

Preventing Pollution and Protecting Worker Health in Auto Repair

Completed Occupational Health Branch Activity, 2002-2004

Background

There are more than 31,000 automotive repair shops in California. These shops routinely buy and use a variety of aerosol cleaning products. Many of the products contain toxic solvents that can pollute the environment and damage health. Frequent changes in product ingredients, problems obtaining and interpreting Material Safety Data Sheets, and limited health and safety resources make it difficult for many auto repair facilities to know which aerosol products to purchase to protect workers and the environment.

In 2001, OHB's **Hazard Evaluation System and Information Service (HESIS)** issued a health hazard advisory after learning that auto mechanics developed nerve damage from using aerosol brake cleaners containing the toxic solvent, hexane. Ironically, hexane was added to brake cleaners as a replacement for chlorinated solvents like methylene chloride, which cause environmental pollution and cancer. While many manufacturers removed hexane from their products in response to the HESIS advisory, in some cases they replaced hexane with other toxic solvents. Despite the fact that water-based, non-aerosol automotive cleaners are available, aerosol cleaners that contain toxic solvents continue to be popular in auto repair shops because they help mechanics degrease brakes and perform other cleaning jobs quickly.

Purpose

The goal of this project was to protect worker health and prevent environmental pollution by identifying and promoting the use of non-toxic aerosol cleaners that are safe and effective substitutes for products containing toxic solvents. A secondary goal was to help employers develop a comprehensive approach to preventing injury, illness, and pollution from common auto repair industry hazards. The project was funded by the US Environmental Protection Agency Office of Pollution Prevention.

Activities

To achieve this, HESIS and its partners:

- Tested non-toxic aerosol cleaners in 14 diverse auto repair facilities to identify cost-effective cleaners that perform well;
- Evaluated potential health effects of the alternatives and compared them to that of solvents that are currently used;
- Conducted field visits to vehicle repair shops to observe use of automotive cleaners;
- Interviewed employers, union members, hazardous materials inspectors, and others to learn about the use of aerosol cleaners, regulatory compliance, and effective ways to provide health and safety information to the auto repair industry;
- Analyzed data from Cal/OSHA compliance records and from workers' compensation to understand the industry's health and safety problems;
- Developed and distributed educational materials on safer aerosol automotive cleaners and prevention of injury, illness and pollution in the auto repair industry; and
- Strengthened collaboration among government agencies and diverse groups that address worker and environmental protection through a variety of joint activities.

Partners

- Institute for Research and Technical Assistance (IRTA)
- U.S. Environmental Protection Agency (EPA)
- International Association of Machinists (IAM)
- Automotive Service Council
- California Department of Toxic Substances Control (DTSC)
- Bay Area Air Quality Management District (BAAQMD)
- South Coast Regional Air Quality Management District (SCAQMD)
- Cal/OSHA
- California Air Resources Board (CARB)

Frequently Asked Questions

1. How can working with toxic solvents affect my health?
2. How can I find out if I'm working with toxic solvents?
3. What is "Pollution Prevention?"
4. How does Pollution Prevention help to protect workers?
5. Do pollution prevention alternatives always protect workers?
6. What can be done to ensure that pollution prevention alternatives don't harm workers?
7. Did your project find safer aerosol cleaners that are good substitutes for solvent-based aerosols?
8. Did the project identify other auto repair hazards and ways to protect against them?

1. How can working with toxic solvents affect my health?

If you breathe too much of a toxic solvent it affects your nervous system (your brain). Symptoms include nausea, dizziness, clumsiness, drowsiness, and other effects like those of being drunk. If you are overexposed for a short time, the effects on your nervous system go away when exposure stops. However, if you are overexposed for months or years the damage to your nervous system can last a long time and may be permanent. Solvents can also irritate your eyes, nose, throat and skin. Getting solvents on your skin can cause a rash (dermatitis). Some solvents can also cause other long-term health effects, including damage to the nerves in your feet, legs, hands, and arms; damage to your reproductive system; or cancer.

2. How can I find out if I'm working with toxic solvents?

Check the Material Safety Data Sheet (MSDS) for the product you are using. Section 2 of the MSDS should identify toxic solvents and other hazardous materials by their Chemical Abstract Service (CAS) numbers. The MSDS also should have information on health hazards and exposure control methods. However, sometimes the health hazard information is difficult to understand and may not be complete. See the HESIS publications, *Aerosol Use in Auto Repair*, *HESIS Guide to Solvent Safety*, and *n-Hexane Use in Vehicle Repair* for information on the health hazards of toxic solvents and how to protect against exposure and prevent health damage.

3. What is “Pollution Prevention?”

This term refers to an approach in which environmental pollutants are replaced by alternative products or processes that do not create smog or deplete the ozone layer. Pollution Prevention (or P2) is different from pollution control, which relies on controlling the quantity of pollutant released to the environment, and proper handling of chemical wastes (recycling, re-use or acceptable disposal).

4. How does Pollution Prevention help to protect workers?

If pollution prevention alternatives or replacement products are non-toxic and are used in workplaces, they will help protect workers' health as well as the environment. For example, in several industries, water-based cleaners have been developed as replacements for cleaners that contain toxic solvents. Although the primary reason for developing the cleaners was to reduce air pollution, workers who use the cleaners will significantly reduce their risks of developing nerve damage and other serious health problems that can be caused by toxic solvents.

5. Do pollution prevention alternatives always protect workers?

No. If the replacement product is narrowly directed toward preventing environmental pollution without also looking at the potential impact on worker health, an alternative that is harmful to worker health may be introduced. This was the case when brake cleaners were re-formulated with n-hexane as a replacement for chlorinated solvents like methylene chloride. Another example is the development of the toxic solvent 1-bromopropane as a replacement for ozone-depleting solvents like trichloroethane in spray adhesives and degreasers.

6. What can be done to ensure that pollution prevention alternatives don't harm workers?

It is important to identify non-toxic or low toxicity pollution prevention alternatives that are safer for both workers and the environment. This requires researching, developing, and testing the safer alternatives to ensure that they are effective substitutes and can be used by the industry. It's also important for environmental protection and occupational health agencies to work together when pollution prevention alternatives are being considered. For example, HESIS staff participates on technical advisory groups convened by the South Coast Air Quality Management District, the California Air Resources Board, and other agencies to help ensure that alternative chemicals identified as safe for the environment don't pose health hazards for workers.

7. Did your project find safer aerosol cleaners that are good substitutes for solvent-based aerosols?

Yes. We identified water-based aerosol cleaners that were effective for general purpose cleaning, cleaning brakes, and degreasing engines. Aerosol cleaners formulated with soy and acetone were effective in cleaning carburetor or fuel-injection intakes, and were safer for workers and the environment than the solvent-based aerosol cleaners currently in use. The Institute for Research and Technical Assistance (IRTA), a non-profit organization that worked with us on the project, has information on the availability of the safer alternatives we identified during the project. See our fact sheet, ***Aerosol Cleaner Use in Auto Repair***.

8. Did the project identify other auto repair hazards and ways to protect against them?

Yes. We identified a variety of other health and safety hazards in the industry and ways to protect against them. In addition to toxic solvents, common auto repair industry health hazards include asbestos, diesel engine exhaust, and carbon monoxide. Common safety hazards include eye injuries, back and arm injuries, and fires. Our brochure, ***Injury, Illness, and Pollution Prevention in Auto Repair*** helps employers develop a comprehensive plan to protect workers and the environment from common hazards. It also helps them comply with environmental protection and occupational health and safety regulations.

Related Resources (current at the time project was completed)

- Institute for Research and Technical Assistance - nonprofit research organization that develops and promotes materials and processes that are safer for the environment
- Pollution Prevention for Auto Repair and Fleet Maintenance – EPA resource listing for finding and evaluating cost-effective solutions for environmental problems
- California Department of Toxic Substances Control Vehicle Service and Repair Project - promotes the use of pollution prevention methods in the vehicle service and repair industry in California
- California Department of Toxic Substances Control Pollution Prevention Program
- Western Regional Pollution Prevention (P2) Network - an alliance of local, state, federal, and tribal pollution prevention programs; clearinghouse for P2 resources

Related OHB/HESIS Publications

- Aerosol Cleaner Use in Auto Repair – fact sheet
- Injury, Illness & Pollution Prevention in Auto Repair - brochure
- n-Hexane Use in Vehicle Repair Health Hazard Advisory
- n-Hexane Medical Guidelines
- HESIS Guide to Solvent Safety
- N-Hexane-Related Peripheral Neuropathy Among Automotive Technicians – California, 1999-2000 – MMWR report

To see these publications or read more about Occupational Health Branch work, please visit our websites:

- Hazard Evaluation System and Information Service – www.cdph.ca.gov/programs/hesis
- Occupational Health Branch - www.cdph.ca.gov/programs/ohb