



Project Summary

Environmental Regulations and Technology: The Dry Cleaning Industry

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This document reports current and proposed Federal pollution control regulations that will affect the dry cleaning industry and describes several techniques that dry cleaning facilities can use to comply with these regulations. The report examines Federal, state, and local regulations in the four areas that may affect dry cleaners—air quality, water quality, solid wastes, and worker protection. The report discusses control technologies and costs for reducing hydrocarbon emissions for the three solvent systems: perchloroethylene (perc), petroleum distillate (specifically Stoddard solvent), and fluorocarbon (specifically F-113).

This Project Summary was developed by EPA's Center for Environmental Research Information and the Industrial Environmental Research Laboratory, Cincinnati, OH, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

The purpose of the Project Report is to discuss the current and proposed Federal pollution control regulations that will affect the dry cleaning industry and describe several techniques that dry cleaning facilities can use to comply with these regulations.

Federal regulations are being set by the U.S. Environmental Protection Agency (EPA) for air, water and solid

waste and by the Occupational Safety and Health Administration (OSHA) for worker protection. Most state and local regulations are similar to those set by EPA and OSHA. In some cases, however, state and local regulations may be more stringent.

The Project Report examines Federal, state, and local regulations in the four areas that may affect dry cleaners—air quality, water quality, solid wastes, and worker protection—and includes the following discussions:

- Methods available to dry cleaners for complying with existing and proposed regulations,
- Control technologies for reducing hydrocarbon emissions for the three solvent systems: perchloroethylene (perc), petroleum distillate (specifically Stoddard solvent), and fluorocarbon (specifically F-113), and
- Costs of applying these technologies.

Air

Regulations

EPA is developing New Source Performance Standards (NSPS) for new dry cleaning facilities. In December 1979, EPA published a control techniques guideline (CTG) document to assist states in developing regulations

for existing perc sources. Currently, the Agency is studying techniques for controlling emissions from other dry cleaning solvents.

Methods of Compliance

Requirements for reducing perc dry cleaning emissions are similar under the proposed NSPS and the state regulations, based on the CTG. All dry cleaners would be required to follow good maintenance and housekeeping practices and to minimize filter, still, and muck cooker residues. Further, professional cleaners would have to install a carbon adsorber or equivalent control system to collect emissions from the dryer or dry-to-dry machine exhaust.

It is expected that a future CTG for petroleum plants will recommend good housekeeping and maintenance and good extraction techniques. Possible control techniques include carbon adsorption, petroleum recovery tumblers, incineration, and muck stripping (a technique for processing filter muck to recover solvent).

Emission Control Technology

Carbon adsorption is a demonstrated control technology for both perc and Stoddard solvent dry cleaning systems. A water-cooled condenser system similar to the reclaiming dryers used by most perc dry cleaning plants has been developed recently for petroleum plants. Both carbon adsorption and condensation systems are capable of reducing dryer emissions by over 90 percent. Other available control techniques include muck stripping and incineration for petroleum plants and good housekeeping and maintenance practices and solvent waste treatment methods for all three solvents.

Costs

The use of carbon adsorption or a condenser system on a dryer produces a credit for the solvent recoverable and may even provide a net profit (negative annualized control cost). For perc solvent, the capital cost for a condensation system on a 50 pound (23 kilogram) dryer may be higher than that of a similarly sized carbon adsorber. Operating costs for a condensation system are less than for the carbon adsorber. For petroleum solvent, the annual and capital costs of carbon adsorption are considered too great for wide acceptance of this technology at

this time. The condensation system typically produces a net credit; capital costs are much less and it is apparently as safe as conventional (uncontrolled) dryers to operate.

Water

Regulations

The dry cleaning industry was combined with eight other industries under the classification, "Auto and Other Laundries." A technical support document was prepared by EPA in August 1979, as the basis for developing effluent guidelines for the industry.

Methods of Compliance

Dry cleaning effluent concentrations are low compared with laundries, carpet and upholstery cleaners, and car washes. If EPA establishes water regulations in the future, treatment processes will also be identified that will enable the dry cleaning industry to comply with them.

Solid Wastes

Regulations

Current and planned Federal regulations for solid waste based on the Resource Conservation and Recovery Act of 1976, will control major sources of hazardous wastes. Size cutoffs anticipated for these regulations will likely exempt all but the larger industrial dry cleaners from having to control the amount of solvent requiring storage, transport and disposal of residues.

Method of Compliance

The waste products can be controlled by incineration or by reclaiming solvent from the waste material. Incineration is feasible for petroleum solvent still wastes, which may be disposed of in incinerators designed for this compound or burned as an auxiliary fuel in an existing steam boiler. Perc is not flammable; thus, incineration is not an alternative.

Worker Protection

Regulations

The National Institute for Occupational Safety and Health (NIOSH) provides recommendations to OSHA for setting standards to control health hazards in the workplace. The current OSHA rules and regulations on dry

cleaning solvent vapors have not changed since their original publication in the early 1970's. Table 1 shows occupational exposure limits for each of the three solvents, but these standards could change as more information becomes available on health effects.

Methods of Compliance

Proper work practices in the routine handling and use of perc should ensure compliance with employee exposure standards. Because petroleum solvent dry cleaning plants are designated Class II and Class III fire hazards by the National Fire Protection Association, all cleaning room equipment must be explosion proof. Safety codes indicate that room air should be changed every two to three minutes. A properly designed ventilation system can exhaust fluorocarbon solvent vapors from the work area.

The information contained in the Project Report provides the dry cleaning plant operators; consultants; and state, Federal and local agencies with a detailed summary of the regulations currently applicable to the dry cleaning industry.

Table 1. OSHA Standards for Occupational Exposure to Dry Cleaning Solvents

| Standard | Concentration (ppm) | | |
|--|---------------------|-----------|--------------|
| | Perchloroethylene | Petroleum | Fluorocarbon |
| Threshold limit value (no effects below this level)* | 100 | 100 | 1,000 |
| Maximal 8-h time-weighted average | 100 | 500 | 1,000 |
| Maximal concentration, general | 200 | NA | NA |
| Maximal 5-min concentration (allowed once each 3 h) | 300 | NA | NA |

*American Conference of Governmental Industrial Hygienists

NA = not applicable

SOURCE Laundry Cleaning Council, "The Safe Handling of Perchloroethylene Drycleaning Solvent," Chicago, IL, Laundry-Cleaning Council, 1980

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The complete report, entitled "Environmental Regulations and Technology: The Dry Cleaning Industry," (Order No. PB 81-235 384; Cost: \$3.50, subject to change) will be available only from:

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