Enviroscope

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The Aerospace NESHAP As It May Apply To Electroplaters & Surface Finishers

Overview

The aerospace NESHAP, when officially implemented, may affect many electroplaters and surface finishers. The rule covers the emission of hazardous air pollutants (HAPs) and volatile organic compounds (VOCs) as they relate to certain cleaning and coating processes routinely used in the aerospace industry. The comment period on the rule was extended from the original in September 1994 to early 1995. As of the last public hearing (March 1995), the final version of the rule is slated for enactment this July.

As currently written, compliance will be required within 90 days for the housekeeping requirements, and within three years of the effective date for existing affected sources. New sources must comply as they begin operation. An affected source must meet the definition of an aerospace facility, and *any facility processing any aerospace parts would qualify*.

The goal of the rule is to significantly reduce solvent emissions from aerospace manufacturing facilities, as well as from businesses that support the aerospace industry. The rule is aimed at major sources (>10 tons/yr of any single HAP or >25 tons/yr total HAP emissions), and is based on the potential to emit. A Control Technology Guidance (CTG) document is being prepared that will describe the required equipment and/or procedures for those operations in non-attainment areas. The CTG document will be applicable to all sources in non-attainment areas, regardless of whether emissions of HAPs qualify as a minor source.

The rule focuses on four operations: (1) Cleaning, (2) organic coating (both primer and topcoat), (3) depainting, and (4) chemical milling masking. The rule covers both emissions of VOCs and HAPs, proposing composition limits for the substances used and proscribed control technology for the covered processing operations.

Reporting required for the rule is quite extensive and could be particularly burdensome for small facilities using a wide variety of coatings and/or cleaners. Depending on the operation, equipment used, and the chemicals selected, there are daily, monthly, semi-annual and annual reporting requirements. Reporting may also be triggered by failed equipment or extended maintenance down-time. Similar to the chromium rule, the aerospace NESHAP will require extensive documented operation and maintenance procedures on all equipment related to the operation of these processes, and can require the tracking of individual chemical usage or the number of parts processed.

Applicability

The rule applies to facilities engaged in original equipment manufacture and rework of aerospace components and assemblies that are major sources, based on their potential to emit (>10 tons emitted of any one HAP, or >25 tons aggregate HAP emissions).

Potential to emit assumes 24 hours of operation, 365 days a year, and is most likely significantly larger than the facilities' actual emissions. These facilities are required to obtain state operating permits. SIC codes include 3720, 3721, 3724, 3728, 3760, 3761, 3764, 3765 and 4581. The current definition captures those facilities that process *any* aerospace parts, even if it is not the majority of their business.

In addition to the four operations noted earlier, the rule also applies to wastes generated by these processes that do not fall under RCRA, and describes requirements for storage and handling. Cleaning is further broken down to include: Handwipe, spray gun cleaning, and flush cleaning.

General Provisions

Documentation is required to track the various aspects of the rule, which include, but are not limited to:

- Retention of records for five years
- Records of daily/monthly inspections
- Emission testing of control devices
- Control device operation and maintenance records
- Composition records for materials used
- Exempt solvent usage logs
- Compliant and noncompliant coating usages
- Averaging calculations
- Records of the number of parts stripped
- Equipment malfunction log
- Repair logs
- Exempt stripper usage

Reports filed include:

- Start-up
- Notification of emission test results
- Any operational changes
- Changes in production capacity
- Compliance status
- Semi-annual/annual operation

In addition, any facility employing emission control devices for air pollution abatement must submit an operation and maintenance plan. This plan will detail the operational procedures for each air pollution control device required for limiting HAP and VOC emissions. The plan will include preventive maintenance inspections and procedures for identifying and correcting equipment malfunctions. If a facility utilizes a pollution control device not listed in the rule, performance data must be submitted to demonstrate that the device operates within acceptable limits, along with the operational parameters that must be monitored to maintain the reported removal efficiency.

Cleaning

Housekeeping requirements have been developed to minimize releases to the environment from all virgin solvent materials and their associated wastes. They apply to solvent-laden cleaning materials (*i.e.*, rags, towels, swabs, etc.), which must now be kept in closed containers. Solvents must also be kept in closed containers, except during the actual transfer of material from one container to another. Records must be kept on each cleaning solvent used—noting HAP content, composition, and vapor pressure—and reports must be submitted every six months, along with any additions or deletions from the working list.

Handwipe

Except for spray gun cleaning, all handwipe solvents must either meet composition requirements, or have a vapor pressure <45 mm Hg at 20 °C. Composition requirements have been developed for aqueous and hydrocarbon-based cleaners. Aqueous cleaners must be at least 80-percent water, noncombustible, 100-percent soluble, and may contain no HAPs. Hydrocarbon-based cleaners must be composed of hydrocarbons and oxygenated hydrocarbons, with a vapor pressure <7 mm Hg at 20 °C, and no HAPs or ozone-depleting materials.

Certain cleaning operations are exempt from solvent composition requirements, but must still comply with housekeeping portions. These operations include: Manufacture/test of breathing oxygen systems; cleaning for the manufacture of strong oxidizers and reducers (rocket fuel components); cleaning for surface activation prior to adhesive bonding; cleaning for electronics assembly; cleaning for aircraft fuel/fluid systems, and others.

Spray Gun Cleaning

The rule covers four cleaning techniques: Enclosed gun cleaning; closed-when-idle, non-atomized discharge of solvent into a closeable waste container; disassembly of gun into a closeable vat; and atomized discharge into a waste container that captures atomized emissions. Documentation is required of all leaks and repairs of spray gun cleaning equipment within 15 days of a noted deficiency.

Flush Cleaning

Solvents used for flush cleaning must drain into a container that is closed when not in use.

Coating Processes

Each primer and topcoat must be analyzed for VOC and HAP content. Coatings that comply with the composition requirements may be used without further emissions controls. Compliant primers must contain <2.9 lb/gal VOC and <2.9 lb/gal HAP. Compliant topcoats must contain <3.5 lb/gal VOC and <3.5 lb/gal HAP. VOC and HAP contents are measured from "as applied" formulations, less water and exempt solvents. Compliance can also be achieved by averaging together the various primers used, or the various topcoats. Primers and topcoats may not be averaged together to obtain an average below the compliance level.

Exempt solvents are those that have little photochemical activity for forming ground-level ozone. The list includes: Methylene chloride, methyl chloroform, CFC-113, CFC-11, CFC-22, CFC-23, various HCFCs and various perfluoro compounds. (Also included are the stratospheric ozone-depleting solvents, which are to be phased out.)

Uncontrolled emissions from organic coating operations are compliant if the primers and topcoats used meet the stated composition requirements. If content averaging is used, a daily log of the usages of each material must be maintained to calculate daily compliance. If coatings are mixed on-site (*e.g.*, thinned), daily calculations of VOC and HAP contents must be recorded. Content averaging may not be used among coatings where emissions are regulated by means of control equipment, or compliant composition coatings.

Coating materials exceeding the composition requirements may be used, but require control equipment with a minimum 81-percent capture efficiency. The rule also specifies the application techniques that are acceptable, which include: Flow coating, roll coating, brushing, dipping, electrostatic attraction, and high-volume, low-pressure (HVLP) spray guns. Substitute processes must demonstrate equivalent performance.

Several coating processes are exempted. These are: Coating of limited-access areas requiring nozzle extensions; application of coatings with fillers that cannot be applied by one of the accepted methods; coatings <0.0005-in. thick that cannot be applied by specified methods; air brush application; stenciling, touch-up and repair. Inorganic HAPs must also be controlled by the use of particulate filtration.

Control devices must be continuously monitored and maintained in peak operating efficiency, and must be shut down when efficiency drops below specified levels.

Depainting

The depainting portion of the rule is specifically aimed at depainting of large aircraft structures in bays and hangars. It therefore applies only to aircraft frames, not parts normally removed—wings and stabilizers are always covered.

No organic HAPs may be emitted, except for spot-stripping and decal removal. Spot-stripping and decal removal strippers are limited by the volume used per aircraft: 26 gal of HAP-containing stripper per commercial aircraft, and 50 gal per military aircraft are allowed.

Preferred depainting methods are non-HAP-containing chemical, media-blasting, and high-intensity UV radiation. Facilities must also regulate emissions of inorganic HAPs from mechanical depainting operations. Continuous monitoring of the control device is required, and the operation must be shut down if the monitored parameters fall below the manufacturer's specified limits. Malfunctions and downed equipment must be reported, as well as usage of replacement materials during down-times.

Chemical Milling Maskants

This portion of the rule applies only to type II maskants used for the chemical milling of large structures. HAP and VOC content must be <1.3 lb/gal each for uncontrolled usage. If noncompliant maskants are used, an emission control device is required with a minimum overall efficiency (both capture and destruction) of 81 percent.

Compliance & Dates

For each affected source, compliance is required within three years of the effective date for this rule. Each affected facility must also submit an operation and maintenance plan as

specified in the general provisions. Compliance with the housekeeping measure is determined continuously. Cleaning techniques are considered in compliance by following the selected techniques and/or using compliant solvents.

Compliance for topcoat, primer, depainting, and chemical milling masking operations is determined by performance tests over varying periods. The period of the performance test varies from continous, up to a maximum of 30 days, depending on whether control devices are used, whether only compliant coatings are used, or if a mixture of compliant and noncompliant coatings are averaged. All emission control devices must have an initial performance test to determine baseline performance and compliance. Compliance for spot-stripping is determined by the usage of material-per-aircraft.

In general, control devices must be monitored continuously to determine effective operation. For particulate filters and water-wash spray booths, pressure drop must be monitored continuously. These devices must be shut down whenever the operation falls below the minimum effective removal standards. Thermal and catalytic oxidation units must monitor combustion temperature continuously, and recalibrate the sensors quarterly.

Recordkeeping & Reporting

The recordkeeping and reporting requirements for this rule are voluminous. Records must be maintained, detailing the composition (including applicable HAP or VOC content), vapor pressure, and the quantity of materials used for the affected processes (*i.e.*, each cleaner, primer, topcoat, and chemical milling maskant on-site). In some cases, the quantity of parts processed is required. Inspections, leak, and repair dates for equipment must be recorded, as well as performance test data and operations reports for the pollution control devices.

The semiannual report is basically a deficiency report that details any out-of-compliance material usage, equipment failures and repairs, periods of noncompliance, and process or material changes.

Summary

It is clear that these requirements, which result from components of the Clean Air Act, could be quite costly to a facility. The best way to minimize expenses, if at all possible, is not to be involved in the programs. The reporting burden for smaller diverse facilities with potential to emit puts them over the major-source threshold, while their actual emissions are significantly below that point. These facilities typically do not have the resources to adequately address the reporting required.

The aerospace NESHAP requires affected facilities to obtain state operating permits. There is also significant reporting requirements under Title V of the Clean Air Act, which governs operating permits. Many facilities would be best served by obtaining synthetic minors, which may allow them to opt out of these programs.

Obtaining a synthetic minor requires that a facility quantify its air emissions and set a cap to those emissions. The cap will form the basis for federally enforceable limits that will guarantee minor source status. Careful evaluation is necessary—setting caps too low could hamstring the business, because re-opening the permit is a lengthy process.

The U.S. Environmental Protection Agency (EPA) is encouraging facilities to consider synthetic minors, because regulation of smaller sources by the part 70 permit is not necessarily efficient. In a guidance document issued on January 25, 1995, EPA discusses various alternatives to operating, and how these alternatives could remove many sources from Title V applicability. The key is to assess facility needs and emissions early, and develop a teaming approach with the state and/or local regulators well before the operating permit application is due. ❑

About the Columnist

Jeffrey R. Lord is corporate manager of Environmental, Health and Safety for The BFGoodrich (BFG) Company. In this capacity, he manages the corporation's Superfund remediation efforts; conducts E, H & S audits of various BFG locations worldwide; and assists the business units on special projects in the areas of pollution prevention, waste minimization, and plating technology. Previously he was environmental coordinator for BFG Aircraft Systems in Vergennes, VT, where his efforts resulted in the award of the first-ever Governor's Award for Environmental Excellence and Pollution Prevention for the company in 1993. He has been active in the environmental field for the past six years, and previously had been a research scientist in the area of fiber optic sensor development for advanced aerospace applications. He holds a master's degree in physical chemistry from Boston College, and a bachelor's degree in chemistry and education from the State University of New York at Cortland.