

**State of the Art (SOTA)  
Manual for Degreasers and Other  
Solvent Based Metal Surface Cleaners**

July 1997

State of New Jersey  
Department of Environmental Protection  
Air Quality Permitting Program

**State of the Art (SOTA)**  
**Manual for Degreasers and Other Solvent Based Metal Surface Cleaners**  
**Section 3.6**

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<b>3.6.i Abbreviations and Definitions</b>	

(Note that terms not specifically defined in this section shall have the same meaning as in 40 CFR 63, subpart T or A)

*Applicable VOC:* any volatile organic compound used for removing foreign matter from metal surfaces with vapor pressure of 0.02 psia or greater.

*Batch cleaning machine:* solvent cleaning machine in which individual parts or a set of parts move through the entire cleaning cycle before new parts are introduced into the solvent cleaning machine. A solvent cleaning machine, such as a ferris wheel, or cross-rod cleaner that cleans multiple batch loads simultaneously and is manually loaded is a batch cleaning machine.

*Batch cold cleaning unit:* a batch cleaning machine which contains a solvent which remains at room temperature during the entire cleaning process.

*Batch heated (non-boiling) cleaning units:* a batch cleaning machine which contains a solvent which is heated, but kept below its boiling point and does not generate any vapor.

*Batch vapor cleaning unit:* a batch cleaning machine which contains a solvent which is heated and maintained at its boiling point that generates a solvent vapor that is used as part of the cleaning or drying cycle.

*Cleaning capacity:* the maximum volume of parts that can be cleaned at one time for a degreaser without a solvent/air interface. In most cases, the cleaning capacity is equal to the volume (length times width times height) of the cleaning chamber.

*Department:* the New Jersey Department of Environmental Protection.

*Degreaser:* a solvent cleaning machine used to remove soils from the surfaces of materials.

*Existing:* for units subject to MACT Standards, any solvent cleaning machine which started construction on or before November 29, 1993. For units not subject to MACT Standards and subject to N.J.A.C. 7:27-16.6 existing means those units which have an approved Permit to Construct and Certificate to Operate as issued by the Department.

*HAP solvent:* any hydrocarbon compound listed in the Clean Air Act, Title III, section 112, subsection b. (42 USC 7412).

*Inline cleaning machine:* a solvent cleaning machine that uses an automated parts handling system, typically a conveyor, to automatically provide a continuous supply of parts to be cleaned. These units are fully enclosed except for the conveyor inlet and exit ports.

*Inline cold cleaning unit:* an inline cleaning machine which uses a solvent that remains at room temperature during the entire cleaning process.

*Inline heated (non-boiling) cleaning unit:* an inline cleaning machine which uses a solvent that is heated but kept below its boiling point so as not to generate any vapor.

*Inline vapor cleaning unit:* an inline cleaning machine which boils liquid solvent generating solvent vapor that is used as a part of the cleaning or drying cycle.

*Local exhaust ventilation:* a system for capturing contaminants within 36 inches of the points at which they emerge from a source operation.

*MACT:* Maximum Achievable Control Technology.

*MACT Solvent:* any of the following halogenated HAP solvents:

- methylene chloride
- perchloroethylene
- trichloroethylene
- 1,1,1,-trichloroethane
- carbon tetrachloride
- chloroform

This classification includes any blended solvent containing 5 percent or greater of any combination of the above solvents.

*MACT Standards:* the requirements set forth in “National Emission Standards for Halogenated Solvent Cleaning found at 40 CFR Part 63, subpart T.

*New:* for units subject to MACT Standards, any solvent cleaning machine which started construction, modification, or reconstruction after November 29, 1993. For units not subject to MACT, new means equipment subject to N.J.A.C. 7:27-16.6 which has not been issued a Permit to Construct and Certificate to Operate or an Operating Permit by the Department.

*RACT:* Reasonably Available Control Technology

*Soils:* contaminants that are removed from the parts being cleaned. Soils include, but are not limited to grease, oils, waxes, metal chips, carbon deposits, fluxes and tars.

### **3.6 SOTA MANUAL FOR DEGREASERS AND OTHER SOLVENT BASED METAL SURFACE CLEANERS**

#### **3.6.1 Scope**

This manual contains technology, methods, and performance levels that can be used by applicants for demonstrating advances in the art of air pollution control. The development of this manual is required by Public Law (P.L.) 1995, Chapter (c.) 188, enacted on 8/2/95.

The SOTA performance levels specified in this manual apply to all surface cleaners listed below that use MACT solvents, HAP solvents and applicable VOC solvents.

- Batch cold cleaning unit
- Inline cold cleaning unit
- Batch heated (non-boiling) cleaning unit
- Inline heated (non-boiling) cleaning unit
- Batch Vapor cleaning unit
- Inline Vapor cleaning unit

Aqueous or detergent based surface cleaners containing less than 5% of MACT or HAP solvents or applicable VOCs are not subject to this manual.

#### **3.6.2 SOTA Performance Levels**

SOTA levels are not a substitution for complying with the regulations in N.J.A.C. 7:27, particularly section 16.6. These regulations must be met for all surface cleaners. For some units, compliance with N.J.A.C. 7:27 will be sufficient.

MACT is considered as SOTA when using the MACT solvents. MACT can also be considered as SOTA when using non-MACT or HAP solvents or applicable VOCs.

In the interest of pollution prevention, the Department encourages the use of non-toxic and non-VOC solvents and equipment that results in recycling/reuse of solvents.

##### **3.6.2.1 List of Available SOTA Technologies for All Units**

The following is a list of technologies available to achieve the SOTA performance levels.

- WORKING MODE COVER (AC)
- FREEBOARD REFRIGERATION DEVICE (FBRD)
- FREEBOARD RATIO = 1.0 (FBR)
- REDUCED ROOM DRAFT (RRD)

- SUPERHEATED VAPOR (SHV)
- DWELL (DWL)
- CARBON ADSORPTION (CA)

### **3.6.2.2 Compliance Options for New or Modified Units Subject to MACT**

A facility is subject to the MACT Standards if it uses a MACT solvent with greater than 5 percent by weight in the cleaning solvent in any of the following solvent cleaning machines:

- batch vapor cleaning machine;
- in-line vapor cleaning machine;
- batch cold cleaning machine (includes heated, non-boiling cleaning machines); and/or
- in-line cold cleaning machine (includes heated, non-boiling cleaning machines)

Note that for the purposes of MACT, heated cleaning machines that are non-boiling are classified as cold cleaning units.

There are several options for an applicant to meet compliance for units subject to MACT Standards. They include: (1) using a combination of controls with multiple work practices and an automated parts handling system, (2) meeting an idling emission limit with multiple work practices and an automated parts handling system, or (3) meeting an overall solvent emissions monthly limit based on a three month rolling average.

Information on these options can be found in the Code of Federal Regulations, 40 CFR Part 63, Subpart T, titled National Emission Standards for Halogenated Solvent Cleaning. These rules were published in the Federal Register, volume 59, No. 231, Friday, December 1, 1994, on pages 61801 through pages 61820. Detailed information can be obtained in a manual titled "Guidance Document for the Halogenated Solvent Cleaner NESHAP, No. 453/R-94-081, April 95". This is available electronically from the Small Business Assistance Program (SBAP) Bulletin Board of the EPA Technology Transfer Network (TTN) at (919) 541-5742, or the New Jersey Small Business Assistance Program at (609) 292-3600.

### **3.6.2.3 Compliance For New or Modified Batch Vapor Units Not Subject to MACT Using HAP Solvents and Applicable VOCs**

All batch vapor units must:

- a. have a freeboard chiller of 40 F. or less;

- b. have a freeboard of 0.75 or greater; and
- c. comply with N.J.A.C. 7:27-16.6 (a),(e) 1-4,6,9,10, and (j) thru (n).

If local exhaust ventilation is used, or if a positive pressure source is within 20 feet of the tank rim, the unit must be equipped with a control device which collects a minimum of 90 percent of the emissions and reduces those emissions by 95 percent.

#### **3.6.2.4 Compliance for New or Modified Inline Vapor Units, Not Subject to MACT Using HAP Solvents and Applicable VOCs**

All inline vapor units must:

- a. have a freeboard chiller of 40 F. or less; and
- b. comply with N.J.A.C. 7:27-16.6 (a), (h) and (j) through (n).

If local exhaust ventilation is used, the unit must be equipped with a control device that collects a minimum of 90 percent of the emissions and reduces those emissions by 95 percent.

#### **3.6.2.5 Compliance For New or Modified Cold and Heated (Non-Boiling) Batch Units Not Subject to MACT Using HAP Solvents and Applicable VOCs**

All cold batch units must comply with N.J.A.C. 7:27-16.6 (a), (b) or (c), and (j) through (n); and all heated (non-boiling) batch units must comply with N.J.A.C.7:27-16.6 (a), (d), and (j) through (n). If local exhaust ventilation is used, the unit must be equipped with a control device that collects a minimum of 90 percent of the emissions and reduces those emissions by 95 percent.

#### **3.6.2.6 Compliance for New or Modified Cold and Heated (Non-Boiling) Inline Units Not Subject to MACT Using HAP Solvents and Applicable VOCs**

All cold inline units must comply with N.J.A.C. 7:27-16.6(f) and all heated (non-boiling) inline units must comply with N.J.A.C. 7:27-16.6(g). If local exhaust ventilation is used, the unit must be equipped with a control device that collects a minimum of 90 percent of the emissions and reduces those emissions by 95 percent.

### **3.6.3 Technical Basis**

For sources, subject to MACT, the technical basis for compliance is the MACT Standard itself.

For sources, not subject to MACT, the technical basis for requiring the freeboard chiller and freeboard ratio is based on a review of permits issued from 1993 through July of 1996. The data is as follows:

A total of 66 approved permits for surface cleaners were reviewed.

- All batch vapor units were equipped with freeboard chillers, regardless of the size of the unit. 25 percent of the chillers were operated at  $-20^{\circ}\text{F}$ , with the remainder at  $40^{\circ}\text{F}$  or less;
- Six inline vapor units were surveyed. All were equipped with freeboard chillers. Three had carbon adsorber control.

#### **3.6.4 Recommended Review Schedule**

The recommended review schedule is every three years.

#### **3.6.5 References**

Air Pollution Engineering Manual by Air & Waste Management Association, Van Nostrand Reinhold, New York. pp 345 - 360.

40 CFR Part 63, Subpart T, from Federal Register, vol. 59. no.231, Friday, December 2, 1994 / Rules and Regulations, pp. 61801 - 61820.

New Jersey Administrative Code, Title 7, Chapter 27, subchapter 1, et seq.