VAPOR DEGREASING

Pollution Prevention Fact Sheet

Add on Controls

ADEM

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For more information contact the ADEM ombudsman 1-800-533-2336

Cleaning and degreasing processes are used in a variety of industries to remove dirt, soil, and grease (often referred together as soil). Vapor degreasing generally involves chlorinated solvents such as methylene chloride, 1,1,1-trichloroethane (TCA), trichloroethylene, or perchloroethylene. Parts are immersed in the vapors of these solvents for degreasing. During the cleaning process, there is often an environmental problem with air emissions from the solvents. After the cleaning process, a waste stream composed of the solvent combined with oil, debris and other contaminants is left for disposal. Using halogenated solvents to clean and degrease not only generates hazardous wastes but also creates conditions that may be detrimental to the health and safety of workers. For these reasons, many industries have begun to reduce or eliminate the use of halogenated solvents. An MACT standard has been promulgated on halogenated solvent cleaners and may require a Title V Permit. For further information contact the ADEM Air Division office or the ADEM ombudsman.

Ninety percent or more of the solvent used in conventional open-top vapor degreasers is lost due to air emissions. Add-on controls can be incorporated into an existing degreaser to reduce air emissions. They limit air emissions through changes in operating practices or equipment modifications. These include:

- **Operating Controls --** Reduce work load related losses. Slow down the rate of entry of the work load into the open-top vapor cleaners (OTVC) tank. Install an electric hoist for even rate of entry control. Reduce the horizontal face area of the basket in proportion to the area of the OTVC tank opening. Place parts in the basket in a way that allows the condensate to drain out of part recesses or install electric-powered rotating baskets.
- **Covers --** Flat or rolling covers can be installed on the top of the OTVC tank to reduce air emissions. They should slide gently over the top of the opening to reduce disturbances. Automatic biparting covers that enclose the tank while the work load is being cleaned are also available. Covers can reduce working air emissions from an OTVC by as much as 35 to 50% (US EPA, 1989).
- **Increased FBR –** Increasing the freeboard height from .75 to 1.0 or 1.25 can reduce air emissions significantly. A raised platform next to the OTVC with an electric hoist compensate for reduced worker accessibility to the tank.
- **Refrigerated freeboard coils –** Air emissions through diffusion can be reduced by installing refrigerated coils on the freeboard above the primary condenser coils. The refrigerated coils may be designed to operate either above or below freezing temperatures. Working emissions are reduced by approximately 20 to 50% for above-freezing coils and by approximately 30 to 80% for below-freezing coils (US EPA, 1989).
- **Reduced room draft/lip exhaust velocities --** Room drafts caused by plant ventilation can cause an increase in air emissions by sweeping away solvent vapors that diffuse into the freeboard region, leaving behind a turbulence that promotes greater emissions. Reducing room drafts may reduce these emissions.

Guide to Cleaner Technologies, Cleaning and Degreasing Process Changes EPA/625/R/93/017 Feb. '94