

# Metal Solvent Degreasing

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MassDEP

# Background

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- Pursuant to Clean Air Act (CAA), U.S. EPA established National Ambient Air Quality Standards (NAAQS) for 6 criteria pollutants, including ozone
- U.S. EPA established new 8-hour NAAQS for ozone in 1997 and in 2008
- EPA is reconsidering the 2008 ozone standard and is expected to establish a revised lower standard in August 2010



# Background

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- MA, like many states in the region, does not meet the 1997 or the 2008 NAAQS for ozone
- CAA also established the Ozone Transport Region (OTR) and the Ozone Transport Commission (OTC)
- OTR is comprised of 13 states, including Massachusetts



# Background

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- The CAA requires the OTC to assess the degree of interstate transport of ozone and its precursors throughout the OTR and recommend strategies that would help states in the OTR meet the ozone NAAQS
- Ozone control strategies have been in effect for over 20 years in the OTR
- Volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>) are ground-level ozone precursors



# Background

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- OTC states identified sources of VOC and NOx emissions, and analyzed the potential for further emission control
- OTC recommended that all OTC states adopt stricter controls of VOCs or NOx emitted from:  
consumer products, paints and other coatings, adhesives and sealants, large boilers, glass furnaces, cement kilns, asphalt production (batching) plants, asphalt paving, and solvent cleaning
- OTC solvent cleaning model rule was developed in 2001



# Background

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- As an ozone “nonattainment” area, MA submitted a “State Implementation Plan” (SIP) to U.S. EPA showing how it plans to meet the ozone standard in 2010 and subsequent years
- MA Ozone SIP includes a commitment to reduce VOC emissions from cold solvent degreasing



# Background

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- MassDEP's previous solvent metal degreasing regulation (adopted on December 31, 1980) was similar to the OTC model rule in many respects
- MassDEP adopted those additional OTC model rule requirements that provide the greatest emission reduction benefits
- Most of OTC's emission reduction benefits are attributed to use of low-volatility cold cleaning solvents



# Massachusetts' Solvent Metal Degreasing Regulations

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- 310 CMR 7.18(8)(a), Cold Cleaning Degreasing
- Regulation was amended on 3/06/2009
- New standards took effect on 9/6/2009





# A Few Definitions

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- SOLVENT METAL DEGREASING means the process of cleaning **[solids from]** metal surfaces by using a volatile organic compound.
- COLD CLEANING DEGREASING means the **batch** process of solvent metal cleaning by **spraying, brushing, flushing, or immersion** while maintaining the solvent below its boiling point. **Wipe** cleaning is **not** included in this definition.



# Applicability

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- Regulation applies to any person who owns, operates, leases, or controls any solvent metal degreasing facility that utilizes a cold cleaning degreaser that can hold more than **1 liter** of solvent
- Halogenated organic Compounds (HOC) are included in the definition of VOC for this rule
  - For purposes of this regulation, HOC are the following specific chemicals:
    - Methylene chloride
    - Perchloroethylene (tetrachloroethylene)
    - CFC-11 (trichlorofluoromethane)
    - CFC-12 (dichlorodifluoromethane)
    - CFC-22 (chlorodifluoromethane)
    - FC-23 (trifluoromethane)
    - CFC-114 (dichlorotetrafluoro- ethane)
    - CFC-115 (chloropentafluoroethane)



# New Requirement

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- The new regulation limits the vapor pressure of cold cleaning solvents to 1.0 millimeter mercury (mm Hg) measured at 20° C in all cold cleaning degreasers that can hold more than 1 liter of solvent



# Exemptions from 1 mm Hg limit requirement

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- Degreasers that are:
  - Used in “Special and Extreme Solvent Metal Cleaning”
  - Used in an operation in which compliance with the vapor pressure requirement would result in unsafe operating conditions and for which MassDEP has issued an exemption approval
  - Located in a permanent total enclosure with a VOC control efficiency of 90 percent or greater



# Special and Extreme Solvent Metal Cleaning

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- Degreasers used in:
  - Manufacturing and rework of electronic parts, assemblies, boxes, wiring harnesses, sensors and connectors used in **aerospace** service
  - Manufacturing of ozone, nitrous oxide, fluorine, chlorine, bromine, halogenated compounds, or oxygen in concentrations greater than 23 percent
  - Cleaning of metal parts exposed to ozone, nitrous oxide, fluorine, chlorine, bromine, halogenated compounds, or oxygen in concentrations greater than 23 percent



# Other Requirements

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- All previously applicable requirements still apply:
  - a. Leaks be repaired immediately
  - b. Degreaser be equipped with a cover that can be easily operated with one hand
  - c. Degreaser be equipped to drain clean parts so that, while draining, the cleaned parts are enclosed for 15 seconds or until dripping ceases, whichever is longer
  - d. Degreaser be equipped with
    - a freeboard ratio of 0.75 or greater; or
    - a water blanket (only if the solvent insoluble in and heavier than water); or
    - an equivalent air pollution control system approved by MassDEP and EPA;
  - e. Covers be closed whenever parts are not being handled in the degreaser or when the degreaser is not in use
  - f. Drafts across the top of each cold cleaning degreaser be minimized
- Items “b” through “f” do not apply if the cold cleaning degreaser is a sink-like work area with a remote solvent reservoir with an open drain area less than 100 square centimeters



# Enforcement Deferral – Now Expired

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- Companies may use, until 4/1/2010, noncompliant solvents purchased prior to 9/6/2009 in existing cold cleaning degreasers subject to 310 CMR 7.18(8)(a)
- Deferral does not apply to any other prohibited activity, including the use of noncompliant solvents purchased after 9/6/2009 or the use of noncompliant solvents on and after 4/1/2010 (even if purchased prior to 9/6/2009)



# Permitting Requirements

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- In general, an air permit is required before installing or modifying a solvent metal degreaser if its potential to emit is more than 1 ton of VOC in any 12 consecutive month period
- In lieu of a permit, a company can install a new degreaser that uses less than 100 gallons per month of solvent and complies with the new solvent vapor pressure limit
- For more information on permitting requirements please contact MassDEP





## Cold Degreasing RACT vs. BACT/LAER

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- Facilities/operations that have received a plan approval after 1990 for BACT or LAER that have a cold solvent degreaser that does not meet the requirements of the newly promulgated Cold Solvent Metal Degreasing rule (RACT) must comply with the new rule



## Reminder

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- Degreasing “buckets” are subject to the cold cleaning degreasing regulation
- They must comply with ***all*** cold cleaning degreasing requirements



# Compliance Options

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- Substituting a solvent with a lower vapor pressure that meets the new requirement
  - In addition to compliant solvents being available on the market, some vendors are able to work with a client to develop an application-specific compliant solvent formulation
- Utilizing an aqueous cleaning system
- Using enclosed cleaning systems (airless/airtight)
- Installing air pollution controls
- Process modification: eliminate the need for cleaning step



# Examples

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- Example of noncompliant solvents (vapor pressure >1.0 mm Hg limit):
  - **Halogenated solvents, alcohols, ketones, naphtha, mineral spirits, and Stoddard solvent**
- Example of complaint solvents\*
  - ***Buckeye Shopmaster RC* (RC stands for resin cleaner)**
  - ***SoySolve*, which is a soy-oil product**
  - **Safety-Kleen: five different products**
  - ***Solvent 142* from Ashland Chemical; also, low vapor pressure solvent formulations can be identified for specific application if the customer discusses their application and requirements with the vendor**

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\* Reference to a company or product does not constitute an endorsement by MassDEP.



# Further Information

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- <http://www.mass.gov/dep/air/laws/regulati.htm#vocamend> (Fact Sheet, Policy Guidance, Final Rule)
- <http://www.mass.gov/dep/service/regulations/regsarch.htm> (Background Technical Document)



# MassDEP Contact Information

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# QUESTIONS?

