

INDUSTRIAL HYGIENIST RESOLVES PAINT BOOTH VENTILATION PROBLEM AT NAS JRB WILLOW GROVE

The Aircraft Intermediate Maintenance Department (AIMD), Work Center 900, maintains various types of ground support equipment such as mobile power plants, de-icer trucks, engine testers, and quick engine change stands for Naval Air Station Joint Reserve Base (NAS JRB), Willow Grove, PA.



Spray-painting ground support equipment inside spray paint booth

Work Center tasks include welding, cutting, brazing, paint removal, assembly, disassembly, and corrosion control on the ground support equipment. One of the Work Center's important tasks is spray-painting. Military and contract employees

frequently spend 20 to 30 hours a week spray-painting ground support equipment in a paint booth that was specially designed for their spray-painting operations.

Components in some of the paints, primers, thinners, strippers, and varnishes that are used in the paint booth can be health-hazardous if used improperly or without the proper personal protective equipment. Workers wear full body protective clothing and supplied breathing air while working inside the Work Center paint booth to protect them against inhalation or skin contact with the chemicals used in preparing and painting of the ground support equipment. For added protection, the paint booth has a ventilation system specifically designed to remove the potentially health-hazardous air contaminants from inside the paint booth, in compliance with state regulations.



Looking into spray booth from outside. Poles hold small parts from ground service equipment. Rims in foreground are from a *buddha tugger*, which pulls airplanes.

AIMD Work Center 900 painters began to notice increased vibration and noise in the paint booth. During the same period, the booth's air filters also clogged up quickly, but substituting new air filters did not solve the problem. The situation interfered with spray-painting operations due to worker distraction and discomfort from the vibration and noise. An inefficient ventilation system can also mean lack of proper airflow and a potential increase in solvent exposure and contamination of the booth.



Industrial Hygienist, Steve Hart, inspects the fan blade motor above the paint booth

NAS JRB relied on Mr. Steven Hart, a Certified Industrial Hygienist with the National Naval Medical Center, who inspects the AIMD yearly, to investigate the paint booth problem. Industrial hygiene is a scientific discipline that is dedicated to the prevention of occupational diseases and injuries through anticipation, recognition, and evaluation of chemical and physical hazards in the workplace, and by developing methods to eliminate or control those hazards.

Mr. Hart has substantial experience in evaluating local exhaust ventilation systems. He determined that airflow within the paint booth was only 55 feet per minute (fpm), which was below the minimum requirement of 75 fpm set by the Occupational Safety and Health Administration (OSHA) for that type of paint booth. After taking additional measurements, Mr. Hart concluded that the booth's exhaust fan and ductwork were the likely cause of the reduced airflow and the increased noise and vibration. The booth was taken out of service, and the industrial hygienist inspected the exhaust fan. He found that layers of dried paint on the fan blades and in the paint booth's ductwork burdened the exhaust system excessively, so that it was no longer capable of efficiently removing exhaust air from the booth.



Exhaust ductwork above paint booth

Mr. Hart recommended that the fan blades and ductwork be cleaned of all paint residues. While thoroughly cleaning



Over 25 pounds of paint residue were removed from fan blades and ductwork

paint residues from the fan blades and ductwork, AIMD workers removed over 25 pounds of dried paint, which was disposed of by the base hazardous waste department. After AIMD cleaned the fan blades and ductwork and changed the air filters, the airflow inside the paint booth increased to a satisfactory 87 fpm, and the vibration and noise from the ventilation system disappeared.

The Industrial Ventilation

Systems Operation and Maintenance Manual requires periodic inspection and cleaning of all ventilation systems. AIMD is now developing a formal Preventive Maintenance Plan to ensure periodic inspection and maintenance of the paint booth ventilation system. Painter Thomas Bailey summed it up: "Thanks to Steve Hart, the painting operation is much more comfortable, and our work environment is greatly improved."



Fan blades after cleaning

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