

**Document Number:** GLM-QS-1800.1.24

**Revision** Revision A

**Effective Date:** 4/4/2012

**Expiration Date:** 4/4/2017

## Occupational Health Programs Manual – Chapter 24

# OSHA Regulated Material w/Change 2 (9/30/2015)

*Approved by: QS/Chief, Safety and Division*

*Distribution: BMS Library*

**NASA - Glenn Research Center  
Cleveland, OH 44135**

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### Change Record

Revision	Effective Date	Expiration Date	GRC25, Change Request #	Description
A	4/4/2012	4/4/2017	307	Reorganization changes (SHD, EMB & OHB)
Change 1	4/14/2014	4/4/2017	N/A	Administrative change to add front cover and change history log to comply with NPR 1400.1, added "The GRC shall follow the requirements of NPR 1800.1C" in Section 4.0 Policy.
Change 2	9/30/2015	4/4/2017	N/A	Administrative change to remove hyperlinks.

*\*\*Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*

Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

## Contents

1.0	PURPOSE.....	4
2.0	APPLICABILITY .....	4
3.0	BACKGROUND.....	4
4.0	POLICY.....	4
5.0	RESPONSIBILITIES .....	5
5.1	SHeD .....	5
5.2	Supervisors .....	6
5.3	Employees .....	6
5.4	Medical Director, Occupational Medicine Services .....	6
5.5	Human Capital Development Branch Chief .....	6
6.0	REQUIREMENTS .....	6
6.1	Hazard Assessment ( <i>NASA NPR 1800.1</i> ) .....	7
6.2	Training ( <i>29 CFR 1910.1200 and Specific OSHA-Regulated Chemical Standards</i> ).....	7
6.3	Medical Surveillance ( <i>29 CFR 1910; NASA NPR 1800.1</i> ).....	7
6.4	Control Measures for Use of OSHA-Regulated Materials ( <i>Specific OSHA-Regulated Chemical Standards</i> ).....	8
6.5	Construction Use of OSHA-Regulated Materials ( <i>29 CFR 1926</i> ).....	8
7.0	RECORDS.....	8
8.0	REFERENCES .....	9
	APPENDIX A.—DEFINITIONS AND ACRONYMS.....	10
	APPENDIX B.—OSHA-REGULATED MATERIALS AT GLENN RESEARCH CENTER (GRC) .....	12
	APPENDIX C.—REGULATORY REQUIREMENTS .....	13

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Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

## Chapter 24—OSHA-Regulated Materials

*Note: The current version of this chapter is maintained and approved by the Safety and Health Division (SHeD). The last revision date of this chapter was April 2012. The current version is located on the Glenn Research Center intranet within the BMS Library. Approved by Chief of Safety and Health Division.*

### 1.0 PURPOSE

The purpose of the Occupational Safety and Health Administration (OSHA)-regulated materials compliance program is to protect employees who may be exposed to chemicals specifically regulated by OSHA from adverse health effects. These materials are covered under OSHA substance-specific standards (sometimes called the OSHA vertical standards) that generally include exposure monitoring, exposure limits, medical examination requirements, personal protective equipment (PPE), and information and training provisions. This program establishes minimum requirements for handling, use, and disposal of applicable OSHA-regulated materials used at NASA Glenn Research Center (GRC) including Lewis Field and Plum Brook Station.

### 2.0 APPLICABILITY

This chapter applies to all civil servant and support service contractor (SSC) employees assigned to GRC sites as well as construction contractors, students, and visitors. This document applies to the use of OSHA-regulated materials not covered by other Occupational Health Manual Programs chapters, such as asbestos and lead, and focuses on those OSHA-regulated materials used at NASA GRC.

SSCs and construction contractors are responsible for the health and safety of their employees and for hazard analyses, training, PPE, medical surveillance, and other requirements to ensure compliance with OSHA standards for the specific chemicals addressed in this chapter.

### 3.0 BACKGROUND

In 1970, OSHA adopted a list of exposure limits for various chemicals published in 1968 by the American Conference of Governmental Industrial Hygienists (ACGIH). This list was included in 1910.1000 and 1926.1100 in the Z Tables. Because some chemicals were highly toxic, including carcinogens, and/or specific to a particular industry, OSHA has promulgated compliance standards for a number of them. These substance- or industry-specific standards typically contain specific requirements for assessing and controlling exposures to employees. They may or may not require exposure monitoring of employees for each job classification potentially exposed, establishment of regulated areas with specific warning signs and handling procedures, mandatory engineering controls, specific work practices, respiratory protection, written programs, and written standard operating procedures. In addition, GRC may determine additional requirements based upon the chemical, its hazards, and the results of a hazard assessment and exposure monitoring.

The Safety and Health Division (SHeD) recognize that OSHA-regulated materials are generally used in small quantities and on an infrequent basis at NASA GRC. Therefore, to comply with the OSHA standards, SHeD has developed the following guidelines for current and future use of applicable OSHA-regulated materials.

### 4.0 POLICY

It is GRC's policy to comply with all applicable regulations regarding chemical use and to prevent illness to workers and damage to the environment from the use, removal, and disposal of chemicals. To accomplish this, all personnel shall comply with the requirements of this chapter.

It is also NASA's official policy to adhere to OSHA or the ACGIH occupational exposure limits (whichever is more restrictive) to ensure worker protection.

This chapter applies to all the OSHA-regulated materials that are either currently used or that will be used in the future at GRC. See Appendix B for those chemicals currently used at GRC. The GRC shall follow the Requirements of NPR 1800.1.C.

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<b>Glenn Research Center Occupational Health Programs Manual</b>	<b>Title:</b> OSHA Regulated Material	
	<b>Document No.:</b> GLM-QS-1800.1.24	<b>Rev.:</b> A

Following is an alphabetical listing of OSHA-regulated materials covered under this program:

2-Acetylaminofluorene	3,3-Dichlorobenzidine (and its salts)
Acrylonitrile	4-Dimethylaminoazobenzene
4-Aminodiphenyl	Ethyleneimine
Arsenic, inorganic	Ethylene oxide
Benzene	Formaldehyde
Benzidine	Methyl chloromethyl ether
1,3-Butadiene	Methylene chloride
Cadmium	4,4-Methylenedianiline
bis-Chloromethyl ether	alpha-Naphthylamine
Chromium VI (hexavalent chromium)	beta-Naphthylamine
Coal tar pitch volatiles	4-Nitrobiphenyl
Coke oven emissions	N-Nitrosodimethylamine
Cotton dust	beta-Propiolactone
1,2-dibromo-3-chloropropane	Vinyl chloride

This chapter does not cover OSHA-regulated materials specifically addressed in other dedicated chapters such as asbestos and lead.

## 5.0 RESPONSIBILITIES

### 5.1 SHeD

The SHeD Program Lead, along with support from Chemical Management and Waste Management as indicated, shall

- Provide guidance on the requirements of Federal, State, and local environmental regulations
- Maintain the chemical inventory
- Review chemical purchases to determine when OSHA-regulated materials or products containing OSHA-regulated materials are requested (Chemical Management)
- Solicit supervisor input to identify employees using OSHA-regulated materials
- Control and approve use of cadmium-containing brazing alloys (Chemical Management)
- Provide guidance for handling spill situations (See Occupational Health Programs Manual, Chapter 8 for details)
- Assist in the collection and disposal of regulated materials and waste products containing regulated materials
- Maintain the OSHA-Regulated Materials Program
- Reviews job hazard analyses (JHAs) or other equivalent hazard assessments and perform exposure assessments where indicated
- Recommend procedures to minimize exposure
- Recommend employees for inclusion in a medical surveillance program, if required
- Maintain the exposure database for all related operations
- Conduct Hazard Communication training (Chemical Management)
- Conduct any required training beyond that provided under the Hazard Communication Standard (Chemical Management)
- Collect and dispose of regulated waste (Waste Management)

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<b>Glenn Research Center Occupational Health Programs Manual</b>	<b>Title:</b> OSHA Regulated Material	
	<b>Document No.:</b> GLM-QS-1800.1.24	<b>Rev.:</b> A

## 5.2 Supervisors

Supervisors shall

- Identify those using regulated materials within the guidelines of this policy and notify the Program Lead of the user's name and material prior to its use
- Complete JHA or equivalent hazard assessment for tasks involving OSHA-regulated materials and forward a copy to the Program Lead
- Comply with the requirements and/or conditions set forth in applicable safety permits, standard operating procedures (SOPs), Laboratory SOPs (LSOPs), and JHAs
- Ensure regulated areas are properly marked and access restricted
- Ensure employees follow good work practices
- Ensure employees meet training requirements and have knowledge of the hazards

## 5.3 Employees

Employees shall

- Procure chemicals in compliance with the Occupational Health Programs Manual, Chapter 14, Acquisition of Hazardous Chemicals and Materials
- Comply with the requirements and/or conditions set forth in applicable safety permits, SOPs, LSOPs, and JHAs
- Use the regulated materials in accordance with procedures established for safe use and storage of these materials
- Use PPE as specified in established work procedures or the hazard assessment(GRC237, JHA, LSOP, etc.)
- Notify Medical Services or their medical provider and their supervisor if they experience any signs or symptoms of overexposure
- Notify their supervisors of any operational changes or new uses of the regulated materials
- Discard waste material through Waste Management
- Attend required training

## 5.4 Medical Director, Occupational Medicine Services

The Medical Director shall

- Maintain medical surveillance programs for civil servant andSSC, as applicable, exposed to regulated chemicals that require medical monitoring
- Maintain complete, accurate records of all medical examinations for personnel in the medical surveillance program. Records are to be retained for at least 30 years. Results of examinations are to be discussed with employees as needed. The Medical Director shall also identify examination elements following an exposure incident.

## 5.5 Human Capital Development Branch Chief

The Human Capital Development Division Chief shall

- Schedule employee training
- Maintain records for employees who completed NASA-sponsored training and any associated examinations

## 6.0 REQUIREMENTS

SHed shall be kept apprised of OSHA-regulated material use throughout the laboratory with the assistance of the Chemical Management staff. SHed shall also be kept apprised when uses of a regulated material changes or when

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Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

new tasks, not previously assessed, require the use of a regulated material. This information shall be provided in a timely manner in order to arrange for hazard assessments and not delay the user's work.

### 6.1 Hazard Assessment (NASA NPR 1800.1)

All regulated materials currently in use at GRC shall have a hazard assessment performed by a SHeD IH. The user or area supervisor shall contact the Program Lead prior to use and arrange for an IH to observe the handling of the material, assess the hazards, and perform exposure monitoring, if necessary. The area supervisor shall be responsible for compliance with this requirement.

Results of the hazard assessments for all current users of a given material enable the IH to determine if a written program shall be established or revised. Written programs, if required, shall be included in this chapter as appendices.

A hazard assessment shall be required by an IH when

- An OSHA-regulated chemical is being requested for purchase
- A process which uses a regulated material changes
- A new task not previously assessed requires the use of a regulated material

Hazard assessments shall include

- A review of the JHA or equivalent hazard assessment for all tasks involving regulated materials
- A review of related standards to determine regulatory requirements
- A meeting with the requester to discuss usage, handling procedures, possible engineering controls, PPE, and scheduling of exposure monitoring

6.1 The SHeD verification procedure to ensure compliance with the requirements listed in this section, shall be accomplished by reviewing equivalent hazard assessments information.

### 6.2 Training (29 CFR 1910.1200 and Specific OSHA-Regulated Chemical Standards)

All employees using hazardous chemicals shall receive Hazard Communication training so they understand the information presented on an MSDS and know how to protect themselves from the hazards of the toxic material.

All employees using OSHA-regulated materials shall have specific training as required under the OSHA standard for the particular chemical being used or handled. The training shall cover the specific hazards of the material, requirements of the standard, and other information regarding controlling exposure. A test or other method is required to demonstrate those being trained have knowledge of the information provided.

6.2 The SHeD verification procedure to ensure compliance with the requirements listed in this section shall be accomplished by reviewing SATERN records or other personal training records as available. Training can also be verified through Facility inspections, reviewing JHA and PPE hazard assessment, training records, and SOPs/LSOPs.

### 6.3 Medical Surveillance (29 CFR 1910; NASA NPR 1800.1)

Individuals using or handling OSHA-regulated materials may be required to receive baseline and routine medical examinations of various organ systems depending upon the material used and the extent of and potential for "exposure."

Individuals requiring an exam as determined by the Program Lead, a SHeD, IH or their supervisor, shall contact Medical Services to receive directions on scheduling the examination. The content of the exam should be determined by the employer with assistance from a SHeD IH for regulatory requirements and Medical Services. For those using another medical provider, they shall contact the Program Lead or a SHeD IH who will coordinate with Medical Services to provide minimum exam content requirements to that medical provider.

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Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

Any employee with a known or suspected excessive exposure shall contact GRC Medical Services or their medical provider immediately to arrange for a post-exposure exam. This exam shall include those items required by OSHA and any additional tests deemed necessary by the physician. Their supervisor shall also be contacted.

6.3 The SHed verification procedure to ensure compliance with the requirements listed in this section shall be accomplished by reviewing medical surveillance program records to determine if those required to be in such programs are and have received the appropriate exams.

#### 6.4 Control Measures for Use of OSHA-Regulated Materials (*Specific OSHA-Regulated Chemical Standards*)

Whenever possible, the use of OSHA-regulated materials shall be eliminated through the use of less hazardous or toxic materials. Where elimination is not feasible, engineering or administrative controls (if allowed under the standard) shall be implemented. When such controls do not completely eliminate the hazard or when they are not feasible personal protective equipment (PPE) shall be required. Personal protective equipment (PPE) may also be used when the task is infrequent or non-routine.

When working on eliminating or controlling the hazards of OSHA-regulated materials, those most knowledgeable about the work shall be involved either through consultation or direct participation.

All provisions of the applicable standard for each regulated material apply when exposures exceed or are likely to exceed the maximum allowable 8-hr time-weighted average (TWA) OSHA permissible exposure limit (PEL), or recommended ACGIH threshold limit value (TLV), whichever is most restrictive, or the short-term exposure limit (STEL). These provisions typically include establishing regulated areas, hygiene facilities, compliance plans, controls, protective clothing, the use of proper work practices, training, posting of warning signs, etc., and are specific to the material regulated. See Appendix B for a summary of the specific requirements.

6.4 The SHed verification procedure to ensure compliance with the requirements listed in this section shall be accomplished by reviewing hazard and exposure assessment data, JHAs, LSOPs, SOPs, safety permits and any other documents related to work with OSHA-regulated chemicals as well as a walk-through of workplaces where such chemicals are used or handled.

#### 6.5 Construction Use of OSHA-Regulated Materials (*29 CFR 1926*)

In general, the use of OSHA-regulated materials listed in this chapter shall be prohibited unless proper controls are used and protective equipment worn. If such materials are required for a particular construction task, the materials shall be listed in the health and safety plan (HASP). The SHed staff members charged with reviewing and approving HASPs shall approve or deny the use of OSHA-regulated materials covered under this chapter on behalf of the Program Lead and shall be knowledgeable on the OSHA-regulated materials and special conditions that apply. Each construction contractor or subcontractor is responsible for assessing hazards to their employees, complying with the requirements of the standard including, but not limited to, providing exposure monitoring, training, medical surveillance, written compliance programs, PPE, warning signs, etc.

6.5 The SHed verification procedure to ensure compliance with the requirements listed in this section shall be accomplished by reviewing health and safety plans.

### 7.0 RECORDS

- Job hazard analyses.—Maintained by SHed.
- Hazard assessments.—Maintained by applicable organization
- Exposure assessments—Maintained by SHed
- LSOPs and safety permits. – Maintained by SHed
- Exposure assessment database.—Maintained by SHed

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<b>Glenn Research Center Occupational Health Programs Manual</b>	<b>Title:</b> OSHA Regulated Material	
	<b>Document No.:</b> GLM-QS-1800.1.24	<b>Rev.:</b> A

- Medical examinations.—Maintained by SHeD Medical Services.
- Chemical inventory.—Maintained by SHeD

## 8.0 REFERENCES

<b>Document Number</b>	<b>Document Name</b>
29 CFR 1910.1002–18; 1026–1028; 1044–1052	Occupational Safety and Health Administration, General Industry Standards, <a href="http://www.osha.gov/">http://www.osha.gov/</a>
29 CFR 1926.60; 1102–1118; 1127–1129; 1144–1148; 1152	Occupational Safety and Health Administration, Construction Industry Standards <a href="http://www.osha.gov/">http://www.osha.gov/</a>
GLM–QSA–1700.1	NASA Glenn Safety Manual, Chapter <b>33</b> , Job Hazard Analysis
NPR 1800.1	NASA Procedural Requirement, “ <a href="#">NASA Occupational Health Program Procedures</a> ”

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Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

## APPENDIX A.—DEFINITIONS AND ACRONYMS

**8-hour TWA.**—Time-weighted average concentration to which an employee is exposed over an 8-hr day.

**Action level (AL).**—This is the concentration or level of an agent at which it is deemed that some specific action should be taken. The action can range from monitoring the exposure on a routine basis to making engineering adjustments. In general the action level is set at one-half of the adopted occupational exposure limit.

**American Conference of Governmental Industrial Hygienists (ACGIH).**—Professional society made up of government-employed industrial hygienists as well as industrial hygienists from the private sector. The ACGIH is devoted to administrative and technical aspects of occupational and environmental health.

**Carcinogen.**—A substance or agent capable of causing or producing cancer in mammals, including humans. A chemical is considered to be a carcinogen or potential carcinogen if (a) it has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, (b) it is listed as a carcinogen or potential carcinogen in the annual report on carcinogens published by the National Toxicology Program (NTP), or (c) it is regulated by the National Institute of Occupational Safety and Health (NIOSH) or Occupational Safety and Health Administration as a carcinogen.

### Code of Federal Regulations (CFR)

**Disposal.**—Final placement for destruction of toxic, radioactive or other wastes, surplus or banned pesticides or other chemicals, polluted soils, and drums containing hazardous materials from remedial actions or accidental releases. Disposal may be accomplished through use of approved secure landfills, surface impoundments, land farming, incineration, etc.

**Engineering controls.**—Designing out the hazard by process changes, substitution of harmful materials, isolation, ventilation, and source modification.

### Glenn Research Center (GRC)

### Health and Safety Plan (HASP)

### International Agency for Research on Cancer (IARC)

### Industrial hygienist (IH)

### Job hazard analysis (JHA)

### Material Safety Data Sheet (MSDS)

### National Institute of Occupational Safety and Health (NIOSH)

### National Toxicology Program (NTP)

### NASA Procedural Requirement (NPR)

### Occupational exposure limit (OEL)

### Occupational Safety and Health Administration (OSHA)

**Permissible exposure limit (PEL).**—The occupational exposure limit (OEL) established by Occupational Safety and Health Administration; the permissible concentration in air of a substance to which nearly all workers may be repeatedly exposed 8 hr a day, 40 hr a week, for 30 yr without adverse effects.

### Personal protective equipment (PPE)

### Plum Brook Station (PBS)

### Safety and Health Division (SHed)

**Sensitizer.**—A material that is capable of causing an immune response in an individual. In most cases, initial exposure results in a normal response, but repeated exposures lead to progressively strong and abnormal responses.

### Short-term exposure limit (STEL)

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Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

**Skin notation.**—Denotes the possibility that dermal absorption may be a significant contribution to the overall body burden of the chemical (i.e., the airborne occupational exposure limit may not be adequate to protect the worker because the compound also readily penetrates the skin. Other reactions to the skin such as irritation, dermatitis, and sensitization are not sufficient to warrant the skin notation.

**Standard operating procedure (SOP).**—A written document that details an operation, analysis, or action whose mechanisms are thoroughly prescribed and that is commonly accepted as a method for performing certain routine or repetitive tasks.

**Support service contractor (SSC)**

**Threshold limit value (TLV).**—Established by the American Conference of Governmental Industrial Hygienists to designate degree of exposure to an exposure level under which it is believed most people can work consistently for 8 hr a day, day after day, with no harmful effects.

**Threshold limit value—ceiling (TLV-C).**—The concentration of a contaminant that should not be exceeded at any time.

**Threshold limit value—short-term exposure limit (TLV-STEL).**—A 15-min TWA exposure that is not to be exceeded at any time during a workday even if the 8-hr TWA is within the TLV-TWA. Exposures above the TLV-TWA up to the STEL should not be longer than 15 min and shall not occur more than 4 times per day; there should be at least 60 min between successive exposures in this range.

**Time-weighted average exposure.**—Average concentration of an agent over a given working period of a person's exposure, as determined by sampling.

**Toxic effect.**—Harmful or poisonous effect of a chemical agent.

**Toxin.**—A poisonous substance.

Glenn Research Center Occupational Health Programs Manual	Title: OSHA Regulated Material	
	Document No.: GLM-QS-1800.1.24	Rev.: A

## APPENDIX B.—OSHA-REGULATED MATERIALS AT GLENN RESEARCH CENTER (GRC)

### Currently Used

Following is a list of OSHA-regulated materials believed to currently be used at GRC.

- Benzene
- Cadmium
- Formaldehyde
- Inorganic arsenic
- 4,4-Methylenedianiline
- Methylene chloride
- Chromium VI (typically found in stainless steel; exposure issues when welding)

Specific requirements for the handling and use of these materials can be found in Appendix C of this document. If you are no longer using and will not be using any of these materials in the future, contact the SHed Program Lead (IH so the list can be updated).

### Currently NOT Used

Following is a list of OSHA-regulated materials not currently used or found at GRC. If you are currently using or know of someone currently using any of these materials, SHed Program Lead IH shall be notified.

- 2-Acetylaminofluorene
- Acrylonitrile
- 4-Aminodiphenyl
- Benzidine
- 1,3-Butadiene
- bis-Chloromethyl ether
- Coal tar pitch volatiles
- Coke oven emissions
- Cotton dust
- 1,2,-dibromo-3-chloropropane
- 3,3-Dichlorobenzidine (and its salts)
- 4-Dimethylaminoazobenzene
- Ethyleneimine
- Ethylene oxide
- Methyl chloromethyl ether
- alpha-Naphthylamine
- beta-Naphthylamine
- 4-Nitrobiphenyl
- N-Nitrosodimethylamine
- beta-Propiolactone
- Vinyl chloride

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### APPENDIX C.—REGULATORY REQUIREMENTS

Requirements	ARSENIC, INORGANIC	BENZENE
PEL//AL	10 ug/m <sup>3</sup> // 5 ug/m <sup>3</sup> 8-hr. TWA	1 ppm//0.5 ppm 8-hr. TWA, 5 ppm STEL; <b>NASA = 0.5 ppm TWA, 2.5 ppm STEL (skin)</b>
Monitoring	<AL = none >AL but <PEL = 6 mo >PEL = 3 mo (until 2 consecutive results 7 days apart <AL) or when process changes	<AL & STEL = none >AL but <PEL = annually >PEL = 6 mo (until 2 consecutive results 7 days apart <AL) Spills, ruptures, changes
Notification, no. of working days	15	15
Regulated area	>PEL, signs required	>PEL, signs required
Compliance methods	Engineering, local exhaust PPE Good handling and housekeeping	Engineering, local exhaust PPE Good handling and housekeeping
Compliance program	>PEL, written plan	>PEL, written plan
Respirators	Interim control	Interim control
Medical surveillance	>AL 30 days or more/yr (are or will be) >AL 30 days or more/yr previously for 10 yrs.	≥AL 30 days or more/yr ≥PEL 10 days or more/yr >10 ppm 30 days or more/yr in a prior yr
Medical removal	Not specified	If medically required, full protection
Signs	DANGER INORGANIC ARSENIC, CANCER HAZARD AUTHORIZED PERSONNEL ONLY NO SMOKING OR EATING RESPIRATOR REQUIRED	DANGER BENZENE CANCER HAZARD FLAMMABLE - NO SMOKING AUTHORIZED PERSONNEL ONLY
Labels	DANGER CONTAINS INORGANIC ARSENIC CANCER HAZARD HARMFUL IF INHALED OR SWALLOWED USE ONLY WITH ADEQUATE VENTILATION OR RESPIRATORY PROTECTION	DANGER CONTAINS BENZENE CANCER HAZARD
MSDS	Provide	Provide
Information and training	Initial and annually if >AL	Initial and annually if >AL
Recordkeeping		
Exposure	Exposure monitoring, MSDS, PPE	30 yr including all pertinent data
Medical	All medical (the longer of 40 yr or employment + 20 yr) and laboratory techniques	30 yr + employment
Transfer of records	To Director of OSHA if no receiver	To Director of OSHA if no successor
Observation of monitoring	Affected employee or their representative; PPE to be provided	Affected employee or their representative; PPE to be provided
Comments		

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Requirements	CADMIUM	FORMALDEHYDE
PEL//AL	5 ug/m <sup>3</sup> // 2.5 ug/m <sup>3</sup> NASA = 2.0 ug/m <sup>3</sup> , respirable	0.75 ppm//0.5 ppm; 2 ppm STEL NASA = 0.3 ppm (ceiling) (sensitizer)
Monitoring	<AL = none >AL but <PEL = annually >PEL = 6 mo (until 2 consecutive results 7 days apart <AL)	<AL and STEL = none ≥AL = 6 mo ≥STEL = annually (until 2 consecutive results 7 days apart <AL and STEL) When process changes
Notification, no. of working days	15	15
Regulated area	>PEL, signs required	>PEL, signs required
Compliance methods	Engineering, local exhaust PPE Good handling and housekeeping	Engineering, local exhaust PPE Good handling and housekeeping Eyewash and safety showers if >0.1% formaldehyde
Compliance program	>PEL, written plan	>PEL, written plan
Respirators	Interim control	Interim control
Medical surveillance	≥AL 30 days or more/yr Previously exposed for ≥60 mo	≥AL or STEL or NASA ceiling limit Emergencies Those with signs and symptoms
Medical removal	If medically required, full protection	Not specified
Signs	DANGER CADMIUM CANCER HAZARD CAN CAUSE LUNG AND KIDNEY DISEASE AUTHORIZED PERSONNEL ONLY RESPIRATORS MAY BE REQUIRED IN THIS AREA	DANGER FORMALDEHYDE IRRITANT AND POTENTIAL CANCER HAZARD AUTHORIZED PERSONNEL ONLY
Labels	DANGER CONTAINS CADMIUM CANCER HAZARD AVOID CREATING DUST CAN CAUSE LUNG AND KIDNEY DISEASE	DANGER FORMALDEHYDE IRRITANT AND POTENTIAL CANCER HAZARD AUTHORIZED PERSONNEL ONLY
MSDS	Provide	Provide
Information and training	Initial and annually if >AL	Initial and annually if >AL; if < 0.1 ppm, no training required
Recordkeeping		
Exposure	30 yr including all pertinent data	30 yr. including all pertinent data (MSDS, PPE, fit tests, etc.)
Medical	30 yr + employment	30 yr. + employment
Training	1 yr from date of training	Not specified
Transfer of records	To Director if no successor	To Director of OSHA if no receiver
Observation of monitoring	Affected employee or their representative; PPE to be provided	Affected employee or their representative; PPE to be provided
Comments	Cadmium used restricted to certain uses; contact OHB	

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Requirements	METHYLENE CHLORIDE	METHYLENE DIANILINE (MDA)
PEL//AL	25 ppm/12.5 ppm; 125 STEL	10 ppb/5 ppb 8-hr TWA; 100 ppb STEL (skin)
Monitoring	<AL and ≤STEL = none <AL but > STEL = STEL every 3 mo ≥AL, but ≤TWA and ≤STEL =TWA every 6 mo ≥AL, but ≤TWA and >STEL =TWA every 6 mo; STEL every 3 mo >TWA but ≤STEL = TWA every 3 mo >TWA and >STEL = TWA and STEL every 3 mo (until 2 consecutive results 7 days apart <AL and STEL) Process changes Spills, ruptures, changes	<AL = none; ≥AL but ≤PEL = 6 mo >PEL = 3 mo (until 2 consecutive results 7 days apart <AL) When process or work practices change Shall visually monitor workers for dermal contamination
Notification, no. of working days	15	15
Regulated area	>PEL, signs required	>PEL and potential dermal exposure, signs required
Compliance methods	Engineering, local exhaust PPE Good handling and housekeeping Control sources of ignition Fire extinguishers and training	Engineering, local exhaust PPE Good handling and housekeeping No dermal contact No job rotation to reduce exposure
Compliance program	>PEL, written plan	>PEL, written plan
Respirators	Interim control	Interim control; HEPA and OV (when liquid or heat is involved)
Medical surveillance	≥AL 30 days or more ≥PEL or STEL 10 or more days/yr >PEL or STEL for any time if cardiac or other MC-related health issues Emergencies	≥AL 30 days or more/yr. Subject to dermal exposure ≥15 days/yr Emergencies Those suspected of dermal exposure Those with signs and symptoms
Medical removal	If medically required, full protection	
Signs	DANGER METHYLENE CHLORIDE POTENTIAL CANCER HAZARD AUTHORIZED PERSONNEL ONLY RESPIRATOR REQUIRED	DANGER METHYLENEDIANILINE MAY CAUSE CANCER LIVER TOXIN AUTHORIZED PERSONNEL ONLY RESPIRATORS AND PROTECTIVE CLOTHING MAY BE REQUIRED TO BE WORN IN THIS AREA
Labels	DANGER CONTAINS BENZENE CANCER HAZARD	DANGER CONTAINS MDA MAY CAUSE CANCER LIVER TOXIN
MSDS	Provide	Provide
Information and training	Initial and annually if >AL	Initial and annually if >AL
Recordkeeping		
Exposure	30 yr including all pertinent data	30 yr including all pertinent data
Medical	30 yr + employment	30 yr + employment
Transfer of records	To Director if no successor	To Director if no successor
Observation of monitoring	Affected employee or their representative; PPE to be provided	Affected employee or their representative; PPE to be

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	provided
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Requirements	HEXAVALENT CHROMIUM
PEL//AL	0.005 mg/m <sup>3</sup> (5 ug/m <sup>3</sup> )
Monitoring	<AL = none ≥AL but ≤PEL = 6 mo >PEL = 3 mo (until 2 consecutive results 7 days apart <AL) or when process changes or reason to suspect exposure >AL
Notification	15 working days
Regulated area	>PEL or reasonably expected to be; signs required
Compliance methods	Engineering, local exhaust Work practices Painting aircraft or large aircraft parts; <25 ug/m <sup>3</sup> if feasible Does not apply if ≤PEL for 30 days/yr PPE Good handling/housekeeping No job rotation
Compliance program	Not applicable
Respirators	Interim control
Medical surveillance	≥AL 30 days or more/yr (are or will be) Signs and symptoms Emergencies
Medical removal	Not specified
Signs	(As required by HazCom Standard)
Labels	
MSDS	Provide
Information and training	Contents of standard Purpose and description of medical surveillance program (plus HazCom)
Recordkeeping	Exposure monitoring, historical data, objective data, and medical surveillance
Transfer of records	Not listed
Observation of monitoring	Not listed
Comments	This is a performance standard.

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