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# National Emission Standards for Aerospace Manufacturing and Rework Facilities: Summary of Requirements for Implementing the NESHAP



**NATIONAL EMISSION STANDARDS FOR  
AEROSPACE MANUFACTURING AND REWORK FACILITIES:  
SUMMARY OF REQUIREMENTS FOR  
IMPLEMENTING THE NESHAP**

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## Disclaimer

The Office of Air Quality Planning and Standards (OAQPS) and the Office of Enforcement and Compliance Assistance (OECA) of the U. S. Environmental Protection Agency (EPA) have reviewed this document and approved it for publication.

When using this document, remember that it isn't legally binding and doesn't replace the final rule - "National Emission Standard for Hazardous Air Pollutants for Aerospace Manufacturing and Rework Facilities" (published in the *Federal Register*, 9/1/95, 60 FR 45948) or any State and local rules that may apply to your facility.

This document isn't intended, nor can you rely on it, to create any rights enforceable by any party in litigation with the United States. The EPA may change this document at any time without public notice.

This document includes requirements from the final rule and amendments published in the *Federal Register* on 3/27/98 (63 FR 15006) through 12/8/00 (65 FR 76945).

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## 1.0 Introduction

The U.S. Environmental Protection Agency (EPA or we) wrote this document to help educate sources, EPA Regional Office staff and State/local air pollution control agency personnel (you) on the requirements of the final rule - National Emission Standards for Hazardous Air Pollutants (NESHAP) for aerospace manufacturing and rework facilities. In this document, we've included an overview of the rule, applicability flow charts and inspection checklists. The flowcharts should help you understand if your process is subject to the rule. The checklists provide the detail needed to help you check if you're in compliance with the rule.

On September 1, 1995, we published the final aerospace NESHAP. The rule regulates emissions of Hazardous Air Pollutants (HAP) from aerospace manufacturing and rework facilities (including maintenance and repair) that are a major source of HAP.

You can find a copy of the rule in Title 40 of the Code of Federal Regulations (CFR) Part 63, Subpart GG or in the September 1, 1995 *Federal Register*, beginning on page 45948. Since September 1, 1996, we've also published amendments to the rule. You can find a copy of these amendments in the March 27, 1998 *Federal Register*, beginning on page 15006, and the September 1, 1998 *Federal Register*, beginning on page 46525.

We wrote the Aerospace NESHAP to reduce emissions of HAP from solvent and other materials used in four types of aerospace operations:

- cleaning
- primer and topcoat application
- paint removal (depainting)
- application of chemical milling maskants

The rule allows you to use multiple compliance options for each of these operations. All options are summarized in Section 2.0.

To summarize, we've included all of the following in this document:

**Section 2.0** discusses the sources subject to this rule and summarizes the rule provisions. **Section 3.0** contains applicability flow charts to help you determine if the rule affects your operations. **Sections 4.0 and 5.0** suggest some procedures that personnel performing an field inspection can follow before, during, and after the inspection. Other materials that might be helpful in understanding and enforcing this rule are listed in **Section 6.0**. **Section 7.0** includes example calculations and spreadsheets for demonstrating compliance with the surface coating (primer and topcoat) requirements. A listing of possible substitutions for cleaning solvents is provided in **Section 8.0**. A glossary of terms associated with the standard is included in **Appendix A**. And finally, a sample initial notification form is included in **Appendix B**.

When using this document, realize that we haven't included requirements in the General Provisions, 40 CFR 63, Subpart A. The General Provisions were published in the *Federal Register* on March 16, 1994 (59 FR 12408) and apply to all NESHAPs, including the aerospace rule. Thus, when you became subject to this rule, you also became subject to the General Provisions. Some sections of the aerospace rule override the General Provisions. You should check **Appendix C** to see which sections of the General Provisions apply for this rule and which don't.

## 2.0 Summary of the Rule

This section summarizes the major requirements of the NESHAP for aerospace manufacturing and rework facilities. While we've attempted to be as complete as possible, you shouldn't use this summary as a substitute for the final rule (published 9/1/95, 60 FR 45948) and any subsequent amendments (published 3/27/98, 63 FR 15006 and 9/1/98, 63 FR 46525).

This document summarizes only the final rule and the 3/27/98 and amendments through 12/8/00. You should keep abreast of new requirements, printed after 9/1/98, by periodically checking the *Federal Register* and the Code of Federal Regulations (CFR).

Remember, in addition to the requirements summarized in this section, you're also subject to §§63.1 through 63.15 of the General Provisions. See **Appendix C** for specific requirements since we haven't included them here.



## Regulatory Overview

CFR Location:	40 CFR 63 Subpart GG	
Regulatory Activity:	Rule Proposal	6/6/94
	Rule Promulgation (effective date):	9/1/95 [60 FR 45948]
	Rule Corrections:	2/9/96 [61 FR 4902], 12/17/96 [61 FR 66226]
	Final Amendment: Release of Final CTG	3/27/98 [63 FR 15006]
	Final Amendment:	9/1/98 [63 FR 46525]

Compliance and Reporting: See Figure 1 for information on compliance dates, performance testing, and reporting.

### What is an affected facility?

An affected facility is one that is a major source of Hazardous Air Pollutants (HAPs). By that we mean, a facility where the total HAPs emitted are \$ 10 tons/yr of any HAP **OR** \$ 25 tons/yr of any combination of HAP.

### What is an affected source?

This rule applies to operations associated with the manufacturing or rework (including maintenance and repair) of aerospace vehicles and components. An affected source includes **any** of the following:

- C all hand-wipe cleaning operations
- C each spray gun cleaning operation (by that we mean each spray gun cleaning operation is a separate affected source)
- C all flush cleaning operations
- C for organic HAP or VOC emissions, each primer application operation (which is the total of all primer applications at a facility)
- C for organic HAP or VOC emissions, each topcoat application operation (which is the total of all topcoat applications at a facility)
- C for organic HAP or VOC emissions, each depainting operation (which is the total of all depainting at a facility)
- C each chemical milling maskant application operation (which is the total of all such applications at a facility)
- C each waste storage and handling operation (which is the total of all such operations at a facility)
- C for inorganic HAP emissions, each spray booth or hangar that contains a primer, topcoat, or depainting operation (by that we mean each booth or hangar is a separate affected source)

## Rule Applicability [63.741]

Various processes performed at your aerospace manufacturing and rework facility are **not covered** under the rule. Also, some processes are **exempt** from the rule and from control requirements. These exemptions include:

The following are **EXEMPT** from 40 CFR 63, Subpart GG:

- C Specialty coatings (see Appendix A to 40 CFR 63, Subpart GG)
- C Sealants and adhesives
- C Adhesive bonding primers
- C Primers, topcoats, chemical milling maskants, strippers, and cleaning solvents containing HAP and VOC <0.1% for carcinogens; <1% noncarcinogens. By this we mean the threshold limits as outlined by the Occupational Safety and Health Administration (OSHA) for reportable quantities on a Material Safety Data Sheet (MSDS)
- C Low-volume use of primers, topcoats, and chemical milling maskants which does not exceed 50 gal (189 liters) per year per formulation; with a combined annual total of all such primers, topcoats, and chemical milling maskants used at the facility not exceeding 200 gal (757 liters); otherwise exempt coatings excluded from totals [63.741(g)]
- C Activities associated with space vehicles (except for depainting)
- C Rework of antique aerospace vehicles or components (>30 yrs old)

The following are **NOT COVERED** under 40 CFR 63, Subpart GG:

- C Rework of aircraft or aircraft components if the holder of the Federal Aviation Administration (FAA) design approval, or the holder's licensee, is not actively manufacturing the aircraft or aircraft component [63.741(f)]
- C Parts and assemblies not critical to vehicle's structural integrity or flight performance
- C Electronic parts and assemblies (except for cleaning and topcoating of completed assemblies)
- C Research and development; Quality control
- C Laboratory testing activities
- C Chemical milling
- C Metal finishing
- C Electrodeposition (except the electrodeposition of paints)
- C Composites processing (except for some cleaning, coating, and composite tooling operations)
- C Aircraft transparencies manufacturing
- C Handling of waste subject to RCRA, 40 CFR 262 -268
- C Wastewater operations

# Cleaning Operations

[63.744(a)]

## What is covered under this section of the rule?

These cleaning requirements apply only to the cleaning of aerospace vehicles and components. If your cleaning operations are subject to the hand-wipe cleaning, flush cleaning, or spray gun cleaning requirements as described later in this section, they are also subject to these general cleaning requirements.

## What compliance options do I have?

You have **two** compliance options available:

**Option 1:** Use cleaning solvents that meet the requirements in the following table [63.744(a)]:

Cleaning Solvent Type	Composition Requirements
Aqueous	<ul style="list-style-type: none"><li>• Cleaning solvents in which water is the primary ingredient (80% of cleaning solvent solution as applied must be water)</li><li>• Aqueous solutions must have a flash point &gt;200EF (93EC) as reported by the manufacturer</li><li>• Solution must be miscible with water</li></ul>
Hydrocarbon-Based	<ul style="list-style-type: none"><li>• Cleaners that are composed of photochemically reactive hydrocarbons and, or oxygenated hydrocarbons</li><li>• Have a maximum vapor pressure (VP) of 7 mm Hg at 20EC (3.75 in. H<sub>2</sub>O at 68EF)</li><li>• Contain no HAP</li></ul>

**Option 2:** If you use a solvent that don't meet the requirements in Option 1, do all of the following [63.744(a)]:

- C place solvent-laden cloth, paper or other absorbent applicators in bags or other closed containers after you've finished using them (cotton-tipped swabs used for very small cleaning operations are exempt from this requirement)
- C keep containers closed at all times, except when depositing or removing materials (cotton-tipped swabs used for very small cleaning operations are exempt from this requirement)
- C store fresh and spent solvents in closed containers (except semi-aqueous cleaners)
- C handle and transfer solvents to, or from cleaning operations, and to waste handling areas in a manner that minimizes spills

## What monitoring must I do?

You don't have any monitoring requirements under this section.

## What records must I keep?

You must keep **all** of the following records:

**All Options**, record the following for each cleaning solvent used [63.752(b)(1)]:

- ☐ name of the product your using
- ☐ it's vapor pressure
- ☐ documentation showing the organic HAP constituents

## What reports must I submit?

You must submit **all** of the following reports:

**All Options**, semiannual report (every 6 months from the date of notification of compliance status) which includes [63.753(b)]:

- ☐ if the operation has been in compliance for the semiannual period, a statement that the cleaning operations have been in compliance
- ☐ the statement must be signed by a responsible official

Reporting of noncompliance is covered under the hand-wipe, flush, and spray gun cleaning sections.

## Hand-Wipe Cleaning Operations

[63.744(b)]

### What is covered under this section of the rule?

Hand-wipe cleaning of aerospace vehicles or components at an aerospace facility.

### What is not covered under this section of the rule?

All of the following operations or processes aren't covered:

*Note: Recordkeeping is still required if you use a noncompliant cleaning solvent on an exempt operation. See "What Records Must I Keep" under this section for specific information.*

- C wipe cleaning operations involving spray gun cleaning (under separate provision) [63.744(b)]
- C cleaning during manufacture, assembly, installation, maintenance, or testing of:
  - < Components of breathing oxygen systems that are exposed to breathing oxygen [63.744(e)(1)]
  - < Components that are exposed to strong oxidizers or reducers [63.744(e)(2)]
- C cleaning and surface activation prior to adhesive bonding [63.744(e)(3)]
- C cleaning during the fabrication, assembly, installation, and maintenance of textile materials used in the interior of the aircraft [63.744(e)(8)]
- C cleaning and cleaning solvent usage associated with research and development, quality control, or laboratory testing [63.744(e)(11)]
- C cleaning operations, using nonflammable liquids, conducted within 5 feet of energized electrical systems [63.744(e)(12)]
- C cleaning of:
  - < electronic parts and assemblies containing electronic parts [63.744(e)(4)]
  - < aircraft and ground support equipment fluid systems that are exposed to fluid [63.744(e)(5)]
  - < fuels cells, fuel tanks, and confined spaces [63.744(e)(6)]
  - < surfaces of solar cells, coated optics, and thermal control surfaces [63.744(e)(7)]
  - < metallic and nonmetallic materials used in honeycomb cores [63.744(e)(9)]
  - < aircraft transparencies, polycarbonate, or glass substrates [63.744(e)(10)]
  - < cleaning operations identified as essential uses under the Montreal Protocol [63.744(e)(13)]

## What compliance options do I have?

You have **three** compliance options available:

**Option 1:** Use cleaning solvents that satisfy Option 1 under “Cleaning Operations” [63.744(b)(1)]

**Option 2:** Use a cleaning solvent with a composite vapor pressure of 24.1 in. H<sub>2</sub>O (45 mm Hg) or less at 68EF (20EC) [63.744(b)(2)]. Determine composite vapor pressure by following 63.750(b)

**Option 3:** Demonstrate that the volume of hand-wipe cleaning solvent usage has been reduced by at least 60 percent from an approved baseline that is adjusted for production. Calculate the baseline by using 1996 and 1997 data, or as otherwise agreed upon by the your permitting agency. The baseline must be approved by the EPA or your permitting agency and be included as part of your title V or Part 70 permit [63.744(b)(3)]

## What monitoring must I do?

You don't have any monitoring requirements under this section.

## What records must I keep?

Keep **all** of the following records based on the option you use:

**If Option 1 or semi-aqueous cleaners is used**, record the following [63.752(b)(2)]:

- c name of each cleaning solvent used
- c demonstration that the cleaning solvent complies with one of the composition requirements
- c annual records of the volume of each solvent used, from facility purchase or usage records.

**If Option 2 is used**, record the following [63.752(b)(3)]:

- c name of each cleaning solvent used
- c composite vapor pressure of each cleaning solvent used
- c all vapor pressure test results (if appropriate), data, and calculations used to determine the composite vapor pressure of each cleaning solvent
- c the amount (in gallons) of each cleaning solvent used each month at each operation (purchase records may be used if you can link the quantity of materials to each operation)

**If Option 3 is used**, maintain a copy of the alternative plan approved by your permitting agency and all supporting documentation. [63.744(b)(3)]

**If a cleaning solvent used in an exempt hand-wipe cleaning operation** doesn't conform to the vapor pressure or composition requirements in Option 1 or 2, record all of the following [63.752(b)(4)]:

- C the identity and amount (in gallons) of each cleaning solvent used each month at each operation (purchase records may be used if you can link the quantity of material to each operation)
- C a list of exempt operations in which these solvents are being used

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aerosp.html](http://www.epa.gov/ttn/uatw/aerosp/aerosp.html). Download example #1. The form is optional, but you may find it useful.

### **What reports must I submit?**

Report **all** of following information semiannually (every 6 months from date of notification of compliance status) based on the option you use [63.753(b)]:

**If Option 1 or 2 is used** [63.744(b)(1), (2)]:

- C any instance where a noncompliant cleaning solvent is used for a nonexempt hand-wipe cleaning operation
- C a list of any new cleaning solvents used for hand-wipe cleaning in the previous 6 months, including evidence of their compliance (such as composite VP or notification that they comply with the composition requirements)

**If Option 3 is used** [63.744(b)(3)]:

- C none, but, submit **your** alternative plan to your permitting authority for approval.

# Spray Gun Cleaning Operations

[63.744(c)]

## What is covered under this section of the rule?

Spray gun cleaning associated with the aerospace manufacturing and rework operations performed at an aerospace facility.

## What is not covered under this section of the rule?

Cleaning of nozzle tips of automated spray equipment systems, except for robotic systems that can be programmed to spray into a closed container [63.744(c)(5)].

## What compliance options do I have?

You have **four** compliance options available:

### **Option 1:** Enclosed System [63.744(c)(1)(i)]

- Ⓒ clean spray gun in an enclosed system that is leak checked on a monthly basis. Enclosed system consists of forcing cleaning solvent through the gun.

### **Option 2:** Nonatomized Cleaning [63.744(c)(2)]

- Ⓒ without the use of atomizing air, clean the spray gun by placing cleaning solvent into a pressure pot and forcing the solvent through the spray gun into a waste container that is closed when not in use

### **Option 3:** Disassembled Gun Cleaning [63.744(c)(3)]

- Ⓒ clean the disassembled spray gun by hand or by soaking in a vat that is closed when not in use or during soaking

### **Option 4:** Atomized Cleaning [63.744(c)(4)]

- Ⓒ force cleaning solvent through the gun and spray directly into a waste container that is fitted with a device to capture the atomized solvent

## What monitoring must I do?

Monitor **all** of the following based on the option you use:

**If Option 1 is used**, perform the following:

- visually inspect seals and other potential sources of leaks of each enclosed system monthly (while operating) [63.751(a)]
- ◻ if leak is found, repair within 15 days or remove solvent and shut down system until leak is repaired [63.744(c)(1)(ii)]

**If Option 2, 3, or 4 is used**, no monitoring required.

## **What records must I keep?**

Keep **all** of the following records based on the option you use:

**If Option 1 is used**, record the following for each leak found [63.752(b)(5)]:

- ◻ source identification
- ◻ date leak was discovered and repaired

**If Option 2, 3 or 4 is used**, no recordkeeping required.

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aeropg.html](http://www.epa.gov/ttn/uatw/aerosp/aeropg.html). Download example #2. The form is optional, but you may find it useful.

## **What reports must I submit?**

Report **all** of following information semiannually (every 6 months from date of notification of compliance status) based on the option you use [63.753(b)]:

**If Option 1 is used** [63.753(b)(1)(iii), (iv)]:

- ◻ any instance where a noncompliant spray gun cleaning method is used
- ◻ any instance where a leaking enclosed spray gun cleaner remains unrepaired and in use for more than 15 days

**If Option 2, 3, or 4 is used**, no reporting required.

## Flush Cleaning Operations

[63.744(d)]

### What is covered under this section of the rule?

These requirements apply only to flush cleaning operations associated with an aerospace part or assembly, or components of a coating unit.

*Flush cleaning is defined as the removal of contaminants such as dirt, grease, and coatings from an aerospace vehicle or component or coating equipment by passing solvent over, into, or through the item being cleaned. The solvent may simply be poured into the item being cleaned and then drained, or be assisted by air or hydraulic pressure, or by pumping [63.742].*

### What is not covered under this section of the rule?

Other (nonflush) cleaning operations, spray gun cleaning (which are covered under separate subsections), and hand-wipe cleaning operations where wiping, scrubbing, mopping, or other hand action is used, are not subject to the flush cleaning requirements [63.742 and 63.744(d)].

### What compliance options do I have?

You have **two** compliance options available:

**Option 1:** Use only cleaning solvents that satisfy Option 1 under “Cleaning Operations”; **OR** are semi-aqueous cleaners (a solution in which 60% of the solvent solution as applied is water) [63.744(d)]

**Option 2:** If cleaning solvent used does not meet the requirements in Option 1, do the following [63.744(d)]:

- c empty flushed solvent into an enclosed container or collection system **OR** into a system with equivalent emission control
- c keep your collection system closed when not in use

### What monitoring must I do?

You don't have any monitoring requirements under this section.

## What records must I keep?

Keep **all** of the following records based on the option you use:

**If Option 1 (semi-aqueous cleaners) is used**, record the following [63.752(b)(2)]:

- C name of each cleaning solvent used
- C all data and calculations that demonstrate that the cleaning solvent complies with the composition requirements
- C annual records of the volume of each solvent used, as determined from facility purchase or usage records

**If Option 1 (nonsemi-aqueous cleaners) is used**, no recordkeeping required.

**If Option 2 is used**, no recordkeeping required.

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aerosp.html](http://www.epa.gov/ttn/uatw/aerosp/aerosp.html). Download example #3. The form is optional, but you may find it useful.

## What reports must I submit?

You don't have any reporting requirements under this section.

## Primer and Topcoat Operations (Organic HAP and VOC Control)

[63.745]

### What is covered under this section of the rule?

**Organic HAP-containing** primer and topcoat (including self-priming topcoat) application operations on aerospace vehicles, parts, or assemblies [63.745(a)-(f)]

*From here on, whenever you see the term “topcoat” it includes “self-priming topcoat”.*

### What is not covered under this section of the rule?

- Coatings applied to aerospace equipment that is no longer operational, not intended for public use, and not easily capable of being moved [63.745(a)]
- The following are exempt from the application technique requirements only. All other regulatory requirements apply [63.745(f)(3)]:
  - < Operation that normally requires the use of an airbrush or extension on the spray gun
  - < Application of coatings that contain fillers which adversely affect atomization with HVLP guns (permitting agency determination required)
  - < Applications that normally have a dried film thickness of < 0.0005 in. (0.0013 cm) (permitting agency determination required)
  - < The use of airbrush application methods for stenciling, lettering, or marking
  - < Use of hand-held spray cans
  - < Touchup and repair operations

### What compliance options do I have?

**All Options:** Use the following application equipment and housekeeping measures:

- Handle and transfer primers and topcoats in a manner to minimize spills [63.745(b)]
- Apply coatings using one or more of the following application techniques [63.745(f)]:
  - < Flow/curtain coating
  - < Dip coat application
  - < Roll coating
  - < Brush coating

- < Cotton-tipped swab application
- < Electrodeposition (dip) coating
- < HVLP spraying
- < Electrostatic spray application
- < Other application methods that achieve emission reductions equivalent to HVLP or electrostatic spray. You must follow 63.750(i) when making this determination
- Operate application devices according to company procedures, local specified operating procedures, and, or manufacturer’s specifications [63.745(f)(2)]
- If application equipment is modified, maintain a transfer efficiency equal to HVLP and electrostatic spray [63.745(f)(2)]

**Option 1:** Uncontrolled, compliant coatings. Use primers and topcoats that comply with the limits below [63.745(c)]:

Coating Type	Maximum Content, as Applied <sup>a</sup>			
	Organic HAP Content		VOC Content	
	g/liter	lb/gal	g/liter	lb/gal
Primers	350	2.9	350	2.9
Topcoats (including self-priming)	420	3.5	420	3.5
General Aviation (all coating categories)	540	4.5	540	4.5
Large commercial aircraft components, fully assembled or components (exterior primer)	650	5.4	650	5.4

<sup>a</sup> HAP content is measured “less water”; VOC content is measured less water and exempt solvents. Include thinner added to calculation.

**Option 2:** Uncontrolled, low HAP coatings. Use “low HAP content” coatings that comply with the limits below [63.752(c)(3)]. Option 2 provides reduced recordkeeping and reporting:

Coating Type	Maximum Content, as Applied <sup>a</sup>			
	Organic HAP Content		VOC Content	
	g/liter	lb/gal	g/liter	lb/gal
Primers	250	2.1	250	2.1
Topcoats (including self-priming)	420	3.5	420	3.5

<sup>a</sup> HAP content is measured “less water”; VOC content is measured less water and exempt solvents. Include thinner added to calculation.

**Option 3:** Uncontrolled, averaged coatings. Average coatings in a manner that meets all of the following criteria [63.745(e)(2). 63.743(d)]:

- C Use any combination of uncontrolled primers or topcoats such that the monthly volume-weighted average of organic HAP and VOC content of the combination of primers and topcoats complies with the content limits in 63.745(c), which is the same as Option 1. Only uncontrolled primers and topcoats can use this option. The permitting agency can specify a shorter averaging period than monthly [63.743(d)]
- C Averaging primers together with topcoats is not allowed
- C Averaging schemes must be pre-approved by the permitting authority as adopted as part of your title V operating permit

**Option 4:** Controlled Coatings. Use add-on controls that meet all of the following criteria [63.745(d)]:

*Note: You may use air pollution control devices not listed in the rule, but to do so, you must submit information about the system you wish to use no later than 120 days prior to the compliance date. See 63.743(c) for additional information.*

- C Demonstrate an overall removal efficiency (of both organic HAP and VOC) of 81%. Overall efficiency is the product of the capture efficiency and the destruction or removal efficiency. Capture and destruction efficiency is determined by following 63.750(g) if your control device is a carbon adsorber, or 63.750(h) whenever a control device other than a carbon adsorber is used
- C Conduct initial performance test unless a waiver is obtained [63.749(d)(2)]

**Option 5:** Waterborne Coatings: Use waterborne coatings that meet all of the following criteria [63.741(i)]:

*Note: Waterborne coatings are exempted from the following sections of the rule if they meet the organic HAP and VOC content limits in 63.745(c): 63.745(d) [control devices], 64.745(e) [compliant coatings], 63.749(d) [performance tests], 63.750(c)-(h) [HAP and VOC content]*

*determination*], 63.752(c) [organic HAP and VOC recordkeeping], and 63.753(c) [primer and topcoat reporting].

- Maintain manufacturer's data and annual purchase records for 5 years
- Waterborne coatings may be averaged under 63.743(d)

## **What monitoring must I do?**

**If Option 1, 2, 3, or 5 is used**, no monitoring is required.

**If Option 4 is used**, monitor control device operation as follows:

- Control device is a carbon adsorber:
  - < Establish as a site-specific operating parameter the outlet total HAP or VOC concentration or the control device efficiency [63.751(b)(1)]
  - < For nonregenerative carbon systems, the carbon replacement time interval may be established as the site-specific operating parameter [63.751(b)(2)]
  - < For capture systems, submit a monitoring plan that identifies the operating parameter to be monitored, discusses why this parameter is appropriate, and identifies the specific monitoring procedures [63.751(b)(3)(i)]
  - < Conduct monitoring in accordance with the submitted plan unless EPA comments require an alternate monitoring scheme [63.751(b)(3)(iii)]
  - < Install, calibrate, operate, and maintain a continuous emission monitor that complies with CFR specifications and requirements [63.751(b)(6)(ii), (iii)(A)]
  - < Do not operate the control device at an average control efficiency less than the required level for three consecutive adsorption cycles or over a 7- to 30-day rolling average, as applicable [63.751(b)(6)(iii)(B), (C)]
  - < Do not operate the capture device at an average parameter value greater or less than (as appropriate) the established value for any 3-hour period [63.751(b)(6)(iv)]
- Control device is an incinerator:
  - < Install, calibrate, maintain, and operate temperature monitoring equipment or a CEMS. Replace or have temperature sensors recalibrated every 3 months [63.751(b)(8)]
  - < Install a thermocouple equipped with a continuous recorder and operate continuously (correct locations indicated in rule) [63.751(b)(9), (10)]
  - < Establish site-specific temperature parameters during each performance test [63.751(b)(11), (12)]

## What records must I keep?

**If Option 1 is used**, record the following [63.762(c)(1,2)]:

- C Name and VOC content as received and as applied for each primer and topcoat used
- C Mass of organic HAP ( $H_i$ ) and VOC ( $G_i$ ) emitted per unit volume of coating as applied for each coating formulation within each coating category used each month (calculate using §63.750(c) and (e))
- C All data, calculations, and test results used in determining  $H_i$  and  $G_i$
- C Volume (gal) of each coating formulation within each coating category used each month

**If Option 2 is used**, record the following [63.752(c)(3)]:

- C Annual purchase records of the total volume of each primer purchased
- C All data, calculations, and test results used in determining organic HAP and VOC as applied, including:
  - < Manufacturer's certification when the primer is applied as received
  - < All data and calculations used to determine  $H_i$  if not applied as received

**If Option 3 is used**, record the following [63.752(c)(4)]:

- C Monthly volume-weighted average masses of organic HAP ( $H_a$ ) and VOC ( $G_a$ ) for all coatings as applied (calculate using §63.750(d) and (f), as applicable)
- C All data and calculations used to determine  $H_a$  and  $G_a$

**If Option 4 is used**, record the following [63.752(c)(5), (6)]:

- C Control device is not a carbon adsorber:
  - < Overall control efficiency of the control system and all test results, data, and calculations used
- C Control device is incineration (catalytic and noncatalytic):
  - < Continuous records of the firebox temperature and all calculated 3-hour averages
- C Control device is a carbon adsorber:
  - < calculations used
  - < The length of the rolling material balance period and all data and calculations used
  - < The record of the certification of the accuracy for the device that measures HAP or VOC recovered
- C Control device is a nonregenerative carbon adsorber:

- < Overall control efficiency of the system and all test results, data, and calculations used
- < The record of the carbon replacement time established as the site-specific operating parameter

**If Option 4 is used**, perform the following [63.743(b)]:

- C Prepare a startup, shutdown, and malfunction plan (excluding any dry particulate filters operated per manufacturer's instructions) which includes:
  - < Requirements in §63.6
  - < Operation and maintenance criteria
  - < A standardized equipment operation and maintenance checklist
  - < Procedures for identifying and reporting malfunctions
  - < Procedures to prevent malfunctions due to preventable conditions
- C Operate all control equipment during startup, shutdown and malfunction in accordance with the startup, shutdown, and malfunction plan.

**If Option 5 is used**, record the following [63.741(i)]:

- Manufacturer's supplied data and annual purchase records for each exempt waterborne coating
- Retain records for 5 years

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aeropg.html](http://www.epa.gov/ttn/uatw/aerosp/aeropg.html). Download example #4(a). The form is optional, but you may find it useful.

## What reports must I submit?

**All Options**, report the following (except for the use of waterborne coatings) [63.753(c)]:

- C Semiannual reports occurring every 6 months (from the date of notification of compliance status) that identify required reporting for each painting category
- C If the operations have been in compliance for the semiannual period, a statement that the operations have been in compliance with the applicable standards

**If Option 1 or 2 is used**, report the following: [63.753(c)(1)(i)]

- C Each value of  $H_i$  and  $G_i$  that exceeds the applicable organic HAP or VOC content limit

**If Option 3 is used**, report the following: [63.753(c)(1)(ii)]

- C Each value of  $H_a$  and  $G_a$  that exceeds the applicable organic HAP or VOC content limit

**If Option 4 is used**, report the following: [63.753(c)(1)(iii),(iv)]

- C Control device is incineration:
- C All periods when the 3-hour average combustion temperature is less than the average combustion temperature established during the most recent performance test
- C Control device is a carbon adsorber:
  - < Each rolling period when the overall control efficiency of the control system is less than 81%, the initial material balance calculation and any exceedance as demonstrated through calculations
- C Control device is a nonregenerative carbon adsorber:
  - < Submit the design evaluation, the continuous monitoring system performance report, and any excess emissions as demonstrated through deviations of monitored values
- C Control device is something other than an incinerator or carbon adsorber:
  - < Each exceedance of the operating parameters established for the control device under the initial performance test during which compliance was demonstrated

**If Option 5 is used**, no reporting is required.

## Primer and Topcoat Operations (Inorganic HAP Control)

[63.745(g)]

### What is covered under this section of the rule?

**Inorganic HAP-containing** primers and topcoats (including self-priming topcoats) that are **spray** applied and are used to coat aerospace parts, assemblies, or vehicles [63.745(g)].

### What is not covered under this section of the rule?

- C Coatings applied to aerospace equipment that is no longer operational, not intended for public use, and not easily capable of being moved [63.745(a)]
- C Touchup of scratched surfaces or damaged paint [63.745(g)(4)(i)]
- C Hole daubing for fasteners [63.745(g)(4)(ii)]
- C Touchup of trimmed edges [63.745(g)(4)(iii)]
- C Coating prior to joining dissimilar metal components [63.745(g)(4)(iv)]
- C Stencil operations performed by brush or airbrush [63.745(g)(4)(v)]
- C Section joining and sealant detackifying [63.745(g)(4)(vi), (viii)]
- C Touchup of bushings and other similar parts [63.745(g)(4)(vii)]
- C Painting of parts in an area identified in a Title V permit, where the permitting authority has determined that it is not technically feasible to paint the parts in a booth [63.745(g)(4)(ix)]
- C Use of hand-held spray can application methods [63.745(g)(4)(x)]

### What compliance options do I have?

All covered coating operations must be conducted in a spray booth or hangar. Air flow must be downward or across the part and must be exhausted through a control device [63.745(g)].

*Note: You may use air pollution control devices not listed in the rule, but to do so, you must submit information about the system you wish to use no later than 120 days prior to the compliance date. See 63.743(c) for additional information.*

Control Device Options for **Existing Sources** [63.745(g)(2)(i)]:

- **Option 1:** Pass air through a dry particulate filter that meets the *existing source* filtration efficiencies below [63.745(g)(2)(i)(A)]

<b>Performance Requirements for Inorganic HAP Arrestors<sup>1</sup></b>		
<i>Filter type/test conditions</i>	<i>Aerodynamic particle size (micron)</i>	<i>Minimum required filtration efficiency (%)</i>
<i>Existing Sources (two-stage arrestor)</i>		
Liquid phase challenge	>5.7	>90
	>4.1	>50
	>2.2	>10
Solid phase challenge	>8.1	>90
	>5.0	>50
	>2.6	>10

<sup>1</sup>Filters must be certified by the filter manufacturer or distributor, paint/depainting booth supplier, and, or facility owner or operator that the filters meet or exceed these efficiency data points. Certification must be based on Method 319 testing [63.750(o)].

- **Option 2:** Pass air through a waterwash system [63.745(g)(2)(i)(B)]
- **Option 3:** Use another control system that meets efficiencies in Option 1 and is approved by the permitting authority [63.745(g)(2)(i)(C)]

Control Device Options for **New Sources** [63.745(g)(2)(ii)]:

- **Option 1:** Pass air through a dry filter that meets *new source* filtration efficiencies below [63.745(g)(2)(ii)(A)]:

<b>Performance Requirements for Inorganic HAP Arrestors<sup>2</sup></b>		
<i>Filter type/test conditions</i>	<i>Aerodynamic particle size (micron)</i>	<i>Minimum required filtration efficiency (%)</i>
<i>New Sources (three-stage arrestor)</i>		
Liquid phase challenge	>2.0	>95
	>1.0	>80
	>0.42	>65
Solid phase challenge	>2.5	>95
	>1.1	>85
	>0.70	>75

<sup>2</sup>Filters must be certified by the filter manufacturer or distributor, paint/depainting booth supplier, and, or facility owner or operator that the filters meet or exceed these efficiency data points. Certification must be based on Method 319 testing [63.750(o)].

- **Option 2:** Use another control system that meets *new source* efficiencies and is approved by the permitting authority [63.745(g)(2)(ii)(B)]

Control Device Options for Sources Constructed or Reconstructed **After June 6, 1994 and prior to October 29, 1996** [63.745(g)(2)(iii)]:

- **Option 1:** Pass air through a 2-stage dry filter or a waterwash system before exhausting it to the atmosphere [63.745(g)(2)(iii)(A)]
- **Option 2:** For primers or topcoats containing *chromium or cadmium*, install a HEPA filter system, 3-stage filter system, or approved system equivalent to a 3-stage filter [63.745(g)(2)(iii)(B)]

## What monitoring must I do?

**For dry filters**, perform the following [63.745(g)(2)(iv)]:

- c Maintain system in good working order
- c Install differential pressure gauge across the filter banks
- c Continuously monitor pressure drop across the filter
- c Read and record the pressure drop across the filter once per shift
- c Shut down operation and take corrective action when pressure drop exceeds or falls below manufacturer's recommendation
- c Shut down operation if scheduled maintenance has not been performed

**For conventional waterwash systems**, perform the following [63.745(g)(2)(v)]:

- c Continuously monitor the booths water flow rate
- c Read and record the water flow rate once per shift
- c Shut down operation when waterwash fails the visual continuity/flow characteristics check
- c Shut down operation when recorded water flow rate goes outside of manufacturer's limits
- c Shut down operation if scheduled maintenance has not been performed

**For pumpless waterwash systems**, perform the following [63.745(g)(2)(v)]:

- c Operate the booth in accordance with the operating efficiency range (parameters) recommended by the manufacturer
- c Continuously monitor the booths parameters
- c Read and record the parameters once per shift

- C Shut down operation when the efficiency range goes outside of manufacturer's limits
- C Shut down operation if scheduled maintenance has not been performed

## **What records must I keep?**

**All Options**, perform the following [63.743(b)]:

- C Prepare a startup, shutdown, and malfunction plan (excluding dry particulate filters operated per manufacturer's instructions) which includes:
  - < Requirements in §63.6
  - < Operation and maintenance criteria
  - < A standardized equipment operation and maintenance checklist
  - < Procedures for identifying and reporting malfunctions
  - < Procedures to prevent malfunctions due to preventable conditions
- C Operate all control equipment during startup, shutdown and malfunction in accordance with the startup, shutdown, and malfunction plan

**If dry filters are used**, record the following [63.752(d)(1)]:

- C Record the pressure drop across the operating system once each shift during operation
- C Record the acceptable limit(s) of pressure drop as specified by the filter or booth manufacturer

**If a conventional waterwash system is used**, record the following [63.752(d)(2)]:

- C Record the water flow rate through the operating system once each shift during operation
- C Record the acceptable limit(s) of water flow rate as specified by the booth manufacturer

**If a pumpless waterwash system is used**, record the following [63.752(d)(2)]:

- C Record the parameter(s) recommended by the booth manufacturer that indicate the performance
- C Record the parameter through the operating system once each shift during operation

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aeropg.html](http://www.epa.gov/ttn/uatw/aerosp/aeropg.html). Download example #4(a) and #5. The forms are optional, but you may find it useful.

## What reports must I submit?

**All Options**, report the following [63.753(c)]:

- C Semiannual reports occurring (every 6 months from the date of notification) for each category
- C If the operations are in compliance, a statement that the operations have been in compliance.

**If dry filters are used** report the following [63.753(c)(1)(vi), (c)(2)]:

- C (Semiannual) All times when a topcoat or primer operation was not immediately shut down when the pressure drop across a dry particulate filter system was recorded to be outside specified limits
- C (Annual) Number of times the pressure drop for each dry filter was outside specified limits

**If a conventional waterwash system is used** report the following [63.753(c)(1)(vi), (c)(2)]:

- C (Semiannual) All times when a topcoat or primer operation was not immediately shut down when the waterwash system was recorded to be outside specified limits
- C (Annual) Number of times the water flow rate for each waterwash system was outside specified limits

**If a pumpless waterwash system is used** report the following [63.753(c)(1)(vi), (c)(2)]:

- C (Semiannual) All times when a topcoat or primer operation was not immediately shut down when the waterwash system was recorded to be outside specified limits
- C (Annual) Number of times the recommended parameters for each waterwash system was outside specified limits

**For booths or hangars that do not have the potential to emit 10 tons/yr or more of an individual inorganic HAP or 25 tons/yr or more of all inorganic HAP combined** [63.743(a)(10)]:

- C Notify the Administrator of such construction or reconstruction on an annual basis. Make notification by March 1 of each year for construction or reconstruction during the prior calendar year and include information in 63.5(b)(4), except that such information is to be limited to inorganic HAP

## Depainting Operations

[63.746]

### What is covered under this section of the rule?

Depainting operations on the outer surface areas of completed aerospace vehicles (including the fuselage, wings, and vertical and horizontal stabilizers of the aircraft) and the outer casing and stabilizers of missiles and rockets [63.746(a)(1)].

Depainting of parts and assemblies for space vehicles designed to travel beyond the limit of the earth's atmosphere, including but not limited to satellites, space stations, and the Space Shuttle System (including orbiter, external tanks, and solid rocket boosters) must comply with this section [63.741(h)].

### What is not covered under this section of the rule?

The following operations are exempt from the requirements of this section:

- C Aerospace manufacturing or rework facility that depaints 6 or fewer completed aerospace vehicles per year [63.746(a)]
- C Equipment that is no longer operational, intended for public display, and not easily moved [63.746(a)(2)]
- C Depainting of parts or units normally removed from the vehicle for depainting (except for wings and stabilizers) [63.746(a)(1), (3)]
- C Depainting of radomes [63.746(a)(3)]
- C Mechanical and hand sanding operations are exempt from requirements to perform work in an enclosed area and use a control system [63.746(b)(5)]

### What compliance options do I have?

**Option 1:** Use non-HAP chemical strippers that meet all of the following requirements [63.746(b)(1)]:

- C Emit no organic HAP from chemical stripping formulations, agents, or chemical paint softeners

**Option 2:** Use nonchemical based equipment that meet all of the following requirements: [63.746(b)(2)]:

*Note: You may use air pollution control devices not listed in the rule, but to do so, you must submit information about the system you wish to use no later than 120 days prior to the compliance date. See 63.743(c) for additional information.*

- C Operate and maintain equipment in accordance with manufacturer’s specifications or locally prepared operating procedures
- C During periods of malfunction, substitute materials may be used during the repair period
  - < Use substitutes no more than 15 days annually, unless organic HAP-free
  - < Substitutes selected shall minimize HAP emissions
- C For dry media blasting systems generating airborne inorganic HAP emissions [63.746(b)(4)], comply with all of the following:
  - < Perform depainting operations in an enclosed area (unless a closed-cycle system is used)
    - C For *existing sources*, pass exhaust air through a dry particulate filter system meeting *existing source* filter efficiencies (as identified in “Primer and Topcoat Operations - Inorganic HAP Control”), or through a baghouse or though a waterwash system prior to exhausting to the atmosphere
    - C For *new sources*, pass exhaust air through a dry particular filter system meeting *new source* filter efficiencies (as identified in “Primer and Topcoat Operations - Inorganic HAP Control”), or through a baghouse prior to exhausting to the atmosphere
    - C For *sources constructed or reconstructed after June 6, 1994 and prior to October 29,1996*, pass air through a 2-stage dry filter or a waterwash system before exhausting it to the atmosphere [63.745(g)(2)(iii)(A)]. For primers or topcoats containing *chromium or cadmium*, install a HEPA filter system, 3-stage filter system, or approved system equivalent to a 3-stage filter [63.745(g)(2)(iii)(B)]

**Option 3:** Organic HAP-containing chemical stripper [63.746(c)]:

*Note: You may use air pollution control devices not listed in the rule, but to do so, you must submit information about the system you wish to use no later than 120 days prior to the compliance date. See 63.743(c) for additional information.*

- C Use a control system to reduce organic HAP emissions by 81% for existing sources and 95% for new sources from baseline established from 1996 and 1997, on a usage per aircraft or usage per ft<sup>2</sup> of surface basis
  - < Control system options include carbon adsorption or noncarbon adsorption

- < Overall efficiency is the product of capture and destruction or removal efficiency, and may take into account the volume of chemical stripper used relative to the baseline. Capture and destruction efficiency is determined by following 63.750(g) if your control device is a carbon adsorber, or 63.750(h) whenever a control device other than a carbon adsorber is used
- < Perform initial performance test unless a waiver is obtained [63.749(d)(2)]

**Spot Stripping and Decal Removal (in addition to Option 1, 2, or 3)** [63.746(b)(3)]:

- C On an annual average basis, use no more than 26 gallons of organic HAP-containing chemical strippers or alternatively 190 pounds of organic HAP per commercial aircraft depainted
- C On an annual average basis, use no more than 50 gallons of organic HAP-containing chemical strippers or alternatively 365 pounds of organic HAP per military aircraft depainted.

**What monitoring must I do?**

Note: Mechanical and hand sanding operations are exempt from the requirements in paragraph 63.746(b)(4) of the rule.

**If Option 1 is used**, no monitoring is required.

**If Option 2 is used**, ensure the following:

- C If dry particulate filter system is used [63.746(b)(4)(iii)]:
  - < Maintain system in good working order
  - < Install differential pressure gauge across filter banks
  - < Continuously monitor the pressure drop across the filter
  - < Read and record the pressure drop once per shift
  - < Shut down operation when pressure drop exceeds or falls below manufacturer's limits
  - < Shut down if scheduled maintenance procedures have not been performed
- C For conventional waterwash systems, perform the following [63.746(b)(4)(iv), (v)]:
  - < Continuously monitor the booths water flow rate
  - < Read and record the flow rate once per shift
  - < Shut down operation when waterwash fails the visual continuity/flow characteristics check

- < Shut down operation when recorded water flow rate goes outside of manufacturer's limits
- < Shut down operation if scheduled maintenance has not been performed
- For pumpless waterwash systems, perform the following [63.746(b)(4)(iv), (v)]:
  - < Operate the booth in accordance with the operating efficiency range (parameters) recommended by the manufacturer
  - < Continuously monitor the booths parameters
  - < Read and record the parameters once per shift
  - < Shut down operation when the efficiency range goes outside of manufacturer's limits
  - < Shut down operation if scheduled maintenance has not been performed

**If Option 3 is used**, monitor control device operation as follows:

- C Control device is a carbon adsorber:
  - < Establish as a site-specific operating parameter the outlet total HAP or VOC concentration or the control device efficiency [63.751(b)(1)]
  - < For nonregenerative carbon systems, the carbon replacement time interval may be established as the site-specific operating parameter [63.751(b)(2)]
  - < For capture systems, submit a monitoring plan that identifies the operating parameter to be monitored, discusses why this parameter is appropriate, and identifies the specific monitoring procedures [63.751(b)(3)(i)]
  - < Conduct monitoring in accordance with the submitted plan unless EPA comments require an alternate monitoring scheme [63.751(b)(3)(iii)]
  - < Install, calibrate, operate, and maintain a continuous emission monitor that complies with CFR specifications and requirements [63.751(b)(6)(ii), (iii)(A)]
  - < Do not operate the control device at an average control efficiency less than the required level for three consecutive adsorption cycles or over a 7- to 30-day rolling average, as applicable [63.751(b)(6)(iii)(B), (C)]
  - < Do not operate the capture device at an average parameter value greater or less than (as appropriate) the established value for any 3-hour period [63.751(b)(6)(iv)]
- C Control device is an incinerator:
  - < Install, calibrate, maintain, and operate temperature monitoring equipment or a CEMS. Replace or have temperature sensors recalibrated every 3 months [63.751(b)(8)]
  - < Install a thermocouple equipped with a continuous recorder and operate continuously (correct locations indicated in rule) [63.751(b)(9), (10)]

- < Establish site-specific temperature parameters during each performance test [63.751(b)(11), (12)]

## What records must I keep?

**For HAP strippers used for spot stripping and decal removal**, record the following [63.752(e)(6)]:

- C Volume of organic HAP-containing chemical stripper used or weight of organic HAP used
- C Annual average volume of organic HAP-containing stripper or volume of organic HAP used per aircraft
- C Annual number of aircraft stripped
- C All data and calculations.

**If Option 1 is used**, record the following [63.752(e)(1)]:

- C Name of each chemical stripper
- C Monthly volumes or weights of each HAP stripper used.

**If Option 2 is used**, record the following [63.752(e)(5)]:

- C Name and type of nonchemical based equipment
- C Malfunction information, including:
  - The nonchemical method or technique that malfunctioned
  - The date the malfunction occurred
  - A description of the malfunction
  - The methods used to depaint during the malfunction period
  - The dates that these methods were begun and discontinued
  - The date the malfunction was corrected
- C If the control system is a dry particulate filter system [63.752(e)(7)]:
  - Actual pressure drop across the particulate filters once each shift during operation
  - Record the acceptable limit(s) of pressure drop as specified by the filter or booth manufacturer
- If a conventional waterwash system is used, record the following [63.752(e)(7)]:

- < Record the water flow rate through the operating system once each shift during operation
- < Record the acceptable limit(s) of water flow rate as specified by the booth manufacturer
- If a pumpless waterwash system is used, record the following [63.752(e)(7)]:
  - < Record the parameter(s) recommended by the booth manufacturer that indicate the performance
  - < Record the parameter through the operating system once each shift during operation

**If Option 3 is used**, record the following [63.752(e)(1)-(4)]:

- C For chemical strippers used in depainting, a listing of the parts, subassemblies, and assemblies normally removed from the aircraft before depainting
  - < Prototype, test models, or aircraft that exist in low numbers (<25 aircraft) are exempt
- C The name of each chemical stripper used
- C Monthly volumes of each organic HAP stripper used
- C Control system information including:
  - < For carbon adsorption systems:
    - C Overall control efficiency
    - C All test results, data, and calculations used in determining efficiency
    - C Length of the rolling material balance period and all data and calculations
    - C A record of the certification of the accuracy of the device that measures the amount of HAP or VOC recovered
  - < For nonregenerative carbon adsorption systems:
    - C Overall control efficiency
    - C All test results, data, and calculations used in determining efficiency
    - C The record of the carbon replacement time established as the site-specific operating parameter

- < For other control devices:
  - ⊆ Overall control efficiency
  - ⊆ All test results, data, and calculations used in determining efficiency.

**For Options 2 and 3**, perform the following [63.743(b)]:

- ⊆ Prepare a startup, shutdown, and malfunction plan (excluding dry particulate filters operated per manufacturer's instructions) which includes:
  - < Requirements in §63.6
  - < Operation and maintenance criteria
  - < A standardized equipment operation and maintenance checklist
  - < Procedures for identifying and reporting malfunctions
  - < Procedures to prevent malfunctions due to preventable conditions
- ⊆ Operate all control equipment during startup, shutdown and malfunction in accordance with the startup, shutdown, and malfunction plan

You can download example and blank recordkeeping forms by going to the implementation section of the Unified Air Toxics Website (UATW) aerospace page at [www.epa.gov/ttn/uatw/aerosp/aerosp.html](http://www.epa.gov/ttn/uatw/aerosp/aerosp.html). Download example #5, 6 and 7. The forms are optional, but you may find it useful.

## **What reports must I submit?**

**All Options**, report the following [63.753(d)(1)(i), (viii), (ix) ]:

- ⊆ Report semiannually (every 6 months from the date of notification of compliance status):
  - < If the operations have been in compliance, a statement that the operations have been in compliance
  - < A list of new and discontinued aircraft models depainted at the facility
  - < A list of parts normally removed for repainting for each new aircraft model being repainted
  - < Any 24-hour period where organic HAP were emitted from the repainting of an aerospace vehicle (other than when a control device was used)

**For spot stripping and decal removal**, report the following [63.753(d)(2)(i)]:

- C Report annually:
  - < The average volume per aircraft of organic HAP-containing chemical strippers or weight or organic HAP used for spot stripping and decal removal operations when depainting limits in 63.746(b)(3) or weight of organic HAP are exceeded

**For booths or hangars that do not have the potential to emit 10 tons/yr or more of an individual inorganic HAP or 25 tons/yr or more of all inorganic HAP combined** [63.743(a)(10)]:

- C Notify the Administrator of such construction or reconstruction on an annual basis. Make notification by March 1 of each year for construction or reconstruction during the prior calendar year and include information in 63.5(b)(4), except that such information is to be limited to inorganic HAP

**If Option 1 or 2 is used**, report the following [63.753(d)(1)(v), (vi)]:

- C Report semiannually:
  - < Any new nonchemical depainting technique used at the facility since the notification of compliance status or any subsequent semiannual report
  - < Any periods of equipment malfunction
    - C The nonchemical method or technique that malfunctioned
    - C The date the malfunction occurred
    - C A description of the malfunction
    - C The methods used to depaint during the malfunction period and dates begun and discontinued
    - C The date the malfunction was corrected.

**If Option 2 is used**, also report the following [63.753(d)(1)(vii), (d)(2)]:

- C Report semiannually:
  - < The periods where a nonchemical depainting operation was not immediately shut down when the pressure drop, water flow rate or recommended parameter(s) was outside acceptable limits
- C Report annually:
  - < Description of any control device currently used that was not listed in the notification of compliance status or any subsequent report
  - < The number of times the pressure drop for each filter system exceeds acceptable limits

- < The number of times the water flow rate or recommended booth parameters if using a pumpless system for each waterwash system exceeds acceptable limits

**If Option 3 is used**, report the following [63.753(d)(1)(i)-(iv)]:

- C Report semiannually [63.753(d)(1)(i)-(iv)]:
  - < Any 24-hour period where organic HAP were emitted from the depainting of an aerospace vehicle (other than when a control device was used)
  - < Any new chemical stripper used at the facility during the reporting period
  - < The organic HAP content of these new chemical strippers
  - < The organic HAP content of each chemical stripper that undergoes reformulation.
- C **Also report** semiannually [63.753(d)(3)]:
  - < Description of any control device currently used that was not listed in the notification of compliance status or any subsequent report
  - < If carbon adsorber is used:
    - C Each rolling period when the overall control efficiency is calculated to be less than 81% for existing systems and 95% for new systems, the initial material balance calculation, and any exceedances as demonstrated through the calculation
  - < If nonregenerative carbon adsorbers are used:
    - C Submit design evaluation, the continuous monitoring system performance report, and any excess emissions as demonstrated through deviations in monitoring values
  - < If other control devices are used:
    - C Each exceedance of the operating parameters established for the control device under the initial performance tests

# Chemical Milling Maskant Operations

[63.747]

## What is covered under this section of the rule?

Chemical milling maskant application operations on aluminum aerospace vehicles, parts, and assemblies. The provisions apply to applications associated with either Type I or Type II etchants [63.742, 63.747].

## What is not covered under this section of the rule?

- c Bonding maskants, critical use and line sealer maskants and seal coat maskants [63.742]
- c Maskants that must be used with a combination of Type I and Type II etchants [63.742]
- c Chemical milling maskants used to touch-up scratched surfaces, trimmed edges, or damaged maskant are exempt from the requirements in Option 1 only [63.747(c)(3)]

## What compliance options do I have?

**All Options:** Handle and transfer materials in a manner that minimizes spills [63.747(b)].

**Option 1:** Uncontrolled, compliant maskants. Use compliant maskants that comply with the limits below [63.747(c)(1), (2)]:

Coating Type	Maximum Content, As Applied			
	Organic HAP Content		VOC Content	
	g/liter	lb/gal	g/liter	lb/gal
Type I Maskant	622	5.2	622	5.2
Type II Maskant	160	1.3	160	1.3

<sup>a</sup> HAP content is measured “less water”; VOC content is measured less water and exempt solvents.  
Include thinner added to calculation.

**Option 2:** Uncontrolled, averaged maskants. Average maskants a manner that meets all of the following criteria [63.747(e)(2). 63.743(d)]:

- c Use any combination of uncontrolled maskants such that the monthly volume-weighted average of organic HAP and VOC content of the combination of maskants complies with the content limits in 63.747(c), which is the same as Option 1. Only uncontrolled maskants

can use this option. The permitting agency can specify a shorter averaging period than monthly [63.743(d)]

- C Averaging Type I and Type II maskants together is not allowed
- C Averaging schemes must be pre-approved by the permitting authority as adopted as part of your title V operating permit

**Option 3:** Controlled Maskants. Use add-on controls that meet all of the following criteria [63.747(d)]:

*Note: You may use air pollution control devices not listed in the rule, but to do so, you must submit information about the system you wish to use no later than 120 days prior to the compliance date. See 63.743(c) for additional information.*

- C Demonstrate an overall removal efficiency (of both organic HAP and VOC) of 81%. Overall removal efficiency is the product of the capture efficiency and the destruction efficiency
- C Operate in a manner that minimizes spills [63.747(b)]
- C Perform initial performance testing unless a waiver is obtained [63.749(d)(2)]

**Option 4:** Waterborne Maskants. Use waterborne maskants that meet all of the following criteria [63.741(i)]:

*Note: Waterborne coatings are exempted from the following sections of the rule if they meet the organic HAP and VOC content limits in 63.747(c): 63.747(d) [control devices], 64.747(e) [compliant maskants], 63.749(h) [performance tests], 63.750(k)-(n) [HAP and VOC content determination], 63.752(f) [organic HAP and VOC recordkeeping], and 63.753(e) [primer and topcoat reporting].*

- Maintain manufacturer's data and annual purchase records for 5 years
- Waterborne coatings may be averaged under 63.743(d)

## **What monitoring must I do?**

**If Options 1, 2 and 4 are used**, no monitoring is required.

**If Option 3 is used**, monitor control device operation as follows:

- Control device is a carbon adsorber [63.751(b)(1)-(7)]:
  - < Establish as a site-specific operating parameter the outlet total HAP or VOC concentration or the control device efficiency [63.751(b)(1)]

- < For nonregenerative carbon systems, the carbon replacement time interval may be established as the site-specific operating parameter [63.751(b)(2)]
- < For capture systems, submit a monitoring plan that identifies the operating parameter to be monitored, discusses why this parameter is appropriate, and identifies the specific monitoring procedures [63.751(b)(3)(i)]
- < Conduct monitoring in accordance with the submitted plan unless EPA comments require an alternate monitoring scheme [63.751(b)(3)(iii)]
- < Install, calibrate, operate, and maintain a continuous emission monitor that complies with CFR specifications and requirements [63.751(b)(6)(ii), (iii)(A)]
- < Do not operate the control device at an average control efficiency less than the required level for three consecutive adsorption cycles or over a 7- to 30-day rolling average, as applicable [63.751(b)(6)(iii)(B), (C)]
- < Do not operate the capture device at an average parameter value greater or less than (as appropriate) the established value for any 3-hour period [63.751(b)(6)(iv)]
- Control device is an incinerator [63.751(b)(9)-(12)]:
  - < Install, calibrate, maintain, and operate temperature monitoring equipment or a CEMS. Replace or have temperature sensors recalibrated every 3 months [63.751(b)(8)]
  - < Install a thermocouple equipped with a continuous recorder and operate continuously (correct locations indicated in rule) [63.751(b)(9), (10)]
  - < Establish site-specific temperature parameters during each performance test [63.751(b)(11), (12)]

## What records must I keep?

**If Option 1 is used**, record the following [63.752(f)(1)]:

- Mass of organic HAP ( $H_i$ ) and VOC ( $G_i$ ) (less water and exempt solvents) emitted per unit volume of chemical milling maskant as applied (less water) for each maskant formulation used each month (calculate using §63.750(k) and (m))
- All data, calculations, and test results used in determining  $H_i$  and  $G_i$
- Volume (gal) of each chemical milling maskant used each month

**If Option 2 is used**, record the following [63.752(f)(2)]:

- Monthly weighted volume of organic HAP ( $H_a$ ) and VOC ( $G_a$ ) emitted per unit volume of chemical milling maskant as applied for each maskant formulation used each month (calculate using §63.750(l) and (n))
- All data, calculations, and test results used in determining  $H_a$  and  $G_a$ .

**If Option 3 is used**, record the following:

- C For carbon adsorption systems [63.752(f)(3)(i)]:
  - < Overall control efficiency
  - < All test results, data, and calculations used in determining efficiency
  - < Length of the rolling material balance period and all data and calculations
  - < A record of the certification of the accuracy of the device that measures the amount of HAP or VOC recovered
- C For nonregenerative carbon adsorption systems [63.752(f)(3)(ii)]:
  - < Overall control efficiency
  - < All test results, data, and calculations used in determining efficiency
  - < The record of the carbon replacement time established as the site-specific operating parameter
- C For other control devices [63.752(f)(4)]:
  - < Overall control efficiency
  - < All test results, data, and calculations used in determining efficiency
- C For incineration (catalytic and noncatalytic) [63.752(f)(4)(ii), (iii)]:
  - < Continuous records of the firebox temperature and all calculated 3-hour averages

**For Options 3 is used**, perform the following [63.743(b)]:

- C Prepare a startup, shutdown, and malfunction plan (excluding dry particulate filters operated per manufacturer's instructions) which includes:
  - Requirements in §63.6
  - Operation and maintenance criteria
  - A standardized equipment operation and maintenance checklist
  - Procedures for identifying and reporting malfunctions
  - Procedures to prevent malfunctions due to preventable conditions
- C Operate all control equipment during startup, shutdown and malfunction in accordance with the startup, shutdown, and malfunction plan

**If Option 4 is used**, record the following [63.741(i)]:

- Manufacturer's supplied data and annual purchase records for each exempt waterborne coating
- Retain records for 5 years.

There are not example recordkeeping forms for chemical milling maskant operations available for download.

## **What reports must I submit?**

**All Options**, report the following [63.753(e)]:

- C Semiannual reports occurring every 6 months (from the date of notification of compliance status) which identify required reporting for each category. If the operations have been in compliance for the semiannual period, a statement that the operations have been in compliance with the applicable standards
- C All chemical milling maskants currently used that were not listed in the notification of compliance status or any other subsequent semiannual report

**If Option 1 is used**, report the following:

- C When nonaveraging methods are used [63.753(e)(1)]:
  - Each value of  $H_i$  and  $G_i$  that exceeds the applicable organic HAP or VOC content limit.

**If Option 2 is used**, report the following:

- C When averaging methods are used [63.753(e)(2)]:
  - Each value of  $H_a$  and  $G_a$  that exceeds the applicable organic HAP or VOC content limit.

**If Option 3 is used**, report the following [63.753(e)(5)]:

- C Description of any control devices currently in use that were not listed in the notification of compliance status or any subsequent reports
- C Control device is incineration [63.753(e)(3)(i)]:
  - < All periods when the 3-hour average combustion temperature is less than the average combustion temperature established during the most recent performance test demonstrating compliance
- C Control device is a carbon adsorber [63.753(e)(3)(ii)(A)]:

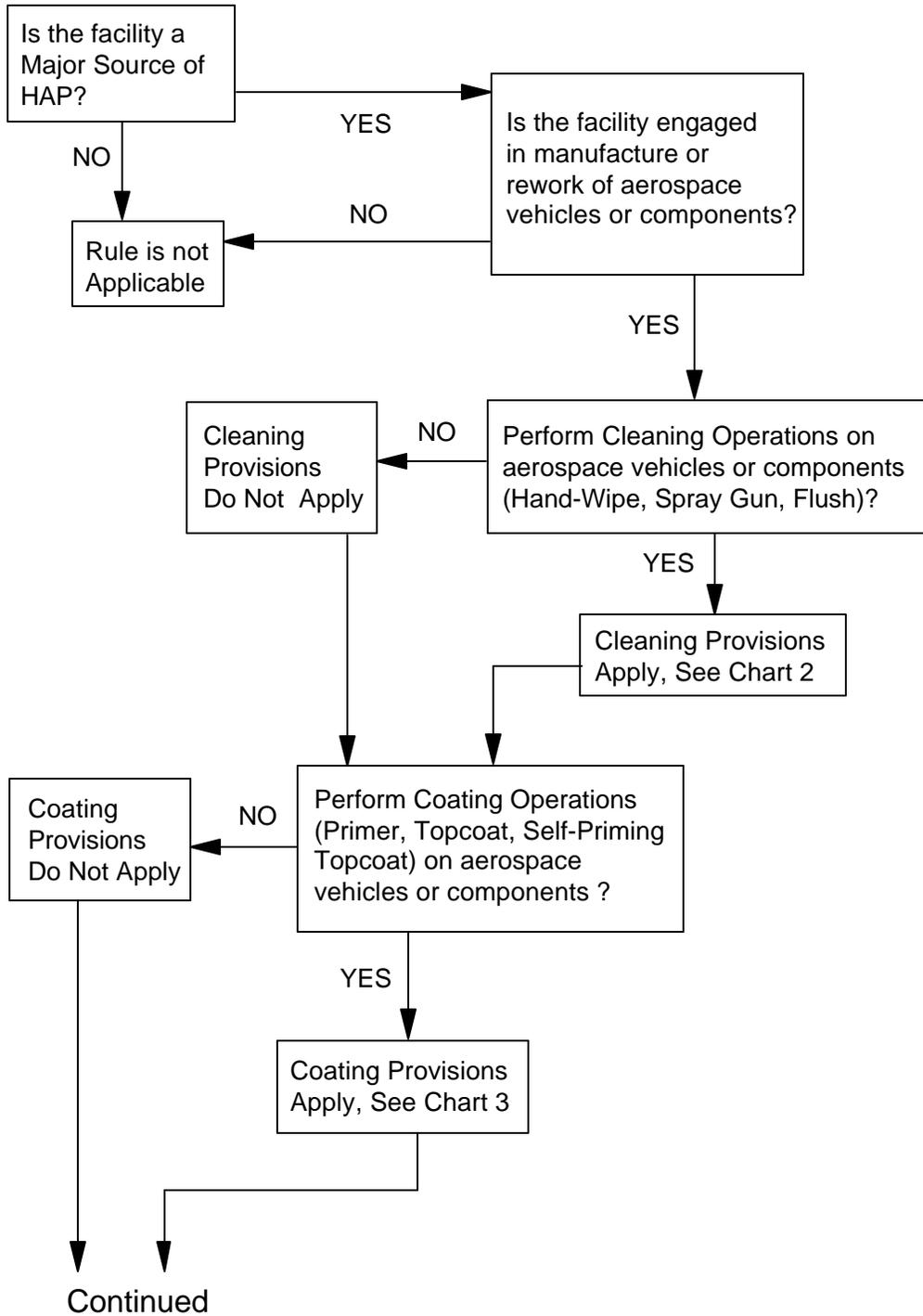
- < Each rolling period when the overall control efficiency of the control system is less than 81%, the initial material balance calculation, and any exceedance as demonstrated through calculations
- C Control device is a nonregenerative carbon adsorber [63.753(e)(3)(ii)(B)]:
  - < Submit the design evaluation, the continuous monitoring system performance report, and any excess emissions as demonstrated through deviations of monitored values
- C Control device is something other than an incinerator or carbon adsorber [63.753(e)(3)(iii)]:
  - < Each exceedance of the operating parameters established for the control device under the initial performance test during which compliance was demonstrated

**If Option 4 is used**, no reporting is required.

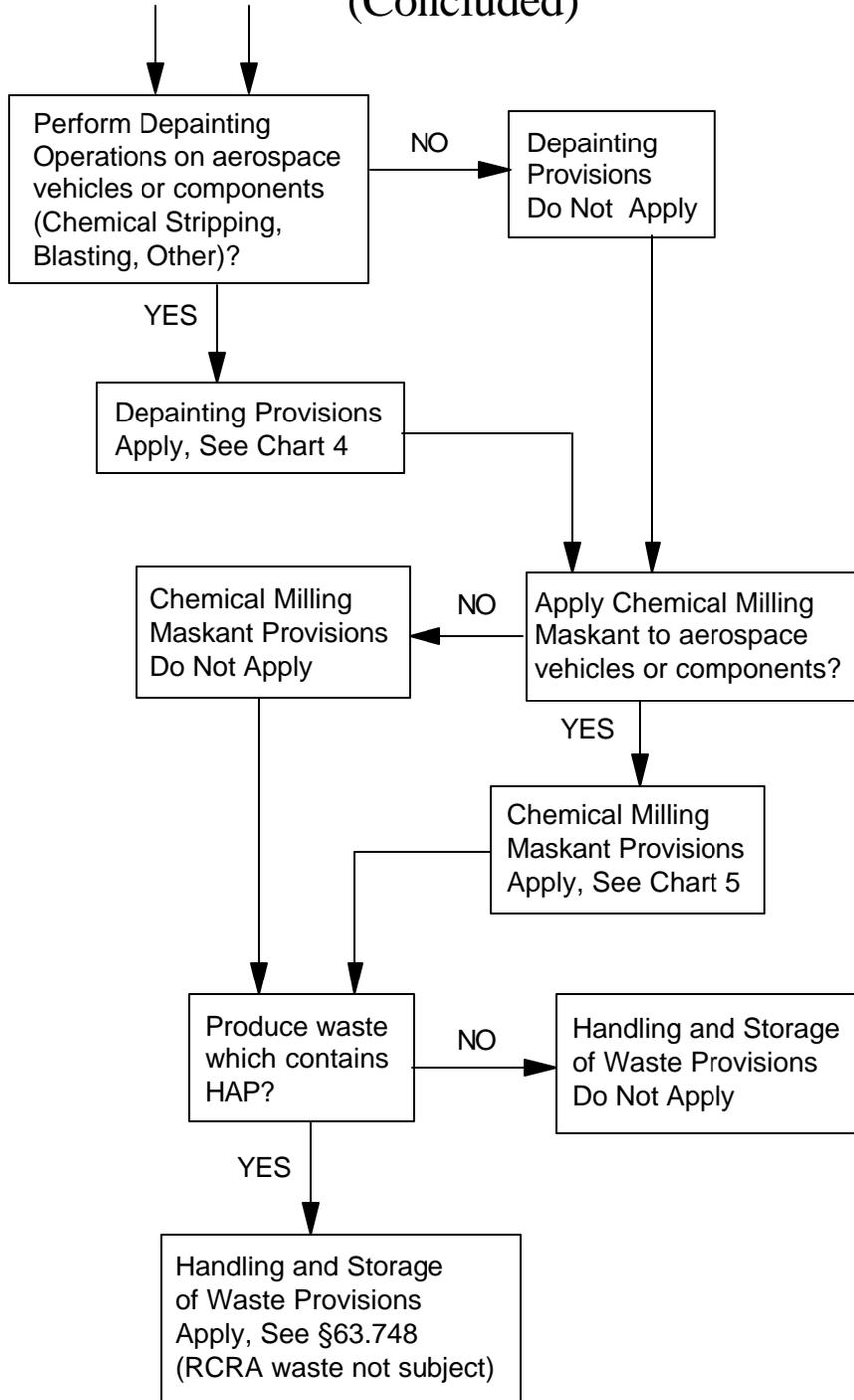
### **3.0 APPLICABILITY FLOW CHARTS**

The simplified flow charts in this section illustrate the applicability decision process for facilities potentially subject to the provisions of the Aerospace NESHAP. Since these charts are in a condensed form, the rule provisions should be consulted prior to making any final applicability decision. In addition, the EPA or the permitting authority should be consulted with any questions related to applicability.

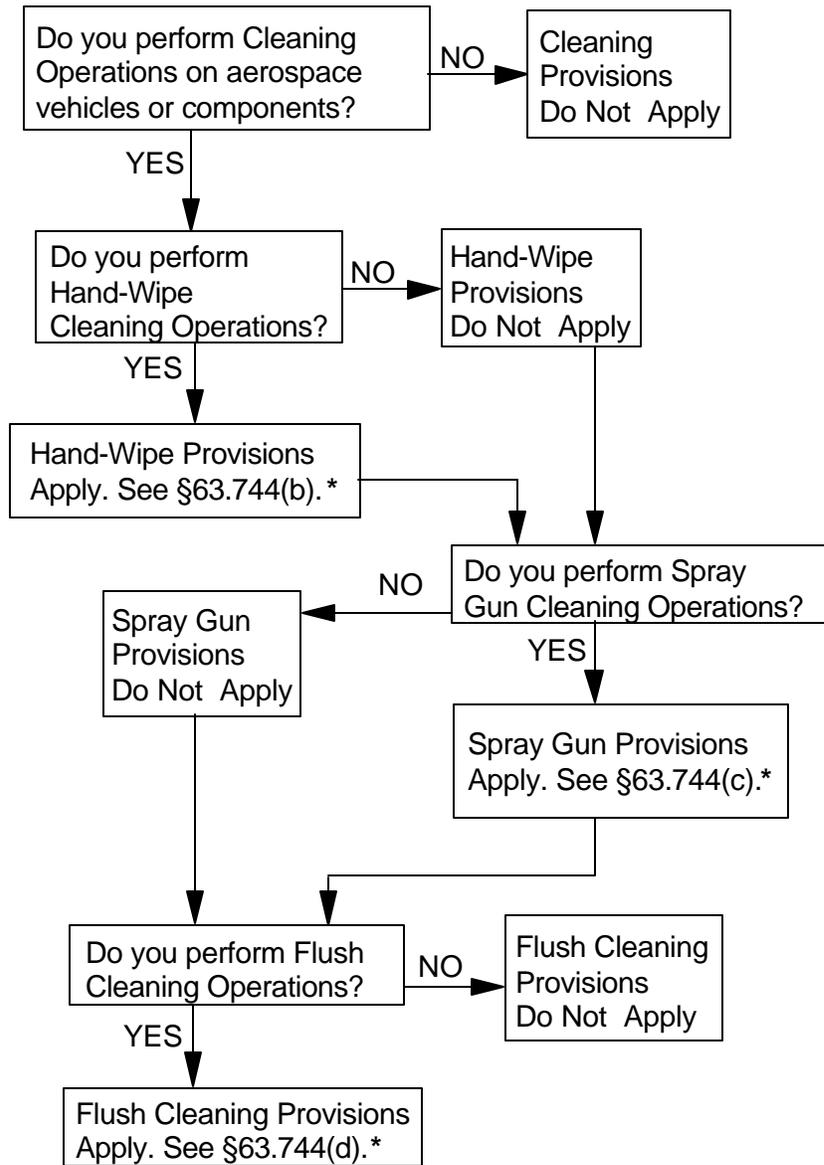
# Chart 1 General Applicability



# Chart 1 General Applicability (Concluded)

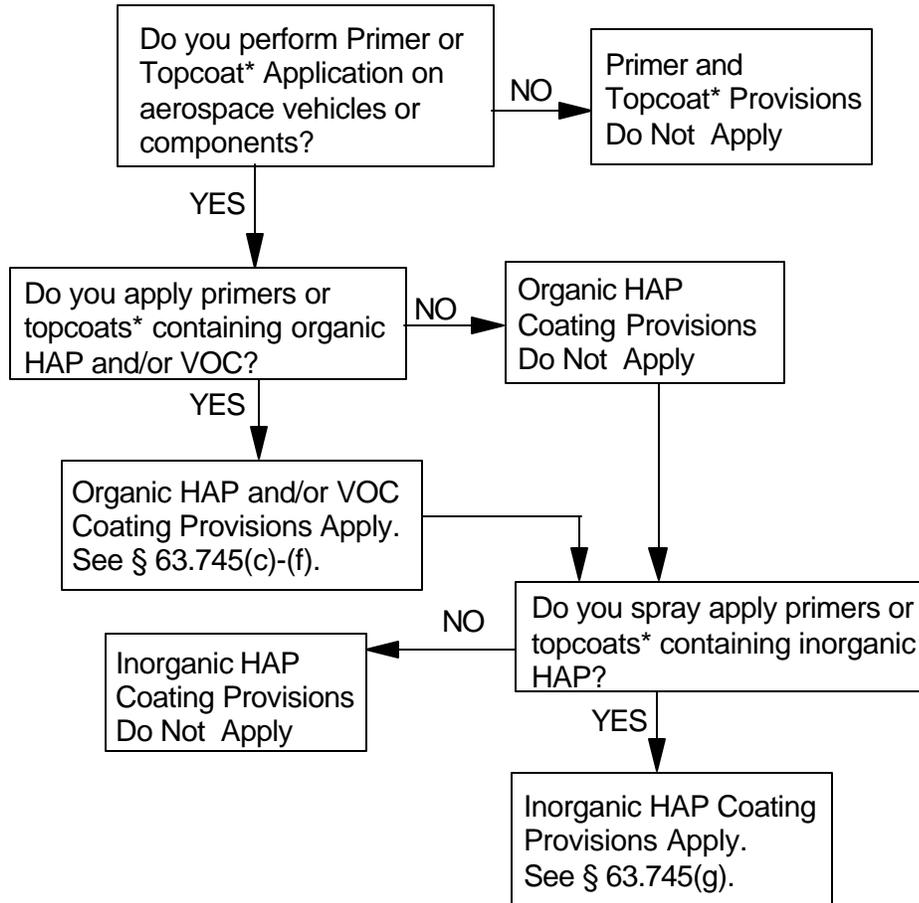


## Chart 2 Cleaning Operations Applicability



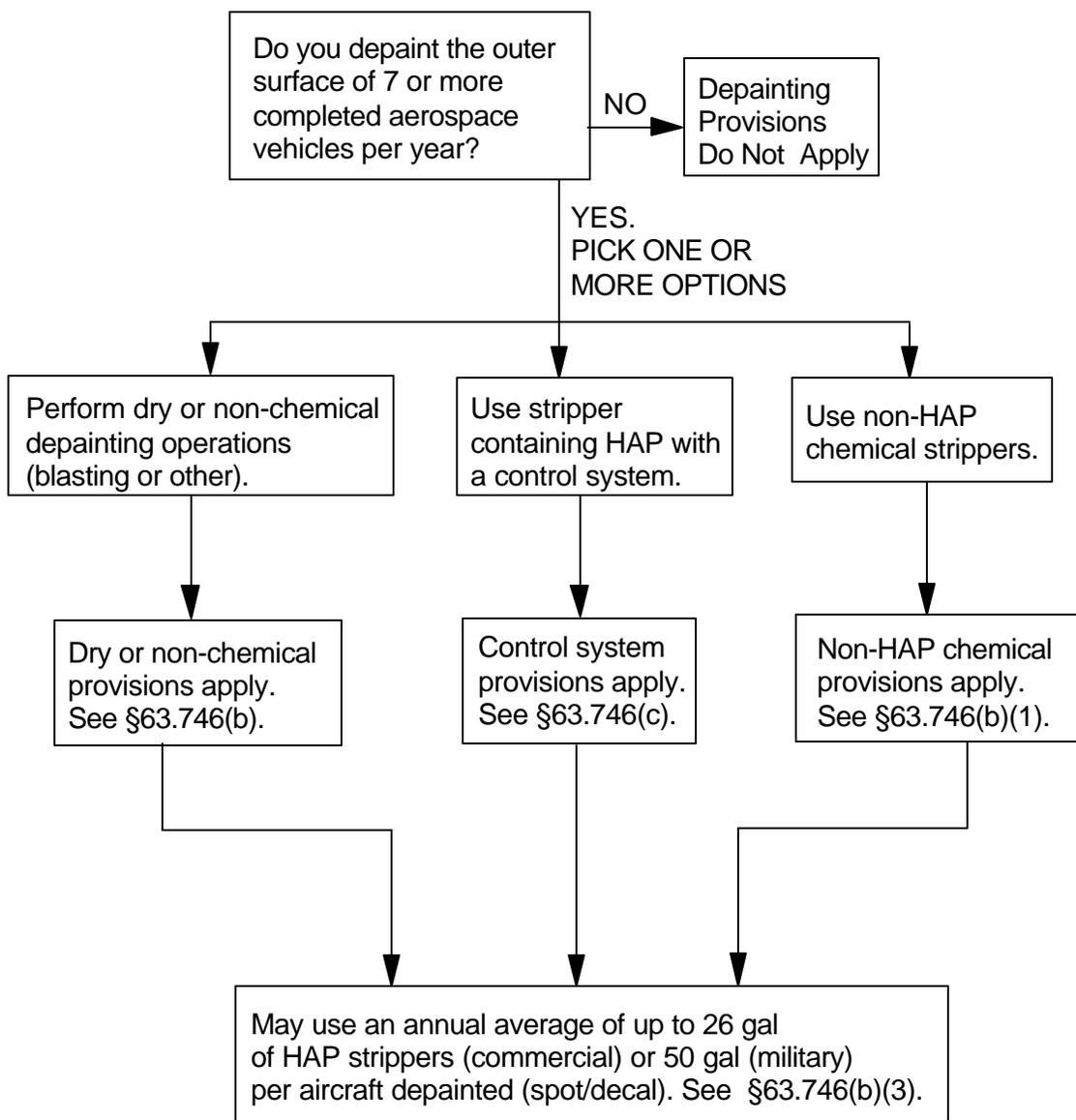
\* Cleaning housekeeping requirements also apply. See §63.744(a).

# Chart 3 Primer/Topcoat\* Operations Applicability



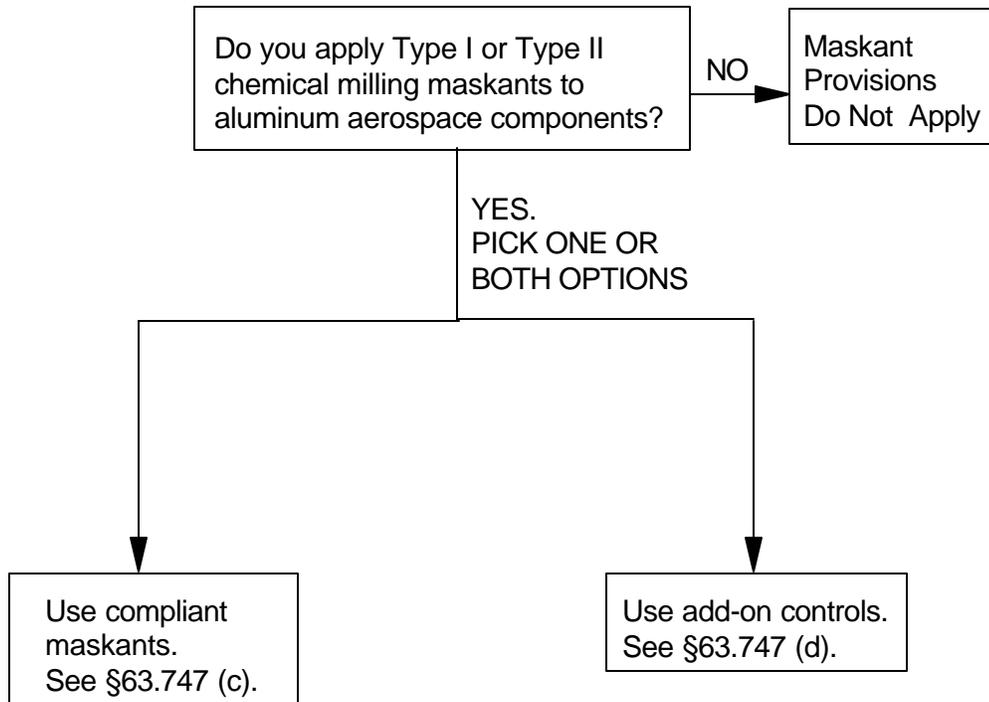
\* Including self-priming topcoat

# Chart 4 Depainting Operations Applicability



# Chart 5

## Chemical Milling Maskant Operations Applicability



## 4.0 INSPECTION PROCEDURES<sup>1</sup>

This section contains guidelines for conducting an onsite or self inspection of an aerospace manufacturing or rework facility that is presumed or known to be subject to the Aerospace NESHAP. The next section includes inspection checklists which should be useful tools in carrying out an inspection at the site.

### Preparing for the inspection

It is important to obtain as much information about the facility prior to the site visit. You may want to review the information available in the source file, including:

- permit applications;
- approved permits;
- equipment lists;
- conditions for each permit unit;
- previous inspections including reports of violation;
- breakdown reports;
- enforcement actions taken;
- complaints;
- variance history;
- alternative emission control plans;
- lists of operations conducted; and
- cleaning solvents and coatings in use

The inspector should become familiar with any aerospace operations claimed by the facility as exempt, as well as with the compliance options chosen by the source. The provisions of the NESHAP, including allowable exemptions, must also be understood.

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<sup>1</sup>

Excerpted from the *Aerospace Coating Operations Manual*, January 1997 Compliance Division, California U. S. Environmental Protection Agency. See page 7-1, document 1.

## **Inspecting the facility - Overview**

The appropriate compliance checklists (see Section 5.0) are intended to guide the inspector through the inspection for the four principal regulated operations: cleaning, primer and topcoat application, depainting, and chemical milling maskant application. It may be most efficient to concentrate on each of these operations in turn. Keep in mind that depainting is essentially a rework and not a manufacturing operation, and that the use of chemical milling maskants is usually a fairly specialized operation carried out by the larger manufacturers or by companies that specialize in doing chemical milling on a subcontractor basis.

In using the checklists, the inspector first checks the box for the compliance option or options chosen for the operation (in instances where options are available), and then checks “Yes” or “No” to indicate the status of the facility with each individual requirement. A separate log for notes and explanations pertaining to certain entries (especially “No” entries) is advised to describe details of the plant’s status.

After all of the operations have been inspected, the inspector may need to review the file information with facility personnel a second time to clarify and correct certain information based on the observations made. Records from the facility files should also be checked to verify compliance, both with operational requirements and with the requirements to keep the records themselves. Material safety data sheets (MSDS) and/or other product data sheets for the cleaning solvents, primers, topcoats, and chemical milling maskants in use could also be collected if they have not already been obtained.

When the inspection and the file review are complete, a wrap-up meeting with appropriate facility personnel should be held to summarize findings, explain any compliance violations noted, and review next steps in the process.

## **Specific Activities - Cleaning Operations**

Be aware of operations exempted from the cleaning requirements (and note whether the exemption applies to all requirements or to hand-wipe only). The inspector needs to view records of all cleaning solvent usages, and the type of cleaning performed with each. Note any open containers for solvents or applicators, and general housekeeping practices (spill provision). Remember, cleaning solvents are used throughout a facility in practically every facet of the production process.

Determine how spray guns are cleaned, and verify that one or more of the allowed options (or equivalents) are being used. Verify through observation or by questioning the painter that solvent containers or reservoirs associated with these cleaners are kept closed except when parts are added or removed.

## **Specific Activities - Primers and Topcoats**

The coatings storage/mix room should be inspected in order to observe coating labels and other records for organic HAP and VOC content. Note whether the information is as-supplied or as-applied. Look for any manufacturer mixing instructions. Ask the painter how he or she reduces the coatings (i.e., is thinner applied), how the viscosity is measured, and what is done if the viscosity is too high or too low. Verify what solvents are used for reduction.

Examine each coating operation to identify the coatings in use (including exempt operations and use of specialty coatings and waterborne coatings). Determine the application equipment used and compare with the allowable equipment (equipment claimed as equivalent should have a demonstration as outlined in the standard). Observe that all electrostatic systems are operated correctly (power on with a clean ground attached, etc.).

For HVLP type spray guns, maximum air pressure as spray exits the gun is specified as 10 psig. The inspector should check to see whether individual spray guns meet these limits. (Some manufacturers supply a small kit that allows the exit air pressure to be measured, while others may supply a gauge for the same purpose.) The gun operator should be able to supply some assistance

on how the required air pressure is achieved or measured. If different application methods than those specified in the NESHAP are in use, determine if a demonstration of equivalent transfer efficiency has been approved. Verify that current conditions match demonstration conditions.

### **Specific Activities - Spray Booths**

Dry filter systems or waterwash systems are used for either inorganic HAP-containing primer and topcoat (including self-priming topcoat) application or depainting operations. The maintenance of the booth (including filters, fan, and ductwork) is very important in the continuing control efficiency for fine particulate generated by these operations (i.e., paint overspray or dry media/paint residue from blast depainting). Check whether any parts of the filter bank are missing, damaged, or improperly installed. Note how often filters are replaced and if the filters appear to be overloaded. Examine the pressure drop across the filters or the water flow rate of the waterwash, and compare the value with the manufacturer's value as contained in the operator's log. Note whether the pressure drop instrument (manometer) contains fluid and is functional (attains a nonzero reading when the fan is activated). For waterwash systems, observe whether the curtain has dry spots, and whether it appears uniform and regular.

### **Specific Activities - Depainting**

If a facility selects the option of using a new nonchemical paint removal system (i.e., dry media blasting), they will need to install a dry filter system or other control device that meets required efficiencies. For existing removal systems, they will need to install a dry filter system, waterwash system, or other equivalent control device. Ask about the facility's maintenance practices for the filters, fan, and ductwork. As with the paint spray booth, check the condition of the filters for completeness and freedom from damage. Note whether the pressure drop instrument (manometer) contains fluid and is functional (attains a nonzero reading when the fan is activated). For waterwash systems, observe whether the curtain has dry spots, and whether it appears uniform and regular. Determine the maintenance and chemical additives schedule.

Except for spot stripping allowances, a facility that selects the use of HAP-containing chemical strippers (i.e., methylene chloride), which are not specifically exempted from the regulation, is required to have an add-on control device in place. See the next subsection for a discussion of add-on controls.

### **Specific Activities - Chemical Milling Maskant**

Chemical milling maskants are considered a coating along with primers and topcoats. The organic HAP/VOC contents of the maskants need to be verified in a similar manner to the other types of coatings. Content and use records are also similar. Each maskant has to be characterized with respect to its use with either Type I or Type II etchants.

As with primer and topcoat applications, and depainting, the use of an add-on control device is an optional approach if the use of compliant coatings is not feasible or desirable. Inspection approaches for add-on controls are addressed in subsection 4.3.2.6.

### **Specific Activities - Control Devices**

Check the integrity of ductwork and any collection hoods. Observe the structural integrity of the device to determine any possible locations of fugitive leaks. Examine the latest source test records to verify that the required capture and control efficiency is being attained. Read the operating parameter value and compare with the established value and monitoring records provided by the source. Ensure that all required records are available from the source.

### **Specific Activities - Sampling Techniques**

It is important that, if any samples are to be collected, they be collected and preserved in accordance with defensible procedures. All samples should be representative of the cleaning solvent or coating as applied. Observe the operator if he is filling your container. Do not let the filled container leave your sight or control. The EPA has issued procedures in the document EPA-340/191-010, "Standard Procedure for Collection of Coating and Ink Samples for Analysis by

Reference Methods 24 and 24A.” As a general rule, samples should be collected into containers that are clean, dry, unbreakable, sealable, nonreactively lined (if needed), and appropriate for the material to be sampled.

## **Specific Activities - Materials Documentation**

Material safety data sheets (MSDS) are guides to workplace safety and, as such, they have limited usefulness in determining the precise content or emission potential of materials. The inspector should be aware that the HAP or VOC listed on the MSDS sheets is not necessarily representative of the content of a specific batch of cleaner or coating, or these contents may not be listed at all. Source operators, further, are free to add materials before applying the cleaner or coating.

Technical specification sheets are provided by the manufacturer usually upon request of the user. They are often tailored for air pollution regulations to include VOC or HAP contents as supplied, and include recommended mixing and thinning ratios. Be sure to ask for the latest MSDS, specification sheet, or product technical bulletin, because formulations may be changed over time. When calculating VOC or HAP in accordance with the test procedures identified within the rule, it may be helpful to review EPA document EPA-340/1-86-016, “A Guideline for Surface Coating Calculations,” July 1986; and EPA-450/3-84-019, “Procedures for Certifying Quantity of Volatile Organic Compounds Emitted by Paint, Ink, and Other Coatings,” December 1984.

## 5.0 INSPECTION CHECKLISTS

This section contains checklists for use in performing NESHAP inspections of the four production operations covered by the regulation: cleaning, primer and topcoat application, depainting, and chemical milling maskant application. These checklists may serve as useful tools for agencies and sources tasked to implement the rule. You will find that the checklists will, when necessary, refer the user back to Section 2.0, Summary of the Rule. However, since the checklists and the rule summary do not contain all details of the NESHAP, the rule itself and any amendments should be referred to when performing facility inspections. Separate sheets may be needed to record more specific information about the operations at individual facilities.

**CHECKLIST A**  
**APPLICABILITY CHECKLIST**  
Aerospace Manufacturing and Rework NESHAP

NOTE: This checklist will establish whether a facility or operations within a facility are subject to this NESHAP.

**1. GENERAL INFORMATION**

- A. Date of Inspection: \_\_\_\_\_
- B. Facility Name: \_\_\_\_\_
- C. Facility Address: \_\_\_\_\_  
 \_\_\_\_\_
- D. Facility Contact: \_\_\_\_\_  
 (Name, Title, and Phone) \_\_\_\_\_
- E. Is the facility a major or an area source?                      Major                       Area   
 (NESHAP applies to *major sources* only)
- F. Inspector(s):

<u>Name</u>	<u>Title/Affiliation</u>	<u>Phone Number</u>

**2. SOURCE IDENTIFICATION**

- A. Does this facility engage in the manufacture or rework of aerospace vehicles, assemblies, or components?    Yes     No     **(If No, do not proceed, this rule does not apply)**
- B. Does this facility perform any of the following operations on aerospace vehicles, assemblies, or components?    **(If Yes to any, proceed, the rule applies)**
- |                               |                              |                             |
|-------------------------------|------------------------------|-----------------------------|
| Cleaning operations           | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Hand-wipe cleaning            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Spray gun cleaning            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Flush cleaning                | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Topcoat or primer application | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Depainting operations         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Chemical milling maskant      | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Handling and storage of waste | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

**3. RULE APPLICABILITY**

Various processes that may be performed at aerospace manufacturing and rework facilities are not covered under 40 CFR 63, Subpart GG. In addition, exemptions from 40 CFR 63, Subpart GG and from control requirements are also identified within the rule. Listed below are processes and materials not covered or exempt from the rule. *This listing of overall exemptions is not repeated within individual checklists.* The cited regulatory provision and §63.742 Definitions should be consulted for more details and for any qualifications on the exemptions. Complete the form by checking off all that apply.

Citation	Process	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
§63.741(e)	Handling of waste subject to RCRA, 40 CFR 262-268			
§63.741(f)	Research and development			
	Quality control operations			
	Laboratory testing activities			
	Chemical milling			
	Metal finishing			
	Electrodeposition (except the electrodeposition of paints)			
	Composite processing (except for cleaning and coating of composite parts or components that become part of an aerospace vehicle or component as well as composite tooling that comes in contact with such composite parts or components prior to cure)			
	Aircraft transparencies manufacturing			
	Wastewater operations			
	Electronic parts and assemblies (except for cleaning and topcoating of completed assemblies)			
	Parts and assemblies not critical to the vehicle's structural integrity or flight performance			
	Specialty coatings			
	Sealants and adhesives			

A - APPLICABILITY

Citation	Process	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
§63.741(f)	Adhesive bonding primers			
	Use primers, topcoats, chemical milling maskants, strippers, and cleaning solvents containing HAP and VOC <0.1% for carcinogens, <1.0% for noncarcinogens			
	Rework of aircraft or aircraft components if the holder of the Federal Aviation Administration (FAA) design approval, or the holder's licensee, is not actively manufacturing the aircraft or aircraft component			
§63.741(g)	Low-volume use of primers, topcoats, and chemical milling maskants which do not exceed 50 gal (189 liters) per year per formulation, with a combined annual total of all such primers, topcoats and chemical milling maskants used not to exceed 200 gal (757 liters). Otherwise exempt coatings are excluded from totals.			
§63.741(h)	Space vehicles (except for depainting)			
§63.741(j)	Antique vehicles and components			

**4. CHECKLISTS:**

If it has been determined that the facility or plant is subject to this NESHAP, go to the appropriate Checklist indicated below and complete the form.

- |                              |   |
|------------------------------|---|
| Cleaning operations          | Go to <b>Cleaning</b> Checklist (Checklist B)                 |
| Hand-wipe cleaning           | Go to <b>Hand-Wipe Cleaning</b> Checklist (Checklists B & C)  |
| Spray gun cleaning           | Go to <b>Spray Gun Cleaning</b> Checklist (Checklists B & D)  |
| Flush cleaning               | Go to <b>Flush Cleaning</b> Checklist (Checklists B & E)      |
| Topcoat & Primer application | Go to <b>Primer/Topcoat</b> Checklist (Checklist F)           |
| Depainting operations        | Go to <b>Depainting</b> Checklist (Checklist G)               |
| Chemical milling maskant     | Go to <b>Chemical Milling Maskant</b> Checklist (Checklist H) |



**CHECKLIST B  
CLEANING CHECKLIST**

Aerospace Manufacturing and Rework NESHP

NOTE: Cleaning operations requirements are applicable only to the cleaning of aerospace vehicles, assemblies, and components. Cleaning operations subject to the hand-wipe cleaning (Checklist C), flush cleaning (Checklist D), or spray gun cleaning (Checklist E) requirements are also subject to these requirements.

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_
- B. Installation Date (if applicable): \_\_\_\_\_

**2. REQUIREMENTS**

Owners/operators may choose one of the following options. Complete the table below by checking either “Yes” or “No” to document the measurement, calculation, or observation meeting the NESHP requirement(s). It may be necessary to write “N/A” (not applicable) for some requirements.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Option 1</b> (§63.744(a))  These requirements are referred to as Table 1 in the rule	Aqueous cleaning solvents (≥80% water content as applied), miscible with water, flash point > 200EF (93EC) are used			
	Hydrocarbon based cleaning solvents (mixture of photochemically reactive HC and/or oxygenated HC), maximum vapor pressure (VP) of 3.75 in. H <sub>2</sub> O at 68EF (7 mm Hg at 20EC), and containing no HAP are used			
<b>If using Option 1, skip Section 3 and go directly to Section 4.</b>				
<b>Option 2</b> (§63.744(a))	Solvent not meeting requirements in Option 1			
<b>If using Option 2, go to Section 3, Housekeeping Measures</b>				

**3. HOUSEKEEPING MEASURES**

Housekeeping measures are required if Option 2 is used to comply with the cleaning operation requirements. Check either “Yes” or “No” to document the measurement, calculation, or observation meeting the NESHAP requirement.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
§63.744(a)(1)	Place absorbent applicators in closed containers upon completing use (except cotton-tipped swabs)			
§63.744(a)(2)	Store fresh and spent cleaning solvents in closed containers (except semi-aqueous cleaners)			
§63.744(a)(3)	Handle and transfer solvent between containers in a manner that minimizes spills			

**4. RECORDKEEPING**

The following recordkeeping is required for all options. Check either “Yes” or “No” to document the measurement, calculation, or observation meeting the NESHAP requirement. Additional requirements will be found in individual sections of the hand-wipe, spray gun, and flush cleaning checklists.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
§63.752(b)(1)	Name, vapor pressure, and documentation showing the organic HAP constituents for each cleaning solvent			
§63.10(b)(1)	Necessary records to be maintained for 5 years (2 years onsite)			



**CHECKLIST C**  
**HAND-WIPE CLEANING CHECKLIST**  
Aerospace Manufacturing and Rework NESHAP

NOTE: Cleaning operations subject to the hand-wipe cleaning requirements are also subject to the cleaning requirements (Checklist B).

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_  
B. Installation Date (if applicable): \_\_\_\_\_

**2. EXEMPTIONS**

The following *hand-wipe cleaning operations* are exempted from portions of the regulatory NESHAP provisions shown in the table (please note that some recordkeeping is required for exempt operations where a noncompliant cleaning solvent is used). The cited regulatory provision and §63.742 Definitions should be consulted for more details and for any qualifications on the exemptions.

<b>The following exemptions apply specifically to the use of <i>hand-wipe cleaning</i> solvents:</b>				
<b>Citation</b>	<b>Exempt Operation</b>	<b>Measurement, Calculation, or Observation</b>	<b>Does Facility Perform Indicated Operation?</b>	
			<b>Yes</b>	<b>No</b>
§63.744(e)(1)	Cleaning of components of breathing oxygen systems that are exposed to the breathing oxygen			
§63.744(e)(2)	Cleaning related to parts that are exposed to strong oxidizers or reducers			
§63.744(e)(3)	Cleaning and surface activation prior to adhesive bonding			
§63.744(e)(4)	Electronic parts, and assemblies containing electronic parts			
§63.744(e)(5)	Aircraft and ground support equipment fluid systems exposed to the fluid (e.g., air-to-air heat exchangers and hydraulic fluid systems)			
§63.744(e)(6)	Fuel cells, fuel tanks, and confined spaces			
§63.744(e)(7)	Solar cells, coated optics, and thermal control surfaces			

C - HAND-WIPE CLEANING

The following exemptions apply specifically to the use of <i>hand-wipe cleaning</i> solvents:				
Citation	Exempt Operation	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
§63.744(e)(8)	Cleaning related to upholstery, curtains, carpet, and other textiles used in aircraft interiors			
§63.744(e)(9)	Metallic and nonmetallic materials used in honeycomb cores			
§63.744(e)(10)	Aircraft transparencies, polycarbonates, and glass substrates			
§63.744(e)(11)	Cleaning associated with R&D, quality control, or laboratory testing			
§63.744(e)(12)	Cleaning operations conducted within 5 feet of energized electrical systems			
§63.744(e)(13)	Cleaning operations that are “essential uses” under the Montreal Protocol (40 CFR §82.4)			

**3. REQUIREMENTS**

Check off the compliance option or options selected by the owner/operator for hand-wipe cleaning operations.

A. **Option 1:** (§63.744(b)(1)) **Meet Table 1 composition requirements** **G**  
 [Table 1 found in rule and in Checklist B (Cleaning), Section 2]

B. **Option 2:** (§63.744(b)(2)) **Meet Composite vapor pressure limit** **G**

Requirement:

Is the composite vapor pressure 24 in. H<sub>2</sub>O (45 mm Hg) or less at 68EF (20EC)?

**Yes G No G**

C. **Option 3:** (§63.744(b)(3)) **Solvent usage reduction** **G**

Requirement:

Was the hand-wipe cleaning solvent usage reduced at least 60% from a 1996 and 1997 baseline value (or other value approved by the permitting agency), adjusted for production?

**Yes G No G**

C - HAND-WIPE CLEANING

Does the plan demonstrate a reduction equivalent to Option 1 or 2, and has an alternative plan been filed?

Yes **G** No **G**

**4. RECORDKEEPING**

Recordkeeping requirements are based on the option or options selected by the owner/operator. Check either “Yes” or “No” to document the measurement, calculation, or observation meeting the NESHAP requirement(s).

<b>For hand-wipe solvents complying with <i>Option 1</i> - Table 1 criteria</b>				
<b>Citation</b>	<b>Requirement</b>	<b>Measurement, Calculation, or Observation</b>	<b>Yes</b>	<b>No</b>
§63.752(b)(2)	Keep records of: 1. name of each cleaning solvent, 2. data and calculations demonstrating compliance with Table 1, and 3. <i>annual</i> volume of each solvent used (facility purchase or usage records)		_____ _____ _____	_____ _____ _____
<b>For hand-wipe solvents complying with <i>Option 2</i> - vapor pressure limit</b>				
§63.752(b)(3)	Keep records of: 1. name of each cleaning solvent, 2. composite vapor pressure of each solvent, 3. test results (if applicable), data, and calculations for composite VP, and 4. <i>monthly</i> volume of each solvent used at each operation (purchase records may be used if the quantity purchased can be linked to each operation)		_____ _____ _____ _____	_____ _____ _____ _____
<b>For hand-wipe solvents used in exempt cleaning operations that do not comply with <i>Option 1</i> or <i>2</i></b>				
§63.752(b)(4)	Keep records of: 1. identity and <i>monthly</i> volume of each solvent used at each operation (purchase records may be used if the quantity purchased can be linked to each operation), and 2. a list of the exempt operations in which these solvents are being used		_____ _____	_____ _____

C - HAND-WIPE CLEANING

**5. INSPECTOR COMMENTS:**

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**END OF CHECKLIST C**

**CHECKLIST D**  
**SPRAY GUN CLEANING CHECKLIST**  
Aerospace Manufacturing and Rework NESHAP

NOTE: Cleaning operations subject to the spray gun cleaning requirements are also subject to the cleaning requirements (Checklist B).

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_  
B. Installation Date (if applicable): \_\_\_\_\_

**2. REQUIREMENTS**

Owners/operators may choose one of the following options. Determine what type of spray gun cleaning operations are performed by completing the table below.

Citation	Requirement	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
<i>Option 1</i> §63.744(c)(1)	Enclosed system cleaning			
<i>Option 2</i> §63.744(c)(2)	Nonatomized cleaning			
<i>Option 3</i> §63.744(c)(3)	Disassembled gun cleaning (manual or soaking)			
<i>Option 4</i> §63.744(c)(4)	Atomized cleaning			

D - SPRAY GUN CLEANING

3. RECORDKEEPING

A. *Option 1:* (§63.744(c)(1)) **Enclosed System G**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.744(c)(1)(i)	Clean spray gun in enclosed system kept closed except when inserting or removing gun. Cleaning consists of forcing the cleaning solvent through the gun.			
<b>Monitoring</b> §63.751(a)	Visually inspect seals and other potential leak sources <i>monthly</i> , while system is in operation.			
<b>Compliance</b> §63.744(c)(1)(ii)	Repair any leak in system as soon as practicable, but no later than 15 days after finding leak. Shut down system if not repaired within 15 days. Repair and restart, or decommission.			
<b>Recordkeeping</b> §63.752(b)(1)	Keep records of name, vapor pressure, and organic HAP constituents for each cleaning solvent.			
<b>Recordkeeping</b> §63.752(b)(5)	Keep records of leaks showing source ID, date each leak found, and date each leak repaired.			

B. *Option 2:* (§63.744(c)(2)) **Nonatomized cleaning G**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.744(c)(2)	Clean spray gun by forcing solvent through gun with atomizing cap in place. No atomizing air is used. Collect solvent from gun in closed container.			
<b>Recordkeeping</b> §63.752(b)(1)	Keep records of name, vapor pressure, and organic HAP constituents for each cleaning solvent.			

D - SPRAY GUN CLEANING

C. *Option 3:* (§63.744(c)(3)) **Disassembled manual cleaning or soaking**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.744(c)(3)	Clean disassembled spray gun by hand (vat kept closed when not in use), or soak components (vat kept closed when not inserting or removing components).			
<b>Recordkeeping</b> §63.752(b)(1)	Keep records of name, vapor pressure, and organic HAP constituents for each cleaning solvent.			

D. *Option 4:* (§63.744(c)(4)) **Atomized cleaning with emissions capture**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.744(c)(4)	Clean spray gun by forcing solvent through gun, collect atomized spray into container that captures the solvent emissions.			
<b>Recordkeeping</b> §63.752(b)(1)	Keep records of name, vapor pressure, and organic HAP constituents for each cleaning solvent.			

4. **INSPECTOR COMMENTS:**

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**END OF CHECKLIST D**

**CHECKLIST E**  
**FLUSH CLEANING CHECKLIST**  
 Aerospace Manufacturing and Rework NESHAP

NOTE: Cleaning operations subject to the flush cleaning requirements are also subject to the cleaning requirements (Checklist B). Flush cleaning means the removal of contaminants by passing solvent over, into, or through the item (spray guns not included) being cleaned.

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_
- B. Installation Date (if applicable): \_\_\_\_\_

**2. REQUIREMENTS**

Check off the compliance option or options selected by the owner/operator for flush cleaning operations.

NOTE: Exempt from the compliance requirements of §63.744(d) are: (1) semi-aqueous cleaning solvents (§60% water as applied), and (2) Table 1 cleaning solvents (Checklist B, Section 2).

- A. **Option 1: Table 1 or semi-aqueous cleaning solvent**  **G**  
 [See Checklist B, Section 2 or Table 1 in rule.  
 Semi-aqueous: §60% water content as applied.]
- B. **Option 2: Enclosed system or collection system**  **G**

**3. RECORDKEEPING**

For operations using an <i>enclosed system</i> for flush cleaning (does not apply to spray gun cleaning)				
Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.744(d)	Empty the used cleaning solvent from flush cleaning into enclosed container or collection system and keep it closed when not in use, or empty into system with equivalent emission control.			
For all <i>flush cleaning</i> operations, unless otherwise noted				
<b>Recordkeeping</b> §63.752(b)(1)	Keep records of name, vapor pressure, and organic HAP constituents for each cleaning solvent.			

E - FLUSH CLEANING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>For semi-aqueous cleaning operations</b>				
<b>Recordkeeping</b> §63.752(b)(2)	For semi-aqueous cleaning solvents (used under Option 1), record name, documentation that each meets composition requirements, and <i>annual</i> volume usage or purchase records. Table 1 solvents are not subject to this recordkeeping requirement.			

**4. INSPECTOR COMMENTS:**

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**END OF CHECKLIST E**

**CHECKLIST F  
PRIMER/TOPCOAT CHECKLIST  
Aerospace Manufacturing and Rework NESHAP**

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_
- B. Installation Date (if applicable): \_\_\_\_\_
- C. The following coating application operations are performed at the facility/plant:

- 9 topcoating (containing organic/inorganic HAP)
- 9 priming (containing organic/inorganic HAP)
- 9 self-priming topcoating (containing organic/inorganic HAP)
- 9 application of waterborne coatings

**2. EXEMPT OPERATIONS**

The following primer/topcoat (including self-priming) operations are exempt based on the regulatory NESHAP provisions shown in the table. The cited regulatory NESHAP provision and §63.742 Definitions should be consulted for more details and for any qualifications on the exemptions.

<b>The following exemptions apply to <i>all</i> primer and topcoat applications:</b>				
<b>Citation</b>	<b>Exempt Operation</b>	<b>Measurement, Calculation, or Observation</b>	<b>Does Facility Perform Indicated Operation?</b>	
			<b>Yes</b>	<b>No</b>
§63.741(i)	Waterborne primers/topcoats (limited exemption, see rule for specific information)			
§63.745(a)	Public display, nonoperational, and not easily moved equipment			
<b>The following are exempt from the <i>application technique requirements</i> for <i>organic HAP</i> requirements only. All other requirements apply.</b>				
§63.745(f)(3)  Application Equipment	Use of airbrush or spray gun extension			
	Coating containing fillers that adversely affect atomization with HVLP			
	Film thicknesses <0.0005 inch			
	Airbrushed stenciling, lettering, or marking			
	Hand-held spray cans			
	Touchup and repair			
<b>The following are exempt from the <i>inorganic HAP</i> requirements only.</b>				

F - PRIMER/TOPCOAT

Citation	Exempt Operation	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
§63.745(g)(4) Inorganic HAP	Touchup of scratches, paint damage			
	Hole daubing for fasteners			
	Touchup of trimmed surfaces			
	Coating prior to joining dissimilar metal components			
	Stencil operations performed by brush or airbrush			
	Section joining			
	Touchup of bushings			
	Sealant detackifying			
	Use of hand-held spray cans			
	Coating of parts that the permitting authority has determined (and which is identified in a Title V permit) is not technically feasible to paint in a booth			

**3. COMPLIANCE OPTIONS - ORGANIC HAP EMISSIONS**

There are five options for demonstrating compliance with the *organic HAP* emissions requirements. Check off the compliance option/options selected by the owner/operator. Owners and operators are required to meet the application techniques and housekeeping measures identified below regardless of the compliance option(s) chosen:

- A. All Options: *Application techniques and Housekeeping* (§63.745(b) and (f)) **G**
- B. Option 1: *Primers/topcoats meet organic HAP/VOC limits* (§63.745(e)(1)) **G**
- C. Option 2: *Primers meet “low HAP content” limit* (§63.752(c)(3)) **G**
- D. Option 3: *Weighted average content* (§63.745(e)(2)) **G**
- E. Option 4: *Add-on controls* (§63.745(d)) **G**
- F. Option 5: *Use of waterborne coatings* (§63.741(i)) **G**

**4. REQUIREMENTS - ORGANIC HAP EMISSIONS**

Document compliance with the specific option or options chosen by the owner/operator by checking “Yes” or “No” for each item in the table for that option. If application or requirement is not applicable, write “N/A” across the “Yes” or “No” column.

*A. All Options: Application techniques, Housekeeping, and Recordkeeping.*

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.745(b)	Handle primers and topcoats in such a manner that minimizes spills			
<b>Compliance</b> §63.745(f)	Apply coatings using one or more of the following methods: <input type="checkbox"/> flow/curtain coating <input type="checkbox"/> dip coat application <input type="checkbox"/> roll coating <input type="checkbox"/> brush coating <input type="checkbox"/> cotton-tipped swab application <input type="checkbox"/> electrodeposition (dip) coating <input type="checkbox"/> HVLP spraying <input type="checkbox"/> electrostatic spray <input type="checkbox"/> other approved methods that meet HVLP or electrostatic spray			
Recordkeeping §63.745(f)(2)	Operate application devices in accordance with company procedures, local specified operating procedures, and, or manufacturer specifications			
Recordkeeping §63.10(b)(1)	Necessary records to be maintained for 5 years (2 years onsite)			

*B. Option 1: Primers/topcoats meet organic HAP/VOC limits (uncontrolled coatings)*

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.745(c) and (e)(1)	Each primer and topcoat in use meets the following content limits for both organic HAP and VOC: Primers: 2.9 lb/gal (350 g/liter) Topcoats: 3.5 lb/gal (420 g/liter) General aviation (all coatings) 4.5 lb/gal (540 g/liter) Large commercial aircraft and assemblies (exterior primer) 5.4 lb/gal (650 g/l)			

F - PRIMER/TOPCOAT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Recordkeeping</b> §63.752(c)(1)	Keep records of name and VOC and HAP content of each primer and topcoat as received and as applied.			
<b>Recordkeeping</b> §63.752(c)(2) (without averaging)	Keep <i>monthly</i> records of mass of organic HAP and VOC emitted per unit volume of coating as applied <i>for each coating formulation</i> , all documentation for these emission values, and the monthly volume usage for each primer and topcoat formulation.			

C. *Option 2: Primers meet “low HAP content” limit (uncontrolled primers)*

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Recordkeeping</b> § 63.752(c)(3)(i)	Keep <i>annual</i> volume purchase records of each low HAP or VOC content coating (<2.1 lb/gal).			
<b>Recordkeeping</b> § 63.752(c)(3)(ii)	Keep all data, calculations, and test results, if applicable, used in determining low organic HAP and VOC content as applied, or manufacturer’s certification when primer is applied as received.			

D. *Option 3: Weighted average content (uncontrolled coatings)*

F - PRIMER/TOPCOAT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.745(c) and (e)(2)	Any combination of primers or topcoats such that the monthly volume-weighted average organic HAP and VOC contents of the combination meet the following limits: Primers: 2.9 lb/gal (350 g/liter) Toncoats: 3.5 lb/gal (420 g/liter) General aviation (all coatings) 4.5 lb/gal (540 g/liter) Large commercial aircraft and assemblies (exterior primer) 5.4 lb/gal (650 g/l)	Averaging scheme, if applicable, approval date _____		
<b>Recordkeeping</b> §63.752(c)(4)	Keep records of <i>monthly</i> volume-weighted average mass of organic HAP and VOC per unit volume of coating as applied for all primers and all topcoats, and all documentation for these calculations.			

E. *Option 4: Add-on control system (controlled coatings)*

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.745(d)	Use a control system that reduces organic HAP and VOC emissions with at least 81% overall efficiency (= capture efficiency x removal efficiency).			
<b>Monitoring</b> §63.751(b)(3)(iii) and (b)(4)	Conduct monitoring of capture and operating parameters established by plan and calculate site specific operating parameter value(s) that demonstrate compliance.			
<b>Monitoring</b> §63.751(b)(6)(iii)(A)	Install, calibrate, operate, and maintain a continuous emission monitor to measure total HAP or VOC concentration exhausted from control device (portable monitor allowed for nonregenerative carbon adsorbers).			
<b>Monitoring</b> §63.751(b)(6)(ii)	Perform a quarterly audit of the continuous emission monitor.			

F - PRIMER/TOPCOAT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Monitoring</b> §63.751(b)(6)(iii)(D)	For <i>nonregenerative carbon adsorption systems</i> , replace the carbon at a regular predetermined time interval.			
<b>Monitoring</b> §63.751(b)(8)	For <i>incinerators</i> , install, calibrate, maintain, and operate temperature monitoring equipment according to manufacturer's specifications. Every 3 months, replace or recalibrate temperature sensors (or use a CEMS to verify destruction efficiency).			
<b>Monitoring</b> §63.751(b)(9)	For <i>noncatalytic incinerators</i> , install thermocouples with continuous recorders immediately downstream of the firebox.			
<b>Monitoring</b> §63.751(b)(10)	For <i>catalytic incinerators</i> , install thermocouples with continuous recorders immediately before and after the catalyst bed.			
<b>Recordkeeping</b> §63.752(c)(6)	<p><b>Records for carbon adsorbers, as appropriate for the type of system:</b></p> <ol style="list-style-type: none"> <li>1. Overall control efficiency, with all data and calculations used to calculate efficiency;</li> </ol> <p><i>For mass balance calculation:</i></p> <ol style="list-style-type: none"> <li>2. Length of rolling material balance period, with all data and calculations;</li> <li>3. Certification of accuracy for the device that measures recovered HAP or VOC; and</li> </ol> <p><i>For nonregenerative carbon adsorbers:</i></p> <ol style="list-style-type: none"> <li>4. Record of carbon replacement time, as required.</li> </ol>			
<b>Recordkeeping</b> §63.752(c)(5)	<p><b>Records for other control devices, as appropriate:</b></p> <ol style="list-style-type: none"> <li>1. Overall control efficiency;</li> <li>2. Continuous records of firebox temperature and calculated 3-hour averages;</li> <li>3. Continuous records of temperature before and after the catalyst bed.</li> </ol>			

F. *Option 5: Use waterborne coatings*

F - PRIMER/TOPCOAT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.741(i)	Coating contains more than 5% water by weight as applied in its volatile fraction and meets applicable HAP and VOC limits. Exemptions from several rule requirements are specified in the rule.			
<b>Recordkeeping</b> §63.741(i)	Keep manufacturer's supplied data and annual purchase records <i>for each exempt waterborne coating</i> for 5 years.			

**5. COMPLIANCE OPTIONS - INORGANIC HAP EMISSIONS**

There are several options for meeting the *inorganic HAP* emissions requirements based on whether the source is new or existing. Check off the compliance option(s) selected by the owner/operator. If the requirement is not applicable, write “N/A” across the “Yes” or “No” portion of the applicable column.

Citation	Requirement	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
<b>All Options</b> §63.745(g)(1)	Apply coatings in a booth or hangar in which air flow is directed downward onto or across the part or assembly being coated.			
<b>Option 1</b> §63.745(g)(2)(i)	For <i>existing sources</i> , use a waterwash system, a dry particulate filter meeting the efficiencies in Tables 1 and 2 of §63.745, or equivalent approved system.			
<b>Option 2</b> §63.745(g)(2)(ii)	For <i>new sources</i> , use a dry particulate filter meeting the efficiencies in Tables 3 and 4 of §63.745, or equivalent approved system.			
<b>Option 3</b> §63.745(g)(2)(iii)(A)	For <i>new sources constructed between 6/6/94 and 10/29/96</i> , use a 2-stage dry filter, or a waterwash system.			
§63.745(g)(2)(iii)(B)	For <i>new sources constructed between 6/6/94 and 10/29/96</i> that apply primers or topcoats containing <b>chromium</b> or <b>cadmium</b> , use a HEPA filter, 3-stage filter, or approved equivalent to a 3-stage control system.			

**6. REQUIREMENTS - INORGANIC HAP EMISSIONS**

These requirements apply to the spray application of primers or topcoats that contain inorganic HAP. If the requirement is not applicable, write “N/A” across the “Yes” or “No” portion of the applicable column.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Is facility using a <i>dry particulate filter system</i> to control the coating operation? If Yes:</b>				
<b>Compliance</b> §63.745(g)(2)(iv)(A)	Maintain dry particulate filter in good working order.			
<b>Compliance</b> §63.745(g)(2)(iv)(B)	Install a differential pressure gauge across the filter banks.			
<b>Compliance</b> §63.745(g)(2)(iv)(C)	Continuously monitor pressure drop across filter, read and record pressure drop once per shift in which coating occurs.			
<b>Compliance</b> §63.745(g)(2)(iv)(D)	Take corrective action when pressure drop goes outside manufacturer’s recommended limit(s).			
<b>Compliance</b> §63.745(g)(3)	Shut down coating operation and take corrective action if pressure drop goes outside specified limit(s).			
	Shut down coating operation if specified maintenance procedures have not been performed as scheduled.			
<b>Recordkeeping</b> §63.752(d)(1)	Record pressure drop across operating filter system once per shift in which coating occurs.			
<b>Recordkeeping</b> §63.752(d)(3)	Log shall include acceptable limit(s) for pressure drop.			
<b>Is facility using a <i>waterwash system (conventional and pumpless)</i> to control the coating operation? If Yes:</b>				
<b>Compliance</b> §63.745(g)(2)(v)	Continuously monitor the water flow rate or operating efficiency range (for pumpless systems), and read and record the water flow rate or efficiency range once per shift in which coating occurs.			



**CHECKLIST G**  
**DEPAINTING OPERATIONS**  
Aerospace Manufacturing and Rework NESHAP

NOTE: The rule covers depainting operations on the outer surface areas of completed aerospace vehicles (including the fuselage, wings, and vertical and horizontal stabilizers of the aircraft ) and the outer casing and stabilizers of missiles and rockets. The rule also applies only to facilities that depaint more than six completed aerospace vehicles per calendar year.

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_  
B. Installation Date (if applicable): \_\_\_\_\_

**2. EXEMPT OPERATIONS**

Depainting performed in the situations or on the parts shown in the table is exempted from the control requirements in §63.746. The cited regulatory NESHAP provisions and §63.742 Definitions should be consulted for more details and for any qualifications on the exemptions.

Citation	Exempt Operation	Measurement, Calculation, or Observation	Does Facility Depaint Indicated Parts?	
			Yes	No
§63.746(a)(1)	Parts normally removed from vehicle for depainting (except wings and stabilizers)			
§63.746(a)(2)	Public display, nonoperational, and not easily moved equipment			
§63.746(a)(3)(i)	Depainting of radomes			
§63.746(a)(3)(ii)	Parts, subassemblies, and assemblies normally removed from primary aircraft structure before depainting			
§63.746(b)(5)	Mechanical and hand sanding operations are exempt from the requirements to <i>perform work in an enclosed area and use a control system</i> . All other requirements apply.			

**3. REQUIREMENTS**

Check off the compliance option or options selected by the owner/operator and check “Yes” or “No” for each item in the table for that option. If the requirement is not applicable, write “N/A” across the “Yes” or “No” portion of the applicable column.

Citation	Requirement	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
<b>Option 1</b> §63.746(b)(1)	Non-HAP chemical strippers and technologies			
<b>Option 2</b> §63.746(b)(2)	Nonchemical based equipment			
<b>Option 3</b> §63.746(c)	Organic HAP chemical strippers (emissions reduced by control system)			

A. Option 1: (§63.746(b)(1)) **Non-HAP chemical strippers** and technologies **G**

Check “Yes” or “No” for each item in the table when using non-HAP chemical strippers and technologies.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.746(b)(1)	Each chemical stripping formulation or agent, and each chemical paint softener, used for depainting shall emit no organic HAP during depainting operations, except for spot stripping and decal removal.			
<b>Compliance</b> §63.746(b)(3)	For spot stripping and decal removal, use no more than: 1. 26 gal organic HAP-containing chemical strippers or 190 lb organic HAP per <i>commercial</i> aircraft depainted, and 2. 50 gal HAP strippers or 365 lb organic HAP per <i>military</i> aircraft depainted, on an <i>annual average</i> basis.			
<b>Recordkeeping</b> §63.752(e)(1)(i)	Keep records of name of each stripper used.			

G - DEPAINTING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Recordkeeping</b> §63.752(e)(1)(ii)	Keep records of <i>monthly</i> volume of each organic HAP containing stripper or weight of organic HAP used for spot stripping and decal removal.			
<b>Recordkeeping</b> §63.752(e)(6)	For spot stripping and decal removal: 1. Volume of organic HAP stripper or weight of organic HAP used; 2. Annual average volume of organic HAP stripper or weight of organic HAP used per aircraft; 3. Annual number of aircraft stripped; and 4. All data and calculations used.			

B. Option 2: (§63.746(b)(2)) **Nonchemical based equipment**

**G**

Check “Yes” or “No” for each item in the table when using nonchemical based equipment.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.746(b)(2)	Maintain nonchemical based depainting equipment according to manufacturer’s specifications or locally prepared procedures.			
	During malfunctions, use substitute materials that minimize HAP emissions.			
	Substitute materials are not to be used for more than 15 days annually, unless non-HAP.			
<b>Does facility use <i>dry media blasting equipment</i> that generates airborne inorganic HAP emissions? If Yes:</b>				
<b>Compliance</b> §63.746(b)(4)(i)	Perform depainting in an enclosed area or use a closed-cycle depainting system.			
<b>Compliance</b> §63.746(b)(4)(ii)(A)	For <i>existing sources</i> , use a waterwash system, baghouse, or a dry particulate filter. Dry particulate filters must meet the efficiency data points in Tables 1 and 2 of §63.745.			

G - DEPAINTING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.746(b)(4)(ii)(B)	For <i>new sources</i> , use a dry particulate filter system meeting the efficiency data points in Tables 3 and 4 of §63.745 or a baghouse.			
<b>Is facility using a <i>dry particulate filter system</i> to control the media blasting operation? If Yes:</b>				
<b>Compliance</b> §63.746(b)(4)(iii)(A)	Maintain dry particulate filter in good working order.			
<b>Compliance</b> §63.746(b)(4)(iii)(B)	Install a differential pressure gauge across the filter banks.			
<b>Compliance</b> §63.746(b)(4)(iii)(C)	Continuously monitor pressure drop across the filter.			
<b>Compliance</b> §63.746(b)(4)(iii)(D)	Take corrective action when pressure drop goes outside manufacturer's recommendation.			
<b>Compliance</b> §63.746(b)(4)(v)	Shut down depainting operation and take corrective action if filter pressure drop goes outside specified limits.			
	Shut down depainting operation and take corrective action if specified maintenance procedures have not been performed as scheduled.			
<b>Is facility using a <i>waterwash system (conventional or pumpless)</i> to control the media blasting operation? If Yes:</b>				
<b>Compliance</b> §63.746(b)(4)(iv)	Continuously monitor the water flow rate or operating efficiency range (for pumpless systems)			
<b>Compliance</b> §63.746(b)(4)(v)	Shut down depainting operation and take corrective action if water path fails visual continuity/flow characteristics check or the water flow rate or efficiency range goes outside specified limits.			
<b>Compliance</b> §63.746(b)(4)(v)	Shut down depainting operation and take corrective action if specified maintenance procedures have not been performed as scheduled.			

G - DEPAINTING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>For a dry particulate filter or a waterwash system:</b>				
<b>Monitoring</b> §63.751(d)	Continuously monitor pressure drop across dry filter or water flow rate for conventional waterwash systems or operating efficiency range for pumpless systems, and read and record these parameters once per shift.			
<b>Recordkeeping</b> §63.752(e)(5)(i)	Records of names and types of nonchemical based equipment (dry media blast, etc.)			
<b>Recordkeeping</b> §63.752(e)(5)(ii)	For malfunction periods, the technique that malfunctioned, date, description of malfunction, methods used during the period, dates these methods were begun and stopped, and date the malfunction was corrected.			
<b>Recordkeeping</b> §63.752(e)(7)	Records of actual pressure drop across dry filters, or visual continuity and water flow rate for waterwash systems, recorded once each shift that depainting occurred. Log also must indicate acceptable limit(s) for the recorded parameters.			

C. Option 3: (§63.746(c)) **Organic HAP chemical strippers**

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(Emissions reduced by use of control device)

Check “Yes” or “No” for each item in the table when using organic HAP chemical strippers.

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.746(c)	Use a control system that reduces organic HAP and VOC emissions with at least: 1. 81% overall efficiency (= capture efficiency x removal efficiency) or mass balance calculations for <i>existing sources</i> , or 2. 95% overall efficiency for <i>new sources or mass balance calculation</i> .			

G - DEPAINTING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Monitoring</b> §63.751(b)(3)(iii) and (b)(iv)	Conduct monitoring of capture and operating parameters established by plan and calculate site specific operating parameter value(s) that demonstrate compliance.			
<b>Monitoring</b> §63.751(b)(6)(iii)(A)	Install, calibrate, operate, and maintain a continuous emission monitor to measure total organic HAP or VOC concentration exhausted from control device (portable monitor allowed for nonregenerative carbon adsorbers).			
<b>Monitoring</b> §63.751(b)(6)(ii)	Perform a quarterly audit of the continuous emission monitor.			
<b>Monitoring</b> §63.751(b)(6)(iii)(D)	For <i>nonregenerative carbon adsorption systems</i> , replace the carbon at a regular predetermined time interval.			
<b>Monitoring</b> §63.751(b)(8)	For <i>incinerators</i> , install, calibrate, maintain, and operate temperature monitoring equipment according to manufacturer's specifications. Every 3 months, replace or recalibrate temperature sensors (or use a CEMS to verify destruction efficiency).			
<b>Monitoring</b> §63.751(b)(9)	For <i>noncatalytic incinerators</i> , install thermocouples with continuous recorders immediately downstream of the firebox.			
<b>Monitoring</b> §63.751(b)(10)	For <i>catalytic incinerators</i> , install thermocouples with continuous recorders immediately before and after the catalyst bed.			
<b>Recordkeeping</b> §63.752(e)(2)	<b>Records for carbon adsorbers, as appropriate for the type of system:</b> 1. Overall control efficiency, with all data and calculations used to calculate efficiency; <i>For mass balance calculation:</i> 2. Length of rolling material balance period, with all data and calculations; and 3. Certification of accuracy for the device that measures recovered HAP or VOC. <i>For nonregenerative carbon adsorbers:</i> 4. Record of carbon replacement time			

G - DEPAINTING

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Recordkeeping</b> §63.752(e)(3)	Records for <b>other control devices</b> , as appropriate: 1. Overall control efficiency and supporting calculations.			
<b>Recordkeeping</b> §63.752(e)(4)	For each aircraft type depainted, a listing of the parts, subassemblies, and assemblies normally removed before depainting. Exempted aircraft types: prototype, test model, and aircraft of which <25 exist.			

**4. INSPECTOR COMMENTS:**

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**END OF CHECKLIST G**

**CHECKLIST H**  
**CHEMICAL MILLING MASKANT OPERATIONS**  
Aerospace Manufacturing and Rework NESHAP

NOTE: Chemical milling maskant is defined as a coating that is applied directly to aluminum components to protect surface areas when chemical milling the component with a Type I or Type II etchant. This does not include bonding maskants and critical use and line sealer maskants, and seal coat maskants. Additionally, maskants that must be used with a combination of Type I or II etchant and any of the above types of maskants are also exempt from the chemical milling maskant requirements.

**1. GENERAL INFORMATION**

- A. Source Location (if applicable): \_\_\_\_\_  
B. Installation Date (if applicable): \_\_\_\_\_

**2. EXEMPT OPERATIONS**

The following maskants are exempt from the rule requirements. The cited regulatory NESHAP provision and §63.742 Definitions should be consulted for more details and for any qualifications on the exemptions.

Citation	Exempt Maskant	Measurement, Calculation, or Observation	Does Facility Use the Maskant?	
			Yes	No
§63.742 Chemical milling maskant	1. Bonding maskants 2. Critical use and line sealer maskants 3. Seal coat maskants 4. Maskants used with a combination of Type I or II etchant and any of the maskant types in 1, 2, or 3 above.			
§63.747(c)	Maskants used for touchup of scratched surfaces, damaged maskant, or trimmed edges			

**3. COMPLIANCE OPTIONS**

Check off the compliance option selected by the owner/operator and check “Yes” or “No” for each item in the table(s) for that option. If a requirement is not applicable, write “N/A” across the “Yes” or “No” portion of the applicable column.

Citation	Requirement	Measurement, Calculation, or Observation	Does Facility Perform Indicated Operation?	
			Yes	No
<b>Option 1</b> §63.747(c)	Chemical milling maskant meets organic HAP/VOC limits			
<b>Option 2</b> §63.747(d)	Add-on controls			
<b>Option 3</b> §63.741(i)	Use of waterborne coatings			

A. Option 1: (§63.747(c)) **Organic HAP and VOC content limits** **G**

I. (§63.747(e)(1)) Each maskant meets limit **G**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.747(b)	Handle and transfer maskant between containers in a manner that minimizes spills.			
<b>Compliance</b> §63.747(c) and (e)(1)	Each maskant in use meets the following content limits for both HAP and VOC: <sup>a</sup> 1. 5.2 lb/gal (622 g/liter) - Type I 2. 1.3 lb/gal (160 g/liter) - Type II			
<b>Recordkeeping</b> §63.752(f)(1)	Keep <i>monthly</i> records of mass of organic HAP and VOC emitted per unit volume of maskant as applied, all documentation for these emission values, and the monthly volume usage for each maskant formulation.			

<sup>a</sup>Different content limits apply to maskants used with Type I or Type II etchants, as shown.

**OR**

II. (§63.747(e)(2)) Weighted average content **G**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.747(b)	Handle and transfer maskant between containers in a manner that minimizes spills.			
<b>Compliance</b> §63.743(d) and §63.747(c) and (e)(2)	The <i>monthly</i> volume-weighted average organic HAP and VOC contents meet the following limits: 1. 5.2 lb/gal (622 g/liter) - Type I 2. 1.3 lb/gal (160 g/liter) - Type II			
<b>Recordkeeping</b> §63.752(f)(2)	Keep records of <i>monthly</i> volume-weighted average mass of organic HAP and VOC for all maskants, and all documentation for these calculations.			

B. Option 2: (§63.747(d)) Add-on control system **G**

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.747(b)	Handle and transfer maskant between containers in a manner that minimizes spills.			
<b>Compliance</b> §63.747(d)	Use a control system that reduces organic HAP and VOC emissions with at least 81% overall efficiency (= capture efficiency x removal efficiency or mass balance calculation). See required Records below for verification of efficiency.			
<b>Monitoring</b> §63.751(b)(3)(iii), (b)(iv)	Conduct monitoring of capture and operating parameters established by plan and calculate site specific operating parameter value(s) that demonstrate compliance.			
<b>Monitoring</b> §63.751(b)(6)(iii)(A)	Install, calibrate, operate, and maintain a continuous emission monitor to measure total HAP or VOC concentration exhausted from control device (portable monitor allowed for nonregenerative carbon adsorbers).			

H - MASKANT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Monitoring</b> §63.751(b)(6)(ii)	Perform a quarterly audit of the continuous emission monitor.			
<b>Monitoring</b> §63.751(b)(6)(iii)(D)	For <i>nonregenerative carbon adsorption systems</i> , replace the carbon at a regular predetermined time interval.			
<b>Monitoring</b> §63.751(b)(8)	For <i>incinerators</i> , install, calibrate, maintain, and operate temperature monitoring equipment according to manufacturer's specifications. Every 3 months, replace or recalibrate temperature sensors (or use a CEMS to verify destruction efficiency).			
<b>Monitoring</b> §63.751(b)(9)	For <i>noncatalytic incinerators</i> , install thermocouples with continuous recorders immediately downstream of the firebox.			
<b>Monitoring</b> §63.751(b)(10)	For <i>catalytic incinerators</i> , install thermocouples with continuous recorders immediately before and after the catalyst bed.			

H - MASKANT

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Recordkeeping</b> §63.752(f)(3) and (4)	<p><b>Records for carbon adsorbers, as appropriate for the type of system:</b></p> <ol style="list-style-type: none"> <li>1. Overall control efficiency, with all data and calculations used to calculate efficiency;</li> </ol> <p><i>For mass balance calculation:</i></p> <ol style="list-style-type: none"> <li>2. Length of rolling material balance period, with all data and calculations;</li> <li>3. Certification of accuracy for the device that measures recovered HAP or VOC; and</li> </ol> <p><i>For nonregenerative carbon adsorbers:</i></p> <ol style="list-style-type: none"> <li>4. Record of carbon replacement time.</li> </ol> <p><b>Records for other control devices, as appropriate:</b></p> <ol style="list-style-type: none"> <li>1. Overall control efficiency and supporting calculations;</li> </ol> <p><i>For noncatalytic incinerators:</i></p> <ol style="list-style-type: none"> <li>2. Continuous records of firebox temperature and calculated 3-hour averages;</li> </ol> <p><i>For catalytic incinerators:</i></p> <ol style="list-style-type: none"> <li>3. Continuous records of temperature before and after the catalyst bed and all calculated 3-hour averages of such temperatures.</li> </ol>			

C. Option 3: (§63.741(i)) **Use waterborne maskants**

G

Citation	Requirement	Measurement, Calculation, or Observation	Yes	No
<b>Compliance</b> §63.741(i)	Maskant contains more than 5% water by weight as applied in its volatile fraction and meet applicable HAP and VOC limits. Exemptions from several rule requirements are specified.			
<b>Compliance</b> §63.747(b)	Handle and transfer maskants between containers in a manner that minimizes spills.			
<b>Recordkeeping</b> §63.741(i)	Keep manufacturer's supplied data and <i>annual</i> purchase records for each exempt waterborne maskant for 5 years.			

**4. INSPECTOR COMMENTS:**

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**END OF CHECKLIST H**

## 6.0 Other Implementation Materials

This chapter provides you with a list of other implementation materials that are available for the Aerospace NESHAP rule. Although we haven't officially reviewed or sanctioned these materials, we are providing a list since it may be helpful to you. These documents may be obtained by getting in touch with the contact person associated with the document. You can find additional information on other implementation materials available by going to [www.epa.gov/ttn/uatw/aerosp/aerosp.html](http://www.epa.gov/ttn/uatw/aerosp/aerosp.html).

Document	Author/Agency	Contact
Aerospace Coating Operations Manual. January 1997	Compliance Division, California EPA, Air Resources Board. Sacramento, CA	Gary Hunter (916) 324-6972
NESHAP Fact Sheet for Aerospace NESHAP & South Coast Air Quality Management District Rules 1124 and 1171. February 11, 1997	South Coast Air Quality Management District. Diamond Bar, CA	Stacey Ebner, Senior Air Quality Engineer. (909) 396-2504 Amir Dejbakhsh, Air Quality Engineer II. (909) 396-2618
PRO-ACT Fact Sheet for the Aerospace NESHAP	HQ Air Force Center for Environmental Excellence	PRO-ACT 1 (800) 233-4356 Web Site: <a href="http://www.afcee.brooks.af.mil/PRO-ACT">http://www.afcee.brooks.af.mil/PRO-ACT</a>
Fact Sheets for Air Toxics Rule: Cleaning Operations (Available November 1997)	U.S. EPA, Office of Enforcement and Compliance Assurance	Transportation Environmental Compliance Assistance Center Web Site: <a href="http://es.inel.gov/oeca/tcac/tcac.html">http://es.inel.gov/oeca/tcac/tcac.html</a>
Fact Sheets for Air Toxics Rule: Depainting and Painting (Available November 1997)	U.S. EPA, Office of Enforcement and Compliance Assurance	Transportation Environmental Compliance Assistance Center Web Site: <a href="http://es.inel.gov/oeca/tcac/tcac.html">http://es.inel.gov/oeca/tcac/tcac.html</a>
U.S. EPA Information Pamphlet: New Regulation Controlling Air Emissions from Aerospace Manufacturing and Rework Facilities, 40 CFR 63, Subpart GG	U.S. EPA, Office of Air Quality Planning and Standards. Research Triangle Park, NC	U.S. EPA Unified Air Toxics Website, <a href="http://www.epa.gov/ttn/uatw">http://www.epa.gov/ttn/uatw</a>

Also, the EPA's Office of Enforcement and Compliance Assurance (OECA) maintains a data base called the Applicability Determination Index (ADI), which contains memoranda issued by the EPA on applicability and compliance issues associated with the New Source Performance Standards (NSPS), NESHAP (Part 61 and MACT, Part 63), and chlorofluorocarbons.

Determinations recently issued are added to the data base on a quarterly basis. Also available are determinations for Subpart T. They can be accessed on the TTN Web at <http://tnwww.rtpnc.epa.gov/html/sscd/compli.htm>.

## 7.0 Example Calculations

This section includes example calculations and spreadsheets to demonstrate compliance with the surface coating requirements involving primers and topcoats in § 63.745 of the rule. The example data was derived from actual facilities' data in response to information collection requests conducted during the aerospace project. Example 1 is a monthly spreadsheet using individual coating compliance for primers and topcoats. Example 2 demonstrates compliance using emissions averaging for primers and topcoats. Example 3 demonstrates compliance using rolling average calculations for primers and topcoats. Additional example calculations can be downloaded from [www.epa.gov/ttn/uatw/aerosp/aeropg.html](http://www.epa.gov/ttn/uatw/aerosp/aeropg.html).

Acronyms (column headings) used in example calculation spreadsheets.

Column	Heading	Description, units
A	Paint ID	Coating identification by the supplier or manufacturer
B	Type of coating	Applicable coating category (i.e., primer or topcoat)
C	Usage	Monthly usage in gallons, (gal/mo)
D	$V_w$	Volume of water in 1 gal of coating, in gal
E	$W_w$	Weight fraction of water in coating, in percent (%)
F	$V_x$	Volume of exempt solvents in 1 gal of coating, in gal
G	$D_c$	Density of coating, in pounds of coating per gal of coating (lb/gal)
H	$M_H$	Mass of organic HAP in 1 gal on coating, in lb
I	$W_H$	Weight fraction of organic HAP in coating, in %
J	H	Mass of organic HAP emitted per volume of coating (lb/gal) less water as applied
K	$M_v$	Mass of VOC in 1 gal of coating, in lb
L	$W_v$	Weight fraction of VOC in coating, in %
M	G	Mass of VOC emitted per volume of coating (lb/gal) less water and exempt solvents as applied

**Example 1.** Monthly spreadsheet for demonstrating compliance using individual coating compliance for primers and topcoats.

Paint ID	Type of coating	Usage, gal/mo	V <sub>w</sub> , gal	W <sub>w</sub> , %	V <sub>x</sub> , gal	D <sub>c</sub> , lb/gal	M <sub>H</sub> , lb	W <sub>H</sub> , %	H, lb/gal	M <sub>v</sub> , lb	W <sub>v</sub> , %	G, lb/gal
515X368	Primer	35	0	0	0	8.9	1.96	22	1.96	2.85	32	2.85
BR127	Primer	234	0	0	0	7.3	2.19	30	2.19	2.85	39	2.85
AR022	Primer	43	0	0	0	9.9	2.67	27	2.67	2.67	27	2.67
AR030	Primer	78	0	0	0	9.3	0.00	0	0.00	2.33	25	2.33
AR150	Primer	81	0.32	0.3	0	9	0.54	6	0.79	0.99	11	1.46
822X450	Topcoat	34	0	0	0	9.3	2.05	22	2.05	3.16	34	3.16
DA0001	Topcoat	250	0	0	0	9.9	3.27	33	3.27	3.37	34	3.37
DA0002	Topcoat	125	0	0	0	10.3	2.58	25	2.58	2.58	25	2.58
DA0003	Topcoat	50	0	0	0	10.6	1.59	15	1.59	2.65	25	2.65
XPT200	Topcoat	174	0.21	0.2	0	8.8	0.88	10	1.11	0.88	10	1.11

HAP and VOC content limit(s): 2.9 lb/gal for primers and 2.5 lb/gal for topcoats  
 Compliance demonstration: Each primer (as applied) has HAP and VOC contents  $\leq 2.9$  lb/gal  
 Compliance demonstration: Each topcoat (as applied) has HAP and VOC contents  $\leq 2.5$  lb/gal

**Example 2.** Monthly spreadsheet for demonstrating compliance using emissions averaging for primers and for topcoats.

Paint ID	Type of coating	Usage, gal/mo	V <sub>w</sub> , gal	W <sub>w</sub> , %	V <sub>x</sub> , gal	D <sub>c</sub> , lb/gal	M <sub>H</sub> , lb	W <sub>H</sub> , %	H, lb/gal	M <sub>V</sub> , lb	W <sub>V</sub> , %	G, lb/gal
515X368	Primer	35	0.0	0	0	8.9	1.96	22	1.96	2.76	31	2.76
BR127	Primer	234	0.0	0	0	7.3	2.77	38	2.77	2.77	38	2.77
DLP001	Primer	140	0.0	0	0	8.38	0.00	0	0.00	2.85	34	2.85
DLP002	Primer	10	0.0	0	0	8.3	4.57	55	4.57	4.57	55	4.57
DLP003	Primer	45	0.1	10	0	12.45	1.25	10	1.46	3.11	25	3.66
DLP004	Primer	26	0.1	6	0	8.76	2.89	33	3.09	3.50	40	3.74
DLP004	Primer	42	0.0	0	0	10.79	2.16	20	2.16	2.16	20	2.16
	SUBTOTAL	532							H <sub>avg</sub> = 1.88			G <sub>avg</sub> = 2.90
822X450	Topcoat	34	0.0	0	0	9.3	3.07	33	3.07	3.07	33	3.07
DA0001	Topcoat	250	0.0	0	0	9.9	3.66	37	3.66	3.66	37	3.66
DA002	Topcoat	18	0.1	5	0	9.85	3.45	35	3.66	3.94	40	4.19
DA003	Topcoat	32	0.3	25	0	9.96	1.00	10	1.42	3.69	37	5.26
DA003	Topcoat	35	0.0	0	0	8.3	4.15	50	4.15	4.15	50	4.15
DA004	Topcoat	17	0.0	0	0	6.64	2.79	42	2.79	4.65	70	4.65
DA005	Topcoat	38	0.0	0	0	7.47	4.48	60	4.48	4.48	60	4.48
DA006	Topcoat	102	0.1	10	0	8.33	1.67	20	1.85	1.67	20	1.85
DA007	Topcoat	4	0.0	0	0	9.5	1.43	15	1.43	2.19	23	2.19
DA008	Topcoat	138	0.0	0	0	9.94	1.49	15	1.49	3.48	35	3.48
	SUBTOTAL	668							H <sub>avg</sub> = 2.84			G <sub>avg</sub> = 3.50

Monthly primer use = 532

Monthly topcoat use = 668

Monthly average limit(s) = 2.9 lb/gal for primers and 3.5 lb/gal for topcoats

Compliance demonstration: monthly primer (as applied) averages: H<sub>avg</sub> and G<sub>avg</sub> ≤ 2.9 lb/gal

TOTAL (combined) = 1,200      Compliance demonstration: monthly topcoat (as applied) averages:  $H_{avg}$  and  $G_{avg} \leq 3.5$  lb/gal

**Example 3.** Rolling average calculations

These rolling calculations are intended to be used to demonstrate compliance with the § 63.745(d) primers and topcoats, § 63.746(c) depainting (chemical strippers), or § 63.747(d) chemical milling maskants using Equation 9 which is located in § 63.750(g). These calculations are also to be used “to demonstrate initial and continuous compliance when emissions are controlled by a dedicated solvent recovery device.”

$$R = \frac{M_r}{\text{Sum of } [(W_{oi})(M_{ci}) \text{ \& } Rs_i]} \times 100 \quad \text{Equation 9}$$

where:

- R = overall HAP or VOC emission reduction, %;
- $M_r$  = the total mass in kilograms of HAP or VOC recovered for a 7 to 30 day period;
- $M_{ci}$  = the total mass in kilograms of each batch of coating (i) applied, or of each coating applied at an affected coating operation during a 7- to 30-day period, as appropriate, as determined from
- $W_{oi}$  = the weight fraction of HAP or VOC in each batch of coating (i) applied, or of each coating applied at an affected coating operation during a 7- to 30-day period, as appropriate, as determined by EPA Method 24 or formulation data; and
- $Rs_i$  = the total mass in kilograms of HAP or VOC retained in the coating after drying. (The value of  $Rs_i$  is zero unless additional documentation is submitted showing that the measured value of  $Rs_i$  exceeds zero.)

**Example VOC data for a 10 day period using eight different coatings (A through H).**

Day	Coating (wt fraction; wt of coating)	Volume applied, gal	Total weight, lb	Mass of VOC recovered, lb
1	A (55%; 10.1 lb)	22	122.2	— — — —
	B (51%; 9.9 lb)	45	227.2	
	C (48%; 11.0 lb)	33	174.2	
2	No coating applied			
3	D (40%; 9.5 lb)	15	57.0	325
	E (55%; 12.2 lb)	69	463.0	
4	B (51%; 9.9 lb)	46	232.3	— — — —
	C (48%; 11.0 lb)	7	37.0	
	F (57%; 10.9 lb)	46	285.8	
5	No coating applied			
6	No coating applied			
7	B (51%; 9.9 lb)	22	111.1	1,748
	C (48%; 11.0 lb)	56	295.7	
	F (57%; 10.9 lb)	41	254.7	
8	No coating applied.			
9	G (45%; 10.5 lb)	82	387.5	— — — —
	H (55%; 12.0 lb)	4	26.4	
10	B (51%; 9.9 lb)	43	217.1	— — — —
	C (48%; 11.0 lb)	24	126.7	
	F (57%; 10.9 lb)	21	130.5	

For each coating used on each day,  $(W_{oi})(M_{ci})$  is represented as “TOTAL WEIGHT” and for Day 1, coating A, the total weight (or mass) of coating A was calculated to be the weight fraction (55%) multiplied by the weight of the coating (10.1 lb/gal) multiplied by volume applied (22 gal) =  $(0.55) \times (10.1) \times (22) = 122.2$  lb.

Using Equation 9, the overall VOC reduction, R, for the first week (days 1 through 7) is calculated as follows (and assuming  $R_s = 0$ ):

$$R = \frac{(325 + 1,748)}{(122.2 + 227.2 + 174.2 + 57 + 463 + 232.3 + 37 + 285.8 + 111.1 + 295.7 + 254.7)}$$

$$R = \frac{2,073}{2,260.2} = 0.917 \times 100\% = 91.7\%$$

On day 10, the rolling average would be calculated for days 4 through 10 as follows:

$$R = \frac{(1,748)}{(232.3 \% 37 \% 285.8 \% 111.1 \% 295.7 \% 254.7 \% 387.5 \% 26.4 \% 217.1 \% 126.7 \% 130.5)}$$

$$R = \frac{1,748}{2,104.8} = 0.830 \times 100\% = 83.0\%$$

Since the overall reduction has to be greater than or equal to 81%, both of these rolling average calculations demonstrate compliance for those coating operations being controlled with a dedicated solvent recovery device.

NOTE: All of the English units used in this example can be converted to metric as defined in the aerospace final rule and the final result will be the same since we are dealing with ratios.

## 8.0 List of Cleaning Solvent Substitutions

This section includes a listing of substitution products that were identified in aerospace industry responses to a Section 114 information collection request involving cleaning operations. The comments section reflects industry's associated comments, not EPA's.

Substitution product	Product substituted for	Comments
97% water, 2% surfactant, 1% MEK	MEK/MIBK blend	Cleaning of noncritical components
Jettacin	MEK	Reduce VOC emissions by 10,000 lb. Reduce MEK usage by 25%.  Use in 80-90% of cleaning applications for final aircraft cleaning.
RIMS-1029 Type 1 Cleaner: Water 96.8% MEK 0.8% Triton X-100 1.8% Triton X-45 0.6%	MEK/MIBK blend	Reduce VOC and HAP emissions by 98%. Reduced MEK usage by 99%. Eliminated MIBK usage. Used in tool cleaning operations, general shop cleaning, and other noncritical aerospace applications--general purpose hand-wipe cleaning.
d-Limonene	MEK	Eliminated MEK usage. Batch cleaning of coating equipment and fabrication of tools.
Solvent 64	MEK	Wipe solvent.
Citri-Kleen	Carbon remover with large percent of the methylene chloride	Used in propeller shop disassembly and cleaning areas
Emulsion cleaners	Vapor degreasers with trichloroethylene	Used in metal parts cleaning
Alkaline cleaner: diethylene glycol monobutyl ether (0.01 mmHg) and water mixture	MEK mixture	Estimated reduction of VOC emissions by 5-10 tons per year. Used in exterior cleaning of wings.
Blend of low vapor pressure solvents	85 wt% CFC-113 15 wt% MEK or organic solvent blend	Reduced VOC emissions by 8,000 lb. Reduced HAP emissions by 37,500 lb. Reduced solvent usage by 308,000 lb. General purpose cleaner.
d-Limonene based hydrocarbon solution	Naphtha, methylene chloride, and perchloroethylene	Reduced HAP emissions by 31,000 lb. Reduced solvent usage by 27,000 lb- solution is recyclable. Machine shop cleaner.

Substitution product	Product substituted for	Comments
Envirosolv KN12000: mixture of wood blend terpenes vapor press = 0.28 mmHg	MEK and MIBK blend Vapor press = 43 mmHg and 1,1,1-TCA vapor press = 100 mmHg	General purpose wipe cleaner and cold degreasing activities
Ardrox 5523	50/50 blend of 1,1,1-TCA and methylene chloride	Reduced usage of 1,1,1-TCA and methylene chloride by 30,000 lb. Used for spray gun cleaning.
Bio-T Mex: Terpene, coors	MEK, TCA	Wiping solvents in machine shop and machinery repair.
Diethylene glycol monobutyl ether (0.01 mmHg)	MEK	Wipe cleaning
Diethylene glycol monobutyl ether (0.01 mmHg) and Citra Safe	MEK	Solvent usage reduced by 50%. Cleaning in assembly and sheet metal areas.
Alkaline cleaner	Freon TES	Parts washer in the machine shop.
Bio-T Max	MEK	Cleaning processes.
Aqueous cleaners <100 gal/L	TCA	Remove grease and oils from machinery prior to paint
Mil-C-383334A type 1 (metal conditioner) no VOC content	Mil-C-5410 376 gal/L	Cleaner
Orange all		Removal of contaminants from noncritical items
Aqueous cleaning solutions, vapor press. = <26 mmHg	MEK, TCA methylene chloride	Wipe solvents
Solvents vapor press. = <45 mmHg at 20EC: Turco 6754 Androx 5515	MEK	Solvent wiping operations needed for aircraft parts. Turco 6754 and Ardrox 5515: Cleaning parts prior to adhesive bonding primer application
Desoclean 20	MEK and acetone	All phases of production and factory support, clean spray guns, lines and related equipment
Diethylene glycol monobutyl ether (0.01 mmHg)	MEK, acetone, toluene	Reduced solvent usage by 12,000 lb/yr. Used in metal cleaning operations.
Diethylene glycol monobutyl ether (0.01 mmHg)	MEK, acetone	Reduced MEK and acetone usage by 600 gal. Used in cleaning machine parts and tool grindings.
Citra-Safe	MEK	Paint gun cleaning.

Substitution product	Product substituted for	Comments
d-Limonene		General purpose cleaning and replacement for solvent cleaning.
Biogenic		Used to remove aircraft corrosion inhibiting contamination.
Toluene Diethylene glycol monobutyl ether (0.01 mmHg)	MEK	Hand wipes.

## Appendix A

### Glossary

**Aerospace facility** means any facility that produces, reworks, or repairs in any amount any commercial, civil, or military aerospace vehicle or component.

**Aerospace vehicle or component** means any fabricated part, processed part, assembly of parts, or completed unit, with the exception of electronic components, of any aircraft including but not limited to airplanes, helicopters, missiles, rockets, and space vehicles.

**Aircraft fluid systems** means those systems that handle hydraulic fluids, fuel, cooling fluids, or oils.

**Aircraft transparency** means the aircraft windshield, canopy, passenger windows, lenses, and other components which are constructed of transparent materials.

**Antique aerospace vehicle or component** means an aircraft or component thereof that was built at least 30 years ago. An antique aerospace vehicle would not routinely be in commercial or military service in the capacity for which it was designed.

**Carbon adsorber** means one vessel in a series of vessels in a carbon adsorption system that contains carbon and is used to remove gaseous pollutants from a gaseous emission source.

**Carbon adsorber control efficiency** means the total efficiency of the control system, determined by the product of the capture efficiency and the control device efficiency.

**Chemical milling maskant** means a coating that is applied directly to aluminum components to protect surface areas when chemical milling the component with a Type I or Type II etchant. Type I chemical milling maskants are used with Type I etchant and Type II chemical milling maskants are used with a Type II etchant. This definition does not include bonding maskants, critical use and line sealer maskants, and seal coat maskants. Additionally, maskants that must be used with a combination of Type I or II etchants and any of the above types of maskants (e.g., bonding, critical use and line sealer, and seal coat) are also exempt from this subpart. (See also Type II etchant definition.)

**Chemical milling maskant application operation** means application of chemical milling maskant for use with Type I or Type II chemical milling etchants.

**Cleaning operation** means collectively spray gun, hand-wipe, and flush cleaning operations.

**Cleaning solvent** means a liquid material used for hand-wipe, spray gun, or flush cleaning. This definition does not include solutions that contain HAP and VOC below the de minimis levels specified in § 63.741(f).

**Closed-cycle depainting system** means a dust-free, automated process that removes permanent coating in small sections at a time, and maintains a continuous vacuum around the area(s) being depainted to capture emissions.

**Coating** means a material that is applied to the surface of an aerospace vehicle or component to form a decorative, protective, or functional solid film, or the solid film itself.

**Coating operation** means the use of a spray booth, tank, or other enclosure or any area, such as a hangar, for the application of a single type of coating (e.g., primer); the use of the same spray booth for the application of another type of coating (e.g., topcoat) constitutes a separate coating operation for which compliance determinations are performed separately.

**Coating unit** means a series of one or more coating applicators and any associated drying area and/or oven wherein a coating is applied, dried, and/or cured. A coating unit ends at the point where the coating is dried or cured, or prior to any subsequent application of a different coating. It is not necessary to have an oven or flashoff area in order to be included in this definition.

**Confined space** means a space that: (1) is large enough and so configured that an employee can bodily enter and perform assigned work; (2) has limited or restricted means for entry or exit (for example, fuel tanks, fuel vessels, and other spaces that have limited means of entry); and (3) is not suitable for continuous employee occupancy.

**Control device** means destruction and/or recovery equipment used to destroy or recover HAP or VOC emissions generated by a regulated operation.

**Control system** means a combination of pollutant capture system(s) and control device(s) used to reduce discharge to the atmosphere of HAP or VOC emissions generated by a regulated operation.

**Depainting** means the removal of a permanent coating from the outer surface of an aerospace vehicle or component, whether by chemical or nonchemical means. For nonchemical means, this definition excludes hand and mechanical sanding, and any other nonchemical removal processes that do not involve blast media or other mechanisms that would result in airborne particle movement at high velocity.

**Depainting operation** means the use of a chemical agent, media blasting, or any other technique to remove permanent coatings from the outer surface of an aerospace vehicle or component. The depainting operation includes washing of the aerospace vehicle or component to remove residual stripper, media, or coating residue.

**Electrodeposition of paint** means the application of a coating using a water-based electrochemical bath process. The component being coated is immersed in a bath of the coating. An electric potential is applied between the component and an oppositely charged electrode hanging in the bath. The electric potential causes the ionized coating to be electrically attracted, migrated, and deposited on the component being coated.

**Electrostatic spray** means a method of applying a spray coating in which an electrical charge is applied to the coating and the substrate is grounded. The coating is attracted to the substrate by the electrostatic potential between them.

**Exempt solvent** means specified organic compounds that have been determined by the EPA to have negligible photochemical reactivity and are listed in 40 CFR 51.100.

**Exterior primer** means the first layer and any subsequent layers of identically formulated coating applied to the exterior surface of an aerospace vehicle or component where the component is used on the exterior of the aerospace vehicle. Exterior primers are typically used for corrosion prevention, protection from the environment, functional fluid resistance, and adhesion of subsequent exterior topcoats. Coatings that are defined as specialty coatings are not included under this definition.

**Flush cleaning** means the removal of contaminants such as dirt, grease, and coatings from an aerospace vehicle or component or coating equipment by passing solvent over, into, or through the item being cleaned. The solvent may simply be poured into the item being cleaned and then drained, or be assisted by air or hydraulic pressure, or by pumping. Hand-wipe cleaning operations where wiping, scrubbing, mopping, or other hand action are used are not included.

**General aviation (GA)** means that segment of civil aviation that encompasses all facets of aviation except air carriers, commuters, and military. General aviation includes charter and corporate-executive transportation, instruction, rental, aerial application, aerial observation, business, pleasure, and other special uses.

**General aviation rework facility** means any aerospace facility with the majority of its revenues resulting from the reconstruction, repair, maintenance, repainting, conversion, or alteration of general aviation aerospace vehicles or components.

**Hand-wipe cleaning operation** means the removal of contaminants such as dirt, grease, oil, and coatings from an aerospace vehicle or component by physically rubbing with a material such as a rag, paper, or cotton swab that has been moistened with a cleaning solvent.

**Hazardous air pollutant (HAP)** means any air pollutant listed in or pursuant to section 112(b) of the Act.

**High efficiency particulate air (HEPA) filter** means a dry particulate filter system that has a 99.97 percent reduction efficiency for 0.3 micron aerosol.

**High volume low pressure (HVLP) spray equipment** means spray equipment that is used to apply coating by means of a spray gun that operates at 10.0 psig of atomizing air pressure or less at the air cap.

**Inorganic hazardous air pollutant (HAP)** means any HAP that is not organic.

**Large commercial aircraft** means an aircraft of more than 110,000 pounds, maximum certified take-off weight manufactured for non-military use.

**Leak** means any visible leakage, including misting and clouding.

**Limited access space** means internal surfaces or passages of an aerospace vehicle or component that cannot be reached without the aid of an airbrush or a spray gun extension for the application of coatings.

**Mechanical sanding** means aerospace vehicle or component surface conditioning which uses directional and random orbital abrasive tools and aluminum oxide or nylon abrasive pads for the purpose of corrosion rework, substrate repair, prepaint surface preparation, and other maintenance activities.

**Natural draft opening** means any opening in a room, building, or total enclosure that remains open during operation of the facility and that is not connected to a duct in which a fan is installed. The rate and direction of the natural draft through such an opening is a consequence of the difference in pressures on either side of the wall containing the opening.

**Nonchemical based depainting equipment** means any depainting equipment or technique, including, but not limited to, media blasting equipment, that can depaint an aerospace vehicle or component in the absence of a chemical stripper. This definition does not include mechanical sanding or hand sanding.

**Nonregenerative carbon adsorber** means a carbon adsorber vessel in which the spent carbon bed does not undergo carbon regeneration in the adsorption vessel.

**Operating parameter value** means a minimum or maximum value established for a control device or process parameter which, if achieved by itself or in combination with one or more other operating parameter values, determines that an owner or operator has complied with an applicable emission limitation.

**Organic hazardous air pollutant (HAP)** means any HAP that is organic.

**Primer** means the first layer and any subsequent layers of identically formulated coating applied to the surface of an aerospace vehicle or component. Primers are typically used for corrosion prevention, protection from the environment, functional fluid resistance, and adhesion of subsequent coatings. Coatings that are defined as specialty coatings are not included under this definition.

**Radome** means the nonmetallic protective housing for electromagnetic transmitters and receivers (e.g., radar, electronic countermeasures, etc.).

**Recovery device** means an individual unit of equipment capable of and normally used for the purpose of recovering chemicals for fuel value, use or reuse. Examples of equipment that may be recovery devices include absorbers, carbon adsorbers, condensers, oil-water

separators, or organic-water separators or organic removal devices such as decanters, strippers, or thin-film evaporation units.

**Research and Development** means an operation whose primary purpose is for research and development of new processes and products, that is conducted under the close supervision of technically trained personnel, and is not involved in the manufacture of final or intermediate products for commercial purposes, except in a de minimis manner.

**Self-priming topcoat** means a topcoat that is applied directly to an uncoated aerospace vehicle or component for purposes of corrosion prevention, environmental protection, and functional fluid resistance. More than one layer of identical coating formulation may be applied to the vehicle or component.

**Semiaqueous cleaning solvent** means a solution in which water is a primary ingredient ( $\geq 60$  percent of the solvent solution as applied must be water.)

**Softener** means a liquid that is applied to an aerospace vehicle or component to degrade coatings such as primers and topcoats specifically as a preparatory step to subsequent depainting by nonchemical based depainting equipment. Softeners may contain VOC but shall not contain any HAP as determined from MSDS's or manufacturer supplied information.

**Solids** means the nonvolatile portion of the coating which after drying makes up the dry film.

**Space vehicle** means a man-made device, either manned or unmanned, designed for operation beyond earth's atmosphere. This definition includes integral equipment such as models, mock-ups, prototypes, molds, jigs, tooling, hardware jackets, and test coupons. Also included is auxiliary equipment associated with test, transport, and storage, which through contamination can compromise the space vehicle performance.

**Specialty coating** means a coating that, even though it meets the definition of a primer, topcoat, or self-priming topcoat, has additional performance criteria beyond those of primers, topcoats, and self-priming topcoats for specific applications. These performance criteria may include, but are not limited to, temperature or fire resistance, substrate compatibility, antireflection, temporary protection or marking, sealing, adhesively joining substrates, or enhanced corrosion protection. Individual specialty coatings are defined in appendix A to subpart GG and in the CTG for Aerospace Manufacturing and Rework Operations (EPA 453/R-97-004).

**Spot stripping** means the depainting of an area where it is not technically feasible to use a nonchemical depainting technique.

**Spray gun** means a device that atomizes a coating or other material and projects the particulates or other material onto a substrate.

\_\_\_ **Stripper** means a liquid that is applied to an aerospace vehicle or component to remove permanent coatings such as primers and topcoats.

**Surface preparation** means the removal of contaminants from the surface of an aerospace vehicle or component, or the activation or reactivation of the surface in preparation for the application of a coating.

**Temporary total enclosure** means a total enclosure that is constructed for the sole purpose of measuring the emissions from an affected source that are not delivered to an emission control device. A temporary total enclosure must be constructed and ventilated (through stacks suitable for testing) so that it has minimal impact on the performance of the permanent emission capture system. A temporary total enclosure will be assumed to achieve total capture of fugitive emissions if it conforms to the requirements found in § 63.750(g)(4) of the rule and if all natural draft openings are at least four duct or hood equivalent diameters away from each exhaust duct or hood. Alternatively, the owner or operator may apply to the Administrator for approval of a temporary enclosure on a case-by-case basis.

**Topcoat** means a coating that is applied over a primer on an aerospace vehicle or component for appearance, identification, camouflage, or protection. Coatings that are defined as specialty coatings are not included under this definition.

**Total enclosure** means a permanent structure that is constructed around a gaseous emission source so that all gaseous pollutants emitted from the source are collected and ducted through a control device, such that 100 percent capture efficiency is achieved. There are no fugitive emissions from a total enclosure. The only openings in a total enclosure are forced makeup air and exhaust ducts and any natural draft openings such as those that allow raw materials to enter and exit the enclosure for processing. All access doors or windows are closed during routine operation of the enclosed source. Brief, occasional openings of such doors or windows to accommodate process equipment adjustments are acceptable, but if such openings are routine or if an access door remains open during the entire operation, the access door must be considered a natural draft opening. The average inward face velocity across the natural draft openings of the enclosure must be calculated including the area of such access doors. The drying oven itself may be part of the total enclosure. An enclosure that meets the requirements found in § 63.750(g)(4) of the rule is a permanent total enclosure.

**Touchup and repair operation** means that portion of the coating operation that is the incidental application of coating used to cover minor imperfections in the coating finish or to achieve complete coverage. This definition includes out-of-sequence or out-of-cycle coating.

**Two-stage filter system** means a dry particulate filter system using two layers of filter media to remove particulate. The first stage is designed to remove the bulk of the particulate and a higher efficiency second stage is designed to remove smaller particulate.

**Type I etchant** means a chemical milling etchant that contains varying amounts of dissolved sulfur and does not contain amines.

**Type II etchant** means a chemical milling etchant that is a strong sodium hydroxide solution containing amines.

**Volatile organic compound (VOC)** means any compound defined as VOC in 40 CFR 51.100. This includes any organic compound other than those determined by the EPA to be an exempt solvent. For purposes of determining compliance with emission limits, VOC will be measured by the approved test methods. Where such a method also inadvertently measures compounds that are exempt solvent, an owner or operator may exclude these exempt solvents when determining compliance with an emission standard.

**Waterborne (water-reducible) coating** means any coating which contains more than 5 percent water by weight as applied in its volatile fraction.

**Waterwash system** means a control system that utilizes flowing water (i.e., a conential waterwash system) or pumpless system to remove particulate emissions from the exhaust air stream in spray coating application or dry media blast depainting operations.

## Appendix B

### Example Initial Notification Form

#### INITIAL NOTIFICATION REPORT<sup>2</sup>

**THIS IS A SAMPLE NOTIFICATION FORM WHICH CAN BE USED BY FACILITIES AT THEIR DISCRETION TO MEET COMPLIANCE WITH 40 CFR 63.753(a)**

Applicable Rule: 40 CFR Part 63, Subpart GG - National Emission Standards for Aerospace

Manufacturing and Rework Facilities. Initial Notification is being made in accordance

with §63.753(a)(1) and §63.9(b)(2).

1. Print or type the following information for each plant in which aerospace manufacturing and rework operations are performed (§63.9(b)(2)(i)- (ii)) :

Owner/Operator/Title \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_

Plant Name \_\_\_\_\_

Plant Contact/Title \_\_\_\_\_

Plant Contact Phone Number (optional) \_\_\_\_\_

Plant Address (if different than owner/operator's) \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code: \_\_\_\_\_

2. Indicate your anticipated compliance date (§63.9(b)(2)(iii)):

Q 1 September 1998

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<sup>2</sup>

Initial notification forms should be sent to the EPA Regional Office servicing your area and to your State or local Air Pollution Control Agency by September 1, 1997. Part 70 permits can be used in lieu of an initial notification provided: (1) the same information is contained in the permit application as required by this rule; (2) the State has an approved Title V program under Part 70; (3) the State has received delegation of authority by the EPA; and (4) Title V permits are submitted by September 1, 1997.

Q Upon startup<sup>3</sup> Anticipated startup date \_\_\_\_\_

3. Check which affected source(s) (as defined by 40 CFR 63.741(c)) are performed at your plant:<sup>4</sup>

- |   |                              |
|---|------------------------------|
| Q Hand wipe cleaning <sup>5</sup>         | Q Waste handling and storage |
| Q Flush cleaning <sup>4</sup>             | Q Topcoat application        |
| Q Spray gun cleaning <sup>4</sup>         | Q Primer application         |
| Q Chemical milling maskant applications Q | Q Depainting operations      |

Briefly describe the nature, size, design and method of operation of the source, including its operating design capacity. (§63.9(b)(2)(iv)):

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EXAMPLE RESPONSE: Plant #4 is responsible for the maintenance, repair and rework of military and commercial aircraft. The plant occupies approximately 1500 acres and contains 12 maintenance shops and one aircraft hangar where aircraft cleaning, topcoating, priming, depainting and chemical milling maskant operations are performed.

All topcoating, priming and milling maskant operations, except for minor touchup operations, are performed in enclosed areas where dry particulate filters are utilized. Depainting of aircraft parts is performed using plastic media blasting where emissions are controlled by the use of HEPA filters. Depainting of parts not normally removed from the aircraft are performed using mechanical or hand sanding. Minor amounts of chemical stripping may be performed in areas where mechanical or hand sanding is not feasible. Approximately 65% of HAP emissions from this plant come from painting and priming operations; 5% from chemical milling maskant operations; 25% from cleaning operations and 5% from depainting operations.

Plant #4 is capable of operating 24 hours per day, 365 days per year but currently operates 16 hours per day (two 8 hour shifts). Approximately 181 aircraft are maintained per year, however, the plant can accommodate up to 300 aircraft per year for maintenance and repair. Approximately 60% of the work performed is at this location involves minor maintenance and

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<sup>3</sup>

Sources may use the application for approval and construction or reconstruction to fulfill the initial notification requirement.

<sup>4</sup>

Operations regulated under 40 CFR 63 Subpart GG include: hand-wipe cleaning, spray gun cleaning, flush cleaning, primer application, topcoat application, depainting operations, chemical milling maskant and waste handling/storage.

<sup>5</sup>

Proposed changes to the final rule were published on October 29, 1996 (61 FR 55853) which proposes limiting the definition of an affected source to those activities subject to the manufacture or rework of aerospace vehicles or components. Until these amendments are finalized, all cleaning operations at the facility are subject to Subpart GG.

repair of internal and external aircraft parts. Approximately 40% involve major rework of the aircraft exterior.

4. Identify each point of emission for each hazardous air pollutant, or if a definitive identification is not yet possible, a preliminary identification of each point of emission for each hazardous air pollutant. If additional lines are needed, make copies of this page (§63.9(b)(2)(iv)).

Please indicate if the information below is: Q Actual Q Preliminary

NOTE: 40 CFR 63.741(c)(ii) identifies each spray gun cleaning operation as an affected source. Each spray gun cleaning operation should be identified separately.

Source ID	Source Location	Source Description	Operation Performed

EXAMPLE RESPONSE:

Source ID	Source Location*	Source Description	Operation(s) Performed
N/A	Bldg 510, 550, Hangar 1, Hangar 2, Flight Line	Wipe-clean aircraft after sanding operations and prior to topcoating, priming and maskant application	Hand-Wipe Cleaning
CLEAN- 1 and 2	Bldg 510, Paint Shop (all sources located in Room 220)	One paint gun cleaner (enclosed system). One disassembled spray gun cleaning area	Spray Gun Cleaning
CLEAN-3 and 4	Hangar 2	One paint gun cleaner (enclosed system). One disassembled spray gun cleaning area	Spray Gun Cleaning
PAINT- 1	Bldg 510, Paint Shop (Room 220)	One walk-in paint booth	Primer and Topcoat Application
PAINT-2	Hangar 2	One corrosion control facility large enough to contain a 747	Primer and Topcoat Application
PAINT-3	Flight Line	Flight Line operations are "touch-up" only	Primer and Topcoat Application

STRIP-1	Bldg 510, Depaint Shop (Room 300)	Plastic media blasting using a walk-in contained booth	Depainting Operations
STRIP-2	Bldg 550, Hangar 1, Flight Line	Mechanical and hand sanding; minor chemical stripping	Depainting Operations
MILL-1	Hangar 2	Apply Type I and II maskant	Milling Maskant
N/A	Bldg 510, 550, Hangar 1, Hangar 2, Flight Line	Store and handle waste	Waste Handling and Storage

\* The following information is available at Plant #4 as of the date of this submittal and may change prior to the compliance date of Subpart GG. Building 510 contains five maintenance shops and Bldg. 550 contains seven shops for parts assembly and minor repair.

5. Check the box that applies (§63.9(b)(2)(v)):

- My plant is a major source of Hazardous Air Pollutants (HAP's)
- My plant is a minor source of HAP's

NOTE: A major source is a facility that emits greater than 10 tons per year of any one hazardous air pollutant (HAP) or 25 tons per year of multiple HAP's. All other sources are area sources. The major/area source determination is based on all HAP emission points inside the plant fenceline, not just the aerospace manufacture and rework facilities.

## Appendix C

### General Provisions Applicability to Subpart GG

Table C-1. General Provisions Applicability to Subpart GG

Reference	Applies to affected sources in Subpart GG	Comment
63.1(a)(1)	Yes	
63.1(a)(2)	Yes	
63.1(a)(3)	Yes	
63.1(a)(4)	Yes	
63.1(a)(5)	No	Reserved
63.1(a)(6)	Yes	
63.1(a)(7)	Yes	
63.1(a)(8)	Yes	
63.1(a)(9)	No	Reserved
63.1(a)(10)	Yes	
63.1(a)(11)	Yes	
63.1(a)(12)	Yes	
63.1(a)(13)	Yes	
63.1(a)(14)	Yes	
63.1(b)(1)	Yes	
63.1(b)(2)	Yes	
63.1(b)(3)	Yes	
63.1(c)(1)	Yes	
63.1(c)(2)	Yes	Subpart GG does not apply to area sources
63.1(c)(3)	No	Reserved
63.1(c)(4)	Yes	
63.1(c)(5)	Yes	
63.1(d)	No	Reserved
63.1(e)	Yes	
63.2	Yes	
63.3	Yes	
63.4(a)(1)	Yes	
63.4(a)(2)	Yes	
63.4(a)(3)	Yes	

TABLE C-1. (continued)

Reference	Applies to affected sources in Subpart GG	Comment
63.4(a)(4)	No	Reserved
63.4(a)(5)	Yes	
63.4(b)	Yes	
63.4(c)	Yes	
63.5(a)	Yes	
63.5(b)(1)	Yes	
63.5(b)(2)	No	Reserved
63.5(b)(3)	Yes	
63.5(b)(4)	Yes	
63.5(b)(5)	Yes	
63.5(b)(6)	Yes	
63.5(c)	No	Reserved
63.5(d)(1)(i)	Yes	
63.5(d)(1)(ii)(A)-(H)	Yes	
63.5(d)(1)(ii)(I)	No	Reserved
63.5(d)(1)(ii)(J)	Yes	
63.5(d)(1)(iii)	Yes	
63.5(d)(2)-(4)	Yes	
63.5(e)	Yes	
63.5(f)	Yes	
63.6(a)	Yes	
63.6(b)(1)-(5)	Yes	§ 63.749(a) specifies compliance dates for new sources
63.6(b)(6)	No	Reserved
63.6(b)(7)	Yes	
63.6(c)(1)	Yes	
63.6(c)(2)	No	The standards in Subpart GG are promulgated under section 112(d) of the Clean Air Act (Act)
63.6(c)(3)-(4)	No	Reserved
63.6(c)(5)	Yes	
63.6(d)	No	Reserved
63.6(e)	Yes	§ 63.743(b) includes additional provisions for the startup, shutdown, and malfunction plan
63.6(f)	Yes	

TABLE C-1. (continued)

Reference	Applies to affected sources in Subpart GG	Comment
63.6(g)	Yes	
63.6(h)	No	The standards in Subpart GG do not include opacity standards
63.6(i)(1)-(3)	Yes	
63.6(i)(4)(i)(A)	Yes	
63.6(i)(4)(i)(B)	No	§ 63.743(a)(4) specifies that requests for extension of compliance must be submitted no later than 120 days before an affected source's compliance date
63.6(i)(4)(ii)	No	The standards in Subpart GG are promulgated under section 112(d) of the Act
63.6(i)(5)-(12)	Yes	
63.6(i)(13)	Yes	
63.6(i)(14)	Yes	
63.6(i)(15)	No	Reserved
63.6(i)(16)	Yes	
63.6(j)	Yes	
63.7(a)(1)	Yes	
63.7(a)(2)(i)-(vi)	Yes	
63.7(a)(2)(vii)-(viii)	No	Reserved
63.7(a)(2)(ix)	Yes	
63.7(a)(3)	Yes	
63.7(b)	Yes	
63.7(c)	Yes	
63.7(d)	Yes	
63.7(e)	Yes	
63.7(f)	Yes	
63.7(g)(1)	Yes	
63.7(g)(2)	No	Reserved
63.7(g)(3)	Yes	
63.7(h)	Yes	
63.8(a)(1)-(2)	Yes	
63.8(a)(3)	No	Reserved
63.8(a)(4)	Yes	
63.8(b)	Yes	

TABLE C-1. (continued)

Reference	Applies to affected sources in Subpart GG	Comment
63.8(c)	Yes	
63.8(d)	No	
63.8(e)(1)-(4)	Yes	
63.8(e)(5)(i)	Yes	
63.8(e)(5)(ii)	No	The standards in Subpart GG do not include opacity standards
63.8(f)(1)	Yes	
63.8(f)(2)(i)-(vii)	Yes	
63.8(f)(2)(viii)	No	The standards in Subpart GG do not include opacity standards
63.8(f)(2)(ix)	Yes	
63.8(f)(3)-(6)	Yes	
63.8(g)	Yes	
63.9(a)	Yes	
63.9(b)(1)	Yes	
63.9(b)(2)	Yes	§63.753(a)(1) requires submittal of the initial notification at least 1 year prior to the compliance date; § 63.753(a)(2) allows a Title V or Part 70 permit application to be substituted for the initial notification in certain circumstances
63.9(b)(3)	No	
63.9(b)(4)	No	
63.9(b)(5)	No	
63.9(c)	Yes	
63.9(d)	Yes	
63.9(e)	Yes	
63.9(f)	No	The standards in Subpart GG do not include opacity standards
63.9(g)(1)	No	
63.9(g)(2)	No	The standards in Subpart GG do not include opacity standards
63.9(g)(3)	No	
63.9(h)(1)-(3)	Yes	§ 63.753(a)(1) also specifies additional information to be included in the notification of compliance status
63.9(h)(4)	No	Reserved
63.9(h)(5)-(6)	Yes	
63.9(i)	Yes	
63.9(j)	Yes	
63.10(a)	Yes	

TABLE C-1. (continued)

Reference	Applies to affected sources in Subpart GG	Comment
63.10(b)	Yes	
63.10(c)(1)	No	
63.10(c)(2)-(4)	No	Reserved
63.10(c)(5)-(8)	No	
63.10(c)(9)	No	Reserved
63.10(c)(10)-(13)	No	
63.10(c)(14)	No	§ 63.8(d) does not apply to this subpart
63.10(c)(15)	No	
63.10(d)(1)-(2)	Yes	
63.10(d)(3)	No	The standards in Subpart GG do not include opacity standards
63.10(d)(4)	Yes	
63.10(d)(5)	Yes	
63.10(e)(1)	No	
63.10(e)(2)(i)	No	
63.10(e)(2)(ii)	No	The standards in Subpart GG do not include opacity standards
63.10(e)(3)	No	
63.10(e)(4)	No	The standards in Subpart GG do not include opacity standards
63.10(f)	Yes	
63.11	Yes	
63.12	Yes	
63.13	Yes	
63.14	Yes	
63.15	Yes	

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16. ABSTRACT  National emission standards to control emissions of HAP from existing and new aerospace manufacturing and rework facilities were promulgated in 1995. This document contains information to assist State and local air pollution control agencies as well as the regulated community in the implementation of these standards. It contains an overview of the rule along with sample inspection sheets are also provided along with a bibliography of Federal, State, and local agency sources of additional information related to these standards. This document is available for download at <a href="http://www.epa.gov/ttn/uatw/aerosp/aeropg.html">www.epa.gov/ttn/uatw/aerosp/aeropg.html</a> .		
17. KEY WORDS AND DOCUMENT ANALYSIS		
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