Citation: 58 Fed. Reg. 62566 1993

public comments on the issues discussed in this document or on other relevant matters. These comments will be considered before taking final action. Interested parties may participate in the Federal rulemaking procedure by submitting written comments to the EPA Regional office listed in the Addresses section of this document.

IV. This Action

Proposed Action

EPA is proposing to approve the amendments to 25 PA Code Chapter 121, section 121.1 Definitions, and 25 PA Code Chapter 126, section 126.1 Oxygenate Content of Gasoline as revisions to the Pennsylvania SIP.

Nothing in this action should be construed as permitting orallowing or establishing a precedent for any future request for revision to any SIP. Each request for revision to the SIP shall be considered separately in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

Under the Regulatory Flexibility Act, 5 U.S.C. 600 *et seq.*, EPA must prepare a regulatory flexibility analysis assessing the impact of any proposed or final rule on small entities. 5 U.S.C. 603 and 604. Alternatively, EPA may certify that the rule will not have a significant impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and government entities with jurisdiction over populations of less than 50,000.

SIP approvals under section 110 and subchapter I, part D of the Clean Air Act do not create any new requirements but simply approve requirements that the state is already imposing. Therefore, because the Federal SIP approval does not impose any new requirements, the Administrator certifies that it does not have a significant impact on any small entities affected. Moreover, due to the nature of the Federal-state relationship under the Act, preparation of a flexibility analysis would constitute Federal inquiry into the economic reasonableness of state action. The Clean Air Act forbids EPA to base its actions concerning SIPs on such grounds. *Union Electric Co.* v. *U.S. EPA*, 427 U.S. 246, 255–66 (1976); 42 U.S.C. 7410(a)(2).

This action has been classified as a Table 2 Action by the Regional Administrator under the procedures published in the **Federal Register** on January 19, 1989 (54 FR 2214–2225). On January 6, 1989, the Office of Management and Budget (OMB) waived Table 2 and Table 3 SIP revisions from the requirement of section 3 of Executive Order 12291 for a period of two years. U.S. EPA has submitted a request for a permanent waiver for Table 2 and Table 3 SIP revisions. The OMB has agreed to continue the waiver until such time as it rules on U.S. EPA's request. This request continues in effect under Executive Order 12866 which superseded Executive Order 12291 on September 30, 1993.

The Administrator's decision to approve or disapprove the SIP revision will be based on whether it meets the requirements ofsection 110(a)(2)(A)-(K), 110(a)(3), and part D of the Clean Air Act, as amended, and EPA regulations in 40 CFR part 51.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Carbon monoxide, Intergovernmental relations, Reporting and recordkeeping requirements.

Authority: 42 U.S.C. 7401–7671q.

Dated: September 10, 1993.

W. T. Wisniewski,

Acting Regional Administrator, Region III.

[FR Doc. 93–29142 Filed 11–26–93; 8:45 am]

BILLING CODE 6560-50-F

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40 CFR Part 63

[AD-FRL-4804-4]

National Emission Standards for Hazardous Air Pollutants: Halogenated Solvent Cleaning

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule and test method; notice of public hearing.

SUMMARY: The EPA is proposing to regulate the emissions of certain organic hazardous air pollutants from new and existing halogenated solvent cleaning machines, which are among the sources being regulated under section 112 of the Clean Air Act. The proposed rule would require sources to achieve emission limits reflecting the application of the maximum achievable control technology consistent with section 112(d) of the Clean Air Act. The proposed rule would reduce the emissions of the halogenated organic chemicals identified in the Clean Air Act list of 189 hazardous air pollutants including methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, and chloroform. To determine the emissions from solvent cleaning machines, a new reference test method 307 is proposed.

A public hearing will be held, if requested, to provide interested persons an opportunity for oral presentation of data, views, or arguments concerning the proposed standards for halogenated solvent cleaning machines.

DATES: *Comments.* Comments must be received on or before January 28, 1994.

Public Hearing. If anyone contacts the EPA requesting to speak at a public hearing by December 20, 1993, a public hearing will be held on December 29, 1993 beginning at 9 a.m. Persons wishing to present oral testimony must contact Ms. Lina Hanzely of the EPA at (919) 541–5673 by December 20, 1993. Persons interested in attending the hearing should call Ms. Hanzely at the same number to verify that a hearing will be held.

ADDRESSES: *Comments.* Comments should be submitted (in duplicate, if possible), to: Air Docket (LE–131), ATTN: Docket No. A–92–39, Room M1500, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460.

Public Hearing. Persons interested in attending the hearing or wishing to present oral testimony should notify Ms. Hanzely, Chemicals and Petroleum Branch, Emission Standards Division (MD–13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541–5673.

Background Information Documents. The background information and supporting documents for the proposed standards may be obtained from the U.S. Environmental Protection Agency Library (MD–35), Research Triangle Park, North Carolina 27711, telephone number (919) 541–2777. Please refer to one or all of the following documents.

Background Information Document: "Halogenated Solvent Cleaning National Emission Standards for Hazardous Air Pollutants Background Information Document";

Supporting Document: "Status of Alternative Solvents and Processes to Halogenated Solvent Cleaning"

Docket. Docket No. A–92–39, containing supporting information used in developing the proposed standards, is available for public inspection and copying between 8:30 a.m. and 3:30 p.m., Monday through Friday, at the EPA's Air Docket, Room M1500, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC. A reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: For information regarding the proposed standards, contact Mr. Paul Almodóvar at (919) 541–0283, Chemicals and Petroleum Branch (MD–13), Emission

Standards Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

SUPPLEMENTARY INFORMATION: The following outline is provided to aid in reading the preamble to the proposed regulation.

- I. List of Source Categories and Subcategories
  - A. Halogenated Solvent Cleaning Operations: Major and Area Source Designation
  - B. Halogenated Solvent Cleaning Category and Subcategories
- II. Background
  - A. Halogenated Solvent Cleaning Source Category Characterization
  - B. Historical Overview
- III. National Emission Standards for Hazardous Air Pollutants Decision Process
  - A. Source of Authority for National Emission Standards for Hazardous Air Pollutants Development
  - B. Criteria for Development of National Emission Standards for Hazardous Air Pollutants
  - C. Maximum Achievable Control Technology Floor Determination and Process of Developing Regulations for Major and Area Sources
- IV. Summary of Proposed Standards
  - A. Sources Covered by the Standard
  - B. Proposed Standards
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  - D. Regulatory Agenda
- **V. Summary of Environmental, Energy, and Economic Impacts**
  - A. Air
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- **VI. Rationale**
  - A. Selection of Pollutants and Source Categories for Regulation
  - B. Selection of Emissions to be Covered by the Standards
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  - D. Development of Regulatory Alternatives
  - E. Selection of Maximum Achievable Control Technologies
  - F. Selection of Format for the Proposed Standards
  - G. Modification and Reconstruction Considerations
  - H. Selection of Monitoring Requirements
  - I. Selection of Recordkeeping and Reporting Requirements
  - J. Operating Permit Program
  - K. Solicitation of Comments
- **VII. Administrative Requirements**
  - A. Public Hearing
  - B. Docket
  - C. Executive Order 12866
  - D. Paperwork Reduction Act
  - E. Regulatory Flexibility Act
  - F. Clean Air Act Procedural Requirements

The following acronym and abbreviation list is provided as an aid in reading the preamble to the proposed standards.

Acronym and Units of Measure Abbreviation List

1990 Amendments=Clean Air Act as amended
Act=Clean Air Act
AEERL=Air and Energy Engineering Research Laboratory
C=chloroform
CFC–113=chlorofluorocarbon-113
CT=carbon tetrachloride
CTG=control techniques guideline
FBR=freeboard ratio
ft²=square feet
ft/min=feet per minute
GACT=generally available control technology
HAP=hazardous air pollutant(s)
kWH=kilowatt hours
kg/hr=kilograms per hour
MACT=maximum achievable control technology
m²=square meters
MC=methylene chloride
Mg=megagram
Mg/yr=megagrams per year
m/min=meters per minute
NAPCTAC=national air pollution control technology advisory committee
NESHAP=national emission standards for hazardous air pollutants
NPV=net present value
NSPS=new source performance standards
OMB=Office of Management and Budget
OSHA=Occupational Safety and Health Administration
OTVC=open top vapor cleaner
PCE=perchloroethylene
RCRA=Resource Conservation and Recovery Act
RFA=Regulatory Flexibility Act
RIA=regulatory impact analysis
SAGE=Solvent Alternative Guide
SIC=Standard Industrial Classification
TCA=1,1,1-trichloroethane
TCE=trichloroethylene
VOC=volatile organic compound

I. List of Source Categories and Subcategories

A. Halogenated Solvent Cleaning Operations: Major and Area Source Designation

Section 112 of the Act requires the EPA to evaluate and control emissions of HAP. The control of HAP is to be achieved through promulgation of emission standards under sections 112(d) and 112(f) for categories of sources that emit HAP. The EPA published a notice in the Federal Register outlining the procedures used to identify a preliminary draft list of categories of major sources and area sources of HAP on June 21, 1991 (56 FR 28548). On July 16, 1992 (57 FR 31592), a list of categories of sources was published. Halogenated solvent cleaning was listed as a category of both major and area sources. Accordingly, the EPA is today proposing emissions standards under section 112 of the Act for halogenated solvent cleaning operations applicable to both area and major sources of halogenated solvent cleaning machines.

In the preamble to the list of source categories, a finding of "threat of adverse effects" was made for the halogenated solvent cleaning source category.

Due to the high usage and emissions of these cleaners throughout industry, as well as the large number of cleaners, the EPA determined that there is a great potential for exposure to the HAP's used as solvents. One of the cleaning solvents, TCA, has also been implicated as causing stratospheric ozone depletion. Trichloroethane(1,1,1) will be phased out with other Agency regulations under Title VI of the CAA.

The health effects associated with halogenated solvent cleaners are best documented for MC, TCE, and PCE. Both MC and TCE are considered probable human carcinogens and are classified in Group B2, while PCE is still under review.

Evidence indicating the carcinogenicity of MC is available through animal studies. Animal inhalation studies on MC have shown significant increases in liver and lung adenomas and carcinomas in both males and females. Other animal studies have indicated that exposure to elevated levels of MC can cause benign mammary tumors. Based upon this available animal evidence, the Agency has determined that MC is a probable human carcinogen. In addition to these adverse effects, short-term exposure to MC has been known to cause impairments in central nervous system (CNS) functioning. Case reports of exposure to MC have shown that humans exposed to MC exhibited narcosis, irritability, analgesia, and fatigue.

Both PCE and TCE are moderately toxic substances that appear to target the CNS, causing dizziness, headaches and slowing of mental activity. Over longer periods of exposure, these adverse effects may also be seen in the liver and kidneys as well as the eyes and upper respiratory tract. The carcinogenic effects from both these chemicals has also been investigated, mostly through animal experiments. Results of TCE tests indicate that inhalation may result in the formation of renal tumors. Other TCE studies suggest that inhalation is fetotoxic and may cause litter resorption and reduced fetal body weight.

An Agency analysis has been conducted of nationwide exposures, individual lifetime risks, and population incidence from halogenated solvent cleaners emissions. This analysis estimates that as many as six increased cancer cases are attributable to halogenated solvent cleaners, annually, in the U.S. This study also suggests that upper-bound maximum individual lifetime risks in the proximity of these cleaners range from one in 1,000,000 (1×10^{-6}) to one in 10,000 (1×10^{-4}). Nationally, the maximum individual risk near a large facility with multiple conveyorized cleaners is as high as five in 10,000 (5×10^{-4}).

Based upon the evidence presented, the Agency found that cleaners using halogenated solvents present a threat of adverse impact to human health or the environment. The Agency therefore added them to the categories of area sources on their initial list of source categories (57 FR 31576).

B. Halogenated Solvent Cleaning Category and Subcategories

The halogenated solvent cleaner source category does not constitute a distinct industry, but is an integral part of many industries. The halogenated solvent cleaner source category consists of two basic types of solvent cleaning machines: batch and in-line cleaning machines (also called continuous cleaning machines). Both of these equipment types are designed to use solvent to clean parts. The solvent is either used to clean in its nonvapor form (referred to as cold cleaning) or heated and used to clean in its vapor form (referred to as vapor cleaning).

Most halogenated solvent use within the halogenated solvent cleaner source category is in vapor cleaning for both batch and in-line cleaning machines. The proposed standards cover the use of any halogenated HAP solvent (e.g., TCA, TCE, MC, PCE, CT, C), either by itself or in a blend, listed on the HAP list in section 112(b) of the Act and used in a solvent cleaning machine. The halogenated solvent CFC–113 is not listed on the HAP list; therefore, cleaners using this solvent are not covered by these proposed standards.

Most batch cold cleaning machines are small maintenance cleaning machines or parts washers that typically use mineral spirits, Stoddard solvents, and alcohols, which are all nonhalogenated solvents. Because this standard applies only to halogenated solvents, these nonhalogenated solvent processes are not included in the proposed standards. The only identified machines that use halogenated solvents in a batch cold cleaning machine application are carburetor cleaners.

Therefore, today's proposed regulations for batch cold cleaning machines are based on the control of carburetor cleaners, but apply to all cold cleaners using halogenated solvents or blends. It should be noted that nonvapor in-line (continuous) cleaning machines using halogenated solvents are covered by the proposed rule for in-line cleaning machines.

When the initial source category list was published (57 FR 31576), the Agency stated that the establishment of subcategories within a source category would be considered during the development of emission standards under authority of section 112(d). The initial source category list contained only one major and one area category for halogenated solvent cleaning. Solvent cleaning machine emissions and emissions reduction potential have been found to depend upon a number of variables, including size, operating schedule, and machine type. The appropriateness of specific controls is dependent on technical feasibility and emission reduction potential. The halogenated solvent cleaning source category has been divided into four size ranges of batch vapor cleaning machines, one in-line cleaning machine size, and one batch cold cleaning machine size considering the available data. It is the intent of the Agency to amend the initial source category list by substituting the following halogenated solvent cleaning subcategories for the categories published in the initial source category list when the halogenated solvent cleaning regulation is promulgated.

1. Small batch vapor cleaning machines <0.6 m^2 (6.5 ft^2); major and area source list;
2. Medium batch vapor cleaning machines 0.6 m^2 (6.5 ft^2) to 1.21 m^2 (13 ft^2); major and area source list;
3. Large batch vapor cleaning machines >1.21 m^2 (13 ft^2) to 2.51 m^2 (27 ft^2); major and area source list;
4. Very large batch vapor cleaning machines >2.51 m^2 (27 ft^2); major and area source list;
5. In-line cleaning machines (vapor and cold) (all sizes); major and area source list; and
6. Batch cold cleaning machines (all sizes); area source list.

The EPA requests comment on the appropriateness of the subcategorization proposed today. Comment is also requested concerning whether there is a basis for removing any of these subcategories from the source category list. Specific information is requested concerning whether the delisting criteria of section 112(c)(9) are met, or whether, in the alternative, it would be appropriate, in the case of any proposed subcategory, to conduct an assessment under section 112(c)(3) of the effect on human health or the environment before finally creating such subcategory and adding it to the source category list.

II. Background

A. Halogenated Solvent Cleaning Source Category Characterization

The five most commonly used halogenated solvents in solvent cleaning machines are MC, PCE, TCA, TCE, and CFC–113. These solvents are used alone and in blends that may contain two or more halogenated solvents or alcohol and other solvents. However, other halogenated solvents, including C and CT, are also used to a limited extent. With the exception of CFC–113, all are HAP covered by these standards. Although the technical analyses do not include data on C and CT halogenated HAP solvents, these solvents are covered under the proposed standards. The proposed standards would control C and CT halogenated solvent emissions from a solvent cleaning machine the same as for the halogenated HAP solvents included in the technical analyses (i.e., MC, PCE, TCA, TCE).

An estimated 199,700 Mg (219,670 tons) of halogenated solvents (i.e., MC, PCE, TCA, TCE) are used in solvent cleaning machines annually. This estimate represents an estimated 16,400 halogenated solvent batch vapor and 8,100 in-line (vapor and cold) cleaning machines nationwide. Of the 199,700 Mg (219,670 tons) consumed, an estimated 95,000 Mg (104,500 tons) are consumed by batch vapor cleaning machines (primarily OTVC's); and 45,800 Mg (50,380 tons) by in-line cleaning machines (including the use for photoresist stripping). An estimated 58,900 Mg (64,790 tons) of halogenated solvent is used in cold cleaning. This cold cleaning machines halogenated solvent consumption estimate is believed by the EPA to include carburetor cleaner (1,400 Mg [1,540 tons]) use and other cleaning operations such as wipe-cleaning and other clean-up solvent uses. These other operations are not included in the source category covered by today's proposed standards.

The use of TCA and CT is expected to decline as a result of the phaseout of these halogenated solvents mandated by Title VI of the Act and presidential order. However, since their use may extend into the future, CT and TCA are included in the proposed standards.

Halogenated solvent consumption has decreased over the last decade because of solvent recycling efforts, future mandated production phase-outs for TCA, and environmental and occupational health concerns surrounding the use of PCE and MC.

The estimated national baseline HAP emissions for the halogenated solvent cleaner source category are 128,600 Mg/yr (141,400 tons per year). Batch vapor cleaning machine emissions are estimated to represent 66 percent of the emissions, in-line cleaning machines represent 33 percent, and carburetor cleaners the remaining 1 percent. These emissions estimates reflect the level of emission control achieved by the affected industry in the absence of EPA standards.

B. Historical Overview

Control technique guidelines were established in 1977 for the control of VOC from solvent cleaning machines; recommended requirements were adopted by 33 States. In 1980, NSPS were proposed for the solvent cleaning machine industry. The NSPS were never promulgated. An alternative control technology document for halogenated solvent cleaning machines was published in 1989 after substantial review by industry.

The EPA was subsequently sued for not promulgating the NSPS and is under consent decree to propose a NESHAP within 3 years of the passage of the 1990 Amendments to be promulgated within 1 year of proposal. The required proposal date for the halogenated solvent cleaner source category NESHAP is November 15, 1993. The information from the alternative control technology document was updated, as appropriate, in developing the technical basis for the proposed NESHAP. These proposed standards fulfill the NESHAP proposal requirements under the consent decree.

III. National Emission Standards for Hazardous Air Pollutants Decision Process

A. Source of Authority for National Emission Standards for Hazardous Air Pollutants Development

Title III of the 1990 Amendments was enacted to help reduce the increasing amount of nationwide air toxics emissions. Under title III, section 112 of the Act was amended to give the EPA the authority to establish national standards to reduce air toxics from sources that emit one or more HAP. Section 112(b) contains a list of HAP that are the specific air toxics to be regulated by a NESHAP. Section 112(c) directs the EPA to use this pollutant list to develop and publish a list of source categories for which a NESHAP will be developed. The EPA must list all known categories and subcategories of "major sources" ("major sources" emit or have the potential to emit, considering controls, 9.1 Mg/yr [10 tons per year] or greater of any one HAP or 22.7 Mg/yr [25 tons per year] or greater of total HAP) that emit one or more of the listed HAP. Area source (i.e., nonmajor) categories and subcategories selected by the EPA for NESHAP development will be based on the Administrator's judgment that the sources, individually or in aggregate, pose a "threat of adverse effects to human health or the environment," or alternatively will be listed and regulated under authority of section 112.

B. Criteria for Development of National Emission Standards for Hazardous Air Pollutants

The NESHAP are to be developed to control HAP emissions from both new and existing sources according to the statutory directives set out in section 112, as amended. The statute requires the standards to reflect the maximum degree of reduction in emissions of HAP that is achievable for new or existing sources. The NESHAP must reflect consideration of the cost of achieving the emission reduction, and any nonair quality health and environmental impacts, and energy requirements for control levels more stringent than the MACT floors. (As described in section III.C. of this preamble, the MACT floor is the minimum stringency level for MACT standards, and is determined according to section 112(d) of the Act.) The emission reduction may be accomplished through application of measures, processes, methods, systems or techniques including, but not limited to, measures that:

1. Reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications;
2. Enclose systems or processes to eliminate emissions;
3. Collect, capture or treat such pollutants when released from a process, stack, storage, or fugitive emissions point;
4. Are design, equipment, work practice, or operational standards (including requirements for operator training or certification) as provided in section 112(h); or
5. Are a combination of the above [section 112(d)(2)].

To develop a NESHAP, the EPA collects information concerning the industry, including information on emission source characteristics, control technologies, data from HAP emission tests at well-controlled facilities, and information on the costs and other energy and environmental impacts of emission control techniques. The EPA uses this information to analyze possible regulatory approaches.

Although NESHAP are normally structured in terms of numerical emission limits, alternative approaches are sometimes necessary. In some cases, physically measuring emissions from a source may be impossible or at least impracticable due to technological and cost limitations. Section 112(h) authorizes the Administrator to promulgate a design, equipment, work practice, or operational standard, or combination thereof, in those cases where it is not feasible to prescribe or enforce an emissions standard.

C. Maximum Achievable Control Technology Floor Determination and Process of Developing Regulations for Major and Area Sources

The EPA must set MACT standards for each of the source categories listed under section 112(c) of the Act that contain major sources. Such standards must be set at a level at least as stringent as the "floor." Congress provides certain very specific directives to guide the EPA in the process of determining the regulatory floor. As described below, area sources may be regulated with either a MACT standard or a GACT standard. A GACT standard is not required to be as stringent as the MACT floor.

For MACT, Congress specified that the EPA shall establish standards that require "the maximum degree of reduction in emissions of the HAP * * * that the Administrator, taking into consideration the cost of achieving such emission reduction, and any nonair quality health and environmental impacts and energy requirements, determine is achievable for new or existing sources in the category or subcategory to which such emission standard applies * * *" [the Act section 112(d)(2)]. In addition, Congress limited the Agency's discretion by establishing a minimum baseline or "floor" for standards. For new sources, the standards for a source category or subcategory "shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source, as determined by the Administrator" [the Act, section 112(d)(3)]. Congress provided that existing source standards could be less stringent than new source standards but could be no less stringent than the average emission limitation achieved by the best performing 12 percent of the existing sources (excluding certain sources) for categories and subcategories with 30 or more sources or the best performing 5 sources for categories or subcategories with fewer than 30 sources [the Act, section 112(d)(3)].

Once the floor has been determined for new or existing sources for a category or subcategory, the Administrator must set a MACT standard that is no less stringent than the floor. Such standards must then be met by *all* sources within the category or subcategory. However, in establishing standards, the Administrator may distinguish among classes, types, and sizes of sources within a category or subcategory [the Act, section 112(d)(1)]. Thus, for example, the Administrator could establish two classes of sources within a category or subcategory based on size and establish a different emission standard for each class, provided both standards are at least as stringent as the MACT floor.

In addition, the Act provides the Administrator further flexibility to regulate area sources. Section 112(d)(5) provides that in lieu of establishing MACT standards under section 112(d), the Administrator may promulgate standards that provide for the use of "generally available control technologies or management practices." Area source standards promulgated under this authority (GACT standards) would not be subject to the MACT "floors" described above. Moreover, for source categories subject to standards promulgated under section 112(d)(5), the EPA is not required to conduct a residual risk analysis under section 112(f).

At the end of the data gathering and analysis, the EPA must decide whether it is more appropriate to follow the MACT or the GACT approach for regulating an area source category. An area source is "any stationary source of HAP that is not a major source." As stated previously, MACT is required for major sources. If all or some portion of the sources emits less than 9.1 Mg/yr (10 tons per year) of any one HAP (or less than 22.7 Mg/yr [25 tons per year] of total HAP), then it may be appropriate to define subcategories within the source category and apply a combination MACT/GACT approach, MACT for major sources and GACT for area sources. In other cases, it may be appropriate to regulate both major and area sources in a source category under MACT.

The next step in establishing a MACT or GACT standard is the investigation of regulatory alternatives. With MACT standards, only alternatives at least as stringent as the floor may be considered. Information about the industry is analyzed to develop model plant populations for projecting national impacts, including HAP emission reduction levels, costs, energy, and secondary impacts. Several regulatory alternative levels (which may be different levels of emissions control or different levels of applicability or both) are then evaluated to determine the appropriate MACT or GACT level.

The regulatory alternatives for new versus existing sources may be different, and separate regulatory decisions must be made for new and existing sources. For both source types, the selected alternative may be more stringent than the MACT floor. However, the control level selected must be technically achievable. In selecting a regulatory alternative to represent MACT or GACT, the Agency considers the achievable reduction in emissions of HAP (and possibly other pollutants that are co-controlled), the cost and economic impacts, energy impacts, and other environmental impacts. The objective is to achieve the maximum degree of emission reduction without unreasonable economic or other impacts.

The selected regulatory alternative is then translated into a proposed regulation. The regulation implementing the MACT or GACT decision typically includes sections of applicability, standards, test methods, and compliance demonstration, monitoring, reporting, and recordkeeping. The preamble to the proposed regulation provides an explanation of the rationale for the decision. The public is invited to comment on the proposed regulation during the public comment period. Based on an evaluation of these comments, the EPA reaches a final decision and promulgates the standard.

IV. Summary of Proposed Standards

A. Sources Covered by the Standard

Hazardous air pollutant emissions from the halogenated solvent cleaner source category and its subcategories are being regulated under sections 112(d) and (h) of the Act. The proposed standards cover the use of any halogenated solvent (e.g., TCA, TCE, MC, PCE, CT, C) listed on the HAP list in section 112(b) of the Act in a solvent cleaner. The proposed standards would regulate listed halogenated HAP emissions from each new and existing batch and in-line solvent cleaning machine. The regulated source is the individual halogenated solvent cleaning machine.

As authorized under section 112(h) of the Act, the proposed standards consist of a combination of equipment controls, work practices, and operational requirements to provide the best demonstrated HAP emissions control for halogenated solvent cleaning machines. Alternative emission limits are also proposed.

B. Proposed Standards

The standards proposed include multiple alternatives to allow owners or operators maximum compliance flexibility. These standards include an equipment standard, in conjunction with work practice requirements, and an alternative overall solvent emissions standard.

If an owner or operator elects to comply with the equipment standard, they must install one of the control combinations listed in the regulation, use an automated parts handling system to process all parts, and follow multiple work practices. The control combinations for new and existing batch and in-line cleaners are shown in table 1. As an alternative to selecting one of the control combinations listed in the regulation, an owner or operator may demonstrate that the batch vapor or in-line cleaning machine can meet the idling mode emission limit specified in the standards. The idling emission limits are also shown in table 1. In addition to maintaining this idling mode emission limit, the owner or operator of a batch vapor or in-line machine must use an automated parts handling system to process all parts and comply with the work practice standards. No idling standard is proposed for batch cold cleaning machines.

TABLE 1.—CONTROL COMBINATIONS OR IDLING LIMIT ALTERNATIVES FOR SOLVENT CLEANING MACHINES[a]

Cleaner type/size (m^2 solvent/air interface area)	Control combination options or	Idling limits (kg/hr per m^2 solvent/air interface area)
Batch vapor cleaning machines (≤1.21 m^2)	Freeboard ratio of 1.0, freeboard refrigeration device, reduced room draft or Bi-parting cover used during idling and working modes, freeboard refrigeration device, reduced room draft or. Bi-parting cover used during idling and working modes, freeboard ratio of 1.0, reduced room draft or. Freeboard refrigeration device, manual cover used during idling mode, reduced room draft	0.15
Batch vapor cleaning machines (>1.2 m^2)	Bi-parting cover used during idling and working modes, freeboard refrigeration device, reduced room draft or. Dwell, freeboard refrigeration device, reduced room draft or Bi-parting cover used during idling and working modes, freeboard refrigeration device, super heated vapor or. Freeboard ratio of 1.0, reduced room draft, super heated vapor or Dwell, reduced room draft, super heated vapor or Bi-parting cover used during idling and working modes, reduced room draft, super heated vapor or. Bi-parting cover used during idling and working modes, dwell, reduced room draft.	0.15
All batch cold cleaning machines	Cover, water layer.	N/A
All existing in-line cleaning machines	1.0 freeboard ratio, freeboard refrigeration device	0.10
All new in-line cleaning machines	Superheated vapor system, freeboard refrigeration device	0.10

[a] Each owner or operator of a solvent cleaning machine would adopt one of the control combinations listed in table 1 or demonstrate that their solvent cleaning machine can achieve and maintain specified idling emission limits (kg/hr per m^2 solvent/air interface area). N/A = not applicable.

Compliance with the equipment standard for all batch vapor and in-line machines is demonstrated through the monitoring of process parameters. All controls must be monitored either weekly or monthly, as specified in the regulation. Annual reports of monitoring results, and quarterly reports of exceedances of monitored parameters are required. Any exceedance of a monitored parameter would be a violation of the standard. Batch vapor or in-line halogenated solvent cleaning machine operators are required to be trained in the proper operation (work practices) of the cleaning machine to ensure emissions reduction. If requested during an inspection by the Administrator, an owner or operator would need to demonstrate that all batch vapor or in-line solvent cleaning machine operators understand and follow the required work practices. This would be demonstrated by passing an operator test supplied by the inspector. No monitoring or operator test is proposed for batch cold cleaning machines.

As an alternative to the equipment and work practice standard, an owner or operator of a batch vapor or in-line machine may elect to demonstrate that the solvent cleaning machine emits less than the overall solvent emission limit specified in the standards. These specified emission limits are presented in table 2. Compliance is demonstrated by maintaining records of solvent additions and removals and using mass balance equations to calculate emissions. Annual reports including emission calculations, and quarterly reports of exceedances of the emission limit are required. A cleaning machine that meets the overall solvent emission limit is not subject to any other requirements, including monitoring process parameters or the work practice standards. No alternative emission standard is proposed for batch cold cleaning machines.

TABLE 2.—ALTERNATIVE COMPLIANCE EMISSION LIMITS FOR SOLVENT CLEANING MACHINES

Solvent cleaning machine	3-month rolling average monthly emission limit (kg/m^2-month)
Batch vapor solvent cleaning machines	109.8
Existing in-line solvent cleaning machines	153.2
New in-line solvent cleaning machines	98.5

C. Relationship of Standards to the Pollution Prevention Act

The Congress passed and the President signed into law the Pollution Prevention Act of 1990 (PPA) making pollution prevention a national policy. Section 6602 (b) identifies an environmental management hierarchy in which pollution "should be prevented or reduced whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other releases into the environment should be employed only as a last resort * * * " In short, preventing pollution before it is created is preferable to trying to manage, treat or dispose of it after it is created.

According to PPA section 6603(5), source reduction is defined as reducing the generation and release of hazardous substances, pollutants, wastes, contaminants or residuals at the source, usually within a process. The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training or inventory control. Source reduction does not include any practice that alters the physical, chemical or biological characteristics or the volume of a hazardous substance, pollutant or contaminant through a process or activity that is not integral to or necessary for producing a product or providing a service.

Pertaining to this proposal, section 6604(b)(2) of the EPA directs the EPA to, among other things, "review regulations of the Agency prior and subsequent to their proposal to determine their effect on source reduction." The EPA believes that this proposed rule is consistent with the purpose of the Act's requirement to consider source reduction technologies. The Agency's emphasis on source reduction hierarchy is also entirely consistent with Clean Air Act Amendments of 1990, particularly the air toxics provision (title III) that requires the maximum achievable emission reductions through measures that "reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications; * * * " etc.

In todays proposed standards, the EPA has incorporated the application of the environmental source reduction management hierarchy. These proposed standards encourage source reduction as follows:

1. Encourages elimination or reduction of the need to clean whenever feasible. Although the option is not widely available at this time, there are some emerging processes and technologies that facilitate the elimination or reduction of the need to clean and the industry should be encouraged to move toward this goal;
2. Increases the efficiency of cleaning operations to reduce the emissions, and thereby reduces the overall use of halogenated solvents; this may be achieved through modification of certain equipment (e.g., adding a cover, increasing the free board ratio, etc.) or through adoption of new technologies (e.g., totally enclosed or vacuum systems);
3. Improves the housekeeping measures, work practices and maintenance of equipment; and
4. Discourages the use of end-of-pipe or treatment technologies, such as carbon adsorption units that may have significant multi-media impacts.

In addition, a number of alternative solvents and cleaning processes exist that may further promote source reduction in this source category. Alternative solvents include aqueous, semi-aqueous, hydrochlorofluorocarbons, and organic solvents. Alternative cleaning processes include the use of ice particles, plasma, pressurized gases, super critical fluids, ultraviolet/ozone, mechanical, thermal vacuum deoiling, and no-clean processes that eliminate the need for surface cleaning. However, there is no "drop-in" alternative to replace halogenated solvent cleaning operations at this time and selection of an alternative may depend largely on the substrate to be cleaned, the type of soil to be cleaned, level of cleanliness required and other factors. Although the switch-over to certain alternatives may eliminate the use and emission of halogenated solvents, or reduce an impact to one media, the substitute may not when considered from a multi-media perspective, lead to an overall environmental improvement. Generally speaking, many of the alternatives are not without some trade-offs and cross-media transfer problems. Sources contemplating switch-over to alternatives need to carefully weigh the trade-offs before a decision is made.

For further information regarding alternative solvents, the EPA has established an on-line Solvent Alternative Guide, referred to as SAGE. The SAGE is accessible through the EPA's Technology Transfer Network under the Control Technology Center Bulletin Board; modem number (919) 541–5742. The SAGE was established to be used as an analytical tool to assist persons with making an educated decision on potential alternative solvents based on their needs. Information accessible includes costs, potential secondary impacts, and requirements for use. Information included in SAGE is based on available case studies and is constantly evolving.

For further information regarding SAGE, contact Mr. Charles Darvin at (919) 541–7633, Air and Energy Engineering Research Laboratory (MD–61), Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

D. Regulatory Agenda

Although no one is expected to switch to alternative solvents as a direct result of today's proposed standards, the EPA recognizes the industry trend to reduce or eliminate halogenated solvent cleaning machines. Several ongoing Agency activities could potentially have an impact on owners or operators of halogenated solvent cleaning machines who elect to switch to alternative cleaning techniques. The following is a list of current projects and contact names; information on each of these programs is published twice a year in the EPA Agenda.

(1) Metal Products and Machinery Effluent Guideline—The EPA is currently developing effluent standards under the Clean Water Act for this industry. Solvent cleaning operations generating wastewater (e.g., aqueous or semi-aqueous operations) will likely be included. For more information, contact: Bill Cleary of the U. S. Environmental Protection Agency's Office of Water at (202) 260–9817.

(2) Aerospace Industry NESHAP—The EPA is currently developing emission standards under the Act for this industry. This standard will cover wipe cleaning operations performed in the aerospace industry. For more information, contact: Vicki Booth of the U. S. Environmental Protection Agency at (919) 541–0164.

(3) Solvent Alternative Guide (SAGE)—The EPA has developed SAGE, a computer program that provides suggestions for alternative industrial cleaning and degreasing technologies. Users of the program provide information regarding their surface cleaning requirements and SAGE provides cleaning options that can satisfy those requirements. Options include aqueous and semiaqueous systems, supercritical fluids systems, and low vapor pressure biodegradable cleaning systems. For more information, contact: Charles H. Darvin of the U. S. Environmental Protection Agency at (919) 541–7633.

V. Summary of Environmental, Energy, and Economic Impacts

A. Air

The proposed standards would reduce nationwide emissions of hazardous air pollutants from halogenated HAP solvent cleaning machines by 80,400 Mg/yr (88,440 tons per year), or 63 percent in 1996 compared to the emissions that would result in the absence of the proposed standards. No adverse secondary air impacts are expected from the implementation of control options.

B. Water and Solid Waste

There are no adverse water or solid waste impacts anticipated from the promulgation of these standards. However, the use of some halogenated solvents is expected to decline as a result of the phaseout mandated by the 1990 Amendments, the Montreal Protocol, and presidential order; and aqueous cleaners have been chosen by many owners or operators as a cleaning alternative. These standards have the potential to cause some owners or operators to switch to aqueous cleaners or other alternative cleaning technologies; although, this effect is expected to be minor compared to the other factors listed above. As discussed in section IV. C., sources contemplating switch-over to alternatives need to carefully weigh the trade-offs before a decision is made as there may be trade-offs and cross-media (i.e., water) transfer problems. There is a potential impact on water quality from the use of carbon adsorption from the regeneration of carbon beds. The use of carbon adsorbers, however, is not recommended under these proposed standards. Carbon adsorbers are not expected to be selected by owners or operators to control halogenated HAP solvent emissions because of their expense relative to other control options. The quantity of waste solvent or carbon from existing carbon adsorption units disposed of as hazardous waste would not be affected by the proposed standards.

C. Energy Impacts

The anticipated energy impacts result from increased electricity usage for additional air pollution control devices, such as freeboard refrigeration devices, and automated parts handling systems. The national annual energy usage is expected to increase from 57.2 million kWH/yr to 117.1 million kWH/yr, which is equivalent to approximately 32.5 thousand barrels of oil.

D. Cost Impacts

The implementation of this regulation is expected to result in an overall annual national net savings of $30.4 million. This includes a net annualized savings from installation of control devices of $46.8 million and a total monitoring, reporting, and recordkeeping cost of $16.5 million. These savings will come from the significant decrease in solvent emissions and, therefore, solvent consumption, which outweigh the overall cost of air pollution control equipment and monitoring and recordkeeping costs. The only solvent cleaning machine subcategory that would incur an overall national cost is the small cleaning machine. The national annual cost for small cleaning machines is $6.3 million.

E. Economic Impacts

The analysis attempted to compute the impacts on the facilities with the highest control costs. Those facilities were the small facilities, and these facilities were defined using the specifications listed earlier for a small model solvent cleaning machine. Monitoring, recordkeeping, and reporting costs were included with the control costs as an input to the economic impact analysis. Economic impacts were not computed for facilities with negative costs, which include all the affected facilities except for small and medium solvent cleaning machines and new in-line solvent cleaning machines. The methodology for calculating economic impacts is discussed at length in the background information package (see the Background Information Documents section near the beginning of this preamble).

The economic impact analysis shows that the economic impacts from this proposed standard are insignificant. Since a majority of solvent cleaning facilities that will be affected by the standard will actually experience negative costs, the analysis calculated impacts only for those facilities that did not experience negative costs. With the chosen alternatives, and under the assumption that facilities experiencing positive costs cannot pass on any increase in costs from the standard to consumers, the increase in total cost of production for facilities in 39 SIC codes ranges from 0.02 to 0.61 percent (existing cleaning machines), and 0.01 to 0.58 percent (new cleaning machines). The major reason for such small increases in production cost is the small cost share that is attributable to solvent cleaning machines uses. This share ranges from 0.1 (SIC 376—Guided Missiles, Space Vehicles, Parts) to 9.7 percent (SIC 359—Industrial Machinery, n.e.c. [not elsewhere classified]). Due to the small increase in production cost, the impetus for facilities with positive costs to switch to substitutes for halogenated solvent cleaning operations is minor as a result of this standard alone. There will also be minimal effects on the markets for the solvents themselves.

VI. Rationale

A. Selection of Pollutants and Source Categories for Regulation

1. Designated Pollutants

The source category for these proposed standards are solvent cleaning machines that use any of the listed halogenated HAP solvents. During the NSPS and NESHAP development, the HAP studied included MC, PCE, and TCE. The "Alternative Control Technology Document—Halogenated Solvent Cleaners" (EPA-450/3-89-030) also analyzed CFC-113, CT, C, and TCA. All of these solvents except for CFC-113 are HAP listed in the Act and are regulated under these proposed standards. As discussed earlier, the use of TCA and CT is expected to decline as a result of the phaseout mandated by the 1990 Amendments, the Montreal Protocol, and presidential order. However, since their use will extend sometime into the future, TCA and CT are included in proposed standards.

2. Halogenated Solvent Cleaning Machines.

The halogenated solvent cleaning source category does not constitute a distinct industrial category, but is an integral part of many major and minor industries. The largest quantities of halogenated solvents used for cleaning machines are in the following SIC codes.

1. SIC 25–Furniture and Fixtures;
2. SIC 34–Fabricated Metal Products;
3. SIC 36–Electric and Electronic Equipment;
4. SIC 37–Transportation Equipment; and
5. SIC 39–Miscellaneous Manufacturing.

Additional industries that use halogenated solvents in cleaning include the following.

1. SIC 20–Food and Kindred Products;
2. SIC 33–Primary Metals;
3. SIC 35–Nonelectric Machinery; and
4. SIC 38–Instruments and Clocks.

Nonmanufacturing industries such as railroad, bus, aircraft, and truck maintenance facilities; automotive and electric tool repair shops; automobile dealers; and service stations also use halogenated solvent cleaning machines.

Batch and in-line cleaning machines are subject to these proposed standards. Brief cleaning machine and process descriptions for these cleaning machine types are discussed in the following paragraphs. These process descriptions are discussed at length in the background information package (see Background Information Documents).

3. Batch Vapor Cleaners.

The most common type of batch vapor cleaning machine is the OTVC; however, other (non-OTVC) batch vapor cleaning machines such as the cross-rod batch vapor cleaning machine have been developed to accommodate varying industrial cleaning demands.

The basic OTVC tank is designed to generate and contain solvent vapor. The tank is equipped with a heating system that uses steam, electricity, hot water, or heat pumps to boil liquid solvent. As the solvent boils, dense solvent vapors rise and displace the air inside the tank. The solvent vapors rise to the level of the primary condensing coils. Coolant (e.g., water, refrigerant) is circulated or recirculated through the condensing coils to provide continuous condensation of rising solvent vapors, thereby creating a controlled vapor zone that prevents vapors from escaping the tank. Condensing coils are generally located around the inside walls of the cleaner, although in some equipment the primary coils are at one end or side of the cleaner.

During the vapor cleaning machine operation, solvent vapors condense on the cooler workload entering the vapor zone. Condensing solvent dissolves some contaminants and flushes both dissolved and undissolved soils from the workload. Condensed solvent and dissolved or entrained contaminants then drain back into the sump below. When the temperature of the workload reaches that of the vapor, condensation ceases and the vapor phase cleaning machine process is complete. In some instances, the vapor cleaning machine cycle is supplemented, or even replaced, by the immersion of the part into the hot, liquid solvent.

There are numerous batch vapor cleaning machine process variations of the basic vapor cleaning cycle to accommodate differing parts cleaning requirements. Cleaning machine cleaning cycle variations include, but are not limited to, immersion-vapor-spray and vapor-spray-vapor cycles, and nonboiling solvent sections with vapor sections.

Parts are introduced into the cleaning machine manually or with the use of an automated parts handling system. In manual operations, the attendant lowers the parts basket into the cleaning machine and removes the basket once the cleaning has been completed. An automated parts handling system replaces manual operations and decreases potential worker exposure to HAP.

Variations to the basic design include dual or multiple chamber units and ultrasonics. Dual chamber units typically use one chamber for generating the solvent vapor, and the other for immersion cleaning or spraying applications. Some units with multiple chambers include ultrasonics in one of the chambers. Ultrasonics incorporates high frequency sound waves to produce pressure waves in the liquid solvent. Minute vapor pockets are formed in areas of low pressure within the liquid. These pockets collapse as the pressure in the zone cycles to high pressure. The constant creation and collapse of these vapor pockets provides a scrubbing action to aid cleaning.

Non-OTVC batch vapor cleaning machines are hybrids of an OTVC and an in-line cleaning machine. These batch vapor cleaning machines are generally larger and more enclosed than a typical OTVC and typically use conveyorized automated parts handling systems for moving parts through the cleaning cycle. For example, the cross-rod non-OTVC batch vapor cleaning machine is an enclosed cleaning machine that uses rods that suspend parts baskets as they are conveyed through the machine by a pair of power-driven chains.

Similar to OTVC batch vapor cleaning machines, cleaning chambers can contain halogenated solvent for vapor, spray, and immersion cleaning. Controls for OTVC's will be as effective, or more effective, on non-OTVC batch vapor cleaning machines as they are essentially more enclosed OTVC's. Therefore, analysis of the standards based on OTVC batch vapor cleaning machines is reasonable and representative.

4. Batch Cold Cleaning Machines

Batch cold cleaning machines typically use nonhalogenated solvents. Carburetor cleaning machines were the only batch cold cleaning machines identified that use halogenated solvents. In these cleaning machines, MC is blended with other solvents and additives to reduce flammability and increase dissolving power. Emissions from these cleaning machines are typically well controlled because the cleaning solution used contains water, which forms a water layer above the solvent mixture in the tank. The best known control used for carburetor cleaning machines is the use of a cover on the tank and a water layer on the solvent surface. These controls significantly reduce evaporation of MC.

Although in the past some other cold cleaning machines have been sold for use with halogenated solvents, no other cold cleaning machines other than carburetor cleaning machines were identified as using halogenated solvent HAP.

5. In-line (Vapor and Cold) Cleaning Machines.

In-line cleaning machines employ automated parts loading on a continuous basis. In-line cleaning machines can operate in the vapor or nonvapor phase; however, the majority of in-line cleaning machines using halogenated solvents are vapor cleaning machines. An in-line cleaning machine is usually individually designed for a specific workload and production rate. In-line cleaning machines are generally enclosed, except for parts and conveyor inlet and exit openings. The four main types of in-line cleaning machines using halogenated solvents are the monorail, belt, strip, and printed circuit board processing equipment (photoresist strippers, flux cleaners, and developers).

The same cleaning techniques are used in in-line cleaning machines as with batch cleaning machines but are typically larger scale operations than with batch units.

B. Selection of Emissions To Be Covered by the Standards

Halogenated solvent cleaning machines (batch and in-line cleaning machines) are characterized by three operating modes. These operating modes are idling, working, and downtime. Cold cleaners do not have an idling mode.

The three operating modes have characteristic emission mechanisms associated with them. In addition, miscellaneous fugitive emissions from several other loss mechanisms may also occur. Miscellaneous fugitive emissions include those emissions that occur as a result of leaks, filling/draining losses, wastewater losses, start-up/shutdown losses (losses that occur when a cleaning machine is turned on or off), distillation losses, and solvent decomposition losses.

1. Idling Emissions.

Idling emissions are emissions that occur when the cleaning machine is turned on and ready to operate, but is not actively processing parts. Air and solvent vapor interface losses that occur during the idling mode consist of solvent vapor diffusion (or evaporation from liquid solvent in a cold cleaning machine) and solvent vapor convection induced by a warm freeboard.

Diffusion occurs because molecules of solvent move from higher concentrations in the vapor zone to lower concentrations in the air. Because molecular activity increases at higher temperatures, diffusion rates are temperature dependent. Idling diffusion emissions plateau when vapor and air solvent concentrations reach a steady state. Disturbance of this steady state will result in an increase in emissions due to diffusion losses. The diffusion rate steady state can be disturbed if an air flow is introduced across the air and solvent vapor interface as the result of room drafts or a lip exhaust.

Convection occurs from the tank walls being heated from the heated liquid solvent and resulting vapor. The emissions occur as a result of the convective flow up along the freeboard that carries solvent vapor out of the cleaning machine. The amount of convective loss depends on how warm the freeboard walls become. Adequate cooling of the walls by cooling coils can reduce convective losses. Because idling losses can be significant and controls are available to reduce these emissions, idling losses will be controlled by these proposed standards.

2. Working Emissions

Working emissions are emissions that occur when the cleaning machine is turned on and operating (parts are cycling through the cleaning process). Working emission mechanisms for vapor cleaning machines are the same as for idling emissions with additional emissions occurring from the disturbance of the solvent and vapor air interface caused by the introduction and extraction of parts being cleaned, cleaning process (e.g., spraying), the entrainment of solvent vapor on the part as a workload (parts being cleaned) is pulled out of the cleaning machine, and solvent liquid dragout (solvent that remains on the surfaces of clean parts after the parts are removed from the cleaning machine). Working emissions from cold cleaners (batch or in-line) include liquid dragout and cleaning process losses.

Halogenated solvent loss rates are typically the largest during this mode as compared with idling and downtime modes. Because of the large emission potential, working emissions will be controlled by these proposed standards.

3. Downtime Emissions

Downtime emissions are solvent emissions that occur when the heat to the sump (cleaning machine tank) is turned off and the cleaning machine is not operating. Downtime emission mechanisms include evaporation of solvent from the liquid solvent surface and subsequent diffusion into the ambient air. Halogenated solvent loss rates are typically the lowest during this mode as compared to idling and working modes. Generally, these emissions are minimized by the use of a cover, which is required by these standards when the cleaning machine is in the downtime mode. This requirement is considered to exist in the baseline.

4. Miscellaneous Fugitive Emissions

In addition to HAP halogenated solvent losses that occur when the machine is down, idling, or working, there are several other solvent loss mechanisms that contribute to overall losses from a halogenated solvent cleaning machine. These include filling and draining losses as well as machine start-up and shutdown losses. Work practices are included in the proposed standards to reduce these emissions.

C. Emission Control Options

Halogenated solvent cleaning machine emission control options include those controls added to the cleaning machine and those that apply to the cleaning machine operating practices. Alternative cleaning technologies and some emerging new technologies may also be potential options for the reduction of HAP halogenated solvent cleaning machine emissions. This section focuses on batch vapor and in-line (cold and vapor cleaners). Controls for batch cold cleaners are discussed in section VI.A.4.

1. Solvent Cleaning Machine Control Technologies

Emission control technologies for the halogenated solvent cleaning machine industry are classified as idling and/or working mode emission controls for both batch vapor and in-line cleaning machines. Table 3 presents the control efficiencies for various solvent vapor emission control techniques for idling and working modes. A description of these solvent vapor emission controls is summarized here. These emission control techniques are discussed at length in the background information document (see Background Information Documents).

TABLE 3.—SOLVENT VAPOR EMISSION CONTROL EFFICIENCIES FOR VARIOUS CONTROL TECHNIQUES

Cleaner	Control technique	Control efficiency [a] percent	
		Idling	Working
Batch vapor cleaner	Cover	40	0
	Bi-Parting Cover	40	40
	FBR 0.75—>1.0	20	20
	FBR 1.0—>1.25	10	10
	Freeboard refrigeration device	40	40
	Primary condenser temperature (30 to 40 percent of the solvent boiling point).	40	40
	Reduce wind speed 30.3 m/min (100 ft/min)—>calm (15.2 m/min [<50 ft/min]).	50	50
	Hoist	0	35
	Dwell	0	30
In-line cleaners	Freeboard refrigeration device	60	60
	Carbon adsorption system	60	60

[a] Control efficiency over a typical cleaner.

Typical batch cleaner: OTVC with a 0.75 freeboard ratio, circumferential water-cooled primary condensing coils, a manual cover, and located in a room with windspeeds in excess of 30.3 m/min (100 ft/min).

Typical in-line cleaner (vapor and cold): A typical in-line cleaner has water-cooled condenser coils.

Covers are used on halogenated solvent cleaning machines to eliminate drafts within the freeboard and to reduce diffusion losses. A bi-parting cover is a cover made to close around the cables holding parts baskets when the basket is inside the cleaner. A bi-parting cover allows for complete enclosure during the cleaning phase. Covers can be manually operated, or electronically powered.

The freeboard height on a batch vapor cleaning machine is the distance from the solvent/vapor air interface to the top of the tank walls. The freeboard zone serves to reduce solvent/vapor air interface disturbances caused by room drafts and provides a column through which diffusing solvent molecules must migrate before escaping into the ambient air. Higher freeboards reduce diffusional losses by diminishing the effects of air currents and lengthening the diffusion column.

In all vapor cleaning machines, solvent vapor created within the machine is prevented from overflowing through use of primary condenser coils. Freeboard refrigeration devices are a second set of cooling coils located above the primary condenser coils of the cleaning machine. Freeboard refrigeration devices have proven to be an effective control for diffusion losses.

Although a primary condenser is standard equipment on all OTVC's, the cooling temperature and design of the coils have an effect on idling losses. A lower cooling temperature, will lower diffusion losses. This is generally achieved by the use of a refrigerant rather than water.

Air movement over a batch vapor cleaning machine affects the solvent emission rate by sweeping away solvent vapors diffused into the freeboard area and creates turbulence in the freeboard area that increases solvent diffusion as well as solvent vapor and air mixing. By reducing the air speed over the cleaning machine, there is a reduction in these emissions.

The method employed for moving parts through the halogenated vapor cleaning machine cycle has a direct effect on the magnitude of workload related emissions. Rapid movement of parts will increase solvent loss due to carry-out of liquid solvent and entrainment of solvent vapor, and increased disturbance at the solvent/vapor air interface. Use of a mechanical parts handling system (hoist) can reduce emissions by consistently moving parts into and out of the machine at appropriate rates, such as 3.3 m/min (11 ft/min), thereby eliminating excess losses caused by manual operation. Manual operators can move parts at speeds in excess of 24.2 m/min (80 ft/min).

Another advantage of mechanical parts handling is the potential for precise control of the dwell time (i.e., the length of time the part remains in the vapor zone). Proper dwell time decreases emissions by ensuring that the parts have reached the solvent temperature prior to removal from the machine. If parts have not reached the solvent vapor temperature, condensation would still occur as parts are withdrawn from the machine and solvent carry-out losses would increase.

Carbon adsorption can be employed as a control technique in conjunction with a lip exhaust system. With these systems, peripheral exhaust ducts capture the diffusing solvent vapors and to some extent solvent evaporating from clean parts and directs them through an activated carbon bed. The solvent vapor molecules are adsorbed onto the activated carbon, removing the solvent from the vent stream before discharging to the atmosphere. However, the use of lip exhausts increases overall consumption and even when exhausted vapors are controlled by a carbon adsorption unit, does not reduce emissions any more than the other techniques discussed above. Therefore, use of lip exhausts, even those routed to carbon adsorbers, is discouraged. Available anecdotal test data support the EPA's belief that lip exhausts are not required to meet OSHA limits. Attaining OSHA limits is generally the rationale behind the use of a lip exhaust, however, OSHA does not require their use. Furthermore, there are increased cross-media transfer problems associated with the use of carbon adsorption, including increased air, solid/hazardous waste and wastewater impacts.

Control efficiencies for the listed control techniques were derived from emission tests performed on idling and working batch vapor and in-line cleaning machines. Data were available from multiple tests of control techniques on a wide variety of cleaning machines. The EPA evaluated these data and determined an overall average control efficiency for each control technique for the idling and working modes. These control efficiencies represent the average emission reduction attained over a typical cleaning machine. For purposes of calculating these efficiencies, a typical batch cleaning machine is an OTVC having a 0.75 FBR, circumferential water-cooled primary condensing coils, a manual cover (used during downtime), and located in a room with windspeeds in excess of 30.3 m/min (100 ft/min). It is assumed that no lip exhaust is present, unless already vented to a carbon adsorber. A typical in-line (vapor and cold) cleaning machine has water-cooled condenser coils.

It is believed that many of these techniques could also reduce downtime emissions. However, insufficient data were available to assign downtime control efficiencies to the control techniques. Therefore, a zero-percent control efficiency of downtime emissions was used in all analyses.

Generally, multiple control techniques are used in combination on a single cleaning machine. When controls are used in combination, there is an increase in the achievable control efficiency. However, the efficiencies of the two controls added to one cleaning machine are not additive. The net efficiency of two controls is less than the additive sum, because the second control is controlling only the emissions not already controlled by the first control (i.e., the controls are essentially acting in series). The formula for determining the net efficiency for two controls is as follows:

$E_{eff}=E_1 - + E_2 - E_1E_2$

where:

E_{eff}=net efficiency of the combined controls;

E_1=efficiency for control 1; and

E_2=efficiency for control 2.

Similar equations for determining the net efficiency of more than two control devices were also developed.

Redundancy among options occurs when control techniques control the same emissions using similar principles. For example, freeboard refrigeration devices and reduced primary condenser temperature controls both reduce vaporization losses by cooling the freeboard and have an associated 40 percent control efficiency under idling and working conditions. Tests have demonstrated that limited-to-no benefit is obtained by having both techniques employed on the same unit. Similarly, an enclosed design is considered to exert equivalent control as a reduced room draft and a cover; these control techniques may also be considered redundant.

2. Alternative Cleaning Technologies

Rather than reducing the emissions of halogenated solvents by controlling halogenated solvent cleaning machines, it is possible in some instances to replace halogenated solvent cleaning machines or the solvent itself with alternative cleaning technologies. Alternative cleaning technologies include the use of alternative solvents, alternative cleaning machines, and no-clean technologies. These proposed standards allow use of these alternatives in place of a halogenated solvent cleaning machine.

Alternative solvents are generally classified as hydrochlorofluorocarbons, aqueous, semi-aqueous, or organic. Alternative cleaning technologies or processes can also be used to replace common halogenated solvents. Many of these processes are still in the developmental stages. These processes include: (1) Ice particles; (2) plasma; (3) pressurized gases; (4) supercritical fluids; (5) ultraviolet/ozone; (6) mechanical; (7) thermal vacuum deoiling; and (8) no-clean technologies. No-clean technologies include process modifications that eliminate the need for surface cleaning, including the use of low solids flux and controlled atmosphere soldering.

In developing the regulatory approach for controlling this source category, the role of alternative cleaning agents and technologies was considered. However, the proposed NESHAP does not mandate a switch from halogenated solvents to an alternative solvent or technology for the following reasons:

1. Controls exist that can significantly and efficiently reduce the emissions of halogenated solvents from solvent cleaning machines. These controls can

reduce the emissions to a level more stringent than the MACT floor for these units.

2. Determination of an acceptable alternative cleaning technology is site and application specific and can take several years to develop. Not all of the applications are known, and it is uncertain whether an acceptable alternative technology exists for every application.

3. While HAP use could be eliminated or reduced, discharges of other pollutants, to wastewater or air could be increased. Because the switch from a halogenated solvent cleaning machine system to an alternative solvent system is application specific, the relative impacts of making a total switch cannot be confidently assessed.

The EPA has set up a solvent work group that has begun an investigation of the broader uses of alternative solvents and cleaning processes. This group will continue to address this issue after today's proposal. The EPA plans, between proposal and promulgation, to make a better assessment of the feasibility of the use of these alternative technologies and their magnitude of their multi-media impacts.

Currently available information concerning alternative cleaning agents and technologies is available for public inspection and copying from the docket (A–92–39) containing supporting information used in developing the proposed standards. This information is contained in a memo entitled "Status of Alternative Solvents and Processes to Halogenated Solvent Cleaning." The document number for this memo is II-B–14. The docket is available for public inspection and copying between 8:30 a.m and 3:30 p.m., Monday through Friday, at the EPA's Air Docket, Room M1500, U. S. Environmental Protection Agency, 401 M Street, SW, Washington, DC. A reasonable fee may be charged for copying.

As discussed in section II.C., a solvent alternative guide has been developed by the EPA's AEERL to assist users and State or local agencies in the case-by-case evaluation of alternative cleaning agents. The solvent alternative guide (called SAGE) is a computer on-line analytic tool that provides a facility with comprehensive information on some potential solvent alternatives and their associated impacts based on their cleaning needs. This computer system is evolving as further information is obtained. Refer to section IV.C. for further information on accessing SAGE.

The EPA is aware that there may be specific applications where these alternative cleaning agents and technologies are viable alternatives. The EPA requests comments and information on any known application of these agents or technologies and whether they should be considered in the MACT analysis. Information supplied needs to include specifics on applicability, costs, and multi-media impacts (i.e., air, water, soil). Information obtained will be considered by the EPA in the final rulemaking. The EPA may promulgate a rule that requires these technologies for specific applications.

3. New Technologies

Two new solvent cleaning machine technologies are currently being developed by industry. However, at present, these technologies are still under development and insufficient data are available to include these technologies in the MACT decision for these proposed standards.

One such system controls the total processing environment. This reportedly allows the use of many solvent alternatives, including compounds that are vapors at room temperature. The system is a closed loop comprising a processing chamber capable of withstanding both full vacuum and pressure, a gas liquid separator, a compressor or blower, a temperature swing solvent stripper, a gas accumulator, and a gas reheater. The system also contains a vacuum pump and a solvent recycle/supply system. This system is not expected to have idling or downtime emissions because the closed loop remains isolated during nonoperating periods.

The second technology is also applicable to conventional cleaning machine processes and can be retrofit to existing OTVC's. Vendors report that the use of solvents with boiling points as low as 10 °C (50 °F) are expected to be practical and cost effective. This system isolates the solvent process from the environment to avoid solvent loss and worker exposure. This is accomplished by the use of a lightweight perimeter enclosure to enclose the process, a closed-loop temperature swing solvent recovery, a gas accumulator (to accommodate fluctuations of vapor volume and control pressure in the perimeter), and a vacuum air lock to get parts in and out. This system, as with the first system discussed, is not expected to have idling or downtime emissions because the closed loop remains isolated during non-operating periods.

Because of the lack of data, and developmental nature of these technologies, they were not included in the selection of MACT for these proposed standards. These proposed standards, however, would allow the use of new and innovative technologies where they could be demonstrated to be equivalent to the control levels of the proposed NESHAP by complying with the alternative emission limit.

The EPA is currently evaluating enclosure technologies as described above at two facilities. The EPA is evaluating information on the solvents that these systems are designed to use, products that the systems can clean, ability to retrofit existing cleaning systems with the technology, and industries that use these systems.

The EPA is requesting any comments or information concerning new technologies that are feasible and can be justified as the basis for the final rule. Information supplied needs to include specifics on applicability, control efficiency, costs, and multi-media impacts (i.e., air, water, soil). Information obtained will be considered by the EPA in the final rulemaking. The EPA may promulgate a rule that requires these technologies for specific applications.

4. Fugitive Emission Controls

Fugitive emission control for the halogenated solvent cleaner industry vary according to the fugitive loss mechanism. These emission controls are discussed below.

Filling and draining losses occur from open handling procedures and are minimized by operating practices that require that the transfer of HAP solvent be by the use of a threaded or other leakproof coupling with the end of the pipe in the solvent sump being located beneath the liquid solvent surface.

Wastewater losses occur when water is decanted from the separator containing a slight amount of solvent. These losses are considered to be minimal if a separator is correctly designed, operated, and maintained. Provisions for the proper maintenance of the cleaner and controls are included in these proposed standards.

Start-up and shutdown losses are losses that occur during the transition time from when a solvent cleaning machine is turned on or off to the time when equilibrium is achieved. These losses are controlled by some of the same controls that control idling losses. For example, starting the condenser coolant prior to turning on the sump heater is a start-up procedure that facilitates solvent condensation in the saturated zone above the liquid solvent before solvent vapors rise out of the cleaner.

Distillation losses are losses that occur when solvent is regenerated through onsite distillation for reuse.

Losses that occur due to distillation are from evaporation during transfer and from leaks in the equipment; therefore, transfer and operating leak and detection provisions cover any losses that may occur from distillation processes.

Solvent decomposition losses result from the solvent mixture turning acidic due to reactions occurring with water. Emissions occur during handling and disposal of the solvent. This solvent is subject to controls under RCRA that serve to minimize losses by stringent handling and disposal guidelines. These proposed standards do not interfere with RCRA's handling and disposal guidelines to minimize HAP emissions.

D. Development of Regulatory Alternatives

With the exception of the batch cold cleaning machine subcategory, multiple regulatory alternatives were developed for each of the solvent cleaning machine source categories. The only batch cold cleaning machines that the EPA identified that use a halogenated solvent were carburetor cleaners, which are controlled with a cover and a water layer in the absence of a regulation. No additional control techniques were identified that could further reduce the emissions from these cleaning machines. The Administrator determined that the cover and the water layer represent GACT. Therefore, today's proposed standards require the use of a cover and a water layer on all batch cold cleaners. Since the only identified HAP cold cleaners using halogenated solvents are carburetor cleaners, the proposed standard will not have an associated control cost and will not result in an emission reduction because carburetor cleaning machines already incorporate the GACT level of control. Rather, the standard will ensure that new batch cold cleaning machines that use halogenated solvents have the appropriate emission controls. In order to ensure the proper operation of existing batch cold cleaning machines, the standard for cold cleaning machines requires that the cover and the water layer be in place whenever the batch cold cleaning machine is cleaning parts.

The only impact associated with the regulation of batch cold cleaning machines is the reporting cost. Each owner or operator of a batch cold cleaning machine is required to submit a report stating that they have a batch cold cleaning machine and are complying with the standard. This report is discussed in more detail in section VI.I. The estimated respondent cost of 100,000 initial notifications averaged over a 3-year period is $1.1 million. The estimated Federal government cost for 100,000 initial notifications averaged over a 3-year period is $308 thousand.

The EPA solicits comments and supporting data on the inclusion of batch cold cleaning machines in today's proposal. Specifically, the EPA requests comments on the reasonableness of setting GACT standards equal to the baseline level of control, which achieve no HAP emission reduction. Also, the EPA requests data and comment on the existence of other HAP batch cold cleaning machines and whether the proposed standards would be reasonable for those machines.

The regulatory alternatives developed for the five remaining solvent cleaning machine source subcategories are discussed below.

1. Selection of MACT Floor

Emission standards for new and existing sources promulgated under section 112(d) of the Act must represent the maximum degree of reduction achievable; this is typically referred to as the MACT. The Act establishes minimum levels, or "floors," for MACT standards. These floors are to be determined as follows:

> (1) for new sources, the MACT floor cannot be "less stringent than the emission control that is achieved in practice by the best controlled similar source * * *."
>
> (2) for existing sources with more than 30 sources, the MACT floor cannot be less stringent than "the average emission limitation achieved by the best performing 12 percent of the existing sources * * *."

The MACT floors for the halogenated solvent cleaning machine source subcategories are based on control efficiency and sales data obtained from section 114 questionnaires sent to solvent cleaning machine vendors. In this section 114 questionnaires data were gathered for cleaning machines in each subcategory. These data are assumed to be representative of the control levels achieved by the industry as a whole, and represent the best information available to the Administrator.

Using the control efficiencies for the individual control devices, the combined control efficiency formula, and the model cleaning machine operating schedules, a control efficiency was calculated for each reported cleaning machine. The control combination efficiencies were rounded to the nearest 10 percent increment (i.e., 10 percent control, 20 percent control, etc.) due to data and precision. The combinations were then grouped by their combined control efficiencies. All the cleaning machines were grouped based on control efficiencies and ranked from the highest control efficiency combination to the lowest control efficiency combination. The floor for existing sources in each subcategory was then determined by calculating the weighted-average level of control for the top performing 12 percent. The MACT floors, for batch vapor cleaning machine existing sources are as follows: 10 percent for small, 40 percent for medium, 40 percent for large, 60 percent for very large. The MACT floor is 30 percent for existing source in-line cleaners. The MACT floor for new sources in each subcategory was determined by determining the maximum control level achieved (control level of the best-controlled existing source) for each subcategory. The MACT floors for batch cleaning machine new sources are as follows: 40 percent for small, 50 percent for medium, 60 percent for large, 60 percent for very large. The MACT floor is 40 percent for new source in-line cleaning machines.

2. Development of Additional Regulatory Alternatives

Regulatory alternatives were developed for each of the five solvent cleaning machine subcategories. The least stringent regulatory alternative that was examined in detail is the MACT floor; therefore, the MACT floor is always presented as the first alternative. To develop the regulatory alternatives, potential control levels for each subcategory were developed and analyzed. First, all reasonable control combinations were evaluated for their emission reduction potential for each subcategory, based on a typical operating schedule. Then the control combinations were grouped into control levels, rounded to the nearest 10 percent increment. Next, the capital costs were evaluated and the median cost combination was determined for each control level. Median costs were selected instead of average costs because the median costs have a particular control combination associated with each, whereas an average cost may not correspond to any of the available control combinations. Median costs were selected as opposed to the lowest cost combination because some combinations may not be feasible for all cleaning machines. For each subcategory, the control combination cost that represented the median capital cost was chosen to represent the control level.

Once the median cost control combinations were selected, the costs of each control level were evaluated for each subcategory. The total annual cost for each control level was estimated from the annualized capital costs, the annual operation costs; the monitoring, reporting and recordkeeping costs, and the solvent cost savings realized from reduced solvent consumption. The cost per unit of emissions reduction, or cost effectiveness, was then determined for each control level and inferior control options were identified. Inferior control options are defined as those control levels with higher costs than other levels that achieve the same or greater emission reductions. The remaining non-inferior control options made up the set of regulatory alternatives for each subcategory. Both the existing and the new small batch vapor cleaning machine control options at the MACT floor levels were identified as inferior options; however, because they are the MACT floor, they are included as the first regulatory alternatives for this subcategory. Table 4 presents the regulatory alternatives for each subcategory.

TABLE 4.—SOLVENT CLEANER SOURCE SUBCATEGORY REGULATORY ALTERNATIVES

	Existing	New
Batch vapor cleaner:		
Small	I—10% (floor)	I—40% (floor).
	II—30%	II—50%
	III—50%	III—60%
	IV—60%	
Medium	I—40% (floor)	I—50% (floor).
	II—50%	II—60%
	III—60%	
Large	I—40% (floor)	I—60 (floor).
	II—70%	II—70%
Very large	I—60% (floor)	I—60% (floor).
	II—70%	II—70%
In-line	I—30% (floor)	I—40% (floor).
	II—50%	II—50%
		III—70%

The control cost analysis for the regulatory alternatives indicates that a large number of solvent cleaning facilities will have negative costs for moving from the estimated current level of control to meeting each regulatory alternative. That is, the annualized cost of purchasing and operating the control device is less than the cost savings realized by the reduced solvent costs. This savings implies that many facilities have had the possibility of reducing their costs but have not yet taken the opportunity to do so in the absence of the standard. An important question for any analysis of the impact of the proposed regulation is what portion of the firms with this potential savings would realize the savings in the absence of the proposed regulation and what portion would only realize the savings if forced to by the regulation. The main analysis assumes that none of the firms would undertake the control in the absence of regulation requiring control. However, a sensitivity analysis addresses the implications if the firms with the greatest cost savings undertake the control even in the absence of regulation.

This sensitivity analysis uses a criterion of a savings of $25,000 in NPV above all costs of the purchase, operation, and maintenance of the emissions control equipment. The sensitivity analysis thus assumes that a net savings of $25,000 or more will assure that the firm will undertake the control. For these firms the sensitivity analysis does not attribute any emission reduction or cost to the regulation because it assumes the control would be undertaken whether or not there is a regulation. The criterion of $25,000, was chosen for it was a midpoint between the smallest capital investment ($11,200) and the largest capital investment ($38,100) necessary to comply with the standard. Thus, if a solvent cleaning machine operator would experience a return on investment of at least $25,000 in NPV from installing emissions control equipment, the operator would do so in the absence of the standard, and vice versa. Regardless of whether this investment is required by regulation, the level of emission reduction is the same, since solvent cleaning machine operators choosing to invest in control equipment in the absence of a standard will control emissions by the levels the standard requires. This sensitivity analysis did allow analysis of the impact on incremental cost effectiveness and benefit cost analysis of varying assumptions concerning this baseline control issue. There is no marked change in the values obtained for incremental cost effectiveness or benefit cost analysis. Therefore, the uncertainty concerning the baseline level of control does not change the relative attractiveness or the selection of regulatory alternatives. Because reducing this uncertainty would be both quite difficult and not helpful in making the selection among the regulatory alternatives, further analysis beyond the sensitivity analysis was not needed. More information on the baseline investment criterion is available in the background information document (see the Background Information Documents section near the beginning of this preamble).

3. Evaluation of National Costs

After the regulatory alternatives were determined, the national costs were estimated. Information on the location and number of batch and in-line cleaning machines in the United States is difficult to obtain because of the large number of solvent cleaning machines existing within many different industries. Therefore, a method to estimate the nationwide number of solvent cleaning machines was developed using available data such as nationwide solvent consumption and average cleaning machine emission rates. In general, the numbers of cleaning machines were estimated based on the quantity of solvent consumed at the national level, assumptions on the breakdown of the national cleaning machine population (i.e., sizes and percentage of controlled cleaners), and typical solvent consumption rates for each size and control combination. The population of halogenated solvent batch vapor and in-line cleaning machines was estimated to be 24,500.

Assuming an average 15-year lifespan for a solvent cleaning machine and that the number of cleaning machines will remain constant from 1993 to 1996, it was determined that in 1996 (first year of compliance), the cleaning machine population will be 20 percent new cleaning machines (4,900) and 80 percent existing cleaning machines (19,600).

Based on the responses to section 114 surveys, the distribution of cleaning machines among the different control levels (i.e., 10 percent, 20 percent, etc.) was determined for all cleaning machines sold in the last 10-year period. This distribution was used as the control efficiency distribution for existing cleaning machines. The control efficiency distribution of those cleaning machines sold in 1990 was used as the control efficiency distribution for new cleaning machines.

The national cost for cleaning machines to achieve a particular regulatory alternative comprised the sum of the capital; and monitoring, reporting and recordkeeping costs for all cleaning machines to move from their current levels of control to the regulatory alternative level. If a cleaning machine was at or above a regulatory alternative level, that cleaning machine incurred no capital costs; but did incur monitoring, reporting and recordkeeping costs. The corresponding total emission reductions were also estimated and, with the total national costs, used to calculate the average cost effectiveness for each regulatory alternative. Then the incremental cost of moving from one regulatory alternative to the next regulatory alternative was determined. Table 5 presents the national costs, emission reductions, and the average and incremental cost effectiveness values for the regulatory alternatives with a cost credit for reductions in solvent usage.

TABLE 5 —NATIONAL COSTS AND EMISSION REDUCTIONS FOR SOLVENT CLEANERS—WITH SOLVENT RECOVERY CREDITS

Cleaner size	Regulatory alternative * (percent)	Net annualized cost ($/yr)	HAP emission reduction (MG)	Average cost effectiveness ($/MG)	Incremental cost effectiveness ($/MG)
Existing:					
Small	I–10	2,563,000	300	8,540	....
	II–30	1,904,000	1,200	1,590	(730)
	III–50	4,073,000	2,100	1,940	2,410
	IV–60	5,202,000	2,500	2,080	2,820
Medium	I–40	3,214,000	2,900	1,110	....
	II–50	2,123,000	3,900	540	(1,090)
	III–60	3,238,000	4,900	660	1,120
Large	I–40	(2,428,000)	4,300	(560)	....
	II–70	(4,560,000	10,700	(430)	(330)
V. Large	I–60	(8,664,000)	10,100	(860)	....
	II–70	(10,623,000)	14,200	(750)	(480)
In-Line	I–30	(16,210,000)	14,600	(1,110)	....
	II–50	(23,218,000)	29,100	(800)	(480)
New:					
Small	I–40	965,000	400	2,410	....
	II–50	836,000	500	1,670	(1,290)
	III–60	1,119,000	600	1,870	2,830
Medium	I–50	384,000	700	550	....
	II–60	663,000	1,000	660	930
Large	I–60	(711,000)	1,900	(370)	....
	II–70	(1,010,000)	2,400	(420)	600
V. Large	I–60	(2,410,000)	2,700	(890)	....
	II–70	(2,900,000)	3,800	(760)	(450)
In-Line	I–40	(4,304,000)	5,500	(780)	....
	II–50	(6,484,000)	7,400	(880)	(1,150)
	II–70	123,000	11,200	10	1,740

* = Regulatory alternative I is MACT floor. () = Negative values are shown in parentheses.

The costs in table 5 include a cost credit for reductions in solvent usage that result from increased emission control. Table 6 presents national costs, emission reductions, and the average and incremental cost effectiveness for the regulatory alternatives without a cost credit for reductions in solvent usage. The EPA solicits comments on operating experience from users of solvent cleaning machines concerning whether it is appropriate to include a credit for solvent not consumed when calculating the costs and cost effectiveness of the regulatory alternatives. For the remainder of this preamble, the cost effectiveness values from table 5 are presented, which include credits for the reduction in solvent usage.

TABLE 6.—NATIONAL COSTS AND EMISSION REDUCTIONS FOR SOLVENT CLEANERS—WITHOUT SOLVENT RECOVERY CREDITS

Cleaner size	Regulatory alternative* (percent)	Net annualized cost ($/yr)	HAP emission reduction (MG)	Average cost effectiveness ($/MG)	Incremental cost effectiveness ($/MG)
Existing:					
Small	I–10	3,043,000	300	10,140	
	II–30	3,557,000	1,200	2,960	570
	III–50	6,950,000	2,100	3,310	3,770
	IV–60	8,668,000	2,500	3,470	4,300
Medium	I–40	7,242,000	2,900	2,500	
	II–50	7,494,000	3,900	1,920	250
	III–60	9,979,000	4,900	2,040	2,490
Large	I–40	3,583,000	4,300	830	
	II–70	10,294,000	10,700	960	1,050
V. Large	I–60	5,416,000	10,100	540	
	II–70	9,154,000	14,200	640	910
In-Line	I–30	3,743,000	14,600	260	
	II–50	16,485,000	20.100	570	880
New:					
Small	I–40	1,467,000	400	3,670	

TABLE 6.—NATIONAL COSTS AND EMISSION REDUCTIONS FOR SOLVENT CLEANERS—WITHOUT SOLVENT RECOVERY CREDITS—Continued

Cleaner size	Regulatory alternative* (percent)	Net annualized cost ($/yr)	HAP emission reduction (MG)	Average cost effectiveness ($/MG)	Incremental cost effectiveness ($/MG)
	II–50	1,496,000	500	2,990	290
	III–60	1,927,000	600	3,210	4,310
Medium	I–50	1,407,000	700	2,010	
	II–60	2,029,000	1,000	2,030	2,070
Large	I–60	1,925,000	1,900	1,010	
	II–70	2,377,000	2,400	990	900
V. Large	I–60	1,393,000	2,700	520	
	II–70	2,329,000	3,800	610	850
In-Line	I–40	3,240,000	5,500	590	
	II–50	3,655,000	7,400	490	220
	III–70	15,409,000	11,200	1,380	3,090

* = Regulatory alternative I is MACT floor.

4. Benefits Analysis

A benefit analysis was undertaken to examine and illustrate the value of requiring control approaches more stringent than the MACT floor level. The analysis was not conducted on every affected solvent cleaning machine. The analysis started with a risk characterization study on two model solvent cleaning machines, one small and one medium, that were placed in the center of three large cities in different areas of the United States (Detroit, Atlanta, and New York City). Estimates of the total number of people exposed, potential risk to the most exposed, and potential number of cancer cases per year were generated. Applying the regulation to the model cleaning machines yielded emissions reductions, and the monetary benefits from the reductions were then calculated on a per Mg (ton) basis. It should be noted that this analysis assumes that the model plant configurations are representative of solvent cleaning machines in the nation and the population density of the three modelled cities is representative of the nation as a whole.

To complete the analysis required two stages: the first, valuing the reduction in annual cancer mortality risk; the second, valuing the reduction in non-cancer effects. Results from the first stage showed monetary benefits (all computed in 1990 dollars) ranging from $181 to $964 per Mg ($164.54 to $876.36 per ton). For the second stage, the implicit per Mg (ton) value needed to equate incremental costs and benefits was calculated. This showed that implicit benefits after removing credit for reducing cancer incidence for VOC per Mg (ton) must be in the range from $0 to $559 per Mg ($0 to $508.18 per ton) for new medium solvent cleaning machines, and $1,866 to $2,649 per Mg ($1,696.36 to $2,408.18 per ton) for existing and new small solvent cleaning machines. Ranges were computed based on the level of credit for reduction in cancer mortality risk. Methods to fully quantify the non-cancer human health and the ecological benefits of reduced exposures to these chemicals are complex, and in some cases, controversial.

Assuming a policy-based VOC reduction decision criterion of $2,000/Mg ($1,818.18 per ton), the benefits analysis supports emissions control at the selected regulatory alternatives unambiguously except for the small solvent cleaning machines and the new in-line solvent cleaning machines. The $2,000/Mg ($1,818.18 per ton) of VOC reduction decision criterion that has been used as a value for decision-making lies within the upper end of the range for these two solvent cleaning machine types. For these machines, the benefits analysis is not definitive, neither clearly supporting or refuting the proposed levels of control by the benefit/cost criterion. Further information is available in a background information document (see the Background Information Documents section near the beginning of this preamble).

E. Selection of Maximum Achievable Control Technologies

When establishing standards under section 112(d) of the Act, the Administrator must establish limits that reflect the maximum achievable emission reduction, or MACT. However, for area sources, section 112(d)(5) states that "the Administrator may * * * elect to promulgate standards or requirements * * * which provide for the use of generally available control technologies or management practices." This is typically referred to as GACT. Since these standards include area sources, an evaluation of the appropriate regulatory approach for area sources was needed.

The use of GACT as opposed to MACT for area sources is not required by the Act. A GACT approach might be warranted if significant adverse economic impact is expected on small sources. This might especially be the case where the small sources are also small businesses that could not afford the capital expenditure associated with meeting MACT. There could also be some concern that appropriately trained individuals would not be available to operate sophisticated controls. A GACT approach may also be warranted if there is a technological limitation to installing a control device on smaller emission sources.

In this source category, no reason that would lead to using a GACT approach for batch vapor and in-line cleaning machines is known to exist. Although a number of cleaning machines are expected to be located at small businesses, the use and operation of these cleaners do not represent a significant portion of their business. Batch vapor and in-line solvent cleaning operations typically represent only a small portion of the total operating expenses of a source; generally ranging from 0.1 to 9.7 percent. Therefore, any impact from the standards would not be likely to have a significant impact on the overall facility.

There is no technological barrier to the use of controls on smaller sources. When developing the standards for this source category, the determination of MACT was made for multiple cleaning machine size ranges. The levels selected are above the MACT floor and are equivalent to the levels that would have been established if a GACT approach were used.

While the technological sophistication of controls may increase as the level of control increases, proper operation is still relatively simple. Normal training procedures that would be present at any facility to ensure proper use of the cleaning machine would typically be sufficient to ensure proper control device operation. Some of the control devices are less prevalent on the smaller size cleaning machines; however, there is no technological reason why the controls cannot be applied to these units.

Since there are no significant economic, technological, or feasibility issues that would warrant selecting a GACT approach for batch vapor and in-line cleaning machine area sources in this industry, MACT is warranted for the batch vapor and in-line cleaning machines subcategories. This proposed standard is based on MACT control applied to all batch vapor and in-line cleaning machines and GACT control applied to all batch cold cleaning machines.

Requiring area sources to meet MACT as opposed to GACT means that the section 112(f) requirement, that EPA conduct a residual risk analysis 8 years after promulgation of the MACT standard, will apply to those sources. The EPA requests comment on whether this residual risk requirement should be a factor to be weighed in determining whether MACT or GACT should apply to a category or subcategory of area sources. For example, in the present case, where MACT and GACT would require the same level of control, is it permissible to call the standard GACT for area sources in order to exempt those sources from the requirements of 112(f)?

1. Evaluation of Regulatory Alternatives

The EPA has chosen the most stringent regulatory alternative for each solvent cleaning machine source subcategory for both existing and new cleaning machines, considering emission reduction, cost, economic, and other environmental impacts. As shown in table 5, the incremental cost effectiveness of moving from the next most stringent to the most stringent regulatory alternative for these subcategories ranged from an incremental cost-effectiveness savings of $600/Mg ($550 per ton) to a incremental cost effectiveness of $2,830/Mg ($2,570 per ton) of HAP emission reduction. No adverse economic or other environmental impacts are expected for any of the alternatives presented. Batch cold cleaning machines are not included in this table, but are proposed to be regulated under GACT, as discussed in section VI.D.

The analysis for existing and new small and medium batch vapor cleaning machines and new in-line cleaning machines revealed incremental cost-effectiveness estimates ranging from $1,120/Mg to $2,830/Mg associated with adopting the most stringent regulatory alternatives. For large and very large batch vapor cleaning machines, and existing in-line cleaning machines there were incremental cost savings for the most stringent regulatory alternative. Cost savings occur because the control techniques reduce solvent emissions from cleaning machines, thereby reducing the amount of new solvent that must be purchased. The savings in solvent purchase costs outweigh the cost of installing and operating the controls. In light of these incremental cost effectiveness estimates and because no adverse economic or environmental impacts are expected, the most stringent alternatives for the batch vapor and in-line cleaning machine source subcategories are selected as MACT.

The EPA requests comments on it's estimates of the cost, emission reduction benefits, and recovery credits, and solicits comments on the appropriateness of selecting the most stringent alternative for each of the subcategories (particularly for the small and medium subcategories).

Table 7 presents a summary of the MACT standards for existing and new solvent batch vapor and in-line cleaning machine source subcategories covered by these standards. The proposed standards are based on the EPA's evaluation of all data currently available. The EPA invites comment on all the regulatory alternatives presented in this preamble, ranging from the floor to the alternative technologies discussed in section VI.C. Before promulgating a final rule, the EPA will evaluate all additional information and data submitted. Based on this evaluation, the promulgated standards could be set at the MACT floor level, or at the level of any of the other regulatory alternatives presented in this preamble, but will not be less stringent than the floor. The EPA could also establish MACT based on the alternative technologies discussed in section VI.C.

TABLE 7.—SOLVENT CLEANER SOURCE SUBCATEGORY SELECTED REGULATORY ALTERNATIVES

	Existing (percent)	New (percent)
Batch vapor:		
Small	IV—60	III—60
Medium	III—60	II—60
Large	II—70	II—70
Very large	II—70	II—70
In-line	II—50	III—70

F. Selection of Format for the Proposed Standards

Section 112(d) of the Act requires that emission standards for control of HAP be prescribed unless, in the judgment of the Administrator, it is not feasible to prescribe or enforce emission standards. Section 112(h) identifies two conditions under which it is not considered feasible to prescribe or enforce emission standards. These conditions include: (1) If the HAP cannot be emitted through a conveyance device, or (2) if the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations. If emission standards are not feasible to prescribe or enforce, then the Administrator may instead promulgate equipment, work practice, design or operational standards, or a combination thereof.

Multiple approaches for regulating the halogenated solvent batch vapor cleaning and in-line source subcategories are being proposed. The formats include equipment standards (i.e., control technique requirements) coupled with work practices; idling emission limit standards coupled with equipment standards (i.e., use of a hoist) and work practices; and an alternative overall solvent emission limit standard. The owner or operator of a batch vapor or in-line cleaning machine would select one of these compliance approaches.

Multiple compliance alternative options are being proposed for batch vapor and in-line cleaning machines to allow these cleaning machine owners or operators flexibility. It was determined that a combination of standard formats best met the halogenated solvent batch vapor and in-line cleaning machine subcategories' compliance needs because of the vast number of different industries and operating schedules associated with the use of these cleaners.

An emission limit standard was considered initially, as required by the Act. Solvents are not generally emitted through a conveyance device. The only exception is when a lip exhaust is used at the edge of the cleaning machine to draw vapors away from the workers.

However, available information indicates that these devices increase losses from the machine unless controlled by a carbon adsorber. Carbon adsorbers are not a component of the regulatory alternatives selected as MACT. In addition, emissions from solvent cleaning machines are dependent on the working schedule, which varies widely within and across solvent cleaning subcategories. Since no conveyance device is used, and emissions are variable, establishing an emission standard for all solvent cleaning machines was not technologically possible. However, emission standards were used to the extent possible in these standards.

An emission limit based on a limited working schedule was established as an alternate standard for solvent batch vapor and in-line cleaning machines. This limit represents, at a minimum, the MACT level of control. For some cleaning machines the alternative emission limit could be more stringent than MACT. In particular, it is expected that this alternate standard will be more difficult to meet for larger machines and machines operating for more than one shift or that clean parts with difficult configurations. It was not possible to account for these variables when establishing alternative emission limits without making the alternative standard unenforceable or overburdensome. Sources meeting the alternative emission limits proposed today are subject to less burdensome monitoring, recordkeeping, and reporting requirements than sources meeting the other combinations of idling emission limits and equipment and work practice standards. The reduced burden provides an incentive for innovative emissions control strategies to limit solvent use.

An idling emission standard was then evaluated. An idling emission standard would allow a numerical standard to be set without considering workload and operating schedules of the solvent cleaning subcategories. However, maintaining an idling emission limit does not ensure maximum emission reductions at all times. Therefore, work practices and equipment standards (i.e., use of a hoist) were established as part of this compliance alternative. The idling emission limit compliance alternative may be economically impracticable for some owners and operators. A compliance test would need to be performed for each cleaning machine if vendors do not supply model cleaning machine test data indicating idling emission limit compliance. Therefore, the EPA concluded that establishing an idling emission limit for all sources would not be practicable. However, an idling emission limit was developed as an alternative compliance method because it allows for the development and use of new emission control techniques.

An emission reduction (percent) standard was also evaluated for the halogenated solvent batch vapor and in-line cleaning machine source subcategories. It was determined that this format was not feasible or practicable for halogenated solvent cleaning operations because the percent emission reduction from a cleaning machine would depend on the percentage of time working. A percentage emission reduction standard would be economically impracticable to determine because the percentage of time working varies within and across solvent cleaning operations. It would also be technologically impracticable to measure a percent emission reduction for the halogenated solvent cleaning source category as most control techniques for solvent cleaning machines prevent emissions from leaving the machine and therefore do not allow for simultaneous measurement of uncontrolled and controlled emissions.

Use of an equipment standard, in conjunction with work practices, was then evaluated for the halogenated solvent batch vapor and in-line cleaning source subcategories. An equipment standard would include requirements for control techniques or combinations of control techniques to meet MACT. This would be used in conjunction with work practice requirements to ensure MACT limits are met. The equipment standard compliance format allows an owner or operator flexibility in meeting the established MACT limits, and allows use of existing control devices an owner or operator may have in place. The equipment standard compliance format also allows for compliance without meeting a specified emission limit that may not be feasible to measure, or achievable to meet because of varying operating schedules.

Equipment standards were determined for the batch vapor and in-line halogenated solvent cleaning subcategories based on control efficiencies estimated for a "typical" operating schedule, and control efficiencies for individual controls based on tests. Work practice standards were established as a supplement to equipment standards to ensure that the desired emission reductions are met and maintained.

Work practice standards include proper operating and maintenance practices, and are proposed to minimize solvent emissions from poor operating and maintenance practices. Work practice standards would include reducing or preventing room drafts near the solvent cleaning machine, spray design and techniques, start-up and shutdown procedures, workload introduction and removal techniques, parts racking to facilitate drainage, solvent transfer practices, and operator qualification test requirements.

In summary, equipment and work practice standards are used as the basis of today's proposed standards. Under this format, a facility is required to monitor equipment control parameters and work practices to ensure compliance. Two additional compliance format alternatives are included: (1) An idling emissions limit, plus the use of a hoist and work practices, and (2) an emission limit standard. These format alternatives are proposed as alternative compliance methods for operator or owner flexibility.

The idling compliance emission level for the emission limit approach was set based on the solvent air interface (kg emissions per m^2 solvent air interface [lb emissions per ft^2 solvent air interface]) and on a 2-hour a day working schedule for batch cleaning machines and an 8-hour a day working schedule for in-line cleaning machines. The batch vapor cleaning machine working schedule is considered to be slightly more than "typical" for small and medium batch vapor cleaning machines, and less than "typical" for large and very large batch vapor cleaning machines.

The overall compliance emission levels for the batch vapor and in-line cleaning machine subcategories were determined by taking the idling emission rates for an uncontrolled cleaning machine and applying the maximum idling emission reduction component identified for the selected regulatory alternative control levels to get an idling emission standard.

The proposed batch cold cleaning machine source subcategory regulatory format approach consists of an equipment standard coupled with work practices. The owner or operator of a batch cold cleaning machine would follow the equipment standard and work practices in order to comply with the regulation.

G. Modification and Reconstruction Considerations

Section 112(g) of the Act establishes requirements for sources that are modified or reconstructed. Provisions for modifications and reconstructions are being developed under separate rulemakings, and will be applicable to all halogenated HAP sources subject to today's proposed regulations.

H. Selection of Monitoring Requirements

Section 114(a)(3) requires enhanced monitoring and compliance certification of all major stationary sources. The annual compliance certifications certify whether or not compliance has been continuous or intermittent. Enhanced monitoring shall be capable of detecting deviations from each applicable emission limitation or other standard with sufficient reliability and timeliness to determine continuous compliance over the applicable reporting period. Such monitoring data will be directly enforceable. If monitoring required under these standards is not performed the owner or operator would be in violation of the regulation. The best way to assure continuous compliance is through continuous emission monitoring. However, EPA must consider technical feasibility and cost when selecting enhanced monitoring systems. Section 504(b) states that continuous emission monitoring is not required for determining compliance if other means are sufficiently reliable and timely. Emission monitoring was considered for the emission limit portions of the standards. Continuous emissions monitoring was determined not to be feasible for the halogenated solvent cleaner source category because emissions are not ducted through a control device under these proposed standards and are not measured in a manner that allows for continuous emissions monitoring.

The batch cold cleaning machine subcategory is a subcategory of area sources. The machines in this subcategory are typically located at small businesses, such as automotive service stations. The emissions from individual cleaning machines are small and the controls required for this subcategory are already in place on all cleaning machines. Proper operation is relatively simple. In addition, if not properly operated, the facility would lose additional solvent. Since operation is relatively simple and there is an economic incentive to maintain proper operation, no periodic monitoring is proposed. Even though no monitoring is required, the owner or operator would be required to continuously meet the standards. Violations would be easily detected through random inspections.

Owners or operators choosing to comply with the alternative emission limit standards would be required to conduct monthly solvent consumption mass balance emissions estimates. This method would require the owner or operator to maintain a log of solvent additions and deletions for each cleaner and demonstrate that the emissions based on a 3-month rolling average, from each solvent cleaning machine (calculated from these records) are equal to or less than the established limits for their cleaner. If the 3-month rolling-average emissions from a solvent cleaning machine exceeds the established limits, or monitoring is not done, the owner or operator would be in violation of the regulation.

For owners or operators complying with the alternative idling emission standards in conjunction with the use of a hoist and work practices, the selected monitoring approach would require that the idling reference test method 307, also being proposed today, be used to demonstrate compliance with the idling limit and establish the monitoring parameters for the solvent cleaning machine. Method 307 uses a liquid level procedure, where the change in liquid level corresponds directly to the amount of solvent lost from the cleaner. The emissions compliance parameters to be monitored are determined by this test. The owner or operator would need to demonstrate that the frequency and types of parameters monitored on the solvent cleaning machine were sufficient to demonstrate continued compliance with the idling standard. A owner or operator that fails to monitor control parameters or does not maintain the same control system operating parameters as during the test is in violation of the regulation.

The proposed standards include equipment standards that require use of specific control techniques or control technique combinations. In order to ensure that the control efficiency level is maintained, monitoring requirements are required. Monitoring each control system operating parameter would be necessary to ensure effective and continuous emission reduction.

Control system monitoring entails the measurement or monitoring of a parameter that is determined to demonstrate compliance. Monitoring of control system operating parameters can entail visual inspection or control-specific measurement devices.

Monthly visual inspection monitoring would be required for automated or manual covers to ensure that covers completely cover the machine opening, are in place, secure, and closing properly.

Monitoring requirements for each control device that are necessary to ensure proper operation were determined. These monitoring requirements would include the use of a velometer to measure windspeed across a solvent cleaner for reduced room draft, and a thermometer or thermocouple to measure the center of the air blanket temperature for a freeboard refrigeration device or super-heated vapor system. These control parameters would be monitored weekly under these proposed standards. Failure to monitor control system operating parameters, or to maintain control system parameters as required, would be a violation of the regulation.

Proposed work practice standards have been set to minimize emissions associated with operating solvent cleaners. Direct monitoring of work practice standard compliance would be difficult. It was determined that an operator qualification test would be the best work practice monitoring technique. This test would be completed by an operator during inspection, if requested by the Administrator. The operator qualification test would include, but may not be limited to, the following information.

1. The correct way to determine the adequate cycle time;
2. How to determine if a specific control device is functioning;
3. The correct part entry and exit speed and a method for calculating this speed;
4. The proper use of a cover;
5. The impacts of room drafts on a cleaning machine and how to mitigate the impacts;
6. The proper parts orientation; and
7. The basic cleaning machine parts and their functions.
8. The procedures followed at halogenated solvent cleaning machine startup, shutdown, and during halogenated solvent cleaning machine malfunction.

I. Selection of Recordkeeping and Reporting Requirements

Under section 114(a) of the Act, the Administrator may require any person who owns or operates any emission source, who the Administrator believes may have information subject to any requirement of this Act on a one-time, periodic, or continuous basis, establish and maintain records; make reports; use and maintain monitoring equipment; and use such audit procedures, or methods; and provide such other information as the Administrator may reasonably require.

Owners of machines in the batch cold cleaning machine subcategory are typically small businesses, such as an automotive service station. As discussed in section VI.H., no monitoring is required for these sources. In order to eliminate unnecessary burden, these sources are required to submit only an initial notification and are exempt from all other recordkeeping and reporting requirements in both the proposed standards and in the General Provisions of Part 63. The initial notification must contain the name and address of the facility as well as a certified statement that each batch cold cleaning machine at the facility meets the applicable requirements of Subpart T.

These proposed standards for the 5 remaining subcategories would require recordkeeping and reporting to verify emission limit standard compliance, and equipment and work standards compliance. All records must be kept for 5 years. The proposed recordkeeping provisions would require that each owner or operator electing to comply with the overall emission limit standard option maintain records of dates and amounts of solvent added to the tank, solvent composition of wastes removed from the cleaning machine, and materials balance calculation sheets documenting the 3-month rolling average solvent consumption estimates calculated each month for their solvent cleaning machine. Each owner electing to comply with the idling emission limit format, supported by equipment and work practice standards option, would be required to maintain records of equipment design, date of installation, and control device monitoring results for 5 years.

Each owner electing to comply with the equipment and work practice standards would be required to keep records of the monthly or weekly monitoring of control equipment parameters, owners's manuals for the solvent cleaning machine and controls, and the date of installation for the solvent cleaning machine and all of its control devices.

As proposed by the General Provisions (Subpart A of this part), a startup, shutdown, and malfunction plan will be determined, followed, and kept on-site for audit inspection.

An initial notification report would be required for each halogenated solvent cleaning machine HAP source. This report would include the name and address of the facility where the solvent cleaning machine is located; solvent cleaning machine design characteristics (type of cleaner, solvent air interface area); yearly halogenated solvent consumption for each cleaning machine; and existing solvent cleaning machine control devices.

An initial compliance report would be required within 30 days of the date of compliance (2 years after promulgation for existing sources). This report would indicate whether each solvent cleaning machine complies with the regulation, and the standard format the owner or operator elects to adopt to comply with the regulation. The initial compliance report would include an initial test report (vendor-supplied or using reference test method 307) for those owners or operators choosing to comply with the idling emission standard format. Along with the initial test report, an owner or operator would also report the control parameters to be maintained and monitored in order to comply with the standards. This initial compliance report would also include the 3-month solvent consumption rolling average for those owners or operators choosing to comply with the overall emission limit standard. If an owner or operator chooses the equipment and work practice standard format, the initial report would include control equipment verification information and a control parameter monitoring report within 30 days of the date of compliance.

After cleaning machine owners and operators verify compliance, they are only required to submit a compliance report to the Administrator annually, unless noncompliance with the standards is indicated. This report includes the startup, shutdown, and malfunction reporting requirements as proposed by the General Provisions (Subpart A of this part). If any exceedances occur, startup, shutdown and malfunction reporting requirements will be submitted as part of the exceedance report.

Exceedance of any of the regulatory standards, at any time after the applicable compliance date, would require that a report of noncompliance be submitted. This report would include regulation violations such as when any of the monitored operating parameters were outside the required values (e.g., a temperature recorded at the center of the air blanket that is above regulation-specified levels, or when visual observations reveal that a cover does not close properly). These reports would be submitted quarterly.

Additional reporting requirements for owners and operators that elect to comply with the overall emission limit include reports on solvent consumption materials balance emissions documenting the rolling 3-month average emissions every year. Solvent consumption records are often maintained as solvent purchase records by a facility operator or owner; therefore, it would not be a burden to record and report solvent consumption.

J. Operating Permit Program

Under title V of the Act, major sources of HAP as defined by section 112 would be required to obtain an operating permit. Often, emission limits, monitoring, and reporting and recordkeeping requirements are scattered among numerous provisions of SIP's or Federal regulations. As discussed in the promulgated regulation for the operating permit program published on July 21, 1992 (57 FR 32250), this new permit program includes all of the requirements that pertain to a single major stationary source in a single document. Sources subject to the program are required to submit complete permit applications within a year after a State program is approved by the EPA or, where a State program is not approved, within a year after a program is promulgated by the EPA. If an emission standard for area sources has been established under this part, the EPA can choose to exempt that area source from the requirement to obtain a permit if permitting them is determined by the EPA to be impracticable, infeasible, or unnecessarily burdensome. The EPA proposes in today's standards that the cold batch cleaning machine subcategory be exempt from the requirement to obtain a permit based on the reasons outlined above.

K. Solicitation of Comments

The EPA specifically requests comment on the following issues:

1. For this source category, the EPA is proposing that all area sources be regulated by MACT except the batch cold cleaner subcategory, which will be required to meet GACT. No specific criteria are statutorily prescribed to determine whether GACT is warranted for area sources in a particular source category. The EPA requests comments on criteria that were used in this proposal and any other(s) that the commenter believes should be used in making this determination. In addition, as discussed in section VI.E., the EPA requests comment on whether the application of section 112(f) should be a factor in deciding whether to apply MACT or GACT to an area source category or subcategory.

2. As discussed in section I.B., the EPA requests comment on its proposed subcategorization of the listed source category. Specific information is requested concerning whether the delisting criteria of section 112(c)(9) are met, or alternatively, whether a finding under section 112(c)(3) should be made for individual subcategories.

3. Standards for batch cold cleaning machines proposed today are based on carburetor cleaners, but apply to any HAP batch cold cleaning machines. The EPA could not identify any other use of

halogenated HAP solvents in cold cleaning machines. The EPA solicits comments and supporting data on the inclusion of batch cold cleaning machines in today's proposal or alternative strategies for addressing emissions from this subcategory that are consistent with the Act. Specifically, the EPA requests comments on the reasonableness of setting standards equal to the baseline level of control. Also, the EPA requests data and comments on the existence of other HAP batch cold cleaning machines and whether the proposed standards would be reasonable for those machines.

4. Limited data were identified by the EPA concerning downtime emission controls and control efficiencies for the halogenated solvent cleaning machine subcategories. The EPA solicits comments and data on downtime emission controls and control efficiencies.

5. At the NAPCTAC meeting in December 1992, there was concern expressed by industry that the control efficiencies used to evaluate the emission reductions and costs for the various options represent "typical" facilities as measured in the laboratory and may not match the operating conditions and schedules for each individual cleaning machine. However, multiple compliance alternatives are provided for this NESHAP, including equipment, work practice, and emission limit (idling and overall) standards since the data were generally obtained under laboratory conditions. The equipment standards, in conjunction with work practices, allows compliance without meeting a specified emission limit. No compliance method requires demonstration with a percent reduction standard. The EPA believes that the multiple compliance alternatives in today's proposal ensures maximum control while minimizing the potential impacts of the use of laboratory data for "typical" cleaning machines. The EPA requests comments on this issue and any available data on control techniques for halogenated solvent cleaners.

6. The EPA solicits comment and data on whether it is appropriate to include credits for reductions in solvent usage when calculating the annualized costs and cost effectiveness values of the regulatory alternatives.

7. Alternative cleaning technologies presented in the preamble include alternative solvents, alternative cleaning machines and no-clean technologies. The EPA is seeking information on specific applications of these cleaning technologies and whether they should be used as the basis for MACT in the promulgated standards. Information supplied needs to include specifics on applicability, costs, and multi-media impacts (i.e., air, water, soil). Information obtained will be considered by the EPA in the final rulemaking.

8. The EPA has not fully evaluated room enclosures as an option for reducing fugitive emissions. Room enclosures could potentially capture and control fugitive emissions from solvent cleaning machines. However, occupational exposure health risks, costs, available room space, and halogenated solvent cleaning machine accessibility could be potential problems associated with the use of room enclosures. The EPA is seeking comment on the cost, impacts, feasibility, and specific applicability of these controls and whether these controls should be considered as MACT for the promulgated standards.

9. The EPA is currently testing and gathering quantitative information on two low solvent emitting vapor cleaning systems. The EPA is also collecting information on the solvents that these systems are designed to use, products that the systems can clean, ability to retrofit existing cleaning systems with the technology, and industries that use these systems. The EPA requests comments or information concerning these new technologies that justify the feasibility of their inclusion in the final rule.

Any comments submitted to the Administrator on this proposed rule for existing and new halogenated solvent cleaners, however, should contain specific information and data pertinent to an evaluation of the magnitude and severity of its impact and suggested alternative courses of action that would avoid this impact.

VII. Administrative Requirements

A. Public Hearing

A public hearing will be held, if requested, to discuss the proposed standard in accordance with section 307(d)(5) of the Act. Persons wishing to make an oral presentation on the proposed standards for halogenated solvent cleaning machines should contact the EPA at the address given in the ADDRESSES section of this preamble. Oral presentations will be limited to 15 minutes each.

Any member of the public may file a written statement before, during, or within 30 days after the hearing. Written statements should be addressed to the Air Docket Section address given in the ADDRESSES section of this preamble and should refer to Docket No. A–92–39.

A verbatim transcript of the hearing and written statements will be available for public inspection and copying during normal working hours at the EPA's Air Docket Section in Washington, DC (see **ADDRESSES** section of this preamble).

B. Docket

The docket is an organized and complete file of all the information submitted to or otherwise considered by the EPA in the development of this proposed rulemaking. The principal purposes of the docket are: (1) To allow interested parties to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process and (2) to serve as the record in case of judicial review (except for interagency review material [307(d)(7)(A)]).

C. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, 10/04/94), the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The order defines "significant" regulatory action as one that is likely to lead to a rule that may:

1. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligation of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of Executive Order 12866, it has been determined that this rule is a "significant" regulatory action. This action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record to be included in the docket listed at the beginning of today's notice under **ADDRESSES.** The docket is available for public inspection at the EPA's Air Docket Section, which is listed in the **ADDRESSES** section of this preamble.

D. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request document has been prepared by EPA (ICR No. 1652–01), and a copy may be obtained from Sandy Farmer, Information Policy Branch, EPA, 2136, 401 M Street, SW., Washington, DC 20460, or by calling (202) 260–2740. The public reporting and recordkeeping burden for this collection of information is estimated to average 57 hours (or to vary from 36 to 142 hours) the first year. This reporting and recordkeeping burden is estimated to average 42 hours (or to vary from 29 to 55 hours) annually, thereafter. This includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM–223Y, U. S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for the EPA." The final rule will respond to any OMB or pubic comments on the information collection requirements contained in this proposal.

E. Regulatory Flexibility Act

The RFA, (or Public Law 96–354, September 19, 1980) requires Federal agencies to give special consideration to the impact of regulation on small businesses. The RFA specifies that a regulatory flexibility analysis must be prepared if a proposed regulation will have a significant economic impact on a substantial number of small entities. Regulatory impacts are considered significant if:

1. Annual compliance costs increase total costs of production by more than 5 percent.
2. Annual compliance costs as a percent of sales are at least 20 percent (percentage points) higher for small entities.
3. Capital cost of compliance represent a significant portion of capital available to small entities.
4. The requirements of the regulation are likely to result in closures of small entities.

A "substantial number" of small entities is generally considered to be more than 20 percent of the small entities in the affected industry. Since the economic analysis deals only with small entities (in this case, facilities), conclusions can be drawn from what was done there already. Each of the criteria for significant impacts will be considered in turn.

The largest increase in total cost of production from increased emission control is 0.61 percent (SIC 359—Industrial Machinery, n.e.c.). This figure is well below the significant-impact threshold of five percent.

Assessing the differential impacts, measured by a comparison of compliance costs as a percent of sales for small and large entities, is more difficult as large model facilities were not analyzed in the economic impact analysis. Treatment of this small business impacts criterion involves creating two large model facilities.

If it is assumed that large facilities use large solvent cleaning machines, then compliance costs for large cleaning machines are negative, and are thus savings. To be conservative, it is assumed here that large model facilities possess five very large solvent cleaning machines, so that a "maximum savings" case is modelled. This case is important as it models the maximum cost differential between large and small facilities.

Large model facilities were created for SIC 359 (Industrial Machinery, n.e.c.) and SIC 254 (Partitions and Fixtures). SIC 359 was chosen because the small model facilities in this group experience the highest cost absorption impact when compared with other small model facilities. SIC 254 was used because it had the smallest average per-facility revenue of facilities with greater than 100 employees. Thus, if they incur the same absolute savings as other large facilities, their relative percentage savings will be the highest, and they will experience the greatest cost savings in percentage terms as a result of the standard. The cost differentials are in no case larger than one percentage point. Thus, by this criterion, small business impacts are not deemed significant.

The third criterion focuses on the amount of capital available to small businesses or facilities. Since the capital costs incurred as a result of investment in control equipment needed for small businesses to meet the standard was less than 10 percent of the businesses' total assets in all 39 affected SIC codes, it was concluded that the total assets of small facilities will not be so adversely affected as to prohibit the procurement of outside financing. (Examining an increase in capital costs as a percentage of total assets is a measure of the ability of a firm or facility to meet this capital costs increase.) The conclusion, then, is that lack of available capital will not be an obstacle for small facilities in complying with the regulation.

Criterion number four stipulates that small business impacts are significant if compliance leads to closure. The only implication of closure in the economic impact analysis is found in the section on earnings impacts. Here it was found that, under worst-case assumptions, closures might occur in only two SIC codes, 254 and 259 (Miscellaneous Furniture and Fixtures), given their low rate of profitability in the baseline. If this indeed occurs, the question of whether or not these closures make up a substantial portion of small entities must be addressed. The actual number of impacted facilities in the 39 impacted SIC codes is unknown. If it can be assumed that each SIC is impacted in the same proportion, a proxy for the share of impacted facilities represented by SIC codes 254 and 259 is the total number of facilities in these SIC codes as a share of the total number of potentially impacted firms. Standard Industrial Classification codes 254 and 259 hold a combined total 3,194 small facilities. This makes up 3.4 percent of the total 93,121 small facilities in all 39 SIC codes. Thus, in the extreme case that some closures result, the number of closures is estimated to far less than the amount required for substantial number of impacted facilities.

In conclusion, and pursuant to the provisions of 5 U.S.C. 605(b), I hereby certify that this proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities, for the impacts do not meet or exceed the four previously stated criteria in the RFA guidelines.

Further information on the RFA screening effort is available in the background information package (see the Background Information Documents section near the beginning of this preamble).

F. Clean Air Act Procedural Requirements

In accordance with section 117 of the Act, publication of this proposal was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. The Administrator will welcome comments on all aspects of the proposed regulation, including health, economic and technological issues, and on the proposed liquid level procedure test method.

Section 112(d)(6) requires the Administrator to review this regulation no less often than every 8 years. In addition, section 112(f)(2) requires a single review within 8 years of promulgation. This review will include an assessment of factors such as evaluation of the residual health risks, any overlap with other programs, the existence of alternative methods, enforceability, improvements in emission control technology and health data, and the recordkeeping and reporting requirements.

List of Subjects in 40 CFR Part 63

Environmental protection, Air pollution control, Hazardous substances, Halogenated solvent cleaning machines, Reporting and recordkeeping requirements.

Dated: November 15, 1993.

Carol M. Browner,

The Administrator.

For the reasons set out in the preamble, title 40, chapter I, part 63, of the Code of Federal Regulations is amended as set forth below:

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

1. The authority citation for part 63 continues to read as follows:

Authority: 42 U.S.C. 7401, 7412, 7414, 7416, and 7601.

2. Part 63 is amended by adding subpart T consisting of §§ 63.460 through 63.468 to read as follows:

Subpart T—National Emission Standards for Halogenated Solvent Cleaning

Sec.
63.460 Applicability and designation of source.
63.461 Definitions.
63.462 Standards.
63.463 Alternative standards.
63.464 Test methods.
63.465 Monitoring procedures.
63.466 Recordkeeping requirements.
63.467 Reporting requirements.
63.468 Equivalent methods of control.

Subpart T—National Emission Standards for Halogenated Solvent Cleaning

§ 63.460 Applicability and designation of source.

(a) The provisions of this subpart apply to each individual solvent cleaning machine that uses methylene chloride, perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, carbon tetrachloride, chloroform, or any blend using a halogenated solvent as a cleaning solvent.

(b) The provisions of subpart A of this part apply to owners or operators of batch vapor and in-line cleaning machine sources.

(c) The owners or operators of batch cold cleaning machine sources are not subject to the provisions of subpart A of this part.

(d) Each solvent cleaning machine that commences construction or reconstruction on or after November 29, 1993 shall achieve compliance with the provisions of this subpart immediately upon startup or the date of promulgation of this subpart, whichever is later.

(e) Each solvent cleaning machine that commenced construction or reconstruction before November 29, 1993 shall achieve compliance with the provisions of the subpart no later than 24 months after the date of promulgation of this subpart.

(f) The following authorities shall be retained by the Administrator and not transferred to a State: (To be determined by EPA at the final rule stage.)

§ 63.461 Definitions.

Terms used in this subpart are defined as follows:

Air blanket means the layer of air inside the solvent cleaning machine freeboard which extends from the solvent/air interface to the top coil of the freeboard refrigeration device. The center of the air blanket is equidistant between the sides and between the top and bottom of the air blanket.

Automated parts handling system means a mechanical device that carries all parts and parts baskets from the initial loading of soiled parts through the removal of the cleaned parts at a controlled speed. Automated parts handling systems include, but are not limited to, hoists and conveyors.

Batch cleaning machine means a 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. An open top vapor cleaning machine is a type of batch cleaning machine.

Bi-parting cover means an automatic cover for a solvent cleaning machine that consists of two halves that slide horizontally when the cover is being opened or closed. A bi-parting cover can be closed while parts are in the solvent cleaning machine.

Carburetor cleaning machine means a small maintenance solvent cleaning machine or parts washer that uses room temperature liquid solvent and solvent blends to clean parts (typically carburetors). Carburetor cleaning machines have a water layer over the solvent that provides control of emissions. Carburetor cleaning machines typically consist of a pail containing the solvent and water layer, a basket in which the parts are placed, and a gasketed cover containing a motor which rotates the basket.

Clean liquid solvent means fresh unused solvent or used solvent that has been filtered, skimmed, and/or distilled to remove soils (e.g., skimmed of oils or sludge and strained of metal chips.)

Cold cleaning machine means any device or piece of equipment that contains and uses solvent in the liquid phase to clean and remove soils from the surfaces of materials.

Cover means a lid, top, or portal cover for a solvent cleaning machine. Types of covers include, but are not limited to, bi-parting, roll-top, and hinged covers.

Downtime mode means the time period when the solvent cleaning machine is turned off.

Dwell means the period of time when parts are held within the freeboard area of the solvent cleaning machine after cleaning to allow solvent to drain from the parts back into the solvent cleaning machine.

Existing means any solvent cleaning machine that commenced construction or reconstruction on or before November 29, 1993.

Freeboard area means for a batch cleaning machine the area within the solvent cleaning machine that extends from the solvent/air interface to the top of the solvent cleaning machine. For an in-line cleaning machine, it is the area within the solvent cleaning machine that extends from the solvent/air interface to the bottom of the entrance or exit opening, whichever is lower.

Freeboard height means for a batch cleaning machine the distance from the solvent/air interface to the top of the cleaning machine. For an in-line cleaning machine, it is the distance from the solvent/air interface to the bottom of the entrance or exit opening, whichever is lower.

Freeboard ratio means a ratio of the solvent cleaning machine freeboard height to the smaller interior dimension (length, width, or diameter) of the solvent cleaning machine.

Freeboard refrigeration device (also called a chiller) means a set of secondary coils mounted in the freeboard area which carry a refrigerant to provide a chilled air blanket above the solvent vapor.

Hoist means a mechanical device that carries the parts basket and the parts to be cleaned from the loading area, into the solvent cleaning machine, and to the unloading area at a controlled speed. A hoist can be operated by controls or can be programmed to cycle parts through the cleaning cycle automatically.

Hot vapor recycle means a solvent cleaning system for vapor cleaning machines in which parts are cleaned using superheated solvent vapor that is recirculated in the vapor zone.

Idling mode means the time period when a solvent cleaning machine is turned on but is not actively cleaning parts.

In-line cleaning machine (also called a continuous cleaning machine) means a solvent cleaning machine that uses an automated parts handling system, typically a conveyor, to provide a continuous supply of parts to be cleaned. These units are fully enclosed except for the conveyor inlet and exit portals. In-line cleaning machines can be either cold or vapor cleaning machines.

Leak-proof coupling means a threaded or other type of coupling which prevents solvents from leaking while filling or draining solvent to/from the solvent cleaning machine.

Lip exhaust means a device installed around the top of the opening of a solvent cleaning machine that draws in air and solvent vapor emissions and ducts them away from the solvent cleaning area.

Manual cover means a lid, top, or portal cover for a solvent cleaning machine that is opened and closed by physically lifting, sliding, or pulling it (i.e., is not operated mechanically). Manual covers include, but are not limited to, hinged, sliding, and roll-top covers.

Monthly reporting period means the calendar month in which the owner or operator of a solvent cleaning machine is required to calculate and report the solvent emissions from each solvent cleaning machine.

New means any solvent cleaning machine, the construction or reconstruction of which is commenced after the Administrator first proposes a relevant standard under this part.

Open top vapor cleaning machine means a batch solvent cleaning machine that has its upper surface open to the air and boils solvent to create solvent vapor that is used to clean parts.

Primary condenser means a series of circumferential cooling coils on a vapor cleaning machine through which a refrigerant is circulated or recirculated to provide continuous condensation of rising solvent vapors and, thereby, create a controlled vapor zone which prevents vapors from escaping from the cleaning machine.

Reduced room draft means decreasing the flow or movement of air across the solvent cleaning machine to meet the specifications of § 63.462(e)(2)(ii).

Soils means water-insoluble 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.

Solvent cleaning machine means any device or piece of equipment that uses halogenated solvent in the liquid or gaseous phase to clean and remove soils from the surfaces of materials.

Solvent/air interface means for a vapor cleaning machine the location of contact between the concentrated solvent vapor layer and the air. For a cold cleaning machine it is the location of contact between the liquid solvent and the air.

Solvent/air interface area means for a vapor cleaning machine the surface area of the solvent vapor that is exposed to the air. For a cold cleaning machine it is the surface area of the liquid solvent that is exposed to the air.

Solvent vapor zone means for a vapor cleaning machine the area which extends from the liquid solvent surface to the solvent vapor/air interface.

Sump means the part of a solvent cleaning machine where the liquid solvent is located.

Sump heater coils means the heating system on a vapor cleaning machine which uses steam, electricity, or hot water to boil the liquid solvent.

Superheated vapor system means employing the use of heating coils that boil liquid solvent generating solvent vapors that are heated to temperatures that are more than 1.5 times greater than the solvent boiling point.

Vapor cleaning machine means a batch or in-line solvent cleaning machine that boils liquid solvent generating solvent vapor that is used as an integral part of the cleaning cycle.

Water cover means for a batch cold cleaning machine a layer of water which floats above the denser solvent and provides control of solvent emissions. In many cases, the solvent used in batch cold cleaning machines is sold containing the appropriate amount of water to create a water cover.

Working mode means the time period when the solvent cleaning machine is turned on and is actively cleaning parts.

§ 63.462 Standards.

(a) Except as provided in § 63.463, each existing, new, or reconstructed batch vapor or in-line solvent cleaning machine shall conform to the following design requirements:

(1) Each cleaning machine shall be equipped with a cover that may be readily opened or closed, completely covers the cleaner openings when in place, and is free of cracks, holes, and other defects.

(2) Each cleaning machine shall have a freeboard ratio of at least 0.75.

(3) Each cleaning machine shall use an automated parts handling system at a maximum speed of 3.3 meters per minute for transporting all parts and parts baskets from the initial loading of parts through removal of cleaned parts.

(4) Each vapor cleaning machine shall be equipped with a device that shuts off the sump heat if the sump liquid solvent level drops down to the height of the sump heater coils.

(5) Each vapor cleaning machine shall be equipped with a vapor level control device which shuts off sump heat if the vapor level in the vapor cleaning machine rises above the height of the primary condenser.

(6) No lip exhaust shall be used, unless all collected solvent vapors are routed through a carbon adsorber.

(b) Except as provided in § 63.463, each owner or operator of an existing or new batch vapor cleaning machine shall comply with either paragraph (b)(1) or (b)(2) of this section:

(1) Each owner or operator of a batch vapor cleaning machine with a solvent/air interface area of 1.21 square meters or less shall:

(i) Employ one of the control combinations listed in table 1 of this subpart, or

(ii) Demonstrate that their solvent cleaning machine can achieve and maintain an idling emission limit of 0.15 kilograms per hour per square meter of solvent/air interface area, determined using the procedures in § 63.464(a).

(2) Each owner or operator of a batch vapor cleaning machine with a solvent/air interface area of greater than 1.21 square meters shall:

(i) Employ one of the control combinations listed in table 2 of this subpart, or

(ii) Demonstrate that their solvent cleaning machine can achieve and maintain an idling emission limit of 0.15 kilograms per hour per square meter of solvent/air interface area, determined using the procedures in § 63.464(a).

(c) Except as provided in § 63.463, each owner or operator of an in-line cleaning machine shall comply with paragraph (c)(1) or (c)(2) of this section, as appropriate:

(1) Each owner or operator of an existing in-line cleaning machine shall:

(i) Employ a 1.0 freeboard ratio and a freeboard refrigeration device, or

(ii) Demonstrate that their solvent cleaning machine can achieve and maintain an idling emission limit of 0.10 kilograms per hour per square meter of solvent/air interface area, as provided in § 63.464(a).

(2) Each owner or operator of a new in-line cleaning machine shall:

(i) Employ a super heated vapor system and a freeboard refrigeration device, or

(ii) Demonstrate that their solvent cleaning machine can achieve and maintain an idling emission limit of 0.10 kilograms per hour per square meter of solvent/air interface area, as determined using the procedures in § 63.464(a).

(d) Except as provided in § 63.463, each owner or operator of an existing or new batch vapor or in-line solvent cleaning machine shall meet all of the following required work and operational practices that are applicable to the type of cleaner:

(1) The cover(s) to each solvent cleaning machine shall be closed during the downtime mode.

(2) The parts baskets or the parts being cleaned in an open top batch vapor cleaner shall not occupy more than 50 percent of the solvent/air interface area, unless the parts baskets or parts are introduced at a speed of 0.9 meters per minute or less.

(3) Any spraying operations shall be done within the vapor zone or within a section of the solvent cleaning machine that is not directly exposed to the ambient air.

(4) Parts or parts baskets shall not be removed from any solvent cleaning machine until condensation or dripping has stopped.

(5) Parts shall be oriented so that the solvent drains from them freely. Parts having cavities or blind holes shall be tipped or rotated before being removed from any solvent cleaning machine.

(6) During startup of each vapor cleaning machine, the primary condenser shall be turned on before the sump heater.

(7) During shutdown of each vapor cleaning machine, the sump heater shall be turned off, and the solvent vapor layer allowed to collapse before the primary condenser is turned off.

(8) When solvent is added or drained from any solvent cleaning machine, the solvent shall be transferred using threaded or other leakproof couplings and the end of the pipe in the solvent sump shall be located beneath the liquid solvent surface.

(9) Each solvent cleaning machine and associated controls shall be maintained as recommended by the manufacturers of the equipment.

(10) Each owner or operator of a solvent cleaning machine shall complete and pass a test of solvent cleaning operating procedures if requested during an inspection by the Administrator.

(11) Waste solvent, still and sump bottoms shall be collected and stored in closed containers. The closed containers may contain a device that would allow pressure relief, but would not allow liquid solvent to drain from the container.

(e) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with paragraph (b)(1), (b)(2), (c)(1), or (c)(2) of this section shall:

(1) Conduct monitoring of each control device as provided in § 63.465.

(2) Operate each control device used to comply with these standards within the following parameters:

(i) If a freeboard refrigeration device is used to comply with these standards, the owner or operator shall ensure that the temperature at the center of the air blanket is 20 degrees below the ambient room temperature.

(ii) If a reduced room draft is used to comply with these standards, the owner or operator shall:

(A) Ensure that the movement of air across the solvent cleaning machine does not exceed 15.2 meters per minute at any time, and

(B) Establish and maintain the operating conditions under which the wind speed was demonstrated to be 15.2 meters per minute or less as described in § 63.465(a)(2).

(iii) If a bi-parting cover is used to comply with these standards, the owner or operator shall ensure that the cover opens only for part entrance and removal, completely covers the cleaner openings when closed, and is free of cracks, holes, and other defects.

(iv) If a manual cover is used to comply with these standards, the owner or operator shall ensure that the cover is in place whenever parts are not in the solvent cleaning machine, completely covers the cleaner openings when in place, and is free of cracks, holes, and other defects.

(v) If a dwell is used to comply with these standards, the owner or operator shall:

(A) Determine the appropriate dwell time for each part or parts basket as described in § 63.464(c), and

(B) Ensure that parts are held in the freeboard area of the solvent cleaning machine after cleaning for the determined dwell time.

(vi) If a super-heated vapor system is used to comply with these standards, the owner or operator shall ensure that the temperature at the center of the solvent vapor zone is 50 percent above the solvent's boiling point.

(f) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with paragraph (b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) of this section shall:

(1) Conduct an initial performance test to:

(i) Demonstrate compliance with the applicable idling emission limit, and

(ii) Establish parameters that shall be monitored to demonstrate compliance.

(2) Conduct monitoring of the parameters identified in the initial performance test. The required monitoring frequency will be determined by the Administrator and will be based on the variability of the parameters that are established.

(3) Operate solvent cleaning machine within parameters identified in the initial performance test.

(g) Each owner or operator of a batch cold solvent cleaning machine shall:

(1) Employ a tightly fitting cover that shall be closed at all times except during parts entry and removal.

(2) Employ a water layer on the surface of the solvent within the cleaning machine.

(3) Collect and store waste solvent in closed containers. The closed container may contain a device that would allow pressure relief, but would not allow liquid solvent to drain from the container.

§ 63.463 Alternative standards.

(a) As an alternative to meeting the requirements in § 63.462, each owner or operator of a batch vapor or in-line solvent cleaning machine subject to the provisions of this subpart may:

(1) Maintain a log of solvent additions and deletions for each cleaner, and

(2) Ensure that the emissions from each solvent cleaning machine are equal to or less than the limits presented in table 3 of this subpart, as determined using the procedures in § 63.464(b).

(b) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with § 63.463(a) of this subpart shall demonstrate compliance with the applicable 3-month rolling average monthly emission limit in table 3 of this subpart on a monthly basis, as described in § 63.464(b).

§ 63.464 Test methods.

(a) Each owner or operator of a batch vapor or in-line solvent cleaning machine choosing to comply with § 63.462(b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall determine the idling emission rate of the solvent cleaning machine using Reference Method 307 in appendix A of this part.

(b) Each owner or operator of a batch vapor or in-line solvent cleaning machine choosing to comply with § 63.463(a) shall, on the first day of every month:

(1) Ensure that the solvent cleaning machine system contains only clean liquid solvent,

(2) Using the records of all solvent additions and deletions for the previous monthly reporting period required under § 63.463(a), determine solvent emissions (E_i) using the following equation, except as provided in paragraph (b)(3) of this section:

$$E_i = SA_i - LSR_i - SSR_i \qquad (1)$$

where:

E_i=the total solvent emissions from the solvent cleaning machine during the most recent monthly reporting period [kilograms of solvent].
SA_i=the total amount of liquid solvent added to the solvent cleaning machine during the most recent monthly reporting period i, [kilograms of solvent].
LSR_i=the total amount of clean liquid solvent removed from the solvent cleaning machine during the most recent monthly reporting period i, [kilograms of solvent].
SSR_i=the total amount of solvent removed from the solvent cleaning machine in solid waste, as supported by tests conducted using EPA reference method 25d, during the most recent monthly reporting period i, [kilograms of solvent].

(3) Owners or operators for which SSR_i is an unknown can, as an alternative to the method described in paragraph (b)(2) of this section, determine solvent emissions using the following procedure:

(i) Determine SSR_i using the following equation:

$$SSR_i = (EF)(SA_i) - LSR_i \qquad (2)$$

where:

SSR_i=the total amount of solvent removed from the solvent cleaning machine in solid waste during the most recent monthly reporting period i, [kilograms of solvent].
EF = an emission factor which has the following values. For existing and new batch vapor cleaning machines: small and medium cleaning machines = 0.41, large and very large cleaning machines = 0.48. For existing in-line cleaning machines = 0.36. For new in-line cleaning machines = 0.48
SA_i=the total amount of liquid solvent added to the solvent cleaning machine during the most recent monthly reporting period i, [kilograms of solvent].
LSR_i=the total amount of clean liquid solvent removed from the solvent cleaning machine during the most recent monthly reporting period i, [kilograms of solvent].

(ii) Use the value of SSR_i obtained from equation (2) to solve for E_i in equation (1).

(4) Determine the monthly rolling average, EA, for the 3-month period ending with the most recent reporting period using the following equation:

$$EA = \frac{\sum_{j=1}^{3} E_j}{3} \qquad (3)$$

where:

EA=the average solvent emissions over the preceding 3 monthly reporting periods, (kilograms of solvent/month).
E_j=solvent emissions for each month (j) for the most recent 3 monthly reporting periods (kilograms of solvent).
j=1 = the most recent monthly reporting period.
j=2 = the monthly reporting period immediately prior to j=1.
j=3 = the monthly reporting period immediately prior to j=2.

(c) Each owner or operator of a batch vapor or in-line solvent cleaning machine choosing to use a dwell to comply with § 63.462 shall determine the appropriate dwell for each part or parts basket using the following procedure:

(1) Determine the amount of time for the part or parts basket to cease dripping once placed in the vapor zone.

(2) The minimum proper dwell period is equal to 35 percent of the time determined in paragraph (c)(1) of this section.

§ 63.465 Monitoring procedures.

(a) Except as provided in paragraph (c) of this section, each owner or operator of a batch vapor or in-line solvent cleaning machine complying with § 63.462(b)(1)(i), (b)(2)(i), (c)(1)(i), or (c)(2)(i) shall conduct weekly monitoring of the following control devices:

(1) If a freeboard refrigeration device is used to comply with these standards, the owner or operator shall use a thermometer or thermocouple to measure the temperature at the center of the air blanket while the solvent cleaning machine is in the idling mode.

(2) If a reduced room draft is used to comply with these standards, the owner or operator shall measure the windspeed using the following procedure:

(i) Determine the direction of the wind current by slowly rotating a velometer until the maximum speed is located.

(ii) Orient a velometer in the direction of the wind current at each of the four corners of the machine.

(iii) Record the reading for each corner.

(iv) Average the values obtained at each corner and record the average wind speed.

(3) If a super-heated vapor system is used to comply with these standards, the owner or operator shall use a thermometer or thermocouple to measure the temperature at the center of the solvent vapor zone while the solvent cleaning machine is in the idling mode.

(b) Except as provided in paragraph (c) of this section, each owner or operator of a batch vapor or in-line solvent cleaning machine complying with § 63.462 (b)(1)(i), (b)(2)(i), (c)(1)(i), or (c)(2)(i) shall conduct monthly monitoring of the following control devices, as appropriate:

(1) If a bi-parting cover is used to comply with these standards, the owner or operator shall conduct a monthly visual inspection to determine if the bi-parting cover is opening and closing properly, completely covers the cleaning machine openings when closed, and is free of cracks, holes, and other defects.

(2) If a manual cover is used to comply with these standards, the owner or operator shall inspect the cover monthly to ensure that it is free of cracks, holes, or other defects.

(3) If a hoist is used to comply with these standards, the owner or operator shall determine the hoist speed by measuring the time it takes to travel a measured distance (meters per minute).

(4) If a dwell is used to comply with these standards, the owner or operator shall determine the dwell time by measuring the period of time that parts are held within the freeboard area of the solvent cleaning machine after cleaning.

(c) Each owner or operator using a control device listed in paragraph (a) or (b) of this section can use alternative monitoring procedures approved by the Administrator.

(d) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with § 63.462(b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall establish monitoring parameters and procedures which demonstrate compliance, and submit such parameters and procedures and other rationale to the Administrator for approval.

§ 63.466 Recordkeeping requirements.

(a) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.462 shall maintain records of the following for the lifetime of the machine:

(1) Owner's manuals for the solvent cleaning machine and control equipment,

(2) The date of installation for the solvent cleaning machine and all of its control devices,

(3) If a dwell is used to comply with these standards, records of the tests, required in § 63.464(c), used to

determine an appropriate dwell time for each part or parts basket.

(4) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.462 (b)(1)(ii), (b)(2)(ii), (c)(1)(ii), or (c)(2)(ii) shall maintain records of the initial performance test, including the idling emission rate and values of the monitoring parameters measured during the test.

(b) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.462 shall maintain records of the results of control device monitoring required under § 63.465(a), (b), (c), and/or (d) either in computerized or written form for a period of 5 years.

(c) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.463 shall maintain records of the following for a period of 5 years:

(1) The dates and amounts of solvent that is added to the solvent cleaning machine;

(2) The solvent composition of wastes removed from cleaning machines as measured during batch specific tests or as calculated using the procedure described in § 63.464(b)(3); and

(3) Calculation sheets showing how monthly emissions and the rolling 3-month average emissions from the solvent cleaning machine were determined, and the results of all calculations.

§ 63.467 Reporting requirements.

(a) Each owner or operator of an existing batch vapor or in-line solvent cleaning machine subject to the provisions of this subpart shall submit an initial report to the Administrator no later than 90 days after the date of promulgation of this subpart. This report shall include the following:

(1) The name and address of the owner or operator; and

(2) The address (i.e., physical location) of the solvent cleaning machine(s); and

(3) A brief description of each solvent cleaning machine, including machine type (batch vapor, or in-line), solvent/air interface area, and existing controls; and

(4) An estimate of the yearly consumption of halogenated solvents for each solvent cleaning machine.

(b) Each owner or operator of an existing batch cold solvent cleaning machine subject to the provisions of this subpart shall submit an initial report to the Administrator no later than 90 days after the date of promulgation of this subpart. This report shall include the following:

(1) The name and address of the owner or operator; and

(2) The address (i.e., physical location) of the solvent cleaning machine(s); and

(3) A brief description of each solvent cleaning machine, including machine type (such as, carburetor cleaner), solvent/air interface area, and existing controls;

(4) An estimate of the yearly consumption of halogenated solvents for each solvent cleaning machine; and

(5) A statement, signed by the owner or operator of the solvent cleaning machine, stating that the solvent cleaning machine for which the report is being submitted, is in compliance with the provisions of this subpart.

(c) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.462 shall submit to the Administrator an initial statement of compliance for each solvent cleaning machine within 30 days after the compliance date specified in § 63.460 (b) and (c). This statement shall include the following:

(1) A list of the control equipment used to achieve compliance for each solvent cleaning machine; and

(2) For each piece of control equipment required to be monitored, a list of the parameters which are monitored and the values of these parameters measured on or during the first month after the compliance date; and

(3) Each owner or operator of a solvent cleaning machine complying with the provisions of § 63.462(b)(1)(ii), (b)(2)(ii), (c)(1)(ii), (c)(2)(ii) shall submit a test report for tests of idling emissions meeting the specifications in Method 307 of appendix A of this subpart.

(i) This test must be on the same specific model cleaner used at the source and can be done by the owner or operator or can be supplied by the vendor of that solvent cleaning machine.

(ii) This report must clearly state the monitoring parameters and monitoring frequency required to demonstrate continuous compliance.

(iii) If a solvent cleaning machine vendor test report is used to demonstrate compliance, it shall include the following for the solvent cleaning machine tested: Model name, the date the solvent cleaning machine was tested, serial number, a drawing of the solvent cleaner tested.

(iv) If a solvent cleaning machine vendor test report is used the owner or operator of the solvent cleaning machine shall:

(A) Submit a statement by the solvent cleaning machine vendor that the unit tested is the same as the unit the report is being submitted for; or

(B) Demonstrate to the Administrator's satisfaction that the solvent emissions from the solvent cleaning machine for which the test report is being submitted are equal to or less than the solvent emissions from the solvent cleaning machine in the vendor test report.

(4) Conditions to maintain the wind speed requirements of § 63.462(e)(2)(ii).

(d) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.463 shall submit to the Administrator an initial statement of compliance for each solvent cleaning machine within 30 days after the compliance date specified in § 63.460 (b) and (c). The statement shall include the results of the first 3-month average emissions calculation.

(e) Each owner or operator of a batch vapor or in-line solvent cleaning machine complying with the provisions of § 63.462 shall submit a control device monitoring report every year beginning one year after the compliance date specified in § 63.460 (b) and (c). This control device monitoring report should contain all of the following:

(1) The results of all control equipment monitoring recorded under § 63.466 (a); and

(2) A signed statement from the facility owner stating that, "All operators of solvent cleaning machines have received training on the proper operation of solvent cleaning machines and their control devices sufficient to pass the test required in § 63.462 (d)(10)."

(f) Each owner or operator of a batch vapor or in-line solvent cleaning machine electing to comply with the provisions of § 63.463 shall submit a solvent consumption report every year. This solvent consumption report shall contain all of the following:

(1) The average monthly solvent consumption for the solvent cleaning machine in kilograms/month; and

(2) The 3-month monthly rolling average solvent consumption estimates calculated each month using the method as described in § 63.464(b)(4).

(g) The owner or operator of an affected facility must submit an exceedance report if any required monitoring or emissions calculations indicate that any applicable requirements of § 63.462 or § 63.463 are not met. This report must be submitted on a quarterly basis for any quarter in which there is an exceedance. This report must include the reason for the exceedance and a description of the repairs performed, if applicable.

§ 63.468 Equivalent methods of control.

Upon written application, the Administrator may approve the use of equipment or procedures after they have been satisfactorily demonstrated to be equivalent, in terms of reducing emissions of halogenated solvents to the atmosphere, to those prescribed for compliance within a specified paragraph of this subpart. The application must contain a complete description of the equipment or procedure and the proposed equivalency testing procedure and the date, time, and location scheduled for the equivalency demonstration.

TABLE 1.—CONTROL COMBINATIONS FOR BATCH VAPOR SOLVENT CLEANING MACHINES WITH A SOLVENT/AIR INTERFACE AREA OF 1.21 SQUARE METERS OR LESS

Option	Control combinations
1	Freeboard ratio of 1.0, freeboard refrigeration device, reduced room draft.
2	Bi-parting cover used during idling and working modes, freeboard frigeration device, reduced room draft.
3	Bi-parting cover used during idling and working modes, freeboard ratio of 1.0, reduced room draft.
4	Freeboard refrigeration device, manual cover used during idling mode, reduced room draft.

TABLE 2.—CONTROL COMBINATIONS FOR BATCH VAPOR SOLVENT CLEANING MACHINES WITH A SOLVENT/AIR INTERFACE AREA GREATER THAN 1.21 SQUARE METERS

Option	Control combinations
1	Bi-parting cover used during idling and working modes, freeboard refrigeration device, reduced room draft.
2	Dwell, freeboard refrigeration device, reduced room draft.
3	Bi-parting cover used during idling and working modes, freeboard refrigeration device, super heated vapor.
4	Freeboard ratio of 1.0, reduced room draft, super heated vapor.
5	Dwell, reduced room draft, super heated vapor.
6	Bi-parting cover used during idling and working modes, reduced room draft, super heated vapor.
7	Bi-parting cover used during idling and working modes, dwell, reduced room draft.

TABLE 3.—EMISSION LIMITS FOR BATCH VAPOR AND IN-LINE SOLVENT CLEANING MACHINES

Solvent cleaning machine	3-month rolling average monthly emission limit (kilograms/square meters-month)
Batch vapor solvent cleaning machines	109.8
Existing in-line solvent cleaning machines	153.2
New in-line solvent cleaning machines	98.5

3. Appendix A to part 63 is amended by adding in numerical order Method 307 to read as follows:

Appendix A to Part 63—Test Methods

* * * * *

Method 307—Determination of Emissions from Halogenated Solvent Vapor Cleaning Machines Using a Liquid Level Procedure

1. Applicability and Principle

1.1 Applicability. This method is applicable to the determination of the halogenated solvent emissions from solvent vapor cleaners in the idling mode.

1.2 Principle. The solvent level in the solvent cleaning machine is measured using inclined liquid level indicators. The change in liquid level corresponds directly to the amount of solvent lost from the solvent cleaning machine.

2. Apparatus

Note: Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

2.1 Inclined Liquid Level Indicator. A schematic of the inclined liquid level indicators used in this method is shown in Figure 307–1; two inclined liquid level indicators's having 0.05 centimeters divisions or smaller. Glass, Teflon, or any similar material that will not react with the solvent shall be used. A 6-in. x 1-in. slope is recommended; however the slope may vary depending on the size and design of the solvent cleaning machine. Note: It is important that the inclined liquid level indicators be constructed with ease of reading in mind. The inclined liquid level indicators should also be mounted such that they can be raised or lowered if necessary to suit the solvent cleaning machine size.

2.2 Horizontal Indicator. Device to check the inclined liquid level indicators orientation relative to horizontal.

2.3 Velocity Meter. Hot-wire and vane anemometers, or other devices capable of measuring the flow rates ranging from 0 to 15.2 meters per minute across the solvent cleaning machine.

3. Procedure

3.1 Connection of the Inclined Liquid Level Indicator. Connect one of the inclined liquid level indicators to the boiling sump drain and the other inclined liquid level indicator to the immersion sump drain using Teflon tubing and the appropriate fittings. A schematic diagram is shown in Figure 307–2.

3.2 Positioning of Velocity Meter. Position the velocity meter so that it measures the flow rate of the air passing directly across the solvent cleaning machine.

3.3 Level the Inclined Liquid Level Indicators.

3.4 Initial Inclined Liquid Level Indicator Readings. Open the sump drainage valves. Allow the solvent cleaning machine to operate long enough for the vapor zone to form and the system to stabilize (check with manufacturer). Record the inclined liquid level indicators readings and the starting time on the data sheet. A sample data sheet is provided in Figure 307–3.

3.5 Final Inclined Liquid Level Indicators Readings. At the end of the 16 hour test run, check to make sure the inclined liquid level indicators are level; if not, make the necessary adjustments. Record the final inclined liquid level indicators readings and time.

3.6 Determination of Solvent Vapor/Air Interface Area for Each Sump. Determine the area of the solvent/air interface of the individual sumps. Whenever possible, physically measure these dimensions, rather than using factory specifications. A schematic of the dimensions of a solvent cleaning machine is provided in Figure 307–4.

4. Calculations

4.1 Nomenclature.

A_B=Area of boiling sump interface, m^2 (ft^2).
A_I=Area of immersion sump interface, m^2 (ft^2).
A_V=Area of solvent vapor/air interface, m^2 (ft^2).
E=Emission rate, g/m^3-hr (lb/ft^3-hr).
K=100 cm/m for metric units.
=12 in./ft for English units.
L_{B_f}=Final boiling sump inclined liquid level indicators reading, cm (in.).
L_{B_i}=Initial boiling sump inclined liquid level indicators reading, cm (in.).
L_{I_f}=Final immersion sump inclined liquid level indicators reading, cm (in.).
L_{I_i}=Initial immersion sump inclined liquid level indicators reading, cm (in.).
S_B=Length of the boiling sump, m (ft).
S_I=Length of the immersion sump, m (ft).
S_V=Length of the solvent vapor/air interface, m (ft).
W_B=Width of the boiling sump, m (ft).
W_I=Width of the immersion sump, m (ft).
W_V=Width of the solvent vapor/air interface, m (ft).
ρ=Density of solvent, g/m^3 (lb/ft^3).
θ=Test time, hr.

4.2 Area of Sump Interfaces. Calculate the areas of the boiling and immersion sump interfaces as follows:

$A_B=S_BW_B$ Eq. 307–1
$A_I=S_IW_I$ Eq. 307–2

4.3 Area of Solvent Vapor/air Interface. Calculate the area of the solvent vapor/air interface as follows:

$A_V=S_VW_V$ Eq. 307–3

4.4 Emission Rate. Calculate the emission rate as follows:

$$E=\frac{(L_{B_f}-L_{B_i})\rho A_B+(L_{I_f}-L_{I_i})\rho A_I}{K A_v \theta} \qquad \text{Eq. } 307-4$$

Figures to Appendix A to Part 63

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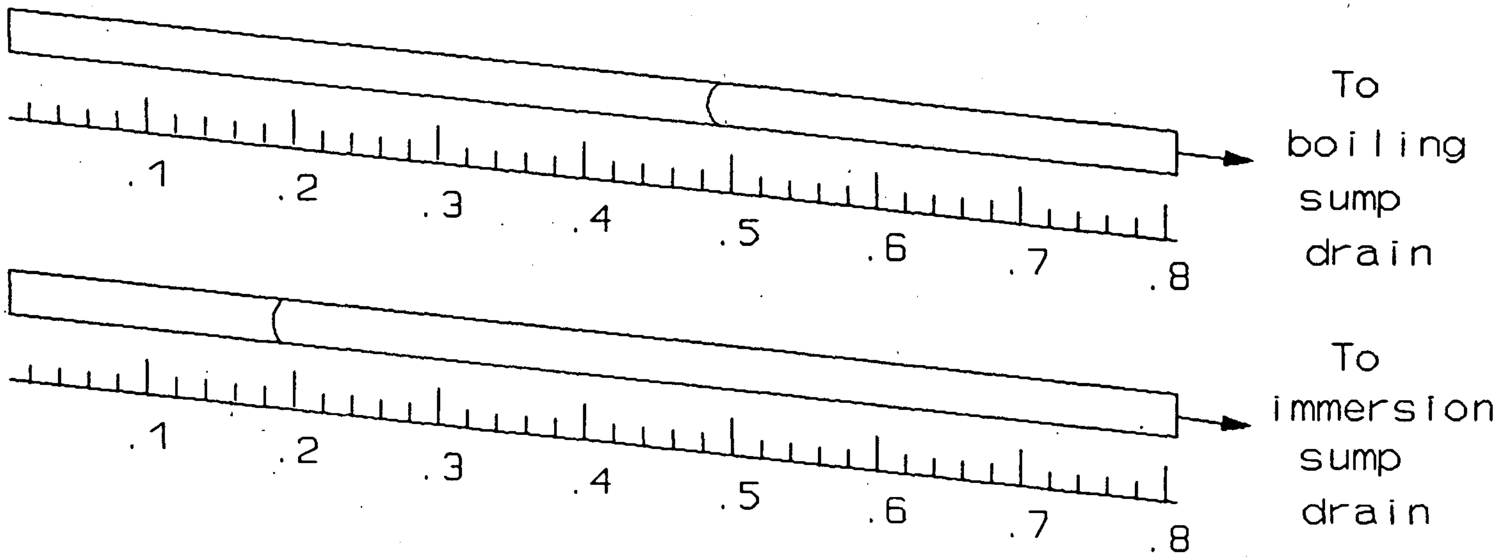


Figure 307-1. Inclined Liquid Level Indicator Apparatus.

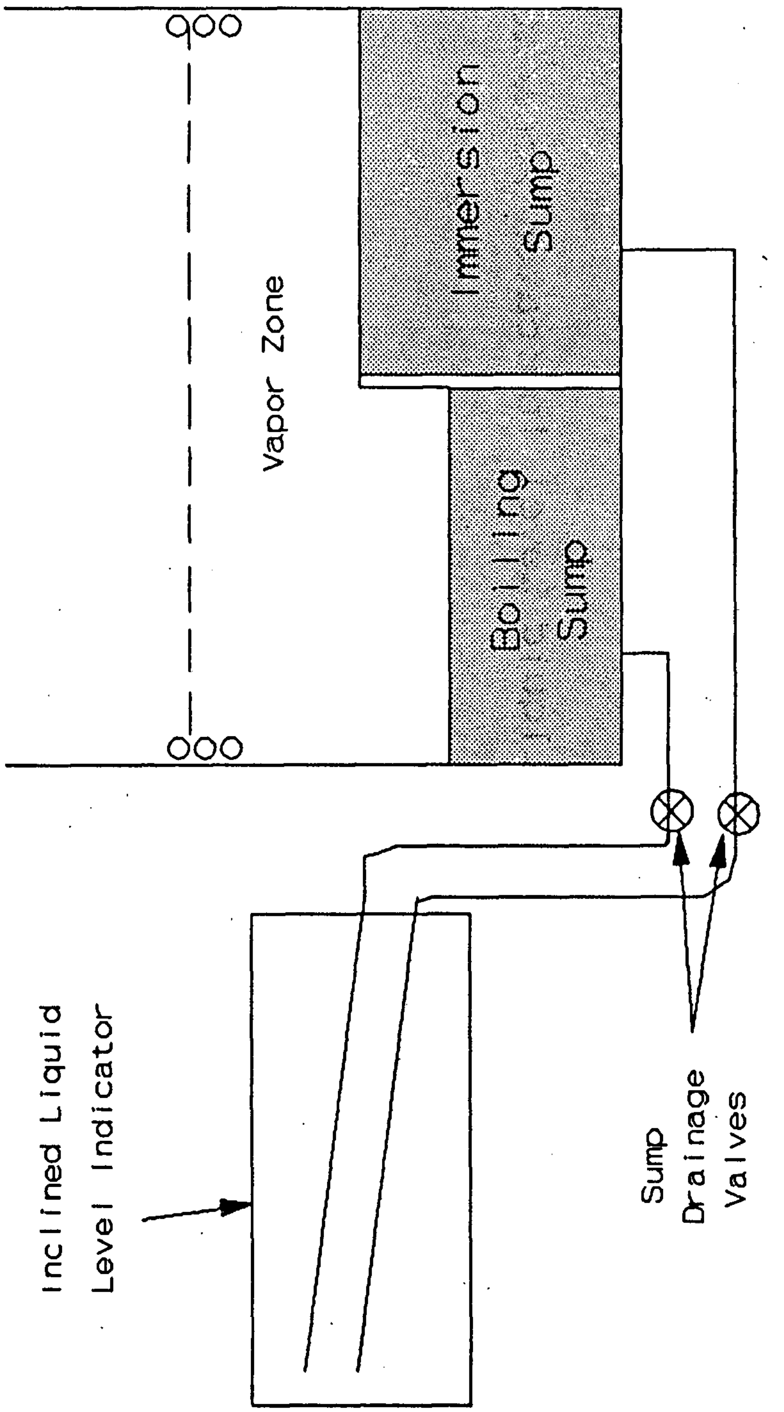


Figure 307-2. Solvent Cleaner Test Setup

Date ______________ Run ______________

Solvent type ________________________
Solvent density g/m^3 (lb/ft^3) ______________________

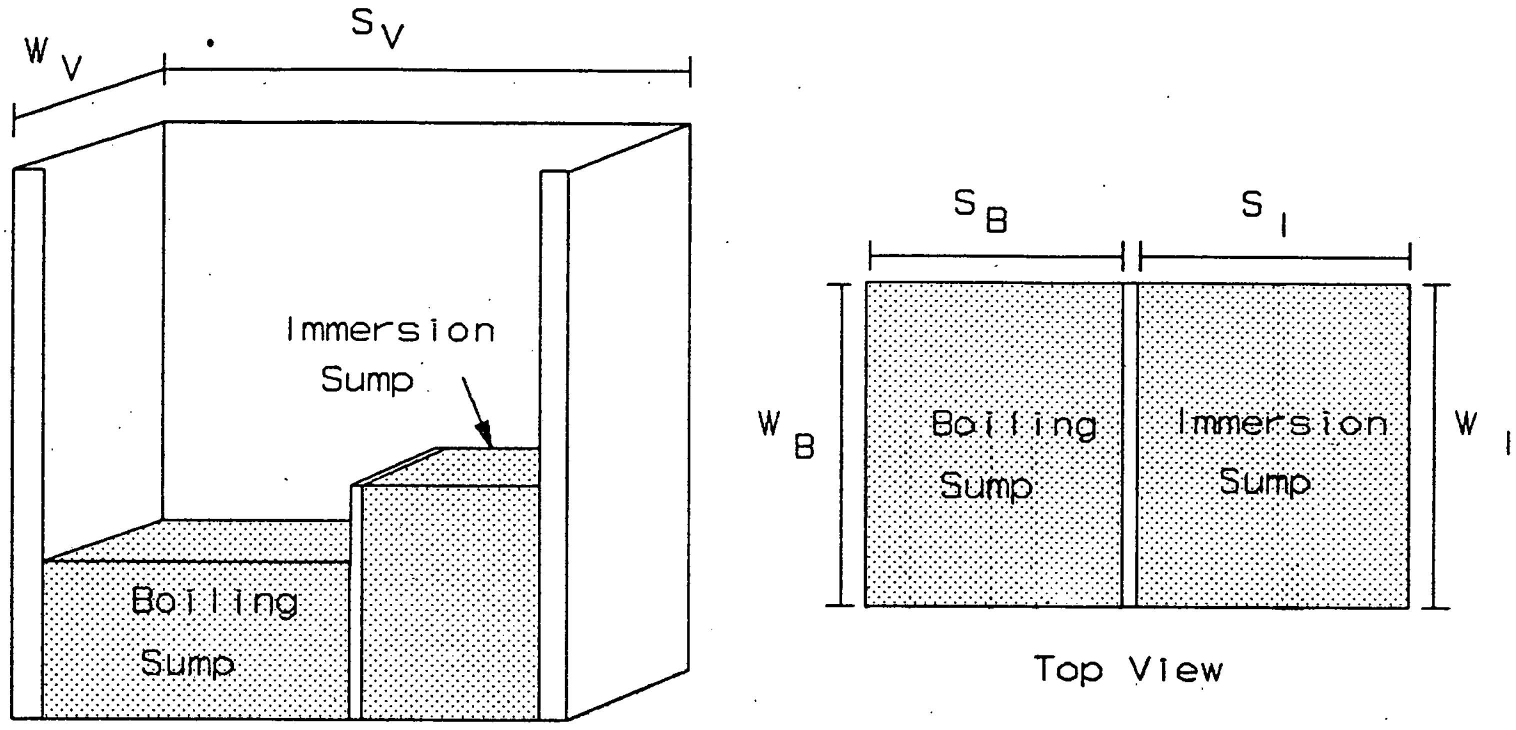
Length of boiling sump (S_B), m (ft) _______________
Width of boiling sump (W_B), m (ft) ________________

Length of immersion sump (S_I), m (ft) _____________
Width of immersion sump (W_I), m (ft) ______________

Length of solvent vapor/air interface (S_V), m (ft) _________
Width of solvent vapor/air interface (W_V), m (ft) __________

Clock Time	Boiling Sump Reading	Immersion Sump Reading	Flow Rate Reading

Figure 307-3. Data sheet.



Front View

Top View

Figure 307-4. Solvent Cleaner Dimensions.

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