United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park, NC 27711

EPA 456/N-97-001
January 1997

EPA Control Technology Center NEWS

Volume 9, No. 1 *A JOINT EPA / STAPPA / ALAPCO PROJECT* *January 1997*

FRACTIONAL PENETRATION OF PAINT OVERSPRAY ARRESTORS MEASURED BY APPCD

By Charles Darvin, NRMRL/APPCD
and Lyndon Cox, NRMRL/APPCD

Paint overspray arrestors are "air cleaners" that remove most paint overspray droplets from the air exhausted from a paint spray booth. They can be designed as fibrous filters, as separators, or as a combination of both.

When paint is sprayed, 10-50% of the paint sprayed becomes droplets that are carried away by air flow. These droplets are defined as overspray. Spray booth operators use a paint overspray arrestor to collect these droplets. An arrestor may collect 90% or more of the mass of the overspray droplets from the air stream. The remaining droplets pass through (penetrate) the arrestor and are discharged to the environment.

In 1995, the City of Philadelphia requested that the CTC conduct a study to determine whether paint droplets deposited on rooftops downwind of some spray booths were caused by a) inefficient paint overspray arrestors, b) poor maintenance of paint overspray arrestors, or c) some other cause.

Manufacturers of arrestors typically advertise the efficiency of their systems based on the percentage of paint aerosol by weight that the arrestor system captures (or collects, or arrests). This value, however, does not define the characteristics of droplets that penetrate the arrestor.Therefore, the research done by the CTC concentrated on determining the fractional penetration of aerosol droplets, i.e., the percentage of droplets in each aerosol droplet diameter range that penetrate the arrestors.

The small droplet sizes comprise

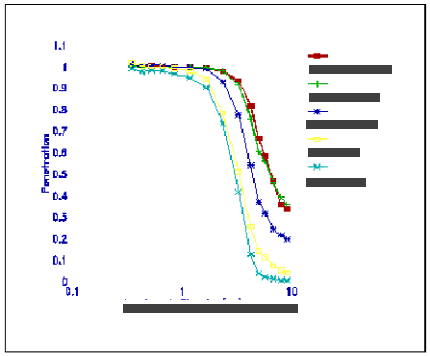


Figure 1. Summary of Clean Fractional Penetration

(continued page 2)

AIRWAVES

By Bob Blaszczak
CTC Co-Chair, OAQPS

All of us here at the CTC hope that all of you have had a pleasant holiday season and wish you a happy, healthy and prosperous new year.

By now you probably are well into meeting (or deleting) your New Year's resolutions and loosing those extra pounds we tend to put on during the holidays. We at the CTC have resolved to figure out what our new mission is given our reduced resources and changes in your need for information and how you access it. To survive in some form, the CTC needs to focus on those activities that best serve you and shed those that have become ineffective or inefficient. It's my guess that the CTC and the RACT/BACT/LAER Clearinghouse (RBLC) will evolve into a new and more focused technology transfer activity in FY97. Given the dramatic drop in HOTLINE calls and requests for CTC products in FY96 (no funds = very limited direct technical assistance and no new products = reduced requests), significant cuts in these areas are likely. (NOTE: See the table for a comparison of FY95/FY96 CTC performance.) A more compact, electronic information transfer (bulletin board system(BBS)/World Wide Web (WWW)) Home Page, pollution prevention/control clean air technology information transfer center is likely to emerge from remnants of the CTC and RBLC. If you have an opinion about the CTC, RBLC, or any of the related services the CTC offers, now is the time to speak up. We prefer that you send your thoughts through the CTC BBS or WWW Home Page, E-Mail or FAX. (See the back page for addresses and phone numbers).

The CTC did manage to complete a couple of old projects

(continued page 2)

AIRWAVES

(continued from page 1)

dealing with emissions from open burning land clearing debris (page 3) and the effectiveness of paint spray booth filters/baffles (lead article). The first four chapters of the revised OAQPS Control Cost Manual are also on the CTC BBS/WWW and we hope to have the remaining chapters available in February '97. When completed, this will be a new fifth edition of the OAQPS Control Cost Manual with updated cost information and some minor text changes. Once the electronic version is ready, a new hard copy fifth edition will be issued.

I'm not absolutely sure, but there is a good chance that this may be the last edition of the CTC NEWS. With limited resources and less or no new products to tell you about, the reasons for publishing the NEWS have all but evaporated. If we don't publish the NEWS in this format again, we will mail a notice to all CTC NEWS subscribers to inform them about that decision and any interim or final decision on the CTC's future. You can also keep in touch through the CTC BBS/WWW. We will do our best to maintain all existing CTC services until a decision on the CTC's future is made, but please be patient. There is a lot less to work with now.

It has been a pleasure serving you. Enjoy this edition of the NEWS and have a good year.

ACCESS TO CTC SERVICES
Fourth Quarter FY96

ACTIVITY	Total YTD FY95	Total YTD FY96	Change for FY95
Hotline:			
Govt. Agencies	1002	571	- 44%
Non-Govt.	2659	1806	- 32%
Total Hotline Calls	3681	2377	- 35%
Requests/CTC Products	10078	1511	- 85%
CTC BBS	12327	13952	+13%
RBLC	16574	12559	- 22%
Total Access	42660	30699	- 28%
FSBAP BBS (New Service)	0	3753	NA
Total Accesses	42660	34452	NA

PAINT

(continued from page 1)

only a small part of the total mass entering the arrestor since the mass of a droplet varies as the cube of its diameter. Thus, their passage was not readily detected when filtration efficiency was defined by weight. All five of the arrestors tested captured above 90% of weight of the paint droplets. As shown in Figures 1 & 2, the small droplets (<3 µm) tended to penetrate the arrestor much more readily than the larger droplets (>8 µm). Between 3 and 8 µm droplet diameters, the fractional penetration of different arrestors was in transition through the cutoff diameter (50% fractional penetration) for the various arrestors. The small difference between the figures results from a small loading of the arrestor with high solids baking enamel.

It was found that the paper mesh and the polyester bag types of arrestors exhibited the greatest efficiencies when tested over the droplet size range of 0.3 to 10 µm. Surprisingly, the pressure drop in the arrestor had no correlation with the fractional penetration. All of the arrestors tested indicated little capture of droplets of less than 3 mm diameter.

The report, "Fractional Penetration of Paint Overspray Arrestors" is available to government agencies through the CTC." Also, it is being made available to the public through the National Technical Information Service (NTIS) at (703) 487-4650. A downloadable version will be available on the CTC BBS/WWW by March 1997. You may contact Charles H. Darvin, the EPA Project Officer, at (919) 541-7633 or by e-mail at cdarvin@engineer.aeerl.epa.gov.

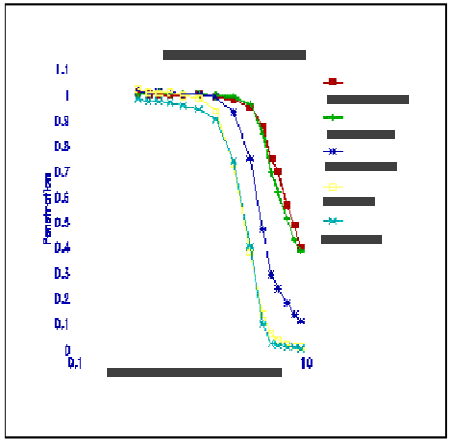


Figure 2. Summary of Loaded Fractional Penetration

MACT, CTG, NSPS, ACT AND TITLE I RULE SCHEDULES**

MACT STANDARD	Proposal	Final
Asbestos Litigation	*1/1/93	*6/15/94
Ferroalloys	3/97	3/98
Flexible Polyurethane Foam	*12/9/96	9/97
Gasoline Distribution	*12/8/95	1/97
Haz. Waste Inc.	*4/19/96	4/97
Mineral Wool	3/97	12/97
Off-site Waste & Recovery	*10/13/94	*7/1/96
Oil & Gas Production	3/97	9/97
Pharmaceutical Production	1/97	4/98
Polymers & Resins I	*6/12/95	*9/12/96
Polymers & Resins III	2/97	11/97
Polymers & Resins IV	*3/15/95	*8/29/96
Portland Cement	5/97	1/98
Primary Aluminum Prod.	*8/29/96	9/97
Primary Copper Smelting	4/97	11/97
Printing/Publishing	*3/1/95	*5/17/96
Pulp & Paper (combustion)	*2/27/95	8/97
Pulp & Paper (non-comb.)	*10/29/95	5/97
Secondary Aluminum Prod.	4/97	11/97
Steel Pickling-HC1 Process	2/97	12/97
Wool Fiberglass Mfg.	5/97	2/98

CTG ****	Proposal	Final
Aerospace Coatings	*10/8/96	4/97
Industrial Wastewater	*12/29/93	*****
Shipbuilding (coating)	*12/6/94	*8/27/96
Offset Lithography	*11/93	*****
Plastic Parts Coating	*****	*****
VOL Storage	*12/93	*****
Wood Furniture Coating	*9/7/95	5/00

ACT	Proposal	Final
Plywood/Particle Board (PM10)	Schedule Under Dev.	
Asbestos Processing Delisting	*1/24/95	*11/30/95

NSPS	Proposal	Final
Cold Cleaning	Withdrew	*10/18/96
Degreaser NSPS	*8/31/94	on Hold
Elec. Utility Gen. Rev. (NOx)	*5/30/94	7/97
Med. Waste Inc. NSPS & lll(d)	*2/27/95	*6/17/96
NOx NSPS Revision (407(c))	*11/31/95	7/97
SOCMI Sec. Sources Suppl.	*10/11/95	12/97
Starch Mfg. Industry NSPS	*8/31/94	on Hold

Other Rules	Proposal	Final
Arch./Ind. Coatings ('183e)	*6/25/96	1/98
Auto Refinishing ('183e)	*4/30/96	4/97
Household Consumer Products	*3/26/96	3/97
Haz. Waste TSDF, Phase II (RCRA)	*7/22/91	*12/6/94
Haz. Waste TSDF Phase III (RCRA)	Schedule under revision	

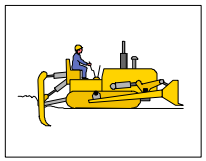
NOTE:
* Indicates date completed.
** All schedules are tentative and subject to change without notice. Only those rules with proposal or promulgation dates within one year are included. Completed rules are removed from list after six months.
***Schedule to be determined by litigation/negotiation
****ACT's were issued for most CTG categories in April 1995
*****Final CTG cancelled or no plans to finalize.

LAND CLEARING DEBRIS COMBUSTION STUDY COMPLETED

By Dr. Paul Lemieux
NRMRL/APPCD

Acurex Environmental recently completed a small-scale study for the CTC to evaluate the emissions from open burning of land clearing debris. Two different samples of debris, one from Florida and one from Tennessee, were combusted in the EPA's Open Burning Test Facility located in Research Triangle Park, NC. Some tests were run using a forced air fan to simulate a crude trench burning air curtain incineration system.

Several gas-phase measurements were made: fixed combustion gases such as oxygen, carbon dioxide, carbon monoxide, nitric oxide, and total hydrocarbon; particulate matter including PM_{10} and $PM_{2.5}$; and trace air toxics, including volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).



Results from the particulate testing showed that a majority of the particulate matter had diameters of <2.5 mm, which is of concern from a respirability standpoint. VOC and SVOC results report emission factors for many of those compounds. Comparison between emissions with and without the simulated trench burner does not show any significant improvement in total emissions, although burn times were shortened by the addition of the forced air.

The report, EPA-600/R-96-128 entitled "Evaluation Of Emissions from the Open Burning of Land-Clearing Debris" is available from the CTC and on the OAQPS Technology Transfer Network. For additional information, please contact Dr. Paul Lemieux at 919-541-0962.

WANTED: SOFTWARE REVIEWS FOR THE AIR COMPLIANCE ADVISOR (ACA) SOFTWARE PROGRAM

By Dan Maloney
University of Illinois at
Urbana-Champaign

The Air Compliance Advisor (ACA) is a software package designed to address air pollution compliance management issues. The ACA can estimate the cost and applicability of control devices and estimate the cost of ancillary control equipment, estimate emission rates, and provide guidance with the applicability of federal regulations.

In order to optimize the usefulness of the ACA, beta testers are needed to review the software and provide feedback. While the ACA is designed to be user-friendly, it is not a simple piece of software. The ACA considers a wide range of issues related to the development of air pollution compliance strategies, and a thorough review of the ACA will require 2-3 days to complete. Responses obtained during the review period will be used to plan the production version of the ACA. Any and all comments will be useful in this endeavor.

The current version of the ACA (beta test version 5.3) is available through the EPA's Control Technology Center (CTC) electronic bulletin board, and through the world wide web (WWW) at http://quattro.me.uiuc.edu/~acad/. Those interested in reviewing the software should contact Dan Maloney at:

Dept. of Mechanical Engineering
University of Illinois at
Urbana-Champaign
1206 West Green Street
Urbana, IL 61801

email: dan@solace.me.uiuc.edu
phone: 217-244-6808
fax: 217-244-4416

Completed reviews should be received by February 28, 1997.

The ACA is part of an on-going project at Argonne National Laboratory. Development of the ACA is sponsored by the US Army Corps of Engineers Construction Engineering Research Laboratory (USACERL), the US Air Force Environics Directorate of Armstrong Laboratory (AL/EQS), the Strategic Environmental Research and Development Program (SERDP), the US Army Center for Public Works (CPW), and the US Environmental Protection Agency (EPA). Thank you, and we look forward to your participation.

ENGINEERING SOLUTIONS TO INDOOR AIR QUALITY PROBLEMS

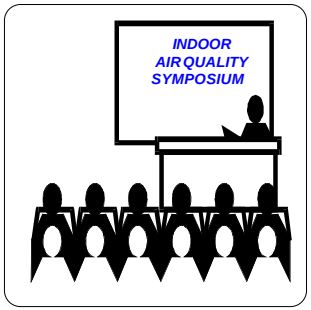
By Kelly W. Leovic
NRMRL/APPCD

The second biennial Engineering Solutions to Indoor Air Quality Problems Symposium, an international symposium cosponsored by the Air & Waste Management Association and EPA's National Risk Management Research Laboratory, will be held July 21-23, 1997, at the Sheraton Imperial Hotel and Conference Center in Research Triangle Park, NC. Papers are invited on the following topics:

- Managing the Risk of Indoor Air Pollution
- Indoor Air Source Characterization Methods
- Indoor Air Source Management
- Low Emitting/Low Impact Materials
- Development (Pollution Prevention)
- Biocontaminant Prevention and Control
- Indoor Air Cleaning Methods
- Ventilation for Indoor Air Quality
- HVAC Systems as Sources of Indoor Air Pollution
- Air Duct Cleaning
- Particles in Indoor Air
- Indoor Air Quality Modeling
- Costs of Managing Indoor Air Quality

The two-and-a-half-day symposium will consist of one general session so that participants will be able to attend all sessions. A poster session, continuing education courses, and an exhibition of related products and services are also planned.

For further information contact: Kelly W. Leovic, U.S. EPA, MD-54, Research Triangle Park, NC 27711; Telephone (919) 541-7717; Fax (919) 541-2157.



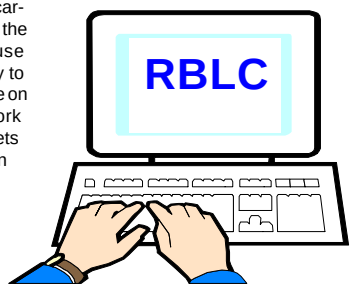
RBLC MOVES ONTO THE INFORMATION HIGHWAY

By Jo Ann Kerrick,
INDUS Corporation

Anyone who gets information electronically can only be amazed by the growth of the Internet and the World Wide Web (WWW). It seems like everywhere you look, organizations are trumpeting the nifty graphics and up-to-the-minute content of their Web sites. While we may not have animated cartoons zipping across our Web page, the RACT/BACT/LAER Clearinghouse (RBLC) has been working diligently to streamline Internet access to our site on the Technology Transfer Network (TTN) Web. The RBLC Web page lets users access most of the information from the TTN with the "point and click" ease of a Web browser instead of the character-based menu of the TTN bulletin board system (BBS).

We've recently enhanced the RBLC road map, one of our most popular selections, to make better use of the Web's ability to link one piece of information with other related topics. Look at the RBLC road map to learn about the general capabilities offered on-line on the RBLC. The short topic list should quickly point you to areas you are interested in. If you are accessing the road map from our Web page, you can use your browser to follow links from one subject area to another. We hope this update helps both new and long-time users learn about and use the full functionality of the RBLC.

Searching the RBLC on the Web is a little more complicated than just clicking on a link in your browser. The searches are actually performed on the BBS. You need a Telnet application installed on your PC, and you need to configure your Web browser to use it. (You can download a Telnet application from various sites on the Internet.) After you've set up both Telnet and your browser, getting to the searchable RBLC database is easy. The information screen that appears when you select to search the RBLC from our Web page explains everything. After you successfully Telnet to the TTN BBS, your session looks just like any other BBS session. You'll log in with your user ID and password or select one if you are a first time user. Then, access the list of Technical Areas and choose the RBLC BBS. From the RBLC BBS, choose **<B>** to search the database. Choose < **T**> to search the regulations database for summaries of Maximum Achievable Control Technology (MACT) standards and other rules enacted in support of the Clean Air Act.



When you are searching on the RBLC and want to save your results in a file on your local PC, be sure to select <I> for the Internet download option. When you use the Internet download option, the system saves your download report in a file on the FTP server. It does not automatically invoke the BBS download function. Perform as many searches as you like; choose any number of download formats. The system tells you when it has successfully created each file. Be sure to make a note of the file names you create. When you have finished searching, quit the search program, exit from the BBS and return to the RBLC Web page. Then from the RBLC Web page, select **FTP files from RBLC User Generated file area** to transfer your search results. Be sure to retrieve your files fairly soon after you create them because all download files are erased each Monday morning.

One of our primary goals for 1997 is to enhance the RBLC so that it is directly searchable from the RBLC Web page. The graphical environment of the (WWW) should allow us to simplify the search procedure. Users would select from drop-down lists of searchable properties and fill in text boxes with the value they are trying to match. This type of interface will be familiar to anyone who has used a search engine to find information on the Web. Similarly, search results would be viewable from your Web browser. Our objective is to maintain the search and reporting functionality of the current RBLC as we make this transition. Stay tuned on-line for more details as this project moves forward.

Control Technology Center NEWS

The CTC NEWS is a quarterly publication of the U.S. EPA's Control Technology Center (CTC). The CTC is an informal, easy-to-use, no cost, technical assistance service for all State and local (S/l) air pollution control agency and EPA Regional Office staffs. For others, some services may be on a cost reimbursable basis. The CTC offers quick access to EPA experts and expertise via the CTC HOTLINE, CTC World Wide Web Home Page and the CTC Bulletin Board, and in-depth technical support through source specific Engineering Assistance Projects or more generic Technical Guidance Projects. The CTC is operated by the Air Pollution Prevention and Control Division, National Risk Management Research Laboratory and the Information Transfer and Program Integration Division, Office of Air Quality Planning and Standards in Research Triangle Park, North Carolina.

If you have any air pollution emission or control questions or would like more information about the CTC and the types of technical assistance available, CALL THE CTC HOTLINE!

(919) 541-0800

Publication of the CTC NEWS does not signify that the contents necessarily reflect the views and policies of the U.S. EPA, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

CTC ASSISTANCE

No cost assistance to staff of State and Local agencies, EPA Regional Offices, and others on air pollution control technology issues.

CTC HOTLINE: CALL (919) 541-0800 to access EPA expert staff for consultations, references to pertinent literature, or access to EPA technical data and analyses. No question is too simple!

CTC FAX: You can send a request for any CTC service listed here by FAX. Our Fax numbers are: (919) 541-0242 or (919) 541-0361.

CTC BBS: Call (919) 541-5742 for up to 14400 baud modem to access the CTC Bulletin Board. Set communications parameters to 8 data bits, N parity, and 1 stop bit, and use a terminal emulation of VT100 or VT/ANSI. You may leave HOTLINE requests, order documents, suggest projects, and download documents and software. The BBS is part of the OAQPS Technology Transfer Network (TTN). In addition, the TTN may be accessed via the Internet at 'ttnwww.rtpnc.epa.gov' or through the EPA Home Page on the World Wide Web. The TTN also has an FTP site for downloading files at 'ttnftp.rtpnc.epa.gov'.

FEDERAL SMALL BUSINESS ASSISTANCE PROGRAM (FSBAP): The FSBAP is available through the SBAP BBS on the TTN (see CTC BBS for connection information), or the CTC HOTLINE or FAX. The FSBAP provides support to State Small Business Assistance Programs.

US-MEXICO INFORMATION CENTER ON AIR POLLUTION (CICA *Centro de Información sobre Contaminación de Aire*): Call the CICA Information line (919) 541-1800 (Spanish) or the CTC HOTLINE (English) to access technical support and assistance in evaluating air pollution problems along the Mexico-US Border.

INTERNET/WORLD-WIDE WEB ACCESS: Send E-Mail to 'blaszczak.bob@epamail.epa.gov'. In addition, you may access our services through the following sites:

For CTC - 'http://www.epa.gov/oar/oaqps/ctc/'
For FSBAP - 'http://www.epa.gov/oar/oaqps/sbap/'
For CICA - 'http://www.epa.gov/oar/oaqps/cica/'

RACT/BACT/LAER CLEARINGHOUSE (RBLC): The RBLC data base is available on the OAQPS TTN BBS (see CTC BBS for connection information). The Clearinghouse provides summary information on control technology and pollution prevention (P2) determinations made by permitting agencies, and on EPA emission standards and control techniques guidelines.

ENGINEERING ASSISTANCE PROJECTS: If you need in-depth assistance concerning a specific control technology or pollution prevention problem, contact the CTC. EPA staff and contractors are available for short-term projects such as review of proposed or existing control or prevention measures. Projects are subject to CTC Steering Committee approval.

TECHNICAL GUIDANCE PROJECTS: The CTC may also respond to a number of similar requests on issues of national or regional interest by undertaking broad, long-term projects. The result may be a control technology document, PC software, seminar, or workshop.

INTERNATIONAL TECHNOLOGY TRANSFER CENTER FOR GLOBAL GREENHOUSE GASES (ITTCGGG): Call the CTC HOTLINE to access ITTCGGG information on greenhouse gas emissions, prevention, mitigation, and control strategies.

MAIL: Address conventional mail inquiries to: CTC (MD-12), U.S. EPA, RTP, NC 27711.

EPA
United States
Environmental Protection Agency
CTC, ITPID, OAQPS (MD-12)
Research Triangle Park, NC 27711
Official Business
Penalty For Private Use,
$300

An Equal Opportunity Employer

FIRST CLASS MAIL
Postage and Fees Paid
EPA.
Permit No. G-35