OFFICE OF TECHNICAL ASSISTANCE & TECHNOLOGY

Less Toxic Alternatives

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Auto body products contain many toxic chemicals. Fortunately, manufacturers continue to research and develop less toxic alternatives, such as water-based paint and gun wash solution.
Many Massachusetts auto body shops are adopting less toxic chemicals and practices that are effective in both cost and performance. These changes reduce worker exposures to toxic chemicals and can even save shops money. This fact sheet describes four specific ways that auto shops can transition to using less toxic alternatives.

Terms to Know

The following are a few terms that manufacturers, suppliers and regulatory agencies use when describing certain chemical groups:

Volatile organic compounds (VOCs)
The term VOC refers to a large class of chemicals that readily evaporate at room temperature. VOCs can be found in spray gun cleaning solutions and other items in your shop. VOC usage in industry is closely regulated because it contributes to air pollution. Many VOCs are also toxic. Because of their quick evaporation time and ability to get into the air, formulations high in VOCs lead to higher worker exposures to toxic chemicals. Always consider using lower VOC products, since lower VOC formulations reduce workplace exposures and are less strictly regulated.

Many examples of products that can contain VOCs

Photo courtesy of Wikipedia “Environmental Impact of Paint,” uploaded by user Brighterorange

Hazardous air pollutants (HAPs)
HAPs are also known as “air toxics.” These pollutants are chemicals that are known or suspected to cause cancer (a.k.a. a carcinogen) or can cause other serious health issues, such as being a reproductive toxin or cause birth defects. The U.S. Environmental Protection Agency (EPA) has designated 188 chemicals as HAPs. HAPs most commonly found in auto body paints are cadmium, chromium, lead, nickel, and manganese.

Isocyanates and diisocyanates
Currently all clear coats contain a chemical family known as diisocyanates or isocyanates. This means that you should make every effort to protect your workers through both respiratory and skin protection because isocyanates can cause work-related asthma and chemical sensitization when it is absorbed through the skin or inhaled. The health damage is irreversible and can be fatal.

Isocyanates can penetrate latex gloves without any trace of damage to the glove. Nitrile gloves provide the best barrier and should be used when working with any clear coat. In addition, supplied air respirators provide the best protection while both painting and applying clear coat.

Options for Toxics Use Reduction

Use a safer gun wash solution
Shops can use water-based or less toxic cleaners instead of solvents or paint thinner to clean spray guns. These solutions work just as well to clean guns that have sprayed water or solvent-based paints and clear coat.

Water-based gun cleaning solutions have low VOC levels. Using low VOC solutions benefit the health of your employees by reducing their exposure to dangerous chemical fumes. A single five gallon pail of water-based gun cleaning solutions can be reused for several years, reducing purchasing and hazardous waste disposal costs.

The 912 Auto Center (Dorchester, Massachusetts) switched from a solvent-based cleaning approach to the Acrastrip® gun cleaning solution. An analysis of 912's gun cleaning costs shows that the shop saves more than $3,000 per year from reduced waste and fewer purchases of the thinner and solvent-based products. See the full case study.

> *"I am happy with the water-based technology and am eager to show other businesses that it is possible and profitable to move toward more environmentally-friendly chemicals and technologies."*
>
> Larry Dossantos, Owner, 912 Auto Center

Use less toxic prewash
Pre-wash materials used to wipe down vehicle surfaces before painting may contain harmful chemicals such as benzene, toluene, and xylene. Some shops have stopped using these more toxic formulations and replaced them with alcohol and water-based glass cleaner.

Keep in mind that VOC-content in your prewash solution must not exceed MassDEP's regulatory limits (310 CMR 7.18(28)(c)). The limit for "pretreatment wash primer" is 6.50 lbs of VOCs per gallon. You should confirm that your prewash solution meets this requirement, and your supplier should be able to identify alternatives with considerably lower VOC content.

> *"We've been able to use an alcohol-based surface cleaner to wipe down cars or parts prior to painting. This has worked effectively and is less toxic than a lot of the alternatives out there."*
>
> Tom Ricci, Owner, Body & Paint Center

Use "HAP-free" paints
Paints that contain chromium, lead, cadmium, nickel, and manganese are HAPs that are regulated by US EPA's NESHAP 6H - "Paint Stripping and Miscellaneous Surface Coating Operations." These can be found in metallic colors and tints of red, orange, and yellow.

All auto shops are required to file with the EPA for NESHAP 6H compliance. Shops that can prove that they use "HAP-free" paint lines can file for an exemption from this regulation. Shops exempt from NESHAP 6H regulations still must comply with Massachusetts air regulations. According to the EPA, approximately

10 percent of shops that filed compliance paperwork with the EPA have already adopted “HAP-free” paints, and are therefore exempt from the EPA’s “6H NESHAP” regulation. See the “Spray Painting Regulations” fact sheet for more information.

Many popular paint manufacturers (such as Sherwin Williams, Sikkens, PPG- also see PPG’s ‘Area Source Rule Exemption Qualifying Products List’ at the bottom of the page - etc.) will provide you with lists of NESHAP regulated coatings or coatings that do not contain target compounds, Ask your supplier or paint manufacturer for a list of products containing these target compounds in your coating lines. Note that both water and solvent-based paints can contain HAPs.

Move from solvent to water-based paints
See the “Water-based paints” fact sheet for further information about the benefits and implementation of waterborne basecoats.

Take the Next Step

Shop owners are encouraged to investigate multiple options for adopting less toxic alternatives for auto refinishing chemicals.

- Check with suppliers about their available less toxic alternatives. Be sure to ask about how alternatives might affect other aspects of your operations (e.g., your spray booth, gun cleaning, and spray gun selection). Your supplier might even provide demonstrations of new product lines and allow you to test new products on a trial basis.

- Talk to other shop owners who have successfully switched to safer alternatives to learn about benefits, performance, savings or challenges. If you do not know any shops that have implemented the changes, contact your supplier or staff at the Massachusetts Office of Technical Assistance (OTA) (617-626-1060) and ask for a reference.

- OTA is very interested in learning about your experiences using less toxic alternatives or water-based paints. If you adopt any changes listed in this fact sheet, please share your impressions with OTA. Contact Marina Gayl at 617-626-1077 or Tiffany Skogstrom at 617-626-1086.

For free and confidential technical assistance or questions, contact:
MA Office of Technical Assistance 100 Cambridge Street, Suite 900, Boston MA 02114
Phone: 617.626.1060 Fax: 617.626.1095 E-mail: maota@mass.gov
www.mass.gov/eea/ota/masscar