4.37	0	0.03	284.68	69.59	0.47	0.03	26.09	26.57	5.02
121	21.29	7.27	0	0.02	154.3	69.35	0.42	0.03	26.31	26.79	2.93
124	21.68	1.08	0	0.14	1070.53	69.22	0.44	0.03	26.12	26.61	20.05
127	21.17	-1.1	0	-0.14	-1123.89	69.26	0.47	0.03	26.14	26.62	-19.19
130	19.57	1.13	0	0.14	1134.06	69.25	0.47	0.03	26.49	26.97	17.33
133	18.21	2.5	0	0.07	531.61	69.19	0.5	0.03	26.18	26.66	7.29
136	16.66	5.32	0	0.03	249.52	69.09	0.5	0.03	25.88	26.36	3.13

139	16.43	3.34	0	0.05	401.83	68.91	0.51	0.03	25.93	26.4	4.92
142	16.73	-2.27	0	-0.08	-616.72	68.92	0.53	0.03	25.94	26.42	-7.36
145	17.19	2.32	0	0.09	641.9	68.98	0.56	0.03	25.99	26.49	7.43
148	19.42	6.58	0	0.04	212.5	68.78	0.52	0.03	26.39	26.91	2.95
151	23.83	5.3	0	0.04	262.17	68.62	0.52	0.03	26.09	26.61	4.5
154	28.57	2.41	0	0.07	563.76	68.48	0.52	0.03	25.81	26.34	11.87
157	33.94	-0.6	0.01	-0.22	-2219.19	68.47	0.5	0.03	25.98	26.54	-56.51
160	38.86	5.91	0	0.02	212.56	68.44	0.48	0.03	25.82	26.4	6.57
163	42.61	8.71	0	0.01	141.79	68.14	0.47	0.03	25.46	26.07	4.89
166	48.6	7.05	0	0	177.79	67.96	0.47	0.03	26.02	26.69	6.89
169	52.44	5.94	0	0	206.41	67.72	0.47	0.03	25.6	26.31	8.83
172	59.68	1	0	0.01	1298.65	67.62	0.49	0.03	25.56	26.32	59.94
175	69.91	5.4	0	0	218.26	67.59	0.46	0.03	25.08	25.9	12.94
178	79.44	11.64	0	0	102.65	67.28	0.46	0.03	25.33	26.21	6.82
181	89.08	7.35	0	0	179.18	66.97	0.5	0.03	25.59	26.54	12.12
184	98.07	6.34	0	0	181.4	66.83	0.43	0.03	25.59	26.6	15.48
187	104.82	4.23	0	0	299.81	66.6	0.49	0.02	25.08	26.15	24.78
190	114.6	2.7	0	0	575.19	66.56	0.58	0.03	25.55	26.7	42.4
193	121.97	10.11	0	0	141.41	66.37	0.53	0.03	25.57	26.8	12.07
196	127.62	12.81	0	0	111.51	65.99	0.54	0.02	25.04	26.31	9.97
199	135.93	9.46	0	0	164.13	65.65	0.59	0.02	25.09	26.43	14.37
202	147.08	9.28	0	0	156.65	65.4	0.54	0.02	25.3	26.73	15.86
205	157.91	11.94	0	0	134.52	65.07	0.61	0.02	24.97	26.43	13.22
208	170.49	13.64	0	0	137.77	64.69	0.69	0.02	25.52	27.06	12.5
211	177.68	13.9	0	0	146.49	64.27	0.75	0.02	25.41	27	12.79
214	182.4	9.85	0	0	261.28	63.89	0.96	0.02	25.21	26.84	18.51
217	190.55	7.75	0	0	329.54	63.66	0.95	0.02	25.27	26.96	24.59
220	196.93	11.93	0	0	245.94	63.37	1.1	0.02	25	26.73	16.5
223	207.2	15.95	0	0	210.55	62.94	1.25	0.02	25.08	26.85	12.99
226	215.95	15.56	0	0	199.91	62.45	1.15	0.02	25.19	27.02	13.88
229	223.54	13.3	0	0	236.77	62.02	1.15	0.02	25.44	27.32	16.81
232	227.5	19.83	0	0	180.52	61.6	1.32	0.02	25.24	27.13	11.47
235	230.96	20.59	0	0	164.91	60.87	1.26	0.02	25.04	26.97	11.22
238	236.69	14.44	0	0	232.4	60.41	1.24	0.02	25.07	27.02	16.39
241	236.22	15.9	0	0	207.1	59.95	1.25	0.02	24.4	26.33	14.86
244	243.47	16.15	0	0	229.23	59.46	1.39	0.02	24.71	26.67	15.07
247	250.55	15.11	0	0	278.81	59	1.55	0.02	25.17	27.17	16.58
250	246.14	12.27	0	0	338.46	58.56	1.56	0.02	24.74	26.71	20.05
253	250.74	15.07	0	0	249.59	58.22	1.38	0.02	25.22	27.23	16.64
256	248.94	20.77	0	0	190.1	57.64	1.47	0.02	24.82	26.8	11.98
259	249.88	22.05	0	0	192.51	57.01	1.58	0.02	24.86	26.85	11.33
262	247.1	15.69	0	0	281.12	56.38	1.65	0.02	24.76	26.72	15.75
265	248.72	9.01	0	0	386.34	56.07	1.27	0.02	25.36	27.35	27.6
268	244.55	13.24	0	0	285.98	55.75	1.39	0.02	25.2	27.16	18.48
271	240.67	19.89	0	0	188.65	55.25	1.39	0.02	25.07	26.99	12.1
274	243.45	21.91	0	0	214.39	54.6	1.71	0.02	25.49	27.43	11.11
277	240.13	16.19	0	0	258.41	54	1.53	0.02	25.47	27.39	14.83
280	243.13	10.22	0	0	383.68	53.63	1.4	0.02	26.02	27.92	23.78
283	239.99	10.04	0	0	403.93	53.33	1.45	0.02	26.05	27.92	23.89
286	235.95	15.32	0	0	251.67	52.98	1.39	0.02	25.97	27.82	15.4
289	232.98	21.17	0	0	186.08	52.41	1.43	0.02	25.83	27.62	11.01
292	227.64	20.79	0	0	182	51.76	1.4	0.02	25.36	27.08	10.95

295	230.4	10.57	0	0	344.85	51.24	1.33	0.02	25.67	27.41	21.8
298	223.99	12.71	0	0	301.19	51.04	1.42	0.02	25.3	26.97	17.62
301	221.61	16.37	0	0	249.9	50.46	1.52	0.02	25.28	26.92	13.54
304	216.67	12.05	0	0	316.06	50.11	1.42	0.02	25.17	26.77	17.98
307	215.69	17.92	0	0	196.19	49.67	1.3	0.02	25.37	26.96	12.04
310	213.95	18.7	0	0	212.93	49.07	1.46	0.02	25.66	27.24	11.44
313	205.77	14.35	0	0	241.74	48.59	1.3	0.02	25.25	26.78	14.34
316	198.98	7.06	0	0	519.3	48.23	1.36	0.02	25.51	27.01	28.2
319	190.13	8.14	0	0	429.36	48.1	1.3	0.02	25.36	26.82	23.35
322	189.56	13.21	0	0	234.71	47.71	1.13	0.02	26.02	27.47	14.35
325	182.55	16.18	0	0	203.21	47.33	1.19	0.02	26.13	27.54	11.28
328	172.78	13.97	0	0	224.52	46.78	1.14	0.02	26.2	27.56	12.37
331	167.4	5.01	0	0	545.11	46.54	0.99	0.02	26.25	27.55	33.44
334	159.1	5.75	0	0	414.22	46.41	0.89	0.02	25.62	26.85	27.68
337	154.64	9.34	0	0	241.62	46.16	0.83	0.02	25.85	27.05	16.55
340	146.97	11.87	0	0	200.12	45.86	0.89	0.02	25.57	26.69	12.38
343	145.81	10.99	0	0	206.98	45.48	0.85	0.02	25.82	26.9	13.27
346	145.62	9.99	0	0	248.53	45.2	0.91	0.02	26.14	27.21	14.58
349	137.44	9.79	0	0	218.61	44.88	0.8	0.02	25.71	26.71	14.04
352	136.59	3.97	0	0	515.39	44.65	0.75	0.02	26.16	27.15	34.41
355	133.11	4.24	0	0	450.91	44.59	0.71	0.02	26.11	27.06	31.37
358	130.54	12.12	0	0	151.91	44.34	0.68	0.02	26.18	27.11	10.77
361	122.9	11.67	0	0	145.29	43.93	0.64	0.02	25.59	26.46	10.53
364	116.16	2.82	0	0	708.3	43.7	0.74	0.02	26.03	26.89	41.15
367	118.14	2.97	0	0	477.69	43.69	0.52	0.02	26.33	27.18	39.81
370	115.83	8.59	0	0	160.49	43.48	0.51	0.02	26.25	27.05	13.49
373	111.23	5.73	0	0	269.22	43.24	0.56	0.02	26.54	27.33	19.41
376	105.73	5.28	0	0	208.49	43.13	0.41	0.02	26.23	26.99	20.02
379	101.2	4.77	0	0	222.63	42.92	0.4	0.02	26.11	26.84	21.23
382	97.65	4.22	0	0	332.55	42.84	0.51	0.03	26.59	27.32	23.14
385	84.55	3.63	0	0	255.78	42.66	0.34	0.02	26.35	27.03	23.3
388	76.56	2.54	0	0	295.93	42.63	0.28	0.02	26.16	26.79	30.09
391	76.48	6.29	0	0	99.71	42.48	0.23	0.02	26.24	26.83	12.16
394	73.68	5.06	0	0	101.3	42.29	0.19	0.02	26.21	26.76	14.55
397	69.14	-2.89	0	0	-191.38	42.23	0.21	0.02	26.07	26.58	-23.95
400	68.97	-3.6	0	0	-155.37	42.41	0.21	0.03	26.27	26.76	-19.14
403	68.05	3.04	0	0	136.52	42.38	0.16	0.02	25.75	26.19	22.4
406	64.64	8.86	0	0	39.66	42.23	0.13	0.02	25.78	26.22	7.29
409	62.95	3.32	0	0	128.58	41.93	0.16	0.02	26.06	26.49	18.95
412	64.48	-0.87	0.01	0	-451.06	42.03	0.15	0.03	26.57	26.99	-74.03
415	63.75	2.61	0	0	140.75	41.93	0.14	0.02	25.87	26.28	24.4
418	59.67	0.4	-0.01	0	719.42	41.91	0.11	0.03	26.44	26.86	148.11
421	55.59	-0.93	0	0	-262.57	41.9	0.09	0.03	26.5	26.91	-59.86
424	53.19	2.31	0	0	137.45	41.93	0.12	0.03	26.6	27	23
427	50.86	6.19	0	0	33.87	41.76	0.08	0.03	26.63	27.02	8.22
430	47.1	2.66	0	0	85.79	41.61	0.09	0.03	25.87	26.25	17.72
433	49.35	-4.52	0	0	-61.99	41.63	0.1	0.03	26.54	26.93	-10.92
436	50.64	-1.96	0	0	-109.93	41.81	0.08	0.03	26.35	26.73	-25.84
439	48.56	3.73	0	0	16.18	41.72	0.02	0.03	25.78	26.17	13.03
442	47.16	2.63	0	0	105.67	41.64	0.11	0.02	25.67	26.07	17.96
445	49.72	0.2	-0.02	0	1238.22	41.57	0.09	0.03	26.16	26.57	254.18
448	53.45	4.04	0	0	87.07	41.58	0.13	0.03	26.47	26.9	13.22

451	56.45	7.37	0	0	18.29	41.34	0.05	0.03	26.19	26.63	7.66
454	56.81	-2.5	0	0	-92.99	41.23	0.09	0.03	26.28	26.73	-22.75
457	61.5	-5.11	0	0	-62.99	41.43	0.12	0.03	25.96	26.43	-12.04
460	68.81	8.14	0	0	47.06	41.42	0.14	0.03	25.99	26.49	8.45
463	72.58	9	0	0	33.94	41.03	0.12	0.03	26.02	26.54	8.07
466	72.43	0.03	-0.1	-0.01	22955.8	40.96	0.23	0.03	25.87	26.43	2723.42
469	73.84	-0.98	0	0	-632.88	40.97	0.23	0.03	26.02	26.61	-75.33
472	75.65	6.76	0	0	125.77	40.95	0.32	0.03	25.66	26.28	11.19
475	76.56	6.53	0	0	120.46	40.62	0.3	0.03	25.93	26.58	11.72
478	75.92	-2.07	0	0	-273.44	40.62	0.21	0.03	26.17	26.86	-36.7
481	74.61	1.76	0	0	481.46	40.66	0.32	0.03	26.04	26.77	42.41
484	74.74	9.69	0	0	46.85	40.48	0.17	0.03	25.67	26.41	7.71
487	78.81	6.29	0	0	108.99	40.16	0.26	0.03	25.98	26.73	12.54
490	75.03	-3.31	0	0	-248.62	40.15	0.31	0.02	25.45	26.2	-22.65
493	76.1	-0.67	0.01	0	-1183.99	40.27	0.3	0.02	25.62	26.39	-114.04
496	76.32	8.22	0	0	49.24	40.14	0.16	0.02	25.26	26.04	9.28
499	77.59	7.55	0	0	114.59	39.85	0.32	0.03	26.06	26.86	10.28
502	73.73	-0.12	0.03	0	-5541.78	39.74	0.25	0.03	25.9	26.71	-622.38
505	69.57	-1.37	0	0	-433.97	39.81	0.22	0.03	26.31	27.12	-50.62
508	67.7	5.72	0	0	62.17	39.77	0.13	0.03	26.27	27.07	11.85
511	64.57	3.82	0	0	86.01	39.53	0.12	0.02	25.62	26.39	16.89
514	64.7	-0.86	0	0	-110.36	39.56	0.03	0.03	26.69	27.48	-75.64
517	58.88	2.3	0	0	74.75	39.52	0.06	0.03	26.14	26.88	25.58
520	56.38	7.09	0	0	25.98	39.41	0.07	0.03	26.47	27.2	7.96
523	55.18	3.45	0	0	10.34	39.16	0.01	0.03	25.86	26.56	15.99
526	54.17	-4.23	0	0	0	39.23	0	0.03	25.97	26.65	-12.79
529	50.87	-2.99	0	0	0	39.34	0	0.03	26.24	26.9	-17.03
532	47.41	6.55	0	0	0	39.35	0	0.03	26.5	27.16	7.24
535	45.29	9.21	0	0	0	39.01	0	0.03	26.13	26.76	4.92
538	46.48	-1.59	0	0	0	38.9	0	0.03	26.45	27.09	-29.14
541	43.36	-4.78	0	0	0	39.05	0	0.03	26.13	26.73	-9.07
544	39.64	-0.91	0.01	-0.02	0	39.12	0	0.03	26.17	26.77	-43.48
547	40.28	5.27	0	0	0	39.09	0	0.03	26.44	27.02	7.65
550	41.37	3.53	0	0	0	38.87	0	0.03	26.12	26.68	11.72
553	39.35	-2.78	0	0	0	38.91	0	0.03	26.28	26.83	-14.14
556	38.01	2.45	0	0.01	0	38.95	0	0.03	26.33	26.87	15.49
559	34.05	5.28	0	0	0	38.78	0	0.03	26.22	26.75	6.44
562	35.97	1.21	0	0	0	38.69	0	0.03	26.67	27.2	29.71
565	36.16	-6.23	0	0	0	38.73	0	0.03	26.01	26.52	-5.81
568	33.83	-2.44	0	0	0	38.98	0	0.03	26.32	26.83	-13.87
571	33.33	6.26	0	0	0	38.83	0	0.03	26.18	26.68	5.32
574	34.01	6.3	0	0	0	38.67	0	0.03	26.37	26.87	5.4
577	35.78	-1.5	0	0	0	38.52	0	0.03	25.93	26.43	-23.87
580	33.4	-6.82	0	0	0	38.74	0	0.03	25.5	26	-4.9
583	32.52	4.57	0	0	0	38.81	0	0.03	25.98	26.49	7.11
586	34.56	4.23	0	0	0	38.54	0	0.03	26.22	26.74	8.18
589	35.67	-2.3	0	0	0	38.6	0	0.03	25.58	26.07	-15.49
592	35	-0.79	0.01	-0.03	0	38.62	0	0.03	26.1	26.6	-44.34
595	30.92	2.89	0	0.01	0	38.63	0	0.03	26.23	26.74	10.69
598	32.08	5.5	0	0	0	38.46	0	0.03	25.9	26.41	5.83
601	34.36	1.55	0	0	0	38.35	0	0.03	26.3	26.82	22.21
604	34.45	-5.7	0	0	0	38.39	0	0.03	26.2	26.72	-6.05

607	32.29	-2.16	0	0	0	38.61	0	0.03	26.2	26.73	-14.92
610	30.76	3.86	0	0	0	38.5	0	0.03	26.06	26.59	7.97
613	34.59	1.72	0	0	0	38.44	0	0.03	26.03	26.56	20.15
616	32.92	0.3	-0.01	0	0	38.39	0	0.03	25.59	26.12	109.57
619	31.67	1.07	0	0.02	0	38.41	0	0.03	25.75	26.28	29.6
622	29.82	4.02	0	0	0	38.32	0	0.03	25.74	26.28	7.41
625	30.99	3.09	0	0.01	0	38.2	0	0.03	26.08	26.63	10.02
628	33.64	-2.75	0	0	0	38.17	0	0.03	26.16	26.71	-12.23
631	33.05	-4.2	0	0	0	38.32	0	0.03	26.36	26.9	-7.86
634	29.54	2.77	0	0.01	0	38.36	0	0.03	26.31	26.87	10.68
637	29.39	3.59	0	0	0	38.2	0	0.03	26.72	27.29	8.18
640	30.06	-1.64	0	0	0	38.19	0	0.03	26.34	26.89	-18.34
643	31.28	-0.73	0.01	0	0	38.26	0	0.03	26.44	26.98	-42.77
646	28.23	2.51	0	0	0	38.21	0	0.03	26.27	26.78	11.26
649	26.61	1.32	0	0	0	38.14	0	0.03	26.6	27.11	20.23
652	30.18	0.44	-0.01	0	0	38.14	0	0.03	26.58	27.08	68.6
655	30.12	-2.78	0	0	0	38.13	0	0.03	26.14	26.62	-10.84
658	30.25	-0.53	0.01	0	0	38.26	0	0.03	26.26	26.74	-57.15
661	28.48	3.08	0	0	0	38.15	0	0.03	26.29	26.76	9.25
664	29.94	1.02	0	0	0	38.12	0	0.03	26.48	26.94	29.42
667	31.73	-0.77	0.01	-0.03	0	38.09	0	0.03	26.46	26.95	-40.96
670	33.09	0.01	-0.4	0.93	0	38.15	0	0.03	26.06	26.55	3308.77
673	32.42	0.01	-0.43	2.26	0	38.09	0	0.03	26.34	26.86	3241.5

Workstation - Work Surface**Test 1**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	15.00
Peak Heat Release Rate (kW/m ²):	606.55
Time to Peak Heat Release Rate (s):	33.00
Total Heat Release (MJ/m ²):	127.31
60 s Average Heat Release Rate (kW/m ²):	273.89
Total Mass Loss (g):	99.71
Average Mass Loss Rate (g/s):	0.118
Average Effective Heat of Combustion (MJ/kg):	12.77
Average Smoke Extinction Area (m ² /kg):	67.51
Average CO ₂ yield (g/g):	0.02
Average CO yield (g/g):	0.0010

Specimen:

Initial mass (g):	229.2
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	77
Time to ignition (s):	15
Time to flameout (s):	898

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-0.53	0.01	-0.32	-0.04	51922.84	228.95	0.2	0.03	25.54	26.06	-52.56
3	3.69	0.01	-0.41	-0.04	42865.57	229.07	0.17	0.03	24.94	25.43	368.67
6	4.68	-2.6	0	0	-195.48	229.06	0.19	0.03	26.16	26.66	-1.8
9	4.48	-4.95	0	0	-104.32	229.21	0.2	0.03	25.2	25.68	-0.9
12	11.46	18.47	0	0	160.29	229.17	1.14	0.03	25.44	25.94	0.62
15	48.71	31.54	0	0	9.13	228.18	0.12	0.02	22.79	23.62	1.54
18	122.9	23.08	0	0.01	16.54	227.43	0.15	0.02	23.67	24.89	5.32
21	202.02	36.21	0	0.01	24.13	226.65	0.34	0.02	23.94	25.49	5.58
24	322.54	50.55	0.13	0.01	38.37	225.25	0.8	0.02	22.31	24.33	6.38
27	409.68	50.06	0.61	0.01	71.89	223.75	1.55	0.02	20.77	23.22	8.18
30	603.35	26.51	0.49	0.02	163.65	222.42	1.6	0.02	23.96	27.11	22.76
33	606.55	15.34	0	0.01	113.5	222.08	0.61	0.02	25.22	28.31	39.55
36	508.56	16.73	0	0.01	40.35	221.4	0.24	0.02	25.63	28.57	30.39
39	341.71	7.54	0	0	78.89	221.13	0.21	0.02	25.85	28.49	45.34
42	268.39	9.5	0	0	115.81	220.87	0.39	0.02	25.59	28.02	28.25
45	213.83	9.66	0	0	116.19	220.56	0.41	0.02	24.94	27.11	22.12
48	205.16	18.45	0	0	65.6	220.24	0.45	0.02	25.01	27.09	11.12
51	202.74	19.7	0	0	64.75	219.51	0.48	0.02	24.8	26.77	10.29
54	204.18	13	0	0	83.38	219.11	0.4	0.02	24.98	26.9	15.71
57	206.36	14.31	0	0	79.64	218.67	0.42	0.02	25.02	26.9	14.42
60	207.29	13.8	0	0	107.03	218.26	0.56	0.02	24.69	26.48	15.02
63	209.1	14.81	0	0	93.55	217.84	0.52	0.02	24.68	26.44	14.12
66	213.12	13.06	0	0	109.73	217.39	0.53	0.02	25.05	26.8	16.32
69	217	19.03	0	0	75.89	217	0.53	0.02	25.29	27.05	11.4
72	222.88	16.89	0	0	121.17	216.3	0.74	0.02	25.95	27.72	13.2
75	215.71	14.24	0	0	116.2	216	0.62	0.02	24.97	26.66	15.15
78	219.03	17.93	0	0	82.71	215.4	0.56	0.02	24.95	26.64	12.21
81	220.46	15.4	0	0	116.07	214.96	0.67	0.02	24.99	26.69	14.31
84	226.34	18.09	0	0	100.34	214.45	0.67	0.02	25.31	27.02	12.52
87	229.81	16.92	0	0	108.02	213.9	0.68	0.02	25.12	26.82	13.58
90	225.89	12.19	0	0	162.76	213.46	0.75	0.02	24.63	26.28	18.53
93	231.97	16.36	0	0	136.94	213.11	0.83	0.02	25.31	27.01	14.18
96	235.22	18.68	0	0	101.66	212.48	0.7	0.02	25.41	27.1	12.59
99	226.08	19.16	0	0	102.94	212	0.75	0.02	24.52	26.14	11.8
102	232.89	16.6	0	0	121.51	211.35	0.75	0.02	25.21	26.88	14.03
105	233.05	17.87	0	0	118.19	210.98	0.79	0.02	25.19	26.86	13.04
108	230.52	19.41	0	0	111.72	210.28	0.81	0.02	25.15	26.79	11.88
111	231.61	15.11	0	0	128.27	209.85	0.72	0.02	25.33	26.97	15.33
114	228.44	18.04	0	0	107.68	209.33	0.73	0.02	25.03	26.65	12.66
117	215.44	15.72	0	0	116.09	208.8	0.71	0.02	24.1	25.64	13.7
120	232.02	15.4	0	0	112.05	208.38	0.63	0.02	25.92	27.58	15.07
123	225.27	14.31	0	0	148.81	207.88	0.78	0.02	25.68	27.29	15.74

126	222.6	15.94	0	0	105.13	207.5	0.62	0.02	25.55	27.13	13.96
129	210.51	17.45	0	0	106.11	206.93	0.71	0.02	24.72	26.21	12.06
132	210.04	15.55	0	0	113.44	206.47	0.67	0.02	24.84	26.34	13.51
135	208.72	15.94	0	0	127.32	205.98	0.77	0.02	24.76	26.26	13.09
138	210.35	12.58	0	0	166.29	205.54	0.78	0.02	25.24	26.74	16.73
141	207.42	17.74	0	0	95.14	205.17	0.64	0.02	25.02	26.5	11.69
144	210.87	17.65	0	0	100.81	204.51	0.66	0.02	25.49	26.98	11.94
147	206.48	15.86	0	0	118.81	204.13	0.7	0.02	25.37	26.84	13.02
150	204.32	16.79	0	0	106.12	203.54	0.67	0.02	25.19	26.64	12.17
153	199.45	10.77	0	0	180.03	203.16	0.74	0.02	24.74	26.15	18.51
156	213.42	15.97	0	0	126.98	202.82	0.73	0.02	26.41	27.9	13.36
159	200.38	15.41	0	0	96.9	202.24	0.56	0.02	25.34	26.75	13
162	198.17	14.05	0	0	116.25	201.9	0.61	0.02	25.3	26.7	14.11
165	194.74	18.11	0	0	68.91	201.36	0.48	0.02	24.85	26.22	10.75
168	194.34	12.55	0	0	87.3	200.88	0.41	0.02	25.04	26.42	15.48
171	193.59	13.05	0	0	87.86	200.57	0.43	0.02	25.18	26.56	14.84
174	193.98	16.52	0	0	55.31	200.07	0.34	0.02	25.53	26.91	11.74
177	187.13	14.7	0	0	59.39	199.61	0.33	0.02	24.93	26.27	12.73
180	190.9	11.8	0	0	79.19	199.2	0.35	0.02	25.51	26.84	16.18
183	182.28	13.18	0	0	63.87	198.88	0.33	0.02	24.47	25.74	13.83
186	182.33	13.6	0	0	13.98	198.41	0.07	0.02	25.44	26.74	13.41
189	179.55	11.32	0	0	11.16	198.07	0.05	0.02	25	26.27	15.86
192	186.51	19.09	0	0	10.77	197.67	0.08	0.02	25.91	27.22	9.77
195	174.94	16.36	0	0	0	197	0	0.02	24.74	25.99	10.69
198	177.91	11.53	0	0	0	196.71	0	0.02	25.39	26.66	15.42
201	181.17	13.67	0	0	0	196.26	0	0.02	25.48	26.76	13.25
204	182.06	13.52	0	0	0	195.9	0	0.02	25.79	27.08	13.47
207	175.7	14.69	0	0	0	195.44	0	0.02	24.91	26.15	11.96
210	177.41	11.16	0	0	0	195.05	0	0.02	25.49	26.75	15.9
213	178.9	10.42	0	0	0	194.76	0	0.02	25.65	26.92	17.18
216	177.5	12.06	0	0	0	194.4	0	0.02	25.86	27.13	14.72
219	170.59	18.71	0	0	0	194	0	0.02	25.06	26.29	9.12
222	171.59	14.96	0	0	0	193.35	0	0.02	25.43	26.66	11.47
225	167.85	10.3	0	0	0	193.11	0	0.02	25.04	26.26	16.3
228	169.1	13.89	0	0	0	192.68	0	0.02	25.56	26.79	12.17
231	163.36	11.98	0	0	0	192.31	0	0.02	24.87	26.06	13.64
234	168.84	14.88	0	0	0	191.93	0	0.02	25.75	26.97	11.35
237	162.78	12.48	0	0	0	191.45	0	0.02	25.4	26.59	13.04
240	163.49	9.39	0	0	0	191.19	0	0.02	25.86	27.05	17.41
243	158.49	10.98	0	0	0	190.85	0	0.02	25.13	26.27	14.44
246	157.85	16.95	0	0	0	190.5	0	0.02	25.12	26.26	9.31
249	159.33	14.58	0	0	0	189.9	0	0.02	25.38	26.54	10.92
252	164.25	6.06	0	0	0	189.66	0	0.02	26.17	27.35	27.09
255	153.26	13.73	0	0	0	189.42	0	0.02	24.8	25.92	11.17
258	155.35	17.35	0	0	0	188.87	0	0.02	25.15	26.28	8.95
261	159.24	8.61	0	0	0	188.47	0	0.02	25.74	26.88	18.49
264	156.19	7.73	0	0	0	188.3	0	0.02	25.93	27.08	20.2
267	151.84	9.66	0	0	0	187.97	0	0.02	25.13	26.24	15.71

270	158.66	16.25	0	0	0	187.69	0	0.02	26.14	27.31	9.76
273	154.18	15.7	0	0	0	187.05	0	0.02	25.43	26.56	9.82
276	157.21	11.48	0	0	0	186.78	0	0.02	26.06	27.22	13.7
279	152.69	12.52	0	0	0	186.33	0	0.02	25.25	26.36	12.19
282	153.28	8.96	0	0	0	186.05	0	0.02	25.49	26.61	17.1
285	147.14	11.52	0	0	0	185.75	0	0.02	24.66	25.73	12.77
288	145.16	12.56	0	0	0	185.37	0	0.02	24.84	25.92	11.55
291	151.09	11.87	0	0	0	185.01	0	0.02	25.92	27.05	12.73
294	148.53	9.71	0	0	0	184.66	0	0.02	25.65	26.77	15.3
297	147.63	14.18	0	0	0	184.39	0	0.02	25.54	26.64	10.41
300	148.08	13.22	0	0	0	183.85	0	0.02	25.68	26.77	11.21
303	144.62	12.34	0	0	0	183.6	0	0.02	25.38	26.45	11.72
306	142.56	12.67	0	0	0	183.1	0	0.02	25.1	26.18	11.25
309	147.36	9.14	0	0	0	182.86	0	0.02	25.72	26.8	16.11
312	148.29	8.38	0	0	0	182.53	0	0.02	26.17	27.26	17.69
315	139.87	8.26	0	0	0	182.35	0	0.02	25.24	26.29	16.93
318	139.68	13.38	0	0	0	182	0	0.02	24.94	25.98	10.44
321	139.61	11.92	0	0	0	181.59	0	0.02	25.5	26.55	11.71
324	140.9	8.61	0	0	0	181.3	0	0.02	25.73	26.79	16.37
327	140.74	12.2	0	0	0	181.03	0	0.02	25.83	26.89	11.54
330	138.73	12.61	0	0	0	180.59	0	0.02	25.19	26.23	11
333	138.97	12.13	0	0	0	180.28	0	0.02	25.32	26.35	11.46
336	136.82	11.51	0	0	0	179.87	0	0.02	24.79	25.81	11.89
339	140.31	6.06	0	0	0	179.62	0	0.02	25.52	26.57	23.14
342	135.67	10.11	0	0	0	179.43	0	0.02	24.96	25.98	13.42
345	139.8	13.16	0	0	0	179.01	0	0.02	25.7	26.74	10.63
348	135.52	13.13	0	0	0	178.67	0	0.02	25.08	26.1	10.33
351	131.25	9.18	0	0	0	178.25	0	0.02	24.7	25.7	14.29
354	137.06	11.64	0	0	0	178.07	0	0.02	25.85	26.9	11.77
357	141.75	16.84	0	0	0	177.54	0	0.02	26.01	27.07	8.42
360	135.49	8.15	0	0	0	177.16	0	0.02	25.32	26.34	16.63
363	132.19	8.25	0	0	0	176.99	0	0.02	24.89	25.9	16.03
366	138.2	11.19	0	0	0	176.64	0	0.02	25.81	26.86	12.35
369	133.7	9.92	0	0	0	176.35	0	0.02	25	26	13.48
372	133.06	10.63	0	0	0	176.03	0	0.02	25.71	26.73	12.52
375	129.18	12.22	0	0	0	175.71	0	0.02	25	25.99	10.57
378	137.45	11	0	0	0	175.32	0	0.02	26.65	27.71	12.49
381	130.94	7.56	0	0	0	175.06	0	0.02	25.41	26.4	17.33
384	127.75	13.4	0	0	0	174.8	0	0.02	25.16	26.15	9.54
387	133.19	13.43	0	0	0	174.29	0	0.02	25.57	26.6	9.92
390	133.22	9.44	0	0	0	174.03	0	0.02	25.75	26.77	14.11
393	132.88	8.95	0	0	0	173.7	0	0.02	25.98	27	14.84
396	129.11	9.16	0	0	0	173.48	0	0.02	25.23	26.22	14.1
399	130.15	12.41	0	0	0	173.14	0	0.02	25.78	26.8	10.49
402	128.68	9.1	0	0	0	172.78	0	0.02	25.24	26.24	14.14
405	128.67	9.09	0	0	0	172.57	0	0.02	25.38	26.37	14.16
408	124.41	9.46	0	0	0	172.23	0	0.02	24.72	25.68	13.15
411	126.6	13.7	0	0	0	171.97	0	0.02	25.29	26.28	9.24

414	128.24	17.21	0	0	0	171.42	0	0.02	25.66	26.65	7.45
417	129.17	5.8	0	0	0	171.05	0	0.02	25.74	26.73	22.27
420	130.33	3.31	0	0	52.54	171.01	0.06	0.02	26.04	27.05	39.33
423	123.99	10.25	0	0	0	170.77	0	0.02	25.15	26.12	12.1
426	124.18	12.14	0	0	0	170.43	0	0.02	25.14	26.1	10.23
429	123.95	9.43	0	0	8.79	170.08	0.03	0.02	25.55	26.52	13.14
432	121.08	14.97	0	0	0.91	169.81	0.01	0.02	25.03	25.98	8.09
435	125	12.6	0	0	9.74	169.24	0.05	0.02	25.45	26.43	9.92
438	127.24	5.57	0	0	9.4	169.09	0.02	0.02	25.67	26.65	22.85
441	126.69	11.3	0	0	14.41	168.82	0.06	0.02	25.88	26.86	11.21
444	122.09	10.67	0	0	11.86	168.45	0.05	0.02	24.92	25.88	11.44
447	122.26	7.76	0	0	17.8	168.19	0.05	0.02	24.93	25.87	15.75
450	123.24	11.2	0	0	13.95	167.94	0.06	0.02	25.23	26.2	11
453	120.47	10.98	0	0	25.56	167.54	0.11	0.02	25.2	26.16	10.97
456	124	10.58	0	0	26.12	167.29	0.11	0.02	25.32	26.28	11.72
459	124.12	8.34	0	0	49.45	166.92	0.16	0.02	25.37	26.33	14.88
462	125.18	10.89	0	0	38.06	166.75	0.15	0.02	26.03	27.01	11.5
465	121.91	11.77	0	0	27.89	166.28	0.12	0.02	25.4	26.35	10.36
468	121.27	9.92	0	0	37.9	166.06	0.14	0.02	25.09	26.03	12.22
471	120.97	13.51	0	0	23.03	165.65	0.12	0.02	25.1	26.05	8.96
474	119.1	6.74	0	0	58.13	165.32	0.15	0.02	25.1	26.05	17.68
477	119.62	4.4	0	0	112.4	165.21	0.19	0.02	25.05	26	27.16
480	122.07	14.13	0	0	33.4	164.97	0.18	0.02	25.39	26.35	8.64
483	122.82	12.29	0	0	49.11	164.44	0.23	0.02	25.76	26.73	9.99
486	122.07	10	0	0	56.89	164.25	0.21	0.02	25.6	26.56	12.2
489	120.34	10.83	0	0	50.89	163.82	0.21	0.02	25.08	26.03	11.11
492	122.19	7.15	0	0	101.05	163.62	0.27	0.02	25.53	26.49	17.09
495	118.64	11.32	0	0	55.29	163.34	0.24	0.02	25.28	26.23	10.48
498	122.83	8.41	0	0	83.51	162.99	0.26	0.02	25.82	26.79	14.6
501	119.59	5.01	0	0	133.68	162.84	0.25	0.02	25.36	26.32	23.88
504	120.52	13.03	0	0	48.78	162.61	0.24	0.02	25.34	26.29	9.25
507	118.51	13.17	0	0	60.24	162.11	0.3	0.02	25.43	26.37	9
510	119.86	9.34	0	0	76.94	161.85	0.27	0.02	25.61	26.55	12.84
513	119.82	11.72	0	0	64.38	161.51	0.29	0.02	25.46	26.39	10.23
516	119.65	9.53	0	0	70.18	161.18	0.25	0.02	25.76	26.71	12.56
519	116.04	7.35	0	0	113.47	160.94	0.32	0.02	25.29	26.21	15.78
522	118.14	7.52	0	0	102.78	160.72	0.29	0.02	25.39	26.32	15.71
525	119.71	11.99	0	0	62.87	160.46	0.29	0.02	25.49	26.44	9.99
528	115.64	11.93	0	0	66.5	160.03	0.31	0.02	24.89	25.81	9.69
531	118.17	9.78	0	0	71.01	159.76	0.26	0.02	25.37	26.31	12.09
534	120	12.36	0	0	59.24	159.41	0.28	0.02	25.57	26.52	9.71
537	117.98	8.84	0	0	93.33	159.06	0.31	0.02	25.48	26.41	13.34
540	115.53	7.03	0	0	122.38	158.87	0.33	0.02	25.26	26.17	16.44
543	113.35	8.91	0	0	83.18	158.61	0.29	0.02	24.36	25.26	12.72
546	116.89	9.56	0	0	88.93	158.34	0.32	0.02	25.55	26.49	12.22
549	117.66	7.37	0	0	118.86	158.05	0.33	0.02	25.54	26.47	15.97
552	118.46	10.77	0	0	86	157.86	0.35	0.02	25.59	26.52	11
555	116.73	13.74	0	0	61.84	157.41	0.33	0.02	25.18	26.11	8.5

558	118.81	10.08	0	0	81.15	157.09	0.3	0.02	25.86	26.82	11.79
561	115.62	9.06	0	0	80.76	156.79	0.28	0.02	24.96	25.88	12.76
564	114.14	8.13	0	0	82.28	156.54	0.26	0.02	24.82	25.73	14.04
567	116.07	8.48	0	0	78.95	156.29	0.25	0.02	25.43	26.36	13.68
570	116.07	10.6	0	0	75.63	156.02	0.3	0.02	25.52	26.46	10.95
573	116.1	9.64	0	0	71.78	155.67	0.26	0.02	25.2	26.11	12.05
576	116.85	11.79	0	0	57.97	155.42	0.26	0.02	25.29	26.22	9.91
579	117.67	11.52	0	0	71.76	154.99	0.31	0.02	25.47	26.4	10.21
582	120.53	6.14	0	0	141.92	154.76	0.32	0.02	26.48	27.44	19.63
585	117.63	8.93	0	0	84.38	154.56	0.28	0.02	25.66	26.58	13.17
588	116.33	10.57	0	0	60.24	154.23	0.24	0.02	25.32	26.24	11
591	112.19	8.45	0	0	81.68	153.95	0.27	0.02	24.97	25.88	13.28
594	114.25	13.33	0	0	54.63	153.68	0.28	0.02	25.49	26.4	8.57
597	113.89	10.08	0	0	73.33	153.21	0.28	0.02	25.25	26.15	11.29
600	117.53	6.05	0	0	125.6	153.09	0.28	0.02	25.88	26.82	19.44
603	115.51	8.87	0	0	79.97	152.79	0.27	0.02	25.76	26.68	13.02
606	115.62	11.13	0	0	66.77	152.56	0.28	0.02	25.32	26.24	10.39
609	116.02	8.03	0	0	86.2	152.17	0.26	0.02	25.38	26.31	14.45
612	120.86	5.06	0	0	137.8	152.07	0.25	0.03	26.57	27.53	23.86
615	117.45	10.54	0	0	62.06	151.8	0.24	0.02	25.82	26.75	11.14
618	115.73	12.96	0	0	48.42	151.46	0.24	0.02	25.5	26.42	8.93
621	114.96	10.84	0	0	58.7	151.06	0.24	0.02	26.15	27.09	10.6
624	110.85	8.98	0	0	69.64	150.81	0.24	0.02	25.08	25.98	12.35
627	112.5	8.93	0	0	66.91	150.51	0.23	0.02	25.11	26.02	12.6
630	115.12	8.83	0	0	76.25	150.27	0.25	0.02	25.96	26.91	13.03
633	115.09	10.01	0	0	68.2	149.97	0.26	0.02	25.83	26.76	11.49
636	115.03	7.49	0	0	89.76	149.69	0.25	0.02	25.94	26.87	15.36
639	112.39	7.51	0	0	96.09	149.5	0.28	0.02	25.3	26.2	14.96
642	114.18	11.32	0	0	62.22	149.22	0.27	0.02	25.56	26.47	10.09
645	115.22	8.53	0	0	79.08	148.87	0.25	0.02	25.83	26.75	13.51
648	114.08	8.15	0	0	76.76	148.69	0.24	0.02	25.65	26.56	14
651	115.04	11.82	0	0	60.09	148.35	0.27	0.02	25.7	26.61	9.73
654	112.55	8.64	0	0	84.37	148.03	0.28	0.02	25.41	26.32	13.02
657	112.34	8.46	0	0	93.09	147.81	0.3	0.02	25.13	26.03	13.28
660	114.93	14.18	0	0	58.54	147.48	0.31	0.02	25.67	26.6	8.1
663	117.95	14.44	0	0	61.89	147.01	0.33	0.02	26.42	27.38	8.17
666	112.84	3.53	0	0	260.74	146.69	0.35	0.02	25.41	26.33	31.93
669	113.66	4.28	0	0	225.57	146.71	0.36	0.02	25.63	26.56	26.55
672	112.48	11.83	0	0	93.63	146.38	0.42	0.02	25.46	26.38	9.51
675	112.21	7.68	0	0	143.2	146.08	0.42	0.02	25.12	26.02	14.61
678	112.92	10.2	0	0	112.24	145.88	0.44	0.02	25.38	26.27	11.08
681	111.29	8.05	0	0	152.15	145.49	0.47	0.02	25.27	26.17	13.83
684	109.01	8.69	0	0	146.45	145.38	0.49	0.02	24.9	25.79	12.54
687	115.07	14.26	0	0	97.02	144.94	0.52	0.02	25.6	26.51	8.07
690	115.08	9.47	0	0	150.01	144.6	0.54	0.02	25.56	26.47	12.15
693	115.21	7.05	0	0	209.81	144.36	0.56	0.02	25.69	26.6	16.34
696	115.5	10.98	0	0	134.87	144.13	0.56	0.02	25.69	26.6	10.52
699	113.36	10.34	0	0	142.87	143.73	0.56	0.02	25.67	26.58	10.96

702	113.15	5.19	0	0	317.08	143.54	0.62	0.02	25.51	26.42	21.8
705	111.7	10.23	0	0	152.37	143.35	0.59	0.02	25.38	26.28	10.91
708	112.82	10.33	0	0	156.68	142.95	0.61	0.02	25.53	26.44	10.92
711	113.72	7.85	0	0	198.04	142.75	0.59	0.02	25.57	26.49	14.49
714	108.6	7.79	0	0	202.02	142.47	0.62	0.02	24.66	25.54	13.95
717	110.34	8.32	0	0	183.32	142.28	0.59	0.02	24.78	25.67	13.26
720	113.14	11.4	0	0	145.66	141.95	0.63	0.02	25.46	26.37	9.93
723	115.27	13.23	0	0	119.81	141.61	0.59	0.02	25.9	26.83	8.71
726	115.09	7.8	0	0	209.21	141.21	0.62	0.02	25.41	26.32	14.75
729	114.63	6.53	0	0	256.47	141.11	0.64	0.02	25.42	26.34	17.54
732	113.39	13.14	0	0	126.43	140.76	0.63	0.02	25.52	26.44	8.63
735	115.16	10.34	0	0	162.62	140.38	0.63	0.02	25.85	26.79	11.14
738	116.91	5.28	0	0	313.35	140.16	0.61	0.02	26.03	26.97	22.15
741	116.91	9.24	0	0	181.16	140	0.63	0.02	25.8	26.73	12.65
744	118.03	11.95	0	0	137.92	139.61	0.61	0.02	26.01	26.94	9.88
747	115.27	8.34	0	0	191.03	139.33	0.6	0.02	25.53	26.46	13.81
750	117.28	10.16	0	0	164.76	139.08	0.63	0.02	25.77	26.71	11.55
753	116.84	7.1	0	0	229.21	138.75	0.61	0.02	25.88	26.83	16.46
756	111.6	9.06	0	0	170.94	138.62	0.6	0.02	24.81	25.7	12.32
759	115.9	9.46	0	0	168.38	138.22	0.6	0.02	25.51	26.43	12.25
762	116.25	4.14	0	0	385.81	138.08	0.61	0.02	25.44	26.37	28.08
765	117.25	11.32	0	0	142.38	137.89	0.61	0.02	25.45	26.39	10.36
768	117.63	12.05	0	0	130.65	137.44	0.6	0.02	25.39	26.32	9.76
771	119.24	11.87	0	0	138.12	137.18	0.61	0.02	25.77	26.72	10.04
774	119.2	10.81	0	0	148.07	136.74	0.6	0.02	25.78	26.72	11.03
777	117.18	5.34	0	0	301.42	136.55	0.61	0.02	25.64	26.58	21.95
780	118.32	10.97	0	0	143.4	136.35	0.59	0.02	25.63	26.57	10.79
783	112.77	10.85	0	0	139.48	135.93	0.6	0.02	24.51	25.41	10.39
786	117.49	11.09	0	0	133.04	135.69	0.56	0.02	25.53	26.47	10.59
789	119.21	16.07	0	0	89.53	135.24	0.54	0.02	25.6	26.54	7.42
792	117.28	6.9	0	0	203.35	134.83	0.53	0.02	25.32	26.25	16.99
795	116.88	4.27	0	0	328.48	134.78	0.53	0.02	25.36	26.28	27.35
798	117.91	12.14	0	0	103.67	134.49	0.48	0.02	25.23	26.16	9.71
801	114.61	12.33	0	0	92.72	134.1	0.45	0.02	24.74	25.67	9.3
804	118	8.01	0	0	145.34	133.79	0.44	0.02	25.29	26.24	14.73
807	118.81	6.98	0	0	166.83	133.6	0.44	0.02	25.28	26.23	17.02
810	124.57	12.1	0	0	101.56	133.33	0.45	0.02	26.15	27.14	10.29
813	122.72	10.16	0	0	107.41	132.92	0.41	0.02	25.6	26.56	12.07
816	118.17	6.64	0	0	160.52	132.73	0.41	0.02	25.16	26.1	17.81
819	118.07	11.36	0	0	80.61	132.46	0.35	0.02	24.95	25.88	10.39
822	123.06	10.69	0	0	85	132.08	0.34	0.02	25.68	26.65	11.51
825	121.16	7.84	0	0	106.19	131.84	0.32	0.02	25.42	26.39	15.45
828	122.17	10.26	0	0	81.88	131.58	0.32	0.02	25.17	26.13	11.91
831	123.78	10.82	0	0	69.66	131.23	0.29	0.02	25.44	26.42	11.44
834	125.24	10.01	0	0	70.32	130.94	0.27	0.02	25.34	26.3	12.51
837	120.47	6.91	0	0	93.99	130.65	0.25	0.02	24.79	25.74	17.44
840	128.81	7.44	0	0	77.34	130.5	0.21	0.02	26.44	27.45	17.32
843	123.25	12.1	0	0	44.27	130.17	0.21	0.02	25.1	26.06	10.18

846	121.36	10.88	0	0	33.72	129.81	0.14	0.02	24.96	25.92	11.15
849	122.58	10.99	0	0	48.35	129.51	0.2	0.02	25.06	26.02	11.15
852	123.79	13.59	0	0	26.76	129.14	0.14	0.02	25.35	26.32	9.11
855	125.04	0.01	-0.29	-0.03	27206.5	128.73	0.1	0.02	25.53	26.5	0
858	124.81	0.01	-0.28	-0.03	27254.95	128.46	0.1	0.02	25.12	26.09	0

Workstation - Work Surface**Test 2**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	17.00
Peak Heat Release Rate (kW/m ²):	539.53
Time to Peak Heat Release Rate (s):	36.00
Total Heat Release (MJ/m ²):	122.29
60 s Average Heat Release Rate (kW/m ²):	263.66
Total Mass Loss (g):	96.22
Average Mass Loss Rate (g/s):	0.114
Average Effective Heat of Combustion (MJ/kg):	12.71
Average Smoke Extinction Area (m ² /kg):	278.89
Average CO ₂ yield (g/g):	0.01
Average CO yield (g/g):	0.0010

Specimen:

Initial mass (g):	225.8
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	74
Time to ignition (s):	17
Time to flameout (s):	899

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
0	-1.73	0.01	-0.39	-0.04	0	225.39	0.59	0.03	25.59	26.01	-172.82
3	-1.45	0.01	-0.39	-0.03	0	225.72	0.58	0.03	25.62	26.04	-144.73
6	0.96	1.47	0	0	1112.44	225.71	0.63	0.03	25.74	26.15	0.65
9	-0.06	-2.27	0	0	-727.89	225.69	0.64	0.03	25.44	25.84	0.02
12	1.29	9.56	0	0	225.02	225.73	0.85	0.03	24.87	25.29	0.13
15	15.32	29.99	0	0	223.17	225.06	2.63	0.03	25.04	25.46	0.51
18	76.45	26.18	0	0.01	53.58	224.11	0.61	0.02	22.38	23.11	2.92
21	194.94	20.6	0	0.01	80.28	223.5	0.69	0.02	22.68	24.13	9.46
24	317.04	37.43	0	0.01	58.93	222.71	0.87	0.02	23.43	25.41	8.47
27	398.37	49.88	0.1	0.01	73.87	221.29	1.46	0.02	22.93	25.21	7.99
30	466.36	44.63	0.42	0.01	110.3	219.86	1.98	0.02	22.22	24.82	10.45
33	538.23	27.26	0.22	0.01	169.57	218.72	1.77	0.02	23.23	26.17	19.74
36	539.53	12.94	0	0.02	257.87	218.2	1.19	0.02	25.01	28.02	41.69
39	437.88	13.72	0	0.01	219.61	217.82	1.07	0.02	25.47	28.26	31.91
42	326.2	15.66	0	0	187.72	217.36	1.06	0.02	25.31	27.83	20.82
45	256.35	12.97	0	0	208.34	216.92	0.98	0.02	25.35	27.67	19.76
48	215.8	11.08	0	0	246.19	216.58	1.01	0.02	24.78	26.88	19.48
51	201.05	12.6	0	0	229.13	216.22	1.06	0.02	25.16	27.16	15.95
54	196.46	13.44	0	0	222.66	215.82	1.09	0.02	25.53	27.44	14.61
57	189.62	14.82	0	0	190.34	215.42	1.05	0.02	24.98	26.75	12.79
60	195	14.8	0	0	217.69	214.94	1.17	0.02	25.78	27.53	13.17
63	193.53	14.28	0	0	208.35	214.53	1.1	0.02	25.45	27.12	13.55
66	192.79	13.6	0	0	227.4	214.09	1.15	0.02	25.3	26.9	14.17
69	191.53	14.68	0	0	225.01	213.7	1.25	0.02	24.9	26.45	13.05
72	193.61	15.75	0	0	208.11	213.21	1.23	0.02	25.05	26.57	12.29
75	200.71	13.43	0	0	253.02	212.78	1.23	0.02	25.95	27.52	14.95
78	191.66	16.28	0	0	197.59	212.37	1.24	0.02	24.52	25.98	11.77
81	193.63	16.26	0	0	187.04	211.82	1.16	0.02	24.73	26.2	11.91
84	202.68	14.13	0	0	247	211.41	1.28	0.02	25.78	27.3	14.34
87	203.16	16.2	0	0	210.38	210.95	1.25	0.02	25.68	27.19	12.54
90	204.86	12.19	0	0	275.06	210.47	1.23	0.02	25.85	27.35	16.8
93	203.21	15.01	0	0	216.96	210.17	1.21	0.02	25.37	26.84	13.54
96	204.18	15.3	0	0	226.08	209.59	1.28	0.02	25.5	26.97	13.35
99	199.97	15.26	0	0	217.01	209.26	1.26	0.02	24.91	26.34	13.11
102	200.52	18.48	0	0	177.85	208.65	1.24	0.02	25.09	26.51	10.85
105	199.45	12.58	0	0	245.96	208.21	1.17	0.02	24.99	26.41	15.86
108	206.37	16.12	0	0	219.91	207.84	1.29	0.02	25.99	27.46	12.8
111	195.52	15.62	0	0	197.26	207.27	1.18	0.02	24.67	26.06	12.52
114	198.98	11.17	0	0	292.95	206.93	1.23	0.02	25.15	26.56	17.82
117	199.83	13.71	0	0	234.64	206.55	1.2	0.02	25.44	26.85	14.57
120	197.75	14.24	0	0	224.07	206.11	1.2	0.02	25.28	26.67	13.88
123	208.69	16.73	0	0	176.1	205.68	1.04	0.02	26.91	28.38	12.47
126	192.45	14.98	0	0	194.96	205.14	1.11	0.02	24.84	26.19	12.85
129	196.09	13.57	0	0	243.91	204.78	1.24	0.02	25.28	26.63	14.45
132	194.18	16.53	0	0	181.62	204.3	1.12	0.02	25.42	26.77	11.75
135	197.07	13.85	0	0	224.5	203.83	1.15	0.02	25.77	27.13	14.23

138	194.01	12.37	0	0	241.34	203.46	1.12	0.02	25.4	26.74	15.68
141	194.46	12.45	0	0	253.67	203.07	1.17	0.02	25.66	27.02	15.62
144	190.83	14.78	0	0	192.43	202.7	1.07	0.02	25.34	26.68	12.91
147	190.79	13.88	0	0	211.51	202.21	1.09	0.02	25.69	27.03	13.75
150	191.94	14.22	0	0	214.4	201.86	1.12	0.02	25.88	27.22	13.5
153	186.13	16.05	0	0	172.79	201.35	1.04	0.02	25.47	26.78	11.6
156	188.69	11.35	0	0	249.57	200.94	1.04	0.02	25.94	27.25	16.62
159	186.58	14.34	0	0	187.23	200.61	0.99	0.02	25.79	27.09	13.01
162	181.86	16.1	0	0	159.48	200.08	0.96	0.02	25.39	26.66	11.3
165	177.27	11.28	0	0	240.84	199.69	1.05	0.02	24.7	25.93	15.71
168	181.29	11.21	0	0	230.3	199.37	0.97	0.02	25.44	26.7	16.18
171	177.67	14.26	0	0	178.91	199	0.97	0.02	25.16	26.4	12.46
174	177.79	14.92	0	0	172.42	198.54	0.97	0.02	25.35	26.59	11.91
177	182.43	11.41	0	0	235.1	198.13	0.98	0.02	26.12	27.38	15.98
180	175.55	13.69	0	0	194.43	197.81	1	0.02	25.41	26.62	12.82
183	176.36	13.75	0	0	167.98	197.32	0.86	0.02	25.66	26.88	12.82
186	178.58	11.05	0	0	200.49	197	0.82	0.02	25.91	27.14	16.16
189	173.78	16.47	0	0	138.74	196.61	0.86	0.02	25.43	26.64	10.55
192	175.21	14.68	0	0	159.45	196.07	0.87	0.02	25.81	27.01	11.94
195	169.18	11.41	0	0	193.88	195.74	0.84	0.02	25.21	26.38	14.83
198	164.67	10.74	0	0	192.95	195.36	0.8	0.02	24.74	25.88	15.33
201	163.9	11.83	0	0	174.74	195.08	0.79	0.02	24.87	26.01	13.85
204	165.36	12.25	0	0	165.53	194.66	0.77	0.02	25.28	26.44	13.49
207	164.12	10.29	0	0	175.11	194.36	0.68	0.02	25.28	26.43	15.95
210	163.75	14.9	0	0	125.63	194	0.71	0.02	25.35	26.49	10.99
213	164.5	11.69	0	0	166.38	193.52	0.72	0.02	25.87	27.03	14.08
216	163.47	8.3	0	0	212.44	193.3	0.65	0.02	25.96	27.12	19.69
219	159.24	15.15	0	0	109.14	192.95	0.62	0.02	25.43	26.56	10.51
222	157.17	19.02	0	0	81.67	192.41	0.59	0.02	25.26	26.38	8.26
225	154.08	12.84	0	0	119	191.88	0.59	0.02	24.78	25.86	12
228	156.99	8.76	0	0	190.44	191.62	0.63	0.02	25.28	26.37	17.92
231	157.93	13.32	0	0	116	191.29	0.58	0.02	25.61	26.72	11.86
234	152.7	12.39	0	0	118.82	190.86	0.56	0.02	25.1	26.18	12.32
237	152.75	8.1	0	0	168.16	190.57	0.52	0.02	25.18	26.26	18.85
240	151.05	10.69	0	0	123.86	190.33	0.5	0.02	25.4	26.49	14.12
243	155.79	15.11	0	0	89.57	189.92	0.5	0.02	25.97	27.08	10.31
246	154.02	12.51	0	0	103.06	189.47	0.48	0.02	25.93	27.03	12.31
249	152.53	10.36	0	0	121.73	189.16	0.47	0.02	25.54	26.61	14.72
252	151.22	15.03	0	0	80.25	188.8	0.45	0.02	25.46	26.53	10.06
255	148.35	12.23	0	0	88.58	188.32	0.41	0.02	25.14	26.19	12.13
258	150.44	7.3	0	0	163.19	188.08	0.45	0.02	25.38	26.44	20.6
261	146.49	13.39	0	0	92.03	187.8	0.47	0.02	25.1	26.14	10.94
264	152.7	10.43	0	0	130.45	187.34	0.5	0.02	26.2	27.3	14.64
267	150.21	9.1	0	0	144.94	187.17	0.49	0.02	25.85	26.93	16.51
270	150.16	13.81	0	0	97.15	186.75	0.5	0.02	25.84	26.91	10.87
273	152.09	11.95	0	0	109.84	186.38	0.48	0.02	26.18	27.27	12.73
276	143.84	10.45	0	0	128.04	186.03	0.51	0.02	25.18	26.23	13.77
279	143.14	11.45	0	0	116.42	185.74	0.5	0.02	25.6	26.65	12.5
282	143.52	14.97	0	0	83.62	185.33	0.47	0.02	25.71	26.76	9.58
285	142.57	8.9	0	0	158.45	184.9	0.53	0.02	25.45	26.49	16.02
288	138.7	10.36	0	0	122.06	184.75	0.49	0.02	24.87	25.88	13.39
291	139.39	13.26	0	0	95.83	184.27	0.48	0.02	25.22	26.25	10.51

294	140.19	8.63	0	0	146.69	184	0.48	0.02	25.51	26.56	16.25
297	139.13	11.02	0	0	110.44	183.7	0.46	0.02	25.4	26.44	12.63
300	137.82	12.14	0	0	99.14	183.35	0.46	0.02	25.2	26.23	11.35
303	139.57	10.28	0	0	128.37	183	0.49	0.02	25.65	26.69	13.57
306	139.03	8.51	0	0	145.32	182.73	0.46	0.02	25.78	26.82	16.33
309	133.98	14.3	0	0	82.01	182.44	0.45	0.02	25.03	26.04	9.37
312	135.31	11.81	0	0	97.82	181.92	0.44	0.02	25.3	26.31	11.45
315	135.01	7.94	0	0	150.99	181.74	0.46	0.02	25.15	26.15	16.99
318	134.49	13.53	0	0	81.18	181.39	0.42	0.02	25.11	26.1	9.94
321	136.54	11.03	0	0	102.03	180.98	0.42	0.02	25.56	26.57	12.37
324	135.31	7.9	0	0	146.7	180.73	0.43	0.02	25.71	26.72	17.12
327	134.06	13.39	0	0	75.65	180.45	0.39	0.02	25.29	26.28	10.01
330	131.69	15.42	0	0	62.27	179.95	0.37	0.02	24.98	25.96	8.54
333	131.35	7.83	0	0	125.23	179.59	0.38	0.02	24.9	25.87	16.77
336	134.66	7	0	0	160.5	179.43	0.42	0.02	25.64	26.64	19.25
339	132.26	13.15	0	0	75.72	179.12	0.38	0.02	25.35	26.34	10.05
342	134.91	9.16	0	0	103.55	178.71	0.36	0.02	25.47	26.46	14.74
345	135.77	7.89	0	0	121.03	178.55	0.36	0.02	25.6	26.6	17.22
348	137.09	13.74	0	0	69.12	178.19	0.35	0.02	25.95	26.95	9.98
351	131.41	11	0	0	87.18	177.79	0.37	0.02	25.04	26.01	11.94
354	129.76	6.07	0	0	150.62	177.54	0.35	0.02	25.08	26.05	21.39
357	129.83	11.93	0	0	78.68	177.35	0.36	0.02	24.94	25.9	10.88
360	132.83	14.8	0	0	64.85	176.85	0.36	0.02	25.46	26.45	8.98
363	132.11	9.45	0	0	92.62	176.52	0.33	0.02	25.16	26.14	13.99
366	134.88	8.38	0	0	99.88	176.25	0.31	0.02	25.65	26.65	16.1
369	136.59	9.48	0	0	96.67	176	0.33	0.02	26.42	27.43	14.4
372	128.38	14.31	0	0	47.88	175.66	0.27	0.02	24.9	25.84	8.97
375	130.46	11.36	0	0	59.39	175.19	0.25	0.02	25.54	26.53	11.49
378	129.43	7.3	0	0	95.52	174.99	0.27	0.02	25.18	26.14	17.73
381	129.97	9.42	0	0	71.84	174.71	0.26	0.02	25.45	26.41	13.79
384	136.12	8.6	0	0	91.82	174.44	0.29	0.02	26.67	27.68	15.84
387	133.55	13.84	0	0	49.22	174.15	0.25	0.02	26.13	27.12	9.65
390	132.96	15.42	0	0	38.6	173.63	0.22	0.02	25.94	26.93	8.62
393	130.94	12.23	0	0	43.4	173.27	0.2	0.02	25.3	26.26	10.71
396	127.66	9.59	0	0	62.21	172.9	0.22	0.02	25.58	26.55	13.31
399	122.67	5.32	0	0	107.56	172.7	0.22	0.02	24.53	25.46	23.04
402	129.84	11.71	0	0	45.59	172.51	0.2	0.02	26.1	27.09	11.09
405	125.17	12.95	0	0	41.05	172.03	0.2	0.02	25.22	26.18	9.67
408	128.09	7.5	0	0	76.96	171.78	0.22	0.02	25.46	26.43	17.08
411	125.17	9.56	0	0	50.08	171.53	0.18	0.02	25.1	26.05	13.09
414	129.02	8.55	0	0	65.7	171.22	0.21	0.02	25.93	26.9	15.1
417	131.48	11.53	0	0	51.08	170.99	0.22	0.02	26.37	27.35	11.4
420	126.99	12.71	0	0	44.48	170.54	0.22	0.02	25.31	26.25	9.99
423	127.68	12.98	0	0	43.84	170.24	0.21	0.02	25.54	26.49	9.84
426	126.22	12.75	0	0	48.58	169.77	0.23	0.02	25.63	26.59	9.9
429	126.06	6.32	0	0	108.14	169.51	0.26	0.02	25.43	26.4	19.96
432	128.05	9.25	0	0	76.18	169.32	0.27	0.02	25.47	26.43	13.84
435	127.36	11	0	0	58.42	168.96	0.24	0.02	25.43	26.38	11.58
438	125.7	6.6	0	0	95.37	168.7	0.24	0.02	25.39	26.33	19.05
441	126.52	10.35	0	0	66.84	168.51	0.26	0.02	25.74	26.7	12.23
444	123.6	14.58	0	0	46.15	168.08	0.26	0.02	25.05	25.99	8.48
447	126.23	9.96	0	0	73.03	167.7	0.27	0.02	25.69	26.65	12.67

450	124.84	6.92	0	0	105.74	167.47	0.28	0.02	25.52	26.47	18.03
453	123.24	10.39	0	0	66.25	167.24	0.26	0.02	25.15	26.09	11.86
456	124.8	10.59	0	0	62.45	166.87	0.25	0.02	25.9	26.87	11.79
459	123.26	7.97	0	0	96.4	166.62	0.29	0.02	25.73	26.67	15.47
462	121.09	10.35	0	0	71.57	166.36	0.28	0.02	25.16	26.09	11.7
465	122.53	10.23	0	0	71.82	166.01	0.28	0.02	25.41	26.35	11.98
468	119.98	12.55	0	0	58.58	165.73	0.28	0.02	25.03	25.95	9.56
471	124.87	10.23	0	0	85.1	165.3	0.32	0.02	26.21	27.17	12.21
474	122.18	6.12	0	0	136.41	165.13	0.32	0.02	25.5	26.43	19.98
477	125.27	9.88	0	0	80.67	164.87	0.29	0.02	26.28	27.24	12.68
480	123.03	12.57	0	0	66.88	164.54	0.31	0.02	25.75	26.7	9.79
483	119.03	11.42	0	0	78.27	164.15	0.34	0.02	25.31	26.23	10.42
486	121.04	9.21	0	0	103	163.87	0.36	0.02	25.52	26.45	13.14
489	121.58	8.46	0	0	111.75	163.58	0.36	0.02	25.61	26.53	14.37
492	120.34	10.03	0	0	96.46	163.34	0.37	0.02	25.4	26.33	12
495	122.66	11.31	0	0	86.5	162.98	0.37	0.02	25.81	26.75	10.85
498	122.7	11.22	0	0	108.15	162.67	0.45	0.02	26.03	26.98	10.94
501	123.3	9.04	0	0	175.04	162.33	0.59	0.02	26.1	27.04	13.64
504	116.89	9.02	0	0	233.16	162.12	0.81	0.02	25.03	25.92	12.95
507	116.27	10.31	0	0	217.63	161.77	0.86	0.02	25.12	26.02	11.28
510	120.12	9.54	0	0	270.06	161.51	0.96	0.02	25.82	26.75	12.6
513	119.76	9.11	0	0	300.61	161.2	1.02	0.02	25.86	26.78	13.14
516	120.3	9.44	0	0	302.77	160.96	1.07	0.02	25.81	26.73	12.74
519	117.76	11.53	0	0	239.42	160.62	1.05	0.02	25.34	26.22	10.21
522	123.37	9.46	0	0	305.95	160.3	1.07	0.02	26.06	26.98	13.04
525	119.4	6.79	0	0	423.83	160.06	1.1	0.02	25.33	26.22	17.59
528	120.37	6.58	0	0	437.33	159.87	1.07	0.02	26.02	26.94	18.29
531	116.23	10.91	0	0	253.33	159.63	1.04	0.02	25.57	26.48	10.65
534	116.22	12.18	0	0	233.69	159.23	1.08	0.02	25.38	26.28	9.54
537	120.83	10.49	0	0	287.89	158.93	1.11	0.02	26.28	27.22	11.52
540	119.54	11.62	0	0	264.13	158.59	1.14	0.02	26	26.92	10.29
543	117.83	6.88	0	0	463.95	158.26	1.19	0.02	25.83	26.74	17.13
546	116.83	10.14	0	0	340.87	158.12	1.31	0.02	25.47	26.35	11.52
549	117.11	12.5	0	0	277.28	157.66	1.32	0.02	25.45	26.34	9.37
552	114.47	7.83	0	0	434.05	157.42	1.3	0.02	25.17	26.05	14.63
555	118.93	7.81	0	0	461.93	157.16	1.33	0.02	26.19	27.1	15.23
558	113.39	10.03	0	0	353.18	156.94	1.36	0.02	25.27	26.16	11.3
561	114.44	11.84	0	0	304.29	156.57	1.36	0.02	25.66	26.57	9.67
564	112.97	5.44	0	0	654.09	156.28	1.35	0.02	25.41	26.31	20.76
567	115.6	9.36	0	0	393.36	156.17	1.38	0.02	25.7	26.6	12.36
570	116.26	13.53	0	0	273.13	155.72	1.37	0.02	26.06	26.96	8.59
573	117.98	7.73	0	0	487.15	155.43	1.39	0.02	26.27	27.17	15.27
576	114.99	6.19	0	0	589.82	155.22	1.39	0.02	25.35	26.21	18.57
579	112.59	10.7	0	0	347.81	155.01	1.4	0.02	25.63	26.52	10.52
582	113.51	13.35	0	0	277.41	154.6	1.4	0.02	25.64	26.53	8.5
585	110.72	8.81	0	0	426.11	154.26	1.43	0.02	25.31	26.19	12.56
588	114.52	7.94	0	0	483.83	154.04	1.44	0.02	25.81	26.7	14.43
591	112.37	11.98	0	0	327.85	153.75	1.48	0.02	25.62	26.51	9.38
594	113.81	9.03	0	0	423.22	153.37	1.42	0.02	25.97	26.86	12.6
597	110.9	7.89	0	0	481.93	153.2	1.46	0.02	25.18	26.04	14.05
600	111.18	11.44	0	0	341.24	152.86	1.49	0.02	25.25	26.12	9.72
603	111.86	9.91	0	0	440.52	152.55	1.65	0.02	25.58	26.48	11.29

606	111.18	3.1	0	0	1439.72	152.3	1.7	0.02	25.39	26.28	35.88
609	109.69	6.27	0	0	710.12	152.29	1.7	0.02	25.27	26.16	17.5
612	110.14	12.61	0	0	348.1	151.9	1.69	0.02	25.13	26	8.73
615	112.47	10.41	0	0	445.35	151.6	1.74	0.02	25.76	26.65	10.81
618	112.74	6.83	0	0	684.34	151.29	1.74	0.02	26.03	26.92	16.5
621	110.46	7.84	0	0	593.16	151.15	1.77	0.02	25.46	26.33	14.09
624	111.88	13.9	0	0	332.47	150.79	1.74	0.02	25.66	26.53	8.05
627	109.38	9.18	0	0	509.08	150.39	1.78	0.02	25.41	26.28	11.91
630	110.12	7.8	0	0	616.52	150.22	1.82	0.02	25.55	26.41	14.12
633	110.82	9	0	0	532.83	149.9	1.82	0.02	25.45	26.31	12.31
636	111.51	10.47	0	0	469.69	149.68	1.84	0.02	25.83	26.71	10.65
639	110.01	8.42	0	0	573.69	149.3	1.86	0.02	25.11	25.96	13.06
642	111.5	6.87	0	0	720.92	149.17	1.86	0.02	25.68	26.55	16.23
645	110.92	10.09	0	0	489.78	148.85	1.88	0.02	25.49	26.35	10.99
648	108.56	7.43	0	0	666.39	148.6	1.93	0.02	24.85	25.69	14.61
651	111.34	8.81	0	0	574.92	148.38	1.91	0.02	25.72	26.59	12.64
654	110.38	11.14	0	0	455.64	148.06	1.92	0.02	25.61	26.48	9.91
657	107.87	8.58	0	0	594.99	147.75	1.98	0.02	24.94	25.79	12.57
660	109.77	7.75	0	0	666.58	147.54	1.97	0.02	25.33	26.2	14.16
663	110.33	11.59	0	0	464.58	147.25	2.03	0.02	25.67	26.55	9.52
666	107.38	8.92	0	0	557.61	146.88	1.94	0.02	24.77	25.62	12.04
669	108.67	9.7	0	0	500.55	146.7	1.84	0.02	25.46	26.34	11.21
672	109.8	8.06	0	0	604.72	146.32	1.86	0.02	25.28	26.15	13.62
675	110.18	5.5	0	0	904.07	146.21	1.88	0.02	25.59	26.47	20.02
678	109.54	12.43	0	0	396.13	145.92	1.87	0.02	25.52	26.39	8.81
681	109.84	11.71	0	0	419.49	145.52	1.86	0.02	25.54	26.42	9.38
684	110.72	6.65	0	0	762.81	145.25	1.89	0.02	25.94	26.83	16.66
687	110.2	7.76	0	0	648.08	145.08	1.9	0.02	25.6	26.48	14.21
690	110.26	8.14	0	0	620.98	144.79	1.91	0.02	25.67	26.54	13.54
693	110.73	9.45	0	0	542.18	144.59	1.92	0.02	25.84	26.71	11.71
696	108.55	10.14	0	0	505.46	144.23	1.96	0.02	25.33	26.18	10.71
699	110.86	7.27	0	0	737.28	144	2	0.02	25.91	26.78	15.24
702	111.51	10.47	0	0	515.29	143.75	2.03	0.02	25.77	26.64	10.65
705	110.04	10.94	0	0	510	143.39	2.1	0.02	25.69	26.56	10.06
708	108.1	8.92	0	0	667.35	143.11	2.27	0.02	25.39	26.25	12.12
711	109.11	10.71	0	0	635.62	142.83	2.56	0.02	25.72	26.59	10.18
714	108.28	9.11	0	0	779.48	142.49	2.7	0.02	25.41	26.28	11.88
717	112	7.45	0	0	1045.48	142.28	2.9	0.02	25.96	26.86	15.04
720	103.25	7.62	0	0	944.49	142.03	2.85	0.02	24.38	25.23	13.55
723	110.31	3.93	0	0	1659.91	141.85	2.48	0.02	25.44	26.32	28.05
726	112.95	12.56	0	0	504.32	141.72	2.39	0.02	25.64	26.51	8.99
729	111.55	10.54	0	0	578.68	141.16	2.31	0.02	25.56	26.44	10.58
732	110.2	4.54	0	0	1267.36	141.11	2.22	0.02	25	25.85	24.29
735	110.85	13.35	0	0	417.8	140.8	2.12	0.02	25.5	26.37	8.3
738	113.25	8.72	0	0	653.83	140.4	2.16	0.02	25.59	26.47	12.98
741	112.11	7.98	0	0	701.65	140.25	2.13	0.02	25.46	26.33	14.04
744	113.69	11.78	0	0	481.18	139.89	2.14	0.02	25.63	26.5	9.65
747	112.44	6.53	0	0	896.3	139.6	2.22	0.02	25.55	26.42	17.21
750	113.36	8.87	0	0	671.52	139.45	2.23	0.02	25.87	26.77	12.78
753	112.42	10.2	0	0	566.09	139.07	2.19	0.02	25.45	26.32	11.02
756	109.7	8.6	0	0	675.8	138.86	2.23	0.02	25.15	26.02	12.76
759	114.45	9.15	0	0	670.91	138.54	2.28	0.02	26.01	26.9	12.51

762	115.73	11.24	0	0	583.83	138.3	2.39	0.03	26.55	27.46	10.3
765	113.58	8.82	0	0	738.44	137.9	2.44	0.02	25.77	26.66	12.88
768	112.2	11.42	0	0	524.51	137.74	2.28	0.02	25.44	26.32	9.83
771	112.66	11.87	0	0	621.46	137.23	2.79	0.02	25.55	26.43	9.49
774	111.05	6.1	0	0	1314.73	137.06	3.09	0.02	25.11	25.98	18.21
777	113.25	10.41	0	0	833.92	136.8	3.25	0.02	25.84	26.73	10.88
780	110.53	6.88	0	0	1238.3	136.49	3.3	0.02	24.97	25.84	16.06
783	110.2	7.23	0	0	1105.34	136.36	3.11	0.02	24.87	25.73	15.24
786	117	10.09	0	0	734.76	136.04	2.73	0.02	26.21	27.12	11.59
789	114.83	5.13	0	0	1386.13	135.8	2.66	0.02	25.82	26.71	22.4
792	116.97	8.54	0	0	797.79	135.67	2.55	0.02	25.78	26.67	13.7
795	117.16	11.66	0	0	492.2	135.29	2.16	0.02	25.72	26.62	10.05
798	115.1	10.79	0	0	524.13	135	2.14	0.02	25.59	26.48	10.66
801	118.59	8.83	0	0	643.08	134.65	2.1	0.02	26.12	27.03	13.43
804	114.48	10.45	0	0	509.15	134.45	2.01	0.02	25.6	26.5	10.95
807	114.82	8.84	0	0	601.57	134.05	2.03	0.02	25.3	26.2	12.99
810	114.6	5.03	0	0	1051.17	133.93	2.02	0.02	25.29	26.2	22.79
813	115.62	11.86	0	0	442.5	133.68	1.99	0.02	25.49	26.4	9.75
816	115.39	8.84	0	0	599.61	133.28	1.98	0.02	25.8	26.72	13.06
819	118.05	8.45	0	0	631.72	133.13	1.98	0.02	26.02	26.95	13.97
822	118.31	12.48	0	0	428.3	132.75	1.98	0.02	26.11	27.04	9.48
825	114.77	8.84	0	0	601.54	132.43	1.99	0.02	25.85	26.78	12.98
828	116.43	6.75	0	0	789.61	132.21	2.01	0.02	25.56	26.48	17.26
831	115.09	10.43	0	0	517.63	131.99	2.04	0.02	25.61	26.53	11.03
834	117.06	10.79	0	0	512.68	131.6	2.08	0.02	25.68	26.6	10.85
837	116.98	11.45	0	0	478.17	131.34	2.06	0.02	25.65	26.57	10.21
840	116.57	7.06	0	0	807.81	130.95	2.13	0.02	25.78	26.71	16.52
843	119.79	5.42	0	0	1062.25	130.9	2.14	0.02	25.94	26.88	22.08
846	115.79	14.35	0	0	394.03	130.56	2.16	0.02	25.27	26.19	8.07
849	119.15	7.15	0	0	804.83	130.14	2.18	0.02	25.51	26.43	16.67
852	118.34	10.49	0	0	556.74	130.06	2.22	0.02	25.44	26.36	11.28
855	120.32	12.04	0	0	501.09	129.52	2.28	0.02	25.54	26.48	9.99
858	116.53	0.01	-0.31	-0.03	0	129.36	2.35	0.02	25.23	26.15	0
861	118.54	0.01	-0.32	-0.04	0	128.84	2.35	0.02	25.78	26.72	0

Workstation - Work Surface**Test 3**External Heat Flux 70 kW/m²

Test Results:

Time to Sustained Ignition (s):	16.00
Peak Heat Release Rate (kW/m ²):	610.54
Time to Peak Heat Release Rate (s):	32.00
Total Heat Release (MJ/m ²):	127.85
60 s Average Heat Release Rate (kW/m ²):	272.31
Total Mass Loss (g):	100.66
Average Mass Loss Rate (g/s):	0.119
Average Effective Heat of Combustion (MJ/kg):	12.70
Average Smoke Extinction Area (m ² /kg):	5.64
Average CO ₂ yield (g/g):	0.02
Average CO yield (g/g):	0.0008

Specimen:

Initial mass (g):	223.7
Thickness (mm):	29
Surface area (cm ²):	100
Test start time (s):	93
Time to ignition (s):	16
Time to flameout (s):	861

Time (s)	HRR (kW/m ²)	MLR (g/m ² s)	CO ₂ yield (g/g)	CO yield (g/g)	Specific Ext. Area (m ² /kg)	Mass (g)	Smoke Ext. Coef. (1/m)	Duct Mass Flow Rate (kg/s)	Duct Vol Flow Rate (l/s)	Smoke Vol Flow Rate (l/s)	Effective HOC (MJ/kg)
2	0.45	0.01	-0.35	-0.04	0	223.75	0	0.03	25.32	25.73	45.2
5	-0.03	0.01	-0.39	-0.03	0	223.78	0	0.03	25.38	25.78	-3.26
8	1.85	-0.91	0	0	0	223.77	0	0.03	25.93	26.32	-2.03
11	1.08	0.74	0	0	0	223.81	0	0.03	24.87	25.25	1.45
14	7.86	17.16	0	0	934.51	223.62	6.23	0.03	25.33	25.73	0.46
17	32.73	24.97	0	0.01	0	222.82	0	0.02	22.93	23.58	1.31
20	147.83	39.66	0	0	0	222.08	0	0.02	23.53	24.58	3.73
23	261.72	53.87	0.09	0	0	220.46	0	0.02	22.32	23.7	4.86
26	387.5	50.04	0.53	0.01	26.72	218.99	0.55	0.02	22.02	24.24	7.74
29	552.19	39.5	0.58	0.01	39.2	217.54	0.62	0.02	22.31	24.93	13.98
32	610.54	18.22	0.05	0.01	0	216.7	0	0.02	24.06	26.9	33.51
35	544.48	9.2	0	0.01	0	216.34	0	0.02	24.21	26.9	59.18
38	401.39	17.71	0	0	0	216.01	0	0.02	24.94	27.52	22.66
41	319.67	15.64	0	0	0	215.34	0	0.02	24.6	26.95	20.44
44	263.93	16.04	0	0	0	215.06	0	0.02	25.27	27.56	16.45
47	243.7	17.14	0	0	0	214.38	0	0.02	25.05	27.2	14.22
50	235.94	13.9	0	0	0	214.06	0	0.02	25.22	27.27	16.98
53	225.7	17.28	0	0	0	213.51	0	0.02	25.25	27.21	13.06
56	217.45	8.92	0	0	0	213.1	0	0.02	24.95	26.79	24.39
59	209.57	15.3	0	0	0	212.87	0	0.02	24.59	26.34	13.69
62	213.04	16.93	0	0	0	212.21	0	0.02	25.14	26.88	12.58
65	211.55	11.39	0	0	0	211.91	0	0.02	25.17	26.85	18.58
68	213.37	15.82	0	0	0	211.46	0	0.02	25.36	27.03	13.48
71	209.01	15.97	0	0	0	210.98	0	0.02	24.84	26.44	13.08
74	209.34	14.49	0	0	0	210.51	0	0.02	24.8	26.37	14.45
77	216.48	14.63	0	0	0	210.1	0	0.02	25.42	27.03	14.8
80	211.84	16.62	0	0	0	209.62	0	0.02	24.79	26.33	12.74
83	209.26	16.48	0	0	0	209.12	0	0.02	24.39	25.9	12.7
86	216.37	16.88	0	0	0	208.63	0	0.02	25.27	26.83	12.82
89	214.89	16.1	0	0	0	208.11	0	0.02	24.93	26.45	13.35
92	218.25	17.38	0	0	0	207.65	0	0.02	25.6	27.15	12.56
95	217.42	18.14	0	0	0	207.07	0	0.02	25.39	26.93	11.99
98	210.87	15.57	0	0	0	206.59	0	0.02	24.59	26.06	13.54
101	218.19	13.32	0	0	0	206.14	0	0.02	25.46	26.98	16.38
104	213.07	14.4	0	0	0	205.76	0	0.02	25	26.48	14.79
107	212.81	18.9	0	0	0	205.25	0	0.02	25.05	26.52	11.26
110	212.02	12.58	0	0	0	204.7	0	0.02	25.19	26.67	16.85
113	207.03	12.09	0	0	0	204.46	0	0.02	24.83	26.27	17.12
116	210.65	17.28	0	0	0	203.94	0	0.02	25.37	26.84	12.19
119	209	12.55	0	0	0	203.48	0	0.02	25.35	26.81	16.66
122	207	18.87	0	0	0	203.12	0	0.02	25.06	26.49	10.97
125	211.8	16.58	0	0	0	202.41	0	0.02	26.02	27.48	12.77
128	206.6	10.95	0	0	0	202.14	0	0.02	25.35	26.76	18.86
131	206.18	18.3	0	0	0	201.66	0	0.02	25.71	27.13	11.27
134	201.77	18.25	0	0	0	201.09	0	0.02	25.24	26.62	11.06
137	205.04	13.67	0	0	0	200.61	0	0.02	25.76	27.15	15

140	205.63	13.39	0	0	0	200.24	0	0.02	26.03	27.44	15.35
143	192.15	13.95	0	0	0	199.79	0	0.02	24.23	25.54	13.77
146	200.54	14.52	0	0	0	199.4	0	0.02	25.6	26.98	13.81
149	198.04	18.12	0	0	0	198.9	0	0.02	25.23	26.58	10.93
152	194.38	15.26	0	0	0	198.36	0	0.02	25.07	26.39	12.74
155	193.58	13.68	0	0	0	197.98	0	0.02	24.9	26.2	14.15
158	193.53	15.95	0	0	0	197.52	0	0.02	24.97	26.27	12.14
161	193.08	13.07	0	0	0	197.06	0	0.02	25.13	26.42	14.77
164	193.89	10.85	0	0	0	196.72	0	0.02	25.37	26.67	17.87
167	190.77	17.95	0	0	0	196.34	0	0.02	25.2	26.48	10.63
170	192.92	15.58	0	0	0	195.71	0	0.02	25.6	26.89	12.38
173	189.64	14.38	0	0	0	195.4	0	0.02	25.58	26.87	13.19
176	187.3	16.66	0	0	0	194.82	0	0.02	25.22	26.48	11.24
179	188.38	12.63	0	0	0	194.45	0	0.02	25.64	26.91	14.92
182	185.4	13.25	0	0	0	194.04	0	0.02	25.12	26.38	13.99
185	183.98	13.15	0	0	0	193.65	0	0.02	25.12	26.38	14
188	185.23	13.59	0	0	0	193.24	0	0.02	25.53	26.79	13.63
191	183.18	13.17	0	0	0	192.84	0	0.02	25.36	26.6	13.91
194	181.18	14.94	0	0	0	192.44	0	0.02	25.37	26.59	12.12
197	183.39	11.43	0	0	0	191.98	0	0.02	25.89	27.12	16.04
200	176.11	13.44	0	0	0	191.72	0	0.02	25.03	26.22	13.1
203	182.41	17.77	0	0	0	191.16	0	0.02	25.95	27.17	10.26
206	174.99	10.52	0	0	0	190.73	0	0.02	25.18	26.37	16.64
209	173.76	13.29	0	0	0	190.46	0	0.02	25.04	26.2	13.08
212	168.87	12.63	0	0	0	189.95	0	0.02	24.77	25.91	13.38
215	172.13	14.27	0	0	0	189.7	0	0.02	25.29	26.46	12.06
218	170.82	11.37	0	0	0	189.12	0	0.02	25.27	26.44	15.03
221	165.44	14.67	0	0	0	188.97	0	0.02	24.48	25.6	11.27
224	167.66	16.96	0	0	0	188.25	0	0.02	25.15	26.29	9.89
227	167.3	10.46	0	0	0	188.01	0	0.02	25.03	26.17	16
230	165.18	14.5	0	0	0	187.55	0	0.02	24.95	26.08	11.4
233	167.78	13.93	0	0	0	187.17	0	0.02	25.26	26.39	12.04
236	166.37	11.18	0	0	0	186.74	0	0.02	25.23	26.36	14.88
239	167.42	8.97	0	0	0	186.49	0	0.02	25.66	26.79	18.65
242	161.64	16.01	0	0	0	186.14	0	0.02	25.19	26.28	10.1
245	163.13	10.63	0	0	0	185.61	0	0.02	25.49	26.6	15.35
248	161.35	11.02	0	0	0	185.47	0	0.02	25.53	26.64	14.64
251	162.28	12	0	0	0	184.94	0	0.02	25.6	26.71	13.52
254	161.06	13.14	0	0	0	184.74	0	0.02	25.76	26.86	12.26
257	159.22	13.92	0	0	0	184.16	0	0.02	25.45	26.54	11.44
260	161.86	14.87	0	0	0	183.91	0	0.02	26.03	27.14	10.88
263	156	13.56	0	0	0	183.28	0	0.02	25.14	26.2	11.51
266	157.33	8.35	0	0	0	183.12	0	0.02	25.82	26.92	18.85
269	153.78	12.79	0	0	0	182.72	0	0.02	25.12	26.18	12.03
272	151.13	10.82	0	0	0	182.39	0	0.02	25.05	26.11	13.97
275	154.42	8.02	0	0	0	182.07	0	0.02	25.51	26.59	19.27
278	152.79	15.37	0	0	0	181.84	0	0.02	25.54	26.61	9.94
281	149.37	13.93	0	0	0	181.21	0	0.02	24.93	25.97	10.72
284	152.44	9.2	0	0	0	181.03	0	0.02	25.47	26.52	16.56
287	150.39	11.59	0	0	0	180.61	0	0.02	25.69	26.75	12.98
290	147.21	14.09	0	0	0	180.34	0	0.02	25.03	26.05	10.45
293	145.87	8.21	0	0	0	179.82	0	0.02	25.01	26.04	17.77

296	149.22	12.12	0	0	0	179.78	0	0.02	25.46	26.5	12.31
299	144.37	17.05	0	0	0	179.08	0	0.02	25.1	26.14	8.47
302	141.87	9.97	0	0	0	178.84	0	0.02	24.74	25.75	14.23
305	141.17	10.01	0	0	0	178.44	0	0.02	24.85	25.86	14.11
308	146.65	11.58	0	0	0	178.23	0	0.02	25.87	26.91	12.66
311	143.51	9.78	0	0	0	177.77	0	0.02	25.51	26.54	14.67
314	139.25	8.47	0	0	0	177.63	0	0.02	25.04	26.05	16.44
317	141.56	14.28	0	0	0	177.21	0	0.02	25.26	26.27	9.91
320	145.44	11.23	0	0	0	176.84	0	0.02	25.98	27.02	12.95
323	144.73	7.06	0	0	0	176.55	0	0.02	25.58	26.59	20.5
326	142.6	11.55	0	0	0	176.35	0	0.02	25.57	26.59	12.35
329	145.3	10.19	0	0	0	175.89	0	0.02	25.9	26.93	14.26
332	138.74	9.58	0	0	0	175.73	0	0.02	25.33	26.33	14.48
335	139.32	21.48	0	0	0	175.24	0	0.02	25.23	26.23	6.49
338	136.67	11.37	0	0	0	174.6	0	0.02	25.12	26.1	12.02
341	138.61	4.99	0	0	0	174.54	0	0.02	25.54	26.53	27.8
344	135.9	12.69	0	0	0	174.19	0	0.02	25.31	26.31	10.71
347	135.59	13.21	0	0	0	173.82	0	0.02	25.13	26.12	10.26
350	139.27	8.92	0	0	0	173.44	0	0.02	25.71	26.72	15.61
353	134.83	9.31	0	0	0	173.25	0	0.02	25.02	26	14.47
356	139.81	10.22	0	0	0	172.87	0	0.02	25.65	26.66	13.68
359	142.71	11.14	0	0	0	172.64	0	0.02	26.67	27.7	12.81
362	135.63	11.19	0	0	0	172.21	0	0.02	25.11	26.08	12.12
365	132.07	11.08	0	0	0	171.97	0	0.02	24.82	25.78	11.92
368	136.97	10.57	0	0	0	171.55	0	0.02	25.75	26.74	12.96
371	135.39	10.81	0	0	0	171.33	0	0.02	25.5	26.48	12.53
374	134.36	12.69	0	0	0	170.89	0	0.02	25.58	26.55	10.59
377	137.72	10.2	0	0	0	170.6	0	0.02	26.01	27	13.5
380	132.8	15.05	0	0	0	170.24	0	0.02	25.38	26.34	8.83
383	132.69	9.29	0	0	0	169.76	0	0.02	25.07	26.02	14.28
386	129.17	7.44	0	0	0	169.65	0	0.02	24.55	25.48	17.37
389	131.38	10.09	0	0	0	169.28	0	0.02	24.84	25.79	13.02
392	132.84	14.22	0	0	0	169.04	0	0.02	25.27	26.23	9.34
395	130.9	12.66	0	0	0	168.47	0	0.02	25.38	26.32	10.34
398	132.46	6.93	0	0	0	168.3	0	0.02	25.54	26.49	19.12
401	126.59	13.14	0	0	0	167.98	0	0.02	24.67	25.59	9.63
404	132.81	10.61	0	0	0	167.57	0	0.02	25.71	26.67	12.52
407	128.66	11.22	0	0	0	167.32	0	0.02	25.05	25.98	11.47
410	131.28	12.78	0	0	0	166.89	0	0.02	25.56	26.51	10.27
413	132.25	9.22	0	0	0	166.59	0	0.02	25.7	26.65	14.34
416	128.28	8.27	0	0	0	166.32	0	0.02	25.2	26.13	15.5
419	132.95	10.96	0	0	0	166.07	0	0.02	25.93	26.89	12.13
422	128.2	9.79	0	0	0	165.69	0	0.02	25.54	26.47	13.09
425	127.14	9.47	0	0	0	165.47	0	0.02	25.19	26.11	13.42
428	127.24	12.74	0	0	0	165.09	0	0.02	25.52	26.44	9.99
431	127.08	12.36	0	0	0	164.74	0	0.02	25.24	26.17	10.28
434	126.85	9.2	0	0	0	164.37	0	0.02	25.4	26.33	13.78
437	126.68	13.94	0	0	0	164.13	0	0.02	25.3	26.22	9.09
440	125.79	11.21	0	0	0	163.59	0	0.02	25.08	26.01	11.22
443	124.1	5.3	0	0	0	163.48	0	0.02	25.17	26.1	23.43
446	123.29	8.83	0	0	0	163.2	0	0.02	24.83	25.75	13.96
449	122.63	10.02	0	0	0	162.96	0	0.02	25.09	26.02	12.24

452	124.81	10.03	0	0	0	162.61	0	0.02	25.33	26.27	12.44
455	122.78	10.98	0	0	0	162.36	0	0.02	25.34	26.27	11.18
458	124.43	12.59	0	0	0	161.95	0	0.02	25.36	26.28	9.88
461	126.15	6.49	0	0	0	161.65	0	0.02	25.4	26.33	19.44
464	128.19	13.88	0	0	0	161.47	0	0.02	26.13	27.08	9.24
467	130.02	11.25	0	0	0	160.88	0	0.02	26.32	27.28	11.56
470	127.07	6.93	0	0	0	160.81	0	0.02	25.96	26.89	18.33
473	124.86	10.22	0	0	0	160.41	0	0.02	25.49	26.41	12.21
476	125.12	10.62	0	0	0	160.22	0	0.02	25.69	26.61	11.79
479	121.19	5.81	0	0	0	159.81	0	0.02	25.21	26.12	20.86
482	122.86	11.51	0	0	0	159.8	0	0.02	25.27	26.18	10.67
485	124.03	18.79	0	0	0	159.11	0	0.02	25.73	26.66	6.6
488	119.67	6.67	0	0	0	158.8	0	0.02	24.72	25.61	17.94
491	117.82	9.42	0	0	0	158.62	0	0.02	24.62	25.5	12.51
494	121.14	10.62	0	0	0	158.24	0	0.02	25.37	26.29	11.41
497	120.73	7.35	0	0	0	158.01	0	0.02	25.2	26.1	16.42
500	120.47	10.51	0	0	0	157.76	0	0.02	25.39	26.3	11.46
503	121.92	9.44	0	0	0	157.4	0	0.02	25.08	25.98	12.92
506	120.11	12.99	0	0	0	157.16	0	0.02	25.15	26.06	9.24
509	120.47	8.53	0	0	0	156.67	0	0.02	25.18	26.08	14.12
512	125.26	11.78	0	0	0	156.61	0	0.02	26.44	27.38	10.64
515	118.92	9.29	0	0	0	156	0	0.02	25.18	26.08	12.8
518	120.7	4.83	0	0	0	156.06	0	0.02	25.45	26.35	25.01
521	121.22	12.07	0	0	0	155.64	0	0.02	25.86	26.76	10.04
524	119.32	6.88	0	0	0	155.41	0	0.02	25.28	26.17	17.34
527	122.49	14.7	0	0	0	155.15	0	0.02	25.91	26.81	8.33
530	117.82	12.44	0	0	0	154.6	0	0.02	25	25.87	9.47
533	120.08	5.54	0	0	0	154.43	0	0.02	25.17	26.04	21.68
536	121.43	8.66	0	0	0	154.19	0	0.02	25.73	26.62	14.01
539	120.12	11.41	0	0	0	153.91	0	0.02	25.12	25.98	10.53
542	121.78	12.37	0	0	0	153.53	0	0.02	25.69	26.57	9.84
545	120.25	5.23	0	0	0	153.22	0	0.02	25.41	26.27	23
548	120.42	12.65	0	0	0	153.12	0	0.02	25.54	26.41	9.52
551	116.64	11	0	0	0	152.52	0	0.02	24.87	25.72	10.61
554	120.48	7	0	0	0	152.48	0	0.02	25.69	26.55	17.21
557	118.33	11.81	0	0	0	152.04	0	0.02	25.4	26.26	10.02
560	120	7.33	0	0	0	151.82	0	0.02	25.75	26.61	16.37
563	117.86	14.47	0	0	0	151.53	0	0.02	25.52	26.36	8.15
566	118.43	9.14	0	0	0	151.03	0	0.02	25.59	26.45	12.96
569	120.3	10.42	0	0	0	150.95	0	0.02	25.77	26.63	11.54
572	116.94	9.25	0	0	0	150.42	0	0.02	25.11	25.97	12.64
575	118.2	5.46	0	0	0	150.41	0	0.02	25.1	25.96	21.66
578	114.37	9.29	0	0	0	150.04	0	0.02	25.02	25.86	12.31
581	115.48	7.02	0	0	0	149.88	0	0.02	25.08	25.93	16.45
584	115.61	14.84	0	0	0	149.56	0	0.02	25.29	26.15	7.79
587	118.05	10.66	0	0	0	149.07	0	0.02	25.9	26.78	11.07
590	119.71	9.49	0	0	0	148.91	0	0.02	25.89	26.76	12.62
593	114.77	6.78	0	0	0	148.51	0	0.02	25.35	26.2	16.94
596	118.08	7.42	0	0	0	148.48	0	0.02	25.45	26.31	15.91
599	116.66	14.12	0	0	0	148.02	0	0.02	25.41	26.27	8.26
602	117.71	7.05	0	0	0	147.72	0	0.02	25.57	26.43	16.71
605	116.45	8.61	0	0	0	147.55	0	0.02	25.66	26.52	13.53

608	115.4	12.65	0	0	0	147.19	0	0.02	25.76	26.63	9.12
611	114.92	7.41	0	0	0	146.85	0	0.02	25.37	26.22	15.5
614	116.29	8.26	0	0	0	146.7	0	0.02	25.77	26.64	14.08
617	114.41	9.26	0	0	0	146.35	0	0.02	25.1	25.95	12.35
620	115.37	9.19	0	0	0	146.15	0	0.02	25.24	26.1	12.55
623	115.2	11.64	0	0	0	145.78	0	0.02	25.11	25.98	9.89
626	116.99	8.27	0	0	0	145.49	0	0.02	25.19	26.06	14.15
629	116.43	10.98	0	0	0	145.25	0	0.02	25.32	26.19	10.6
632	117.9	6.54	0	0	0	144.88	0	0.02	25.47	26.34	18.03
635	113.56	8.37	0	0	0	144.82	0	0.02	24.75	25.59	13.57
638	115.44	13.79	0	0	0	144.35	0	0.02	25.6	26.47	8.37
641	114.64	8.61	0	0	0	144.06	0	0.02	24.96	25.8	13.32
644	117.47	8.55	0	0	0	143.8	0	0.02	25.64	26.5	13.74
647	115.19	7.67	0	0	0	143.54	0	0.02	25.27	26.1	15.03
650	112.53	14	0	0	0	143.3	0	0.02	24.54	25.36	8.04
653	114.3	7.74	0	0	0	142.79	0	0.02	25.18	26.03	14.77
656	116.05	4.49	0	0	0	142.81	0	0.02	25.07	25.92	25.86
659	115.21	13.34	0	0	0	142.44	0	0.02	25.38	26.25	8.63
662	118.79	11.67	0	0	0	142.08	0	0.02	26.21	27.1	10.18
665	116.91	8.17	0	0	0	141.76	0	0.02	25.61	26.47	14.3
668	117.76	5.29	0	0	0	141.59	0	0.02	25.7	26.58	22.26
671	118.75	8.39	0	0	0	141.4	0	0.02	25.67	26.54	14.16
674	117.37	9.71	0	0	0	141.09	0	0.02	25.55	26.42	12.09
677	114.07	12.98	0	0	0	140.81	0	0.02	25	25.85	8.79
680	114.85	11.13	0	0	0	140.35	0	0.02	25.15	26	10.32
683	111.3	6.8	0	0	0	140.16	0	0.02	24.59	25.41	16.37
686	109.99	5.09	0	0	0	139.92	0	0.02	24.14	24.95	21.61
689	120.87	9.56	0	0	0	139.8	0	0.02	26.27	27.16	12.64
692	115.8	14.77	0	0	0	139.35	0	0.02	25.72	26.58	7.84
695	117.78	6.82	0	0	0	139.01	0	0.02	25.67	26.54	17.27
698	116.2	8.3	0	0	0	138.87	0	0.02	24.85	25.69	14
701	118.49	12.67	0	0	0	138.49	0	0.02	25.67	26.55	9.35
704	115.21	7.4	0	0	0	138.18	0	0.02	24.79	25.63	15.57
707	113.59	8.3	0	0	0	138	0	0.02	24.86	25.72	13.69
710	116.91	12.5	0	0	0	137.66	0	0.02	25.22	26.1	9.35
713	119.2	5.43	0	0	0	137.33	0	0.02	25.77	26.67	21.94
716	116.79	10.81	0	0	0	137.25	0	0.02	25.31	26.18	10.8
719	116.62	12.55	0	0	0	136.7	0	0.02	25.31	26.17	9.3
722	118.19	7.8	0	0	0	136.55	0	0.02	25.47	26.34	15.16
725	117.82	5.81	0	0	0	136.21	0	0.02	25.28	26.14	20.27
728	115.67	8.35	0	0	0	136.16	0	0.02	24.85	25.7	13.85
731	114.7	16.91	0	0	0	135.68	0	0.02	24.88	25.73	6.78
734	117.24	8.32	0	0	0	135.26	0	0.02	24.88	25.74	14.08
737	120.85	6.38	0	0	0	135.13	0	0.02	25.55	26.44	18.94
740	119.29	13.91	0	0	0	134.82	0	0.02	25.56	26.45	8.57
743	115.08	7.63	0	0	0	134.39	0	0.02	24.59	25.44	15.08
746	119.46	5.64	0	0	0	134.33	0	0.02	25.6	26.49	21.17
749	120.46	14.51	0	0	0	133.98	0	0.02	25.69	26.58	8.3
752	117.91	9.36	0	0	0	133.55	0	0.02	25.04	25.91	12.6
755	118.77	5.97	0	0	0	133.41	0	0.02	25.24	26.11	19.89
758	118.13	12.73	0	0	0	133.12	0	0.02	25.32	26.19	9.28
761	119.49	11.45	0	0	0	132.7	0	0.02	25.18	26.05	10.44

764	121.58	7.56	0	0	0	132.46	0	0.02	25.42	26.3	16.09
767	120.86	4.99	0	0	0	132.23	0	0.02	25.14	26.01	24.23
770	120.33	11.18	0	0	0	132.1	0	0.02	25.33	26.2	10.76
773	117.09	15.65	0	0	0	131.58	0	0.02	24.88	25.75	7.48
776	122.12	4	0	0	0	131.27	0	0.02	25.52	26.42	30.56
779	121.17	7.01	0	0	0	131.23	0	0.02	25.45	26.34	17.29
782	121.18	19.46	0	0	0	130.78	0	0.02	25.11	26	6.23
785	120.27	8.52	0	0	0	130.23	0	0.02	25.05	25.94	14.12
788	122.55	4.29	0	0	0	130.23	0	0.02	25.4	26.3	28.58
791	121.81	14.62	0	0	0	129.87	0	0.02	25.12	26.01	8.33
794	121.24	9.53	0	0	0	129.45	0	0.02	24.83	25.72	12.72
797	124.37	8.29	0	0	0	129.28	0	0.02	25.77	26.7	15.01
800	123.62	8.24	0	0	0	128.94	0	0.02	25.35	26.27	15
803	125.67	7.7	0	0	0	128.78	0	0.02	25.58	26.5	16.31
806	122.63	11.56	0	0	0	128.45	0	0.02	25.33	26.24	10.61
809	125.41	9.59	0	0	0	128.13	0	0.02	25.55	26.47	13.08
812	127.19	9.08	0	0	0	127.87	0	0.02	25.88	26.82	14.01
815	128.81	10.78	0	0	0	127.57	0	0.02	26.18	27.13	11.94
818	124.7	9.36	0	0	0	127.24	0	0.02	24.91	25.82	13.33
821	124.26	12.85	0	0	0	126.98	0	0.02	25.02	25.94	9.67
824	125.27	13.03	0	0	0	126.5	0	0.02	25.03	25.95	9.61
827	128.79	7.23	0	0	0	126.23	0	0.02	25.37	26.32	17.82
830	122.4	10.66	0	0	0	126	0	0.02	24.64	25.56	11.48
833	125.5	5.56	0	0	0	125.64	0	0.02	25.34	26.28	22.57
836	129.75	9.28	0	0	0	125.61	0	0.02	25.57	26.51	13.98
839	128.1	20.27	0	0	0	125.05	0	0.02	25.47	26.41	6.32
842	128.96	6.43	0	0	0	124.56	0	0.02	25.65	26.61	20.04
845	131.96	5.26	0	0	0	124.57	0	0.02	25.51	26.46	25.1
848	125.99	16.76	0	0	0	124.16	0	0.02	24.61	25.53	7.52
851	129.91	8.06	0	0	0	123.7	0	0.02	25.66	26.62	16.13
854	124.86	5.79	0	0	0	123.63	0	0.02	24.89	25.82	21.56
857	128.7	0.01	-0.35	-0.03	0	123.29	0	0.02	25.37	26.32	0
860	130.79	0.01	-0.29	-0.03	0	122.95	0	0.02	25.31	26.26	0