Guidelines for Compliant Spray Booth Operation

In 2008, the Massachusetts Department of Environmental Protection (MassDEP) introduced regulations that affect many spray booth and coating operations emitting relatively small amounts of solvents and pollutants known as Volatile Organic Compounds (VOC). In January 2008, the U.S. Environmental Protection Agency (EPA) finalized regulations for auto body shops and certain other businesses with spray coating or paint stripping operations. By complying with the state and federal guidelines, you can prevent pollution and protect your shop from financial penalties and legal liabilities, as well as ensure worker safety. The Office of Technical Assistance and Technology (OTA) prepared this document to help you to: understand the regulations; avoid common regulatory compliance violations; reduce VOC emissions; and save money. OTA can help you to comply with the new regulations and find new ways to reduce the use of toxic material.

Why Massachusetts Regulates Coating Operations

During coating operations, solids are deposited on an object to provide corrosion protection, increased durability, adhesion, or to increase aesthetic appeal, but coatings may contain liquid Volatile Organic Compounds (VOC) that can be carried to the air. VOC, when contained in materials used in coating operations and in surface-prep and clean-up solutions, contribute to the formation of ground-level ozone. Workers can suffer long-term health impacts from inhaling solvent vapors. For the shop owner, this can result in productivity losses, worker compensation claims, and other problems. Air emissions can also generate complaints from neighbors.

Use of LaserTouch™ Spray Gun at Bay Path Regional Vocational Technical School

The Massachusetts Regulations and What They Mean for You

In 2008, the MassDEP announced regulations on VOC for companies with spray coating operations: including plastics parts coaters, wood finishers, metal parts and products coaters, automotive surface coaters and refinishers, and leather surface finishers. The regulations are based on the amount of VOC emitted by a shop. To determine if the regulations apply to your facility, the key questions are:

Do you have a valid air permit from MassDEP for your spray booth?

If yes, you must follow requirements of the permit and keep records that show you are in compliance.

If you don't have an air permit for your spray booth operation, can you qualify for a permit exemption?

You may qualify for an exemption:

- If your shop uses less than 670 gallons per calendar month of all materials containing VOC (example: including solvents, water-based paints, and adhesives), or has an emission rate of less than 2.5 tons of VOC per calendar month **and** your coating operations meet specific guidelines and requirements regarding: record keeping, spray booth specifications, hazardous waste handling, and equipment maintenance. (Source registration is required – see 310 CMR 7.12).

  Or

- If your shop uses less than 2,000 gallons per 12-month rolling period of any organic material (including VOC and non-VOC, such as acetone), or has an emission rate less than 10 tons of organic material per 12-month rolling period **and** your coating operations meet specific guidelines and requirements regarding: record keeping, spray booth specifications, hazardous waste handling, and equipment maintenance. (Source registration is not required).

Some Guidelines and Best Practices to Help Satisfy Permit Exemption Requirements[1]

Here are key requirements pertaining to spray booths, equipment and operations:

- Face velocity of air at the filter cannot exceed 200 feet per minute.
- Spray guns must employ either high volume low pressure (HVLP) or electrostatic spray applications, or an alternative method that is equally efficient and is approved in writing by MassDEP. HVLP spray guns should be operated according to the manufacturer's specifications.
- Use a coating that complies with VOC limits contained in the regulation.

1. 310 CMR 7.03(16)

- The VOC content of any surface preparation solution should not exceed 1.67 pounds per gallon, unless it is used to prepare plastic parts.
- Spray guns must be cleaned in a device that minimizes solvent evaporation during cleaning, rinsing, and draining operations. The device must be capable of recirculating solvent during cleaning so it can be reused — and collecting the spent solvent in an enclosed system for proper disposal or recycling.
- Spray booth filters must include two or more layers of dry fiber mat totaling at least two inches thick or a system MassDEP has determined is equivalent and achieves a particulate control efficiency of at least 97% by weight. Companies subject to the federal regulations described below must have filters that are 98% efficient. Filter material must be maintained and disposed in accordance with all applicable MassDEP regulations.
- The stack must discharge vertically and be at least 35 feet above ground or 10 feet above the roof with no rain cap that restricts the vertical exhaust flow. The stack gas exit velocity must be greater than 40 feet per second. Emissions from the stack must have 0% opacity.
- To demonstrate compliance, spray booth operators must maintain detailed monthly records of the coatings and clean-up solutions used and either overall organic materials use or VOC emissions (See 310 CMR 7.03(16)K) . Automotive refinishers have the option of maintaining monthly purchase records of coatings and surface preparation products. (See 310 CMR 7.03(16)L)

The Federal Regulations and What They Mean for You

Those affected by this regulation include paint stripping operations using methylene chloride; surface coaters of motor vehicles or other mobile equipment; spray coating either plastic or metal parts; or making products with coatings that contain chromium, lead, manganese, nickel, or cadmium. Motor vehicle and mobile equipment surface coaters (such as auto refinishers) can petition the EPA for an exemption from this regulation as long as none of the coatings they spray contains chromium, lead, manganese, nickel, or cadmium. Anyone who is not exempt must implement a number of measures aimed at minimizing the use and emissions of hazardous air pollutants. More detailed information can be found at: https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100AUJ3.TXT.

Long-Range Operational Planning

Keep in mind there only are two ways to reduce VOC emissions from surface coating operations: reduce or replace the organic solvent in a coating system and/or improve the transfer efficiency of the coating operation. There are high solids, low-VOC paints that will give you finished quality equal to the paints you currently use. Ask your paint suppliers for information on these and other compliant paints. There are powder, UV-cured, electronic-beam-cured, waterborne and high-solids coatings which contain no or a lower percentage of organic solvents and can limit VOC emissions.

Transfer efficiency is the ratio of the amount of coating solids deposited on the part surface compared to the amount of coating solids sprayed. When the transfer efficiency for a particular surface coating operation is increased, the amount of coating (and resulting VOC emissions) is reduced. Training employees in proper spray technique and having frequent refresher training is a highly effective way to increase transfer efficiency, reduce coating use, and save money. Typical technologies used to improve transfer efficiency in surface coating operations include electrostatic spraying, dip-coating, flow coating, and laser guided spray gun application equipment. OTA staff can help you to reduce or eliminate the use of organic solvents and improve the transfer efficiency of your coating operations.

Next Steps

Call the Office of Technical Assistance and Technology (OTA) to arrange a confidential site visit; all of our advisory services are provided at no cost to you. We are a non-regulatory office that will review your operations and identify possible compliance problems before you apply for a MassDEP permit and can help identify whether you are exempt from the permit regulations.

Contact Information

For more information about changes to the spray booth regulations or to schedule a confidential site visit, please contact maota@mass.gov.

OTA is ready to help you reduce toxics use and conserve energy, water and other resources. To learn more about our non-regulatory, confidential services — which are provided at no cost to Massachusetts companies, call (617) 626-1060.