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# COMPLIANCE MANUAL

for

## Indiana's Fiber Reinforced Plastics Manufacturers

**Featuring...**

- ✓ **IDEM regulations**
- ✓ **IOSHA regulations**
- ✓ **U.S. DOT regulations**
- ✓ **Indiana Fire Code regulations**
- ✓ **Pollution prevention &  
waste minimization recommendations**

**Published by the**

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
Compliance and Technical Assistance Program**

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[MANUFACTURING OPERATIONS SCHEMATIC](#)



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# Table of Contents

(use your mouse to click on the chapter you wish to view)

## CHAPTERS

CHAPTER 1: INTRODUCTION.....	9
CHAPTER 2: RECEIVING .....	15
CHAPTER 3: RAW MATERIALS STORAGE .....	17
CHAPTER 4: RAW MATERIALS TRANSFER (PIPES) .....	26
CHAPTER 5: GEL/RESIN COAT AND PAINT COATING MIXING.....	28
CHAPTER 6: GEL COAT AND RESIN/GLASS APPLICATION.....	36
CHAPTER 7: PAINT COATING APPLICATION .....	42
CHAPTER 8: CURING/DRYING .....	52
CHAPTER 9: POST-MOLD DEFLASH AND SECONDARY OPERATIONS.....	54
CHAPTER 10: DUST COLLECTION.....	58
CHAPTER 11: HYDROTESTING .....	60
CHAPTER 12: PRODUCT PACKING/SHIPPING.....	62
CHAPTER 13: SOLID WASTE STORAGE/SHIPPING .....	66
CHAPTER 14: LIQUID WASTE STORAGE/SHIPPING .....	72

## APPENDIX

AIR PERMITTING.....	86
RCRA CONTINGENCY PLAN.....	112
NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES).....	118
SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN.....	126
WELLHEAD PROTECTION.....	130
DRINKING WATER REGULATIONS .....	132
ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS .....	134
RECORDKEEPING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES.....	136

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<b>RESPIRATORY PROTECTION .....</b>	<b>138</b>
<b>HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (“HAZWOPER”) .....</b>	<b>140</b>
<b>LOCKOUT/TAGOUT PROGRAM .....</b>	<b>142</b>
<b>CONFINED SPACE ENTRY .....</b>	<b>146</b>
<b>FIRE PROTECTION.....</b>	<b>148</b>
<b>OCCUPATIONAL NOISE EXPOSURE .....</b>	<b>150</b>
<b>EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN.....</b>	<b>152</b>
<b>THE HAZARD COMMUNICATION STANDARD.....</b>	<b>156</b>
<b>ERGONOMICS PROGRAM STANDARD (PROPOSED).....</b>	<b>160</b>
<b>BLOODBORNE PATHOGENS.....</b>	<b>162</b>
<b>TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS.....</b>	<b>170</b>
<b>DEMOLITION AND RENOVATION: ASBESTOS.....</b>	<b>172</b>
<b>INDIANA STYRENE RULE.....</b>	<b>178</b>
<b>MANUFACTURING OPERATIONS SCHEMATIC .....</b>	<b>180</b>

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*For assistance, contact CTAP or the appropriate office or agency listed in Chapter 1 of this manual.*

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# NOTICE

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## REFERENCES

Many original and secondary sources have been used in compiling guidance for this manual. Attribution is given to the source where lengthy sections are quoted verbatim or paraphrased. Included in these sources are the following:

- Interagency Regulatory Analysis Committee, King County, Seattle, Washington, "Spray Coating Operations: An Informational Summary of Regulatory Guidelines for King County, Washington" (October 1996)
- Minnesota Pollution Control Agency and University of Minnesota, School of Public Health, various documents, including "Basic Hazardous Waste Requirements for Business," Safety Basics for Manufacturing Industries in Minnesota" (undated)
- North Carolina Department of Environment, Health and Natural Resources, Office of Waste Reduction, "Waste Reduction: Strategies for Fiberglass Fabricators""(David R. Hillis, A. Darryl David, authors) (undated)
- North Carolina Division of Pollution Prevention and Environmental Assistance, "Establishing Waste Reduction Benchmarks and Good Manufacturing Practice for Open Mold Laminating" (David R. Hillis, author) (undated)
- Northwest Pollution Prevention Resource Center, "Fiberglass Fabrication Industry, Northwest Pollution Prevention and Regulatory Perspectives"
- Northwest Pollution Prevention Resource Center, "Fiberglass Industry Regulatory Issues"
- State of Washington, Department of Ecology, "A Guide for Fiberglass Operations"
- U.S. DOT, various publications, reports and web site documents
- U.S. EPA, various publications, reports and web site documents
- U.S. OSHA, various publications, reports and web site documents

Other information for this manual was obtained through meetings, seminars, on-site visits and telephone discussions with manufacturers and their suppliers and vendors. The authors appreciate the contributions of all from whom information was solicited.

## ACRONYMS

Btu	British Thermal Unit	MSDS	Material Safety Data Sheet
BuSET	Bureau of Safety Education and Training (part of the Indiana Dept. of Labor)	NESHAP	National Emissions Standards for Hazardous Air Pollutants
CTAP	Compliance and Technical Assistance Program (part of IDEM)	NPDES	National Pollution Discharge Elimination System
CESQG	Conditionally Exempt Small Quantity Generator	NRC	National Response Center
CFR	Code of Federal Regulations	OAQ	Office of Air Quality (IDEM)
CWA	Clean Water Act	OSHA	Occupational Safety and Health Administration
DOT	Department of Transportation (Federal agency)	OLQ	Office of Land Quality (IDEM)
EPA	Environmental Protection Agency	OWQ	Office of Water Quality (IDEM)
EPCRA	Emergency Preparedness & Community Right to Know Act	P2	Pollution Prevention
FRP	Fiber Reinforced Plastics	PPE	Personal Protective Equipment
HAP	Hazardous Air Pollutant	POTW	Publicly Owned Treatment Works
IC	Indiana Code	PVC	Polyvinyl Chloride
IDEM	Indiana Department of Environmental Management	PWSS	Public Water Supply System
IOSHA	Indiana Occupational Safety and Health Administration		
LDR	Land Disposal Restrictions		
LEPC	Local Emergency Planning Committee		
LQG	Large Quantity Generator		



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# CHAPTER 1: INTRODUCTION

## 1.1 FRP Manufacturers & the Environment

Protecting the health of Indiana citizens and the quality of our land, air and water is everyone's responsibility. This responsibility is especially important for organizations in our communities that handle chemicals that are harmful to human health or the environment. Because the owners and operators of Fiber Reinforced Plastics (FRP) manufacturing facilities deal with hazardous chemicals every day, they are often on the front line of caring for the environment and the health of their employees and the surrounding community. When handled properly, hazardous chemicals can be used safely, minimizing the health and safety risk for workers and surrounding neighbors.

The Indiana Department of Environmental Management is mandated to protect public health and the environment for the State. In fulfilling its responsibility, IDEM works to establish effective regulations and then implement and enforce those regulations. IDEM encourages business and industry to implement pollution prevention and waste minimization practices. By preventing pollution, companies can gain operating flexibility, avoid civil liability, and avoid the regulatory burdens of treatment and disposal because the waste is reduced or simply not generated in the first place.

## 1.2 IDEM's New Approach to Regulation

As IDEM strives to meet its mandates, its approach to environmental protection in recent years has fundamentally changed. It is complementing its traditional approach of command and control for environmental regulations with approaches that include the aggressive use of education, partnerships, and incentives. A key step in this effort was the creation of the Compliance and Technical Assistance Program (CTAP) in 1994 by the Indiana General Assembly and Governor Bayh. CTAP has grown into an innovative program that has been recognized as a national leader in small business assistance.

### **IDEM identified the FRP manufacturing industry for this manual because:**

- there are too many businesses in this industry to effectively regulate them with a traditional command and control approach;
- although the environmental impact of each facility may be relatively minor, the industry as a whole has a profound environmental impact;
- the industry generally uses a standard set of operations;
- the chemicals and pollutants from the industry are environmental priorities for IDEM, consistent with the Environmental Performance Partnership Agreement that IDEM has with the United States Environmental Protection Agency, and
- the industry is represented by a number of associations that will effectively partner with IDEM to implement this project.

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### 1.3 Who Should Use this Manual?

This manual is intended for owners and operators of FRP and boat manufacturing facilities that do business in Indiana. The compliance requirements for these manufacturers depend on the number of people employed, the type of operations performed, the geographic location of the shop, and the type and volume of emissions and waste generated.

### 1.4 The Benefits of Using this Manual

By implementing pollution prevention techniques, recycling products that would otherwise be considered a hazardous waste, and, by following the regulations you can reduce the amount of emissions and wastes generated. This also means you can:

- reduce disposal costs;
- improve your market by promoting a positive environmental image to customers;
- improve worker productivity;
- decrease worker exposure to chemical hazards in the workplace, and
- reduce your financial and civil liability.

Be aware that both the owner and manager of a FRP manufacturing facility share responsibility and financial liability for all environmental violations that may occur. If there is an intentional violation, or if the owner or manager knew of a past violation that was not disclosed, both may be criminally liable.

### 1.5 How to Use this Manual

This compliance manual is organized according to the distinct operations involved in manufacturing FRP components. There are many regulations issued by federal EPA and OSHA and their Indiana counterparts, as well as the U.S. DOT and the Indiana Department of Fire and Building Services that govern manufacturing operations.

There are two categories of regulations referenced in this manual:

- **Operation-specific regulations** - those that affect, directly, the normal conduct of an operation involved in manufacturing a product (e.g., OSHA machine guarding regulations govern the operation and use of production equipment and machines).
- **Facility-wide regulations** - those that affect (1) some aspect of the operation, or (2) a result or a byproduct of the operation, or (3) an unforeseen consequence (like an emergency) of the operation. The recognition of the relevance of these regulations, usually, is expressed through a facility-wide permit, plan or other document which references all similar facility operations to which the conditions in (1) - (3), above, may pertain. For example, RCRA regulations apply to the management of waste at the point of generation in satellite storage containers, the storage of waste in the

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accumulation area and the facility response to spills/releases of waste from containers. These “facility-wide” regulations -- unlike the “operation-specific” regulations -- pertain to various operations or types of operations, not just one or one type.

The organization of this manual follows the [MANUFACTURING OPERATIONS SCHEMATIC](#) . Users of the electronic version of this manual will only have to “point and click” on the “box” of interest to access the pertinent chapter of the manual containing the regulations and codes affecting that operation. These users will also be able to "point and click" to any regulatory citation underlined in the manual to gain access to the complete text of the regulation. Users cannot, however, access electronically the 1998 Indiana Fire Code, which adopts and modifies, where necessary, the Uniform Fire Code. Only changes to the Uniform Fire Code specific to the State of Indiana can be found at 675 IAC 22-2.2. The 1998 Indiana Fire Code can be purchased through the Department. It is also available in the reference section of many public libraries, and local fire departments may have it to borrow or reference.

Throughout this manual, we use the word “you” to mean the owner, operator, or manager of a wood products manufacturing facility. In each Chapter of the manual, there is a list of the things that:

- **YOU MUST** do in order to be in compliance;
- **YOU SHOULD** do in order to improve the environmental health of your shop;
- **YOU SHOULD CONSIDER** in order to make these improvements.

The list of options to consider typically involves up-front costs and/or innovative technology. Please pay special attention to the lists as you read through or refer back to this manual.

## 1.6 IDEM’s On-Line Permit Guide

[www.state.in.us/idem/guides/permit](http://www.state.in.us/idem/guides/permit)

The Indiana Department of Environmental Management’s Internet-Based Permit Guide is available on-line. This site provides the most accurate and current information available for permit assistance and compliance issues. From site and business development to environmental permitting, this new site puts the latest information at your fingertips. Businesses, local governments, state agencies and interested citizens can all use this new site.

The new site is easy to navigate. You can reach it from IDEM’s home page, or by going directly to the site.

The on-line guide has six sections:

- *About This Guide:* Provides an overview of the guide, its purpose and how it can help you.
- *Land Development and New Activities:* This section has significant importance to new businesses and other organizations that are developing new facilities.
- *Air Emissions-Related Issues:* Helps determine if you will be a regulated source of air emissions.

- 
- *Water-Related Issues:* Provides information on permitting for water usage as well as wastewater discharges.
  - *Waste Handling and Disposal Issues:* Identifies disposal options for your business or regulated activity.
  - *Other Non-IDEM Approval Issues:* Provides useful links and information about issues that other agencies may regulate.

Visitors to the site will be able to use these other key features:

- Direct links to other web sites and key documents, including the Environmental Protection Agency, Indiana Department of Natural Resources, Indiana Department of Commerce and Indiana Department of Transportation web sites.
- Links to guidance documents, rules and statutes, and permit applications.
- A search function that allows users to quickly find the information they need.
- What's New - a current listing of recent additions to the site.
- A name, phone and e-mail list for IDEM permitting contacts.
- A comments section - the chance to tell us what you think of the site or ask questions.

For more information on the web site or any other permit needs, call: David Parry at IDEM, 317/233-4638, or Melanie Darke at the Indiana Department of Commerce, 317/232-8926. Visit the IDEM home page at: [www.state.in.us/idem](http://www.state.in.us/idem). Visit the IDOC home page at: [www.indianacommerce.com](http://www.indianacommerce.com).

## 1.7 Fax-on-Demand System

### **Fax-on-Demand 800/726-8000**

For the IDEM Fax-on-Demand Directory call Fax-on-Demand and ask for document # 8000 or check the web at [www.state.in.us/idem/fod/index.pdf](http://www.state.in.us/idem/fod/index.pdf).

The Fax-on-Demand System is a statewide fax service managed by the Small Business Development Center. This system provides 24-hour access to numerous environmental compliance and technical documents, fact sheets, rules, vendor lists and more. All that you need is a touch-tone phone and a fax machine to use this service. Simply call 800/726-8000 and, when prompted, enter the access code of the document you wish to receive and your fax machine's number. You may request up to three documents per call. If you have questions or difficulty receiving your order, call (800) 988-7901.

**Note:** Information available via the Fax-On-Demand is generally also available on the Internet. Visit IDEM Online at: [www.state.in.us/idem](http://www.state.in.us/idem).

## 1.8 Who to Call for Assistance

If you have questions or need compliance assistance, please contact the appropriate office within IDEM or the appropriate regulatory agency. Keep in mind that CTAP offers confidentiality, but the regulatory program areas of IDEM and the other listed regulatory agencies **do not**.

- 
- **IDEM's Compliance & Technical Assistance Program (CTAP)**  
800/988-7901 or 317/232-8172 [www.state.in.us/idem/ctap/](http://www.state.in.us/idem/ctap/)
    - Northern Regional Office 219/245-4879 or 800/753-5519 ext. 4879
    - Northwest Regional Office 219/881-6720 or 888/209-8892 ext. 6720
    - Southern Indiana Office 812/952-1144
    - Southwest Regional Office 812/436-2583 or 888/627-8323 ext. 2583
  
  - **IDEM's Office of Air Quality (OAQ)**  
800/451-6027, ext. 3-0178 or 317/233-1078 [www.state.in.us/idem/oam](http://www.state.in.us/idem/oam)
  
  - **IDEM's Office of Land Quality (OLQ)**  
800/451-6027 ext. 2-8941 or 317/232-8941 [www.state.in.us/idem/olq](http://www.state.in.us/idem/olq)
  
  - **IDEM's Office of Water Quality (OWQ)**  
800/451-6027 or 317/232-8670 [www.state.in.us/idem/owm](http://www.state.in.us/idem/owm)
  
  - **IDEM's Spill 24-Hour Emergency Hotline**  
317/233-7745 local and out-of-state or 888/233-7745 statewide (toll free)
  
  - **Fax-on-Demand System**  
800/726-8000 [www.state.in.us/idem/fod/index.pdf](http://www.state.in.us/idem/fod/index.pdf)  
Document #8000 (IDEM Comprehensive Directory)
  
  - **National Response Center**  
800/424-8802 [www.nrc.uscg.mil](http://www.nrc.uscg.mil)
  
  - **EPA Ozone Protection Hotline**  
800/296-1996
  
  - **RCRA Hotline (EPA's Hazardous Waste Information Line)**  
800/424-9346 [www.epa.gov/epaoswer/hotline/](http://www.epa.gov/epaoswer/hotline/)
  
  - **Department of Fire & Building Services (State Fire Marshal)**  
317/232-2222 [www.state.in.us/sema/dfbs.html](http://www.state.in.us/sema/dfbs.html)  
  
Plan Review Division: 317/232-1431  
Inspection Division: 317/232-2228
  
  - **Indiana OSHA's Bureau of Safety Education and Training (BuSET)**  
317/232-2688 [www.state.in.us/labor/busets/buset.html](http://www.state.in.us/labor/busets/buset.html)
  
  - **Indiana Clean Manufacturing Technology and Safe Materials Institute**  
765/463-4749 [www.ecn.purdue.edu/CMTI](http://www.ecn.purdue.edu/CMTI)

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- **U.S. Department of Transportation**  
202/366-1111 [www.dot.gov](http://www.dot.gov)
  - **Local Health Departments**  
[www.state.in.us/isdh/links/local\\_dep/index.html](http://www.state.in.us/isdh/links/local_dep/index.html)
  - **Publicly Owned Treatment Works (POTW)**  
(Local Wastewater Treatment Plant)  
*Refer to the Fax-on-Demand directory for a listing of the 46 POTWs with approved wastewater treatment programs. To obtain information on POTWs that are privately owned, contact the Office of Water Quality.*
  - **Solid Waste Management Districts**  
[www.state.in.us/idep/oppta/recycling/SWMDpage.html](http://www.state.in.us/idep/oppta/recycling/SWMDpage.html)

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## CHAPTER 2: RECEIVING

The Receiving area of your facility may be a warehouse, loading dock or some other designated location.

The Receiving area, for many small facilities, “receives” everything shipped to the plant, including raw materials for production, some of which may be hazardous. And these hazardous materials may be contained in totes, drums, 5-gallon buckets, smaller containers of 1 gallon or less and cardboard cartons of individual containers, including aerosol spray containers.

It is assumed that all facility employees receive Hazard Communication training ([29 CFR 1910.1200](#)). Employees working in Receiving areas, in addition, are required to receive Hazmat employee training ([49 CFR 172.704](#)) if they **unload** or help unload the shipments of hazardous materials or **handle** the hazardous materials.

Recognizing that it is practically impossible to work in a Receiving area without, in some way, assisting in the unloading of hazardous materials or handling (moving, carrying, dollying, stacking, etc.) containers of hazardous materials, you need to recognize and follow the requirements of the U.S. Department of Transportation regulations. Therefore:

### **You Must**

- ensure that affected personnel are trained according to the requirements of [49 CFR 172.704](#) [Note: 49 CFR 172.704(b) allows employee training conducted according to the requirements of [29 CFR 1910.120](#) (OSHA “Hazwoper” training) to satisfy this requirement]

### **You Should**

- observe and follow safety precautions to protect employees and the environment, including:
  - thoroughly inspect each container of hazardous materials received for damage and leaks
  - immediately report any damaged or leaking containers to the proper facility manager
  - implement the emergency procedures required at the facility to prevent leaked contents from spreading

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [SPILL PREVENTION CONTROL AND COUNTERMEASURES \(SPCC\) PLAN](#)
- ✓ [HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE \(“HAZWOPER”\)](#)
- ✓ [ERGONOMICS PROGRAM STANDARD \(PROPOSED\)](#)
- ✓ [TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS](#)





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## CHAPTER 3: RAW MATERIALS STORAGE

Raw Materials Storage refers to an indoor or outdoor area or location where hazardous materials are stored in above ground containers, such as drums, totes or tanks, or in smaller containers. Typically, bulk containers include portable (movable) totes and stationary tanks and silos (for solid hazardous materials) from which hazardous materials are transferred to smaller containers or directly to production processes via piping systems or manual or electric pumps. The term “container” is **not** used here to include highway or rail cargo tanks, the large “tank farm” type of storage tanks, or underground storage tanks.

### 3.1 Indiana Fire Code Regulations

Regulations of various government agencies -- including regulations that incorporate safety codes of private organizations -- affect Raw Materials Storage. First, you need to know about the 1998 Indiana Fire Code. To be in compliance with the 1998 Indiana Fire Code:

#### **You Must**

- maintain your storage containers, tanks, etc., according to the rules of the Fire Prevention and Building Safety Commission that were in effect when the container, tank, etc., was installed
- post warning signs for flammable liquids in locations designated by the fire inspection authority (state and/or local), including signs for hazardous waste, if it is classified as a flammable liquid [§7901.9.3]
- label or placard tanks over 100 gallons permanently installed or mounted and used for storage of Class I, II or III-A flammable or combustible liquids<sup>1</sup> [§7902.1.3.2]
- locate vent pipe outlets for tanks storing Class I, II or III-A liquids such that the vapors are released at a safe point outside of buildings and not less than 12 feet above the adjacent ground level ... and at least 5 feet from building openings or property lines [§7902.1.11.4]
- place visible hazard identification signs as specified in NFPA 704M on stationary above ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled [§8001.7]
- provide secondary containment for outdoor storage areas to contain a spill from the largest individual vessel. If the area is open to rainfall, the secondary containment shall include the volume of a 25 year - 24 hour storm. [§8003.1.3.3]

**There are many other requirements, some of which apply only to new construction or addition. You are advised to consult with the local fire department, a design professional, a fire code consultant or the Indiana Department of Fire and Building Services, Office of the State Fire Marshal (317-232-2222).**

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<sup>1</sup> The National Fire Protection Association (NFPA) Standard 704M (1996 edition) is adopted by the 1998 Indiana Fire Code.

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## 3.2 OSHA Regulations

There are also OSHA regulations, adopted by Indiana, which pertain to the storage of flammable and combustible materials. Most of these requirements are similar to the 1998 Indiana Fire Code; however, each facility may present exceptions where one or another rule would have precedent, or where seeming conflicts might exist. For example, the OSHA Hazard Communication Standard [[29 CFR 1910.1200\(f\)\(5\)](#)] requires that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the identity of the chemical and the appropriate hazard warning.

### Labeling

There are, then, two distinct requirements -- 1998 Indiana Fire Code's and OSHA's -- for labeling storage tanks of flammable liquids. You are advised to affix **both** the proper NFPA-704M sign and, for example, a Hazardous Materials Information System (HMIS) label to each bulk tank storing flammable liquids.

If you have questions about the similarity of the two regulations, you can check the OSHA regulations at [29 CFR 1910.106](#) and [29 CFR 1910.107\(e\)](#).

Also, facilities that receive containers of hazardous materials required to be marked, labeled or placarded in accordance with the U.S. Department of Transportation's Hazardous Materials Regulations [[49 CFR 172](#)] must **not** remove those markings until the container is empty, cleaned of residue and purged of **vapors** to remove any potential hazards.

**If you still have questions, call:**

**Indiana OSHA  
Bureau of Safety, Education and Training (BUSET)  
317-232-2688**

### You Should Consider

- other resin storage systems, if applicable, such as -
  - drums with disposable liners
  - a bulk or mini-bulk resin storage system to eliminate the problems of inventory, temperature control, space consumption, handling and disposal associated with drum storage
- regularly performing QA/QC procedures to avoid "off-spec" material
- order raw materials matched to production orders to avoid loss of "shelf-life" of unused or infrequently used materials

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There are few U.S. EPA regulations that pertain to bulk storage tanks containing raw materials, whether hazardous or not. [See [CHAPTER 14: LIQUID WASTE STORAGE/SHIPPING](#), concerning tank storage of hazardous waste].

### 3.3 Storage of Organic Peroxides

Organic peroxide catalysts must be highly reactive in order to perform their function of initiating polymerization and cure. This high reactivity, however, means that MEKP (methyl ethyl ketone peroxide) and the other organic peroxides found in fiberglass fabrication must be stored and handled most carefully. Among other conditions, catalysts must be stored away from heat and sunlight, usually in controlled temperatures. Their vapors are very flammable. If the auto ignition temperature is reached, there may be an explosion without a fire beforehand. Finally, the decomposition of organic peroxides can be accelerated by contamination with chemicals and heavy metals. Cobalt and amine accelerators used in fiberglass fabrication should be added separately to resin batches and never come in contact with organic peroxides directly. For this reason, masonry diked storage buildings are located away from the operations area of a fiberglass fabrication plant.<sup>2</sup>

The National Fire Protection Association (NFPA) Standard 432 (previously 43B)<sup>3</sup> classifies organic peroxide formulations according to test procedures described in “United Nations Recommendation on Transportation of Dangerous Goods, Tests and Criteria,” and it is based on the behavior of these formulations in their U.S. Department of Transportation-approved shipping containers and under conditions of fire exposure. This classification system may comport only **coincidentally**, in some cases, with that used for classifying the flammability or combustibility of liquid hazardous materials. The 5 classes and their definitions are as follows:

- **Class I** are those formulations that are capable of deflagration but not detonation.
- **Class II** are those formulations that burn very rapidly and that present a severe reactivity hazard.
- **Class III** are those formulations that burn rapidly and that present a moderate reactivity hazard.
- **Class IV** are those formulations that burn in the same manner as ordinary combustibles and that present a minimum reactivity hazard.
- **Class V** are those formulations that do not burn and that present no decomposition hazard.

The 1998 Indiana Fire Code, in Section 8003.7, sets forth rules governing the storage of organic peroxides. The following Tables combine information from Tables 8001.15-A and 8001.15-C of the 1998 Indiana Fire Code with Tables 2-10(a) and 2-10(b) of the NFPA Standard 432 pertaining to the limitations on storage of organic peroxides.

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<sup>2</sup> CFA Regulation Compliance Manual, 3<sup>rd</sup> ed., Fall 1994, Copyright 1994 Composites Fabricators Association, p.1.3.6.

<sup>3</sup> Not yet adopted as part of the Indiana Fire Code.

## Exempt Amounts

	Non-sprinklered Building		Sprinklered Building		Approved Storage <sup>4</sup> In Sprinklered Bldg.	
<u>Class</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>
I	5	½	10	1	20	2
II	50	5	100	10	200	20
III	125	12 ½	250	25	500	50
IV	500	60	1000	100	2000	200
V	N.L. <sup>5</sup>	N.L.	N.L.	N.L.	N.L.	N.L.

## Maximum Allowable Quantities

### Non-Sprinklered Buildings

	Segregated Storage		Cut-off Storage		Detached Storage (50' Separation) <sup>6</sup>	
<u>Class</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>
I	N/A <sup>7</sup>	N/A	N/A	N/A	1,000	100
II	N/A	N/A	2,000	200	20,000	2,000
III	1,500	150	3,000	300	70,000	7,000
IV	100,000	10,000	200,000	20,000	300,000	30,000
V	N.L.		N.L.		N.L.	N.L.

## Maximum Allowable Quantities Sprinklered Buildings

	Segregated Storage		Cut-off Storage		Detached Storage (50' Separation) <sup>6</sup>	
<u>Class</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>	<u>Pounds</u>	<u>Gallons</u>
I	N/A	N/A	2,000	200	2,000	200
II	4,000	400	50,000	5,000	100,000	10,000
III	50,000	5,000	100,000	10,000	200,000	20,000
IV	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
V	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.

4 Approved storage includes approved storage cabinets, gas cabinets or exhausted enclosures

5 N.L. – Not Limited

6 Tables 2-10(a) and 2-10(b) of NFPA 432 also provide maximum allowable quantities for minimum separation distances of 100 feet and 150 feet. "Minimum separation means the distance from the line of property that is or can be built upon, including the opposite side of a public way, or the distance from the nearest important building on the same property." [NFPA 432, Table 2-10(a) and (b)]

7 N/A – Not Allowed

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**Segregated Storage**, as defined in NFPA 432, 1.7, refers to storage in the same room or inside area(s), but physically separated by distance from, incompatible materials.

**Cut-off Storage** refers to storage in the same building or inside area(s), but physically separated from, incompatible materials by partitions or walls.

**Detached Storage**, according to NFPA 432, refers to storage in either an open outside area or a separate building containing no incompatible materials and located away from all other structures.

The most common organic peroxide used by FRP manufacturers, Methyl Ethyl Ketone Peroxide (MEKP), is a **Class III** formulation. Using the preceding tables, you can determine that:

- up to 12.5 gallons in a non-sprinklered building, up to 25 gallons in a sprinklered building and up to 50 gallons in approved storage in a sprinklered building is **exempt** from the provisions of the 1998 Indiana Fire Code
- in non-sprinklered buildings, up to 150 gallons can be stored in the same building with incompatibles segregated by space, up to 300 gallons can be stored separated by partitions or walls and up to 7,000 gallons can be stored in a detached structure
- in sprinklered buildings, these amounts are 5,000, 10,000, and 20,000 gallons respectively for storage of a Class III organic peroxide

Following are other provisions of the 1998 Indiana Fire Code, Section 8003.7, pertaining to storage of organic peroxides:

- an approved supervised smoke detection system must be provided in rooms or areas where Class I, II, III or IV organic peroxides are stored [§8003.7.1.7]
- Class II and III organic peroxides can be stored in piles no greater than 10' wide and 8' high with a distance of 4' between piles and 4' to a combustible wall (or 2' to a non-combustible wall) [Table 8003.7-D] and -
  - containers and packages in storage areas must be closed
  - bulk storage must not be in piles or bins
  - minimum 2' clear space must be maintained between storage and uninsulated metal walls
  - 55-gallon drums must not be stored more than 1 drum high [§8003.7.1.8.2]
- Class I and II organic peroxides can only be stored on the ground floor. Class III organic peroxides must not be stored in basements [§8003.7.1.8.3]
- Organic peroxides must be stored in their original DOT shipping containers. During storage, care must be taken to prevent contamination [§8003.7.1.9]

### 3.4 Emergency Planning and Notification Requirements

Most facilities are aware of the Emergency Planning and Notification requirements [[40 CFR 355.10](#)] that derive from Sections 302 and 304 of the Emergency Planning and Community Right to Know Act of 1987. To comply with this regulation:

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### You Must

- notify the Local Emergency Planning Committee [LEPC] that your facility is subject to the emergency planning notification requirements if you have an amount of any **extremely hazardous substance** present at any one time at the facility that is equal to or exceeds the threshold planning quantity (TPQ)
- designate a facility emergency coordinator to participate in the local emergency planning process as a facility emergency response coordinator

### You Should

- check the content and volume [converted to pounds] of your bulk storage tanks and refer to the following citation to check the list of extremely hazardous substances and their TPQs

[40 CFR 355.10](#) Appendices A and B

Your tank and tote volumes, if they contain extremely hazardous substances in concentrations greater than **one percent by weight**, will contribute significantly to your facility's total amount present at any one time.

- actively participate in the programs of the LEPC to ensure that an emergency plan is prepared for your community, including your location
- cooperate with representatives of the LEPC and/or the local fire department, if they request a site visit to tour your facility or require additional information about the substances stored and used at your facility

## 3.5 Releases

The same Emergency Planning and Notification regulation, in [40 CFR 355.40](#), sets forth requirements for reporting releases when -

- there is a release of a CERCLA hazardous substance or an extremely hazardous substance that meets or exceeds the **Reportable Quantity** (RQ) for that substance, and
- the release could result in exposure to persons **outside** the boundaries of the facility.

To comply with the reporting or notification requirements for such releases:

### You Must

- immediately notify the LEPC and the Indiana Emergency Response Commission (IERC)

**THE IERC's EMERGENCY NUMBER IS:**

**1-800-669-7362**

- the notification must include:
  - the chemical name or identity of any substance involved in the release
  - an indication of whether the substance is an extremely hazardous substance

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- an estimate of the quantity of any such substance that was released into the environment
  - the time and duration of the release
  - the medium or media into which the release occurred
  - any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals
  - proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordination pursuant to the emergency plan)
  - the name and telephone number of the person or persons to be contacted for further information
- as soon as practicable after a release, submit a written follow-up emergency notice to the LEPC and IERC **updating the information specified above** and including additional information pertaining to:
- actions taken to respond to and contain the release
  - any known or anticipated acute or chronic health risks associated with the release, and
  - where appropriate, advice regarding medical attention necessary for exposed individuals

The list of CERCLA hazardous substances is found in [40 CFR 302.4](#).

### 3.6 Hazardous Chemical Reporting

Another EPA regulation derived from the Emergency Planning and Community Right to Act of 1987 [EPCRA] is the **Hazardous Chemical Reporting** requirement ([40 CFR 370.20](#)). You know these requirements as the “MSDS reporting” and “Inventory (Tier II) reporting” rules. To comply with the Hazardous Chemical Reporting rule:

#### You Must

- submit a copy of a Material Safety Data Sheet (MSDS) to the LEPC for any hazardous chemical present at your facility in a total amount equal to or greater than 10,000 pounds and for all extremely hazardous substances present at the facility in an amount equal to or greater than 500 pounds or the TPQ, whichever is less [**NOTE: a “hazardous chemical” is defined in [29 CFR 1910.1200\(c\)](#), the OSHA Hazard Communication Standard**]

A list of hazardous chemicals may be submitted rather than individual MSDSs. The list must contain the chemical or common name provided on the MSDS, the hazardous components of each chemical, and the chemical’s need to be grouped by hazard category, as defined in [29 CFR 1910.1200](#).

**NOTE: The Indiana Emergency Response Commission (IERC) publishes the “SARA Title III Reporting Booklet,” which provides guidance on the EPCRA reporting requirements discussed above. Copies can be obtained by writing to the**

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**IERC, 100 North Senate Avenue, P.O. Box 7024, Indianapolis, IN 46207-7024, or by faxing your request to 1-800-726-8000 for document numbers 8051 and 8171.**

- submit a Tier II form to the LEPC, the local fire department (if it isn't the "headquarters" of the LEPC) and the IERC by March 1 of each year, reporting hazardous chemicals present at the facility at any one time during the preceding calendar year in a total amount equal to or greater than 10,000 pounds, and extremely hazardous substances in a total amount equal to or greater than 500 pounds or the TRQ, whichever is less.

### 3.7 Toxic Chemical Release Reporting

The other EPA reporting requirement derived from EPCRA is the Toxic Chemical Release Reporting rule [40 CFR 372.22]. You know these reports as the "TRI" or Form R reports that have to be submitted to EPA and IDEM by July 1 of each year for the preceding calendar year. The reporting requirements are rather complex and, recently, there have been modifications to the requirements for small businesses and for certain toxic chemicals.

You can access TRI reporting guidance from the following sources:

**EPA's Toxics Release Inventory web-site:** <http://www.epa.gov/tri/>

**IDEM's OPPTA web-site:** <http://www.state.in.us/idem/oppta/index.html>

**For assistance call [IDEM]:** 317/233-6661

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#### Facility-Wide Regulations

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [SPILL PREVENTION CONTROL AND COUNTERMEASURES \(SPCC\) PLAN](#)
- ✓ [CONFINED SPACE ENTRY](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN](#)
- ✓ [TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS](#)

**NOTE:** The content of large containers and tanks could require your facility to comply with two other regulations: OSHA's Process Safety Management (PSM) of Highly Hazardous Chemicals [29 CFR 1910.119] and EPA's Chemical Accident Prevention Provisions, the Risk Management Planning (RMP) requirements of §112(r) of the Clean Air Act [40 CFR 68.1]. The only chemical common to both regulations and known to the authors of this manual that might be found at your facility is chlorine -- for water or wastewater treatment. The threshold amount that "triggers" compliance is 1,500 pounds (PSM) and 2,500 pounds (RMP). Propane, at 10,000 pounds (RMP), will also trigger compliance, as will the following PSM chemicals, if present at your facility in the threshold amounts:



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<b><u>Chemical</u></b>	<b><u>CAS No.</u></b>	<b><u>Threshold Quantity (lbs.)</u></b>
cumene hydroperoxide	80-15-9	5,000
dibenzoyl peroxide	94-36-0	7,500
dilauroyl peroxide	105-74-8	7,500
methyl ethyl ketone peroxide (concentration greater > 60 percent)	1338-23-4	5,000

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## CHAPTER 4: RAW MATERIALS TRANSFER (PIPES)

The means of transferring raw material from the storage containers in the storage area to the gel/resin coat or paint coating mixing area and from there to the application operations is regulated by OSHA requirements pertaining to pipes and hoses. To be in compliance with [29 CFR 107\(e\)\(6\)](#):

### **You Must**

- install piping systems of steel or other material having comparable properties if flammable and combustible liquids are being transferred and such systems must be properly bonded and grounded
- install a shutoff valve between a container or a pipe and any hose or flexible connection and keep the valve **closed** except when spraying operations are conducted
- install an approved pump when flammable and combustible liquids are being withdrawn from containers having a capacity greater than 60 gallons
- inspect all hose and couplings at regular intervals and any hose or coupling showing material deterioration or weakness must be replaced
- test the piping system before placing it in use by hydrostatically testing it to 150 percent of the maximum anticipated pressure or pneumatically testing it to 110 percent of the maximum anticipated pressure, but not less than 5 pounds per square inch gauge at the highest point of the system. The test must be maintained for at least 10 minutes while a visual inspection of all joints and connections is made [[29 CFR 1910.106\(c\)\(7\)](#)]

The 1998 Indiana Fire Code [§7901.9.3] **requires** piping containing flammable liquids to be identified according to the American National Standards Institute - ANSI Standard A13.1-56 Scheme for the Identification of Piping Systems. OSHA requires piping identification **only** for oxygen-fuel gas welding and cutting; pulp, paper and paperboard mills, and textile plants.

### **You Should**

- train foremen, lead operators and other production employees to be constantly vigilant to drips and leaks from hoses, pipes and couplings to reduce employee risk of exposure and to prevent the loss of, usually, expensive raw materials.

### **You Should Consider**

- implementing pollution prevention strategies by installing pressure-drop annunciators, gauges, and other leak detection devices to alert employees to leaks in piping systems and, thereby, avoiding a larger release requiring an emergency or routine spill clean-up response
- labeling all pipes in the facility with the names of the chemicals conveyed in them and posting information about the hazards of the chemicals (e.g., affixing a large HMIS or other label) nearby.

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■ **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [SPILL PREVENTION CONTROL AND COUNTERMEASURES \(SPCC\) PLAN](#)
- ✓ [HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE \("HAZWOPER"\)](#)
- ✓ [FIRE PROTECTION](#)

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## CHAPTER 5: GEL/RESIN COAT AND PAINT COATING MIXING

Many of the regulations controlling operations in the Gel/Resin Coat and Paint Coating Mixing areas are the same as those controlling Raw Materials Storage discussed in [CHAPTER 3: RAW MATERIALS STORAGE](#) of this manual.

In 2001, the Indiana Styrene Rule went into effect. This rule significantly affects gel coat and resin formulations and mixing. Refer to Appendix 21 to determine how to comply with this regulation.

### 5.1 Open and Closed Systems

#### Indiana Styrene Rule

The Indiana Styrene Rule (326 IAC 25), requires that all resin and gel coat mixing containers with a capacity equal to or greater than 55 gallons, must have a cover with no visible gaps in place at all times except when material is being added to or removed from a container, or when mixing or pumping equipment is being placed in or removed from a container. For more information on the Indiana Styrene Rule, see Appendix 21.

#### Indiana Fire Code

To understand the application of the 1998 Indiana Fire Code to the mixing operations requires a familiarity with a few terms that pertain to the operation, as these are defined in the 1998 Indiana Fire Code.

- “Mixing,” is the combining, blending or bringing together in the same container, tank or vessel flammable or combustible liquids or other materials whereby flammable vapors could be liberated to the atmosphere.
- “Use, Open System,” is use of a solid or liquid hazardous material in a vessel or system that is continuously open to the atmosphere during normal operations and where vapors are liberated, or the product is exposed to the atmosphere during normal operations. Examples of open systems for solids and liquids include dispensing from or into open beakers or containers, and dip tank and plating tank operations.
- “Use, Closed System,” is use of a solid or liquid hazardous material in a closed vessel or system that remains closed during normal operations where vapors emitted by the product are not liberated outside of the vessel or system and the product is not exposed to the atmosphere during normal operations, and all uses of compressed gases. Examples of closed systems for solids and liquids include reaction process operations and product conveyed through a piping system into a closed vessel, system or piece of equipment.

It is important to understand the differences between an “open” and “closed” system because **both** systems may be found in the **same** mixing area. To comply with the 1998 Indiana Fire Code for each type of system:

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## **You Must**

### **Open System**

*Ventilation:* provide continuous mechanical ventilation at a rate of not less than 1 cubic foot per minute per square foot of floor area over the design area. Provisions shall be made for introduction of makeup air in such a manner to include all floor areas or pits where vapors can collect. Local or spot ventilation shall be provided when needed to prevent the accumulation of hazardous vapors. For ventilation system design, see the Building and Mechanical Codes. [§7903.2.3.4.2]

*Exception:* Where natural ventilation can be shown to be effective for the materials used, dispensed or mixed.

*Explosion control:* provide explosion control for Class I liquids or where explosive vapor-air mixtures can develop under normal operating conditions. Explosion control shall be designed in accordance with the Indiana Building Code. [§7903.2.3.4.3]

*Spill control and secondary containment:* provide spill control in accordance with Section 7901.8 when flammable or combustible liquids are dispensed into containers exceeding 1.1-gallon capacity or mixed or used in open containers or systems exceeding 5.3-gallon capacity. Spill control and secondary containment must be provided in accordance with Section 7901.8 when the capacity of an individual container exceeds 55 gallons or the aggregate capacity of multiple containers or tanks exceeds 100 gallons. [§7903.2.3.4.4]

### **Closed System**

*Ventilation:* provide closed systems designed to be opened as part of normal operations with ventilation in accordance with Section 7903.2.3.4.2. (See above). [§7903.2.3.5.2]

*Explosion control:* provide explosion control when an explosive environment can occur as a result of the dispensing, mixing or use process. Explosion control shall be designed in accordance with the Building Code. [§7903.2.3.5.3]

*Exception:* When process vessels are designed to fully contain the worst-case explosion anticipated within the vessel under process conditions considering the most likely failure.

*Spill control and secondary containment:* provide spill control in accordance with Section 7901.8 when flammable or combustible liquids are dispensed into or used or mixed in [closed] containers 55-gallon capacity. Spill control and secondary containment shall be provided in accordance with Section 7901.8 when the aggregate capacity of multiple containers or tanks exceeds 1,000 gallons. [§7903.2.3.5.4]

### **Spill Control**

The two references above to Section 7901.8 pertaining to spill control and secondary containment further refer to Section 8003.1.3.2 for spill control and 8003.1.3.3 for secondary containment.

First, **Spill Control:** if you **dispense** hazardous material liquids into vessels exceeding 1.1 gallons or **use** such liquids in **open systems** [see preceding definition] exceeding 5.3

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gallons **and/or** you **store** these liquids in vessels of 55 gallons or more or in multiple vessels exceeding 1,000 gallons capacity, then:

**You Must**

- prevent the flow of liquids from rooms, buildings or areas (indoor or outdoor) to adjoining areas by **one** of the following methods:
  - constructing a liquid-tight sloped or recessed floor;
  - constructing a liquid-tight floor provided with liquid-tight raised or recessed sills or dikes; or
  - sumps and collection systems

**Secondary Containment**

For **Secondary Containment**, the same **dispensing, usage and/or storage** thresholds apply as for Spill Control. To comply with the 1998 Indiana Fire Code requirements for Secondary Containment (Section 8003.1.3):

**You Must**

- construct the floor or sills and dikes or install a sump in the room, building or area in which the hazardous materials liquids are dispensed, used and/or stored, as described above.
  - drainage systems leading to an approved location are also permitted
  - the containment area must contain the spilled material **and** any fire-protection water
- separate incompatible materials from each other in the secondary containment system
- design secondary containment for indoor storage areas to contain a spill from the largest vessel plus the design flow volume of fire-protection water calculated to discharge from the fire-extinguishing system over the minimum required system design area or area of the room or area in which the storage is located, whichever is smaller, for a period of 20 minutes
- design secondary containment for outdoor storage areas to contain a spill from the largest individual vessel. If the area is open to rainfall, secondary containment shall be designed to include the volume of a 24-hour rainfall as determined by a 25-year storm, and provisions shall be made to drain accumulations of groundwater and rainwater.
- provide a monitoring method to detect hazardous materials in the secondary containment system. The monitoring method is allowed to be visual inspection of the primary or secondary containment, or other approved means. Where secondary containment is subject to the intrusion of water, a monitoring method for detecting water shall be provided. When monitoring devices are provided, they shall be connected to distinct visual or audible alarms.
- install drainage systems in accordance with the Plumbing Code and the following:
  - the slope of floors in indoor locations or similar areas in outdoor locations to drains shall not be less than 1 percent
  - drains from indoor storage areas shall be sized to carry the volume of the fire-protection water as determined by the design density discharged from the automatic fire-extinguishing system over the minimum required system design

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- area or area of the room or area in which the storage is located, whichever is smaller
  - drains from outdoor storage areas shall be sized to carry the volume of the fire protection/water flow and the volume of a 24-hour rainfall as determined by a 25-year storm
  - materials of construction for drainage systems shall be compatible with the materials stored incompatible materials shall be separated from each other in the drainage system, and
  - drains shall terminate in an approved location away from buildings, valves, means of egress, fire access roadways, adjoining property and storm drains.

### Designating a Responsible Person

The 1998 Indiana Fire Code [§8001.11.1.1 and §8001.11.1.2] also requires that:

- persons responsible for the operation of areas in which hazardous materials are stored, dispensed, handled or used must be familiar with the **chemical nature** of the materials and the appropriate **mitigating actions** necessary in the event of a fire, leak or spill
- responsible persons be designated and trained to be liaison personnel for the fire department to aid the fire department in pre-planning emergency responses and identifying where hazardous materials are located. This liaison person must have access to the MSDSs for these materials and be knowledgeable in the site emergency response procedures.

These requirements place the same responsibility on employers for emergency preparedness and employee information and training as does the OSHA Hazard Communications Standard [[29 CFR 1910.1200](#)] and the EPA Contingency Plan and Emergency Procedures regulation [[40 CFR 265.50](#)].

**THERE MAY BE OTHER FIRE CODE REQUIREMENTS THAT PERTAIN TO YOUR OPERATION. YOU ARE ADVISED TO CALL YOUR LOCAL FIRE DEPARTMENT, A FIRE CODE CONSULTANT OR THE INDIANA DEPARTMENT OF FIRE AND BUILDING SERVICES, OFFICE OF THE STATE FIRE MARSHAL (317-232-2222).**

## 5.2 Mixing Gelcoat/Resincoat Formulations

### Employee Exposure and Monitoring

OSHA (IOSHA) requires employers to limit an employee's exposure to chemicals in the workplace, including air contaminants, such as styrene and MEK Peroxide. The OSHA regulations, in [29 CFR 1910.1000](#), establish 8-hour Time Weighted Averages (TWAs), also known as Permissible Exposure Limits (PELs), for these chemicals. The regulation also establishes acceptable "Ceiling" (C) concentrations or limits for some chemicals that shall

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not be exceeded **at any time** during an 8-hour shift. The limits for the chemicals of concern are presented below:

<u>Chemical</u>	<u>OSHA PEL</u>	<u>Ceiling</u>
Styrene <sup>8</sup>	100 ppm	200 ppm
MEK peroxide <sup>9</sup>	0.7 ppm	
Benzoyl peroxide	5 mg/m <sup>3</sup>	

The CFA “Regulatory Compliance Manual”<sup>10</sup> states that, “Employers must monitor in order to establish their employees’ exposure levels to workplace contaminants, such as styrene. The employer must consider all job classifications, processes and operations and begin monitoring those jobs where the greatest potential exists for exposure and proceed to those with less risk of exposure.”

Periodic monitoring is recommended in any situation where an employer may be close to the maximum permissible exposure levels. An employer may use either a pump monitoring device or a badge type monitoring system. The pump type is a precision pump which draws a precise amount of air into a collection chamber. The contents of the collection chamber can then be analyzed at a laboratory. Vapor badges are worn for a specific amount of time, sealed in a special container and sent to a laboratory for analysis.

When using organic vapor badges, the minimum number of any potentially exposed group who should be monitored is:

- Three or less: monitor all persons
- Four to Nine: monitor three persons
- Ten to Fifteen: monitor four persons
- Add one additional person monitored for each additional five exposed persons.

Select the appropriate monitoring device and FOLLOW THE USE INSTRUCTIONS CAREFULLY.

If workplace exposure levels exceed the OSHA PELs, the employer must either employ engineering controls to reduce the vapor concentrations, or employ a respirator program. A respirator program must be a written program, pursuant to [29 CFR 1910.134](#). If the exposure levels in a facility are below the statutory levels, and any employee chooses to use a respirator for additional protection, the employer is obligated to have a written respirator program.

### **Coating Storage**

The OSHA regulations [[29 CFR 1910.106\(e\)](#)] classify the use of flammable and combustible liquids as “**incidental**” to the principal business when such liquids are components of coating systems. These regulations set forth the requirements for storage of flammable and combustible (hazardous materials) liquids in drums or other containers

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<sup>8</sup> The Threshold Limit Value (TLV) established by the American Conference of Governmental Industrial Hygienists is 50 ppm with a Short Term Exposure Limit (STEL), which is a 15-minute TWA exposure that should not be exceeded at any time during a workday, is 100 ppm. The Composites Fabricators Association (CFA) urges fabricators to adhere to the ACGIH limits.

<sup>9</sup> The “Ceiling” recommended by the ACGIH is 0.2 ppm.

<sup>10</sup> Composite Fabricators Association, 3<sup>rd</sup> Ed., Fall 1994



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(including flammable aerosols) **not** exceeding 60 gallons individual capacity and portable tanks not exceeding 660 gallons individual capacity. To be in compliance with these regulations:

### **You Must**

- store such liquids in tanks or closed containers which meet the requirements of the U.S. Department of Transportation, Hazardous Materials Regulation Board [[29 CFR 1910.106\(d\)\(1\)](#)]
- ensure that each portable tank is provided with sufficient emergency venting to limit internal pressure under fire exposure conditions to 10 p.s.i.g., or 30 percent of the bursting pressure of the tank, whichever is greater [[29 CFR 1910.106\(d\)\(2\)](#)]
- ensure that **not** more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids are stored in a **storage cabinet**
- ensure that any **storage cabinet** you use is designed and constructed to limit the internal temperature to not more than 325°F
- label storage cabinets with conspicuous lettering, “**Flammable Keep Fire Away**” [[29 CFR 1910.106\(d\)\(3\)](#)]
- ensure that **inside storage rooms** are designed and constructed to meet the required fire-resistive rating for their use. Construction shall comply with the test specifications set forth in NFPA251-1969, Standard Methods of Fire Tests of Building Construction and Materials [[29 CFR 1910.106\(d\)\(4\)](#)]
- ensure that openings from the storage area to other rooms are provided with non-combustible raised sills or ramps at least 4 inches in height, or the floor in the storage area is 4 inches below the adjacent floor and that the wall-floor joints are liquid-tight. An open-grated trench inside the room which drains to a safe location is an acceptable alternate to the sill or ramp [[29 CFR 1910.106\(d\)\(4\)](#)]
- install a **fire protection system** in the storage room such as a sprinkler, water spray, carbon dioxide, or other approved system [[29 CFR 1910.106\(d\)\(4\)](#)]
- ensure that at least one 3-foot wide aisle is maintained in the storage room and that containers over 30-gallon capacity are **not** stacked one upon the other [[29 CFR 1910.106\(d\)\(4\)](#)]

Now, flammable and combustible liquids may be “**located**” outside of an inside storage room or storage cabinet in a building or in any **one** fire area of a building, **but such amounts cannot exceed:**

- 25 gallons of Class I-A (flammable liquids) one or more containers
- 120 gallons of Class I-B, I-C (flammable) or Class II or III (combustible) liquids in one or more containers
- 660 gallons of Class I-B, I-C, II or III liquids in a **single** portable tank

The OSHA regulations [[29 CFR 1910.106\(e\)](#)] also require that:

- areas in which flammable or combustible liquids are **transferred** from one tank or container to another be separated from other operations in the building by adequate distance or by construction having adequate fire resistance
- adequate natural or mechanical ventilation be provided
- flammable liquids be kept in covered containers when not in use

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- leaks and spills from other than closed containers be handled promptly and safely
  - Class I liquids **not** be used where there are open flames or other sources of ignition within the possible path of vapor travel
  - flammable or combustible liquids be transferred from/to vessels, containers or portable tanks within a building only through a closed piping systems or by safety cans or by means of a device drawing through the top, or from a container or portable tanks by gravity through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks is **not** allowed

The Emergency Planning and Community Right To Know Act (EPCRA) and the U.S. EPA regulations derived from that legislation (see [CHAPTER 3: RAW MATERIALS STORAGE](#)) pertain to the Formulation and Mixing Area, as well, for reporting spills and calculating estimates for the Tier II and TRI reports.

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### Facility-Wide Regulations

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [SPILL PREVENTION CONTROL AND COUNTERMEASURES \(SPCC\) PLAN](#)
- ✓ [RESPIRATORY PROTECTION](#)
- ✓ [HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE \(“HAZWOPER”\)](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [THE HAZARD COMMUNICATION STANDARD](#)
- ✓ [INDIANA STYRENE RULE](#)

**NOTE:** The content of large containers and tanks could require your facility to comply with two other regulations: OSHA’s Process Safety Management (PSM) of Highly Hazardous Chemicals [[29 CFR 1910.119](#)] and EPA’s Chemical Accident Prevention Provisions, the Risk Management Planning (RMP) requirements of §112(r) of the Clean Air Act [[40 CFR 68.1](#)]. The only chemical common to both regulations and known to the authors of this manual that might be found at your facility is chlorine -- for water or wastewater treatment. The threshold amount that “triggers” compliance is 1,500 pounds (PSM) and 2,500 pounds (RMP). Propane, at 10,000 pounds (RMP), will also trigger compliance, as will the following PSM chemicals, if present at your facility in the threshold amounts:

<u>Chemical</u>	<u>CAS No.</u>	<u>Threshold Quantity (lbs.)</u>
cumene hydroperoxide	80-15-9	5,000
dibenzoyl peroxide	94-36-0	7,500
dilauroyl peroxide	105-74-8	7,500
MEK peroxide (concentration greater > 60 percent)	1338-23-4	5,000



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## CHAPTER 6: GEL COAT AND RESIN/GLASS APPLICATION

In 2001, the Indiana Styrene Rule went into effect. This rule significantly affects gel coat and resin application as well as the actual formulations of the gel coat and resin materials. Refer to Appendix 21 to determine how to comply with this regulation.

The OSHA regulations in Section [1910.107\(m\)](#) require:

- all spraying operations involving the use of organic peroxides to be conducted in approved sprinklered spray booths
- “No Smoking” signs to be prominently displayed and smoking to be prohibited
- only non-sparking tools to be used in any area where organic peroxides are stored, mixed or applied

Chapter 15 of the 1997 **NFPA 33 Standard for Spray Application Using Flammable or Combustible Materials** was published specifically for “Styrene Cross-Linked Composites Manufacturing,” where the processes do not produce vapors that exceed 25 percent of the Lower Flammable Limit (LFL). It has yet to be adopted in Indiana; however, if you decide to use Chapter 15 of the NFPA Code as a guide:

### **You Should**

- install and use equipment and apparatus for spray application of resin according to the requirements of Chapters 14 and 15 of NFPA 33
- protect resin application areas with a sprinkler system designed and installed according to the requirements of **NFPA 13, Standard for the Installation of Sprinkler Systems (1996 edition)**
- restrict the quantity of flammable and combustible liquids located in the vicinity of resin application areas so as to not exceed the greater of -
  - a supply for one day; **or**
  - the sum of 25 gallons of Class IA liquids in containers and 120 gallons of Class IB, IC, II or III liquids in containers, **or**
  - one approved portable tank not exceeding 660 gallons of Class IB, IC, II or III liquids

**Note:** the term “vicinity,” here, means outside of an inside storage room or storage cabinet in any one process area. Also the “Class” references, above, are to differentiate combustible from flammable liquids based on flashpoint.

- use only electrical wiring and equipment in the resin application area (where it is subject to deposits of combustible residues) that is listed for such exposure and is suitable for Class I, Division I or Class II, Division 1 locations. Ensure that the wiring and equipment is installed according to **NFPA 70, National Electrical Code (1996 edition)**
- electrically ground all metal parts of resin application areas, exhaust ducts, ventilation fans, spray application equipment, work pieces or containers that receive the spray stream and the piping that conveys flammable or combustible liquids

- 
- not locate space heating appliances or other hot surfaces in resin application areas
  - design and install mechanical ventilation throughout the resin application area according to the requirements of Chapter 5 of NFPA 33
- Note:** one of these provisions, 5-2.1, requires that “spray areas equipped with overspray collection filters must have visible gauges, audible alarms, or an effective inspection program to ensure that the required air velocity is being maintained”

Chapter 14 of NFPA 33 pertains to **Organic Peroxides and Plural Component Coatings**. If you decide to use NFPA 33 as a guide or if it has been adopted by your local municipality:

### **You Should**

- assure that spray operations involving organic peroxide formulations are conducted in areas that are protected by automatic sprinkler systems that meet the requirements of Chapter 7 of NFPA 33
- exercise care at all times to prevent the contamination of organic peroxide formulations
- use only spray guns and related handling equipment specifically manufactured for use with organic peroxide formulations
- use **separate** fluid-handling equipment for the resin and for the catalyst and do not interchange them
- ensure that the wetted portions of equipment and apparatus that handle organic formulations shall be constructed of stainless steel (300 series), polyethylene, Teflon, or other materials that are specifically recommended for this application
- exercise care to prevent contamination of organic peroxide formulations with dusts or overspray residues resulting from the sanding or spray application of finishing materials, because such mixing can result in a spontaneous fire or explosion
- promptly remove spills of organic peroxides so there are no residues. Absorb spills using a non-combustible absorbent and then dispose of promptly according to state and local regulations.
- carefully handle organic peroxide formulations to avoid shock and friction, which can cause decomposition and violent reaction
- not mix organic peroxide formulations directly with any cobalt compounds or other promoters or accelerators as violent decomposition or explosion can result
- not store promoters or accelerators adjacent to organic peroxide formulations
- prohibit smoking, post “No Smoking” signs and use only non-sparking tools in any area where organic peroxide formulations are stored, mixed or applied
- use only designated personnel **trained** to use and handle organic peroxide formulations when storing, mixing or applying
- consult the Material Safety Data Sheet or its equivalent where organic peroxide formulations are used

### **You Should Consider**

- other resin application technologies, if applicable, such as -
  - **Prepreg Fiber Reinforcing:** fiber reinforcements presaturated with resins; reduces atomization and clean-up and disposal problems, but requires refrigeration until lay-up begins and placing the mold in an oven to complete the cure. Best suited for

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applications where extremely high strength-to-weight ratios are required and cost factors are secondary

- **In-House Resin Impregnation:** impregnators feed resin-saturated reinforcing materials directly to the molding operation. A conventional resin pump and catalyst metering device provide the proper mix to a roller-reservoir system and the woven fiberglass is impregnated as it passes through the reservoir system. Eliminates atomization and emissions as well as requirements of high levels of make-up air. Most useful for fabricators who can consolidate a number of small mold lay-up operations or those that need a large quantity of material rapidly delivered to a large mold
- **Resin Rollers - Spray-less Application Systems:** two pumps supply resin and catalyst to a static mixer and the roller applicator is attached to the mixer by a flexible hose. The unit is sometimes mounted on an overhead traveler to give the operator greater freedom of movement. The flow of resin is controlled by a trigger on the roller mechanism and the resin is distributed uniformly around the 1 ½" circumference of the 9" wide roller cover through about 150 small holes. One advantage of the resin roller is that one operator performs both resin application and roll-out operations. Atomization and overspray are totally eliminated and routine maintenance and repair is less than that of conventional spray systems. Resin rollers are estimated to save laminators 5 to 10% in resin usage. Maintaining productivity levels, however, may require changing work methods and work area design so that resin application is done continuously throughout the shift.
- **Programmable Logic Controller (PLC):** once the base color of the mold is covered with a few mils of gel coat, the visual guides used by the operator disappear. Using a wet film gauge to measure gel coat thickness interrupts production. A PLC models the spray time required for each different mold to control the amount of gel coat or resin coat to be applied. The operator activates the PLC for the appropriate mold and when the trigger on the gun is depressed the PLC begins to count the time. When the trigger is released, the counting stops. When the programmed spray time is ¾ elapsed, a horn briefly sounds and the operator continues to complete the mold until all the time has elapsed, signaled by the continuous sound of the horn. The horn is an audible signal to help the operator pace the work and apply the right amount of material

(from North Carolina Department of Environment, Health and Natural Resources, "Waste Reduction: Strategies for Fiberglass Fabricators," Hillis and Davis, authors. Note: other technologies discussed in this source include Vacuum Bag Molding, Infusion, Resin Transfer Molding (RTM) and Rotational Molding) Organic Peroxides Safety and Handling<sup>11</sup>

## Handling

The first concern in handling peroxides should always be to avoid contact with any material or condition that will cause the peroxide to decompose or catch fire. Handle peroxides with care. Think before acting.

- Personal safety should be of utmost importance when handling peroxides:
  - wear protective, sensible clothing

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<sup>11</sup> From copyrighted publication of the same title (97-6a), Akzo Nobel. Permission to quote granted.

- 
- wear eye protection
  - avoid skin contact with any organic peroxide
  - wear gloves when handling liquid peroxides such as MEK peroxides and hydroperoxides. Handle these materials like corrosives.
  - avoid breathing peroxide fumes, vapors, or particles
- When transferring peroxides to metering or dosing vessels, or when adding peroxides to resin batches, add the material slowly. Avoid splashing and spilling the product.
  - If a liquid material has a long falling distance, add the material through an additional funnel or dip tube.
  - For dosing or short-term storage, loosely covered vessels should be used to avoid any pressure buildup if decomposition of the organic peroxide occurs.
  - Care must be taken to avoid direct contact of organic peroxides with accelerators such as cobalt, octoate and dimethyl aniline. **Direct contact could result in a violent decomposition or fire.**
  - Do not smoke or light matches when handling organic peroxides. Keep organic peroxides away from all sources of ignition such as sparks, open flames or fires.
  - Keep organic peroxides away from all sources of heat, such as steam pipes, space heaters, hot water pipes, radiators, hot surfaces etc. Protect against direct sunlight.
  - All dispensing and transfer equipment must be adequately grounded.
  - If solvents are to be used to dilute organic peroxides, use only high purity approved solvents. Solvents with low flash points substantially increase the potential fire hazard of organic peroxides.
  - Wherever organic peroxides are handled or stored, special maintenance procedures must be instituted. All maintenance work should be approved by personnel trained in the hazards of organic peroxides.

### Storage

- Most organic peroxides can be stored at ambient temperatures: 30°C (90°F) maximum; but for longer than one month shelf life lower temperatures are recommended: 25°C (77°F) maximum.
- In areas where excessive temperatures may occur, cooling should be provided. Storage areas must be constructed to provide maximum ventilation and sun reflection. Refrigerated organic peroxides must be stored in specially constructed cooled areas provided with alarms and isolated from the work area.
- All electrical fittings, light bulbs and equipment installed in the storage area must be of an “explosion proof” type suitable for areas where flammable vapors may occur under abnormal conditions in such a concentration as to constitute an explosion hazard.
- An inert absorbent material, such as vermiculite, must be available in or near the storage area. A broom and non-sparking dustpan should be available to sweep up wetted absorbed organic peroxide spills.
- Water for cleaning and fire fighting purposes must also be available nearby.
- A dry powder or CO<sub>2</sub> fire extinguisher should be located outside of the storage area, near the door. Fire in a large organic peroxide storage area cannot be extinguished with fire extinguishers. Retreat to a safe area and call the fire department.

- 
- Keep the storage area clean; no litter, rags, etc., present. Clean up spills immediately. Remove damaged or leaking containers from the storage area.
  - Keep the storage area closed and allow access only by authorized and trained personnel.

### Firefighting

- A very small organic peroxide fire can be extinguished with CO<sub>2</sub>, although dry powder, foam or water can also be used. Water is the preferred extinguishing agent for larger fires although a fire in its initial stage involving a small amount of organic peroxide can be extinguished with CO<sub>2</sub>. However, this must be followed by a soaking with water to prevent re-ignition. A bigger fire must be fought with large amounts of water applied from a safe distance. Whenever large quantities of organic peroxide are involved in a fire, personnel must immediately retreat to a safe area.  
**CAUTION:** facilities should always report fires to the local fire department and if extinguishers do not suppress the fire, employees should immediately retreat and leave the fire fighting to trained fire fighters.
- Personnel and firefighting equipment must be stationed a safe distance from the fire.
- Organic peroxides are thermally unstable and can decompose in the absence of air, forming vapor clouds and heat. The vapor clouds are flammable so personnel must be evacuated from the area. Application of water from a safe distance will cool down this exothermic reaction. This decomposition phenomenon can continue after the fire (flame) is extinguished. Water is the only effective means to control this exothermic decomposition. If fire occurs near an organic peroxide stock, which cannot be moved away from the fire, apply water for cooling.

### Spray Gun Cleaning

Some members of the FRP sector continue to allow employees to flush their spray lines and guns with methylene chloride or acetone.

Spent methylene chloride is, by federal regulation, a F002 hazardous waste from non-specific sources. Also, IDEM identified methylene chloride, along with styrene, as two chemicals it will target for emissions reductions through inspection and enforcement.

OSHA's Technical Guidelines for methylene chloride [[29 CFR 1910.1052](#)] establish an 8-hour Time Weighted Average (TWA, also Permissible Exposure Limit - PEL) of 25 parts per million (ppm) and a Short-term Exposure Limit (STEL) of 125 ppm. OSHA requires **any employer** having methylene chloride in the workplace to determine **each employee's** exposure according to the monitoring procedures prescribed. If the monitoring reveals that each employee's exposure is **below the action level** of 12.5 ppm, then, **only** the following provisions of 29 CFR 1910.1052 apply:

- a record must be made of the monitoring determination
- employees must receive information and training (under paragraph "i")
- employees must be protected from contact with liquid methylene chloride (under paragraph "h")



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If monitoring reveals employee exposure **above** the 12.5 ppm action level, then all of the other provisions of 29 CFR 1910.1052 apply.

OSHA interprets the results of various animal and human epidemiological studies to “**mean that there is suggestive (but not absolute) evidence that methylene chloride is a human carcinogen.**” Unfortunately, acetone has replaced other solvents because it was exempted from the list of Toxic Release Inventory (TRI) chemicals a few years ago.

The 8-hour TWA (or PEL) for acetone is 750 ppm and its STEL is 1,000 ppm; however, its low flash point (0°F) and its Lower Explosive Limit (LEL) of 2.6 percent make it a dangerous fire hazard and a moderate explosion hazard when vapor is exposed to flame. **And, important to the FRP sector, acetone can react vigorously with oxidizers creating a disaster hazard.**

### **You Should Consider**

- using replacements for methylene chloride and acetone with high-flash point solvents such as:
  - diacetone alcohol
  - dibasic ester
  - N-methyl pyrrolidine
  - propylene carbonate (dioxolanone)
  - or with water-based resin emulsifiers or detergent cleaners. The **liquid** remaining from the use of the substances can usually be discharged to the POTW, with prior approval.

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [RESPIRATORY PROTECTION](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN](#)
- ✓ [INDIANA STYRENE RULE](#)

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# CHAPTER 7: PAINT COATING APPLICATION

## 7.1 OSHA Regulations

Another challenge to facilities with paint coating applications operations is the OSHA requirements pertaining to spray finishing using flammable and combustible materials [[29 CFR 1910.107](#)] and to dip tanks containing flammable or combustible liquids [[29 CFR 1910.108](#)] [[29 CFR 1910.125](#)] [[29 CFR 1910.126](#)]. To be in compliance:

### **You Must**

#### *Spray Booths*

- ensure that the average air velocity over the open face of the spray booth (or booth cross section during spraying) is **not less** than 100 linear feet per minute. Visible gauges or audible alarms or pressure activated devices must be installed to monitor air velocity [[29 CFR 1910.107\(b\)\(5\)\(i\)](#)]
- remove discarded filter pads and rolls to a safe, well-detached location or place them in a water-filled metal container [[29 CFR 1910.107\(b\)\(5\)\(ii\)](#)]
- install clean filters and filter rolls with a type having a combustibility **not** in excess of Class 2 filters [[29 CFR 1910.107\(b\)\(5\)\(vi\)](#)]
- separate each spray booth from other operations by **not less** than three (3) feet or by a partition or wall to reduce the danger from other hazardous operations [[29 CFR 1910.107\(b\)\(8\)](#)]

#### *Electrical Sources*

- prohibit any open flame or spark-producing equipment in any spraying area and from within twenty (20) feet, unless separated by a partition [[29 CFR 1910.107\(c\)\(2\)](#)]
- use only explosion-proof wiring for electrical installations in the spray booth approved for Class I, group D locations and conforming to Class I, Division 1, Hazardous Locations. Wiring and other electrical equipment outside of, but within twenty (20) feet of, the booth must conform to the Class I, Division 2, Hazardous Locations standards [[29 CFR 1910.107\(c\)\(6\)](#)]
- permanently ground all metal parts of spray booths, exhaust ducts, and piping systems conveying flammable or combustible liquids [[29 CFR 1910.107\(c\)\(9\)](#)]

#### *Ventilation*

- provide **all** spraying areas with mechanical ventilation adequate to remove flammable vapors, mists and powders and to confine and control combustible residues [[29 CFR 1910.107\(d\)\(2\)](#)]
- ensure that the terminus of the spray booth exhaust duct is **not less** than six (6) feet from any combustible exterior wall or roof [[29 CFR 1910.107\(d\)\(9\)](#)]

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### *Liquid Storage and Handling*

- ensure that the quantity of flammable and combustible liquids kept in the vicinity of spraying operations shall be the minimum required for operations and should **not** exceed a supply for one (1) day or one (1) shift [[29 CFR 1910.107\(e\)\(2\)](#)]
- ensure that original closed containers, approved portable tanks, approved safety cans or a properly arranged piping system is used for bringing flammable and combustible liquids into the spray finishing room [[29 CFR 1910.107\(e\)\(3\)](#)]
- withdraw flammable and combustible liquids from containers having a capacity of greater than 60 gallons **only** using approved pumps [[29 CFR 1910.107\(e\)\(4\)](#)]
- fill containers, including portable mixing tanks, **only** in a mixing room or in a spraying area when the ventilation system is operating [[29 CFR 1910.107\(e\)\(4\)](#)]
- limit containers under air pressure supplying spray nozzles to that necessary for one (1) day's operation and ensure containers are designed and approved for such use. Original shipping containers must **not** be subjected to air pressure for supplying spray nozzles [[29 CFR 1910.107\(e\)\(5\)](#)]
- provide a shutoff valve between a hose or flexible connection and any container or piping. Keep valves **closed** when spraying operations are not being conducted [[29 CFR 1910.107\(e\)\(6\)](#)]
- ensure that whenever flammable or combustible liquids are transferred from one container to another, **both** containers are bonded and grounded [[29 CFR 1910.107\(e\)\(9\)](#)]
- protect space within the spray booth on the downstream and upstream sides of filters with approved automatic sprinklers [[29 CFR 1910.107\(b\)\(5\)\(iv\)](#)]

### *Fire Protection*

- ensure that sprinkler systems in paint booths conform to other OSHA requirements (in 1910.159); locate sprinkler heads so water is provided throughout the entire booth [[29 CFR 1910.107\(f\)\(1\)](#)]
- install an adequate supply of portable fire extinguishers near all spraying areas [[29 CFR 1910.107\(f\)\(4\)](#)]

### *Operations and Maintenance*

- restrict the use of cleaning solvents to those having flash points **not less** than 100°F; however, for cleaning spray nozzles and auxiliary equipment, solvents having flash points **not less** than those normally used in spray operations may be used. Nozzle cleaning must be conducted inside the spray booth with the ventilating equipment operating [[29 CFR 1910.107\(g\)\(5\)](#)]
- post "No Smoking" signs in conspicuous locations at all spraying areas and paint storage rooms [[29 CFR 1910.107\(g\)\(7\)](#)]

### *Fixed Electrostatic Apparatus*

- locate transformers, power packs, control apparatus and all other electrical portions of the equipment, with the exception of high-voltage grids, electrodes and electrostatic atomizing heads and their connections, **outside** the spraying area [[29 CFR 1910.107\(h\)\(3\)](#)]

- 
- properly insulate and protect high-voltage leads to electrodes from mechanical injury or exposure to destructive chemicals [[29 CFR 1910.107\(h\)\(5\)](#)]
  - maintain a safe distance between the object being painted and the electrodes or electrostatic atomizing heads or conductors of at least twice the sparking distance. Post a sign near the area indicating this safe distance [[29 CFR 1910.107\(h\)\(6\)](#)]
  - equip electrostatic apparatus with automatic controls to disconnect the power supply to the high voltage transformer and to signal the operator, when -
    - there is a failure of the ventilating system
    - a conveyor carrying goods through the high voltage field is stopped
    - there is the occurrence of a ground or an imminent ground at any point on the high voltage system
    - when the “safe distance” is reduced below that specified [[29 CFR 1910.107\(h\)\(9\)](#)]
  - ventilate the spraying area to ensure safe conditions from a fire and health standpoint [[29 CFR 1910.107\(h\)\(11\)](#)]
  - protect all areas used for spraying, including the interior of the booth, by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment **must** be provided [[29 CFR 1910.107\(h\)\(12\)](#)]

#### *Electrostatic Hand Spraying Equipment*

- use only approved types of apparatus and devices in connection with coating operations with high voltage circuits designed to not produce a spark of sufficient intensity to ignite any vapor-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under all normal operating conditions [[29 CFR 1910.107\(i\)\(3\)](#)]
- locate transformers, power packs, control apparatus, and all other electrical portions of the equipment, with the exception of the handgun itself and its connections to the power supply, outside of the spraying area [[29 CFR 1910.107\(i\)\(4\)](#)]
- ensure that the handle of the spraying gun is electrically connected to ground by a metallic connection and is so constructed that the operator, in normal operating position, is in intimate electrical contact with the grounded handle [[29 CFR 1910.107\(i\)\(5\)](#)]
- ground all electrically conductive objects in the spraying area, including paint containers, wash cans, and any other objects or devices in the area. The equipment **must** carry a prominent permanently installed warning regarding the necessity for this grounding feature [[29 CFR 1910.107\(i\)\(6\)](#)]
- ensure that objects being painted or coated are maintained in metallic contact with the conveyor or other grounded support. Hooks **must** be regularly cleaned to ensure this contact and areas of contact **must** be sharp points or knife-edges where possible [[29 CFR 1910.107\(i\)\(7\)](#)]
- interlock electrical equipment with the ventilation of the spraying area that the equipment cannot be operated unless the ventilation fans are in operation [[29 CFR 1910.107\(i\)\(8\)](#)]
- ensure that the spraying operation takes place within a spray area which is adequately ventilated to remove solvent vapors released from the operation [[29 CFR 1910.107\(i\)\(9\)](#)]

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### *Powder Coating*

- ensure that exhaust ventilation is sufficient to maintain the atmosphere below the lowest explosive limits for the materials being applied. All non-deposited air-suspended powders shall be safely removed via exhaust ducts to the powder recovery cyclone or receptacle [[29 CFR 1910.107\(l\)\(2\)](#)]
- keep all areas free of the accumulation of powder coating dusts, particularly such horizontal surfaces as ledges, beams, pipes, hoods, booths, and floors [[29 CFR 1910.107\(l\)\(4\)](#)]
- locate transformers, power packs, control apparatus, and all other electrical portions of the equipment, with the exception of the charging electrodes and their connections to the power supply outside of the powder coating area [[29 CFR 1910.107\(l\)\(7\)\(ii\)](#)]
- ground all electrically conductive objects within the charging influence of the electrodes. The powder coating equipment **must** carry a prominent, permanently installed warning regarding the necessity for grounding these objects [[29 CFR 1910.107\(l\)\(7\)\(iii\)](#)]
- ensure that objects being coated are maintained in contact with the conveyor or other support in order to ensure proper grounding. Hangers **must** be regularly cleaned to ensure effective contact and areas of contact **must** be sharp points or knife-edges where possible [[29 CFR 1910.107\(l\)\(7\)\(iv\)](#)]
- ensure that the electrical equipment is interlocked with the ventilation system so that the equipment cannot be operated unless the ventilation fans are in operation [[29 CFR 1910.107\(l\)\(7\)\(v\)](#)]

### **Dip Tanks**

Another OSHA rule that pertains to the use of dip tanks containing flammable or combustible liquids is 29 CFR 1910.108. To be in compliance with this rule:

#### **You Must**

##### *Ventilation*

- keep the airborne concentration of any substance below 25% of its lower flammable limit (LFL)
- control worker exposure levels as required in [29 CFR 1910.1000](#)
- if using a mechanical ventilation system, ensure the system conforms with [29 CFR 1910.6](#)

##### *Recirculated Exhaust Air*

- ensure that the exhaust air does not contain any substance that poses a health hazard or exceeds 25% of its LFL
- ensure that the exhaust air is free of any solids
- monitor the system with approved equipment
- have a system that sounds an alarm and automatically shuts down when vapor concentrations in the air stream exceed 25% of its LFL

##### *When Using an Exhaust Hood*

- provide each room having exhaust hoods with a volume of air at least 90% of the volume of the exhausted air
- ensure the outside air does not damage exhaust hoods

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### *Construction of Dip Tanks*

- use only dip tanks, including drainboards, if provided, constructed of substantial noncombustible materials. Any container that is used for a dip tank must be strong enough to withstand any expected load [29 CFR 1910.125(a)] [29 CFR 1910.124(a)]
- Keep dip tanks of over 150 gallons in capacity or 10 square feet in liquid surface area with a properly trapped overflow pipe leading to a safe location; overflow pipes shall be at least 3 inches in diameter and have sufficient capacity to prevent the dip tank from overflowing [29 CFR 1910.125(b)] . Piping connections on drains and overflow pipes must allow for access to the interior of the pipe for inspections and cleaning. The bottom of the overflow connection must be at least 6 inches below the top of the dip tank.
- equip dip tanks over 500 gallons in liquid capacity with bottom drains automatically and manually arranged to drain the tank within five minutes in the event of fire, unless the viscosity of the liquid at normal atmospheric temperature makes this impractical, or if the dip tank is equipped with an automatic closing cover that meets the requirements of 29 CFR 1910.125(f)(3). Manual operation **must** be from a safely accessible location. Where gravity flow is not practicable, automatic pumps shall be required. If a conveyor system is used for dip coating operations, the system must shut down automatically if there is a fire, or if the ventilation rate drops below the required rate [29 CFR 1910.125(c)].
- protect dip tanks exceeding 150 gallons liquid capacity or having a liquid surface area exceeding 4 square feet with at least one of the **automatic extinguishing system** [29 CFR 1910.125(f)]
- ensure that dip tank liquids that are artificially heated, either by the dipping of heated articles, or by other application of heat to the liquid, will **not** raise the temperature at or above the liquid's boiling point, and will **not** sustain a temperature rise greater than 100°F below the liquid's auto-ignition temperature [29 CFR 1910.125(g)]

### *Storage and Handling of Liquids used in Dip Tanks*

- ensure that the storage of flammable and combustible liquids in connection with dip tank operations conform to the requirements of 29 CFR 1910.106 , where applicable. Where portable containers are used for the replenishment of flammable and combustible liquids, provision **must** be made so that both the container and tank shall be positively grounded and electrically bonded to prevent static electric sparks [29 CFR 1910.125(e)]

### *Electrical and Other Sources of Ignition*

- restrict open flames, spark producing devices, or heated surfaces having a temperature sufficient to ignite vapors from any vapor area [29 CFR 1910.125(e)]
- ensure that electrical wiring and equipment in any vapor area is the explosion proof type [29 CFR 1910.125(e)]
- restrict open flames or spark producing devices from any floor space within 20 feet of a vapor area that is not separated by tight partitions [29 CFR 1910.125(e)]

### *Operations and Maintenance*

- keep areas in the vicinity of dip tanks as clear of combustible stock as practical and keep such areas entirely free of combustible debris [29 CFR 1910.125(e)]

- 
- ensure that when waste or rags are used in connection with dip tank operations, approved metal waste cans are provided and all impregnated rags or waste are deposited in such cans immediately after use. Dispose of the contents of waste cans at least once daily at the end of each shift [[29 CFR 1910.125\(e\)](#)]
  - make periodic inspection or tests of all dip tank facilities, including covers, overflow pipe inlets and discharge, bottom drains and valves, electrical wiring and equipment and grounding connections, ventilating facilities, and all extinguishing equipment and correct any defects found
  - post “No Smoking” signs in large letters on contrasting color background in conspicuous locations in the vicinity of dip tanks

#### *Types of Extinguishment*

- **manual:** areas in the vicinity of dip tanks
- **automatic water spray systems:** to protect tanks, drainboards and stock over drainboards
- **automatic foam systems:** suitable for the dip tank liquid used
- **automatic carbon dioxide system:** to protect dip tanks and drainboards and stock over drainboards, unless protected by automatic water spray system
- **dry chemical systems:** to protect dip tanks and drainboards and stock over drainboards, unless protected by automatic water spray or carbon dioxide system
- **dip tank covers:** covers arranged to close automatically in the event of fire must be activated by approved automatic devices, as well as arranged for manual operation [[29 CFR 1910.125\(c\)](#)]
  - covers must be of substantial non-combustible materials or the tin-clad type, with enclosing metal applied with locked joints
  - chains or wire rope must be used for cover support or operating mechanism where the burning of a cord would interfere with the action of a device
  - covers shall be kept closed when tanks are not in use

#### *Special Dip Tank Applications*

##### *Flow Coat*

[Except as modified here, all of the preceding standards for dip tanks apply]. [[29 CFR 1910.126\(b\)](#)]

- ensure that all piping is strongly erected and rigidly supported
- supply paint by direct low-pressure pumping arranged to automatically shut down by means of approved heat actuated devices, in the case of fire, or paint may be supplied by a gravity tank not exceeding 10 gallons in capacity
- consider the area of the sump and any areas on which paint flows as the area of dip tank

##### *Roll Coating*

- ensure that the processes of roll coating, spreading, and impregnating, in which fabrics, paper, or other materials are passed directly through a tank or trough containing flammable or combustible liquids, or over



- 
- the surface of a roller that revolves partially submerged in a Class I or Class II liquid conforms to the applicable requirements cited above
  - ensure that adequate arrangements are made to prevent sparks from static electricity by electrically bonding and grounding all metallic rotating and other parts of machinery and equipment and by the installation of static collectors or maintaining a conductive atmosphere such as a high relative humidity [[29 CFR 1910.126\(c\)](#)]

OSHA safety regulations are, as you can see, very specific. Few facilities employ persons expert in the regulations pertaining to the storage, handling and use of flammable and combustible liquids. To ensure compliance:

#### **You Should**

- employ the services of a fire, building or safety consultant to assess your current operation and make recommendations for correction or improvement
- schedule an assessment by a representative of your insurance carrier; usually experts are employed by, or are contracted to, insurance companies
- **contact the Indiana Department of Labor, Bureau of Safety Education and Training (BuSET) [317-232-2688] and request an audit of your operation. Violations discovered by BuSET will not carry a penalty unless they are not corrected, usually, within 30 days for a safety violation or 60-90 days for an industrial hygiene violation.**

Facilities where flammable and combustible liquids are stored, handled and used pose a safety and health **risk** to employees working there. There are a few chemical-specific standards (e.g., benzene) and industrial process-specific standards (e.g., coke ovens) that require quarterly or annual work area and/or employee monitoring to ensure that the **OSHA Permissible Exposure Levels (PELs)** are not being exceeded. But, if your facility is not covered by a specific standard, there is no monitoring requirement. Often, employers initiate monitoring only when employees complain of some malady (nausea, itching, skin rash) or when a noticeable odor, not present previously, is detected. At this time, perhaps, employees have already been exposed or the potential exists for exposure above the PEL. A facility that stores, handles or uses flammable and combustible liquids also needs to ensure that areas where these chemicals are present do not exceed the established **Lower Explosive Limits (LELs)** that, otherwise, could create an **explosive**, as well as a toxic, atmosphere.

If your facility stores, handles or uses flammable and combustible liquids:

#### **You Should**

- conduct, at least, a semi-annual comprehensive monitoring program of areas where such chemicals are present and of personnel that have a potential for exposure. If the industrial hygiene expertise is not found among facility personnel, the employer should contract for it; perhaps its insurance carrier can arrange for this monitoring to be provided.



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## 7.2 Fire Code

The 1998 Indiana Fire Code, adopted by the Indiana Fire Prevention and Building Safety Commission, includes **Article 45 -- Application of Flammable Finishes**, that pertains to coating application operations.

The Fire Code applies to:

- the application of flammable or combustible paint, varnish, lacquer, stain or other flammable or combustible liquid applied as spray by compressed air, airless or hydraulic atomization, steam, electrostatic or other methods or means in continuous or intermittent process;
- dip tank operations in which articles or materials are passed through contents of tanks, vats or containers of flammable or combustible liquids, including coating, finishing, treatment and similar processes, and
- the application of combustible powders by powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds

The Fire Code and the OSHA regulations pertaining to spray booths and dip tanks, cited above, are similar in many respects; in fact, many of the OSHA provisions are taken verbatim from the 1998 Indiana Fire Code. To comply with the **additional** provisions of the Fire Code:

### You Must

- install a mechanical ventilation system that has air intake ducts extended to pick up flammable vapor within 6 inches of the floor [§4502.5.7]
- conduct limited, non-continuous touch-up or spot painting in an approved spraying area [§4502.6]
- install only portable infrared, or listed and approved drying apparatus, if drying is conducted in the spray booth [§4502.10.2.2.2]
- install an automatic fire extinguishing system or dip tank covers for -
  - tanks exceeding 150 gallons **or** 10 square foot liquid surface area, **and**
  - tanks containing a liquid with a flash point **below** 110°F and having **both** a capacity of more than 10 gallons and a liquid surface area of more than 4 square feet [§4503.7.2](Note: the OSHA regulation [[29 CFR 1910.125](#)] requires automatic extinguishing equipment for dip tanks exceeding 150 gallons with a liquid surface area exceeding 4 square feet. The effect of the Fire Code is to reduce the dip tank volume to 10 gallons)
- protect fixed powder application equipment by installing an approved flame-detection device designed to react to the presence of flame within one-half second and initiate the following:
  - disconnect the conveyor, ventilation, application, transfer and powder collection equipment
  - close dampers to interrupt airflows from the application equipment to the powder collectors, and
  - activate an alarm, which is audible throughout the powder coating room or booth [§4505.9.Z]

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## 7.3 Water Wash Spray Booths

### **Wastewater Discharge**

Wastewater from water wash spray booths may contain solids, volatile, and/or heavy metals. Discharge of wastewater containing pollutants into the waters of the United States is covered under the National Pollution Discharge Elimination System (NPDES).

Sources discharging any process wastewater pollutants directly into waters of the U.S. will, in all likelihood, be required to obtain a NPDES permit under [40 CFR 122](#). The discharge limits required in the permit will vary with several factors including discharge volume, location, and frequency of discharge. Sources that choose not to obtain an NPDES permit must either discharge the process wastewater to a publicly owned treatment works (POTW) or have it hauled away by a commercial disposal facility.

A source that is connected to a POTW may only discharge its process wastewater to the POTW if it complies with regulations found in [40 CFR 403](#). Under these regulations, a source may discharge its process wastewater to a POTW without a permit if the source's wastewater will not interfere with the operations of the POTW, or cause the POTW to exceed its NPDES permit limitations. If a source discharges materials that can interfere with the operations of the POTW, or cause the POTW to exceed its NPDES permit limitations, the POTW must issue that facility a pretreatment permit. The permit will contain limits on pollutant concentrations allowed from that source.

### **You Must**

- ensure that no process wastewater that contains pollutants is discharged into U.S. waters, or if required, obtain an NPDES permit for its discharge.
- send all process wastewater to a POTW or have it managed by a commercial disposal company.
- contact the POTW and inform them of the make-up of the wastewater to be discharged.
- if required, comply with the pretreatment permit limits issued by the POTW.

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS](#)
- ✓ [RECORDKEEPING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES](#)
- ✓ [RESPIRATORY PROTECTION](#)
- ✓ [HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE \("HAZWOPER"\)](#)
- ✓ [OCCUPATIONAL NOISE EXPOSURE](#)
- ✓ [EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN](#)
- ✓ [THE HAZARD COMMUNICATION STANDARD](#)
- ✓ [ERGONOMICS PROGRAM STANDARD \(PROPOSED\)](#)



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## CHAPTER 8: CURING/DRYING

The curing/drying operations involving air, infrared or ultraviolet technologies are regulated by the 1998 Indiana Fire Code, OSHA/IOSHA, and the U.S. EPA/IDEM.

The 1998 Indiana Fire Code, §6201-§6205, pertain to baking and drying ovens which are heated with oil or gas fuel or which, during operation, contain flammable vapors from the products being dried. Drying ovens are also subject to the **NFPA 86, 1995 edition**. To comply with Sections §6201-§6205:

### **You Must**

- consider the possibility of injury to persons and property from overheating or from the escape of fuel or fuel oil, and explosion when locating a drying oven [§6203.1]
- provide ready access to ovens for inspection and maintenance and provide adequate clearance for proper functioning of explosion vents. Roofs and floors of ovens must be insulated and ventilated to keep temperatures at combustible ceilings and floors below 160°F [§6203.3].
- equip ovens that could contain flammable air-gas mixtures with explosion venting [§6203.5]
- construct ducts of non-combustible material. Ducts passing through combustible walls, floors or roofs must have adequate insulation and clearances to prevent surface temperatures from exceeding 160°F [§6203.6].
- ensure that exhaust ducts do not discharge near doors, windows or other air intakes that will risk reentry of vapors into the building [§6203.6]
- equip ovens in which flammable or toxic vapors are liberated or through which products of combustion are circulated with ventilation that introduces fresh air and vents exhaust outdoors [§6204.1]
  - discharge (exhaust) pipes shall not terminate within 10 feet, measured horizontally, from doors, windows or wood frame walls of buildings [§6204.1]
  - ventilation must provide well-distributed air circulation within the oven to ensure that flammable vapor concentration will be below the lower explosive limit [LEL] at all times [§6204.1]
  - the rate of ventilation must not be less than 10,000 cubic feet of fresh air per gallon of solvent evaporated in continuous process ovens and not less than 380 cubic feet per minute per gallon of flammable solvent evaporated in batch process ovens [§6204.1]
- locate exhaust duct intake openings in the area of greatest concentration of vapors [§6204.2]
- ensure that exhaust is conveyed by mechanical means using power-driven fans [§6204.3]
- provide safety controls specified in NFPA 86, 1995 edition, to prevent fire and explosion [§6205.1]
  - interlocked ventilation controls must ensure required ventilation of the system [§6205.2]

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- interlocked fuel safety controls must minimize the possibility of dangerous accumulations of explosive air-fuel mixtures in the heating system [§6205.3]
  - excess temperature controls must be provided to maintain a safe operating temperature within the oven [§6205.4]
  - conveyor interlocks must be provided in conveyor ovens having a flammable vapor hazard so that the conveyor cannot move unless ventilating fans are operating and discharging the required volume of air [§6205.5]

The OSHA regulations, in [29 CFR 1910.107\(j\)](#), pertain to drying, curing or fusion apparatus employed in spray finishing operations. The standard incorporates **NFPA 86-1999, Standard for Ovens and Furnaces**, by reference. To comply with the OSHA standard:

#### **You Must**

- **not** use spray booths, rooms or other enclosures used for spray operations for the purpose of drying by any arrangement which will cause a material increase in the surface temperature of the spray booth, room or enclosure [[29 CFR 1910.107\(j\)\(2\)](#)]
- **not** install drying, curing or fusion units utilizing a heating system having open flames or which may produce sparks in a spraying area, but may be installed adjacent to a spraying area when equipped with an interlock ventilating system arranged to:
  - thoroughly ventilate the drying space before the heating system can be started
  - maintain a safe atmosphere at any source of ignition
  - automatically shut down the heating system in the event of failure of the ventilating system [[29 CFR 1910.107\(j\)\(3\)](#)]

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#### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [LOCKOUT/TAGOUT PROGRAM](#)
- ✓ [CONFINED SPACE ENTRY](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN](#)

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## CHAPTER 9: POST-MOLD DEFLASH AND SECONDARY OPERATIONS

Often, there is no distinct separation in the facility between the deflash, sanding, machining areas and secondary operations, such as bonding and assembly.

Most of these operations usually consist of various manual or partly manual functions employing hand-operated tools.

Federal and state regulations pertaining to Assembly operations are primarily in the domain of OSHA and IOSHA. The general OSHA regulations in [29 CFR 1910.242](#) and the guarding regulations in [29 CFR 1910.243](#) are the most pertinent to Assembly. To comply with these regulations:

### **You Must**

- assume responsibility for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees
- not allow compressed air greater than 30 p.s.i. to be used for cleaning purposes and then only allow its use with the proper chip guarding and personal protective equipment
- ensure that all portable, power-driven circular saws with a block diameter greater than 2 inches are equipped with guards above and below the base plate or shoe
- ensure that circular saws, 2 inches or more, electric, hydraulic or pneumatic chain saws and percussion tools are equipped with a constant pressure switch or control that will shut off the power when the pressure is released. Handheld, gasoline powered chain saws must be equipped with a constant pressure throttle control that will shut off power to the saw chain when the pressure is released
- ensure that all handheld powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders with discs greater than 2 inches in diameter, belt sanders, reciprocating saws, saber, scroll, and jigsaws with blade shanks greater than a nominal one-fourth inch, and other similarly operating powered tools are equipped with a constant pressure switch or control, or a lock-on control so that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on
- ensure that all other handheld powered tools, such as, but not limited to, platen sanders, grinders with wheels 2 inches in diameter or less, disc sanders with discs 2 inches in diameter or less, routers, planers, laminate trimmers, nibblers, shears, saber, scroll, and jigsaws with blade shanks a nominal one-fourth of an inch wide or less are equipped with either a positive “on-off” control, or other controls as described above
- ensure that belt-sanding machines are provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact.
- remove all cracked saws from service

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- ensure that portable electric powered tools are properly grounded
  - ensure that tool retainers are installed on pneumatic powered tools so that tools are not ejected
  - ensure that hose and hose connections used for conducting air are designed for the pressure and service for which they are subjected

The use of jigsaw or router-style cutters to remove cutout areas and the use by some facilities of high-pressure water cutters for the same purpose demands that these guarding and pressure switch control rules be observed.

The assembly of FRP components may require the use of contact adhesives. The OSHA (IOSHA) regulations and compliance guidance (See

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[CHAPTER 7: PAINT](#) COATING APPLICATION) also pertains to the **spray application** of flammable adhesives.

Other glues and adhesives applied manually or mechanically (e.g., roller) could subject employees to potential dermal (skin) exposure through contact and possible respiratory (inhalation) hazards, even if the glues/adhesives are “waterbased.” If you suspect there may be a potential for employee exposure to glues/adhesives and/or you receive complaints from employees about reactions to these products:

### **You Should**

- carefully examine the Material Safety Data Sheets for the products and determine if safer substitutes are available
- provide proper personal protective equipment to **all** employees having potential exposure, regardless of employee complaints, if advised to do so by an Industrial Hygienist or if the MSDS advises
  - proper PPE would include eye protection (goggles) and hand protection (rubber or latex disposable gloves)
  - if the MSDS or an Industrial Hygienist advises respiratory protection, seek a replacement for the glue or adhesive product: **employees should not be exposed to an unnecessary inhalation hazard**

**NOTE: if employees are allowed to provide their own PPE (e.g., goggles or safety glasses) the employer is responsible for assuring its adequacy, including proper maintenance and sanitation of the PPE [29 CFR 1910.132(b)]**

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [RESPIRATORY PROTECTION](#)
- ✓ [THE HAZARD COMMUNICATION STANDARD](#)
- ✓ [ERGONOMICS PROGRAM STANDARD \(PROPOSED\)](#)





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## CHAPTER 10: DUST COLLECTION

Dust collection systems, usually terminating in a baghouse or cyclone, are intended to remove resin/fiberglass dust and other particulates from the workplace and, thereby, reduce the potential for respiratory illness or injury of employees due to inhalation. Dust is also an irritant to the eyes and mucous membranes.

The function of OSHA/IOSHA regulation is to ensure that employees are not exposed to dust levels exceeding the 8-hour Time Weighted Average (TWA). The “resin/fiberglass dust” TWA is **not** listed in [29 CFR 1910.1000](#), but it **is** included as an “inert or nuisance dust, whether mineral, inorganic or organic, not listed specifically by name [but] covered by the [TWA for] Particulates Not Otherwise Regulated (PNOR).” The TWA for PNOR is 15 mg/m<sup>3</sup> (milligrams of dust per cubic meter of air) for total dust and 5 mg/m<sup>3</sup> for respirable fraction (dust of a size capable of passing through the upper respiratory system to reach the lower lung passages).

To ensure that employees are not exposed to a dust hazard:

### **You Should**

- daily, observe the workplace for dust in the air and films of dust settling on machinery, benches, floors, etc. [Looking through sunlight passing through a window into the workplace provides one of the best ways of detecting airborne dust].
- provide necessary maintenance on the dust collection system to ensure proper operation
- frequently clean the dust collection “traps,” duct work and blowers to prevent dust build-up and ensure maximum operating efficiency
- encourage employees to immediately report any eye or inhalation irritation to their supervisor

The 1998 Indiana Fire Code, in **Article 76**, establishes standards for the **Prevention of Dust Explosions**. The Fire Code defines “dust” as “combustible dust,” which is “finely divided, solid material 420 microns or less in diameter [there are 25,400 microns in one inch] and which, when dispersed in air in the proper proportions, could be ignited by a flame, spark or other source of ignition.” To comply with all of the applicable provisions of the 1998 Indiana Fire Code:

### **You Must**

- provide dust-producing and dust agitating machinery, such as grinding mills and separators, and elevators, elevator legs, spouts, hoppers and other conveyors with casing or enclosures maintained as nearly dust-tight as possible [§7602]
- install approved magnetic or pneumatic separators ahead of shellers, crackers, crushers, grinding machines, pulverizers and similar machines in which the entrance of foreign materials could cause sparks to be generated [§7603]
- install suitable dust-collecting equipment on all dust-producing machinery and interlocked with the machinery power supply so that the machinery cannot be operated without the dust-collection equipment also operating [§7604]

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- keep accumulation of dust to a minimum in the interior of buildings. Accumulated dust on floors and other surfaces must be collected by vacuum cleaning. Forced-air or similar devices shall not be used to remove dust from surfaces [§7605]
  - ensure that artificial lighting in areas containing dust-producing or dust-agitating operations is installed in accordance with the Indiana Electrical Code. Machinery and metal parts of crushing, drying, pulverizing and conveying systems shall be electrically grounded in accordance with the Indiana Electrical Code [§7606].
    - static electricity shall be removed from machinery and other component parts by permanent grounds or bonds or both. The design and installation of such grounds shall be in accordance with approved standards [§7606].
  - prohibit smoking, carrying matches, use of heating or other devices employing an open flame, and use of spark-producing equipment in areas containing dust-producing or dust-agitating operations [§7607]
  - provide buildings in which flammable or explosive dusts are manufactured, processed or generated with explosion control in accordance with the Indiana Building Code [§7608]

### **You Should Consider**

- recycling airborne dust collected in the baghouse for use as a “filler” in the resin

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS](#)
- ✓ [RECORDKEEPING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES](#)
- ✓ [RESPIRATORY PROTECTION](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [THE HAZARD COMMUNICATION STANDARD](#)

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## CHAPTER 11: HYDROTESTING

Fiberglass composite products and components may be tested for water leaks by spraying in a confined area or by partial submersion in a tank or larger “pool.” If the surface of the tank or pool is level with the floor, an OSHA regulation, [29 CFR 1910.23](#), applies.

Section (a)(8) of the rule requires floor holes or openings into which a person could accidentally walk be guarded by either a floor covering and, when in use, a full-time attendant or removable railing, or a “standard railing and standard toe board on all exposed sides.”

Section (e)(1) defines a “standard railing” as consisting of a top rail, intermediate rail and posts with a minimum height of 42 inches from the floor to the top surface of the top rail. A “standard toe board” is defined in section (e)(4) as being at least 4 inches in vertical height from the floor and extending the length of the railing.

Platforms and runways 4 feet or more above the adjacent floor or ground level must be fitted with a standard railing and standard toe board, as defined above.

Draining the water from a tank or in-floor “pool” could require compliance with federal, state or local environmental regulations. Discharging directly to the “waters of the state” or to a storm sewer will require a NPDES permit from the IDEM Office of Water Quality, pursuant to [40 CFR 122](#). If the water is discharged to a storm sewer, the source will have to comply with the NPDES requirements for storm water discharges associated with industrial activity, found in [40 CFR 122.26](#).

If the water is discharged to a POTW, the facility will have to comply with the provisions of 40 CFR 403. Discharging to a POTW will require the facility to meet the effluent limits imposed by the POTW. It is unlikely that this process water will contain levels of contaminants that will exceed effluent limits; however, the POTW may require that a laboratory analysis be performed and the results submitted. In any situation where a manufacturer intends to discharge to the POTW, it is obliged to inform the POTW in advance with information about the volume, frequency and constituents of the discharge.

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### Facility-Wide Regulations

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM \(NPDES\)](#)
- ✓ [WELLHEAD PROTECTION](#)
- ✓ [CONFINED SPACE ENTRY](#)



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## CHAPTER 12: PRODUCT PACKING/SHIPPING

The transfer of FRP products from the production to the packing and shipping area is most likely accomplished by manual means or powered, industrial equipment, like a forklift. The packing or packaging of products for shipping is, usually, a labor intensive operation involving wrapping, palletizing, crating, strapping, cardboard packaging and, at some facilities, filling the package around the product with foam protection to further reduce damage during transportation.

Neither the DOT nor EPA regulations pertain to these operations unless hazardous wastes are involved.

### 12.1 Forklifts

#### **Batteries and Propane**

The 1998 Indiana Fire Code regulates some aspects of industrial truck operation, primarily the charging of batteries and the storage/use of propane cylinders. To comply with the Fire Code:

#### **You Must**

- use battery chargers that are an approved type. Combustible storage shall be kept a minimum of 5 feet from battery chargers. Battery charging shall not be conducted in areas accessible to the public [§1108.2].
- provide ventilation in an approved manner in battery-charging areas to prevent a dangerous accumulation of flammable gases [§1108.3]
- provide battery-charging areas with a fire extinguisher having a minimum rating of 4-A-20B:C within 20 feet of the battery charger [§1108.4]
- refuel industrial trucks using liquid fuel or LP-gas outside of buildings or in areas specifically approved for that purpose [§1108.5]
- perform repairs to fuel systems, electrical systems or repairs utilizing open flame or welding in approved locations outside of buildings or in areas specifically approved for that purpose [§1108.6]

The OSHA regulations, in 29 CFR 1910.178(g), amplify the Fire Code requirements for **changing and charging storage batteries**. To comply with these requirements:

#### **You Must**

- locate battery charging installations in areas designated for that purpose
- provide facilities for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries
- provide a conveyor overhead hoist, or equivalent material handling equipment, for handling batteries
- properly position and secure reinstalled batteries in the truck
- provide a carboy tilter or siphon for handling electrolyte

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- when charging batteries, pour acid into the water; **do not** pour water into the acid
  - properly position trucks and apply the brakes before changing or charging batteries
  - ensure that vent caps are functioning; open the battery or compartment cover to dissipate heat
  - prohibit smoking in the charging area
  - take precautions to prevent open flames, sparks or electric arcs in battery charging areas
  - keep tools and other metallic objects away from the top of uncovered batteries
  - The **NFPA 58, 1995 edition, Section 8-3.6**, applies to **LP-Gas installation on industrial (and forklift) trucks**. To comply with NFPA 58 as it pertains to refueling -
  - refuel trucks with permanently mounted containers out-of-doors
  - exchange removable tanks preferably out-of-doors, but if done indoors, minimize the release of fuel when containers are exchanged by -
    - using an approved, quick-closing coupling in the fuel line, or
    - closing the shut-off valve at the fuel container and running the engine until the fuel in the line is exhausted
  - not use more than two fuel containers on a truck
  - not exceed 105 pounds [nominal 45 pounds] of LP-Gas capacity in the containers
  - not park and leave trucks unattended in areas occupied or frequented by the public
  - not park and leave trucks unattended in areas of excessive heat or near sources of ignition

### **LP-Gas**

The OSHA regulation for storage and handling LP-Gas as fuel, found in 29 CFR 1910.178(f), references the **NFPA 58, Storage and Handling of Liquefied Petroleum Gases**. The provisions of the 1998 Indiana Fire Code Standard given above are adequate guidance for this operation.

### **Operator Training for Forklift Operation**

Another aspect of product transfer by forklift is the actual operation of the forklift. OSHA revised its Operator Training regulation, found in 29 CFR 1910.178(l), effective March 1, 1999. Employees hired before December 1, 1999 must be trained by that date. Employees hired after that date must be trained before he/she is assigned to operate a powered, industrial truck. The revised standard requires a designated trainer, classroom instruction, practical training, and evaluation as part of the initial training and, at least once every three years, refresher training, as necessary.

### **Forklift/Industrial Truck Maintenance**

The OSHA Standards also regulate industrial truck maintenance. Your maintenance personnel must be knowledgeable of the requirements in 29 CFR 910.178(q) before undertaking any repairs.

## **12.2 Storage and Warehouse Areas**

The 1998 Indiana Building code, rather than federal regulations, will govern the design and construction of storage and warehouse areas. The 1998 Indiana Fire Code requirements in

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Chapter 81 pertain only to “high-hazard commodities,” and publicly accessible areas where mechanical stocking methods are used [§8102.10.2]. The OSHA regulations, found in 29 CFR 1910.176, are rather general; however, to comply with these provisions:

**You Must**

- allow safe clearance for aisles, at loading docks, through doorways and whenever turns or passage must be made
- keep aisles and passageways clear of obstructions that could create a hazard
- mark permanent aisles and passageways
- stack, block, interlock and limit the height of stored containers in tiers
- keep storage areas free from accumulation of materials that constitute hazards from tripping, fire, explosion and pest harborage
- provide signs to warn of clearance limits

### **12.3 Product Packing/Packaging**

Packing or packaging of products is also an operation where federal or state regulation is relatively absent, except in two respects: (1) assembling pallets and crates with portable powered tools (e.g., pneumatic nailers, circular saws, etc.) and (2) blowing packing foam in shipping cartons.

The OSHA regulations pertaining to the first operation, found in 29 CFR 1910.243.

The second operation, blowing packing foam around products in shipping cartons to reduce damage, typically utilizes a two-part foam blowing system. Typically, one part is polyurethane resin containing a catalyst and the other is totally, or almost totally, MDI (Diphenylmethane diisocyanate).

According to the OSHA Table Z -1, limits for Air Contaminants [29 CFR 1910.1000], the 8-hour Time Weighted Average or Permissible Exposure Limit (PEL) for MDI is 0.02 parts per million (ppm) and this PEL is also the “Ceiling Value,” which means that **at no time** shall an employee’s exposure exceed that limit at any time during the work day. The Threshold Limit Value (TLV) for the substance is 0.005 ppm.

MDI can cause mucous membrane, skin, eye and respiratory tract irritation. It can also lead to an allergic sensitivity in some people, resulting in asthma-like symptoms such as shortness of breath, even at levels **below** the PEL. Laboratory tests have shown that respiratory sensitization can result from skin contact with MDI.

To protect employees having a potential over-exposure to MDI:



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### **You Should**

- provide them with goggles or safety glasses with side shields and/or face shield
- provide them with chemical resistant butyl rubber, nitrile rubber, polyvinyl alcohol, or other suitable gloves
- allow the foam-blowing operation to be conducted only in a well-ventilated area or use local exhaust, if necessary, to maintain levels below the PEL
- conduct frequent air and personal monitoring to ensure that the PEL is not being exceeded
- provide training to employees responsible for spill response and clean-up on the special procedures required when MDI is involved

**NOTE: if employees are allowed to provide their own PPE (e.g., goggles or safety glasses) the employer is responsible for assuring its adequacy, including proper maintenance and sanitation of the PPE [29 CFR 1910.132(b)].**

**For assistance call [IDEM]: 317/233-6661**

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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [FIRE PROTECTION](#)
- ✓ [OCCUPATIONAL NOISE EXPOSURE](#)
- ✓ [ERGONOMICS PROGRAM STANDARD \(PROPOSED\)](#)
- ✓ [TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS](#)

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## CHAPTER 13: SOLID WASTE STORAGE/SHIPPING

The largest portion of your facility's solid waste stream is, undoubtedly, gel coat/chop coat overspray, fiberglass dust, and fiberglass trimmings or cutouts. The generation of these manufacturing by-products remains a problem even for those that have modified the production process to reduce waste.

### 13.1 Solid Waste

Indiana solid waste regulations [[329 IAC 10-2-179.1\(b\)\(14\)](#)] classifies manufacturing production wastes, like wood scraps, bricks, concrete, plumbing fixtures, wiring and non-asbestos insulation as solid waste. They are **not** considered industrial waste. Non-hazardous, non-industrial, solid wastes may be disposed of only in a permitted municipal solid waste landfill or a permitted construction/demolition landfill.

### 13.2 Industrial Waste

A significant portion of your solid waste stream may be wastes considered by Indiana law to be **industrial waste**. For fiberglass product manufacturers, industrial waste may include:

- gel coat/resin chop coat overspray
- fully polymerized resins and gel coats
- gel coat, resin-chop coat or paint spray booth filter media
- gel coat, resin-chop coat or paint booth papers - wall and floor
- gel coat, resin-chop coat or paint booth sweepings
- glue and glue residue
- ash from burning booth filters, if permitted to do so
- racks and other fixtures used to hold products while being painted
- filters and dust from areas where sanding, cutting, or trimming of fiberglass is performed

On March 17, 2000, Senate Enrolled Act No. 372 was signed into law. This legislation replaces the "Special Waste" regulations with a new "Industrial Waste" category and requirements. The solid waste management board is required to adopt these requirements prior to July 1, 2001. Waste certified as "Special Waste" before its repeal (July 1, 2000) may continue to be disposed of under its certification until the expiration of the certification or July 1, 2001, whichever comes first. The state of Indiana has established "Industrial Waste" rules to reduce the risk of groundwater and soil contamination. These rules not only protect our natural resources, they also ensure both the landfill and the generator that what is being disposed of is a non-hazardous waste and does not pose a threat to the environment or individuals that may be exposed to the waste.

#### Exemptions

Industrial wastes are non-hazardous solid wastes generated from industrial processes, pollution control processes, and waste generated from the cleanup of chemical spills.

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Excluded from the regulation are “[RCRA empty](#)” containers and construction or demolition debris (excluding asbestos). Also excluded are wastes similar to those wastes generated in households such as paper, cardboard, glass, and office wastes. However, if these wastes are contaminated with chemicals (i.e. cardboard soaked with resin or paint) they would more than likely fall under the industrial waste requirements.

Non-hazardous industrial process wastes that are generated in “small quantities” are also exempt from industrial waste regulations. Small quantities are defined as individual waste streams (excluding asbestos) that are generated in quantities of less than 220 lbs. per month.

### 13.3 Hazardous Waste Determination

Under federal regulations, a generator must make a hazardous waste determination for all wastes generated. The first step in making this determination is ensuring that the waste is not [a listed hazardous waste](#). The next step is to determine if the waste is a [characteristic hazardous waste](#). This determination may be made using analytical testing or by applying generator knowledge.

#### Using Generator Knowledge

The use of generator knowledge in lieu of analytical testing can save the company the expenses associated with testing. However, just saying “I think this material is non-hazardous” will not be sufficient to satisfy the landfill, IDEM, or the U.S. EPA. You must have documentation and sufficient knowledge of the waste and the process generating the waste to back up your claims. This documentation may include technical information supplied by the coatings supplier (MSDS sheets alone will not provide the detailed information required, but may be useful in the decision/determination documentation) or information from previous analytical tests that show a trend indicating the waste is non-hazardous and the results are consistent. A sample documentation form is shown on the next page.

**Example:** A company has performed analytical testing on the resin chop coat booth filters and has proven this waste stream to be non-hazardous. In a separate booth the same resin chop coat is sprayed, but with one difference: in this process, calcium carbonate fillers are added to the resin. The technical information provided by the chemical manufacturer on the filler indicates that this material does not contain any hazardous constituents. Using the technical information and test results from the resin chop coat filters, this company deems the filters from the resin chop coat containing the filler to be non-hazardous.

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## Generator Knowledge Documentation: SAMPLE FORM

**Waste Identification:** Paper spray booth filters contaminated with gel coat (product number, SC145-7).

**Description of the Process generating this Waste Stream:** The waste paper spray booth filters are generated from the application of gel coat (product number, SC145-7) in booth 5 on production line 4. The waste filters are removed from the booth every morning of production.

**Listed Hazardous Waste Status:** This material is not specified as a listed hazardous waste by EPA in 40 CFR 261, Subpart D.

### **Waste Determination (Characteristic Hazardous Waste):**

**Ignitability:** This material is a solid waste that is not capable of causing a fire under normal conditions, through friction, or absorption of water. This waste is not considered an ignitable waste under 40 CFR 261.21, nor will this waste generate heat that would adversely affect routine solid waste disposal operations, adversely affect the structure of the landfill, or adversely affect the health or safety of workers or the public as outlined in 329 IAC 10-7.1-3(b)(5).

**Corrosivity:** Under 40 CFR 261.22, a waste is considered corrosive if it is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5. The waste may also be considered to be a corrosive waste if it corrodes steel at a rate greater than 6.35 mm per year at 130° F. This material is a solid waste that is not aqueous, nor is this waste a liquid, nor will this waste cause the accelerated corrosion of other materials. Therefore, this material does not exhibit the characteristic of corrosivity as defined under 40 CFR 261, Subpart C. (See attached technical data sheet).

**Reactivity:** This material is a solid waste that does not react violently or have the capability of generating heat when mixed with other wastes or water, nor does this waste contain cyanide or sulfides and, therefore, is not considered a reactive waste under 40 CFR 261.23.

**Toxicity:** The technical information provided by the manufacturer for the sealer provides the chemical makeup of the material to the nearest 0.01% by weight. None of the contaminants listed in 40 CFR 261.23 as Toxicity Characteristics in Table 1 are listed in the technical information supplied by the manufacturer. Due to the fact that none of these chemicals are present in this material, or are present in extremely low concentrations (< 0.01% by weight) and due to the fact the filters are replaced daily, it has been concluded that the waste paper filters contaminated with sealer will not be hazardous due to toxicity (see attached technical data sheet).

**Polychlorinated Biphenyls (PCBs):** The technical information provided by the manufacturer for the sealer provides the chemical makeup of the material to the nearest 0.01% by weight. No polychlorinated biphenyls have been listed on this information and, therefore, are in concentrations less than 0.01% by weight. Therefore, this material has concentrations of PCBs less than the regulatory limits specified in 40 CFR 761 and 329 IAC 4 (see attached technical data sheet).

**Asbestos:** The spray booth filters are made up of paper and do not contain any asbestos (see attached technical data sheet).

**Free Liquids:** The spray booth filters collect the overspray from the gel coating process. The material reaching the filters cures within minutes of landing on the filters forming a solidified resin. The filters are changed out in the morning allowing twelve hours of cure time to ensure complete polymerization of the overspray. There are no free liquids remaining on the filters at the time of disposal.

**This information is, to the best of my knowledge, true, accurate, and complete.**

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Generator Signature

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Date

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Title

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## Testing Waste

If the company cannot make a determination about hazardous waste characteristics using generator knowledge, they have two options; consider the waste hazardous, or test the waste. Prior to performing testing on waste streams there are a few things to consider:

- the samples tested must be representative samples, or samples of the worse case scenario
- waste streams cannot be combined for testing
- confer with IDEM and/or your landfill if you are unsure what parameters must be included in the analytical tests. This can minimize testing parameters and thus reduce testing costs
- sampling and testing must conform to, or be an IDEM approved equivalent to, procedures dictated in SW-846
- even if the landfill does not require Level III Quality Assurance/Quality Control, as stipulated in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,” always obtain Level III QA/QC to validate the results. (See IDEM’s Guidance document, “[Solid Waste Program Analytical Data Deliverables](#)”)

SW-846 requires a sampling and analysis plan. Information required in these plans includes:

- a description of how the samples were collected
- a diagram of the sample collection sites
- calculations used to determine how many samples are required
- the volume of the waste stream
- a description of the test methods and testing equipment used
- the detection limits

Examples of testing options:

1. A company has a dry filter booth in which chop coat is sprayed. Information collected from the chemical manufacturer indicates that the waste filters should be non-hazardous, yet there is not sufficient documentation to satisfy the landfill. To reduce complexity of the sampling plan, the company should remove the most heavily loaded filters for testing. As long as the laboratory provides “Level III QA/QC” and the results are well below the regulatory thresholds for hazardous waste, further testing will not be required. However, if changes in the process occur, such as changes in the resin’s chemical makeup, additional testing may be required.
2. This same company has a gel coat booth in which many different colors are sprayed during the course of a day in the same booth. The filters in this booth are changed at the end of the day. To comply with the sampling requirements, this company can take samples of the booth filters containing overspray from all colors, and test the composite sample. If this waste stream varies in composition of materials from day to day (if the ratio of different materials sprayed varies greatly from day to day), repeat the testing twice more on different days in order to obtain sampling results that are representative of the waste stream and then do a statistical evaluation of the results. This would be an acceptable method of evaluating the waste.

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3. Another company has a gel coat booth in which they spray many different colors, but only spray one color in any one day. At the end of the day, the filters are changed, and the next day the line runs another color. In this case, a booth filter sample that contains overspray from multiple colors would not be a representative sample of the waste streams. So, the company has three options: 1) Test one booth filter sample set from each color of gel coat and use sufficient information from the supplier indicating that there are none of the hazardous waste characteristic contaminants present. If sufficient information cannot be obtained from the supplier, then test at least one sample from each color in order to obtain sampling results that are representative of the waste stream. 2) Use technical documentation from their chemical supplier, determine which color has the highest level of contaminants, and, therefore, is most likely to fail or come the closest to failing the analytical test. Using this information, test a sample group from this worst-case color. If the results of this test reveal the samples to be non-hazardous, then the company can use generator knowledge to determine that waste booth filters from the other colors will also be non-hazardous. 3) If the company can obtain sufficient information from the supplier indicating that there are none of the hazardous waste characteristic contaminants present in any of the waste streams that would make them hazardous, then testing may not be necessary.

## 13.4 Treating Waste Resins

[Small quantity generators](#) or [large quantity generators](#) of hazardous waste are allowed to treat a characteristic hazardous waste to render it non-hazardous. This practice is allowed only if performed in accordance with federal requirements. One of the wastes that can be treated under federal law is waste resin.

Waste resins have the characteristic of ignitability, and are, therefore, a hazardous waste under the RCRA definition. These resins are also in liquid form and wastes containing free liquids may not be disposed of in a landfill. However, if the waste resins are treated by polymerization, and the resins are fully reacted, they would no longer exhibit the characteristic of ignitability nor contain free liquids. **Note: the treatment of resins must be performed in accordance with federal and state regulations** (see “Polymerization Treatment of Waste Polyester/Styrene and MEK Peroxide” in [CHAPTER 14: LIQUID WASTE STORAGE/SHIPPING](#)). The generator of fully polymerized resins must then ensure that the waste meets the federal land disposal restrictions outlined in [40 CFR 268, Subpart D](#). This will include a waste analyses plan [40 CFR 268.7\(a\)\(5\)](#) and a one time notification to the IDEM Commissioner [329 IAC 3.1-12-2-8](#). If the non-hazardous waste meets the land disposal restrictions and the generator has met the notification requirements of [329 IAC 3.1-12-2-8](#), it would be considered an industrial waste.

## 13.5 Disposing of Waste

After you have determined the status of your waste stream, the next thing to consider is the type of landfill in which you will dispose your waste.

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For disposal in Subtitle D cells (see “[Indiana Special Waste Disposal Sites](#)”), you must follow the notification requirements. A generator of industrial waste (before disposing of the waste for the **first** time) must supply a signed notification to the landfill. This notification must:

- state that the waste is non-hazardous
- state that the waste determination was performed in accordance with federal regulations ( 40 CFR 240 through 40 CFR 299, 40 CFR 761)
- identifies any waste that requires special handling requirements

If changes to the process change the characteristics of the waste, the generator must make a new hazardous waste determination and submit a new notification, thus notifying the landfill of the change.

If the waste is to be sent to a landfill that does not meet the Subtitle D landfill requirements or to a waste-to-energy facility, you must have the landfill apply to IDEM for a permit modification prior to disposing of industrial waste at that facility.

## 13.6 Other Wastes

There are other types of solid waste and other wastes classified under modifications of the hazardous waste rules that may be generated at your facility. Information about these can be obtained in the form of Non-Rule Policy Documents, Information, or Guidance sheets from IDEM Office of Land Quality. Some you may be interested in are listed below.

- [Universal Waste Rule](#). Cited as OSHWM General ID #0055-01-HW, May 1994
- [Disposal of Fluorescent Light Ballast](#). Cited as OSHWM General ID #0012-01-SHW, July 1995
- [Management of Hazardous Waste Residues Removed from Empty Containers](#). Cited as a Non-Rule Policy Document, May 9, 1997
- [Disposal of Empty Containers as Solid Waste](#). Cited as WASTE-0005-NPD, a Non-Rule Policy Document, May 9, 1997
- [Complying with Indiana’s Used Oil Rule](#). Undated, not coded.
- [Used Oil Filters](#). Cites as OSHWM General ID #0060-01-HW, May 1997
- [Classification of Used Antifreeze](#). Cited as OSHWM General ID #0034-02-HW, May 1997
- [Management of Contaminated Wipes](#). Cited as Regulatory Analysis, November 14, 1995

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### Facility-Wide Regulations

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [FIRE PROTECTION](#)

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## CHAPTER 14: LIQUID WASTE STORAGE/SHIPPING

Your production operation undoubtedly generates **liquid wastes** -- most of it “hazardous” -- from its gel coat, resin chop, and paint coating application operations.

It’s probably this **liquid waste storage/shipping operation** that can cause you the greatest problem if the federal and state regulations aren’t followed.

In 2001, the Indiana Styrene Rule went into effect. This rule affects storage of HAP containing material including waste. Refer to Appendix 21 to determine how to comply with this regulation.

There are a few definitions in the regulations that can help.

- “Large quantity generator:” defined by EPA and IDEM to mean a facility that generates in excess of 2200 pounds of hazardous waste each month. This amount of waste can be stored at the “LQG” facility for up to 90 days.
- “Small quantity generator:” a facility that generates between 220 and 2200 pounds of hazardous waste in a calendar month. The “SQG” can store up to 13,200 pounds of hazardous waste on site for up to 180 days.
- “Satellite accumulation:” the area at or near the point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste.
- “Hazmat employer:” an employer (manufacturer) that uses its employees to -- among other things -- cause hazardous materials to be transported or shipped in commerce. Hazardous waste is a hazardous material by U.S. DOT definition.
- “Group F Occupancy:” FRP manufacturing facilities, among others, may be classified in this group by the 1998 Indiana Building Code.

So, let’s look at these requirements for environmental protection, worker health and safety protection, transportation and fire and building safety. And let’s look at these “regs” from an operations perspective -- as if we are the manager of the liquid waste storage/shipping operation.

### 14.1 Liquid Hazardous Waste Stored at or near the Point of Generation

#### “Satellite Accumulation”

##### You Must

- ensure the waste is under the control of the operator of the process generating the waste
- label the container with the words “Hazardous Waste” or with other words identifying the contents of the container
- be sure not to accumulate more than 55 gallons the of hazardous waste (one quart of acutely hazardous waste) in the satellite accumulation area



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- make sure the container(s) are in good condition and free of leaks
  - make sure the container is compatible with the waste
  - make sure the container is closed at all times except when adding or removing waste
  - when 55 gallons of hazardous waste (or one quart of acutely hazardous waste) has accumulated, the date must be entered on the label and the drum or container moved to the 90 day or 180 day storage area within three days

## 14.2 Liquid Hazardous Waste is Transferred to the Storage/Shipping Area

### By 55 Gallon Drums

If the waste is transferred in 55 gallon drums from the production area:

#### **You Must**

- be sure to check each drum to make sure it is labeled or marked with the words “Hazardous Waste”
- be sure that the date entered in the “accumulation date” space on the label is the date the drum or container was filled in the satellite accumulation area. If there is another date entered, remove this label and put on another one and insert the date that the drum or container became filled in the satellite accumulation area.<sup>12</sup>
- make sure the container(s) are in good condition and free of leaks
- make sure the container is compatible with the waste
- make sure the container is closed at all times except when adding or removing waste
- inspect storage area(s) at least once a week
- maintain sufficient aisle space between containers to allow for fire protection and spill control in an emergency
- make sure all emergency equipment to handle fires or spills are maintained and tested to assure proper operation

**If you’re an LQG, this drum of waste must be shipped to your treatment, storage and disposal facility within 90 days of the date entered on the label. If you’re an SQG, it must be shipped within 180 days, and you may not exceed the 13,200-pound limit within that period.**

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<sup>12</sup> The EPA regulations pertaining to “Accumulation Time” (40 CFR 262.34) are confusing and varies depending on where waste is collected. For satellite accumulation areas, the “accumulation date” is entered when the “last drop” is put in the 55-gallon drum NOT when the “first drop” is put in. If the waste is accumulated in the 90 or 180 day storage area, then the “accumulation date” is entered when the “first drop” is added to the 55-gallon drum, NOT when the “last drop” is put in.

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### By Pipe

If the waste is transferred by pipe to a tank or by container, which is pumped or poured into a tank located in the liquid waste storage area:

### You Must

- label or mark tanks storing hazardous waste “Hazardous Waste” [[40 CFR 262.34\(a\)\(3\)](#)]
  - post warning signs that read, DANGER-FLAMMABLE LIQUIDS, if:
    - you are required to do so by the 1998 Indiana Fire Code
    - the liquid hazardous waste is classified as flammable ([675 IAC 22-2.2-343](#) and 1998 Indiana Fire Code §7901.9.1) comply [with 40 CFR Part 265 Subpart AA Air Emission Standards for Process Vents](#) if you are a LQG and you manage, in **tanks**, hazardous waste with a volatile organic concentration at least 10 ppm, by weight
    - the Recordkeeping requirements for Subpart AA are found in [40 CFR 265.1035](#)
  - comply with [40 CFR Part 265 Subpart BB Air Emission Standards for Equipment Leaks](#) if you are an LQG and you manage, in **tanks**, hazardous waste with a volatile organic concentration of at least 10 percent, by weight
    - the Recordkeeping requirements for Subpart BB are found in [40 CFR 265.1064](#)
  - comply with [40 CFR 265, Subpart CC Air Emission Standards for Tanks, Surface Impoundments and Containers](#) if you are an LQG and manage, in **tanks or containers**, hazardous waste with a volatile organic concentration at point of origination greater than, or equal to, 500 ppm, by weight
    - the Recordkeeping requirements for Subpart CC are found in [40 CFR 265.1090](#)
- (If you are unsure whether the Subpart AA, BB or CC Air Emission Standards apply to your operation, call the IDEM Hazardous Waste Compliance Branch, Office of Land Quality)**

## 14.3 Liquid Hazardous Waste Containers Prepared for Shipment

Your hazardous waste may be restricted from land disposal:

- If you are an SQG or LQG and your waste is a F001, F002, F003, F004 or F005 **listed** hazardous waste the waste is restricted from land disposal.
- If you are an SQG or LQG and your waste is a **characteristic** waste as defined in 40 CFR 261 Subpart C, you must determine the underlying hazardous constituents. Generally, D001, D002, D003, and D012-D043 wastes need to be treated for the characteristic and any underlying hazardous constituents prior to landfill disposal.

### You Must

- with the **initial** shipment of hazardous waste that is sent to a hazardous waste treatment, storage or disposal facility (TSD), notify the TSD in writing. According to [40 CFR 268\(7\)\(a\)\(2\)](#), this notice must include:
  - the EPA Hazardous Waste number
  - identification of waste as a wastewater or nonwastewater

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- the waste constituents that the treater will monitor, if monitoring will **not** include all regulated constituents, for waste F001-F005, F039, D001, D002, D003, and D012-D043
  - the manifest number associated with the shipment of waste
  - the waste analysis data, where available
  - when hazardous debris is to be treated by an alternative technology, a statement to that effect and the contaminants subject to treatment
  - for contaminated soil, the constituents subject to treatment and the following statement: "This contaminated soil [does/does not] contain listed waste and [does/does not] exhibit a characteristic of hazardous waste and [is subject to/complies with] the soil treatment standards as provided by 40 CFR 268.49 (c) or the universal treatment standards."
- with the initial shipment of waste that you have already treated and that you are sending to a hazardous waste treatment, storage, or disposal facility, notify the TSD in writing. According to 40 CFR 268(7)(a) this must include:
- the EPA Hazardous Waste number
  - identification of waste as a wastewater or nonwastewater
  - the waste constituents that the treater will monitor, if monitoring will **not** include all regulated constituents, for waste F001-F005, F039, D001, D002, D003, and D012-D043
  - the manifest number associated with the shipment of waste
  - the waste analysis data, where available
  - for contaminated soil, the constituents subject to treatment and the following statement: "This contaminated soil [does/does not] contain listed waste and [does/does not] exhibit a characteristic of hazardous waste and [is subject to/complies with] the soil treatment standards as provided by 40 CFR 268.49 (c) or the universal treatment standards."
- And the following certification statement, signed by an authorized representative of the generator facility, must be included:
- I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268, Subpart D. I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.
- for characteristic hazardous waste that you have already treated and intend to dispose of in a landfill, notify the Indiana Department of Environmental Management (IDEM) in writing. According to 40 CFR 268.9, this notification must include:
- the name and address of the RCRA Subtitle D facility receiving the waste shipment
  - a description of the waste as initially generated, including the applicable EPA waste code
  - the treatability group, treatment method

- 
- the underlying hazardous constituents, unless the waste will be treated and monitored

And the following certification statement, signed by an authorized representative of the generator facility, must be included:

I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operations of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for the obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

### **You Should**

- check with your hazardous waste transporter or TSD to see if they have a form that can be used for purposes of notification
- your hazardous waste containers need to be properly labeled and marked before shipping, according to U.S. EPA and U.S. DOT regulations

### **You Must**

- affix a U.S. DOT-approved label (e.g., “Flammable Liquid”) on the surface of drum next to the Hazardous Waste label [[40 CFR 262.31](#) reference to [49 CFR Part 172, Subpart E](#)]
- mark each container with the following information if you do NOT use the common, yellow Hazardous Waste label
  - the statement: “HAZARDOUS WASTE – Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U. S. Environmental Protection Agency.”
  - generator’s name and address
  - manifest document number [[40 CFR 262.32](#)]
- offer your transporter the appropriate placards for the load of hazardous waste being shipped [[40 CFR 262.33](#) reference to [49 CFR 172, Subpart F](#)]

## **14.4 The Manifest [shipping paper] Prepared for Transporting Containers of Liquid Hazardous Waste**

Every shipment of liquid hazardous waste—whether one container or several—is required to be manifested [[40 CFR 262.20](#) and [49 CFR 172.205](#)]. Instructions for completing the manifest are found in 329 IAC 3.1-7. If you’re a generator shipping hazardous waste from your facility:

### **You Must**

- identify a TSD facility that has an EPA permit to handle your waste and designate this facility on the manifest
- identify a transporter to transport your waste to the TSD

- 
- sign the manifest certification by hand and obtain the signature of the transporter driver and the date the driver accepts the shipment
  - retain one copy of the manifest and give the transporter the remaining copies
  - retain your copy of the manifest for three years or until you receive a signed copy from the TSD that received your waste
  - retain the copy signed by the TSD facility for three years from the date of the shipment
  - retain records of any test results, waste analyses and other documents pertaining to your waste for at least three years from the date of shipment

### **You Should**

- retain all records of all shipments in a permanent file, indefinitely – generators have been identified as a “potentially responsible party” (PRP) in a Superfund corrective action many years after the waste was shipped

By March 1 of each even numbered year, generators are required to summarize the information from all their manifests for the previous calendar year on a EPA Form 8700-13A, known as the **Biennial Report**.

**On March 13, 2000, Senate Enrolled Act No. 511 was signed into law [Effective January 1, 2002]. This legislation will require SQGs and LQGs to submit an annual report to IDEM by March 1 of each year. This report must contain information that summarizes the facility’s hazardous waste shipments during the previous year. The facility may submit this report on the annual report forms provided by IDEM, or in the case of LQGs, may submit the biennial report required by the EPA.**

### **You Must**

- include the following information in the Biennial Report
  - generator’s name, address, EPA identification number
  - name, address and EPA identification number of each TSD to which waste was shipped
  - name, address and EPA identification number of each transporter used to transport waste to a TSD
  - a description, EPA hazardous waste number, DOT hazard class, and quantity of each hazardous waste shipped to each TSD, listed by EPA identification number
  - description of efforts to reduce the volume and toxicity of waste generated
  - a description of the changes in volume and toxicity of waste actually achieved, compared to previous years
- the report certification must be signed by the generator or authorized representative

### **You Should**

- provide copies of the Biennial Report to others at your facility responsible for completing the facility’s Emergency Contingency Plan [[40 CFR 265.50](#)] and its Tier I and II Reports [[40 CFR 370.40 & .41](#)] and the Toxic Release Inventory (TRI) report [[40 CFR 372.10](#)], if required - your Biennial Report information will be very helpful.

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## 14.5 Preparing for an Emergency: Rely on your Facility's Emergency Procedures, Plans, and Personnel

The regulations of every federal and state agency covered in this Compliance Guide require your facility to be prepared for an emergency, such as a fire, spill of hazardous waste or material, or explosion. Emergency response procedures must be developed and these must be incorporated in a "plan." Employees who may be assigned to respond to emergencies also have to be trained in response procedures. The various regulations requiring procedures, plans and trained personnel have been considered a "jumbled mess," but, finally, in 1996, the federal agencies got together and developed what they call the "Integrated Contingency Plan" (ICP) [[Federal Register, Vol. 61, No. 109, June 5, 1996](#)].

- If you prefer to prepare and maintain distinct emergency plans, you may. You can refer to the regulations listed here to review each agency's requirements.

### U.S. EPA

[40 CFR Subpart C](#) - Preparedness and Prevention

[40 CFR Subpart D](#) - Contingency Plan and Emergency Procedures

[40 CFR Part 355](#) - Emergency Planning and Notification

[40 CFR Part 112](#) - Spill Prevention Control and Countermeasures Plan

### U.S. OSHA

[29 CFR 1910.120](#) – Hazardous Waste Operations and Emergency Response ("Hazwoper") rule

### INDIANA DEPARTMENT of FIRE and BUILDING SERVICES

Section 8001.3.2 of the 1998 Indiana Fire Code requiring the preparation of a Hazardous Materials Management Plan does not apply to facilities regulated under the Emergency Planning and Community Right To Know Act (EPCRA) as set forth at 42 U.S.C. 11001, et seq.

Hazardous waste generator-shippers are not only subject to EPA regulations, but, also, to U.S. DOT regulations as a shipper of hazardous materials. As a hazardous material shipper:

### **You Must**

- provide emergency response information that can be used in the mitigation of an incident involving your hazardous waste [[49 CFR 172.602](#)]. This information must include:
  - the basic description of the waste
  - the 24-hour emergency telephone number of the facility shipping the waste (or its designated knowledgeable person)
  - the immediate hazards to health
  - the risks of fire or explosion
  - immediate precautions to be taken in the event of an accident or incident
  - immediate methods for responding to fires
  - initial methods for responding to spills or leaks, without fire
  - preliminary first aid measures

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### **You Should**

- have such technical information prepared by the laboratory that analyzed your waste. Your waste analysis document does not provide the information required here. The Material Data Safety Sheets for the raw material constituents of your waste often will not provide the necessary information. If virgin toluene becomes waste toluene, for example, the MSDS should satisfy this requirement. But if the waste consists of two or more raw materials, the MSDSs for these raw materials will not accurately convey the information required
- provide a copy of each emergency response information sheet to the transporter driver by paper-clipping (not stapling) it to the hazardous waste manifest; this way, it is away from the container of hazardous waste, as required by U.S. DOT.
- U.S. DOT regulations [[49 CFR 172.604](#)] also require that you maintain a 24-hour emergency telephone response during the period your waste is being transported to the TSD.
- The phone must be monitored by a person who is knowledgeable of the hazards of the waste and the appropriate response procedures or monitored by a person who has immediate access to the knowledgeable person.
- Trained employees, capable of responding to leaks, small spills and fires involving hazardous waste, can mitigate what could otherwise be a serious situation.

**BUT, AN EMPLOYER IS NOT REQUIRED TO RELY ON EMPLOYEES FOR EMERGENCY RESPONSE. HOWEVER, IF EMPLOYEES WILL BE INVOLVED, THEY MUST BE TRAINED. IF THEY ARE NOT GOING TO RESPOND, THEY MUST EVACUATE THE PREMISES.**

There are employee training requirements that complement the requirements for emergency plans. They include U.S. EPA [40 CFR 265.16](#) Personnel Training.

To comply with the personnel and training recordkeeping requirements of this regulation:

### **You Must**

- have a written job description for each position at your facility that has any responsibility for hazardous waste management. These job descriptions must include -
  - a job title
  - the duties of the position
  - information about the requisite skill, education or other qualifications
- maintain a written description of the type and amount of both introductory and continuing training that was provided to each person filling each position
- maintain records that document that the training or job experience required for each position has been provided to each employee
- maintain training records on current personnel until closure of the facility
- maintain training records on former employees at least three years from the date the employee last worked at the facility

### **You Should**

- secure the services of a professional environmental, safety and health trainer

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- maintain a training log, including the date and description of training and names of the employees trained
  - maintain a copy of the training curriculum used by the instructor

### **Hazardous Waste Operations and Emergency Response (“Hazwoper”) rule**

[29 CFR 1910.120](#)

To comply with the recordkeeping requirements of this regulation:

#### **You Must**

- ensure that employees who successfully complete the training and field experience required by this regulation receive a certificate from the internal or consulting training organization
- maintain a description of the training and/or equivalent job experience and if an employee’s job experience (competency) is used in lieu of training, you must keep a record of the methodology used to demonstrate competency

#### **You Should**

- secure training services from a professional training organization
- maintain a written log of training, including dates and description and names of employees participating
- maintain a copy of the written curriculum used by the instructor
- maintain a copy of each employee’s certificate in a central training file

There’s another employee emergency response training requirement that pertains to your Liquid Hazardous Waste Storage Area--the U.S. DOT **Hazmat Employee Training** requirement found in [49 CFR 172.704](#)--because your facility and, specifically, your area is shipping hazardous waste--a hazardous material. To comply with this regulation:

#### **You Must**

- provide for each “hazmat employee”: general awareness/familiarization training, function-specific training, and safety training
  - if the OSHA Hazard Communication training or “Hazwoper” training provided your employees satisfies the requirements of [49 CFR 172.704\(a\)](#), this hazmat employee training need not be provided.
- create and retain a record of current training, inclusive of the preceding three years, for as long as each employee is employed as a hazmat employee, and for 90 days thereafter
  - the training record must include the hazmat employee’s name; training dates; description, copy or location of the training materials; name and address of the trainer, and certification that the hazmat employee has been trained and tested

#### **You Should**

- make sure that everyone working in the Liquid Hazardous Waste Storage Area receives hazmat employee training and participates in refresher training at least annually, if they are not a member of the facility’s hazardous materials emergency



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response team and trained according to the “Hazwoper” requirements. For most employers, the Hazard Communication Standard training does not include emergency response training and, therefore, it **should not** be considered comparable, regardless of DOT’s allowance.

## **POLYMERIZATION TREATMENT OF WASTE POLYESTER/STYRENE AND MEK PEROXIDE**

Small quantities of polyester/styrene monomers and MEK peroxide wastes can be reacted together to create “fiberglass scrap.” Non-polymerized polyester/styrene monomers and MEK peroxide wastes are regulated as high-TOC (Total Organic Carbon) ignitable waste (D001). The hardened resin created by this treatment process is inert and does not generally exhibit the hazardous waste characteristics of toxicity, ignitability, corrosivity or reactivity. Authority granted to manufacturers to employ polymerization (POLYM) as a waste treatment method by the EPA was published in the **Federal Register**, Vol. 62, No. 91 (May 12, 1997), p. 25998.

Treatment employing polymerization can be performed at the manufacturer-generator facility without a permit for treatment, storage or disposal (TSD). For purposes of this manual, it is assumed that such treatment will occur in a container with a volume less than a 55-gallon drum or in a 55-gallon drum.

You also have a choice to treat your waste in **other** than a satellite accumulation container in an area such as in your 90-day/180-day storage area or another location, **or** you may treat your waste **in** a satellite accumulation container. Regardless where you treat your waste, it must be done within the 90 or 180-day storage limitation for Large and Small Quantity Generators, respectively. And Large Quantity Generators that treat waste on-site must report this activity in their biennial report.

You need to be aware that treating your waste in **other** than a satellite accumulation container will require cognizance of and compliance with many more regulations than if you decide to treat **in** a satellite accumulation container. And, except as noted, these requirements apply equally whether you are a Large Quantity Generator or a Small Quantity Generator. Certain of the requirements will be ones that you will already comply with because of your status as a Large or Small Quantity Generator:

- the requirements for **Preparedness and Prevention** found in [40 CFR 265, Subpart C](#), which include providing and maintaining emergency response and spill cleanup equipment, maintaining adequate aisle space between containers in the 90-day/180-day waste storage area, providing communications or alarm systems, and making emergency arrangements with local authorities
- the requirements for **Contingency Plan and Emergency Procedures** found in [40 CFR 265, Subpart D](#), for **Large Quantity Generators** for responding to fires, explosions or unplanned waste releases, and designating an emergency coordinator
- the requirements found in [40 CFR 262.34\(d\)](#) for **Small Quantity Generators** which include designating an emergency coordinator, posting emergency information next to telephones in the facility, ensuring that employees are thoroughly familiar with emergency procedures, ensuring that the emergency coordinator will respond to

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emergencies and will immediately notify the National Response Center in the manner prescribed

- the requirements for **Personnel Training** found in [40 CFR 265.16](#), for **Large Quantity Generators**, including the development of job descriptions and titles and annual and verifiable instruction in emergency response procedures provided by a knowledgeable and experienced instructor
- the provisions of [40 CFR 262.34\(d\)\(iii\)](#) for **Small Quantity Generators**, which require that employees be “thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies”

So, let’s first assume that you choose to treat in other than a satellite accumulation container. If this is your choice:

### **You Must**

comply with:

- the requirements of [40 CFR 265 Subpart I](#), Use and Management of Containers
  - use containers that are in good condition and not leaking and that are compatible with the waste stored and treated therein
  - keep containers closed except when adding or removing waste and handle the containers so that leaks and ruptures are prevented<sup>13</sup>
  - inspect the container storage area at least weekly for signs of leakage or deterioration
  - locate containers of ignitable or reactive waste at least 50’ from the facility’s property line (**applies to Large Quantity Generators only**)
- the provisions of [40 CFR 262.34](#), namely - label or mark each container used to collect [accumulate] the waste with the words “Hazardous Waste.” (The purpose of treating the hazardous waste employing polymerization is to render it non-hazardous; therefore, when the reaction has concluded and the waste has fully polymerized, the “Hazardous Waste” label or marking, and the marked date (if applicable) can and should be removed from the container. The label should be removed because the container and its content will now be managed as a special waste.) [See Special (Industrial) Waste discussion in
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<sup>13</sup> The word “closed,” as applied to a container in which polymerization is initiated, should be interpreted as meaning “covered,” that is, **no** container in which an exothermic reaction is taking place should have its cover firmly attached because of the possibility that the reaction could cause a rupture of the drum or a worse, unforeseen event. Also, a loose-fitting cover will allow air to enter the container; if the container is void of air during the reaction and air is suddenly introduced when a tight-fitting cover is removed, a “backflash” reaction could occur, injuring employees and/or damaging property. In its May 6, 1997 Guidance on “[Closed Containers](#)” IDEM states its position that “the closed container provision was intended to apply to containers in storage and/or [for waste] being accumulated, and was not meant to strictly apply to **treatment** in containers.”

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- - [CHAPTER 13: SOLID WASTE STORAGE/SHIPPING](#)
    - ensure each container is properly dated (if the waste was accumulated in a satellite accumulation area, it would be the date the last drop was added, if the waste was accumulated in the 90 or 180 day storage area, it would be the date the first drop was added)
  - the requirements of [40 CFR 268, Subpart D](#), if you are treating hazardous waste to meet the standards for land disposal, including:
    - prepare, follow and keep on site a **waste analysis plan** describing procedures you will follow to comply with the treatment standards found in [40 CFR 268.7\(a\)\(5\)](#)<sup>14</sup>
    - issue and maintain the required notifications and certifications relating to the treated waste and its disposal found in Part 268
    - submit notification to the IDEM Commissioner, pursuant to [329 IAC 3.1-12-2-8](#), when such treated waste is disposed as non-hazardous
  - the requirements of [40 CFR 265.114](#) for disposal or decontamination of equipment, structures and soils
  - the closure performance standards specified in [40 CFR 265.111](#) upon closure of the unit where the storage or treatment has occurred
  - the requirements of [40 CFR 265, Subpart AA, Subpart BB or Subpart CC](#) (**for Large Quantity Generators**)
    - the Subpart AA Air Emission Standards for Process Vents apply if you manage hazardous waste in **tanks** with a volatile organic concentration at least 10 ppm by weight (this will **not** apply to polymerization conducted in containers)
    - the Subpart BB Air Emission Standards for Equipment leaks apply if you manage hazardous waste in **tanks** with volatile organic concentration of at least 10 percent by weight (this will **not** apply to polymerization conducted in containers)
    - the Subpart CC Air Emission Standards for Tanks, Surface Impoundments and Containers apply if you manage hazardous waste in **tanks or containers** with a volatile organic concentration at point of origination greater than or equal to 500 ppm by weight<sup>15</sup>

Now, let's assume you choose to treat your waste employing polymerization in a satellite accumulation container.

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<sup>14</sup> The provision requires the generator to develop and follow a written waste analysis plan, which describes the procedures they will carry out to comply with the treatment standards of 40 CFR 268.40. The plan must be kept on site in the generator's records and the following requirements must be met: the waste analysis plan must be based on a detailed chemical and physical analysis of a representative sample of the prohibited waste(s) being treated and contain all information necessary to treat the waste(s) in accordance with [these] requirements...including the selected testing frequency; such plan must be kept in the facility's on-site files and made available to inspectors, wastes shipped off-site with the notification requirements of 40 CFR 268.7(a)(3).

<sup>15</sup> The volatile organic concentration of the polyester/styrene monomers and MEK peroxide wastes treated in a container **should not** exceed the 500-ppm by weight limit; therefore, Subpart CC should not apply. In addition, IDEM states, in its May 6, 1997 Guidance on "Closed Containers," "If...volatile emissions are simply the result or by-product of other treatment, **such as polymerization**, [Subpart CC] controls are not necessary." In any case, you **must** determine the volatile organic concentration of the hazardous waste stream before the first time the waste is placed in the container.

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First, the provisions of [40 CFR 262.34\(c\)\(1\)](#) allow “the accumulation of as much as 55 gallons of hazardous waste (or one quart of acutely hazardous waste) in containers at or near the point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste ... **without complying with paragraph (a) of this section**”. This means that the provisions of 262.34(a) detailed above for treatment in **other** than a satellite accumulation container, which require compliance (or, at least, investigation of the need for compliance) with:

- Subparts AA, BB or CC of 40 CFR 265
- Subpart I of 40 CFR 265
- Subpart C and D of 40 CFR 265
- 40 CFR 265.16
- 40 CFR 268.7(a)(4),

are **not** applicable to the **accumulation** of hazardous waste in satellite accumulation containers, as long as you comply with the provisions of [40 CFR 265\(c\)\(1\)](#), which are:

- mark your containers with the words, “Hazardous Waste” or with other words that identify the contents of the containers, and
- comply with [40 CFR 265.171](#), [40 CFR 265.172](#) and [40 CFR 265.173\(a\)](#) requiring that -
  - the contents of a leaking container be transferred to one in good condition (265.171)
  - the container be made of or lined with a material which will not react with and is compatible with the waste (265.172)
  - the container holding hazardous waste be closed during storage, except when necessary to add or remove waste (265.173(a))

IDEM states in its July 12, 1999 Guidance, “[Treatment of Hazardous Waste On-Site by Generators](#),” that “both general requirements and management standards specific to [the] mode of hazardous waste containment apply under the generator accumulation allowance of 40 CFR 262.34 **and, hence, also to the activity of on-site generator treatment**. Therefore, it is reasonable to assume that polymerization can occur in satellite accumulation containers restricted only by compliance with the two requirements stated above.

If you decide to treat hazardous waste in satellite containers:

### **You Should Consider**

- that **each** spray booth is a point of generation; therefore, a satellite accumulation container can be located in or near each booth for use as a waste treatment container
- that the satellite accumulation containers need to be under the control of the operator of the process; therefore, the container needs to be located inside the spray booth or area or in close proximity to the area when the treatment occurs and the process operator needs to be the employee responsible for initiating the polymerization process
- that **very small** quantities of hazardous waste generated at multiple spray booths can be collected by someone **other than the process operator** and aggregated in a container which is maintained as a satellite accumulation point in the same room or work area as long as the total accumulated in the container does not exceed 55 gallons; then this person would be responsible for initiating the polymerization process

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- that initiating an exothermic reaction (polymerization) -- even small quantities – in a work area where employees are present could create an unnecessary threat to persons and property. You need to consider whether the relatively simpler compliance regimen of treating waste in satellite containers rather than in other-than-satellite containers is worth the risk.
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### **Facility-Wide Regulations**

You may also want to check the following facility-wide regulations in the Appendix for application to this operation:

- ✓ [AIR PERMITTING](#)
- ✓ [RCRA CONTINGENCY PLAN](#)
- ✓ [SPILL PREVENTION CONTROL AND COUNTERMEASURES \(SPCC\) PLAN](#)
- ✓ [WELLHEAD PROTECTION](#)
- ✓ [ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS](#)
- ✓ [RECORDKEEPING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES](#)
- ✓ [HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE \(“HAZWOPER”\)](#)
- ✓ [FIRE PROTECTION](#)
- ✓ [EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN](#)
- ✓ [TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS](#)
- ✓ [INDIANA STYRENE RULE](#)

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## Appendix 1

# AIR PERMITTING

### A-1.1 Construction Permits [\(326 IAC 2 et seq.\)](#)

Construction permits are required for most sources that have the potential to emit criteria air pollutants or Hazardous Air Pollutants (HAPs). The type and requirements of the construction permit will be based on:

- the amount and type of pollutants the facility has the potential to emit
- the amount and type of pollutants the facility actually will emit
- the type of facility the source is and the processes performed at the facility
- the location of the source

State construction permit program allows companies to build structures and install equipment other than air pollution control equipment prior to receiving the final permit. The federal construction permit program (regarding Offset or Prevention of Significant Deterioration (PSD) sources) only allows for the ordering of materials and site clearing operations prior to receiving the permit. Any building, paving, or laying of underground pipe prior to receiving the permit will be a violation.

#### A-1.1.1 State Construction Permits

Under the state construction permit rules there are different levels of regulation. These include “[Letter of Exemption](#)”, “[Registration](#)”, “[Permit-By-Rule](#)”, and “[New Source Construction Permits](#).” (see IDEM/OAQ’s [Electronic Permit Applications Information](#) web site)

The first step in determining the air permit requirements of your [source](#) is determining it’s [potential to emit](#). Potential to emit is defined as the maximum amount of emissions of any [criteria air pollutant](#) or [HAP](#) under physical or operational design. Criteria pollutants includes Volatile Organic Compounds (VOCs), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), particulate matter (PM), particulate matter less than 10 microns (PM-10), lead (Pb) and hazardous air pollutants (HAPs). A facility must also take into consideration the location of the source, whether it is in an attainment or [non-attainment area](#).

#### A-1.1.2 Letter of Exemption [\(326 IAC 2-1.1-3\)](#)

A source with a potential to emit less than or equal to 10 tons/year of NO<sub>x</sub>, SO<sub>x</sub> and VOCs (5 tons/year of VOCs if using a pollution control device to comply with 326 IAC 8), less than 25 tons/year CO, or 0.2 tons/year Pb, 1 ton/year of any one HAP or 2.5 tons/year of any combination of HAPs, and less than 5 tons/year of PM and PM-10, may file for a Letter of Exemption. With a Letter of Exemption, a company may construct and operate an

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**emission source or pollution control device as long as their potential to emit remains under the levels listed above. The fee for a letter of exemption is \$100.**

#### **A-1.1.3 Registration ([326 IAC 2-5.1](#))**

A source with a potential to emit less than 25 tons/year of NO<sub>x</sub>, SO<sub>x</sub>, VOCs, PM and PM-10, less than 100 tons/year CO, or 5 tons/year Pb, 10 tons/year of any one HAP or 25 tons/year of any combination of HAPs may file for Registration. Registration documentation will include operating conditions that the company must follow. A separate operating permit will not be required as long as the source's emissions remain under the Registration limits, and the source operates according to the requirements outlined in the registration. The fee for registration is \$600.

If the source's potential to emit of any of the criteria pollutants exceed the levels permitted under registration, they must apply for a New Source Construction Permit. A company must receive a New Source Construction Permit prior to the placement, hook-up, or operation of an emission unit or pollution control device. The exception to this rule is a company operating under the Permit-by-Rule program. These companies will not require a construction or operating permit as long as they remain under the Permit-by-Rule criteria. However, a new source will be required to have a New Source Review Construction Permit in place at least 12 months prior to operating under Permit-by-Rule.

#### **A-1.1.4 Permit by Rule ([326 IAC 2-10 & 11](#))**

To fall under the Permit by Rule program [326 IAC 2-10] a source must meet the following conditions:

1. Source emissions are limited to 20% of Title V thresholds for that location;
  - a. NO<sub>x</sub>, SO<sub>x</sub>, CO, PM-10 and VOCs are limited to 20 tons/year, and Pb is limited to 0.2 tons/year in attainment areas.
  - b. HAPs are limited to 2 tons/year of any one HAP or 5 tons of the combination of all HAPs in attainment areas.
2. The source does not rely on air pollution control equipment to comply with condition 1.

Within 30 days of being requested, the source must supply records of pollutant emission throughput for the past 12 months to prove compliance with this rule. These companies will not require a construction or operating permit as long as they remain under the Permit-by-Rule criteria.

#### **A-1.1.5 New Source Construction Permit (Minor New Source Review) ([326 IAC 2-5.1-3](#))**

A source with a potential to emit any of the criteria pollutants exceeding the levels permitted under registration, and which are not operating under Permit-by-Rule or Source



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Specific Operating Agreement (SSOA), must apply for a New Source Construction Permit. If the source's potential to emit exceeds PSD threshold levels for that location, and the company chooses not to accept limitations on its potential to emit, that facility will be required to comply with the Federal Construction Permit requirements. PSD threshold levels include greater than 250 tons per year VOCs and may be as low as 25 tons per year VOCs in severe non-attainment areas.

A company must receive a New Source Construction Permit prior to the placement, hook-up, or operation of an emission unit or pollution control device (a permit may not be required for certain control devices added to an existing permitted source). The fee for a State New Source Construction Permit is \$3,500.

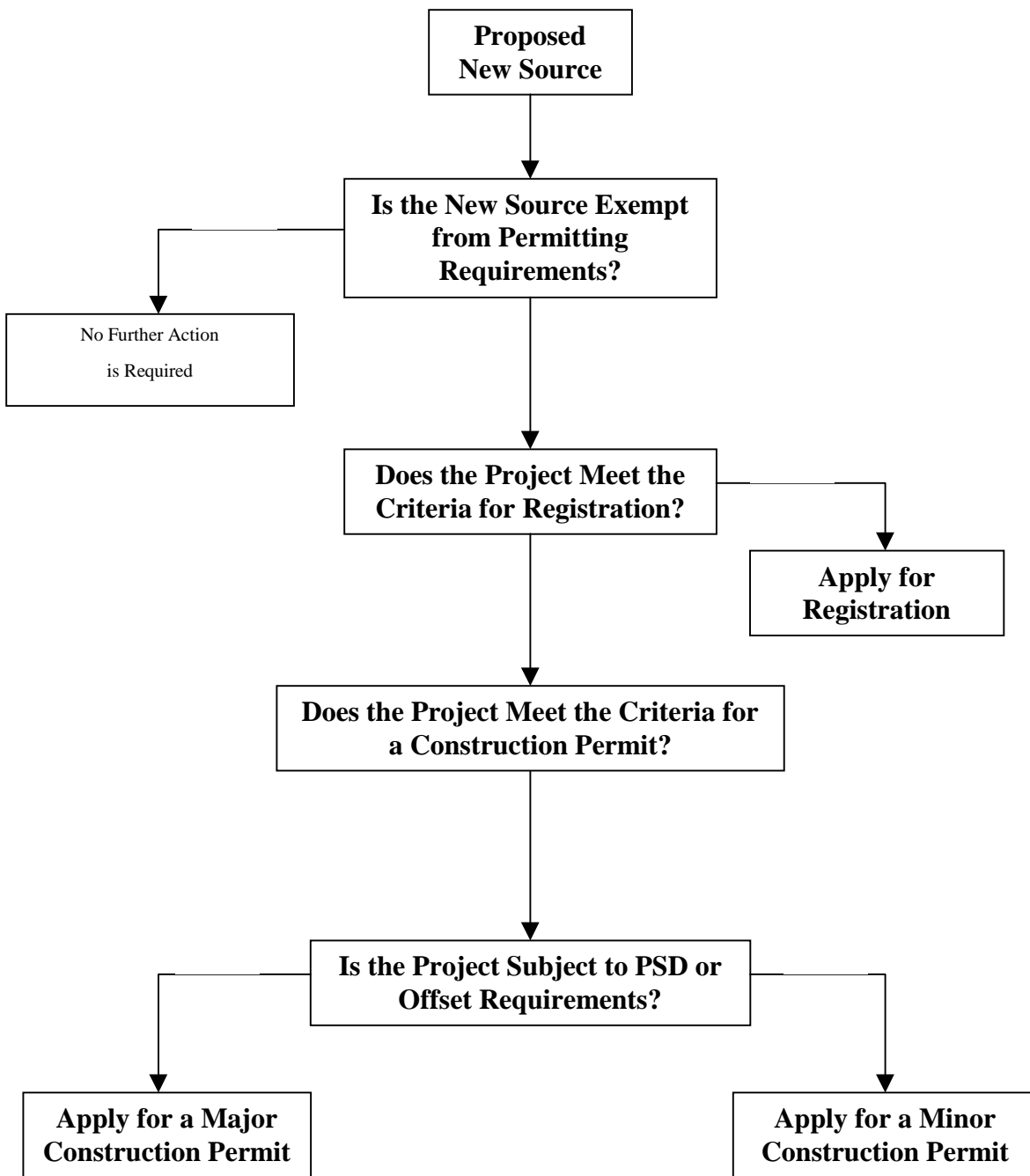
#### **A-1.1.6 Federal Construction Permits ([326 IAC 2-2-1](#))**

If the source's potential to emit exceeds the PSD thresholds and is located in an attainment area, the facility will fall under the Prevention of Significant Deterioration (PSD) requirements. This will require a new source to install the Best Available Control Technology ([BACT](#)). The source will also be required to perform air modeling to prove that this new source will not cause significant deterioration of that area's air quality. If the source's potential to emit exceeds the PSD thresholds and is located in a non-attainment area, the facility will be required to comply with the Lowest Achievable Emissions Rate ([LAER](#)) requirements. In addition, the source will be required to achieve a greater than one-for-one offset of the same pollutant from an existing source. The federal construction permit (regarding offsets or PSD sources) only allows for ordering of materials and site clearing operations prior to receiving the permit. Any building, paving, or laying of underground pipe prior to receiving the permit will be a violation.



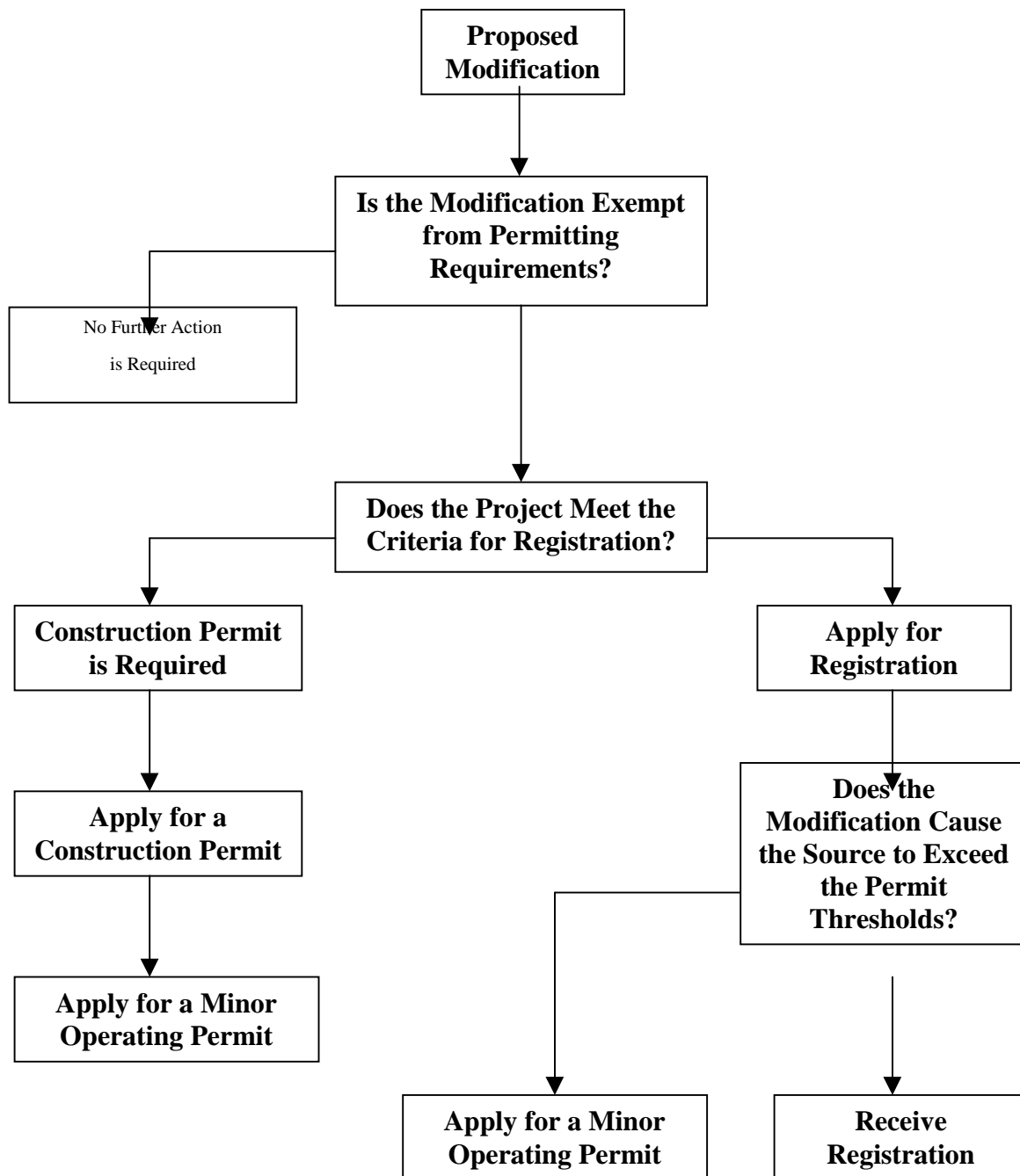
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## Air Permitting Decision Tree for New Sources



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## Air Permitting Decision Tree for Existing Sources Operating Under Registration



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## A-1.2 Operating Permits

### A-1.2.1 Exemptions or Alternatives to an Operating Permit

#### **Letter of Exemption** ([326 IAC 2-1.1-3](#))

A source with the potential to emit less than or equal to 10 tons/year of NO<sub>x</sub>, SO<sub>x</sub> and VOCs (5 tons/year of VOCs if using a pollution control device to comply with 326 IAC 8), less than 25 tons/year CO, 0.2 tons/year Pb, 10 tons/year of any one HAP or 25 tons/year of any combination of HAPs, and less than 5 tons/year of PM and PM-10, may file for a Letter of Exemption. With a Letter of Exemption, a company may construct and operate as long as their potential to emit remains under the levels listed above. A company operating under the Letter of Exemption regulations will not fall under additional operating permit requirements as long as the source operates under the provisions of this rule.

#### **Registration** ([326 IAC2-5.1-2](#))

A source with the potential to emit less than 25 tons/year of NO<sub>x</sub>, SO<sub>x</sub> VOCs, PM and PM-10, less than 100 tons/year CO, or 5 tons/year Pb may file for Registration. (Note: if the potential to emit of any one exceeds HAP10 tons/year or 25 tons/year of any combination of HAPs the source will fall into a major source category, and will not be able to operate under Registration.) A Registration will include operating conditions that the company must follow. A separate operating permit will not be required under registration.

#### **Permit by Rule** ([326 IAC 2-10 & 11](#))

To fall under the Permit by Rule program [326 IAC 2-10] a source must meet the following conditions:

1. Source emissions are limited to 20% of Title V thresholds for that location
  - a) NO<sub>x</sub>, SO<sub>x</sub>, CO, PM-10 and VOCs are limited to 20 tons/year, and Pb is limited to 0.2 tons/year in attainment areas.
  - b) HAPs are limited to 2 tons/year of any one HAP or 5 tons of the combination of all HAPs in attainment areas.
2. The source does not rely on air pollution control equipment to comply with condition 1.

Within 30 days of being requested, the source must supply records of pollutant emission throughput for the past 12 months to prove compliance with this rule. These companies will not require a construction or operating permit as long as they remain under the Permit-by-Rule criteria.

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### A-1.2.2 Operating Permits

#### **Minor Source Operating Permit (MSOP) ([326 IAC 2-6.1](#))**

If a source is not exempt from obtaining an operating permit, and its potential to emit exceeds the thresholds for Registration but is below Title V potential to emit thresholds, it can apply for a Minor Source Operating Permit.

A Minor Source Operating Permit will contain a written description of the source's requirements under this permit. These include but are not limited to:

- Emission limitations
- Monitoring, testing, reporting and recordkeeping requirements

A minor source operating permit must be renewed every five years.

#### **Federally Enforceable State Operating Permit (FESOP) ([326 IAC 2-8](#))**

A source with a potential to emit that exceeds the Title V potential to emit thresholds, but chooses to place limits on its operations to keep its emissions below these thresholds may apply for a FESOP. Limits may include limitations of solvent usage, raw material throughput, or hours of operation.

A FESOP will contain a written description of the source's requirements under this permit. These may include but are not limited to:

- Compliance monitoring [326 IAC 2-8-4(3)] including;
  - a preventive maintenance plan [326 IAC 2-8-4(9)]
  - baghouse inspection requirements
  - periodic observations of emissions
  - periodic observations for overspray fallout or dust from the facility
  - spray booth filter inspections
  - tracking of VOC and HAP emissions [326 IAC 2-8-4(3)]
- Corrective Actions requirements [326 IAC 2-8-4(1)] [326 IAC 2-8-5(1)] including an implementation of the preventive maintenance plan [326 IAC 2-8-4(9)]
- Emissions limitations including the tracking and reporting of VOC, PM-10, and HAP emissions [326 IAC 2-8-4]
- Reporting requirements [326 IAC 2-8-4(3)]

A FESOP must be renewed every five years.

#### **Title V Operating Permit ([326 IAC 2-7](#))**

A source with a potential to emit that exceeds the Title V potential to emit thresholds, but chooses **not** to place limits on its operations to keep its emissions below these thresholds must apply for a Title V permit.

A Title V permit will contain a written description of the source's requirements under this permit. These include but are not limited to:

- Annual compliance certification [326 IAC 2-7-6(5)]

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- Preventive maintenance plan [326 IAC 2-7-5(1), (3) & (13)] [326 IAC 2-7-6(1) & (6)] [326 IAC 1-6-3]
  - Emergency provisions [326 IAC 2-7-16]
  - Deviations from permit requirements & conditions [326 IAC 2-7-5 (3)(C)]
  - Permit modifications [326 IAC 2-7-11 & 12]
  - Permit renewal [326 IAC 2-7-4]
  - PSD status [326 IAC 2-2] [40 CFR 52.21]
  - Particulate matter emission limitations [326 IAC 6]
  - Opacity [326 IAC 5-1]
  - Open burning [326 IAC 4-1]
  - Incineration [326 IAC 4-2]
  - Fugitive dust [326 IAC 6-4]
  - Stack height [326 IAC 1-7]
  - Asbestos abatement project [326 IAC 14-10] [326 IAC 18]
  - Compliance monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]
  - Emergency reduction plans [326 IAC 1-5-2 & 3]
  - Risk Management plan [326 IAC 2-7-5 (12)] [[40 CFR 68.215](#)]
  - Emission statement [326 IAC 2-7-5] [326 IAC 2-7-19] [326 IAC 2-6] [326 IAC 2-7-19]
  - Reporting requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

A Title V permit must be renewed every five years.

**Prevention of Significant Deterioration (PSD)** ([326 IAC 2-2](#))

If a source's actual emissions exceed the PSD thresholds, that source may be required to comply with the PSD requirements. PSD requirements are very complex and are beyond the scope of this manual.

### **A-1.3 Emission Cap Program** ([326 IAC 2-1.1-12](#))

Emission cap programs can be included into Title V or FESOP operating permits. The emission cap program allows the source to make modifications at the source, without preconstruction approval or operating permit revisions, as long as the source maintains compliance with the emission cap program. The source is required, however, to notify IDEM at least 10 days prior to construction.

An emissions cap may be based on one of the following:

- Actual emissions
- The PSD permitted allowable emissions
- A permit limitation

**Note: A source must first apply for an emissions cap program, and the commissioner issue a Title V or FESOP permit including the terms and conditions of the emission cap provision of your Title V or FESOP permit to apply.**

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## **A-1.4 Permit Modifications**

A source with an existing permit that would like to make a modification to its existing facility may be required to gain written approval from IDEM in the form of a permit revision. However, under some limited circumstances, written approval, or even written notification will not be required. The following is a brief overview of the requirements for modification of an existing source.

### **A-1.4.1 Modification to Sources Operating under a Letter Exemption ([326 IAC 2-1.1](#))**

A source operating under a letter of exemption which wishes to modify its emission source must go through the determinations outlined in the construction permit section of this manual. If the modifications are so minor that the source remains under the letter of exemption thresholds, they may reapply for a new letter of exemption. If the modification causes the source to exceed the letter of exemption thresholds, then the source will be subject to the new source review process, and be required to obtain an operation permit or registration.

### **A-1.4.2 Modification to Permit-by-Rule Sources ([326 IAC 2-10 & 11](#))**

Permit-by-rule sources may make modifications to their source without IDEM approval or notification if the total emission from that source remains below the permit-by-rule thresholds

### **A-1.4.3 Modifications of Minor Source Operating Permit (MSOP) Sources ([326 IAC 2-6.1-6](#))**

#### **Exemption to Modification Notification and Approval to MSOP Sources**

Changes can be made to a MSOP source without IDEM approval or notification if the modifications that will not cause the facility to exceed its permit limit, and have the potential to emit less than the following: 25 tons per year of CO, 10 tons per year of SO<sub>x</sub>, NO<sub>x</sub>, or VOCs (5 tons per year for VOCs in facilities required to use a control device), 5 tons per year PM, PM-10, 2.5 tons per year of a combination of HAPs or 1 ton of any single HAP, or 0.2 tons per year of lead.

#### **Notice-Only Change to MSOP Sources**

If a MSOP source wishes to make modifications that increase monitoring, or wish to install pollution prevention projects that do not increase the potential to emit, or make modifications that increase the potential to emit for a single HAP by more than 1 ton per year, but less than 10 tons per year (or greater than 2.5 tons per year but less than 25 tons per year of a combination of HAPs), the source may apply for a notice-only change. A source may also replace equipment, or add emission units of the same type already permitted, except if the changes cause the source to

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exceed the PSD threshold levels. A request for revision to the permit must be made within 30 days from when the changes were made.

### **Minor Permit Revisions to MSOP Sources**

If the source's modifications do not fall under either the exemption for modification and approval, or the notice-only change provisions, the facility will be required to apply for either a [minor permit revision](#) or a [significant permit revision](#).

A minor permit revision will be required if:

- The modifications have a potential to emit of -
  - PM -  $\geq 5$  tons per year and  $< 25$  tons per year
  - PM-10 -  $\geq 5$  tons per year and  $< 25$  tons per year
  - VOCs (using control equipment to comply with 326 IAC 8) -  $\geq 5$  tons per year and  $< 25$  tons per year
  - SO<sub>2</sub> -  $\geq 10$  tons per year and  $< 25$  tons per year
  - NO<sub>x</sub> -  $\geq 10$  tons per year and  $< 25$  tons per year
  - VOCs (not using control equipment) -  $\geq 10$  tons per year and  $< 25$  tons per year
  - CO -  $\geq 25$  tons per year and  $< 100$  tons per year
  - Pb -  $\geq 0.2$  tons per year and  $< 5$  tons per year
  - H<sub>2</sub>S, total reduced sulfur, reduced sulfur compounds, and fluorides -  $\geq 25$  tons per year and  $< 5$  tons per year
- The revision reduces the frequency of any monitoring or reporting requirements required by a permit condition or applicable requirement.
- The revisions include adding or moving portable sources that could change the conditions of the permit.
- Changes that require a significant change in methods used to demonstrate or monitor compliance, but do not increase the potential to emit above the listed thresholds.
- Modifications for which the potential to emit is limited to less than 10 tons per year for any single HAP or 25 tons per year for the combination of HAPs.
- Modifications for which emission limits are put in place limit the VOC emissions to 25 tons per year to avoid BACT requirements.

Note: This is not a complete list of changes requiring a minor permit revision, see [326 IAC 2-6.1-6](#) for a complete list.

### **Significant Permit Revisions to MSOP Sources**

If the source's modifications exceed the criteria for minor permit revisions, or,

- raise the potential to emit above the PSD, emission offset thresholds or major HAP levels, or
  - require an upgrade to a FESOP or Title V permit, or
  - require the source to comply with BACT requirements,
- they will be required to apply for a significant permit revision.

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Note: This is not a complete list of changes requiring a significant permit revision; see [326 IAC 2-6.1-6](#) for a complete list.

#### **A-1.4.4 Modifications to Federally Enforceable State Operating Permit (FESOP) Sources ([326 IAC 2-8-10 & 11.1](#))**

##### **Exemption to Modification Notification and Approval to FESOP Sources**

The changes can be made to a FESOP source without IDEM approval or notification if the modifications do not cause the source to exceed its emission cap limits, or have the potential to emit less than the following: 25 tons per year of CO, 10 tons per year of SO<sub>x</sub>, NO<sub>x</sub>, or VOCs (5 tons per year for VOCs in facilities required to use a control device), 5 tons per year PM, PM-10, 2.5 tons per year of a combination of HAPs or 1 ton of any single HAP, or 0.2 tons per year of lead.

##### **Administrative Permit Amendments to FESOP Sources**

Administrative permit amendments allow FESOP sources to make specific changes that will not increase the sources potential to emit. This includes replacement of equipment (as long as it does not involve replacement of the entire process or be considered reconstruction or result in an increase of actual emissions), or adding of emission sources (as long as they are of the same type already covered under the permit and will comply with the same applicable requirements and permit terms and conditions). However, if any of these modifications increase the facilities actual emissions above the PSD or offset thresholds, the facility will be required to submit for a significant permit revision.

##### **Minor Permit Revisions to FESOP Sources**

If the source's modifications do not fall under either the "exemption for modification and approval," or the "administrative permit amendments provisions," the facility will be required to apply for either a minor permit revision or a significant permit revision.

A minor permit revision will be required if:

- the modifications have a potential to emit -
  - PM –  $\geq 5$  tons per year and  $< 25$  tons per year
  - PM-10 –  $\geq 5$  tons per year and  $< 25$  tons per year
  - VOCs (using control equipment to comply with 326 IAC 8) –  $\geq 5$  tons per year and  $< 25$  tons per year
  - SO<sub>2</sub> –  $\geq 10$  tons per year and  $< 25$  tons per year
  - NO<sub>x</sub> –  $\geq 10$  tons per year and  $< 25$  tons per year
  - VOCs (not using control equipment) –  $\geq 10$  tons per year and  $< 25$  tons per year
  - CO –  $\geq 25$  tons per year and  $< 100$  tons per year
  - Pb –  $\geq 0.2$  tons per year and  $< 5$  tons per year
  - H<sub>2</sub>S, total reduced sulfur, reduced sulfur compounds, and fluorides -  $\geq 25$  tons per year and  $< 5$  tons per year
- the revision reduces the frequency of monitoring and reporting requirements



- 
- the revisions include adding or moving portable sources that could change the conditions of the permit.
  - the revisions require a significant change in the methods used to demonstrate or monitor compliance, but do not increase the potential to emit above the listed thresholds.
  - the potential to emit of the modification is limited to less than 10 tons per year for any single HAP or 25 tons per year for the combination of HAPs.
  - emission limits are put in place to limit the VOC emissions to 25 tons per year to avoid BACT requirements.

Note: This is not a complete list of changes requiring a minor permit revision, see [326 IAC 2-8-11.1](#) for a complete list.

#### **Significant Permit Revisions to FESOP Sources**

If the source's modifications exceed the criteria for minor permit revisions, or;

- raise the potential to emit above the PSD or emission offset thresholds, or major HAP thresholds,
  - require an upgrade to a Title V permit, or
  - require the source to comply with BACT requirements,
- they will be required to apply for a significant permit revision.

Note: This is not a complete list of changes requiring a significant permit revision, see [326 IAC 2-8-11.1](#) for a complete list.

### **A-1.4.5 Modifications to Title V Sources [\[326 IAC 2-7-10.5 & 11\]](#)**

#### **Administrative Permit Amendments for Title V Sources**

Certain amendments can be made to a Title V permit using an Administrative Permit Amendment. Changes made under this provision include:

- corrections to typographical errors
- changes to names, addresses, or telephone numbers listed in the permit
- changes in ownership

#### **Minor Permit Modification and Significant Permit Modification for Title V Sources**

If the permit's modifications cannot be addressed in an administrative permit amendment, the facility will be required to apply for either a minor permit modification or a significant permit modification.

#### **Minor Source Modification for Title V Sources**

Changes can be made to a Title V source without applying to IDEM for a minor source modification if the modifications do not cause the source to exceed the permit limits, and have the potential to emit less than the following: 25 tons per year of CO, 10 tons per year of SO<sub>x</sub>, NO<sub>x</sub>, or VOCs (5 tons per year for VOCs in facilities required to use a control device), 5 tons per year PM, PM-10, 2.5 tons

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per year of a combination of HAPs or 1 ton of any single HAP, or 0.2 tons per year of lead.

A minor source modification will be required if:

- the modifications have a potential to emit:
  - PM –  $\geq 5$  tons per year and  $< 25$  tons per year
  - PM-10 –  $\geq 5$  tons per year and  $< 25$  tons per year
  - VOCs (using control equipment) –  $\geq 5$  tons per year and  $< 25$  tons per year
  - SO<sub>x</sub> –  $\geq 10$  tons per year and  $< 25$  tons per year
  - NO<sub>x</sub> –  $\geq 10$  tons per year and  $< 25$  tons per year
  - VOCs (not using control equipment) –  $\geq 10$  tons per year and  $< 25$  tons per year
  - CO –  $\geq 25$  tons per year and  $< 100$  tons per year
  - Pb –  $\geq 0.2$  tons per year and  $< 5$  tons per year
- the modification reduces the frequency of monitoring and reporting requirements
- the modification includes adding or moving portable sources that could change the conditions of the permit.
- the modification requires a significant change in methods used to demonstrate or monitor compliance, but does not increase the potential to emit above the listed thresholds.
- the modifications have the potential to emit is limited to less than 10 tons per year for any single HAP or 25 tons per year for the combination of HAPs.
- emission limits are put in place to limit the VOC emissions to 25 tons per year to avoid BACT requirements.
- the modification is subject to reasonably available control technology (RACT), a new source performance standard (NSPS), or a national emissions standard for hazardous air pollutants (NESHAP).
- the source is located in Porter or Lake County, and the modification increases emissions as follows:
  - $> 15$  lbs. per day VOCs
  - $> 25$  pounds per day NO<sub>x</sub>

Under a minor source modification:

- The source may implement the changes upon approval of the request for minor modifications.
- The minor source modification will be issued within 45 days of receipt of the application.
- Minor source modifications are not required to go through public notice.

### **Significant Source Modifications for Title V Sources**

If the source's modifications exceed the criteria for minor source modification, they will be required to apply for a significant source modification.

Under a significant source modification:

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- The source may not implement the modification until they are issued a significant source modification.
  - The source modification will be issued within 120 days of the receipt of the application.
  - There is a required 30-day public notice period.
  - There is a 45-day EPA review period.

### **A-1.5 Incinerators** [\(326 IAC 4-2\)](#)

The term incinerator is defined in 326 IAC 1-2-34 to mean “***An engineered apparatus that burns waste substances with controls on combustion factors including, but not limited to, temperature, retention time, and air.***”

This rule [\[326 IAC 4-2\]](#) pertains to industrial incinerators that emit regulated pollutants, including particulate matter (PM) and particulate matter less than 10 microns (PM-10).

#### **You Must**

- ensure the incinerator is equipped with a primary as well as a secondary chamber.
- ensure the incinerator is equipped with a primary burner (unless burning wood products)
- comply with state federal construction and operating permit requirements
- maintain and operate the unit according to the manufacturer’s recommendations
- comply with state and local rules and ordinances regarding the installation and operation of incinerators
- operate the unit in a manner to insure no dangerous chemicals, dangerous gases, or noxious odors are emitted.
- ensure the unit does not emit particulate matter in excess of -
  - 0.3 lbs. particulate per 1,000 lbs. of dry exhaust (max burning capacity 200 lbs. or more per hour)
  - 0.5 lbs. particulate per 1,000 lbs. of dry exhaust (max burning capacity less than 200 lbs. per hour)
- ensure the unit does not create a nuisance or fire
- not burn hazardous waste
- make a hazardous waste determination of the ash produced and dispose of it in accordance with special waste or hazardous waste regulations (whichever is applicable)

### **A-1.6 Particulate Rules, Non-Attainment Area Limitations** [\(326 IAC 6-1\)](#)

Sources or facilities that are located in the counties listed in 326 IAC 6-1-7 (Dearborn, Dubois, Lake, Marion, Vigo, Wayne, Howard, Vanderburgh, Clark, or St. Joseph County) and not specifically listed by company name in that citation and have the potential to emit 100 tons per year or more of particulate matter or have actual emissions of 10 tons per year or more of particulate matter, must comply with the provisions of 326 IAC 6-1-2. The requirements listed in this rule includes:

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- for solid fuel combustion steam generators of greater than 250 million Btu, particulate matter emissions must be less than 0.10 lbs. per million Btu.
  - for solid fuel combustion steam generators of equal to or greater than 25 million Btu but less than 250 million Btu, particulate matter emissions must be less than 0.35 lbs. per million Btu.
  - for solid fuel combustion steam generators of greater than 63 million Btu, particulate matter emissions must be less than 0.6 lbs. per million Btu.
  - for liquid fuel combustion steam generators, particulate matter emissions must be less than 0.15 lbs. per million Btu.
  - for gaseous fuel combustion steam generators, particulate matter emissions must be less than 0.01 lbs. per million Btu.

Facilities that are located in counties that are specifically listed in 326 IAC 6-1-7 must comply with the limitations specified.

### **A-1.7 Particulate Matter (PM) Rules** [\(326 IAC 6-3-2\)](#)

FRP operations located anywhere in Indiana are required to follow the particulate limitations outlined in 326 IAC 6-3-2 (if not limited by 326 IAC 6-1).

#### **You Must**

- Ensure no process releases particulates in concentrations greater than the following:
  - For sources with a process weight rate up to 60,000 lbs. per hour, this formula should be used to determine the particulate emission limitation.  

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{the rate of emissions in pounds per hour}$$

$$P = \text{process weight in tons per hour}$$
  - For sources with a process weight rate in excess of 60,000 lbs., this formula should be used to determine the particulate emission limitation.  

$$E = 55.0 P^{0.11} - 40 \quad \text{where } E = \text{the rate of emissions in pounds per hour}$$

$$P = \text{process weight in tons per hour}$$

### **A-1.8 Open Burning** [\(326 IAC 4-1\)](#)

Indiana environmental regulations set up standards to regulate open burning that would result in emissions of regulated pollutants. A facility's operating permit may also stipulate restrictions on open burning.

Under 326 IAC 4-1-2 open burning is prohibited except as allowed in 326 IAC 4-1-3, 326 IAC 4-1-4, or 326 IAC 4-1-4.1. These citations do allow for burning for maintenance purposes (such as brush, wood, and remains of the demolition of wooden structures, but only under the conditions listed in 326 IAC 4-1-3. Burning may also be performed under emergency conditions

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with approval of the commissioner 326 IAC 4-1-4, or with the commissioner's approval under the conditions listed in 326 IAC 4-1-4.1.

**You Must**

- not perform open burning of materials other than shrubs, wood, or the remains of a wood structure without prior approval and,
  - all fires are attended to at all times until completely extinguished
  - all asbestos material must be removed prior to burning
  - the fire does not create a pollution problem, a threat to public health, a nuisance, or a fire hazard
  - the burning is not done during unfavorable weather conditions or when a pollution alert or ozone action day has been declared
  - the burning is performed in accordance with state and local laws
  - adequate fire fighting equipment is on-site to extinguish the fire
- get approval from the commissioner to perform open burning except under the above listed circumstances.

[IDEM/OAM's Open Burning Variance Application Packets](#)

**A-1.9 Fugitive Dust Emissions** [\(326 IAC 6-4\)](#)

Fugitive dust is defined as "the generation of particulate matter to the extent that some portion of the material escapes beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located." [326 IAC 6-4-1]

A source that generates fugitive dust will be in violation if any of the following are exceeded:

- fugitive dust concentrations are greater than 67% in excess of ambient upwind concentrations as determined by the following formula:

$$P = 100 (R-U) / U$$

P = % increase

R = number of particles measured at downwind site

U = number of particles measured at upwind site

- the fugitive dust is comprised of 50% or more respirable dust
- the ground level ambient air concentrations exceed 50 micrograms per cubic meter above background concentrations for a sixty-minute period.
- if the fugitive dust is visibly crossing the boundary or property line of a source.

**You Must**

- Keep fugitive dust from leaving the boundary of the source.

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**A-1.10 Title V Potential to Emit Thresholds (Attainment Areas)**

<b>Pollutant</b>	<b>Potential to Emit Threshold (tons/year)</b>
NO <sub>x</sub>	100
SO <sub>x</sub>	100
CO	100
PM-10	100
Pb	10
VOCs	100
Single HAP	10
Combination of HAPs	25

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### A-1.11 Title V Potential to Emit Thresholds (Non-attainment Areas)

Pollutant	Potential to Emit Threshold (tons/year)
NO <sub>x</sub>	25 (Lake & Porter Counties)
SO <sub>x</sub>	100
CO	100
PM-10	100
Pb	10
VOCs	25 (Lake & Porter Counties)
Single HAP	10
Combination of HAPs	25

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## A-1.11 Industrial Boilers

### A-1.11.1 New Source Performance Standards for Boilers (NSPS) ([40 CFR 60 Subpart Db](#))

Industrial boilers that were constructed, modified, or reconstructed after June 19, 1984 and have a maximum design heat input capacity of greater than 100 million Btu per hour must comply with the “Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.” [[40 CFR 60 Subpart Db](#)]

- Coal-fired sources with a heat input capacity greater than 250 million Btu, constructed, modified, or reconstructed after June 19, 1984, but on or before June 19, 1986, must comply with the particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>) standards of the NSPS.
- Coal-fired sources with a heat input capacity of 100 – 250 million Btu, constructed, modified, or reconstructed after June 19, 1984, but on or before June 19, 1986, must comply with the particulate matter (PM) and nitrogen oxides (NO<sub>x</sub>) standards of the NSPS.
- Oil-fired sources with a heat input capacity greater than 250 million Btu, constructed, modified, or reconstructed after June 19, 1984, but on or before June 19, 1986, must comply with the particulate matter (PM), nitrogen oxides (NO<sub>x</sub>), and sulfur dioxide (SO<sub>2</sub>) standards of the NSPS.
- Oil-fired sources with a heat input capacity of 100 – 250 million Btu, constructed, modified, or reconstructed after June 19, 1984, but on or before June 19, 1985, must comply with the nitrogen oxides (NO<sub>x</sub>) standards of the NSPS.

#### NSPS SO<sub>2</sub> Standards ([40 CFR 60.42b](#))

No source shall discharge gases that contain SO<sub>2</sub> in excess of 10% of the potential SO<sub>2</sub> emission rate and that contain SO<sub>2</sub> in excess of the limits determined by the following formula:

$$E_s = (K_a H_a + K_b H_b) / (H_a + H_b)$$

where:

$E_s$  is the sulfur dioxide emission limit in lb./million Btu

$K_a = 1.2$  lb./million Btu

$K_b = 0.80$  lb./million Btu

$H_a$  is the heat input from coal in million Btu

$H_b$  is the heat input from oil in million Btu

No source that combusts coal refuse alone in a fluidized bed combustion steam generating unit shall discharge any gas that contains sulfur dioxide in excess of 20% of the potential sulfur dioxide rate and that contain sulfur dioxide in excess of 1.2 lb/million Btu heat input.



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No source that uses an emerging technology for control of sulfur shall discharge gases that contain SO<sub>2</sub> in excess of 50% of the potential SO<sub>2</sub> emission rate and that contain SO<sub>2</sub> in excess of the limits determined by the following formula:

$$E_s = (K_c H_c + K_d H_d) / (H_c + H_d)$$

where:

$E_s$  is the sulfur dioxide emission limit in lb./million Btu

$K_c = 0.60$  lb./million Btu

$K_d = 0.40$  lb./million Btu

$H_c$  is the heat input from coal in million Btu

$H_b$  is the heat input from oil in million Btu

Additional sulfur dioxide standards are listed in 40 CFR 60.42b

**NSPS PM Standards** [\[40 CFR 60.43b\]](#)

No source shall discharge gases that contain PM in excess of:

- 0.05 lb./million Btu if the source uses only coal or coal and other fuels but has an annual capacity for other fuels of 10% or less.
- 0.10 lb./million Btu if the source burns coal and other fuels and has an annual capacity for other fuels of greater than 10%, and has a federally enforceable limit of greater than 10%.
- 0.20 lb./million Btu if the source burns coal or coal and other fuels and:
  - has an annual capacity factor for coal or coal and other fuels of 30% or less
  - has a maximum heat input of 250 million Btu/hour or less
  - has a federally enforceable limit of 30% or less for coal and other fuels
  - was constructed after June 19, 1984, and before November 25, 1986

Additional PM standards are listed in [40 CFR 60.43b](#).

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**NSPS NO<sub>x</sub> Standards** [\[40 CFR 60.44b\]](#)

No source shall discharge gases that contain NO<sub>x</sub> in excess of:

<b>Fuel/Generating Type</b>	<b>NO<sub>x</sub> Emission Limits (lb./million Btu)</b>
Natural gas and distillate oil (except duct burners)	
1. Low heat release rate	
2. High heat release rate	0.10
Residual oil	0.20
1. Low heat release rate	
2. High heat release rate	
Coal	0.30
1. Mass-feed stoker	0.40
2. Spreader stoker and fluidized bed	
3. Pulverized coal	
4. Lignite (except 5)	0.50
5. Lignite mined in North or South Dakota and Montana	0.60
	0.70
6. Coal derived synthetic fuels	0.60
Duct burner used in combined cycle systems	0.80
1. Natural gas and distillate oil	0.50
2. Residual oil	
	0.20
	0.40

Additional nitrogen oxide standards are listed in [40 CFR 60.44b](#).

Testing monitoring, recordkeeping, and reporting will be required to determine compliance with PM NO<sub>x</sub>, and SO<sub>2</sub> limits. [\[40 CFR 60.45b – 60.49b\]](#)

**A-1.11.2 New Source Performance Standards for Small Boilers (NSPS)** [\[40 CFR 60, Subpart Dc\]](#)

Industrial boilers that were constructed, modified, or reconstructed after June 9, 1989 and have a maximum design heat input capacity of 100 million Btu per hour or less, or greater than or equal to 10 million Btu per hour, must comply with the “Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.” [\[40 CFR 60 Subpart Dc\]](#)

**NSPS SO<sub>2</sub> Standards** [\[40 CFR 60.42c\]](#)

No source (see exceptions) shall discharge gases that contain SO<sub>2</sub> in excess of 10% of the potential SO<sub>2</sub> emission rate or in excess of 1.2 lb./million Btu. If coal is combusted with other fuels the emission limit is determined by the following formula:

$$E_s = (K_a H_a + K_b H_b + K_c H_c) / (H_a + H_b + H_c)$$

where:

$E_s$  is the sulfur dioxide emission limit in lb./million Btu

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$K_a = 1.2 \text{ lb./million Btu}$   
 $K_b = 0.60 \text{ lb./million Btu}$   
 $K_c = 0.50 \text{ lb./million Btu}$   
 $H_a$  is the heat input from coal in million Btu  
 $H_b$  is the heat input from coal that uses an emergency technology, in million Btu  
 $H_c$  is the heat input from oil in million Btu

***Exceptions***

- Sources that combust only coal refuse in a fluidized bed shall not emit gasses that contain  $\text{SO}_2$  in excess of 20% of the potential  $\text{SO}_2$  rate or in excess of 1.2 lb./million Btu.
- Sources that combust only coal and use an emergency technology for control shall not emit gasses that contain  $\text{SO}_2$  in excess of 50% of the potential  $\text{SO}_2$  rate or in excess of 0.6 lb./million Btu.
- Sources that burn coal or coal in combination with other fuels and:
  1. have a heat input capacity of 75 million Btu or less,
  2. have an annual capacity for coal of 55 % or less and have a federally enforceable limit to 55% or less,
  3. combust coal in a duct burner as part of a combined cycle system where 30% or less of the heat entering the unit is from the combustion of coal and at least 70% of the heat entering the unit is from exhaust gases from the duct burner.

**are not** required to comply with the percent reduction requirements, but are required to comply with the emission limit as determined by the following formula:  $E_s = (K_a H_a + K_b H_b + K_c H_c) / (H_a + H_b + H_c)$

Sources that combust oil **shall not** emit gasses that contain  $\text{SO}_2$  in excess of 0.50 lb./million Btu unless the facility only burns oil that contains sulfur in concentrations of 0.5 % or less by weight.

**NSPS PM Standards ([40 CFR 60.43c](#))**

No source shall discharge gases that contain PM in excess of:

- 0.05 lb./million Btu if the source uses only coal or coal and other fuels but has an annual capacity for other fuels of 10% or less.
- 0.10 lb./million Btu if the source burns coal and other fuels and has an annual capacity for other fuels of greater than 10%, and has a federally enforceable limit of greater than 10%.
- 0.10 lb./million Btu if the source combusts wood or wood and other fuels (except coal) and has a heat capacity of 30 million Btu/hr or greater and has the capacity factor for wood of greater than 30%.
- 0.30 lb./million Btu if the source combusts wood or wood and other fuels (except coal) and has a heat capacity of 30 million Btu/hr or greater and has the capacity factor for wood of less than 30% and has federally enforceable limits to its annual capacity factor for wood of less than 30%.

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No source that combusts coal, wood, or oil and has a heat output capacity of 30 million Btu/hr or greater shall emit gases that have greater than 20% opacity.

Testing monitoring, recordkeeping, and reporting will be required to determine compliance with PM and SO<sub>2</sub> limits. [[40 CFR 60.44c – 60.48c](#)]

**A-1.11.3 Sulfur Dioxide Emission Limitations for Boilers** ([326 IAC 7-1.1](#)) & ([326 IAC 7-4](#))

Sources located in Lake, Marion, Vigo, Wayne, LaPorte, Jefferson, Sullivan, Vermillion, Floyd, Warrick, Morgan, Gibson, Dearborn, or Porter County have specific sulfur dioxide emission limitations. Sources located in these counties should refer to [326 IAC 7-4](#).

Sources located in attainment areas that have the potential to emit 25 tons per year or ten pounds per hour of sulfur dioxide must comply with the following sulfur dioxide (SO<sub>2</sub>) emission limitations:

- Coal combustion, 6.0 pounds SO<sub>2</sub> per million Btu.
- Residual oil combustion, 1.6 pounds SO<sub>2</sub> per million Btu.
- Distillate oil combustion, 0.5 pounds SO<sub>2</sub> per million Btu.
- Coal and oil combustion, 6.0 pounds SO<sub>2</sub> per million Btu.

Sources that have the potential to emit 25 tons per year or ten pounds per hour of sulfur dioxide must comply with the following ([326 IAC 7-2](#)):

**Fuel sampling requirements**

Coal-fired boilers with a heat input capacity of 1,500 million Btu or greater must submit quarterly reports to the commissioner that include

- A 30 day weighted average SO<sub>2</sub> emission rate
- Records of daily average coal sulfur content, coal heat content, weighted factors, and daily average SO<sub>2</sub> emission rate. (sampling of coal must be performed in accordance with [326 IAC 3-7-2](#) or [326 IAC 3-7-3](#))

Coal-fired boilers with a heat input capacity of more than one hundred million Btu and less than 1,500 million Btu must submit quarterly reports to the commissioner that include:

- Records of the calendar months average coal sulfur content, coal heat content, and SO<sub>2</sub> emission rate. (sampling of coal must be performed in accordance with [326 IAC 3-7-2](#) or [326 IAC 3-7-3](#))
- The total monthly coal consumption rate.

All other fuel combustion sources must submit quarterly reports to the commissioner that include:

- Records of the calendar months average sulfur content, heat content, and SO<sub>2</sub> emission rate. (sampling of oil must be performed in accordance with [326 IAC 3-7-4](#))
- The total monthly coal consumption rate.

#### A-1.11.4 Particulate Emission Limitations for Sources of Indirect Heating [\[326 IAC 6-2\]](#)

Particulate emissions from existing indirect heating facilities located anywhere in Lake, Porter, Marion, Boone, Hamilton, Hendricks, Johnson, Morgan, Shelby, or Hancock County shall be limited by the following equation:

$$Pt = \frac{0.87}{Q^{0.16}}$$

Where:

Pt =	pounds of particulate matter emitted per million Btu (lb./mmBtu)
Q =	total source maximum operating rating in million Btu per hour (mmBtu/hr)

If Q is less than 10 mm Btu/hr, Pt must not exceed 0.6. If Q is greater than or equal to 10,000 mmBtu/hr, Pt must not exceed 0.2.

#### A-1.11.5 Particulate Rules, Non-Attainment Area Limitations [\[326 IAC 6-1\]](#)

Facilities that are located in the counties listed in 326 IAC 6-1-7 (Dearborn, Dubois, Marion, Vigo, Wayne, Howard, Vanderburgh, Clark, or St. Joseph Counties) and not specifically listed by company name in that citation and have the potential to emit 100 tons per year or more of particulate matter, must comply with the provisions of [326 IAC 6-1](#). The requirements listed in this rule includes:

- for solid fuel combustion steam generators of greater than 250 million Btu, particulate matter emissions must be less than 0.10 lbs. per million Btu.
- for solid fuel combustion steam generators of equal to or greater than 25 million Btu but less than 250 million Btu, particulate matter emissions must be less than 0.35 lbs. per million Btu.
- for solid fuel combustion steam generators of greater than 63 million Btu, particulate matter emissions must be less than 0.6 lbs. per million Btu.
- for liquid fuel combustion steam generators, particulate matter emissions must be less than 0.15 lbs. per million Btu.
- for gaseous fuel combustion steam generators, particulate matter emissions must be less than 0.01 grains per dry standard cubic foot.

Facilities that are located in any of the listed counties and are specifically listed in [326 IAC 6-1-7](#) must comply with the limitations specified.

#### A-1.11.6 Nitrogen Oxides Control in Clark and Floyd Counties [\[326 IAC 10-1\]](#)

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Sources located in Clark or Floyd Counties using boilers that have a heat capacity of greater than or equal to 100 million Btu per hour, and that combust coal, oil, or gas must comply with the nitrogen oxides control requirements of [326 IAC 10-1](#).

Sources located in Clark or Floyd Counties using boilers that have a heat capacity of greater than or equal to 100 million Btu per hour, and that combust **only** coal, oil, or gas must not exceed the following limits\*:

Boiler Type	Fuel Type	Emission Limit (lb./million Btu)
Wall-fired dry bottom	Pulverized coal	0.5
Tangentially fired	Pulverized coal	0.4
Spreader stoker	Pulverized coal	0.5
Overfeed stoker	Pulverized coal	0.4
Oil fired	Distillate oil	0.2
	Residual oil	0.3
Gas fired	Gas	0.2

(Limits shall be complied with on a three-hour basis, 30 day rolling average if a continuous emission monitor is used)

Sources located in Clark or Floyd Counties using boilers that have a heat capacity of greater than or equal to 100 million Btu per hour, and that combust **a mixture of** coal, oil, or gas must comply with the emission limits determined by the following equation<sup>16</sup>:

$$E = (A \times E1 + B \times E2 + C \times E3) / (A + B + C)$$

Where: E = the NO<sub>x</sub> limit in lbs./million Btu

**A = heat input in million Btu from coal**

B = heat input in million Btu from oil

C = heat input in million Btu from gas

E1 = applicable emission limits for coal listed in the table above

E2 = applicable emission limits for oil listed in the table above

E3 = applicable emission limits for gas listed in the table above

These sources will be required to comply with the recordkeeping and reporting requirements of [326 IAC 10-1-6](#) and [326 IAC 10-1-7](#).

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<sup>16</sup> A source may also elect to comply with this rule through the alternative compliance methods listed in 326 IAC 10-1-4(c)



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## Appendix 2

# RCRA CONTINGENCY PLAN

[\[40 CFR 265.50\]](#)

from IDEM Guidance Document titled “[Hazardous Waste Contingency Plans](#),”

OSHW General ID #0021-02-HW, October 1996

### A-2.1 Contingency Plan Preparation Guidance

Federal and State hazardous waste regulations (40 CFR 265 Subpart D – Contingency Plan and Emergency Procedures ([40 CFR 265.50 through 265.56](#), referenced by [329 IAC 3.1-10-1](#)), require that large quantity hazardous waste generators (by reference in [40 CFR 262.34](#)) and treatment, storage and disposal facilities (TSD’s) must have, and be prepared to implement, a Contingency Plan which is designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

The following discussion provides guidance on key elements of the contingency plan.

#### A-2.1.1 Contingency Plan Implementation

The contingency plan is a document which sets out an organized, planned, and coordinated course of action to be followed in case of a fire, explosion, or release of hazardous waste or its hazardous constituents which could threaten human health or the environment. The plan need not address all product spills but must address spills of materials which are hazardous wastes.

The contingency plan must be implemented for an on-site, as well as an off-site release that could threaten human health and the environment, even if the emergency coordinator does not believe that the wastes will leave the site.

At a minimum, the plan must map out general strategies to deal with both sudden and non-sudden events. Such strategies must involve outlining a series of steps to be taken in response to an incident and should include decision points where outside assistance may be required and the circumstances under which evacuation of the facility is advisable. The following criteria should be used in the contingency plan implementation decision process.

The contingency plan must be implemented if an imminent or actual incident could threaten the environment or human health from:

**Spills, if**

- the spill could result in release of flammable liquids or vapors creating a fire or gas explosion hazard
- the spill could cause the release of toxic liquids or fumes
- the spill can be contained on-site but the potential exists for groundwater pollution due to aquifer contamination



- 
- the spill cannot be contained on-site resulting in off-site soil contamination and/or ground or surface water pollution

**Fires, if**

- the fire could cause the release of toxic fumes
- the fire spreads, it could ignite materials at other locations at the site or cause heat-induced explosions
- the fire could spread to off-site areas
- the use of water or water and chemical fire suppressant could result in contaminated run-off

**Explosions, if**

- an imminent danger exists that an explosion could occur, resulting in a safety hazard due to flying fragments or shock waves
- an imminent danger exists that an explosion could ignite other hazardous waste at the facility
- an imminent danger exists that an explosion could result in release of toxic material
- an explosion has occurred

#### **A-2.1.2 Emergency Coordinators**

The facility must select at least one (1) employee who is either on the facility premises during normal operational periods or is available to respond to an emergency by reaching the facility within a short period of time. This employee must be designated the primary emergency coordinator. The emergency coordinator is responsible for coordinating all emergency response measures, and being thoroughly familiar with:

- the facility's contingency plan
- all operations and activities at the facility
- the location and characteristics of waste handled
- the location of all records within the facility, and
- the physical layout of the facility

The selected emergency coordinator must have the authority to expend funds and recruit employees to implement the Contingency Plan. The owner/operator should also select alternate emergency coordinators if for some reason the designated emergency coordinator may be unavailable.

#### **A-2.1.3 Emergency Response Procedures for Spills, Fires, and Explosions**

The appropriate level of response to a particular incident is largely a matter of professional judgment. However, the full range of response methods to be employed in a variety of potential situations can be anticipated and, thus, should be outlined as emergency procedures. The level of detail appropriate for these response procedures is dependent upon a number of factors including:

- the type of waste handled
- the potential for fires, explosions, or releases
- the immediate health and safety impact of the incident on facility personnel

- 
- the potential hazard to the outside environment

The contingency plan must contain elements which address emergency procedures to be undertaken -

- immediately upon discovery of an imminent or actual emergency: the first duty of the emergency coordinator is to warn the operating personnel, since they are likely to be the first group exposed to danger. Second, appropriate State or local emergency response agencies should be called if their assistance is needed to cope with the emergency. In the event of a release, fire, or explosion, the emergency coordinator must identify the character, exact source, amount, and extent of any released material and must also assess possible hazards to the environment and human health. If the release, fire, or explosion could threaten the environment or human health outside the facility, the emergency coordinator must immediately notify the appropriate local authorities and notify either the on-scene U. S. Environmental Protection Agency (EPA) coordinator for that geographical area, or the National Response Center at 800-424-8802, and the Indiana Department of Environmental Management (IDEM), Office of Emergency Response at 317-233-SPIL (7745).
- during the emergency control phase: the emergency coordinator must take all reasonable steps necessary to ensure that explosions and releases do not occur, recur, or spread to other hazardous waste at the facility. These steps include, where applicable, stopping operations. The emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever appropriate. Details should be provided to emergency personnel concerning the types of on-site emergency equipment to be used and the need for personnel protection equipment.
- immediately after an emergency: the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material. The recovered material must be handled as a hazardous waste unless it is a characteristic hazardous waste only, which is analyzed and determined not to be hazardous. The emergency coordinator must ensure that in the affected areas of the facility, no waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed. All emergency equipment must be cleaned and made fit for its intended use before operations are resumed.

#### **A-2.1.4 Emergency Equipment**

[40 CFR 265.52\(e\)](#), referenced by [329 IAC 3.1-10-1](#) of the State hazardous waste regulations, specifies that the plan include a list of all emergency equipment at the facility. In addition, the location of this equipment is to be noted and a physical description of each item on the list is to be provided along with a brief outline of the equipment's capabilities. Emergency equipment will vary from facility to facility, but must include the following as required by the regulation, unless none of the hazards posed by waste handled at the facility could require the equipment's use:

- an internal communication or alarm system capable of providing emergency instructions

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- a device capable of summoning external assistance (telephone or two-way radio)
  - portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment

#### **A-2.1.5 Evacuation Plan**

The Contingency Plan must include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. Where no possibility exists that facility evacuation could ever be necessary, this plan element may be omitted. Situations which would warrant partial or complete evacuation are as follows:

- **explosions** resulting in airborne debris including container fragments and hazardous waste
- **spills or chemical reactions** resulting in toxic fumes
- **fire** when it cannot be contained and is spreading to other parts of the facility, or when fire could generate toxic fumes
- **all incidents** where necessary protective equipment is not available to emergency response personnel

The evacuation plan must ensure the safe egress of facility personnel. The evacuation plan must indicate a recognizable signal to start evacuation, evacuation routes, and alternate evacuation routes (in case primary exist routes are blocked by releases of hazardous waste or fires).

#### **A-2.1.6 Required Reports**

Within fifteen (15) days after an incident requiring implementation of the contingency plan, the owner or operator must submit a written report on the incident to the EPA Regional Administrator, and the Commissioner of the Indiana Department of Environmental Management, which includes:

- name, address, and telephone number of owner/operator
- name, address, and telephone number of the facility
- date, time, and type of incident
- name and quantity of materials involved
- an assessment of actual or potential hazards to human health or the environment
- estimated quantity and disposition of recovered material that resulted from the incident

Before operations are resumed in the affected areas of the facility, the owner/operator must notify the Regional Administrator and appropriate State and local authorities that the facility is in compliance with follow-up procedures to an emergency prior to resuming operations in the affected areas.

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### **A-2.1.7 Amendment of the Contingency Plan**

The contingency plan must be reviewed, and immediately amended, whenever the following situations apply:

- applicable regulations are revised
- the plan fails in an emergency
- the facility changes in its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases
- the list of emergency coordinators changes
- the list to emergency equipment changes

**For More Information contact IDEM's Office of Land Quality at (317) 233-0447 or the IDEM toll-free number (800 451-6027).**

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## Suggested Outline

# Contingency Plan

### 1. Facility Identification and General Information

- a. Name of Facility
- b. Address of Facility
- c. Name, Title, Home Address, and Telephone Number (office and home) of Primary Emergency Coordinator
- d. Type of Facility
- e. Site Plan
- f. Description of Generator, Activities

### 2. Emergency Coordinator

- a. Primary Coordinator
- b. Alternate Coordinators
- c. Duties and Authority to Commit Resources

### 3. Implementation of the Contingency Plan

- a. Spills
- b. Fires
- c. Explosions

### 4. Emergency Response Procedures for Spills, Fires, and Explosions

- a. Immediately upon discovery of an emergency (Notification)
- b. During the emergency control phase (Control and Containment)
- c. Following attainment of control (Follow-up)

### 5. Emergency Equipment

- a. Emergency Equipment Inventory
- b. Location of Emergency Equipment (Facility Diagram)
- c. Equipment Capabilities
- d. Emergency Equipment Available from Other Sources

### 6. Coordination Agreements and Telephone Numbers

- a. Police
- b. Fire
- c. Hospital
- d. Other Emergency Response Units
- e. Spill Contractors

### 7. Evaluation Plan

- a. When to Evacuate
- b. Signals to Begin Evacuation
- c. Primary Evacuation Routes
- d. Alternate Evacuation Routes

### 8. Required Reports

- a. Incident Report
- b. Notification of Compliance Before Resuming Operations

### 9. Amendment of Contingency Plan

- a. Revised Regulations
- b. Facility Change
- c. Emergency Coordinator Change
- d. Emergency Equipment Change

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## Appendix 3

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)

## REGULATIONS/PERMIT REQUIREMENTS FOR STORMWATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

[\[40 CFR 122.26\]](#)

NPDES general permit rules have been developed in Indiana for storm water discharges. These rules are found in Title 327 of the Indiana Administrative Code, Article 15, Rules 1-6. Rules 1-4 establish the basic requirements for all NPDES general permit rules. Rule 5 establishes requirements for storm water runoff associated with **construction activity**. Rule 6 establishes requirements for storm water discharges associated with **industrial activity**. The general permit rules were published in the October 1, 1992, *Indiana Register* (pp.15-32), which is sent to all public libraries in the State of Indiana. Copies may also be obtained through the Legislative Services Agency at 317-232-9557.

### A-3.1 Determining if you need a Storm Water Permit

The following three questions will help determine whether a NPDES storm water permit is required for storm water discharges from a facility. If the answer to **any** of these 3 questions is “no,” a storm water permit application is **not** required at this time.

1. Is the facility identified in any of the categories of industries “involved in industrial activity” as defined in [327 IAC 15-6-4\(2\)\(A-J\)](#)?
2. Are there any discharges of storm water “associated with industrial activity” as defined in 327 IAC 15-6-4(2) from the facility?  
Facilities specifically listed in 327 IAC 15-6-4(2) clause (J) which are not otherwise included under clauses (B) through (I) only need to apply for a permit when storm water is potentially exposed to industrial activity as it is defined in the rule. All other facilities must submit a permit application regardless of the actual exposure of materials or activities to storm water.
3. Does the storm water associated with industrial activity at the facility discharge through a municipal separate storm sewer system (MS4) or result in a point source discharge to a surface water of the state?
  - The definition of “point source “ found in [327 IAC 5-1-2\(33\)](#), includes any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, and discrete fissure. Sheet runoff to a surface water of the state is not regulated by this rule. If storm water is retained on the property by means of a retention pond that does not discharge to a surface water of the state, no permit application is required.

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- Discharges through a MS4 **are** regulated, but discharges through a combined (storm & sanitary) sewer system are **not** regulated by these rules.
  - Discharges to groundwater are not regulated by these rules, except where there is a known hydrological connection to a nearby surface water. If a facility discharges storm water associated with industrial activity to groundwater via a drywell or sinkhole, it is recommended that a storm water permit application be submitted. However, drywells and sinkholes may be considered injection wells (holes in the ground which are deeper than their widest surface and are used to discharge or dispose of fluids underground) which are regulated by the EPA. For more information on EPA's Underground Injection Control Program requirements, please call EPA Region 5 at 312-886-1492.

To summarize, in accordance with state and federal regulations, those facilities described in [40 CFR 122.26\(b\)\(14\)](#) or [327 IAC 15-6-4](#) which have storm water associated with industrial activity that discharges through a MS4 or results in a point source discharge to a surface water of the state **are** required to submit applications for storm water discharge permits. IDEM may also require a facility that is found to be a significant contributor of pollutants to waters of the state to submit an application for a NPDES permit.

## A-3.2 Obtaining a Storm Water Permit

### A-3.2.1 Notice of Intent

There are two options available for obtaining a storm water permit in Indiana. The first option is to submit a Notice of Intent (NOI) letter to comply with 327 IAC 15-6, the general permit rule for Storm Water Discharges Associated With Industrial Activity (see NOI letter outline below). You should only submit a NOI if you know you are subject to the regulations and are agreeing to comply with the terms of the general permit rule. Since the NPDES general permit rules for storm water discharges are permit-by-rules, you will not be receiving an actual permit. The permit requirements are contained in the NPDES general permit rule. **Once a NOI letter has been submitted, the “clock” starts and the requirements in the general permit rule MUST be implemented on schedule.** Do not wait for acknowledgment from the Office of Water Management before proceeding to comply with the terms of this permit-by-rule. When the NOI is reviewed, you will receive a general permit identification number. You are strongly encouraged to choose this first option unless you are prohibited from doing so for the reasons listed below.

#### **Notice Of Intent Letter Requirements To Comply With 327 IAC 15-6**

The State of Indiana has not developed a form for Notice of Intent (NOI) letters to comply with the NPDES general permit rule for Storm Water Discharges Associated with Industrial Activity (327 IAC 15-6). However, the information required in the NOI letter (also found in 327 IAC 15-3-2 and 327 IAC 15-6-5) is listed below. All of the following information must be submitted before the NOI is considered complete. A NNOI letter may be typed on facility letterhead.

- 
1. Address the NOI letter to:  
Indiana Department of Environmental Management  
Office of Water Management  
Permits Section, Storm Water Group  
100 North Senate Avenue  
P.O. Box 6015  
Indianapolis, IN 46206-6015
  2. Specify that you are submitting the NOI to comply with 327 IAC 15-6, Storm Water Discharges Associated With Industrial Activity. Please indicate if this is a new facility.
  3. Provide the name, mailing address and location of the facility for which the notification is submitted.
  4. Provide the Standard Industrial Classification (SIC) code that best represents the principal products or activities provided by the facility. Not all industrial activities have SIC codes. If the facility does not have an applicable SIC code, then provide a written description of the type of operations conducted at the facility.
  5. Provide the person's name, address, telephone number, ownership status and status as federal, state, private, public or other entity. "Person" is defined in 327 IAC 4-1-2, as "an individual, partnership, co-01partnership, firm, company, corporation, association, joint stock company, trust, estate, municipal corporation, city, school city, town, school town, school district, school corporation, county, any consolidated unit of government, political subdivision, state agency or any other legal entity."
  6. Provide the latitude and longitude of the approximate center of the facility to the nearest fifteen (15) seconds.
  7. Provide the name of the receiving water(s), or, if the discharge is to a municipal separate storm sewer, the name of the municipal operator of the storm sewer **AND** the ultimate receiving water of the storm sewer.
  8. Identify the number and location of each point source discharge (outfall) of storm water associated with industrial activity (which enters a surface water of the state or municipal separate storm sewer system) **AND** the corresponding industrial activity associated with the drainage area of each discharge.
  9. Identify which of the discharge points in item #8, if any, are substantially similar, and, if appropriate, the outfall to be monitored as representative of all such discharge points. Also, explain the rational used to identify why certain point sources are similar.
  10. Provide the name of the responsible corporate officer and/or written authorization for an alternate person or position to act as the duly authorized representative for that person, if appropriate, who will be responsible for all signatory responsibilities for the facility under 327 IAC 15-4-3(g).
  11. Include the following certification statement:  
"I certify under penalty of law that his document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who



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manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

12. The person identified in item #10 must sign and date the NOI letter.
13. A \$50.00 application fee must be submitted with the NOI. There is also an annual fee of \$100.00 for storm water discharges associated with industrial activity, for which you will be billed.

**NOTE: If you answer yes to any of the following questions (#14-17), you may be required to submit an individual application (EPA Forms 1 & 2F) for those discharges instead of the NOI letter.**

14. Are the receiving waters identified in item #7 classified as an outstanding state resource water or an exceptional use stream (see Appendix A)?
15. Are any of the point source discharges referenced in item #8 already covered by an individual NPDES permit?
16. Are any of the point source discharges referenced in item #8 comprised of anything other than storm water? If so, what is the source of the additional discharge? Some non-storm water contributions are allowable under the NPDES general permit rule (see Appendix B). Are any of the Point source discharges referenced in item #8 subject to federal categorical standards for which effluent limitations for storm water have already been promulgated (see Appendix C)? Only those point source discharges that are subject to federal storm water effluent limits are excluded from being regulated by this NPDES general permit rule.

#### **A-3.2.2 Individual NPDES Storm Water Permit**

The second option is to apply for an individual NPDES storm water permit. To apply for this permit, EPA Forms 1 and 2F must be completed and submitted to the Office of Water Management. An individual storm water permit (rather than a general permit) is required under the following circumstances: the direct receiving waters are classified as either an outstanding state resource or an exceptional use water (see Appendix A attached); the point source discharge is composed of something other than the allowable non-storm water discharges listed in Appendix B; the outfall is already covered by an individual NPDES permit, or the discharges are subject to federal categorical standards for which storm water effluent limitations guidelines have already been promulgated (see Appendix C attached).

#### **A-3.3 Exempt**

If a facility is not required to submit a storm water permit application at this time, it is recommended that documentation be kept on site which explains that the regulations were reviewed with reasons why the facility is believed to be exempt. If a facility desires confirmation from the Office of Water Management, a letter may be submitted with the pertinent information and rationale relating to the decision and a response will be sent.

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All facilities that discharge storm water that are not subject to the current (Phase I) regulations are considered Phase II dischargers. Federal regulations were promulgated December 8, 1999, and IDEM will follow with its Phase II rules in about two years. Persons interested in these rules may access an EPA web site at [www.epa.gov/owm/sw/phase2/index.htm](http://www.epa.gov/owm/sw/phase2/index.htm).

**Questions regarding the storm water regulations or Rule 6 requirements may be directed to the Office of Water Management at 317-233-6725 or 317-233-1862.**

### **LIST OF RECEIVING STREAMS TO WHICH DISCHARGE UNDER THE GENERAL PERMIT RULES FOR STORM WATER IS PROHIBITED**

#### **327 IAC 2-1-2(3):**

The following waters of high quality, as defined in subsection (2), are designated by the board to be an outstanding state resource and shall be maintained in their present high quality without degradation:

- (A) The Blue River in Washington, Crawford and Harrison Counties, from river mile 57.0 to river mile 11.5.
- (B) Cedar Creek in Allen and DeKalb Counties, from river mile 13.7 to its confluence with the St. Joseph River.
- (C) The North Fork of Wildcat Creek in Carroll and Tippecanoe Counties, from river mile 43.11 to river mile 4.82.
- (D) The South Fork of Wildcat Creek in Tippecanoe County, from river mile 10.21 to river mile 0.00.
- (E) The Indiana portion of Lake Michigan.
- (F) All waters incorporated in the Indiana Dunes National Lakeshore.

#### **327 IAC 2-1-11(b):**

The following waters of the state are designated for exceptional use pursuant to 327 IAC 2-1-3(a)(6):

1. Big Pine Creek in Warren County downstream of the State Road 55 bridge near the Town of Pine Village to its confluence with the Wabash River.
2. Mud Pine Creek in Warren County from the bridge on the County Road between Brisco and Rainsville to its confluence with Big Pine Creek.
3. Fall Creek in Warren County from the Old C.R. 119 bridge in the NW quarter of Section 21, Township 22N, Range 8W downstream to its confluence with Big Pine Creek.
4. Indian Creek in Montgomery County from the County Road 650 West bridge downstream to its confluence with Sugar Creek.
5. Clifty Creek in Montgomery County within the boundaries of Pine Hills Nature Preserve.
6. Bear Creek in Fountain County from the bridge on County Road 450 North to its confluence with the Wabash River.
7. Rattlesnake Creek in Fountain County from the bridge on County Road 450 North to its confluence with Bear Creek.

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8. The small tributary to Bear Creek in Fountain County within the Portland Arch Nature Preserve which enters Bear Creek at the sharpest bend and has formed the small natural bridge called Portland Arch.
  9. Blue River from the confluence of the West and Middle Forks of the Blue River in Washington County downstream to its confluence with the Ohio River.
  10. The south Fork of Blue River in Washington County from the Horner's Chapel Road bridge downstream to its confluence with Blue River.
  11. Lost River and all surface and underground tributaries upstream from the Orangeville Rise (T2N, R1W, Section 6) and the Rise of Lost River (T2N, R1W, Section 7) and the mainstream of the Lost River from the Orangeville Rise downstream to its confluence with the East Fork of White River.

### **A-3.4 Allowable Non-Storm Water Discharges**

Indiana's NPDES general permit rules do not authorize non-storm water discharges mixed with storm water except as provided below. Non-storm water discharges which are allowed under Indiana's NPDES general permit rule 327 IAC 15-6 (unless such discharges are sources of pollutants), include: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, flows from riparian habitats and wetlands, routine building washdown without detergents, pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used, and discharges from fire fighting activities.

If any of these sources are present, they should be identified in the NOI letter and must be identified in the storm water pollution prevention plan prepared for the facility. Where such discharges occur, the plan must also identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge. For example, to reduce pollutants in irrigation drainage, a plan could identify low maintenance lawn areas that do not require the use of fertilizers or herbicides; for higher maintenance lawn areas, a plan could identify measures such as limiting fertilizer use based on seasonal and agronomic considerations, decreasing herbicide use with an integrated pest management program, introducing natural vegetation or more hardy species, and reducing water use (thereby reducing the volume of irrigation drainage).

### **A-3.5 Categories that contain Storm Water Effluent Limitations**

The following categories of facilities are subject to federal storm water effluent limitations guidelines for at least one of their subcategories. A facility that falls into one of these categories should examine the regulations to determine if it is categorized in one of the subcategories that have storm water effluent guidelines. If a facility is classified in one of these subcategories, that discharge is subject to the standards listed in the CFR for that category and must be regulated by an individual permit.

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Cement Manufacturing (40 CFR 411)  
Feedlots (40 CFR 412)  
Fertilizer Manufacturing (40 CFR 418)  
Petroleum Refining (40 CFR 419)  
Phosphate Manufacturing (40 CFR 422)  
Steam Electric Power Generation (40 CFR 423)  
Coal Mining (40 CFR 434)  
Mineral Mining and Processing (40 CFR 436)  
Ore Mining and Dressing (40 CFR 440)  
Asphalt (40 CFR 443)



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## Appendix 4

# SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN

[\[40 CFR 112\]](#)

The SPCC plan requirements were first promulgated pursuant to the Federal Water Pollution Control Act (now, Clean Water Act) on December 1973; therefore, they antedate the RCRA Contingency Plan and “Hazwoper” Emergency Planning requirements by quite a few years.

Perhaps, because of their earlier promulgation and the relative inexperience of environmental rule writers in the early 1970’s, the SPCC plan requirements have been subject to considerable modification and clarification over the years. And, today, the requirements are not always understood by the regulated community or some regulators. SPCC plans have been overshadowed by the subsequent promulgation of the RCRA Contingency Plan and the “Hazwoper” Emergency Plan requirements.

Many manufacturing facilities that are subject to the SPCC plan provisions don’t realize it, often because the plan, now required by the “Oil Pollution Act of 1990,” is considered to cover only “oil,” when, in fact, its coverage is broader than the common product we identify as “oil.” Substances such as mineral spirits, mineral oil, tung oil and turpentine are also covered.

Other facilities, particularly those located at a distance from a “navigable water” (e.g., river, lake, or ocean) reasonably assume that this condition requiring a SPCC plan doesn’t pertain to them when, in fact, the terms refer to “any natural surface water,” including creeks, streams, wetlands (and some regulators have maintained that side ditches with standing water or seasonal water flow are “natural surface water”). Indiana is partially bordered on three sides by segments of the largest waterways in the Midwest and the state contains thousands of miles of other creeks, streams and rivers and hundreds of small ponds and lakes. Few manufacturers will **not** be near “natural surface water.”

The “oil pollution prevention regulations” were originally intended for the large fixed or mobile facilities involved in oil production, refining and storage. You may recall an incident a few years ago at the large Ashland Chemical oil tank farm located on the Kentucky shore of the Ohio River that resulted in many thousands of gallons of oil being released to the river. SPCC plans and the corresponding Facility Response Plan are intended to mitigate the adverse effects of spills from these types of facilities. However, the SPCC plan requirements pertain to **any** facility that has an above ground storage capacity greater than 1,320 gallons (or 660 gallons in a single container) or an underground storage capacity greater than 42,000 gallons. The storage **capacity** of the container(s) is the volume used to determine whether the thresholds have or will be exceeded. Unlike the CERCLA reporting rule and Indiana’s spill reporting rule that are both based on the reportable quantity (RQ) of the regulated substance, the SPCC plan regulation considers a

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mixture or solution in, say, a 55-gallon drum that contains only 4 percent of a regulated substance to be the same as a drum containing 100 percent of that same substance.<sup>17</sup>

Many manufacturers store virgin product or raw materials containing SPCC-regulated substances in drums and **it requires only 24 drums to exceed 1,320 gallons**. A 660-gallon above ground tank is rare; most product or raw material tanks are **considerably larger**.

Manufacturers also need to recognize that their vehicle maintenance, trucking, plant heating and other operations attendant to manufacturing production must be considered in making the determination of whether a SPCC plan is required: gasoline, jet fuel, fuel oil (No. 1-6), lubricating oil, diesel fuel and motor oil are all SPCC-regulated substances. Oil mixed with waste and hazardous waste containing SPCC-regulated substances also have to be included in the calculation of total volume.

Finally, the SPCC plan regulations state that “facilities are only subject to the SPCC requirements if they could reasonably be expected to discharge **harmful quantities** [of regulated substances ...] A “harmful quantity” is defined as an amount of a regulated substance that “causes a film or a sheen on the surface of the water” or which “violates water quality standards.” Facilities need to recognize that this criteria requiring reporting is rather subjective. It is different than the spill reporting criteria, such as those contained in the federal CERCLA regulation and in Indiana’s “Spill Reporting, Containment and Response” rule [[327 IAC 2-6.1-1](#)], which require notification when the Reportable Quantity (RQ) amount of a regulated substance is spilled. The conscientious facility will report **any** amount of a regulated substance spilled or released that threatens to harm natural surface water.

**For more information, contact U.S. EPA, Region V, Superfund Division, Emergency Response Branch (312-353-8200) or IDEM’s Compliance and Technical Assistance Program (CTAP) at 1-800-451-6027, ext. 2-8172.**

A list of selected substances regulated by the SPCC plan provisions follows.

**Selected Substances from the List of Petroleum and Non-Petroleum Oils Covered and NOT Covered by the Spill Prevention Control and Countermeasures (SPCC) Plan Requirements [40 CFR 112]<sup>18</sup>**

<u><b>Covered</b></u>	<u><b>Not Covered</b></u>
<u><b>Petroleum Oils</b></u>	Acetone
Camphor oil	Alcohols (incl. Butanol,
Gasoline	Methanol)
Jet fuel	Methyl Ethyl Ketone
Kerosene	Methylene Chloride

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<sup>17</sup> Confirmed via telephone conversation with Dr. Barbara Carr, U.S. EPA Region V, Superfund Division, Emergency Response Branch, on December 6, 1999.

<sup>18</sup> Lists, titled “List of Petroleum and Non-Petroleum Oils for the Purposes of the FWPCA” and “Substances Which Are Not Considered Oil for the Purposes of the FWPCA,” provided to the authors by U.S. EPA Region V, Superfund Division, Emergency Response Branch, December 3, 1999. The authors were informed that the lists have not been formally published and that they are still being discussed by EPA and the Coast Guard.

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Mineral spirits (incl. Naphtha: heavy,  
paraffinic, petroleum, solvent,  
Stoddard Solvent and VM & P  
(75%) naphtha)  
Fuel oil (Nos. 1-6)  
Diesel oil (fuel)  
Lubricating oil  
Mineral oil  
Motor oil

Perchloroethylene  
Trichloroethane  
Trichloroethylene  
Xylene  
Any CERCLA Hazardous  
Substance listed in  
[40 CFR 116.4](#), (incl. Methyl  
Methacrylate, Styrene,  
Toluene)

Non-Petroleum Oils

Any animal or vegetable (incl. edible) oils  
Linseed oil  
Creosote  
Tall oil  
Tung oil  
Turpentine





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## Appendix 5

# WELLHEAD PROTECTION

[\(327 IAC 8-4.1\)](#)

Indiana's Wellhead Protection Program is designed to protect groundwater drinking supplies from pollution that can threaten health, lives, and community development. The program reduces the potential for contaminants to enter groundwater (which supplies approximately 60% of the state's drinking water) by identifying and managing areas where the groundwater supplies specific wells or wellfields.

Note that the Wellhead Protection Program is a new program that has not yet been fully implemented. It is your responsibility to stay up-to-date with new regulations and to comply with them. Contact your local public water supplier to see if your facility is located in a wellhead protection area. If you are in a wellhead protection area, you need to be aware of regulations that are being developed in your community as a result of new state regulations (327 IAC 8-4.1).

**Contact your local water company to see if you are located in a wellhead protection area and are required to follow specific rules if you have a spill.**



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## **Appendix 6**

# **DRINKING WATER REGULATIONS**

[\(327 IAC 8-2\)](#)

If your facility utilizes wells to supply water, it may be considered a public drinking water supply well. Most often, the well will receive an identification number at the time of installation, but, if, at that time, the well did not meet the definition of a public water system, it may not have been given a number. If the well is currently servicing at least 25 individuals daily at least 60 days out of the year, it is probably classified as a public water system and must have an identification number. Public drinking water supply wells are required to be monitored for water contaminants. The type of contaminants you must monitor for vary depending on the type of system the well is considered. Most manufacturing facilities with public supply wells will be considered non-transient, non-community public water systems. These systems must monitor for inorganic chemicals, volatile organic chemicals, and synthetic organic compounds.

**Contact the Office of Water Management at 317-308-3340 to obtain the Drinking Water Questionnaire to determine if your facility is a public water system.**

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## Appendix 7

# ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS

[\[29 CFR 1910.20\]](#)

This OSHA and IOSHA regulation pertains to the entire manufacturing facility and all of the employees – production and non-production alike. **This regulation applies to any employer who makes, maintains, contracts for, or has access to employee exposure or medical records or analysis of such records for employees exposed to toxic substances or harmful physical agents.** The regulation requires that you:

- provide access to exposure and medical records, within a reasonable time, place and manner, when requested by an employee or a designated representative.
  - **exposure records** - includes any of the following kind of information: workplace monitoring and sampling data; biological monitoring (excluding alcohol or drug effects); **material safety data sheets** or a **chemical inventory list** showing the chemical identity and where and when it was used
  - **medical records** - includes medical and employment questionnaires or histories; results of medical examinations and laboratory tests; medical opinions and diagnoses; first aid records, descriptions of treatments and prescriptions and employee medical complaints
  - **employee** - means a current or former employee

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## Appendix 8

# RECORDKEEPING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES

[\[29 CFR 1904\]](#)

This OSHA and IOSHA regulation pertains to the entire manufacturing facility and all of the employees -- production and non-production, alike.

**If you employed eleven (11) or more employees at any time during the calendar year immediately preceding the current calendar year, the regulation requires that you:**

- maintain a **log** and summary of all **recordable** occupational injuries and illnesses
  - **log** - use form OSHA 200 or an equivalent
  - **recordable** - any injury or illness other than those requiring only first aid, even if the first aid was administered by your plant medical personnel or in a doctor's office or hospital
- enter each recordable injury or illness on the log and summary at least within six (6) days after receiving information that the recordable injury or illness has occurred.
- maintain a separate copy of all logs that show the recordable injury and illness experience of your facility current to within 45 calendar days
- prepare a **supplementary record** for each recordable injury or illness at the time you enter the information on the OSHA 200 form.  
**supplementary record** - use the OSHA 101 form or an acceptable substitute, like an insurance or workers compensation report, as long as it contains the information
- prepare and post an annual summary of recordable occupational injuries and illnesses using the OSHA 200 form. The summary must be signed by a designate's representative of the employer
- provide copies of the log and summary, upon request, to IOSHA. Provide copies to any employee, former employee or employee representative for examination in a reasonable manner and at reasonable times
- orally **report** the death of any employee or the in-patient hospitalization of three or more employees resulting from a work-related incident, within eight (8) hours of the incident, to [IOSHA at 317-232-2693].
  - **report** - the oral report shall include the name of the company, location of incident, time of incident, number of fatalities or hospitalized employees, contact person, phone number and a brief description of the incident.

**If you employed ten (10) or fewer employees at any time during the calendar year immediately preceding the current calendar year, the regulation requires that you:**

- orally **report** the death of any employee or the in-patient hospitalization of three or more employees resulting from a work-related incident, within eight (8) hours of the incident, to [IOSHA at 317-232-2693].
  - **report** - the oral report shall include the name of the company, location of incident, time of incident, number of fatalities or hospitalized employees, contact person, phone number and a brief description of the incident.



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- maintain a log of recordable occupational injuries and illnesses and make reports on an Occupational Injuries and Illnesses Survey Form if you are notified in writing by the U.S. Bureau of Labor Statistics that you have been selected to participate in a survey.

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## Appendix 9

# RESPIRATORY PROTECTION

[\[29 CFR 1910.134\]](#)

Manufacturers are required to provide respiratory protective equipment when it is necessary to protect the health of employees. However, the employer is required, first, to determine if the atmospheric contamination can be prevented by engineering controls (e.g., enclosure or isolation of the operation, installation of local ventilation, substitution of less toxic raw material).

Requiring employees to wear respirators without first determining whether the contamination can be prevented is unlawful.

### A-9.1 Respiratory Protection Program

Employers are required to prepare and implement a **written** Respiratory Protection Program with worksite-specific procedures. Components of the written program must include, as relevant, the following:

- procedures for selecting respirators for use in the workplace
- medical evaluations of employees required to use respirators
- fit testing procedures for tight-fitting respirators
- procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
- procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators
- procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators
- training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations
- training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance
- procedures for regularly evaluating the effectiveness of the program

Where the employer has determined that respirator use is **not** required:

- an employer may provide respirators at the request of employees or permit employees to use their own respirators, if the employer determines that such respirator use will not in itself create a hazard. If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in Appendix D to the standard (“Information for Employees Using Respirators When Not Required Under the Standard”)
  - in addition, the employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is medically able to use that respirator, and that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.
- Exception: Employers are not required to include in a written respiratory protection

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program those employees whose only use of respirators involves the voluntary use of filtering face pieces (dust masks).

A decision by the employer to require employees to wear respiratory protective devices must be predicated on the results of a medical evaluation, provided by a physician or other licensed health care professional, to determine each employee's ability to use a respirator without being subjected to physiological burdens. Employees, then, must be fit-tested with the same make, model, style and size of respirator he/she will be assigned. Only those employees who pass the fit test can be assigned respirators.

Employees, also, have to ensure that provision is made for cleaning, disinfecting, storing, inspecting and repairing respirators. It isn't adequate for an employer to assign these procedures to the employees or to assume employees will, themselves, perform these tasks: the employer must provide the necessary surveillance and supervision of the program to ensure compliance with the rule and employee safety.

## **A-9.2 Employee Training**

Employee training is an important component of the respiratory protection program and the initial training must be provided before the employee is required to wear the respirator. The employer must provide at least annual training that is comprehensive and understandable. Each employee must be able to demonstrate knowledge of the following:

- why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator
- what the limitations and capabilities of the respirator are
- how to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions
- how to inspect, put on and remove, use, and check the seals of the respirator
- what the procedures are for maintenance and storage of the respirator
- how to recognize medical signs and symptoms that may limit or prevent the effective use of respirators
- the general requirements of the respiratory protection standard

Finally, employers are required to re-train employees when:

- changes in the workplace or the type of respirator render previous training obsolete
- it becomes apparent that the employee's knowledge of and use of the respirator is inadequate and the employee has not retained the requisite understanding or skill, or
- any other situation arises in which retraining is deemed to be necessary to ensure safe respirator use

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## Appendix 10

# HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (“HAZWOPER”)

[\[29 CFR 1910.120\]](#)

Manufacturers that have chemicals present in the workplace and/or store hazardous waste for up to 90-days are required to comply with the “Hawwoper” regulation if:

- they intend that their employees **will** respond to **uncontrolled** releases of hazardous substances that may also involve other response organizations

If manufacturers evacuate their employees from the danger area and do not permit them to assist in the response, they do **not** have to comply with this standard as long as they comply with the provision of the Emergency Action Plan standard ([29 CFR 1910.38](#)).

One “grey area” of the release/response definition needs to be clarified: responses to **incidental** releases of hazardous substances where the substance can be absorbed, neutralized or otherwise controlled at the **time of release** by employees **in the immediate work area** or by facility **maintenance personnel** are **not** considered to be emergency responses, according to the standard.

The term “incidental” means “related to production” and refers to “a small amount.” It is assumed by the standard that employees have received Hazard Communication or related safety and health training and, therefore, are familiar with the hazards of the chemicals in their work area.

Section (q) of the standard, “Emergency Response to Hazardous Substance Releases,” pertains to manufacturers, including those that are large quantity generators, that will train their employees to respond to releases.<sup>19</sup>

### A-10.1 Emergency Response Plan

Regulated employers must prepare and implement an emergency response plan designed to handle anticipated emergencies **prior** to the emergency happening. The elements of the plan are found in paragraph (q)(2). These elements include:

- pre-emergency planning and coordination with outside emergency response organizations
- a definition and description of personnel roles and responsibilities, lines of authority, employee training and communication
- emergency recognition and prevention
- safe distances and places of refuge

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<sup>19</sup> Note: the “Hawwoper” standards cannot be totally satisfied by large quantity generators if employee training is restricted to the provisions of [40 CFR 265.16](#), the RCRA Personnel Training requirements. Both training requirements and emergency contingency/response plan requirements ([29 CFR 1910.120](#) and [40 CFR 265.50](#)) must be met by large quantity generators.

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- site security and control
  - evacuation routes and procedures
  - decontamination policies and procedures
  - emergency medical treatment and first aid
  - emergency alerting (alarms and communications) and response procedures
  - critique of response and follow-up
  - personnel protective and emergency equipment

Preparation of the plan requires identification of the chemical hazards to which employees could be exposed during response operations and the identification of the correct personal protective equipment to ensure employee protection. Employees who may be exposed to inhalation hazards must be trained and fitted to wear positive pressure self-contained breathing apparatus (SCBA's).

## A-10.2 Employee Training

The standard, in paragraph (q)(6), establishes the duration of training for each of the various levels of response personnel. Different levels of initial training are required depending on the duties and functions of each responder, plus demonstrated competence or annual refresher training sufficient to maintain competence:

- **First responders at the “awareness level”** (individuals likely to witness or discover a hazardous substance release and initiate the emergency response) must demonstrate competency in such areas as recognizing the presence of hazardous materials in an emergency, the risks involved, and the role they should perform.
- **First responders at the “operations level”** (individuals who respond for the purpose of protecting property, persons, or the nearby environment without actually trying to stop the release) must have eight hours of training plus “awareness level” competency or demonstrate competence in their role.
- **Hazardous materials technicians** (individuals who respond to stop the release) must have 24 hours of training equal to the “operations level” and demonstrate competence in several specific areas.
- **Hazardous materials specialists** (those who support the technicians but require a more specific knowledge of the substances to be contained) must have 24 hours of training equal to the technician level and demonstrate competence in certain areas.
- **On-scene incident commanders** (who assume control of the incident scene beyond the “awareness level”) must have 24 hours of training equal to the “operations level” and demonstrate competence in specific areas.

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## Appendix 11

# LOCKOUT/TAGOUT PROGRAM

[\[29 CFR 1910.147\]](#)

The Lockout/Tagout Rule requires employers to establish a written program and utilize procedures for affixing appropriate lockout/tagout devices to energy isolating devices. These devices include electrical circuit breakers, disconnect switches, as well as other tools that physically prevent the transmission or release of energy. The Occupational Safety and Health Administration (OSHA) developed the Lockout/Tagout Rule to prevent injuries from occurring while machines are being serviced or maintained.

Manufacturers may do the servicing or maintenance on their own equipment or may have these duties contracted out. In either case, it is essential that all employees understand that a potentially dangerous condition exists whenever a machine is being serviced, and the people who normally operate the equipment are unaware of this activity.

Locks and tags are used to prevent people from inadvertently starting machines or equipment when they are being serviced. When a lock is used on energy isolating devices (EID), such as circuit breakers, on-off switches, or plugs, it will physically prevent anyone from turning on the system. **If the EID is capable of being locked out, it must be locked out (rather than merely tagged).** All newly installed equipment must be capable of being locked out. Under unusual circumstances, when a lockout device cannot be applied to a piece of machinery or equipment, a tag system may be utilized by the employer if they can demonstrate that an equal level of safety is achieved using a tagout procedure. If necessary, chains, wedges, blocks, or other hardware should be used to restrain energy.

Lockout/Tagout actions should be implemented whenever servicing and maintenance activities are being performed, which include: constructing, installing, setting-up, adjusting, inspecting, or modifying any equipment.

OSHA's Lockout/Tagout Program does not apply when minor adjustments and servicing tasks take place during normal production operations. These activities are **not** covered by this standard if they are **routine, repetitive, and integral to the use of the equipment for production**, provided that the work is performed using alternative measures which provide effective protection.

All employees shall be instructed on the safety significance of the lockout/tagout procedure. The employer must, at no cost to each authorized employee, furnish the necessary items to effectively carry out these procedures. The initial training on lockout/tagout should be given during employee orientation. Additional training will be given to authorized and affected employees when the employee is assigned to a job that requires direct use of lockout/tagout procedures. All employees must be able to recognize lockout/tagout equipment and shall be updated annually on new procedures. In this case, as in all others, training should be documented and updated as conditions change.

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## A-11.1 Classifications

All employees are placed in one of three categories:

**Authorized:** Any employee whose job requires them to do servicing or maintenance on any machine and while performing these function, puts themselves in a potentially hazardous position.

**Affected:** Any employee who, during normal job duties, will be affected by the locking or tagging out of a machine they work on.

**Other:** Any employee whose specific job assignment is not affected by a machine's shut down.

## A-11.2 Preparation for Lockout/Tagout

Before starting any service or maintenance on a piece of equipment, all authorized employees involved in the repair or maintenance will make a visual survey to locate and identify all energy sources. This is done to ensure that all appropriate energy sources are properly locked or tagged out. On many machines, there may be more than one source of energy.

## A-11.3 Sequence for Lockout/Tagout

1. Notify all effected employees that a lockout/tagout procedure is going to be used on the machine and the reason for it.
2. If the machine or equipment is being operated, shut it down by normal stopping procedures.
3. Go to the energy source and operate the switch, valve, or other energy disconnect so the equipment is isolated from its energy source.
4. Stored energy such as that in springs, elevated machine members, rotating flywheels, hydraulic systems, air, gas, steam or water pressure, must be dissipated by bleeding off or restrained by methods such as repositioning, strapping or blocking.
5. Lockout or tagout the energy isolating devices (valves, switches, etc.) with individual locks and tags.
6. After ensuring that no personnel are exposed, attempt to restart the machine using normal operating controls to make certain that the machine will not operate.  
**CAUTION: MAKE SURE TO RETURN OPERATING CONTROLS TO "OFF" OR "NEUTRAL" POSITION AFTER TEST.**
7. The machine is now locked and tagged out.

## A-11.4 Restoring Machine or Equipment to Normal Production

1. After the maintenance is completed and the equipment is ready for normal production, check the area around the machine to ensure that no one is exposed to an unsafe situation during restart.
2. Check to make sure all tools and supplies are removed from the machine.

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3. Make sure all guards and safety equipment are reinstalled.
  4. Notify all effected personnel that the machine is about to be re-energized.
  5. After making sure the machine controls are in the “off” or “neutral” position, remove lock and tag and re-energize machine.

### **A-11.5 Group Lockout**

When servicing and/or maintenance is performed by two or more individuals, they must utilize special procedures.

1. Responsibility. Primary responsibility for the lockout is vested in one employee working on that particular job. This employee will maintain responsibility throughout the project.
2. Multiple individual locks. Each authorized employee shall affix a personal lockout/tagout device to the group lockout device, group lockbox, or comparable mechanism when he or she begins work, and shall remove those devices when their job is completed on that project.

### **A-11.6 Shift or Personnel Changes**

1. When a shift or personnel change occurs, a designated employee shall ensure the continuity of the lockout/tagout protection.
2. The designated employee shall provide for the orderly transfer of lockout or tagout devices between off-going and oncoming employees.

### **A-11.7 Procedures to take if Lockout/Tagout cannot be Accomplished**

1. Notify all affected employees that maintenance or repair of machinery is going to take place.
2. All affected employees must acknowledge this information (either verbally or in writing).
3. The machine is then stopped (shutdown) and the energy source removed, if possible.
4. Follow procedures to dissipate energy as indicated above.

### **A-11.8 Outside Contractors**

When outside contractors are doing maintenance or repair work on your equipment, they must demonstrate their lockout/tagout procedures to all affected employees. If the contractor’s work is unrelated to your operation (i.e., plumbing, heating and cooling, air monitoring, etc.), the operator must inform the contractor of the potential hazards of the equipment (and chemicals) in the area.



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This entire program shall be reviewed on an annual basis and upgraded when necessary.

A more detailed guide covering the development of a Lockout/Tagout Program is available from the Bureau of Safety Education and Training (BuSET).

This guide is available free of charge and may be obtained by calling BuSET at (317) 232-2688 or by using the BuSET order form on the Fax-On-Demand system.

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## Appendix 12

# CONFINED SPACE ENTRY

[\[29 CFR 1910.146\]](#)

There may be tanks, large pipes, oil reservoirs, pits beneath machines, sewer traps, boiler line tunnels, storage silos and other such areas at your facility that, from time-to-time, need cleaning or maintenance.

Before you assign your employees to perform this work, you need to know the provisions of the regulation governing -

- Permit-required confined spaces ([29 CFR 1910.146](#))

If these areas require cleaning or maintenance:

### **You Should**

- Contact IOSHA/BuSET (317-232-2688) for the names of cleaning/maintenance firms experienced in confined space entry and contract with such a firm to perform the required work.

If you decide to assign your own employees to perform this work:

### **You Must**

- Develop and implement a written permit confined space entry program.
- Train all employees to be assigned such work and certify the successful completion of such training.
- Purchase the necessary equipment to test the atmosphere of confined spaces and allow the entrance and extrication of employees from such spaces.
- Contract for or employ the necessary expertise (e.g., certified industrial hygienists, certified safety professionals) to conduct monitoring of each confined space and establish protocols for entry into and rescue from each space, as well as lock-out/tag-out procedures.
  - The monitoring results prior to entry **MUST** be posted on the **entry permit** and a written **record** of the test results **MUST** be kept at the work site for the duration of the job.

### **You Should**

- Maintain a central file for copies of all entry permits and **records** of test results for all confined space work.



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## Appendix 13

# FIRE PROTECTION

[\[29 CFR 1910.157, .159\]](#)

Not all fires in a manufacturing facility require a response from the local fire department. Small incipient fires can be successfully extinguished with portable fire extinguishers provided for employee use or by automatic sprinkler systems. Two OSHA regulations govern fire protection systems in manufacturing facilities:

- Portable Fire Extinguishers ([29 CFR 1910.157](#))
- Automatic Sprinkler Systems ([29 CFR 1910.159](#))

Your plant manager, shop foreman, and any safety personnel need to know the provisions of both regulations.

### A-13.1 Portable Fire Extinguishers

#### You Must

- Establish and implement a written fire safety policy requiring the immediate and total evacuation of all employees from the workplace upon the sounding of a fire alarm signal.
  - This policy **MUST** include an emergency action plan and a fire prevention plan which meet the requirements of [29 CFR 1910.38](#).
  - The emergency action plan may designate certain employees to be the only employees authorized to use the available portable fire extinguishers, but require all others to evacuate.
- Annually perform a maintenance check on all portable fire extinguishers and retain **records** of such checks for one year or the life of the cylinder of “shell,” whichever is less.
- Retain certification **records** of the required hydrostatic testing of each fire extinguisher, including the date of the test, signature of the person performing the test and serial number or other identifier of the fire extinguisher that was tested, until it is retested or taken out of service, whichever comes first.

### A-13.2 Automatic Sprinkler Systems

Automatic sprinkler systems used to meet OSHA requirements must be designed, installed and tested in accordance with Automatic Sprinkler Systems ([29 CFR 1910.159](#))

If your sprinkler systems meet these requirements:

#### You Must

- Conduct proper acceptance tests on sprinklers installed for employee protection and **record** the date of such tests.

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- Identify and **record** the location, the basis of design and the number of sprinklers in a hydraulically designed sprinkler system and retain these **records** in a central location.

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**Appendix 14**  
**OCCUPATIONAL NOISE EXPOSURE**  
**(HEARING CONSERVATION PROGRAM)**  
[\[29 CFR 1910.95\]](#)

Employers must prepare and implement a hearing conservation program whenever employee noise exposures equal or exceed an 8-hour Time Weighted Average (TWA) sound level of 85 decibels.

When exposures at this level are suspected, the employer must develop and implement a monitoring program and employees who are found to be exposed at or above the TWA must be notified. Also, audiometric testing must be made available to these employees.

Employers must make hearing protectors available to these employees and train employees in the use and care of such protectors on at least an annual basis. The training program must include information about -

- the effects of noise on hearing
- the purpose of hearing protectors and instructions on selection, fitting, use and care
- the purpose of audiometric testing and an explanation of test procedures

Employers are also required to maintain records of audiometric test results on all affected employees for the duration of the employee's employment.



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## **Appendix 15**

# **EMPLOYEE EMERGENCY PLAN AND FIRE PREVENTION PLAN**

[\[29 CFR 1910.38\]](#)

(This emergency action plan should be customized to fit the needs of your company).

### **A-15.1 Purpose**

The purpose of an Emergency Action Plan is to protect the employees from serious injury, property loss, or loss of life in the event of a natural disaster or emergency. A natural disaster constitutes any one of the following: severe thunderstorm, flood, tornado, or earthquake. Emergencies would constitute any one of the following: bomb threat, robbery, fire, or hazardous chemical spill. In the event of any disaster listed, this Emergency Action Plan describes the responsibilities and actions to be taken to protect all employees.

The emergency action plan must be in writing and must cover those designated actions employers and employees must take to ensure employee safety from fire and other emergencies. For those employers with 10 or fewer employees, the plan may be communicated orally to employees and the employer need not maintain a written plan. [IDEM recommends that all employers keep a written plan.]

### **A-15.2 General Procedures**

The employer needs to provide emergency escape procedures and emergency escape route assignments to every employee in case of an emergency as well as procedures to account for all employees after an emergency evacuation has been completed.

Emergency alarms should be established for each company that complies with OSHA standards. In the event of a natural disaster, the warning may come from a radio or civil defense siren, or there may be no warning. In the event of an emergency, the warning may come from any one of the following sources: in-plant sprinkler system, telephone, security alarm, or verbal warning from personnel in the plant.

A person receiving notification of a possible natural disaster or in-plant emergency should immediately notify their supervisor.

A map of all evacuation sites will be displayed in the lunchroom and at every work area. Each map will show the route and exit to take depending where employees are located in the plant. It will be the responsibility of supervisors to inform employees of these evacuation routes.

#### **A-15.2.1 Natural Disasters**



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In the event of a SEVERE THUNDERSTORM, all personnel should have a radio to listen for possible warnings. All open exterior doors should be closed, and customers in the shop should be kept away from plate glass windows.

In the event of a TORNADO, warnings may be sounded by civil defense sirens and National Weather Service warnings on radio. At times, tornadoes form with no warning. The only indication of a problem is often the sound of a train moving toward you. If the shop is in or near the path of a tornado, the following procedures must be followed immediately and in the following order as time and safety permits:

1. All employees should be moved to a place of safety, such as an interior wall, beneath a counter or table, but away from windows.
2. All exterior doors closed.
3. All computers turned off to protect circuit boards.
4. Machinery turned off at main power switch
5. After the tornado passes, the supervisor on duty should evacuate the shop, if necessary, and make sure all personnel are accounted for. Check for injuries, and await the arrival of emergency personnel.

EARTHQUAKES normally occur without any type of warning. Due to the suddenness, all personnel should attempt to get into a doorway passage or under a table or desk. **NO ONE SHOULD GO OUTSIDE THE BUILDING.** After the earthquake has stopped, all employees should help restore calm to fellow workers; check for injuries, shut off all gas, electricity, and water at main controls.

#### **A-15.2.2 Man-made Emergencies**

A BOMB THREAT will normally be telephoned in. If this should happen, the person receiving the call should immediately notify a supervisor or manager. The supervisor should, in turn, notify the owner at once. Either the supervisor or manager must call the police to inform them of the threat. Employees must follow any and all instructions given them by law enforcement personnel.

In the event of a ROBBERY, the person or persons involved should do exactly as requested by the robber. If your facility is equipped with a security system, set it off only if the robber will not be able to notice. If this cannot be done safely, wait until the robber has left, and then do so immediately. If your facility is not equipped with a security system, call the police as soon as the robber has left the scene. When the police arrive, **DO NOT** run outside to them; they will come inside to you. Just stand and wait for their instructions. If anyone is injured during a robbery or robbery attempt, **DO NOT** use the security alarms. Call 911 instead and request medical assistance.

To the best of your ability, remember what the person looked like and write down a description and other relevant information to give to the police when they arrive. Include a physical description, description of any weapon, and direction of travel when they left the facility.

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In the event of a FIRE, quickly determine the scope of the fire. If it is very small and can be managed quickly with the use of a the fire extinguisher, put out the fire. Otherwise, evacuate the facility and call 911. If it can be done safely, turn off gas and steam lines. Make sure the fire fighters understand that there are hazardous chemicals inside the building, and provide them with the location of the MSDS book.

In the event of a HAZARDOUS CHEMICAL SPILL, do the following:

1. Try to determine what has been spilled. Look at the container the chemical was in, or see where the chemical is draining from.
2. Use absorbent material to help contain the spill.
3. Inform a supervisor of the emergency and the steps that have been taken.
4. Turn on all ventilation systems and open all doors. Refer to the MSDS book for further instructions on clean-up.

### **A-15.3 Fire Prevention & Workplace Hazards**

#### **A-15.3.1 Fire Prevention**

The employer must provide portable fire extinguishers for employee use in the workplace, and the employer shall also provide a training program to familiarize employees with the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

It is the responsibility of all employees to prevent any type of fire in the building. The following are general rules to accomplish this objective:

1. Extinguish all cigarettes in their proper place.
2. Do not smoke or have open flame around any type of chemicals or gasses.
3. Smoking shall be confined to designated areas (if any) or outside.
4. Do not put hot cigarette butts in trashcans.

#### **A-15.3.2 Workplace Hazards**

These include equipment and all chemicals used in the facility. It is important that all chemicals are stored in clearly marked containers. At the end of each day, all chemicals should be tightly capped and put away in designated areas. Store flammable or combustible materials according to Indiana Fire Code.

Good housekeeping will prevent many problems. It is the responsibility of EVERY employee to make sure trash is kept off the floors (and taken to the dumpster when necessary), and that exits are kept clear. If there are any questions about safety in the facility, employees should contact their supervisor right away.



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## Appendix 16

# THE HAZARD COMMUNICATION STANDARD

[\[29 CFR 1910.1200\]](#)

### A-16.1 Background

The Hazard Communication Standard, also known as the **Worker's Right-to-Know Law**, was enacted by OSHA to ensure that hazards in the workplace are identified and communicated to all employees and employers. This transmittal of information is accomplished through a comprehensive hazard communication program which includes container labeling, material safety data sheets, and employee training.

This standard places several requirements on facilities which have hazardous chemicals in their workplace. Hazardous chemicals are substances which pose potential physical or health hazards to employees in the workplace.

The Hazard Communication Standard applies to any business that uses, distributes, or imports hazardous chemicals, *regardless of the number of individuals employed*. All facilities must satisfy the following five requirements to be in compliance:

1. Evaluate all chemicals in the workplace to determine if they are hazardous (hazard determination).
2. Develop a written hazard communication program.
  3. Ensure that all hazardous chemicals used in the workplace are properly labeled.
4. Maintain an updated inventory of material safety data sheets (MSDS) for each hazardous chemical in the workplace.
5. Provide information and training on hazardous chemicals found in the workplace to all employees.

### A-16.2 Chemical Inventory/Hazard Determination

You are required to inventory all chemicals in your workplace to determine if they are hazardous. This hazard determination should be based on information provided by the chemical manufacturer. The actual procedure you use to determine the hazard of each chemical must be in writing.

Performing a chemical inventory is most easily accomplished by walking through your facility and recording the name of every chemical used or found (i.e., office supplies, household cleaners, solvents, fuels, paint, lubricants, etc.). Do not base your hazard determination merely on the presence or absence of a material safety data sheet (MSDS) or warning label. The inventory list should include all chemicals, especially those with the following characteristics:

- flammable, combustible, or ignitable;
- causes skin, eye, or respiratory irritation;

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- dangerous if swallowed, and/or
  - produces reactions when mixed with other chemicals (e.g., bleach & ammonia).

The name of each chemical added to your inventory list should correspond to the name identified on its MSDS, if one is available. Other useful information worth recording on the inventory list includes: the chemical's trade or manufacturer's name; whether an MSDS is available for that chemical, and the chemical's location in your shop. When completed, this inventory list will become a component of the hazard communication program.

### **A-16.3 Container Labeling**

All chemical containers (i.e., spray bottles, drums, storage tanks, etc.) in your workplace must be labeled. All shipping containers should be labeled by the manufacturer, and every effort should be made to keep these substances in their original containers. These labels warn employees of the chemical's potential dangers and provide a source for obtaining further information about the substance. The label provided by the manufacturer should contain the following:

- 1) identity of the hazardous chemical(s);
- 2) appropriate hazard warning, and
- 3) name & address of the chemical manufacturer, importer, or other responsible party.

Employers should check to see that all newly-delivered chemicals are properly labeled. *If a proper label is not attached, refuse shipment until a proper one is applied.* The chemical manufacturer may be able to supply you with additional labels as needed.

OSHA does not require a specific labeling system as long as the above information is provided, is legible, and is in English. All chemicals arriving in the workplace should have the required manufacturers hazardous label on the container. It is, therefore, unnecessary to re-label any container unless:

- 1) the label is worn, destroyed, or becomes outdated, or
- 2) the chemical is transferred into a smaller container.

### **A-16.4 Material Safety Data Sheet (MSDS)**

The Hazard Communication Standard requires all chemical manufacturers and importers of hazardous chemicals to obtain or develop an MSDS for each chemical they produce or import. Employers are required to have an MSDS for each hazardous chemical they use.

The employer is not responsible for information on the MSDS which they have not prepared, but it is their obligation to check the document for obvious inaccuracies. If an MSDS is found to be incomplete, inaccurate, or outdated, the employer needs to contact the manufacturer to request a corrected copy. MSDSs are typically available from the chemical manufacturer or supplier but it is the employer's responsibility to assure that a MSDS is available to employees for each chemical in the workplace.

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MSDSs contain specific hazard information such as:

- 1) physical and health hazards;
- 2) routes of entry;
- 3) exposure limits;
- 4) precautions for safe handling;
- 5) spill clean-up procedures;
- 6) personal protective equipment required;
- 7) emergency and first aid procedures, and
- 8) the name, address and telephone number of the manufacturer.

All of the information on the MSDS must be in English and available to all employees working with or near the hazardous chemical. A copy of the MSDS should also be available to members of your community, by request, as a component of the Community-Right-to-Know law (SARA Title III).

## **A-16.5 Employee Training & Information**

Employers are required to provide employees with information and training on all chemicals found in their workplace at the time of initial assignment and whenever a new hazard (chemical) is introduced into their area. Training needs to be provided to those employees who have the potential for exposure to any chemical, and this may include office staff, custodial personnel and others who are not production employees.

Employers need to provide information about the standard, where hazardous chemicals are present, along with the location and availability of the written hazard communication program, hazardous chemical inventory, and MSDS(s).

Training should be specific to the workplace and includes: methods and observations used to detect the presence or release of the chemical; physical and health hazards; protective measures required, labeling, and explanation of the MSDS. All chemicals listed on the hazardous chemical inventory should be covered in the training. Training should allow for interaction between the instructor and the employees to ensure they understand the information presented.

Employers are responsible for ensuring that all affected employees comprehend and apply the information provided to them. They should know the location of the MSDS(s), how to read a label, have general knowledge of the hazardous chemicals in the workplace, and how to respond appropriately in emergency situations. Each employee's level of knowledge with regard to training and information required by this standard can be obtained through testing or by demonstration of their knowledge. Information posters, employee incentives, etc., may help ensure the retention of the training and information provided.

Always document your training and retrain as necessary (at initial job assignment or when job assignment is changed, when new chemicals are introduced into the workplace and when exposure risk changes). Training records must include the date and content of the program;

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name and qualifications of the instructor, and a list of attendees. These records should be kept for duration of employment plus an additional thirty (30) years.

### **A-16.6 The Written Hazard Communication Program**

This written hazard communication program combines all of the required components of the standard (hazard determination, chemical inventory list, description of labeling system, MSDS, information and training) into one working document. This written program should address at least the following topics:

- how the hazard chemical determination will be conducted;
- the methods the employer will use to inform employees of the hazards of non-routine tasks;
- how the employer will notify contractors working on-site of hazards found in the workplace. Include how information about your labeling system, MSDS(s) and a copy of your Hazard Communication Program will be provided to the contractor, which routine precautions need to be taken, and proper emergency procedures.
- how container labeling will be handled;
- how training and information will be provided;
- methods for obtaining, organizing, and distributing MSDSs.

A copy of the written program must be made available upon request to all employees and OSHA officials.

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## Appendix 17

# ERGONOMICS PROGRAM STANDARD (PROPOSED)

[\[29 CFR 1910.900\]](#)

Printed as a proposed rule in the November 23, 1999 Federal Register, the long-awaited and much-debated Ergonomics Standard will undoubtedly become “law” in 2000 unless lawsuits and court decisions further delay its implementation.

The standard, as proposed, applies to manufacturing jobs, manual handling jobs and to jobs in which the employee reports an OSHA recordable musculoskeletal disorder (MSD) that meets specified screening criteria.

Following is a description of the elements of a complete ergonomics program:

■ **Management Leadership and Employee Participation:**

You must demonstrate management leadership of your ergonomics program. Employees (and their designated representatives) must have ways to report “MSD signs” and “MSD symptoms,” get responses to reports, and be involved in developing, implementing and evaluating each element of your program. You must not have policies or practices that discourage employees from participating in the program or from reporting MSD’s signs or symptoms.

■ **Hazard Information and Reporting:**

You must set up a way for employees to report MSD signs and symptoms and to get prompt responses. You must evaluate employee reports of MSD signs and symptoms to determine whether a covered MSD has occurred. You must periodically provide information to employees that explains how to identify and report MSD signs and symptoms.

■ **Job Hazard Analysis and Control:**

You must analyze the problem job to identify the “ergonomic risk factors” that result in MSD hazards. You must eliminate the MSD hazards, reduce them to the extent feasible, or materially reduce them using the incremental abatement process in the standard. If you show that the MSD hazards only pose a risk to the employee with the covered MSD, you may limit the job hazard analysis and control to that individual employee’s job.

■ **Training:**

You must provide training to employees so they know about MSD hazards and your ergonomics program and measures for eliminating or materially reducing the hazards. You must provide training initially, periodically, and at least every 3 years at no cost to employees.

■ **MSD Management:**

You must make MSD management available promptly whenever a covered MSD occurs. You must provide MSD management at no cost to employees. You must



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provide employees with the temporary “work restrictions” and “work restriction protection (WRP)” this standard requires.

■ **Program Evaluation:**

You must evaluate your ergonomics program periodically, and at least every 3 years, to ensure that it is in compliance with the standard.

For more information access the [OSHA web site](http://www.osha-slc.gov/ergonomics-standard/fedregabbrversion.html) at <http://www.osha-slc.gov/ergonomics-standard/fedregabbrversion.html>, and/or call Indiana OSHA BuSET at 317-232-2688

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## Appendix 18

# BLOODBORNE PATHOGENS

[\[29 CFR 1910.1030\]](#)

### A-18.1 Background

The Bloodborne Pathogens regulations are designed to protect employees from exposure to the AIDS virus, Hepatitis virus, and other pathogens that are transmitted by contact with blood or other body fluids. The potential exists for the diseases to be transmitted even though your employee does not have any visible cuts or other openings on the skin. Dry, cracked skin, hangnails and other unnoticed imperfections in the skin's protective barrier could allow disease-carrying organisms to enter the body.

While the AIDS virus gets the headlines, the Hepatitis B virus actually poses the greater risk and likelihood of infection. There is a vaccine for Hepatitis B which will prevent infection even if a person is exposed to the virus. The vaccine involves a series of three injections over a period of several months, and is only effective if the vaccine is received **prior** to exposure to the virus. Your employees cannot wait until they are exposed and then get the vaccine in hopes of fending off the infection.

#### **You Must**

- make a determination of which employees may be exposed to blood while performing their job duties. For your facility, that could be the employees who provide first aid to someone who is injured and bleeding, or any employee that might touch blood-contaminated surfaces. For those designated employees -
  - provide them with basic first aid training
  - provide adequate first aid supplies
  - train them in bloodborne pathogens (what they are, how they can be spread in your workplace, how to prevent exposure or infection, protective equipment needed, personal decontamination procedures, and what to do in case they are exposed)
  - train them in proper techniques and equipment for cleaning blood from surfaces (a 10% household bleach solution will suffice for hard surfaces that will not be damaged by bleach; for other surfaces, contact a local commercial cleaning supply distributor for recommendations for a safe, yet effective disinfectant for the type of surface involved)
  - provide protective equipment (gloves, goggles/face shields, aprons)
  - provide ready access to soap and water for washing hands
  - provide the opportunity for them to receive the Hepatitis B vaccine
- provide properly labeled receptacles for disposal of contaminated items (gauze, etc.)
- have a written Exposure Control Plan (a sample is in the attachment to this section)
- train all employees that only designated employees are to provide first aid or clean contaminated vehicles

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**NOTE:** You are required to offer them the vaccine, and to pay for it; if they do not want the vaccine, they must sign a statement signifying they knew the benefits of getting the vaccine, but decided not to get it. (The language is specified, and can be found in the attachment to this section). If they change their mind later, you must then provide the vaccine. (Contact your local health department or health care provider to learn where to get the shots and what the cost is). The OSHA regulations have an exemption for employees whose exposure is only related to providing first aid. The exemption allows that the Hepatitis vaccine is not required to be offered for first aid employees until the employee actually provides first aid the first time. Then they must receive the vaccine within 24 hours. Receiving the vaccine after potential exposure will NOT, however, prevent the person from contracting Hepatitis B.

## **A-18.2 What Are Your Options**

If you are close to a hospital or medical facility so that an injured employee could receive first aid within 4 MINUTES of when they first get hurt, you do not need to have a designated, trained, first aid provider. For all practical purposes, however, unless your facility is next door to a doctor, clinic or hospital, there is little chance that an OSHA inspector will agree that you are in this category. That means you need to have someone at your facility trained in first aid and you must have the necessary supplies to provide basic first aid. That trained, designated, first aid provider would then need to have the bloodborne pathogens training, equipment and availability of the Hepatitis vaccine.

Having all your employees trained gives your facility the most flexibility because anyone can do any job, and the nearest person is able to provide first aid to an injured employee. That option could be costly, however, because you would have to provide first aid and bloodborne pathogens training for each employee, and offer each of them the opportunity to receive the Hepatitis B vaccine.

A less expensive option would be to have 2-3 employees designated for both first aid and decontamination. Other employees could be instructed that if first aid is needed, these designated employees are the ones to provide it.

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## **Hepatitis B Vaccine -- Employee Waiver**

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring Hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself. However, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease. If, in the future, I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with Hepatitis B vaccine, I can receive the vaccination series at no charge to me.

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Employee Name

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Date

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## BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN

Facility Name: \_\_\_\_\_

Date: \_\_\_\_\_

In accordance with the OSHA Bloodborne Pathogens standard [29 CFR 1910.1030], the following exposure control plan has been developed.

### 1. Exposure Determination

OSHA requires employers to perform an exposure determination concerning which employees may incur occupational exposure to blood or other potentially infectious materials. The exposure determination is made without regard to the use of personal protective equipment (i.e., employees are considered to be exposed even if they wear personal protective equipment). This exposure determination is required to list all jobs in which employees may be expected to occasionally incur such occupational exposure, regardless of frequency. At this facility, the following job duties fall in this category:

#### PROCEDURE

#### NAME OF EMPLOYEE


### 2. Implementation Schedule and Methodology

OSHA also requires that this plan include a schedule and method of implementation for the various requirements of the standard. The following complies with this requirement:

#### **Compliance Methods**

Universal precautions will be observed at this facility in order to prevent contact with blood or other potentially infectious materials. All blood or other potentially infectious material will be considered infectious, regardless of the perceived status of the source individual.

Because exposure to blood or other infectious material is only likely when an employee designated as a first aid provider treats a bleeding person, or in the event of a vehicle coming to the shop which has blood (or what appears to be blood), the methods of control for exposure to infectious materials focus on protective equipment and proper handling of contaminated debris.

Handwashing facilities are readily available to the employees who incur exposure to blood or other potentially infectious materials. At this facility, handwashing facilities are located:


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After removal of personal protective gloves, employees shall wash hands and any other potentially contaminated skin area immediately or as soon as feasible with soap and water.

If employees incur exposure to their skin or mucous membranes, then those areas shall be washed or flushed with water as soon as feasible following contact.

### **Contaminated Equipment**

Equipment (sinks, faucets, door handles) which has become contaminated with blood or other potentially infectious materials shall be decontaminated with a 10% bleach solution, or other suitable disinfectant.

### **Personal Protective Equipment**

All personal protective equipment used at this facility will be provided without cost to employees. Personal protective equipment will be chosen that does not permit blood or other potentially infectious materials to pass through or reach the employees' clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

#### Personal Protective Equipment Checklist:

- gloves (latex for first aid; utility or chemical resistant for cleaning vehicles)
- apron (when cleaning blood stained vehicles prior to servicing)
- protective goggles or glasses with solid side shield (when cleaning blood stained vehicles prior to servicing)

This equipment is available at the following locations in this facility:

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All items penetrated by blood shall be removed immediately or as soon as feasible. All personal protective equipment will be removed prior to leaving the work area. The following protocol has been developed to facilitate leaving the equipment at the work area:

Biohazard waste baskets are located \_\_\_\_\_ (*these should be near the first aid supplies*). Disposable gloves used at this facility are not to be washed or decontaminated for re-use and are to be replaced as soon as practical when they become contaminated, or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised. Utility or chemical resistant gloves may be decontaminated for re-use provided that the integrity of the glove is not compromised, but need to be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration.

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### **Regulated Waste Disposal**

All contaminated waste (gauze pads, disposable gloves, cleaning rags used to clean bloody parts of the vehicles, etc.) is to be placed in the trash cans with red biohazard bag liners. Once all items are placed in the bag, it should be closed with a twist tie or otherwise sealed prior to disposal.

### **Hepatitis B Vaccine**

All employees who have been identified as having exposure to blood or other potentially infectious materials will be offered the Hepatitis B vaccine, at no cost to the employee, after they have completed Bloodborne Pathogens training. The vaccine will be offered within 10 working days of their initial assignment to work involving the potential for occupational exposure to blood, unless the employee has previously had the vaccine.

Employees who decline the Hepatitis B vaccine will sign a waiver which uses the wording in Appendix A of the OSHA standard. Employees who initially decline the vaccine but who later wish to have it may then have the vaccine provided at no cost.

Vaccinations will be provided by the following physician or health care provider:

### **Post-Exposure Evaluation and Follow-up**

When an employee comes in contact with blood or infectious fluids, they should report the incident to \_\_\_\_\_.

All employees who incur an exposure incident will be offered a confidential, post-exposure, medical evaluation and follow-up to include:

- documentation of the route of exposure and the circumstances related to the incident
- if possible, the identification and documentation of the source individual. The blood of the source individual will be tested (after consent is obtained) for HIV or Hepatitis B.
- results of the testing of the source individual will be made available to the exposed employee and the employee will be informed about the applicable laws and regulations concerning disclosure of the identity and infectivity of the source individual
- the employee will be offered the option of having their blood collected to test for HIV or Hepatitis B. The blood sample will be preserved for up to 90 days to allow the employee to decide if the blood should be tested. However, if the employee decides prior to that time that testing will not be conducted, then the appropriate action can be taken and the blood sample discarded.
- the employee will be given appropriate counseling concerning precautions to take during the period after the exposure incident

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The following person(s) has been designated to assure that the policy outlined here is effectively carried out and to maintain records related to this policy:

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### **Interaction with Health Care Professionals**

A written opinion shall be obtained from the health care professional who evaluates employees of this facility within 15 days of the completion of the evaluation.

Written opinions will be limited to:

- a. whether Hepatitis B vaccination is indicated for an employee, and
- b. if the employee has received such vaccination.

The health care professional's written opinion for post-exposure evaluation and follow-up shall be limited to the following information:

- a. that the employee has been informed of the results of the evaluation, and
- b. that the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.

### **Annual Training**

- Annual training for all employees must be provided within one year of their previous training and, for new or reassigned employees, at the time of initial assignment to tasks where occupational exposure may take place.
- The person conducting the training must be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.
- The training program must contain, at a minimum, the following elements:
  - an accessible copy of the regulatory text of this standard and an explanation of its contents;
  - a general explanation of the epidemiology and symptoms of bloodborne diseases;
  - an explanation of the modes of transmission of bloodborne pathogens;
  - an explanation of the employer's exposure control plan and the means by which the employee can obtain a copy of the written plan;
  - an explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials;
  - an explanation of the use and limitations of methods that will prevent or reduce exposure, including appropriate engineering controls, work practices, and personal protective equipment;
  - information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment;
  - an explanation of the basis for selection of personal protective equipment;
  - information on the Hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being



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vaccinated, and that the vaccine and vaccination will be offered free of charge;

- information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials;
- an explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available;
- information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident;
- an explanation of the signs and labels and/or color coding required by 29 CFR 1910.1030(g)(1), and
- an opportunity for interactive questions and answers with the person conducting the training session.

### **Recordkeeping**

The following will be kept on file in the office:

- all Hepatitis B vaccination waivers
- any evaluations or written communications from the Health Care Professionals
  - this written exposure control plan
  - training records
  - medical evaluation reports on any employee who is exposed

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## Appendix 19

# TRAINING REQUIREMENTS UNDER THE HAZARDOUS MATERIALS REGULATIONS

[\[49 CFR 172.704\]](#)

The U. S. Department of Transportation (DOT) “amended the Hazardous Materials Regulations (HMR) in conformance with amendments to the Federal Hazardous Materials Transportation Law that required DOT to regulate the training of all hazardous materials (hazmat) employees. Training meeting these requirements will increase a hazmat employee’s safety awareness and be an essential element in reducing hazmat incidents.

### A-19.1 Definitions

**HAZMAT EMPLOYEE** means a person who is employed by a hazmat employer and directly affects hazmat transportation safety including an owner-operator of a motor vehicle which transports hazmat; a person (including a self-employed person) who:

- loads, unloads, or handles hazmat;
- tests, reconditions, repairs, modifies, marks, or otherwise represents packagings as qualified for use in the transportation of hazmat;
- prepares hazmat for transportation;
- is responsible for safety of transporting hazmat, or
- operates a vehicle used to transport hazmat.

**HAZMAT EMPLOYER** means a person who uses one or more of its employees in connection with:

- transporting hazmat in commerce;
- causing hazmat to be transported or shipped in commerce, or
- representing, marking, certifying, selling, offering, reconditioning, testing, repairing, or modifying packagings as qualified for use in the transportation of hazmat

**TRAINING** means a systematic program (i.e., consistent approach, testing, and documentation) that ensures that a hazmat employee has knowledge of hazardous materials and the HMR, and can perform assigned hazmat functions properly. (See [49 CFR 172.700\(b\) through 172.704](#)).

### A-19.2 Training Requirements

Each hazmat employee must:

- train and test
- certify, and
- develop and retain records of current training (inclusive of preceding three years) for each hazmat employee (during the period of employment and 90 days thereafter)

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Hazmat training must include:

- general awareness/familiarization
- function-specific
- safety, and
- driver training (for each hazmat employee who will operate a motor vehicle)

Frequency of training:

- a new employee, or an employee who changes job functions, may perform hazmat job functions before completing training, provided:
  - a. the employee does so under the direct supervision of a properly training and knowledgeable hazmat employee, and
  - b. the hazmat training is completed within 90 days of employment or change in job function
- recurrent training is required at least once every three years. The three year period begins on the actual date of training.
- relevant training received from a previous employer or source may be used to satisfy the requirements provided a current record of training is obtained from the previous employer or source

Training Records must include:

- hazmat employee's name
- completion date of most recent training
- training materials (copy, description, or location)
- name and address of hazmat trainer, and
- certification that the hazmat employee has been trained and tested

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## Appendix 20

# DEMOLITION AND RENOVATION: ASBESTOS

[49 CFR 172.704]

This document is intended to help owners and operators of businesses in Indiana identify existing state and federal regulations pertaining to the removal, handling, and disposal of regulated asbestos materials. Specific regulations have only been summarized; therefore, consultation of applicable standards is necessary. Schools must comply with additional asbestos regulations. Operations involving roofing materials and floor tiles may not need to comply with several of the following requirements. Contact CTAP or OAQ for information on determining compliance requirements for roofing operations.

Asbestos-containing materials are regulated by state and federal agencies including the Occupational Safety and Health Administration (OSHA), the Department of Transportation (DOT), and the Indiana Department of Environmental Management (IDEM). OSHA regulations protect employees from airborne asbestos in the workplace. DOT regulates the transport of asbestos-containing material and waste. IDEM has two offices which regulate asbestos-containing materials: the Office of Air Quality (OAQ), which regulates asbestos hazards to the atmosphere and licenses asbestos personnel, and the Office of Land Quality (OLQ), which regulates the disposal of asbestos-containing waste. Names and telephone numbers of contacts in each of the regulatory offices discussed above can be found at the end of this document.

**Determine if your building contains asbestos:** If you are planning either a demolition or a renovation, you must use a licensed asbestos inspector to determine the presence or absence of asbestos in the area where those projects will occur. If the building was constructed prior to January 1, 1981, all surfacing materials and thermal system insulation are presumed to be asbestos-containing material. Do not assume that if the building was constructed after 1/1/81, there will be no asbestos present. Only a licensed inspector can conclude these materials are not asbestos-containing. Be aware that if an abatement had been conducted after the 1/1/81 date, the materials are still presumed asbestos-containing materials unless you can prove the materials contain less than 1% asbestos. (Material safety data sheets or records from previous abatement projects may be able to prove this.)

**Notification:** Prior to beginning the renovation or the demolition, you must:

1. use an Indiana licensed asbestos inspector to determine whether or not asbestos is present. (OAQ)
2. submit a notification to the Office of Air Quality if you are planning a demolition even if no asbestos was found at the site. (OAQ)
3. submit a notification to the Office of Air Quality if you are planning a renovation where regulated asbestos levels that are being stripped, removed, or disturbed exceed the following limits: (OAQ)
  - a) greater than or equal to 260 linear ft. on pipes
  - b) greater than or equal to 160 sq. ft. on other components
  - c) greater than or equal to 35 cubic ft. on all components

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4. if the asbestos project is located in Marion County and is a demolition, notify the Indianapolis Air Pollution Control Division at 317-327-2285 and obtain a permit.
  5. inform other employers of the nature of the work if asbestos removal is taking place in a multi-employer worksite. (OSHA)
  6. notify employees of the presence, location, and quantity of asbestos-containing material. (OSHA)

**Required Training:** Individuals need to acquire training before working on an asbestos abatement project. The number of training hours vary depending on the type of work the individual does. Below is a list of the licensed positions necessary for regulated abatement projects. IDEM has lists of Indiana approved asbestos training course providers, contractors, and inspectors on the OAQ website at <http://www.ai.org/idem/OAQ/index.html> or by calling OAQ at (317) 232-8416 or (317) 233-3861.

1. You must use an Indiana licensed asbestos inspector to thoroughly inspect your facility for asbestos in the area where the demolition or renovation will occur. (OAQ, OSHA) If the inspector finds asbestos which will be disturbed, stripped, or removed, then the following trained employees may be necessary when handling and removing asbestos-containing material.
2. You must use a licensed contractor who will employ at least one licensed supervisor and one licensed worker. (OAQ)
3. At least one Indiana licensed project supervisor must be on-site in the work area during the asbestos removal project. (OAQ, OSHA)
4. Licensed abatement workers must be used for asbestos removal. The level of training varies depending on the type of asbestos and the nature of the work. (OAQ, OSHA)
5. Maintenance and repair workers cleaning the asbestos abatement area must receive training. (OSHA)
6. Training is required for employees who are likely to be exposed to asbestos above the permissible exposure limits. (OSHA)
7. If you use a project designer, this person must be licensed. (OAQ, OSHA)
8. Project monitors may serve as the building owner's representative to ensure abatement work is completed according to specifications and is in compliance with all relevant regulations. They may also perform air monitoring. Currently, training and accreditation for project monitors is recommended but not required. (OAQ)
9. Be sure to use laboratories approved by the National Institute of Standards and Technology (NIST), the American Industrial Hygiene Association, or a similar organization to test the samples in accordance with OSHA or NIOSH methods.

**Employee Health and Safety:** To reduce employee exposure to airborne asbestos, you must:

1. Communicate asbestos hazards to employees. (OSHA) Building and facility owners must maintain records of the presence, location, and quantity of presumed asbestos-containing materials. OSHA requires that employers communicate the hazards of presumed asbestos-containing materials located in all buildings to employees who may be exposed to these materials. For example, an employer must post a sign outside a mechanical room where a pipe containing asbestos is located. The sign must:
  - a) Identify the presumed asbestos containing material.

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- b) Identify the location of the presumed asbestos containing material.
  - c) Identify the appropriate work practices, which, if followed, will ensure the presumed asbestos containing material will not be disturbed.
  - d) The pipe must also be labeled. The label must say:

**DANGER**  
**CONTAINS ASBESTOS FIBERS**  
**AVOID CREATING DUST**  
**CANCER AND LUNG DISEASE HAZARD**

- 2. allow only authorized persons in the work area. (OSHA)
- 3. supply respirators and protective clothing in the following conditions:
  - a) if exposure limits are exceeded
  - b) during Class I asbestos jobs
  - c) during Class II work on friable asbestos
  - d) during Class II and III work when no wetting or negative pressure is used
  - e) during Class II and III work when no negative exposure assessment has been made
  - f) when disturbing thermal system insulation or surfacing material
  - g) in emergencies

Warning signs during respirator usage shall include the following: (OSHA)

**RESPIRATORS AND PROTECTION CLOTHING**  
**ARE REQUIRED IN THIS AREA**

- 4. set up a decontamination room for cleaning equipment, changing, and showering. (OSHA)
- 5. conduct personnel and environmental air monitoring when required.
- 6. be aware of additional OSHA requirements for Class I, II, III, and IV work. Contact BuSET or CTAP for information on additional requirement for Class I, II, III, and IV.

**Emission Control:** When handling and removing regulated asbestos-containing material, you must:

1. have at least one licensed Indiana asbestos project supervisor present on-site during removal. (OAQ) The supervisor must perform frequent and regular inspections of the job site. (OSHA)
2. remove all friable asbestos-containing material before demolition. (OAQ)
3. do not use high-speed abrasive disc saws that do not have HEPA filtered exhaust air or ventilators. You must not use compressed air to remove asbestos materials, waste or dust. You must not dry sweep or shovel asbestos-containing material. (OSHA)
4. lower asbestos-containing material to ground level (i.e. do not drop, throw, slide, or disturb asbestos). (OAQ)
5. seal all asbestos-containing material in leak-tight wrapping or containers after adequately wetting the material. (OAQ, OLQ, OSHA)
6. store asbestos-containing material in a secure area (e.g. locked container, room, truck) where appropriate danger signs are posted or have a licensed worker remain on site if the area is left unsecured. (OAQ)
7. use a HEPA (high efficiency particulate air) filter vacuum to collect all visible asbestos debris after removal. (OAQ, OSHA)
8. have a licensed Indiana supervisor certify in writing that a final inspection was completed and there was no visible suspect asbestos-containing debris. (OAQ)

**Transportation and Disposal:** When you are transporting asbestos-containing waste, you must:

1. label the containers and wrapped materials. Labels must contain the following: (OLQ, NESHAP, OSHA, DOT)

<p style="text-align: center;"><b>DANGER</b> <b>CONTAINS ASBESTOS FIBERS</b> <b>AVOID CREATING DUST</b> <b>CANCER AND LUNG DISEASE HAZARD</b> <b>Avoid breathing asbestos fibers</b></p> <p style="text-align: center;"><b>Generator Label:</b> <b>a. Name</b> <b>b. Address of the work site</b> <b>c. Telephone number</b></p> <p style="text-align: center;"><b>R.Q. Asbestos, 9, NA2212, PG III, Class 9</b></p>
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2. provide a waste shipment/disposal record with each load of asbestos-containing waste. (NESHAP, OLQ) Packings, gaskets, resilient floor coverings and asphalt-based siding and roofing shingles containing asbestos do not have to be accompanied by a waste shipment disposal record as long as the asbestos is nonfriable. (OLQ)
3. provide a copy of the waste shipment/disposal record to the transporter and the disposal site owner. (NESHAP, OLQ)

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4. determine the proper land disposal facility. Asbestos-containing waste is regulated as either a solid waste or special waste. Approved special waste landfills may accept the following:
    - a) Regulated asbestos-containing material that is properly wetted, packaged, and labeled.
    - b) Category II nonfriable asbestos transite paneling and slate board roofing that is labeled and covered with a minimum of 6 inches of solid waste before compaction.
    - c) Asbestos that is encased in concrete or metal (such as furnaces and fire safes), labeled, and covered with a minimum of 6 inches of solid waste before compaction.Any approved sanitary landfill may accept the following material as solid waste (these wastes do not need to be accompanied by a waste shipment disposal record) as long as the material is in good condition (nonfriable):
    - a) Packings, gaskets, resilient floor coverings (including associated mastic), and asphalt-based siding and roofing shingles containing asbestos.
  5. provide the landfill with sufficient notice prior to delivery. (OLQ)
  6. receive a completed copy of the waste shipment/disposal record within 35 days of acceptance by the initial transporter. (OLQ)

### **Definitions**

Category I nonfriable: packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos

Category II nonfriable: any material, excluding Category I nonfriable asbestos containing material, containing more than 1% asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Class I: removal of thermal system insulation and surfacing material.

Class II: removal of asbestos-containing material that is not Class I. This may include floor tile, roofing materials, and shingles.

Class III: repair operations where asbestos-containing material may be disturbed.

Class IV: maintenance activities associated with the clean up of waste from Class I, II, and III.

Demolition: wrecking or taking out of any load-supporting structural member

Exposure limits: There are two exposure limits. One is a time-weighted average which has a limit of 0.1 fiber per cubic centimeter of air as an 8 hour time-weighted average. The other is an excursion limit which is 1.0 fiber per cubic centimeter of air as averaged over 30 minutes

Friable: any material containing more than 1% asbestos and, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure

Nonfriable: any material containing more than 1% asbestos and, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure

Presumed asbestos-containing material: thermal system insulation and surfacing material found in buildings constructed no later than 1980

Regulated asbestos-containing material:

- Friable asbestos material
- Category I nonfriable asbestos-containing material that has become friable
- Category I nonfriable asbestos-containing material that will be or has been sanded, ground, cut, or abraded



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- Category II nonfriable asbestos-containing material that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material.

Renovation: Altering a facility or facility components in anyway

### **Applicable Standards**

OLQ	329 IAC 10-2-179	OAQ	326 IAC 14-10
	329 IAC 10-8.1-12	NESHAP	40 CFR 61 Subpart M
OSHA	29 CFR 1926.1101		

### **Agency Phone Numbers and Contacts**

Occupational Safety and Health Administration (OSHA)	Mr. John Duncan 317-232-2688
Department of Transportation (DOT)	Mr. Don Arnold 317-233-1165
Office of Air Quality (OAQ-IDEM)	
(NESHAP)	Mr. Dan Lamberson 317-233-4385
(AHERA, licensing)	Mr. Frank Profit 317-232-8416
Office of Land Quality (OLQ-IDEM)	Mr. Scott Draschil 317-233-0447
Indianapolis Air Pollution Control Division	Mr. Terry Wilbur 317-327-2285
	Ms. Cheryl Carlson 317-327-2281

or contact CTAP at 800-988-7901 for additional information on regulations that may apply to your facility.

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## **Appendix 21**

# **INDIANA STYRENE RULE**

[\(326 IAC 20-25\)](#)

For information on the Indiana Styrene Rule, please refer to the documents below, available on the web at [www.state.in.us/idem/ctap/fiber/rule.html](http://www.state.in.us/idem/ctap/fiber/rule.html).

The Indiana Styrene Rule (Rule 25) becomes effective on March 7, 2001.

This means:

- a) You must meet the work practice standards by March 7th.
- b) For those employees hired before March 7th, you must train or evaluate them sometime between February 5th and April 6.
- c) For those employees hired after March 7th, you must train them within 15 days of the hire date.

- [Notice of Quickly Approaching Deadlines](#) for the Indiana Styrene Rule, 12/19/00
- [Calendar of Important Environmental Deadlines](#)
- [Indiana Styrene Rule: Questions & Answers](#)
- [Sample Initial Notification](#)
- [Sample Initial Statement of Compliance](#)
- [What will a Typical Styrene Inspection Involve?](#)
- [Operator Training Decision Flowchart](#)
- [CFA Unified Emission Factor Table for Open Molding](#)

[Final Indiana Styrene Rule](#) (pdf file / 35kb), adopted by the Air Pollution Control Board on October 4, 2000



# Manufacturing Operations Schematic

(Use your mouse to click on the operation you wish to access)

