



Pollution Prevention in the Autobody Shop

What is Pollution Prevention (P2)?

Pollution prevention (P2) is the use of materials, processes or practices that reduces or eliminates the creation of pollutants or waste at the source. It includes raw material substitution, improved operating practices, process and equipment modifications, and energy and water conservation.

Why Prevent Pollution?

Some of the advantages of pollution prevention include savings in costs for input material, waste treatment and disposal. Other benefits can include reduced regulatory burdens, reduced permit fees, better worker health and safety conditions and enhanced public image.

Pollution Prevention Opportunities in the Autobody Shop

Pollution prevention practices in the automotive refinishing industry generally fall into one of three categories: product changes, good operating practices, or technology changes.

Product Changes

In the automotive refinishing industry, pollution prevention can take the form of using a safer material in place of a more hazardous one. This is known as material substitution.

Several opportunities to incorporate material substitution as a way to reduce the risk of exposure to hazardous materials have been identified in the autobody shop. In a 1996 survey, nearly all Rhode Island body shops indicated that they now use high

solids, low Volatile Organic Compound (VOC) coatings; such coatings are also approved for usage under RI Air Pollution Control Regulation # 30, "Control of Volatile Organic Compounds from Automobile Refinishing Operations." Other opportunities to reduce risk through material substitution include: replacing solvent-based cleaners (which are used to remove dirt and grime from vehicle surfaces prior to spray painting) with water-based or low VOC materials; eliminating the use of solvents to clean hands and other skin surfaces and substituting with special water-based cleaners, and; using cadmium-free solder and resistant spot welding and/or metal bonding adhesives (in certain applications) in place of conventional automobile welding practices— thereby reducing worker exposure to metal fumes.

Some shops reported that they use the solvent methylene chloride as a paint stripper. This VOC can be eliminated and replaced with special abrasive blasting techniques that use inert (nonsilica-based) media and vacuum control. Several chemical substitutes for methylene chloride also exist: these include aqueous solutions of caustic soda, dibasic esters, and semi-aqueous terpene-based or detergent-based products.

With regard to solvent elimination during spray booth cleaning, disposable masking over interior paint booth surfaces can be used as an alternative to cleaning paint residue from the interior spray booth surfaces. In fact, research conducted by the U.S. Environmental Protection Agency (EPA) revealed that several low-cost masking alternatives to solvent

cleaning exist, including peel/tacky coats, plastic and paper sheeting, scraping and water-based or low VOC cleaners.

In certain applications, paintless dent removal (PDR) can serve as a replacement for conventional refinishing— thereby eliminating potential exposure to contaminants generated during body repair and spray painting. PDR is a purely mechanical process that uses special tools to restore sheet metal back to its original form by removing small dents, creases and surface imperfections without the need for repainting. It has been reported that PDR can replace a significant portion of standard body shop work at a fraction of the cost.

As with all pollution prevention efforts, the primary objective of material substitution should be to reduce risk, being careful not to adopt measures that replace one type of hazard with another.

Good Operating Practices

Though zero risk is the most desirable outcome of any pollution prevention effort, it is not always achievable. In light of this, good operating (or "housekeeping") practices focus on containing or controlling the source which presents the hazard. Many Rhode Island companies currently perform simple conservation measures as part of their housekeeping practices; this is prob-



ably because these measures are recognized cost-saving practices that require no up-front investment. Such practices include: keeping solvent containers closed when not in use; protecting raw materials from damage, contamination or exposure to the elements; supervising and controlling the dispensing of raw materials; training workers to conserve raw materials by minimizing overspray; limiting access to raw materials, and; using a first-in/first-out inventory system.

Many companies have also adopted other more-advanced good operating practices that result in pollution prevention, such as mixing paints in-house and/or using a computerized inventory system.

When it comes to managing waste in the autobody shop, good operating practices exist that can reduce pollution, increase safety, and save money. For instance, storing waste thinners separately from paints, catalysts and other materials is a necessary first step toward recycling. Solvents can be recycled on-site by using a solvent recycling system, or they can be collected for off-site recycling by licensed waste haulers. Even used shop rags offer a clear opportunity for material recycling or waste minimization. Rather than discarding these rags, some shops have found it cost effective to have them cleaned by a professional laundering service. Another useful device that can be employed in the autobody shop is an industrial trash compactor, specifically one designed to compress the cardboard cartons that autobody panels and parts are shipped in.

Certain aspects of EPA's energy savings program, known as "Greenlights," can be adopted to help autobody shops conserve energy, and thus, save money. These include the usage of skylights, and relamping the shop with energy-efficient light bulbs.

Technology Changes

Rhode Island's Air Pollution Control Regulations for automotive refinishing operations contain pollution prevention requirements for coatings application equipment and spray gun cleaning. The coatings application equipment specification requires the use of High Volume Low Pressure (HVLP) spray guns or other types of applications that achieve a 65% transfer efficiency. When properly used, HVLP spray guns are reported to have the following benefits: (1) a 30% or more reduction in coating usage, (2) a reduction in paint overspray resulting in cleanup cost savings and decreased frequency of spray booth filter changes, and (3) improved ability to apply thick or high-solid coatings as compared to conventional high-pressure siphon guns. Low Volume Low Pressure (LVLP) guns are reported to have about the same transfer efficiency as their HVLP counterparts and, from a pollution prevention perspective, may have an additional benefit in that they reportedly consume less energy.

Another technological change in the autobody shop that reduces solvent losses to the environment is the usage of enclosed spray gun cleaners. The pollution prevention rule for spray gun cleaning requires spray guns to be cleaned in a device that (1) recirculates solvent until it can no longer be reused, and (2) is either enclosed or achieves similar emissions reductions. Additional reductions in solvent exposure may be achieved by installing ventilation equipment over the enclosed gun cleaners.

Many companies have also adopted yet another more advanced measure that results in pollution prevention—the usage of a computerized scale for paint mixing. This device can assist in conserving raw material usage up front, which in turn can result in conserving company profits in the long run.

What Does Rhode Island's Pollution Prevention Program Offer?

DEM's P2 Program offers technical and compliance assistance to RI industries looking to reduce their raw chemical and hazardous material purchases, recycle and reuse waste streams, and improve their bottom line. The Program staff, with engineering and scientific support from URI's Center for Pollution Prevention, have performed more than 300 on-site visits ranging from answering simple waste-related questions to conducting a detailed pollution prevention assessment of an industrial facility. The program is completely voluntary, non-regulatory, confidential, and free of charge to RI businesses.

For more information on how your autobody shop can benefit from practicing P2 strategies and technologies, please contact DEM's Office of Technical & Customer Assistance at (401) 222-6822.

