



design FOR THE ENVIRONMENT

Auto Refinishing Project

Spray Booth Filters: The Key to Quality Jobs and Clean Emissions

What Is EPA's Design for the Environment (DfE) Automotive Refinishing Partnership?

EPA's DfE Program forms partnerships to reduce risk to people and the environment through pollution prevention. DfE has been working with the automotive refinishing industry since 1997 to identify and promote safer, cleaner, and more efficient practices and technologies. The DfE team conducts best practices workshops and site visits for collision repair businesses and schools. A Best Practices Outreach Kit with checklists, fact sheets, case studies, health and safety information, and links to numerous resources can be downloaded from the DfE web site at <http://www.epa.gov/dfe/pubs/projects/auto>.



The Key to Quality Jobs and Clean Emissions

Best practices can reduce emissions of hazardous air pollutants during spraying of automotive paints. Painters should be trained in the efficient use of high volume low pressure (HVLP) or equivalent spray guns and use paints that do not contain lead or chromium pigments. All spray painting should be conducted in a well-ventilated and well-maintained spray booth. This fact sheet highlights key factors regarding the need to use and maintain paint booth filters to achieve a quality job and protect the painter, others in the shop, and the environment.

Spray Booth Filters Impact the Job Quality and the Environment

The efficiency of the spray booth operation, as well as the resulting quality of the sprayed finish is affected by both the intake and exhaust filters (also known as paint overspray arrestors). When the intake and paint arrestor filters are well maintained, the air flows evenly through the spray chamber and around the part or vehicle surface, picking up the overspray and volatiles and promptly removing them from the area.



Booth Floor With Dirty Filters
Photo provided courtesy of Air Flow Technology, Inc.

If the spray booth intake or exhaust filters become clogged with dust or oversprayed particles, the air may not flow properly through the chamber. Instead of sweeping over the coated surface and exiting, small pockets of dust and overspray may re-circulate within the booth and affect the quality of the finish. In addition, flammable or explosive conditions may be created if volatile solvents collect within the closed space. Clogged filters also cause the booth fans to work harder, decreasing their efficiency and life.

Note: Most filters do not remove solvent vapors from shop exhausts!

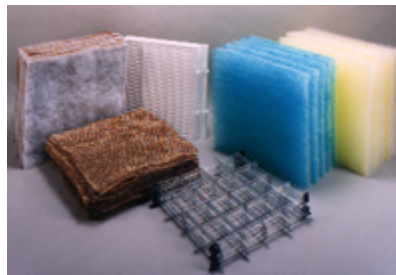
While the spray booth works to remove harmful solvent vapors from inside the shop, most exhaust filters do NOT remove these solvent vapors or volatile organic compounds (VOCs) from the exhaust emitted into the air from the shop.

Consider switching to waterborne paint products to reduce VOCs!

Exhaust Filters or Paint Overspray Arrestors

Booths use exhaust filters or paint overspray arrestors to decrease emissions from the shop by capturing the oversprayed coating mist and particles before that air is exhausted from the shop into the environment. These filters are located at the opposite end of the intake filters in crossdraft booths, and in or near the floor of downdraft booths.

Paint overspray arrestors come in a variety of shapes and styles, including bulk and perforated rolls, blankets, pre-cut pads, cubes and bags, self-supported panels with internal frames, baffled panels, and accordion-folded panels. Paint overspray arrestors can be constructed from various materials including fiberglass, polyester, paper, cardboard, styrene, or a combination of materials.



Spray Booth Exhaust Filters



Pocket Cube Filter
Photos provided courtesy of Air Flow Technology, Inc.

Spray booth exhaust filters are typically capable of removing between 90% to more than 99% of the atomized automotive coating mists and particles that are contained in the spray booth exhaust stream, thus reducing the shop's emissions of potentially hazardous paint materials into the air. These materials may otherwise settle out of the air and fall into neighboring properties and water sources.

Alert! New EPA Regulation

A new national standard now requires all shops that spray coatings containing a targeted hazardous air pollutant (HAP) to conduct spray operations in a booth outfitted with an exhaust filter with a removal efficiency of 98% or greater. Work with your spray booth manufacturer or filter supplier to select the right filter for your shop's filtration needs.

For specific details of the regulation, visit the EPA website at <http://www.epa.gov/fedrgstr/EPA-AIR/2008/January/Day-09/a24718.htm>

Intake Filters

Spray booths utilize *intake* filters to clean dirt and particles from the air entering the chamber. Intake filters are typically positioned in the doors or in panels adjacent the doors at one end of a crossdraft booth, and in the ceiling of downdraft booths. Downdraft booths may also be outfitted with *prefilters* that remove coarse dust upstream of the ceiling diffusion filters, thus extending their life. These filters can remove 75% to more than 99% of particles measuring between 7 and 10 micrometers.

Proper Maintenance of Spray Booth Filters is the Key!

Well-maintained filters ensure clean air enters the booth and efficiently remove overspray particles and mist from exhaust air.

In order to keep filters in the best working condition, it is important to establish the right change-out schedule for your shop.

Readings from a manometer or magnehelic pressure gauge should be used to establish a change out schedule for intake and exhaust filters according to the booth

Remember!

Proper maintenance of your filters not only ensures a quality finish and efficient operation of your spray booth, it is a *vital* step in ensuring that your spray painting operation meets health and safety standards required by OSHA and NFPA regulations.

See OSHA 1910.107 and NFPA 33 for more information about spray booth safety requirements.

manufacturer's specifications. If your booth does not have a pressure gauge, you should establish a strict maintenance schedule based upon the volume of spray finishing taking place on a day-to-day basis. It is typically recommended that ceiling filters be changed at least twice a year. All other intake filters should be changed once a month or as needed.

Different styles and brands of paint arrestors will reach their "target" reading and require replacement at varying rates depending upon the paint type, booth design, operator technique, fan speed, temperature, spray equipment, etc.

Your spray booth manufacturer or filter supplier can help you design an effective change-out schedule for your shop – striking the right balance between your filtration needs and cost efficiency in maintaining optimum spray booth performance.

Worker Safety

When replacing used filters, workers should wear appropriate personal protection: half-face, air-purifying respirator with dual organic vapor and dust/mist cartridges, gloves (e.g., nitrile gloves), protective coveralls, and sleeve protectors.

Workers should wear a dust mask, gloves, and coveralls to protect against dry paint and dust particles that may break loose while handling dry filters.

Proper Disposal of Waste Filters

Before disposing of waste filters, you must determine whether the filters would be considered hazardous waste. Consult with your jobber, filter supplier, and local authorities for assistance in properly characterizing and handling your waste filters.

For additional information, visit the DfE Auto Refinishing Partnership website at <http://www.epa.gov/dfe/pubs/projects/auto>

and the virtual auto body shop on the CCAR-Greenlink website at <http://www.ccar-greenlink.org/cshops>.



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