Hazardous Materials, Personal Safety, And Refinish Safety

Textbook

I-CAR®

Version 1.6

WKR01-STMAN1-E

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Contents

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Introduction

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Obligations To The Customer And Liability

The collision repair industry has an obligation to correctly repair the customer's vehicle. Collision repairs must be performed using:

- recommended or tested procedures from vehicle makers, I-CAR, and other research and testing organizations.
- quality replacement parts and materials.
- repair processes and parts as written and agreed upon in the repair order. If items on the repair agreement are not consistent with the repair order, it can be considered fraud.

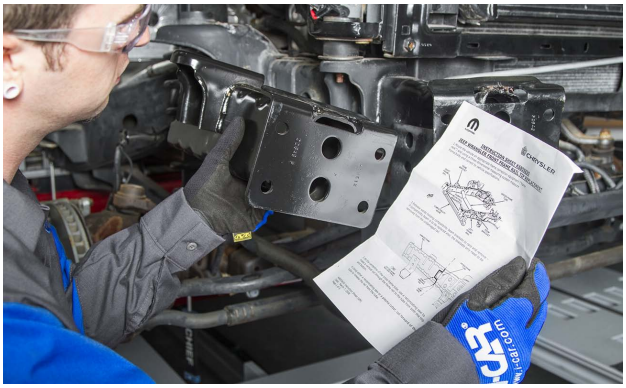
Performing proper collision repairs requires using parts and procedures that keep remaining warranties intact.

Collision repairs must restore:

- safety.
- structural integrity.
- durability.
- performance.
- fit.
- finish.

Throughout the damage analysis and repair process the repairer and insurer must:

- communicate with each other.
- maintain constant communication with the customer.
- be in agreement with each other and the customer on how repairs will be performed.
- inform the customer of any changes in the repair plan from the original repair agreement, and explain the changes and why they have to be made.



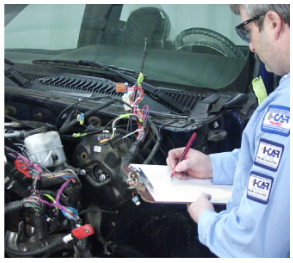
To reduce liability:

- make sure that all repairs are performed thoroughly, correctly and as listed in the damage report.
- follow proper procedures.
- have documentation of required repairs with detailed record keeping available for customers.

Technicians are considered the experts and are expected to be knowledgeable on how to perform a quality repair.

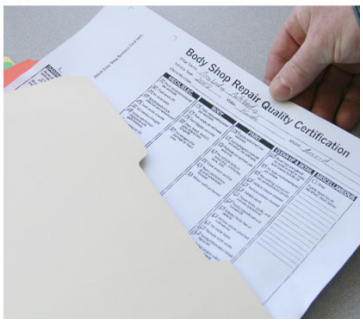
Liability insurance that covers the repair facility may not always cover all damages. For example:

- the policy may not cover faulty repairs, leaving liability responsibility completely on the facility.
- a shop owner may find that repair facility liability coverage may not cover the full amount awarded in a lawsuit. The shop owner would have to pay the difference.



It is difficult to reduce the risk of liability exposure. The part that the repairer can control is the chance of being found at fault. Chances can be minimized by:

- using recommended or tested procedures from the vehicle makers, I-CAR, or other research and testing organizations.
- using quality replacement parts and materials that restore fit, finish, durability, and perform at least as well as the original.
- keeping thorough records.



Keeping thorough records includes more than recording the date, mileage, and pre-existing damage. Record keeping also includes:

- making sure all notes are legible.
- verifying the repairs that were made or not made.
- having the customer sign a waiver for repairs that they do not want performed. Repairers must determine their liability on not repairing safety systems such as restraint and anti-lock brake systems.
- keeping computer printouts or worksheets on file showing wheel alignment readings or vehicle dimensions before and after repairs.
- keeping scan tool printouts and records of computer codes for airbag, anti-lock brake, emission, and powertrain control module (PCM) systems.

- attaching the OEM or other tested procedure printout to the vehicle repair order.
- keeping receipts for all sublet work performed.

Refer to "Video: Topics Off Limits" in the presentation. This video identifies topics that should not be brought up in class.

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Module 1 - Safety Data Sheets

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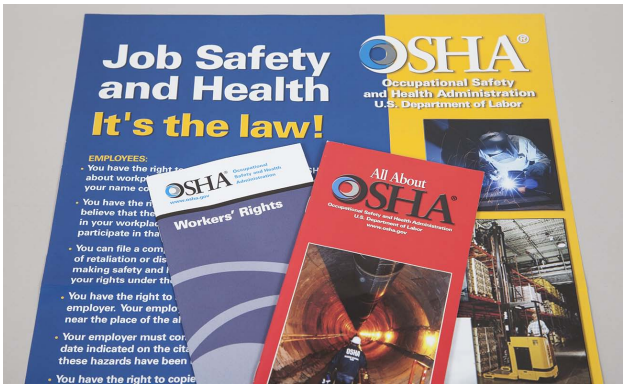
Hazardous Material Regulations

Learning objectives for this module include:

- explaining why hazardous material regulations were developed.
- explaining information contained in a Safety Data Sheet (SDS).
- explaining the different sections of a material SDS.



These OSHA brochures explain worker safety rights in the workplace.

The high cost of medical care for employees has led to different types of awareness programs and government mandates to protect employees from hazardous materials and unsafe work practices on the job. In the United States, the hazardous material awareness program became known as the Right-To-Know Law, administered by the Occupational Safety and Health Administration (OSHA).

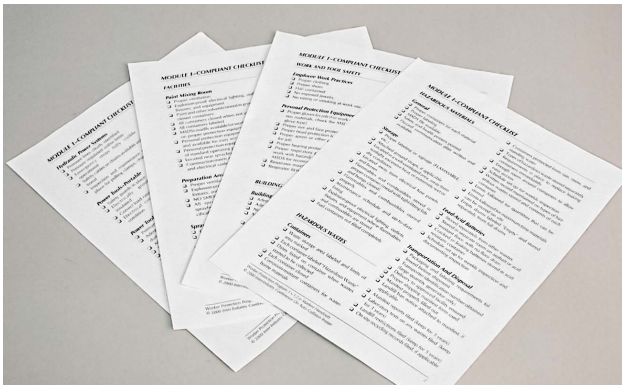
Additional information on government safety and environmental regulations can be found at the following web sites:

- www.osha.gov/dsg/hazcom/
- www.ccar-greenlink.org

Proper hazard communication, such as this sign, is vital to worker health and safety.

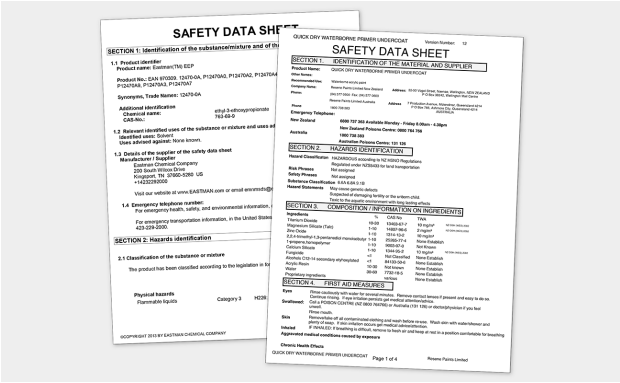
Collision repair facility owners and employees must be aware of the hazardous materials stored and used within the facility. According to OSHA, the number one safety and health violation for collision repair facilities is failure to communicate hazards within the workplace to employees.

Penalties should not be the reason for being compliant with health and environment regulations. The regulations are there to protect the worker. Health and safety of a worker should be the reason for being compliant with the rules.



Refer to Module 1, "Demonstration: Compliant Checklist" in the presentation for an example of a Complaint Checklist.

SDS Layout



These are examples of typical safety data sheets.

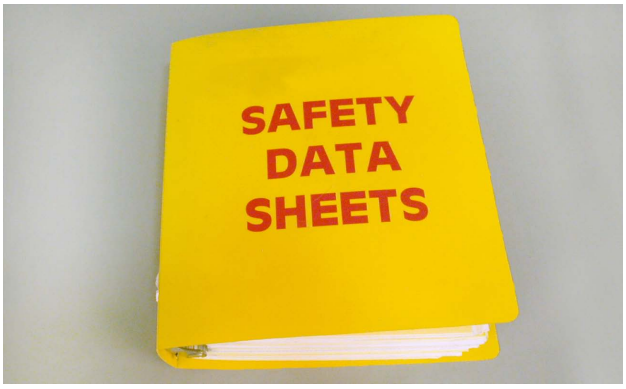
A Safety Data Sheet (SDS) must accompany every hazardous material in a workplace for professional use. The SDS is a technical document that provides detailed:

- hazard information for handling, storing, disposing, and using the material.
- information regarding the effects of overexposure to the material, and the steps to avoid overexposure.
- emergency information.

SDS must be readily accessible to workers when they are in their work areas, during each work shift.

Employers are allowed to add information on hazards relating to the specific workplace, and include local laws, such as waste disposal laws and additional exposure limits. The 16-section structure of the SDS must be kept intact. Employers are no longer allowed to modify the order of the sections as was previously allowed.

If a material is no longer used at a facility, it is required that the SDS or at least product inventory sheets be kept on file for 30 years for medical purposes. This is to ensure the information is available for employees who show ill health effects from exposure to a chemical years later.

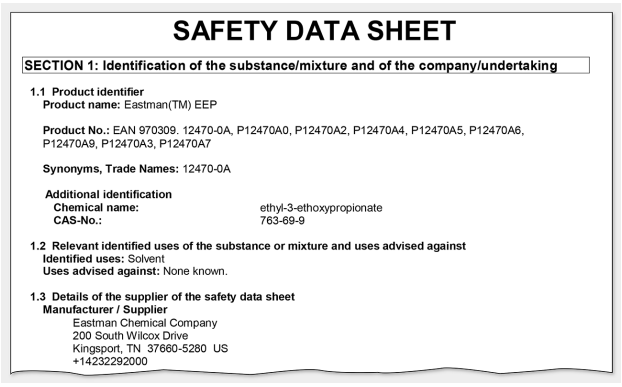


All workplace safety data sheets can be combined into a binder for ease of use.

A supplier-provided SDS is divided into 16 sections, including:

1. Product Identification
2. Hazard(s) Identification

3. Composition / Information On Ingredients
4. First-Aid Measures
5. Fire-Fighting Measures
6. Accidental Release Measures
7. Handling And Storage
8. Exposure Controls / Personal Protection
9. Physical And Chemical Properties
10. Stability And Reactivity
11. Toxicological Information
12. Ecological Information (non-mandatory)
13. Disposal Considerations (non-mandatory)
14. Transport Information (non-mandatory)
15. Regulatory Information (non-mandatory)
16. Other Information



SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Product name: Eastman(TM) EEP

Product No.: EAN 970309. 12470-0A, P12470A0, P12470A2, P12470A4, P12470A5, P12470A6, P12470A9, P12470A3, P12470A7

Synonyms, Trade Names: 12470-0A

Additional identification
Chemical name: ethyl-3-ethoxypropionate
CAS-No.: 763-69-9

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Solvent
Uses advised against: None known.

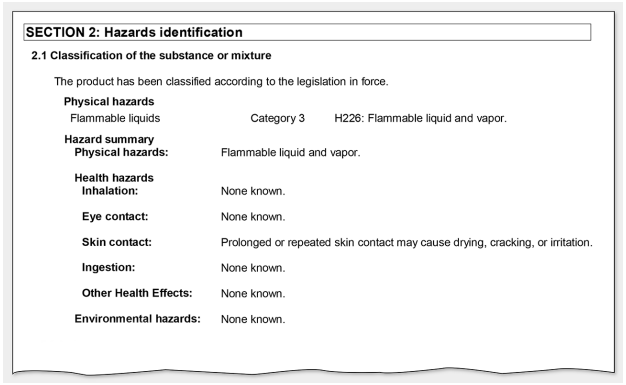
1.3 Details of the supplier of the safety data sheet
Manufacturer / Supplier
Eastman Chemical Company
200 South Wilcox Drive
Kingsport, TN 37660-5280 US
+14232292000

This is an example of an SDS Section 1: Identification information.

This section identifies the material name on the SDS as well as the recommended uses. Information in section 1 includes the:

- product identifier used on the label and any other common names or synonyms by which the substance is known.
- name, address, phone number of the manufacturer, importer, or other responsible party, and emergency phone number.
- recommended use of the chemical (e.g., a brief description of what it actually does, such as flame retardant) and any restrictions on use including recommendations given by the supplier.

An SDS must be updated when the emergency telephone number or other product maker identifiers change.



SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

The product has been classified according to the legislation in force.

Physical hazards
Flammable liquids — Category 3 — H226: Flammable liquid and vapor.

Hazard summary
Physical hazards: Flammable liquid and vapor.

Health hazards
Inhalation: None known.
Eye contact: None known.
Skin contact: Prolonged or repeated skin contact may cause drying, cracking, or irritation.
Ingestion: None known.
Other Health Effects: None known.
Environmental hazards: None known.

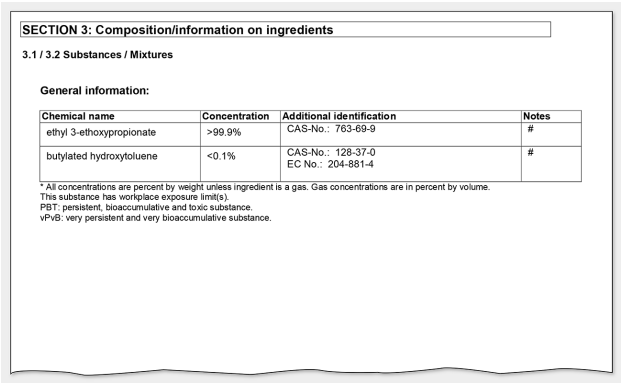
This is an example of an SDS Section 2: Hazards identification information.

This section identifies the hazards of the material presented on the SDS and the appropriate warning information associated with those hazards such as:

- the hazard classification of the material (e.g., flammable liquid).
- hazard symbols. These are pictorial representations of the particular hazard, such as a flame for a flammable material.

- a signal word, either warning or danger.
- hazard statements (e.g., may cause liver and kidney damage or highly flammable liquid and vapor).
- relevant precautionary statements.

Much of this same information is required on supplier product labels.



SECTION 3: Composition/information on ingredients

3.1 / 3.2 Substances / Mixtures

General information:

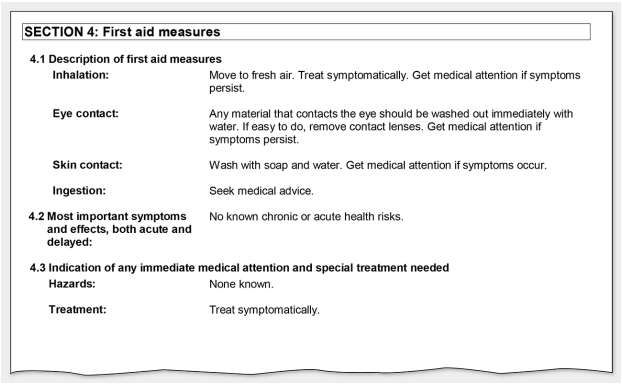
Chemical name	Concentration	Additional identification	Notes
ethyl 3-ethoxypropionate	>99.9%	CAS-No.: 763-69-9	#
butylated hydroxytoluene	<0.1%	CAS-No.: 128-37-0 EC No.: 204-881-4	#

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
This substance has workplace exposure limit(s).
PBT: persistent, bioaccumulative and toxic substance.
vPvB: very persistent and very bioaccumulative substance.

This is an example of an SDS Section 3: Composition / information on ingredients.

This section identifies the ingredient(s) contained in the materials including impurities and stabilizing additives. This section includes information on:

- the chemical names.
- the concentration percentages that each chemical makes up within the material.
- additional identification associated with each chemical.



SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation: Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Eye contact: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lenses. Get medical attention if symptoms persist.

Skin contact: Wash with soap and water. Get medical attention if symptoms occur.

Ingestion: Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed: No known chronic or acute health risks.

4.3 Indication of any immediate medical attention and special treatment needed

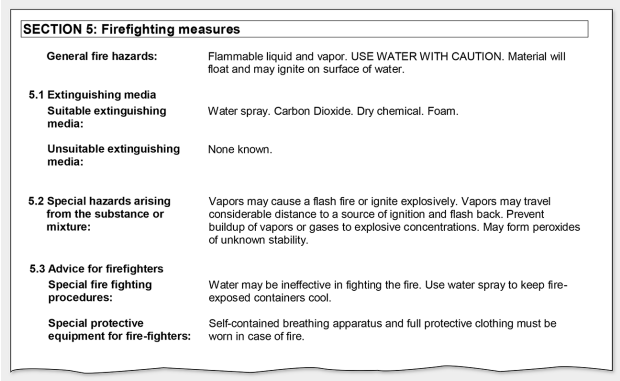
Hazards: None known.

Treatment: Treat symptomatically.

This is an example of an SDS Section 4: First-aid measures information.

This section describes the initial care that should be given by untrained responders to an individual who has been exposed to the material. This section includes:

- the necessary first-aid instructions depending on the route of exposure (inhalation, skin and eye contact, or ingestion).
- a description of the most important symptoms or effects, and any symptoms that are immediate or delayed.
- immediate medical care and special treatment needed, when necessary.



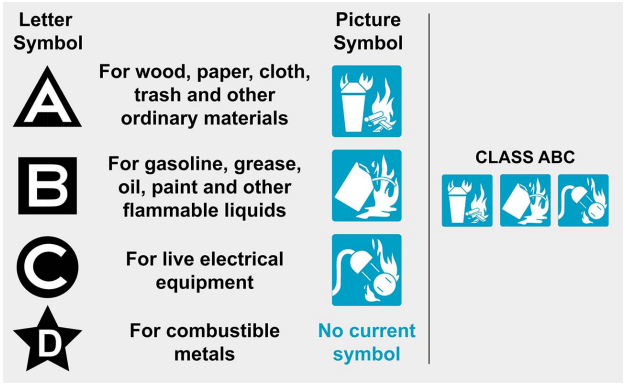
SECTION 5: Firefighting measures

General fire hazards:	Flammable liquid and vapor. USE WATER WITH CAUTION. Material will float and may ignite on surface of water.
5.1 Extinguishing media	
Suitable extinguishing media:	Water spray. Carbon Dioxide. Dry chemical. Foam.
Unsuitable extinguishing media:	None known.
5.2 Special hazards arising from the substance or mixture:	Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations. May form peroxides of unknown stability.
5.3 Advice for firefighters	
Special fire fighting procedures:	Water may be ineffective in fighting the fire. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters:	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

This is an example of an SDS Section 5: Firefighting measures information.

This section provides instructions for fighting a fire involving the material including:

- the appropriate fire extinguisher and information about extinguishing equipment that is not appropriate for a particular situation.
- advice on specific hazards that develop from the material during the fire, such as any hazardous combustion products created when the material burns.
- identification of special protective equipment or precautions for firefighters.



The chart indicates there are four classifications of fire extinguishers. A class A-B-C extinguisher is most common in a collision repair facility.

Fire extinguishers are rated for the type of fire each is designed to extinguish. These classifications include:

- A – ordinary combustible materials
  - Paper and wood
  - Extinguishers use water
- B – flammable liquids
  - Gasoline, oil, solvents
  - Extinguishers use carbon dioxide or dry chemical
- C – energized electrical equipment
  - Battery, electrical wiring
  - Extinguishers use carbon dioxide
- D – combustible metals
  - Magnesium, sodium, and potassium

Most fires in collision repair facilities are A, B, or C fires, and there are “A-B-C” fire extinguishers available. In class A-B-C fire extinguishers, monoammonium (mono-ah-moan-e-um) phosphate is used. Collision repair facilities should

have several A-B-C fire extinguishers throughout the facility.

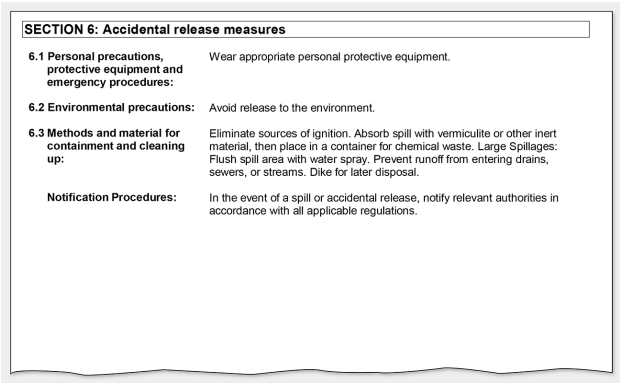
Using the wrong extinguisher is hazardous. For example, using water or a class A extinguisher on a burning liquid or a magnesium fire can spread the fire.

Refer to "Video: Using A Fire Extinguisher" in the presentation. This video discusses the proper use of a fire extinguisher.

This is the symbol that appears on materials that are flammable.

Some terms used when describing fire and explosion data include:

- flammable material. Flammable materials can easily catch fire and burn rapidly or explosively.
- combustible material. Combustible materials can burn, but do not catch fire as easily as flammables.
- flash point. Flash point is the lowest temperature at which a mixture of a liquid's vapor and oxygen can catch fire near a source of ignition, such as a flame or spark. The lower the flash point, the greater the hazard. Flammables have a flash point below 100°F, and combustibles have a flash point at or above 100°F.
- auto-ignition temperature. This is the lowest temperature a vapor or gas will ignite without a flame or spark being present.
- upper and lower flammable, or explosive, limits. These limits are the amount of a material's vapor in the air that will catch fire with a flame or spark. Above the upper flammable limit, the mixture is too rich to burn. Below the lower flammable limit, the mixture is too lean. These limits also indicate proper ventilation requirements when using a material.



SECTION 6: Accidental release measures

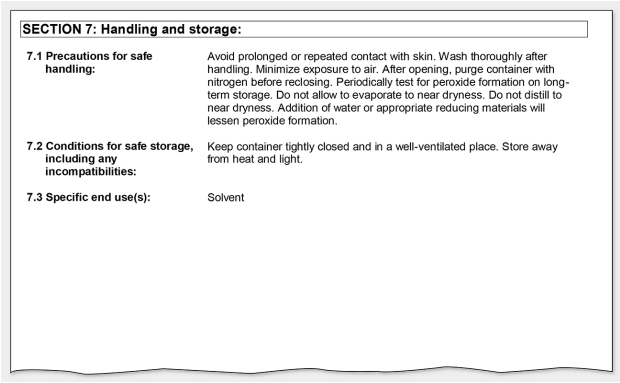
6.1 Personal precautions, protective equipment and emergency procedures:	Wear appropriate personal protective equipment.
6.2 Environmental precautions:	Avoid release to the environment.
6.3 Methods and material for containment and cleaning up:	Eliminate sources of ignition. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Large Spillages: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.
Notification Procedures:	In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

This is an example of an SDS Section 6: Accidental release measures information.

This section provides the appropriate response to spills, leaks, or releases, including containment and cleanup practices to prevent or minimize exposure to people, properties, or the environment. Circumstances distinguishing between responses for large and small spills where the spill volume has a significant impact on the hazard.

Section 6 provides additional information on:

- use of personal precautions, such as removal of ignition sources or providing sufficient ventilation and protective equipment to prevent the injury to skin, eyes, and contamination of clothing.
- emergency procedures, including instructions for evacuations, consulting experts when needed, and appropriate protective clothing used during cleanup.
- methods and materials used for containment such as covering the drains and capping procedures.
- cleanup procedures including appropriate techniques for neutralization, decontamination, and cleaning or vacuuming using adsorbent materials.



SECTION 7: Handling and storage:

7.1 Precautions for safe handling:	Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Minimize exposure to air. After opening, purge container with nitrogen before reclosing. Periodically test for peroxide formation on long-term storage. Do not allow to evaporate to near dryness. Do not distill to near dryness. Addition of water or appropriate reducing materials will lessen peroxide formation.
7.2 Conditions for safe storage, including any incompatibilities:	Keep container tightly closed and in a well-ventilated place. Store away from heat and light.
7.3 Specific end use(s):	Solvent

This is an example of an SDS Section 7: Handling and storage information.

This section provides guidance on the safe handling practices including:

- handling incompatible materials.
- minimizing the release of the material into the environment.
- providing advice on general hygiene practices such as precautions on not eating, drinking, and smoking in work areas.
- the conditions for safe storage.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

If exposure limits have not been established, maintain airborne levels to an acceptable level.

Chemical name	Type	Exposure Limit values	Source
ethyl 3-ethoxypropionate	TWA	50 ppm	Eastman Chemical Company occupational exposure limit: (12 2000)
	STEL	100 ppm	Eastman Chemical Company occupational exposure limit: (12 2000)

8.2 Exposure controls

Appropriate engineering controls: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

General information: Eye bath. Washing facilities.

This is an example of an SDS Section 8: Exposure controls / personal protection information.

This section indicates:

- exposure limits. These are maximum concentrations of each chemical in the material that the worker can be exposed to in a given time.
- appropriate engineering controls such as the type of exhaust ventilation that can be used to minimize worker exposure.
- personal protective measures to prevent illness or injury from exposure to chemicals, such as the use of personal protective equipment (PPE).
- any special requirements for protective clothing such as the type of gloves or respirators to use for the specific material being used.

Not all respirators provide protection in all situations.

Section 8 of the SDS uses several acronyms to describe levels of exposure, including:

- PEL, or permissible exposure limit. This is the legal limit for exposure of an employee to a chemical substance or physical agent. The PEL is usually expressed in parts per million (PPM) or sometimes in milligrams per cubic meter (mg/m3).
- TLV, or threshold limit value. This is the airborne concentration of a chemical under which nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse health effects.
- STEL, or short term exposure limit. This is the concentration of the material that workers can be exposed to continuously for a short period of time without suffering ill effects.
- TWA, or time weighted average. This is the concentration for an 8-hour workday and a 40-hour workweek to which it is believed that nearly all workers may be

repeatedly exposed, day after day, for a working lifetime without adverse effect.
- C, or ceiling. This is the concentration of the chemical that should never be exceeded during any exposure.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical State:	Liquid
Form:	Liquid
Color:	Colorless
Odor:	ester
Odor Threshold:	0.02 ppm
pH:	No data available.
Freezing Point:	< -50 °C
Boiling Point:	165 - 172 °C
Flash Point:	59 °C (Setaflash Closed Cup)
Evaporation Rate:	0.12
Flammability (solid, gas):	Not applicable
Flammability Limit - Upper (%)–:	No data available.
Flammability Limit - Lower (%)–:	No data available.
Vapor pressure:	0.23 kPa (20 °C)
Vapor density (air=1):	5.0
Specific Gravity:	0.95 (20 °C)
Solubility(ies)	

This is an example of an SDS Section 9: Physical and chemical properties information.

This section identifies what the material looks and smells like in its natural state. Information required includes, as appropriate, the materials:

- appearance such as physical state, color, etc.
- flammability of a liquid or gas.
- lower flammability or explosive limit is the level at which point the mixture is too “lean” to burn.
- upper flammability or explosive limit is the level at which point the mixture is too “rich” to burn.
- auto-ignition temperature is the lowest temperature at which a material will spontaneously ignite without a flame or spark.
- flash point which is the lowest temperature at which it can vaporize to form an ignitable mixture in air.
- odor.
- odor threshold.
- vapor pressure.
- vapor density.
- pH.
- relative density.
- melting point / freezing point.
- initial boiling point and boiling range.
- solubility which is the material's ability to dissolve. For example, sugar has high solubility when combined with water.
- evaporation rate.
- decomposition temperature.
- viscosity.

SECTION 10: Stability and reactivity

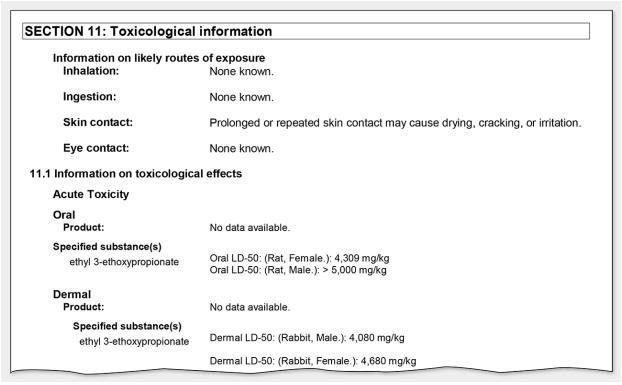
10.1 Reactivity:	None known.
10.2 Chemical stability:	Stable
10.3 Possibility of hazardous reactions:	Forms peroxides of unknown stability.
10.4 Conditions to avoid:	Heat, sparks, flames.
10.5 Incompatible materials:	Strong oxidizing agents.
10.6 Hazardous decomposition products:	Carbon Dioxide. Carbon Monoxide.

This is an example of an SDS Section 10: Stability and reactivity information.

This section describes the reactivity hazards of the material and the material's stability information. Information in this section includes:

- reactivity, which is how reactive the material is and to what other materials.

- material stability, which is how stable the material is under normal ambient temperature, while in storage, and when it is being handled. Also indicated are any safety issues that may arise should the product change in physical appearance.
- a list of all conditions that should be avoided such as static discharge, shock, vibrations, or environmental conditions that may lead to hazardous conditions.
- a list of any known or anticipated hazardous decomposition products that could be produced because of use, storage, or heating.



SECTION 11: Toxicological information

Information on likely routes of exposure

Inhalation: None known.

Ingestion: None known.

Skin contact: Prolonged or repeated skin contact may cause drying, cracking, or irritation.

Eye contact: None known.

11.1 Information on toxicological effects

Acute Toxicity

Oral

Product: No data available.

Specified substance(s)

ethyl 3-ethoxypropionate — Oral LD-50: (Rat, Female.): 4,309 mg/kg; Oral LD-50: (Rat, Male.): > 5,000 mg/kg

Dermal

Product: No data available.

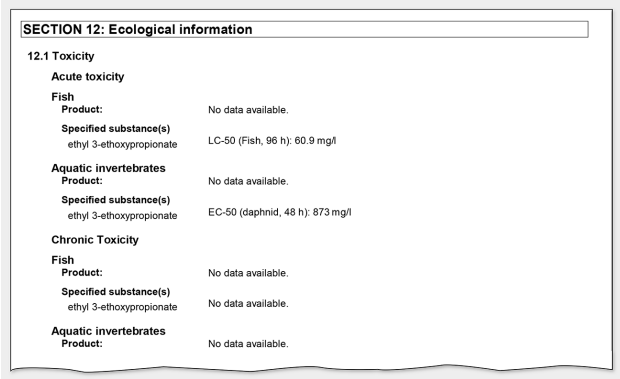
Specified substance(s)

ethyl 3-ethoxypropionate — Dermal LD-50: (Rabbit, Male.): 4,080 mg/kg; Dermal LD-50: (Rabbit, Female.): 4,680 mg/kg

This is an example of an SDS Section 11: Toxicological information.

This section identifies toxicological and health effect information or indicates that the data is not available. The information includes:

- the likely routes of exposure, be it inhalation, ingestion, skin or eye contact.
- effects from short- and long-term exposure.
- toxicity levels, based on the estimated amount of material that would kill 50% of test animals in a single dose.
- a description of the symptoms after the exposure.
- a indication of whether the material can cause cancer.



SECTION 12: Ecological information

12.1 Toxicity

Acute toxicity

Fish

Product: No data available.

Specified substance(s)

ethyl 3-ethoxypropionate — LC-50 (Fish, 96 h): 60.9 mg/l

Aquatic invertebrates

Product: No data available.

Specified substance(s)

ethyl 3-ethoxypropionate — EC-50 (daphnid, 48 h): 873 mg/l

Chronic Toxicity

Fish

Product: No data available.

Specified substance(s)

ethyl 3-ethoxypropionate — No data available.

Aquatic invertebrates

Product: No data available.

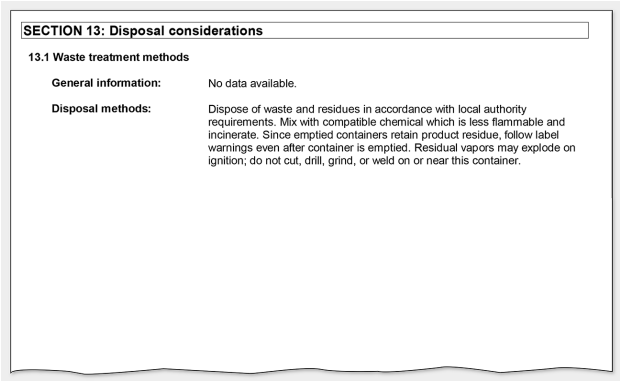
This is an example of an SDS Section 12: Ecological information.

Information in the next four sections are not mandatory, though there must be placeholders for them.

This section shows the impact if the material were to be released to the environment. The information may include:

- data from toxicity tests performed on aquatic and / or terrestrial organisms.
- whether there is a potential for the chemical to persist and degrade in the environment.

- the potential for a substance to move from the soil to the groundwater.
- other adverse effects.



SECTION 13: Disposal considerations

13.1 Waste treatment methods

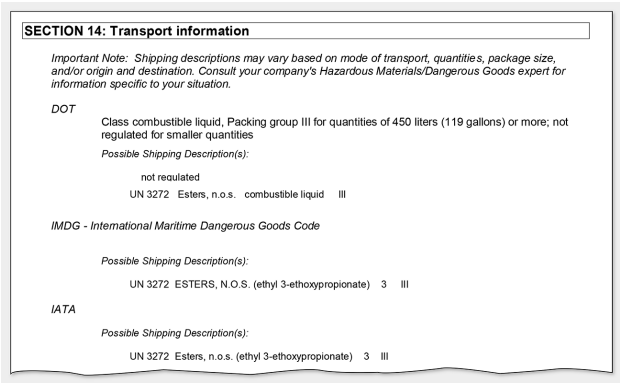
General information: No data available.

Disposal methods: Dispose of waste and residues in accordance with local authority requirements. Mix with compatible chemical which is less flammable and incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container.

This is an example of an SDS Section 13: Disposal considerations information.

This section provides instruction on proper disposal practices, recycling, or reclamation of the material or its container, and safe handling practices to minimize exposure. The information may include:

- a description of appropriate disposal containers to use.
- recommendations of appropriate disposal methods to employ.
- a description of the physical and chemical properties that may affect disposal.
- language discouraging sewage disposal.
- any special precautions for landfills or incineration activities.



SECTION 14: Transport information

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

DOT

Class combustible liquid, Packing group III for quantities of 450 liters (119 gallons) or more; not regulated for smaller quantities

Possible Shipping Description(s):

not regulated

UN 3272 Esters, n.o.s. combustible liquid III

IMDG - International Maritime Dangerous Goods Code

Possible Shipping Description(s):

UN 3272 ESTERS, N.O.S. (ethyl 3-ethoxypropionate) 3 III

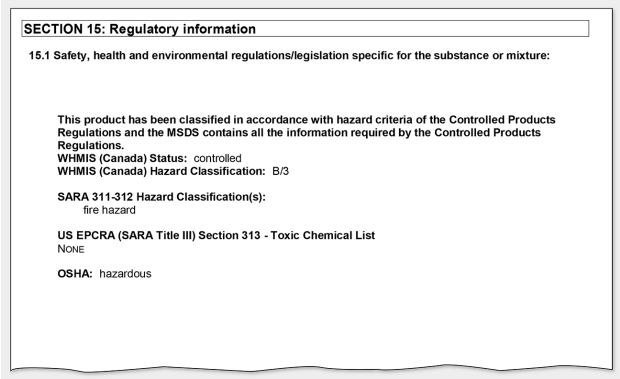
IATA

Possible Shipping Description(s):

UN 3272 Esters, n.o.s. (ethyl 3-ethoxypropionate) 3 III

This is an example of an SDS Section 14: Transportation information.

This section provides guidance on classification information for shipping and transporting of the chemicals contained in the material by road, air, rail, or sea.



SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
WHMIS (Canada) Status: controlled
WHMIS (Canada) Hazard Classification: B/3

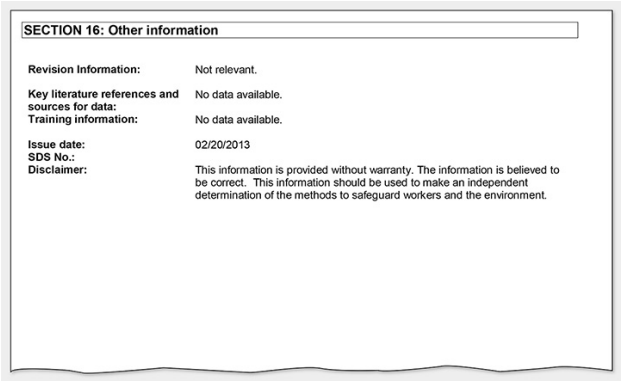
SARA 311-312 Hazard Classification(s):
fire hazard

US EPCRA (SARA Title III) Section 313 - Toxic Chemical List
NONE

OSHA: hazardous

This is an example of an SDS Section 15: Regulatory information.

This section identifies the safety, health, and environmental regulations specific for the product that is not indicated anywhere else on the SDS. Common examples include any national and / or regional regulatory information of the materials including any OSHA, Department of Transportation, Environmental Protection Agency, or Consumer Product Safety Commission regulations.



SECTION 16: Other information

Revision Information:	Not relevant.
Key literature references and sources for data:	No data available.
Training information:	No data available.
Issue date:	02/20/2013
SDS No.:	
Disclaimer:	This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

This is an example of an SDS Section 16: Other information.

This last section indicates when the SDS was prepared or when the last known revision was made.

Module Wrap Up

Topics discussed in this module included:

- why hazardous material regulations were developed.
- information contained in a safety data sheet (SDS).
- the different sections of a material SDS.

Module 2 - Labels

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Label Indicators

Learning objectives for this module include:

- identifying requirements for a supplier label.
- knowing the difference between supplier, workplace, and "other means of identification" labels.
- knowing the requirements for a workplace label.

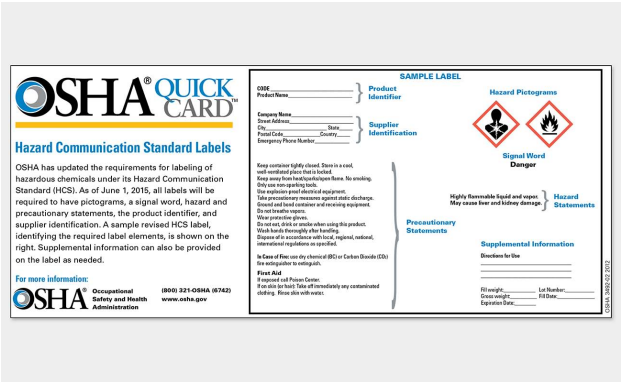
Refer to Module 2, "Activity: Requirement For Labels" in the presentation for video on using labels to correctly identify the contents of a container.

This is an example of a material with a workplace label attached.

There are three types of labels commonly used for identifying hazardous materials. These labels include:

- supplier.
- workplace.
- other means of identification.

None of these labels may replace the SDS.



This is an OSHA quick card that references standard label requirements effective as of June 1, 2015.

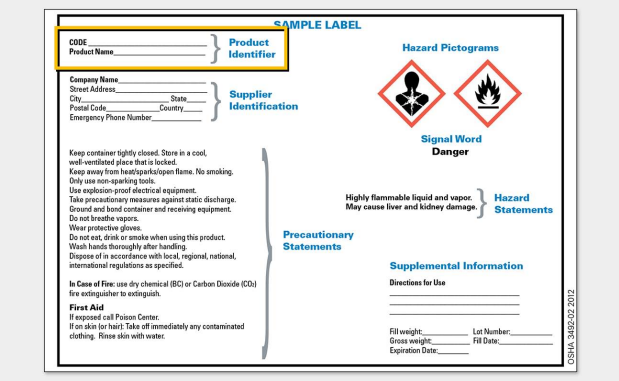
All hazardous chemicals shipped after June 1, 2015, must be labeled with specified elements including pictograms, signal words, hazard statements and precautionary statements. Labels must be legible, in English, and prominently displayed. Other languages may be displayed in addition to English.

United States regulations require every product in the workplace to have a label. If there is a container without a label, do not handle it until you find out from the repair facility manager what the material is. Once you have determined what the product is, place a label on the container.

This is a properly labeled container of hazardous chemicals.

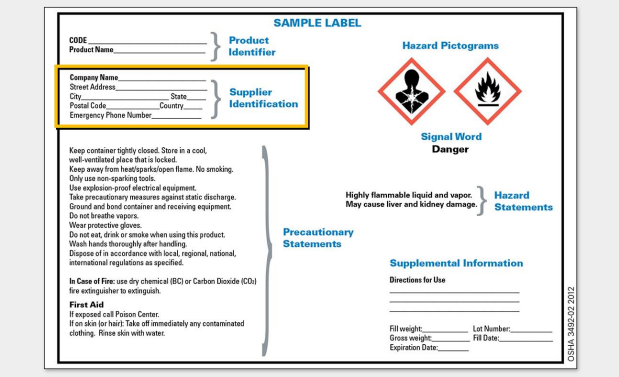
The OSHA Hazard Communication Standard (HCS) requires chemical manufacturers, importers, or distributors to ensure that each container of hazardous materials leaving the workplace is labeled, tagged or marked with the following information:

- Product identifier
- Supplier identification
- Precautionary statements
- Hazard pictograms
- Signal word
- Hazard statement(s)
- Supplemental information



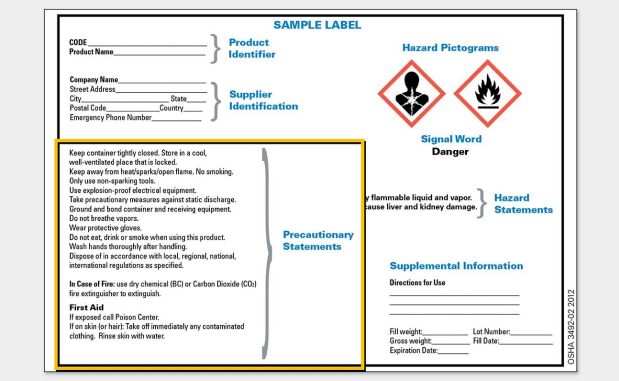
This is a sample label highlighting the product identifier information.

The product identifier identifies the name of the hazardous material. It may also include, but is not limited to, the code number or batch number. The manufacturer, importer or distributor can decide the appropriate product identifier. The same product identifier must also be in section 1 of the SDS.



This is a sample label highlighting the supplier identification information.

The supplier identification part of the supplier label is the name, address, and emergency telephone number of the chemical manufacturer, importer, or other responsible party.

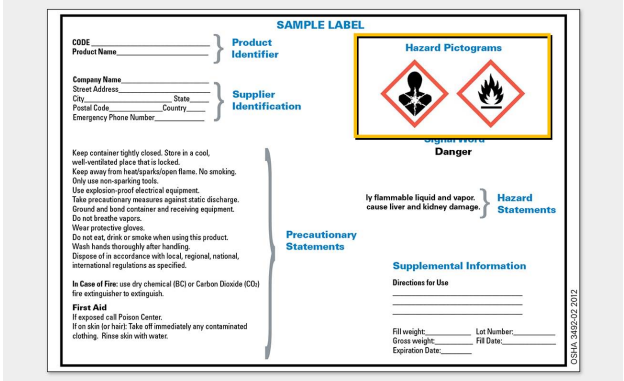


This is a sample label highlighting the precautionary statements information.

Precautionary statements are measures that should be taken to minimize or prevent adverse effects resulting from exposure to the hazardous material or improper storage or handling. An example is "Do not eat, drink, or smoke when using this product".

There are four types of precautionary statements:

- Prevention, for example, "To minimize exposure, wear nitrile gloves when using this product".
- Response, for example, "In case of fire use a dry chemical or Carbon Dioxide fire extinguisher".
- Storage, which will contain information similar to "Store in a cool well-ventilated place that is locked".
- Disposal, which will refere to regulations "as specified by local, regional, and national agencies".



This is a sample of a label highlighting the hazard pictograms information.

Pictograms are graphic symbols used to communicate specific information about the hazards of a material. They are placed on hazardous materials being shipped or transported from a manufacturer, importer or distributor. The required pictograms consist of a red square frame set at a point with a black hazard symbol on a white background, sufficiently wide to be clearly visible.

This symbol indicates the material is flammable.

This symbol indicates the material is flammable which means the material can easily catch fire and burn rapidly or explosively if it comes near an ignition source. The symbol is no longer used for combustibles.

This is the symbol that appears on containers of compressed, liquified, or dissolved gas under pressure.

This symbol means that the substance is a compressed, liquefied, or dissolved gas under pressure at 29 pounds per square inch or more.

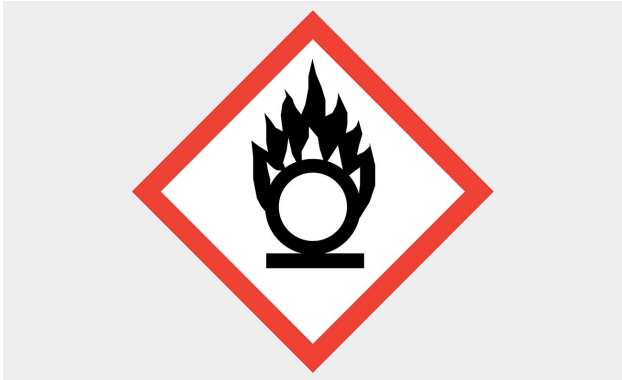
This is the symbol that appears on chemicals or materials that have corrosive properties.

This is the symbol that will appear on materials that have corrosive properties. Depending on the properties of the material, the corrosion pictogram can mean the material can cause severe skin burns and severe or serious eye damage. Corrosive materials can also cause damage to metals.

This is the symbol that appears on chemicals or material that is explosive, self-reactive, or organic peroxide.

The exploding bomb pictogram appears on the materials that are explosive or self-reactive, in which heating may cause fire or an explosion without the need for air.

Another property this symbol represents is for organic peroxide. Most undiluted organic peroxides can catch fire easily and burn very rapidly and intensely. This is because they combine both fuel (carbon) and oxygen in the same compound. An example of an organic peroxide in the repair facility is methyl ethyl ketone peroxide. It is used in the manufacture of fiberglass reinforced plastics as a hardening agent.



This is the symbol that appears on chemicals or materials that are oxidizers.

This pictogram represents oxidizers, which in itself is not necessarily combustible, but may, generally by increasing the concentration of oxygen, cause or contribute to the combustion of other materials such as liquids and solids.

This is the symbol that appears on chemicals that may be toxic or fatal if swallowed, touched to skin, or inhaled.

The skull and crossbones indicates that the material may be toxic or fatal if:

- swallowed.
- touched to skin.
- inhaled.

This is the symbol that appears on materials with varied levels of health hazards.

This is the symbol that is used to indicate varied levels of health hazards within specific categories such as:

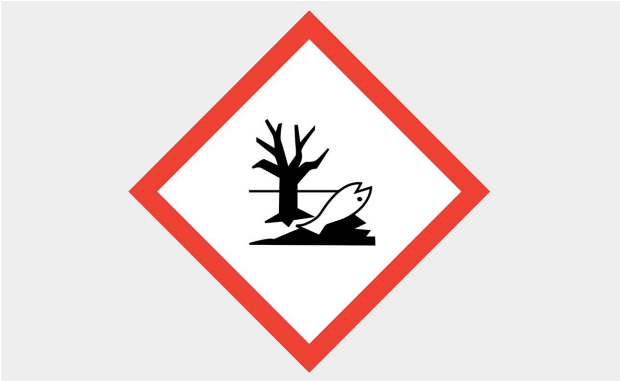
- carcinogen, which is a chemical substance or a mixture of chemical substances which induce cancer or increase its incidence.
- reproductive toxicity, which includes adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in offspring.
- respiratory sensitizer, which is a substance that induces hypersensitivity of the airways following inhalation.
- target organ toxicity that may cause damage to bodily organs.
- aspiration toxicity, which includes severe effects such as chemical pneumonia, varying degrees of pulmonary injury, or death following aspiration.

This is the symbol that appears on chemicals to indicate less severe toxicity.

This is the symbol that appears on materials with less severe toxicity than those found on a material identified by the skull and crossbones. Depending on the health hazard, it can mean harmful if:

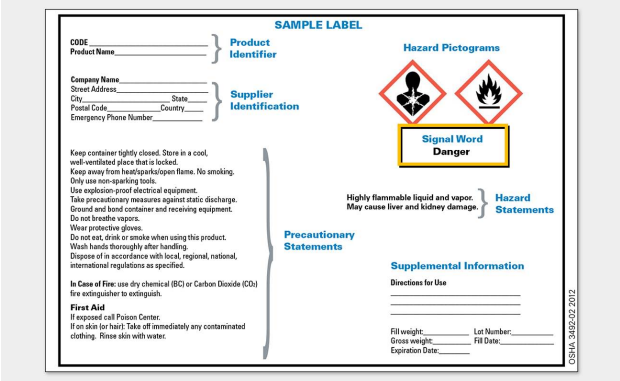
- swallowed or inhaled.
- contact with skin.

Effects include irritants to the skin, eye and respiratory tract, an allergic response following skin contact, narcotic effects such as drowsiness, lack of coordination, and dizziness may appear.



This is the symbol that appears on chemicals or materials that indicate levels of aquatic toxicity.

The environment pictogram is non-mandatory and used to indicate levels of aquatic toxicity.

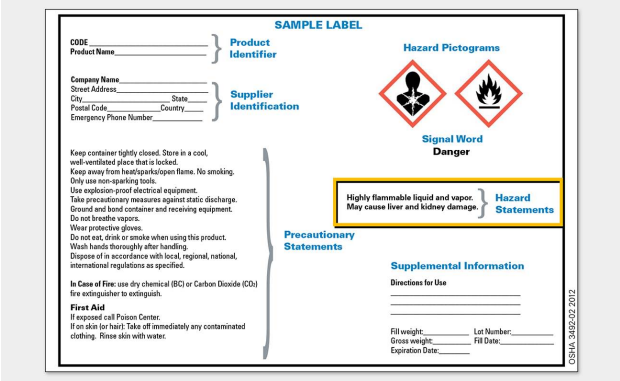


This is a sample label highlighting the signal word information.

The signal word is used to indicate the relative level of severity of the hazard and alert the reader to a potential hazard on the label. There are only two words used as signal words:

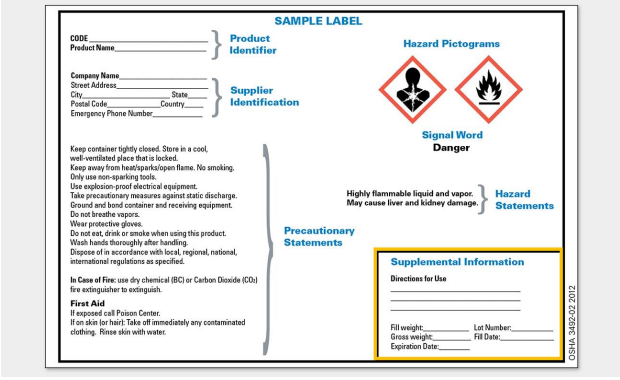
- Danger, which is used for the more severe hazards.
- Warning, which is used for the less severe hazards.

There will only be one signal word on the label no matter how many hazards a material may have. If one of the hazards warrants a “Danger” signal word and another warrants the signal word “Warning,” then only “Danger” will appear on the label.



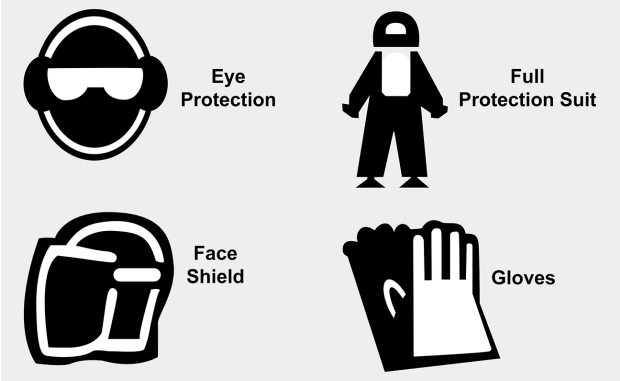
This is a sample label highlighting the hazard statements information.

Hazard statements describe the nature of the hazard(s) of a material, including, where appropriate, the degree of hazard. All of the applicable hazard statements must appear on the label.



This is a sample label highlighting the supplemental information.

The label producer may provide additional instructions or information that it deems helpful.

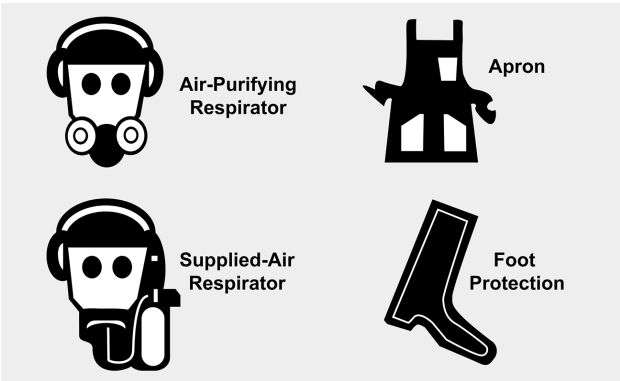


These are examples of universal personal protection symbols that are common in a collision repair facility.

Personal protection symbols show what personal protection is required when working with a material, and like hazard symbols, can be read in any language.

These symbols represent:

- eye protection.
- face shield.
- full-body protection.
- gloves.



These are examples of universal personal protection symbols that are common in a collision repair facility.

Other personal protection symbols represent:

- air-purifying respirator.
- supplied-air respirator.
- apron.
- foot protection.

Label Types

If an inner label is easily seen from the outside, the outer packaging does not need to be labeled again.

The supplier does not have to label an outer container if the inner container label can be seen and read through the outer container.

The product name and any hazardous warnings are all that is required on a U.S. workplace label.

Labels that are created and attached to containers in the workplace are not required to have as much information as a supplier label. There are minimum requirements for a workplace label. A workplace label must contain the product name and the hazardous warning information. Workplace label information can be acquired from the original supplier label or the product SDS.

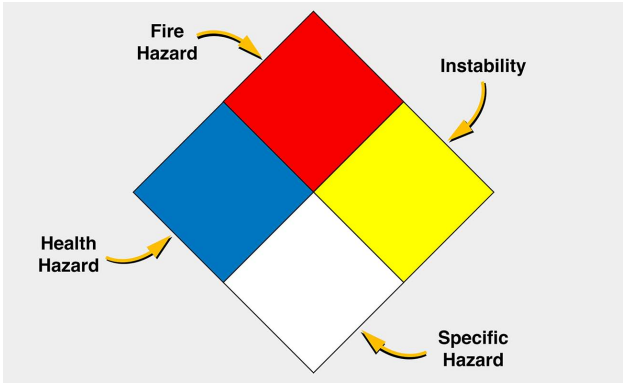
Labels can be either ordered from the product supplier, or blank workplace labels can be purchased from safety product suppliers. These labels are recommended, though not required. Masking tape and permanent marker, written directly on the container, or other stick-on labels are allowed. It is also not required to remove the previous labels.

The two basic parts required for a workplace label are:

- the product name, as stated on the SDS.
- any hazardous warnings that were on the original label.

The hazard information can be found in section 2 of the SDS

A workplace label is not required if the material will be used immediately and only by the person who poured it.



The National Fire Protection Association (NFPA) label system showing the color codes associated with the hazardous materials.

Workplace labels are required when:

- the original supplier label is removed or defaced.
- a product is mixed or diluted and kept for further use, such as mixing an all-purpose cleaner solution into a spray bottle.
- the contents of large containers are transferred into smaller, unlabeled containers.
- pouring mixed paint into a container that will be stored.

Water bottles should also be clearly labeled to ensure water is not confused with other clear liquids.

A workplace label is not required if the material being poured into an unmarked container will be used immediately, or in one shift, and only by the person who poured it. One example is pouring refinishing material into a spray gun. The spray gun does not require labeling if the material will be used by one person during the same work shift.

The National Fire Protection Association (NFPA) has a label system for use by emergency personnel. NFPA labels have a system of codes to show the danger level of certain elements in a hazardous material. The system of codes measure:

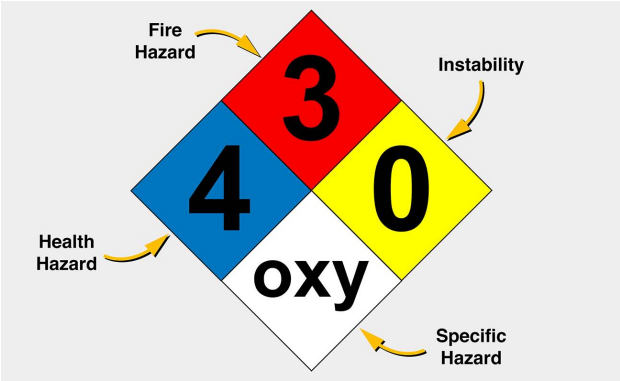
- health hazards.
- fire hazard.
- instability hazard.

The codes on the label are shown in different colored boxes according to the hazard represented. The boxes are always in the same position in the diamond. These colors, and positions, are:

- red for a fire hazard, always on top.
- blue for a health hazard, always on the left.
- yellow for an instability hazard, always on the right.

There is also a fourth category, in a white or blank box, which shows special hazards, such as "acidic," "radioactive,"

"or not to be used with water." The white box is always on the bottom.



The NFPA uses a 5 number code to signify the danger level. The higher the number, the higher the danger level.

An NFPA code has five numbers, 0 – 4. The higher the number, the higher the danger level. With this system:

- 0 is very low danger.
- 1 is slightly dangerous.
- 2 is moderately dangerous.
- 3 is seriously dangerous.
- 4 is severely dangerous.

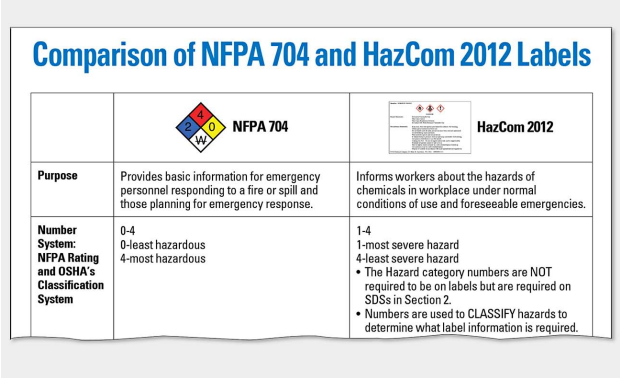
In the lower portion of this symbol special hazards are identified. There are currently only two NFPA approved symbols. They are:

- "OX," which denotes that a material is an oxidizer.
- a "W" with a line through it to denote unusual reactivity with water.

For example, a material with a:

- fire hazard of 0 is not likely to catch fire.
- fire hazard of 4 will catch fire very easily.
- health hazard of 2 is moderately hazardous to health.

NFPA code numbers are found on some SDS versions.



This is a chart to illustrate the difference of the codes used to signify the hazard levels of materials between the NFPA and the HazCom 2012 labels.

An HazCom 2012 code has four numbers or categories, 1 - 4. The lower the number, the most severe the hazard level. With this system:

- 1 is most severe hazard.
- 4 is least severe hazard.

The hazard category numbers are NOT required to be on labels but are required on SDS's in Section 2. Numbers are used to classify hazards to determine what label information is required.

"Other means of identification" labels may be anything that indicates what the product is such as these compressed gas bottles.

The last type of label is “other means of identification.” This type of label is required for containers where the original label may be hidden or covered.

Examples include:

- paint cleaning systems where solvents or paint residues may damage or cover a label on the solvent container.
- large storage containers where labels may be hidden from view.
- secondary containers where solvents commonly wash off the label printing.

“Other means of identification” labels may be anything that indicates what the product is. Some examples include:

- a mark or symbol on the container.
- special color-coded storage area.
- a sign or placard above or to the side of the material that indicates what the material is.

These labels must still include the basic requirements of a workplace label, and be identified in an employee education program so that everyone is informed about the meanings behind any codes, colors, or signs.

Module Wrap Up

Topics discussed in this module included:

- identifying requirements for a supplier label.
- the difference between supplier, workplace, and “other means of identification” labels.
- the requirements for a workplace label.

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Module 3 - Hazardous Materials

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Hazardous Material Exposure

Learning objectives for this module include:

- identifying acute and chronic chemical exposure.
- knowing the different routes of hazardous chemical entry into the body.
- listing the different hazardous chemical categories and where the hazards are located in the collision repair facility.

Refer to Module 3, “Activity: Mixing Unknown Chemicals” in the presentation for a video and exercise on mixing unknown chemicals.

1. Evacuate the area if necessary, for example if there are noxious odors or if it is obvious that the spill cannot be contained to one area.
2. Alert the fire department, if necessary.
3. Put on the proper protective equipment and clothing. This equipment may consist of goggles / glasses, foot protection, hand protection, protective clothing, head protection or breathing protection.
4. Contain the spill by spreading absorbent material on the liquid. If necessary, make a berm with absorbent material to prevent the liquid from spreading. Another possibility is to use an absorbent “snake” to make a portable berm.
5. Once contained and absorbed, sweep up the absorbent material. Treat the absorbent material as hazardous waste by disposing of the material into a hazardous waste container.
6. If there is a film on the floor after cleanup, use shop towels to clean it up. Dispose of the towels as hazardous waste or use an industrial laundry to clean the shop towels.

Without the proper personal protection, this technician is possibly exposing himself to acute and / or chronic hazards.

Overexposure to hazardous materials can be:

- acute.
- chronic.
- acute and chronic.

Acute health effects appear immediately or within hours of exposure to a chemical.

Some signs of an acute exposure include:

- burns.
- eye irritation.
- runny nose.
- sore throat or cough.
- skin rash or redness.
- shortness of breath.
- fatigue or dizziness.
- nausea, chills, or other flu-like symptoms.

Chronic health effects result from repeated long-term exposure to a chemical. Signs of a chronic exposure include:

- extra sensitivity.
- nerve damage.
- lower lung capacity.
- asthma symptoms.

Often a phenomenon called “olfactory (sensory) fatigue” occurs after being exposed to a chemical for a period of time. The chemical can no longer be smelled, even though the exposure is over the allowable limits.

Do not eat on the job or you could digest chemicals.

Hazardous materials can enter the body by:

- breathing, which is the most common.
- swallowing. This does not mean eating or drinking the materials, but such unsanitary practices such as not washing hands before eating, drinking or smoking in an area where hazardous materials are used or stored, or touching hands to the face when sneezing or coughing.
- absorption into the skin or eyes. Skin is porous, like a sponge. This includes the top of the head where hazards are likely to land. Common ways that hazardous materials are absorbed into the skin or eyes is by picking up a solvent-soaked cloth, washing hands with gasoline or other solvents, and rubbing eyes.
- injection into skin. This includes entering through a rash or cuts or splits in the skin. The end of the finger near the fingernail is especially prone to splits. Materials can be forced through

the skin by air tools or cleaning equipment.

Hazardous Material Categories

Hazardous materials found in a collision repair facility can be categorized into these pictograms.

Hazardous materials that may be found in a collision repair facility are grouped into:

- isocyanates.
- bloodborne pathogens.
- reactives and flammables.
- corrosives.
- toxins.
- volatile organic compounds (VOCs).
- irritants.
- carcinogens.
- allergens.

Isocyanates are in the vapors of catalyzed products. Isocyanates cannot be seen, tasted, or felt, so a supplied-air respirator is the best defense.

Isocyanates are used to cure certain urethane materials, and are severe respiratory, skin, and eye irritants. Isocyanates are a common ingredient in many catalysts or hardeners. Catalyzed finishing products include many of the common refinishing materials. Many adhesives and body fillers are also catalyzed with isocyanate-containing hardeners.

Isocyanate vapors are released when mixing, pouring, and applying these products. They are also released when welding a panel with a catalyzed finish residue.

Isocyanates can also lead to a worker's skin or lungs becoming extremely sensitive to exposure. Once sensitized, even a very small exposure can trigger a reaction. Workers with sensitized lungs can be subject to severe asthma attacks. Symptoms include shortness of breath, coughing, wheezing, and tightness in the chest. Evidence indicates that isocyanate sensitization can also be caused by skin exposure. Sensitized skin reactions may

include a rash, itching, hives, and swelling of the arms and legs.

These reactions could be immediate or delayed for hours. Sensitization to isocyanates can become permanent. Any worker found to be sensitive to isocyanates should not work with these products. Isocyanates have no taste or smell, making it impossible to determine if a worker is being overexposed. A NIOSH-approved supplied-air full-face or hood respirator, that isolates a refinishing technician from the workplace air, is the best protection when applying products containing isocyanates.

Isocyanates are also released when a product is opened and mixed. Butyl rubber gloves are recommended to prevent skin exposure. Painter's goggles are recommended to prevent or reduce eye exposure. If an isocyanate-containing finish splashes on bare skin, wash the exposed area with soap and water for 15 minutes.

Detailing technicians may be at the highest risk of exposure to bloodborne pathogens.

Bloodborne pathogens include HIV or hepatitis B viruses that may be present in blood stains. Detailing technicians may be at the highest risk of exposure.

According to the Centers For Disease Control, "HIV was detectable by tissue-culture techniques 1 – 3 days after drying, but the rate of inactivation was rapid." The hepatitis B virus can live at least one week, and possibly up to 30 days in a blood stain outside the body. Following any chance of exposure to bloodborne pathogens, employees should be instructed to see a physician.

Those at high risk of exposure to bloodborne pathogens should receive further training on avoiding exposure and required steps in the event of exposure.

Bloodborne pathogen training should satisfy the OSHA requirement for standard 29 CFR 1910.1030.

For workplaces exposed to bloodborne pathogens, the OSHA Bloodborne Pathogens standard establishes specific requirements for labeling, containment, and disposal of waste material contaminated with blood. The standard also requires that employers develop and implement a written exposure control plan that includes provisions for hepatitis B vaccinations. This plan must be reviewed and updated annually.

More information on bloodborne pathogens can be found in the OSHA standard 29 CFR 1910.1030 OSHA website.

Flammables have a low flash point and must be kept away from sparks to prevent a fire.

Reactives can become unstable, or undergo rapid or violent chemical reactions when heated or mixed with other materials. Flammables have a low flash point, and must be kept away from heat sources and open flames.

Structural Repair Area

A common reactive in the structural repair area is battery (sulfuric) acid, which will react violently if mixed with a strong alkaline, such as sodium hydroxide. Sodium hydroxide is included in the powdery residue after an airbag deployment. Common flammables in the structural repair area include anti-corrosion compounds and petroleum-based solvents.

Metal / Plastic Repair Area

Common flammables in the metal and plastic repair area include solvent-based surface cleaners, glazing putty, adhesion promoters, and adhesives.

Mechanical Repair Area

Reactives in the mechanical repair area include refrigerants, when exposed certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions such as very high temperatures and / or appropriate pressures. All fuels are flammable.

Refinishing Area

Common flammables in the refinishing area include primers, primer-surfacers, topcoats, and solvents.

Detailing Area

Common flammables in the detailing area include glass cleaners and all-purpose cleaners.

Wearing proper personal provective equipment such as neoprene gloves, goggles, a face shield, and a rubber apron will provide protection from corrosives.

Corrosives are either highly acidic or alkaline. Wearing neoprene gloves, rubber

apron, goggles, and a face shield, will provide proper personal protection.

Structural Repair

Battery (sulfuric) acid, besides being reactive, is also a corrosive. Sodium hydroxide, contained in the powder residue after an airbag deployment, is highly alkaline. Avoid exposure to the powder, since moisture in the skin, eyes, and respiratory system can make the sodium hydroxide corrosive.

Metal / Plastic Repair

Common acids in the metal / plastic repair area include chemical paint strippers, metal conditioners, and some prep solvents.

Mechanical Repair

Battery, or sulfuric, acid is a common corrosive. Sodium hydroxide is highly alkaline.

Refinishing

Etching primers are mildly acidic.

Detailing

Common acids in the detailing area include wire wheel cleaners and oxalic acid, a common industrial fallout remover. Some common alkalies in the detailing area include some full-strength degreasers and sodium hydroxide.

Refer to Module 3, “Activity: Safety With Corrosives” in the presentation for video and exercise on precautions when using corrosive material.

What would be your first step?

- Find the SDS for Acid Clean.
- Read the bottle label for Acid Clean.
- **Guide the technician to an eye wash station.**
- Clean the Acid Clean off the vehicle.

This is the symbol that appears on materials to denote varied levels of health hazards such as nerve toxins.

Neuro-, or nerve toxins:

- destroy nerve endings and may cause central nervous system depression.
- effects are similar to drinking too many alcoholic beverages.
- include toluene, xylene, and methyl-ethyl ketone. These chemicals are contained in many solvents, adhesives, and finishes. Read the SDS or product label to see if these chemicals are contained in the material.

Structural Repair

Examples of materials containing nerve toxins in the structural repair area include weld-through primers, chip-resistant coatings, and mercury, found in some airbag sensors.

Metal / Plastic Repair

Examples of materials containing nerve toxins in the metal and plastic repair area include adhesion promoters, glazing putty, rubbing compound, some solvents and adhesives, and some glass cleaners.

Mechanical Repair

Examples of materials containing nerve toxins in the mechanical repair area include hydrocarbon materials and some cleaning solvents.

Refinishing

Most refinishing materials contain nerve toxins such as primers and primer-surfacers, reducers, hardeners, acrylic urethanes, and clearcoats.

Detailing

Examples of materials containing nerve toxins in the detailing area include most general solvent cleaners, some glass cleaners, and some buffing compounds and polishes.

This is the symbol that appears on materials to denote varied levels of health hazards such as blood toxins.

Blood toxins destroy or deform red blood cells, which reduces the amount of oxygen carried through the blood stream. This can lead to difficulty breathing and unconsciousness.

Structural Repair

Some aerosol cleaners used in the structural repair area contain blood toxins.

Metal / Plastic Repair

Examples of materials containing blood toxins in the metal / plastic repair area include finish removers, some adhesive cleaners, and glass cleaner.

Mechanical Repair

Some aerosol cleaners used in the mechanical repair area contain blood toxins.

Refinishing

Examples of materials containing blood toxins in the refinishing area include acrylic enamels and reducers.

Detailing

Some aerosol cleaners used in the detailing area, including glass cleaner, contain blood toxins.

This is the symbol that appears on materials to denote varied levels of health hazards such as liver toxins.

Liver toxins usually enter the body by breathing vapors while pouring, mixing, or applying products. Effects on the body are determined by the length and intensity of exposure to a chemical. These toxins are contained in toluene, xylene, and butyl acetate. Look at the SDS or material label for these chemicals.

Structural Repair

Examples of materials containing liver toxins in the structural repair area include some glass adhesives and seam sealers.

Metal / Plastic Repair

Examples of materials containing liver toxins in the metal / plastic repair area include finish removers, body putties, rubbing compound, adhesive cleaners, and seam sealers.

Mechanical Repair

Some materials containing liver toxins in the mechanical repair area include brake and parts cleaning fluid.

Refinishing

Some materials containing liver toxins in the refinishing area include acrylic enamels, topcoat additives, reducers, and hardeners.

Detailing

Some buffing compounds used in the detailing area contain liver toxins.

This is the symbol that appears on materials to denote varied levels of health hazards such as reproductive toxins.

Reproductive toxins may cause birth defects or sterility.

Structural Repair

Gasoline is considered a reproductive toxin.

Metal / Plastic Repair

Solder that contains lead is considered a reproductive toxin. Chronic inhalation may have an effect on the reproductive system.

Mechanical Repair

Examples of reproductive toxins in the mechanical repair area include gasoline, brake fluid, and any material containing lead, such as some solder.

Refinishing

Finishes containing lead, such as some finishes used for utility vehicles, are considered reproductive toxins.

Detailing

No known chemicals used in the detailing area contain reproductive toxins, however, always check the SDS before using any materials.

This is the symbol that appears on chemicals to indicate less severe toxicity such as with irritants to skin, eyes, and lungs.

Irritants include skin, eye and lung irritants. Skin and eye irritants can cause itching, burning, and rashes.

Lung irritants include:

- upper respiratory which affects nose and throat and are normally not life-threatening.
- middle respiratory which affects trachea and bronchi parts of the respiratory system. Symptoms include coughing and wheezing and are normally not life-threatening.
- lower respiratory which travel deep into the lungs and can be life-threatening.

Ingredients that make some materials lower respiratory irritants are the highly volatile thinners in them, such as acetone and 1-1-1 trichlorethane. These thinners are highly mobile, and easily penetrate human tissue. The working ingredients in these products are solids. The thinners are added to make the products easier to use.

Structural Repair

Examples of irritants used in the structural repair area include rubberized undercoatings (lower lung), weld-through primers (upper and middle respiratory), adhesives (upper and middle respiratory), all types of seam sealers (upper and middle respiratory), some seam sealers (lower lung), welding fumes (eye and skin, and upper and middle respiratory), and glass adhesive (eye and skin).

Metal / Plastic Repair

Examples of irritants used in the metal / plastic repair area include adhesive cleaners (eye and skin), glazing putties (upper and middle respiratory), adhesion promoters (upper and middle respiratory), some adhesives (lower lung), some seam sealers (lower lung), solvents (eye and skin), and surface cleaners (eye and skin).

Mechanical Repair

Examples of irritants used in the mechanical repair area include brake fluid (eye and skin), motor oil (eye and skin), gear oil (eye and skin), automatic transmission fluid (upper and middle respiratory), power steering fluid (upper and middle respiratory), radiator flush (upper and middle respiratory), and adhesives that contain acetone and 1-1-1 trichlorethane (lower lung).

Refinishing

Examples of irritants in the refinishing area include nearly all finishing materials (eye and skin), acrylic enamels (lower lung), urethanes (lower lung), topcoat additives (lower lung), and hardeners (lower lung).

Detailing

Examples of irritants used in the detailing area include all-purpose cleaner (eye and skin), glass cleaner (eye and skin), buffing compounds (eye and skin), rubbing compound (lower lung), dressings (upper and middle respiratory), and engine cleaners (upper and middle respiratory).

This is the symbol that appears on materials to denote varied levels of health hazards such as certain materials that contain known carcinogens.

Certain materials contain known carcinogens (cancer-causing agents). This is a chronic effect of exposure to a chemical. These chemicals are listed by different agencies, such as OSHA, the United States National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC).

Structural Repair

Some known carcinogens found in the structural repair area include diesel fuel, engine oil, transmission fluid, asbestos (found in some brake pads and shoes), and refrigerants.

Metal / Plastic Repair

Some known carcinogens found in the metal / plastic repair area include styrene and titanium dioxide, contained in some plastic filler dust; rubbing compound; body putties; and methylene chloride, found in some paint strippers, cleaners, and adhesives.

Mechanical Repair

Some known carcinogens found in the mechanical repair area include asbestos, automatic transmission fluid, diesel fuel, engine motor oil, and refrigerants.

Refinishing

Some known carcinogens found in the refinishing area include chromates in some etching primers, chromium in some epoxy primers, crystalline silica in some primer-surfacers, nickel and lead compounds in paint used primarily on utility vehicles, and topcoat additives that may contain formaldehyde.

Detailing

Silica, found in some polishing and buffing compounds, is a known carcinogen.

This is the symbol that appears on materials to indicate less severe toxicity such as with allergens.

Allergens may cause people to react to certain chemicals. Normally, the reaction is not when first exposed to a chemical. The reaction starts with the second or further exposures.

It is difficult to know which materials will cause an allergic reaction because each person will have a different reaction to different materials.

Structural Repair

Common allergens used during structural repairs include some cleaners and rubberized undercoating.

Metal / Plastic Repair

Common allergens in the metal and plastic repair area include some adhesives, adhesion promoter, epoxy resins, and body putties.

Mechanical Repair

Common allergens used during mechanical repairs include some adhesives.

Refinishing

Common allergens used during refinishing include acrylic sealers, primer-surfacers, etching primers, hardeners, and topcoat additives.

Detailing

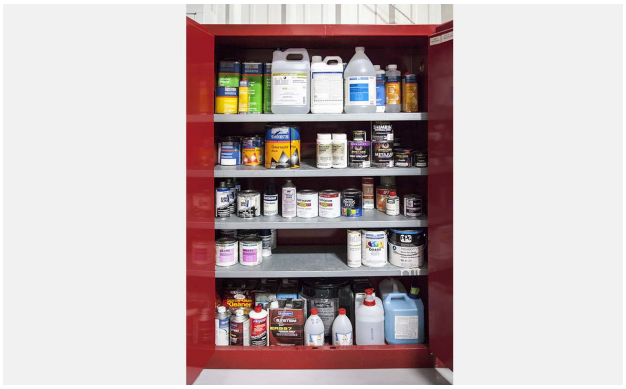
Common allergens used during detailing include compounds and polishes and some dressings.

Storage Regulations

The proper storage for hazardous materials includes a neat and orderly cabinet that can be closed, and is away from extreme conditions.

Storage cabinets for hazardous materials must:

- be located away from sunlight, excessive heat, or extremely wet or dry conditions.
- be located in a well-ventilated area.
- have doors that can be kept closed.
- have proper labels or signs.
- meet all federal and local requirements.
- be located away from electrical fuse panels and boxes.



Proper containers for hazardous materials are closed, labeled, and in good condition.

Storage containers for hazardous materials must be:

- designed and maintained in good condition to securely contain the material.
- sealed or covered when not in use, to help avoid spills or contamination.
- properly labeled.

Use a secondary curb or tray, if required, to help contain possible spills.

Some containers must be grounded to eliminate the chance of sparks.

Cabinets or containers that should be grounded include:

- cabinets where flammable materials are kept.
- containers used for transferring flammable materials. This prevents ignition from the discharge of static electricity.
- storage drums. These should also have a ground wire that can be attached to safety cans when transferring material.
- spray gun cleaning stations.
- a metal table in the paint mixing room. If a metal table is grounded, any metal can that paint is being poured into will be grounded if there is a clean metal-to-metal contact between the two items.

Materials that display the flammable pictogram must adhere to specific regulations.

Regulations specifically for flammable and combustible materials include:

- electrical lighting, outlets, fixtures, and equipment must be explosion-proof.
- all areas and storage tanks must be labeled with NO SMOKING signs.
- all storage tanks, containers, etc. must be equipped with venting.
- rooms where flammable liquids are kept must be vented to the outside. Exits in the room must be available for escaping if there is a fire.
- appropriate fire extinguishers must be nearby.
- spill containment curbs or liners must be provided.
- rooms where flammable liquids are stored or handled must be heated by a non-ignitable heat source, such as steam or hot water.

Module Wrap Up

Topics discussed in this module included:

- acute and chronic chemical exposure.
- the different routes of hazardous chemical entry into the body.
- the different hazardous chemical categories and where the hazards are located in the collision repair facility.

Module 4 - Personal Protective Equipment

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Protective Clothing And Eye Protection

Learning objectives for this module include:

- defining the different personal protective equipment recommended for different tasks in a collision repair facility.
- defining respirator requirements.
- test-fitting and properly maintaining respirators.

Specific personal protection equipment requirements for hazardous materials may be found on the SDS for that material.

Hazardous material regulations require employers to provide the proper personal protection where required. Selecting the appropriate protection can be confusing. More information on protective equipment is available from:

- SDS information.
- product makers.
- product and equipment suppliers.
- paint distributors and jobbers.
- makers of personal protective equipment.

Equipment and material suppliers may be willing to work with repair facilities to help find equipment that workers are comfortable with and will actually use.

The correct choice of protective clothing may be difficult. No one material is resistant to all chemicals, and no glove is completely impenetrable.

Proper foot protection throughout the collision repair facility generally includes steel-toed, leather shoes or boots with solvent-resistant soles.

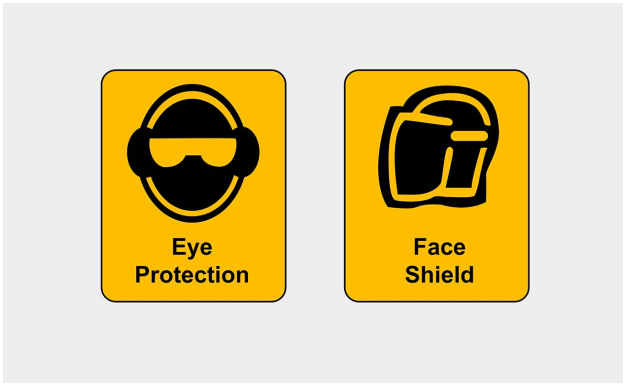
Gloves offer many different levels of protection.

Types of hand protection used in a collision repair facility include:

- disposable light-duty nitrile gloves for limited tasks, where dexterity is required.
- medium-duty nitrile gloves, which should be used when working with chemicals, solvents, and adhesives. Medium-duty nitrile gloves can be used multiple times.
- neoprene gloves, which are designed for use with corrosive

acids and alkalies. A neoprene glove is also designed for repeat use.
- leather or cotton gloves, which help to protect against cuts and abrasions, and can be used multiple times.

Refer to Module 4, "Demonstration: Removing Disposable Gloves" in the presentation for a video of how to take nitrile gloves off and properly dispose of them.



All tasks in a collision repair facility require safety glasses and some require a face shield.

Eye and face protection must be certified by United States standards. United States standards are published by the American National Standards Institute (ANSI).

The ANSI symbol or standard number "Z87" must be printed on the eye or face protection equipment.

More information on standards and selection of personal protection equipment can be found at the following website: www.ansi.org

Proper eye protection should be located where it is required, so it will be used.

Proper eye and face protection also includes locating eye wash stations where they may be required, such as near the mixing room and detailing bays.

Proper eye and face protection in a collision repair facility depends on the task being done.

Eye or face protection includes:

- safety glasses or goggles. Goggles are recommended whenever working with refinish materials or solvents to prevent liquids splashing into the eyes. Examples are when mixing paint and when using cleaning materials, such as thinners or solvents.

- a full-face shield when grinding or sanding.
- a welding helmet. Safety glasses should be worn under the helmet.

Hearing Protection

Decibel Levels	
Jet Engine	140 dB
Riveting Hammer	130 dB
Hammer Banging on Sheet Metal	100 dB
Ventilating Fan (1500 CFM)	90 dB
Arc Welder	85 dB
Inside a Car (50 mph)	75 dB
Ordinary Conversation	60 dB
Quiet Whisper	30 dB

These are some common decibel levels from the OSHA Hearing Conservation standard.

Exposure to high levels of noise causes hearing loss and may also cause other harmful health effects.

Sound is measured in decibels (dB). The screen shows some common dB levels.

Allowable Sound Levels	
dB Level	Maximum Duration
90	8 Hours
92	6 Hours
95	4 Hours
100	2 Hours
105	1 Hour
110	30 Minutes
115	15 Minutes

Hearing protection is required when there is noise at or above 90dB, averaged over eight working hours. The time is shorter as the noise gets louder.

The extent of damage depends primarily on the intensity of the noise and duration of the exposure.

Depending on location, hearing protection is required when noise exposures begin to exceed 85 dB, averaged over eight working hours, or an eight-hour time-weighted average (TWA).

Hearing protection is recommended, but not required, when noise exposures are at 85 dB TWA. If over 90 dB, the average is over a shorter time. The chart shows how the allowable duration decreases as the average noise level increases. Information on dB levels for specific equipment is provided by equipment makers.

Having to raise your voice to be heard is a good indication that hearing protection is required. At 85 dB, it is necessary to raise your voice to be heard from 1 ft. You need to shout to be heard from 2 ft.

If the noise level in a workplace is over 85 dB TWA, OSHA requires establishment of a Hearing Conservation Program in the workplace. OSHA requires this program to include:

- the distribution of hearing protection and instruction on how to use them.
- identification of tasks that generate loud noise and those areas marked off as requiring hearing protection.
- annual hearing tests, or audiograms, for those individuals that work in areas where noise exposures are at or above an 8-hour TWA of 85 dB.

It does not matter which hearing protection you choose. Ear muffs and ear plugs will work just as well.

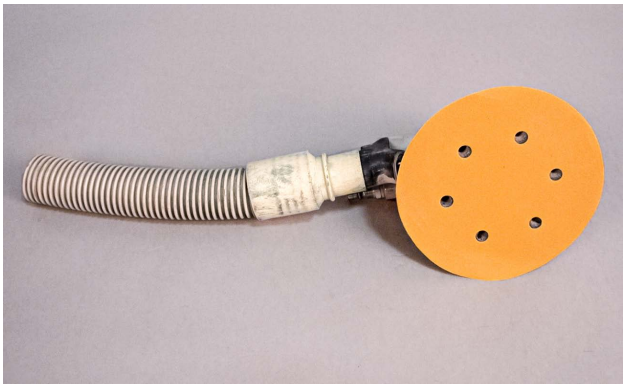
Proper hearing protection includes ear:

- plugs.
- muffs.

Hearing protection is rated. There will be a noise reduction rating (NRR) for each type of hearing protection. The NRR is a single number description of the noise reduction capability of a hearing protection. The more protection, the higher the number. Makers of hearing protection provide NRR levels.

Refer to Module 4, "Demonstration: Inserting Ear Plugs" in the presentation for a video and example of how to properly and safely insert ear plugs.

Respiratory Protection



A dustless sanding system is a good first defense against breathing hazards.

The first defense against breathing in contaminants in a collision repair facility is eliminating or minimizing the contaminants at the source. This includes using:

- vacuum sanding systems.
- welding fume extractors.
- vacuum-recovery media blasting.
- downdraft spraybooths.
- ventilated paint mixing benches or rooms.
- paint mixing room fume extractors.
- HVLP spray guns.

Spray coatings should always be applied inside an approved spraybooth, and never in an open repair facility. Some areas have regulations on spraying materials.

Refer to "Video: Vapor Overcome Exercise" in the presentation. This video depicts a technician which is overcome by fumes.

Not all respirators offer protection in all situations.

In a case of someone being overcome by fumes:

1. move the technician outside or to an area of the repair facility that has clean air.
2. seek medical help, by taking the technician to a medical facility or having a paramedic come to the repair facility.

Look for the NIOSH label on any respirator worn in the workplace.

The second defense against breathing contaminants is a respirator. Any respirator for use in the workplace in North America must be approved by the National Institute for Occupational Safety and Health (NIOSH). NIOSH is responsible for testing and approving respirators. Respirators approved by NIOSH undergo a testing and certification process. The use of non-approved respirators is a violation of OSHA and could result in citations and fines. Some respirators are approved by both NIOSH and the Mining Safety and Health Administration (MSHA). Only respirators for underground use require MSHA approval.

Respirators must be used as designed to maintain approved ratings. No modifications or repairs that alter the respirator should be made.

Air-purifying respirators filter air for breathing.

Respirators can generally be divided into two types, air purifying and supplied air.

Air-purifying respirators:

- filter the contaminated air through filter layers or adsorbent cartridges.
- are full- or half-face.
- protect against either vapors, particulates, or both.
- usually have interchangeable cartridges and pre-filters, so one respirator can be used to help protect against different respiratory hazards.
- are considered negative-pressure, because the user must inhale to pull in the filtered air. This puts more pressure outside the mask than there is inside the mask. This makes it especially important that there are no leaks, since contaminated air enters through the path of least resistance. A battery-powered, air-purifying respirator is considered a positive-pressure, air-purifying respirator.
- may be disposable, for one-time use.
- with cartridges, may have expiration dates for the cartridges. These dates must be calculated using air sample information and the manufacturer's data. The cartridges are changed on or before the expiration date.

Assistance on selecting the proper air-purifying respirator or cartridge for a given contaminant is available from makers of respirator equipment, chemical makers, suppliers, and jobbers.

North, MSA and 3M have an online respirator change-out program that is available free of charge.

Welding smoke is actually tiny solid particles or particulates. Layers of filter material protect against particulates.

When choosing the proper air-purifying respirator, it may be necessary to distinguish between particulates and vapors. Particulates are solid or liquid particles suspended in the air. Particulates include:

- fumes, which are the solid particulates given off by welding.

- dusts, which are solid particulates from sanding or grinding. Dust particulates are larger than fume particulates.
- mists, which are the liquid particulates when spraying.

Layers of filtered material are required to filter particulates.

Dust / mist masks:

- are used only for large particulates that can be seen, such as dust.
- do not protect against hazardous contaminants because they are generally loose-fitting, and difficult to achieve a proper face seal.

Liquid exposed to the air starts to evaporate, causing vapors. Activated carbon is the usual filter material for protection.

Vapors are created by the evaporation of liquids. Organic vapors are formed when a solvent or paint evaporates. Vapors require an adsorbent material, which is usually activated carbon contained in a cartridge. The carbon in a filter is used to adsorb vapors.

Most vapor-cartridge respirators include a pre-filter for protection against both vapors and particulates. Paint spray, for example, is a combination of particulates and vapors.

Different colored cartridges identify what type of hazard the cartridge protects against.

Cartridge-type filters are color coded to indicate the type of material each is designed to filter. These color codes have been set by NIOSH. For example, cartridges with a:

- black color code are designed to protect against organic vapors.
- purple or pink color code are highly efficient for protection against particulates. These filters used to be referred to as high-efficiency particulate air (HEPA) filters. This designation is no longer used, though the filter still meets the filtration criteria for a HEPA filter.
- yellow color code are combination filters designed to protect against acid gases and organic vapors.

Non-Oil Resistant	Oil Resistant	Oil Proof	Efficiency
N100	R100	P100	99.97%
N99	R99	P99	99%
N95	R95	P95	95%

This chart shows the classification system for particulate filters.

NIOSH has developed a classification system for particulate filters. This system identifies a series of three particulate filters and rates them based on filtration efficiency. The three particulate filters include:

- 100-rated filters (99.97% efficiency). This filter offers similar protection to HEPA filters.
- 99-rated filters (99% efficiency).
- 95-rated filters (95% efficiency).

Each are divided into three categories:

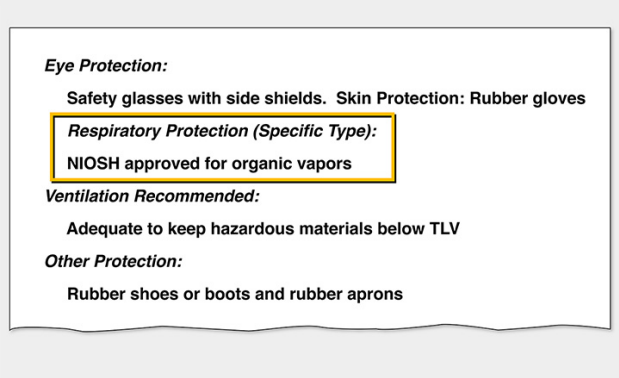
- N for non-oil resistant.
- R for resistant to oil.
- P for oil proof.

In some paint and body applications, a 95% efficient particulate filter is adequate. Oil-based products are generally not used, so a non-oil resistant (N) filter or oil-resistant (R) filter is adequate.

Currently, there are no specific guidelines for the selection of the appropriate efficiency rating.

HEPA or 100-rated filters are used when working with asbestos, welding toxic metals such as galvanized steel, and when buffing with products that contain silica.

N95 filters can be used for general welding. A 100 filter can be used for general welding, but breathing resistance is higher. There is also a potential for exposure to hazardous vapors during some welding operations, which would require an air-purifying respirator that adsorbs vapors. For welding, a supplied-air welding helmet would be the best protection. The hazards are reduced by removing coatings from surfaces that are to be welded.



Look in the Section 8: Exposure Controls / Personal Protection section of the SDS to find specific respirator recommendations.

The type of respirator to wear depends on the material being used. The first step is to check the SDS.

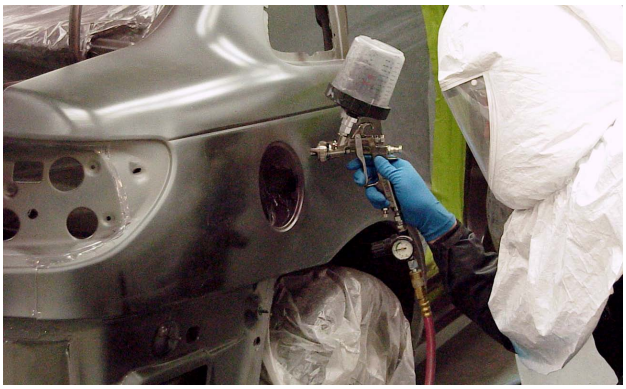
The SDS might not be available for a particular material. For example, it may be necessary to sand or grind the finish off a part that has an unknown coating. In

that case, use common sense and good judgment.

There is no such thing as being over-protected. A HEPA or 100-type cartridge respirator may be the first choice if there are unknown particulate fumes.

The best storage for an air-purifying respirator is an airtight plastic bag.

Air-purifying respirators with cartridges must be stored away from any contaminated area and areas with high humidity and temperature extremes. The best storage is the airtight plastic bag that comes with most respirators. This is done primarily to prevent moisture contamination. Moisture will shorten the life of a charcoal-filled vapor cartridge.



Supplied-air respirators provide an independent source of breathable air.

Supplied-air respirators have an outside source of fresh, breathable air. Supplied-air respirators are primarily used when finishing in a spraybooth, but are also required in environments:

- that are oxygen deficient.
- considered immediately dangerous to life or health.
- with unknown contaminants or unknown levels of contaminants.
- with airborne concentrations of contaminants above the maximum use concentrations of air-purifying respirators.
- with contaminants with poor warning properties, such as isocyanates. An exception to this is if there is a formal schedule in place to change air-purifying respirator cartridges.

There are two types of NIOSH-approved supplied-air respirators, including self-contained breathing apparatus (SCBA) units and type C supplied-air respirators.

A SCBA is used primarily by emergency personnel, such as for fighting fires or for cleaning a hazardous waste spill. They are not for general use in a collision repair facility, though there may be some occasional use.

Type C supplied-air respirators provide a constant flow of fresh, breathable air at low pressure.

Supplied-air respirators are positive-pressure respirators because fresh air is pumped in. There is more pressure inside the mask pushing out than there is outside the mask. Air contaminants are less likely to be inhaled with positive pressure.

A common system includes such parts as a facepiece, breathing tube, belt, supply hose, and regulator.

All individual parts of a supplied-air breathing system must be NIOSH-approved. Individual breathing system parts must not be interchanged between system makers. If parts are interchanged, the NIOSH approval is no longer valid.

Oxygen Content	**19.5 - 23.5%**
Condensed Oil	**Less than 5 mg / m^3 (United States)**
CO	**Less than 10 ppm (United States)**
CO_2	**Less than 1000 ppm (United States)**
Odors must also be removed	

A supplied-air respirator system must supply Grade D air. There are currently nine grades of air classified by the United States Compressed Gas Association, and Grade D is the fourth highest. The three highest grades are for use in medical facilities.

Current Grade D requirements are:

- oxygen content of 19.5 - 23.5%.
- condensed oil content of less than 5 mg/m3.
- CO (carbon monoxide) of less than 10 ppm. CO must always be monitored on a supplied air breathing system.
- CO2 (carbon dioxide) of less than 1000 ppm.

The shop compressor can supply Grade-D air, but there must be monitoring devices to detect contaminants installed.

One source of air for a respirator is an existing air compressor fitted with approved filters. When using an oil-lubricated compressor to supply Grade D air, the CO level must be monitored. This can be done using a high-temperature or carbon monoxide alarm or both. If only a high-temperature alarm is used, the air supply must be monitored at intervals enough to prevent CO in the breathing air from exceeding 10 ppm.

Proper maintenance of the compressor is also required. In the United States, the air must be sampled and analyzed before it reaches the end user.

A multiple-stage filter is generally used to remove oil, water, hydrocarbons, and odors.

A concern that an overheated compressor could burn oil and generate CO is the reason for the monitoring requirement. Another source of CO in an air line is the location of the compressor intake.

An air pump can be a dedicated source of Grade-D air for a supplied-air respirator.

Using an air pump as the air source generally consists of:

- an oil-free, electric, rotary-vane motor.
- filters.
- a hose connection.

The air pump intake must be located in a clean air environment, usually outside away from any exhaust vents. This is necessary because an air pump does not purify the air of solvents, thinners, and other hazardous chemicals found in a repair facility environment. An air pump only moves air from one source to another.

Advantages to using an air pump include:

- portability. It can be placed anywhere electricity is available.
- using its own air. There is no worry about using up the repair facility's compressor capacity to supply breathing air.
- low maintenance.

The recommended protection against isocyanate exposure is a full-face, supplied-air respirator.

Full-face, supplied-air respirators or hoods are recommended when applying finishes that contain isocyanates. This is indicated in government information, product maker literature, and SDS information. But there is an alternative, if certain conditions are met.

As an alternative to formal change-out schedules, painters can use respiratory cartridges equipped with end-of-service-life indicators that provide users a visual sign, such as a color change, indicating when the filter should be changed. ESLI's have not yet been approved to detect the type of isocyanates used in refinishing materials. Therefore a calculated change-out schedule should be used.

Still another alternative is a disposable air-purifying cartridge respirator, for one-time use.

The reason for these extra precautions is because isocyanates do not have good warning properties. An organic vapor cartridge could be used to capacity without warning. Since isocyanates can enter the body through the eyes, hoods or full-face shields are recommended for protection. Safety glasses or prescription eyewear do not offer enough protection for refinishers.

If a half-face, supplied-air respirator is all that is available, wear goggles.

The revised OSHA respiratory protection standard allows the use of an air-purifying respirator when applying an isocyanate coating, but only if the following two requirements are met:

1. The employer ensures that the spraybooth is functioning properly and is properly maintained.
2. The employer implements a formal respiratory cartridge change-out schedule to ensure that painters change organic vapor cartridges before the cartridges become saturated with contaminants.

There must be a tight seal where a face-seal respirator contacts the face.

Half-face air-purifying respirators must have a proper seal. This requires male respirator wearers to be clean shaven, at least where the respirator seals against the face. An employee should not be allowed to do a task that requires respirator protection if he refuses to shave to allow a tight respirator seal until a full-face respirator is made available.

An employee must also not be allowed to do a task that requires respiratory protection if he or she refuses to wear a respirator.

Regulations regarding how to handle an employee with facial hair are NIOSH recommendations that OSHA has adopted.

Medical approval is required before an employee can wear a respirator in the workplace.

Both workplace safety and health rules require that workers who must wear a respirator receive a medical evaluation to determine the employee's ability to use a respirator. This evaluation can be either a medical screening questionnaire or examination. In either case, the evaluation must be administered by a physician or other licensed health-care provider, identified by the employer. The evaluation must be administered confidentially during the employee's normal working hours, or another convenient time.

The physician or other licensed health-care provider must be provided the following information:

- Type and weight of the respirator to be used by the employee
- Duration and frequency of respirator use
- Expected physical work effort
- Additional protective clothing and equipment to be worn
- Temperature and humidity extremes that may be present
- Copy of the written respirator program

If a questionnaire is used, the employer may have to provide a follow-up medical examination, based on the questionnaire responses to the employee's history of medical conditions. The follow-up examination must include any medical tests, consultations, or procedures the physician or health care provider considers necessary.

The employee must be provided the opportunity to discuss the questionnaire or examination with the physician or other licensed health-care provider.

If the medical examination shows that the employee's health would be at risk by using a negative pressure respirator, the employer is required to provide a powered air-purifying respirator or supplied-air respirator.

Additional medical evaluations are required if:

- the employee reports medical signs or symptoms related to the ability to use a respirator.
- the physician, licensed health care provider, supervisor, or respirator program administrator informs the employer that the employee needs to be re-evaluated.
- observations during fit-testing or other respirator program evaluation shows a need for re-evaluation.
- a change occurs in the workplace conditions or employee's

responsibility that will change the respirator use.

A fit-test involves tasting a particulate mist through the respirator.

Respirators with a face seal must be properly fit-tested before using the respirator on the job. OSHA states fit-testing must be done:

- annually.
- whenever a different respirator facepiece is used.
- if there is a change in the employee's physical condition which could affect respirator fit. Examples include dental work, significant weight change, or facial scars.

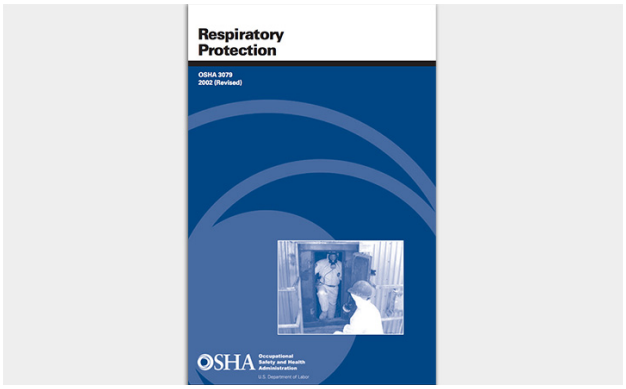
Fit-testing not only determines whether the respirator face seal is adequate, it also:

- provides an opportunity to check that the respirator fit is comfortable.
- allows the employee to choose another, more comfortable respirator if desired.
- reinforces respirator training, such as how to put on and adjust the respirator.
- partially fulfills some of the annual respirator training requirements.

Refer to "Video: Respirator Fit-Test" in the presentation. This video discusses concepts for properly fit-testing a respirator.

Refer to "Video: Seal Check" in the presentation. This video discusses performing a seal check on an air-purifying respirator with a face seal.

Refer to "Video: Cleaning And Disinfecting A Respirator" in the presentation. This video discusses proper methods for cleaning and disinfecting a respirator.



OSHA provides recommendations for respirator programs which can be used to set up a respirator program for the workplace.

United States regulations require employers to develop and implement a written respiratory protection program. The program must be updated as often as necessary to reflect the changes in workplace conditions that affect respirator use. Items that must be put into writing include:

- worksite-specific procedures that require a respirator.
- the criteria for selecting a respirator for use in the workplace.
- medical evaluation or questionnaire results of employees required to use respirators.
- fit-testing procedures for air-purifying respirators with a face seal.
- procedures for proper use of respirators in routine and emergency situations.

Online respirator protection programs can be found on the OSHA website.

Other required parts for a written respirator program include:

- procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
- air-purifying cartridge change-out schedule.
- procedures on how the quality, quantity, and flow of breathing air is being maintained for supplied-air respirators.
- records of training employees in the respiratory hazards to which

they are potentially exposed during routine and emergency situations.
- records of training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and maintenance.
- procedures for regularly evaluating the respirator program for effectiveness.

For areas of the repair facility where respirator use is not required, employers still must have a written program in place with these same provisions for those employees who want to voluntarily wear a respirator. The only situation where a written program is not required is where a dust mask is the only type of mask used.

Respirators, training, and medical evaluations must be provided by the employer at no cost to the employee. A program administrator must be designated to administer or oversee the respiratory protection program, and conduct the required evaluations of the program's effectiveness. The administrator must be qualified by the proper training or experience.

Module Wrap Up

Topics discussed in this module included:

- the different personal protective equipment recommended for different tasks in a collision repair facility.
- United States respirator requirements.
- test-fitting and properly maintaining respirators.

Module 5 - Repair Facility Safety

I-CAR®

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Work And Tool Safety

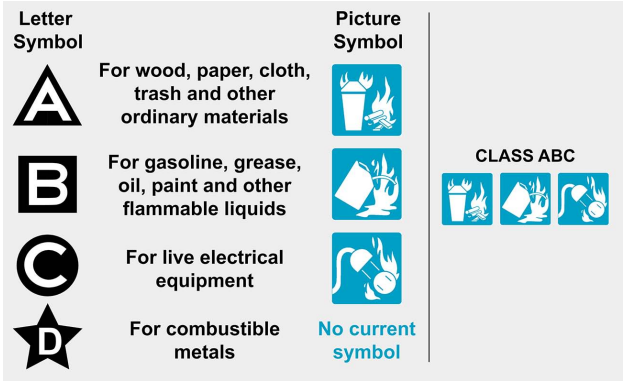
The learning objectives of this module include:

- explaining the different repair facility safety practices when working with glass, engines, batteries, fuel, and welding equipment.
- properly responding to a hazardous materials emergency.
- identifying supplier, employer, and employee responsibilities in a hazardous material training program.

Solids, liquids, and gases can all be dangerous if handled unsafely.

Equipment or situations that can cause injury include:

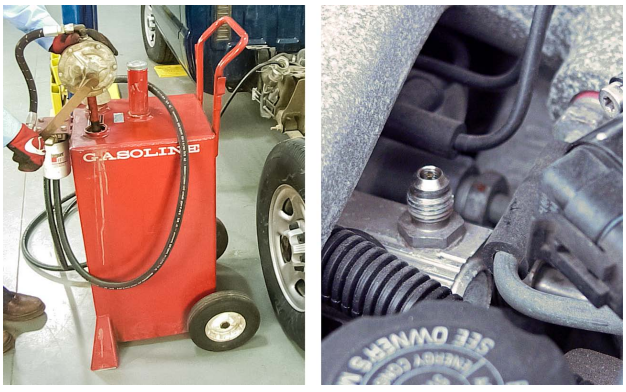
- exposed fuel tanks or containers.
- compressed natural gas (CNG)
- transporting glass parts with suction cups.
- an exposed or operating engine.
- working with batteries.
- welding.



Ensure that the proper fire extinguisher is available when working around fuel.

Refer to safe work practices when working around fuel, and:

- keep fuel and fuel tanks away from other potential sources of ignition.
- have the proper fire extinguisher available.
- do not turn on the ignition or crank an engine with a fuel line disconnected.
- do not prime an engine with fuel while cranking the engine.



When moving fuel, use a proper caddy, and do not confuse a fuel service port with an air conditioning service port.

When working around fuel:

- relieve fuel pressure before performing any engine repairs.
- work in a well-ventilated area.
- do not use fuel as a cleaning agent.
- identify air conditioning and fuel rail access ports before attaching test equipment.
- post “No Smoking” signs in the area.

When working around fuel, observe safe work practices. Safe work practices are the safety recommendations provided by a vehicle, product, or equipment maker.

Gasoline must only be stored in an approved red container.

When working around fuel containers:

- store fuel only in UL- approved containers. Underwriters Laboratories is a certifying organization for products used in the United States.
- do not fill containers completely with liquid fuel. Leave about 1" for expansion.
- if filled containers must be transported, make sure they are secured to prevent tipping.
- do not store a partially filled container for long periods of time.
- never leave containers open after using the container.
- use a ground strap to limit the chance of static electricity causing a fire.

When working with fuel containers, observe safe work practices. Safe work practices are the safety recommendations provided by a vehicle, product, or equipment maker.

CNG has different handling considerations than liquid fuel.

When working near compressed fuel vehicles, such as CNG or liquefied petroleum gas (LPG):

- turn off the gas supply at the tank and run the engine until it stops. This purges the fuel lines. Then disconnect the battery before welding, grinding, or cutting on a vehicle.
- remove LPG tanks before moving the vehicle into a spraybooth. The

heat in a spraybooth can cause tank pressures to exceed the rated relief-valve pressures.

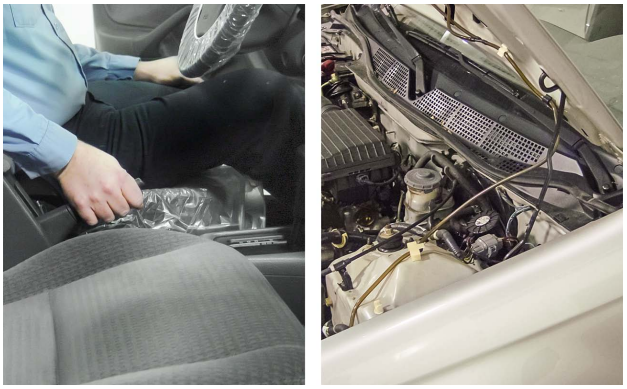
- release CNG before moving the vehicle into a spraybooth. The CNG cylinder does not have to be removed before subjecting the vehicle to a spraybooth bake cycle. It is recommended, however, to empty the cylinder by opening the manual release valve. This is done before bringing the vehicle inside the repair facility. The manual valve is kept open to avoid building up pressure inside the cylinder.
- wear proper hearing and eye protection. When releasing pressure, the sound could cause hearing damage and flying objects could cause an eye injury.

When servicing a CNG-powered vehicle, do not operate infrared heaters (IR) that are suspended from the ceiling. Open any ceiling vents.

Take precautions when working around an engine that is running or hot.

When working around an engine compartment:

- wear proper eye and skin protection. Avoid touching hot engine parts.
- avoid breathing exhaust fumes. Vent exhaust fumes outside of the repair facility.
- keep hands away from fan blades and other moving parts. An electric engine cooling fan may start at any time.
- remove the ignition key to prevent accidental starting of the engine.



Ensure the parking brake and hood prop are securely set.

When working around an engine compartment:

- engage the parking brake and use wheel chocks to prevent the vehicle from moving when working under the hood or underneath the vehicle.
- use safety props when working under hoods and deck lids.


Careless handling of batteries can cause vehicle damage and personal injury.

When working around automotive batteries:

- wear proper eye and skin protection.
- do not smoke, or have open flames or sparks near a battery.
- do not remove vent caps from maintenance-free batteries. These caps are typically not designed to be removed.
- do not charge or jump-start a frozen battery. If charging, ensure that the battery charger is turned off before the clamps are connected or disconnected. Also follow the equipment maker's recommendations for using the battery charger.
- read the markings on the battery to determine the polarity of the terminals.
- ensure that all electrical loads are off before disconnecting or reconnecting battery terminals, and always disconnect and isolate the negative (ground) cable first, and reconnect the ground cable last.

Carry glass so that if it does drop, it would fall away from the body.

When working with glass:

- wear the proper eye and skin protection such as safety glasses and leather gloves.
- wear leather gloves. Inspect the edges of the glass for slivers or rough or sharp edges before handling.
- never carry glass under your arm or over your head. Hold the glass with your palms outward so that it can only fall away from you. Also keep your pathway free of obstacles.
- when carrying glass with suction cups, stay on the side of the glass with the suction cups, and keep the suction cups clean and dry.

Unprotected skin will burn from UV ray exposure.

The welding process involves many safety hazards, including ultraviolet ray exposure. To prevent this type of exposure:

- wear clothing that covers all parts of the body, and a dark enough helmet lens shade. The higher the number, the darker the lens shade. Typically, as a starting point, a welding lens shade of 9 - 10 can be used for low power plasma cutting. A lens shade of 10 - 11 is recommended for GMA (MIG) welding, and a lens shade of 11 - 12 is recommended for aluminum and GTA (TIG) welding. Lower the face shield before striking an arc. Welding helmets with "speed filter plates" are available. These filter plates instantly turn dark when an arc is struck. Another safety measure is to use protective welding curtains that shield a portion of the ultraviolet rays from the welding arc.
- protect against flash burn to the eyes and skin. Flash burn is not a permanent injury, but can cause permanent damage after continued exposures. Flash burn feels like there is sand in the eyes and may not be felt until 4 - 8 hours after exposure.
- say "cover" before striking an arc to protect others who may be in the area.

The American Welding Society (AWS) provides a lens shade range for various welding currents. If it is difficult to see with the darker lens shade suggested for a current range, a lower number lens shade can be used. Do not use a shade lighter than the lowest shade number listed for that current range.

Exposure to ultraviolet rays can be caused by improper equipment maintenance. For example:

- cracks or scratches in the filter plate.
- damaged or missing lens gasket.
- tears in welding gloves or other protective clothing.

Repair or replace damaged equipment, as required.

A fume extractor, such as this, can be used to protect from welding fumes.

By breathing welding fumes, symptoms similar to a 24-hour flu may occur within 4 - 8 hours of exposure.

Methods of protecting from welding fumes include:

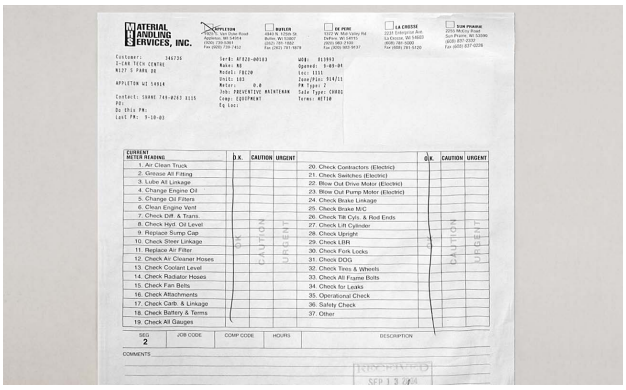
- wearing a respirator such as a supplied-air welding helmet, or by having a source of fresh air to breathe.
- using a fume extractor. This may be required by local regulations. Fume extractors may be a separate unit, or an attachment for a central exhaust system.
- having a fan or other source for circulating the air.

Storing the welding cables properly, such as keeping them off the floor, helps keep the cables in good condition.

To avoid electrical shock from a welding machine:

- configure the welding machine according to the equipment maker's instructions, and ensure proper grounding connections are used.
- keep cables, wires, and connections in good condition, and do not place the welding machine in a wet place, or stand in a wet place when welding.
- do not use the welding machine as a table for beverages.

Repair Facility Maintenance And Emergency Handling



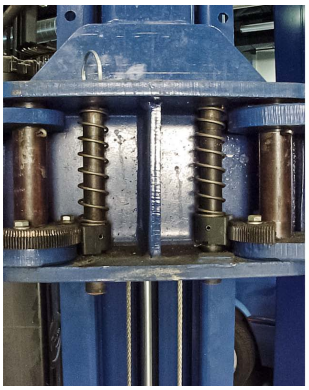
Maintenance records are kept to maintain compliance.

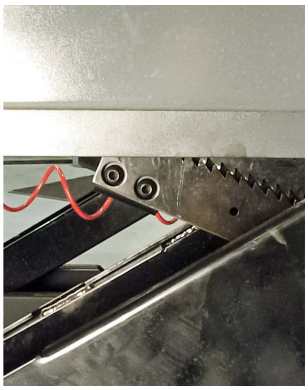
Poor maintenance can result in equipment breakdown and accidents. Emergencies are best handled when there is a plan in place to handle spills, fires, evacuations, etc. Every workplace is required to have these plans in writing.

Every area of a repair facility may have different types of emergencies.

Emergencies at a collision repair facility can take place anywhere and when using any tool. Some of the more probable areas include:

- hydraulic lines used on straightening equipment.
- solvent recyclers.
- lifts.
- paint mixing room.
- compressor unit or lines / hoses.
- spraybooth.
- office.





Locks and stops should be periodically inspected to ensure proper operation.

Safety considerations for hydraulic power systems include:

- clearly identifying pressure lines. These lines must be protected from damage.
- working with pressures regulated within specified limits.
- emergency stops being fully visible and operational.
- making safety cables or chains available.
- having an inspection and maintenance schedule for pulling clamps, chains, etc.

Follow the equipment maker's recommended maintenance on solvent recyclers.

Solvent recycling systems heat and distill used solvents. An equipment maker's recommendations for inspecting and maintaining this equipment may require:

- an annual oil change.
- an annual gasket replacement.
- dust removal from the condenser coils.

Do not use a spray gun cleaner as a recycler for leftover paint materials. For example, do not pour remaining clearcoat from the spray gun cup into a gun cleaner. This will contaminate the solvent prematurely, requiring more frequent solvent changes and cleaning will be less effective.

Solvent recyclers generate sludge that must be properly treated.

Depending on the materials being recycled, and local and regional codes, the leftover solvent-recycler sludge may be:

- collected in a closed drum and removed by a waste hauler.
- subject to a one-time Toxic Characteristic Leaching Procedure (TCLP) test to determine if it must be treated as hazardous waste.
- dried and disposed of as non-hazardous waste.

Read all the safety labels before using a vehicle lift.

Safety requirements for vehicle lifts include:

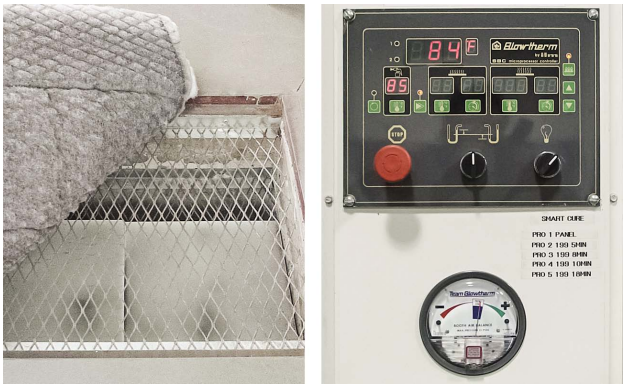
- identifying load capacity which must not be exceeded.
- having all safety guards in place.
- limit stops working properly.
- hand and foot controls being operational.
- operators being properly trained in the use of equipment.
- scheduling periodic equipment inspections.

If the lift operates erratically, it should not be used.

The paint mixing room must be properly ventilated, and well lit for safe operation.

A paint mixing room should provide a safe, clean, well-lit area for a refinisher to store and mix refinishing materials. The mixing room:

- should be located near the spraybooth. Follow local codes according to how close the mixing room can be to the spraybooth.
- must be constructed to meet building, fire, and electrical codes.
- should have sufficient ventilation, or fume extractors installed.



Replacing filters and maintaining proper balance ensure proper operation of a spraybooth.

Spraybooths must have proper airflow to quickly remove vapors, fumes, and paint overspray. All spraybooths sold in the United States must, by law, remove these vapors or mists.

Spraybooth maintenance will help ensure proper operation. Maintenance may include:

- changing filters according to the spraybooth maker's recommendations. Exhaust filters, which contain overspray, must be changed more often than intake filters. A filter-change schedule can help produce quality results.
- checking the spraybooth pressure daily.
- cleaning fans regularly, and lubricating the motor and fan pulley bearings.
- cleaning air hoses frequently, preferably daily. Accumulated dirt and moisture can contaminate fresh paint.

- cleaning and adjusting spraybooth burners to give the proper flame at maximum efficiency.
- keeping the spraybooth clean of any dust, dirt, and debris.

Spraybooth filters are subject to a one-time TCLP test to determine if they must be treated as hazardous waste.

A spraybooth is not an emission control device. The spraybooth filters are designed to capture solid particulates only. Compliance with rules for VOCs may require the exhaust air to be treated with equipment installed outside the spraybooth. Another method of reducing VOC emissions from the source is using waterborne or high-solids refinishing materials.

Maintaining a water-wash spraybooth filter system requires:

- checking the pump motors, spray nozzles, and filter tanks regularly. This will maintain proper airflow.
- treating the water with proper chemicals to prevent algae growth or other problems.

Compressor maintenance includes cleaning the external parts and changing the oil when recommended.

Regularly checking and maintaining the shop compressor is required for proper operation. This process includes:

- following the equipment maker's recommendations for draining fluid from air receivers, dryers, and filters. Some compressors feature automatic draining.
- checking and filling the oil reservoir. Overfilling may cause premature failure or wear. Change the oil following the manufacturer's recommendations.
- cleaning air strainers. Wash felt and foam strainers in a non-corrosive solvent.
- cleaning or blowing dust off the fins of cylinders, heads, intercoolers, aftercoolers, and any other parts that collect dust or dirt.

Other compressor cleaning and maintenance steps include:

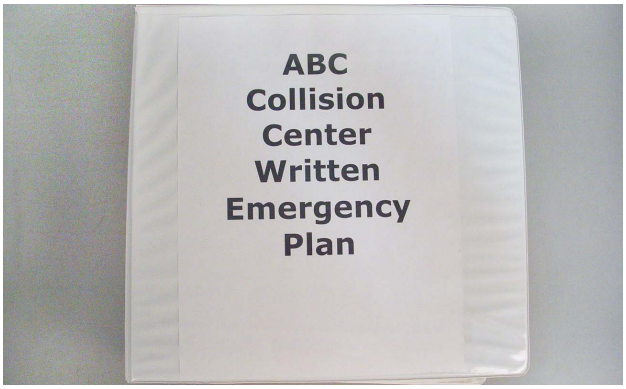
- checking the oil filter / separator in the air line. Change the filter element as required.
- checking the tightness of drive belts. Tighten if required to prevent slippage.
- checking for air leaks on the compressor and piping system.
- listening for unusual noises.

Keeping floor drains clear helps eliminate standing water.

Some floor safety requirements include:

- keeping the surface clean.
- providing a non-slip surface where required.
- using floor drains that must include grates.

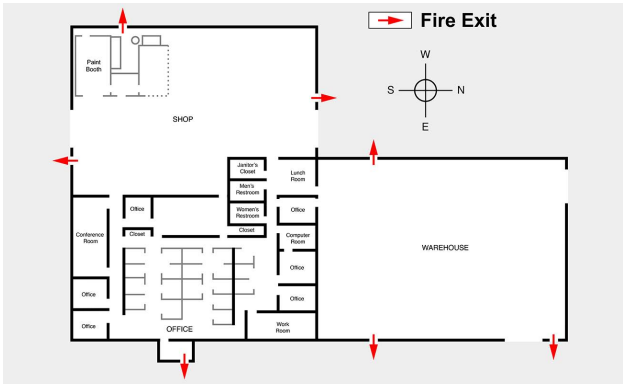
Another requirement may include being connected to a holding tank, grease trap, or sump which pumps to a holding tank.



Every facility must have a written emergency plan available.

United States regulations require every workplace to have a written emergency plan, appropriate to the hazards in the workplace. The plan must include:

- emergency conditions which may arise within the workplace and from nearby workplaces.
- an evacuation plan.
- spill cleanup procedures.
- assigned rescue and medical duties.
- training procedures.



How everybody gets out of the workplace is included in the emergency plan.

Steps in the evacuation part of the emergency plan should have written procedures to:

- notify workers of the nature and location of the emergency.
- evacuate workers safely.
- check and confirm the safe evacuation of all workers. To ensure this, practice meeting in a safe location outside the facility (central point). Assign one or more workers the responsibility for ensuring that everyone is present at the meeting place following an emergency.

Employees should know what emergency phone numbers to call if needed.

Part of the written evacuation plan should also include:

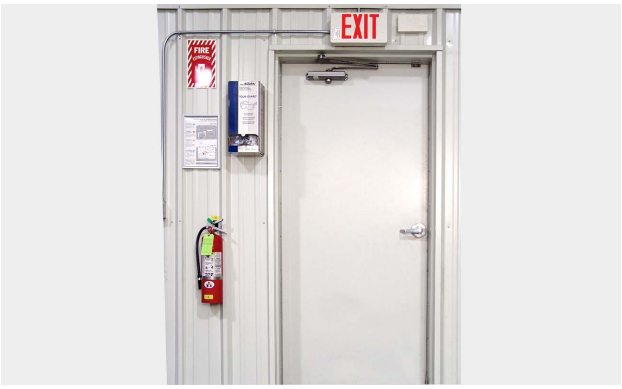
- getting the applicable SDS for the hazardous materials involved, because the emergency personnel will require the information.
- notifying the fire department or other emergency responders.
- notifying adjacent workplaces or residents which may be affected.

Special absorbent materials are available to avoid hazardous wastes going into the drain.

If there is a hazardous material spill:

- identify the material first.
- follow the spill containment procedures as defined in the company spill response program and refer to the SDS for specific handling procedures.
- eliminate flames or other sources of ignition.
- ventilate the area.
- dispose of materials used to clean up the spill, such as an absorbent material, shop cloths, clothing, etc., as hazardous waste.
- do not allow spilled materials to enter a drain that is not closed off to ground water or a water supply. If possible, place a dam between the drain and the spilled material. Further containment procedures, by emergency authorities, are necessary if the spilled materials enter a

drain. Notify proper authorities immediately, if required.



Exits must be properly marked.

If the spill cannot be contained:

- report the spill immediately to the local fire department or other authorities.
- evacuate all personnel from the area.
- have the SDS available for cleanup personnel.

Some large capacity vacuums may have HEPA filters available.

If a dry hazardous spill occurs:

- use a HEPA-filtered vacuum to collect fine dust, such as dust from fiberglass and asbestos. If a vacuum is not available, lightly wet the dust with water and sweep it up.
- do not use compressed air to blow the dust.
- materials used to clean up the spill, such as vacuum bags and shop cloths, must be disposed of as hazardous waste.

Workplace Education

Suppliers must provide an SDS, label, and other specific hazard information for every product.

Three groups share in the responsibility of providing hazardous materials education. These groups include:

- manufacturers or suppliers.
- employers and employees.

Education on hazardous materials begins with the supplier. Although the supplier is not directly responsible for training employees on the hazards of materials,

the supplier must provide employers with information for training.

The supplier is required to:

- classify and label supplied materials.
- provide a current SDS for every hazardous material used in a workplace.
- provide, at the request of an inspector, the source for any data about the toxicity of a material.

The employer must organize all of the safety protection methods and equipment that the employees will use.

Employers are required to have procedures established for the safe, use, handling, storage, and disposal of hazardous materials. This includes personal protective equipment. In addition to SDS information, contact equipment suppliers, paint distributors, and jobbers to help find equipment that workers are comfortable with and will actually use.

An employer is also required to enforce safe work practices for use, handling, storage, and disposal of chemicals.

Employers are also required to provide:

- labels for all unmarked containers of hazardous materials. The label should identify the contents and explain the hazards of the material.
- an SDS for every material. The SDS must be provided in different languages according to the employee's needs.
- a Right-To-Know training program. Attending this I-CAR course does not satisfy facility-specific training on hazardous materials and equipment.

There are commercially available signs that can be posted to remind everyone about safety.

Employers are required to provide signage in the workplace regarding:

- emergency telephone numbers.
- exit signs.

- signs prohibiting eating, smoking, or drinking where appropriate.
- safety and health posters.

MSDS Index #	Product Name	Area Used	Quantity
23	Base	Finishing	25
129	Special Clear		20
839	Primer Acid-Etch		19
180	Primer Epoxy		23
192	Filler		8
521	Red Tint		10
34	Blue Tint		11
279	Conversion Coating		12
180	Acid Etch		13

Every hazardous material currently in the facility, and how much material there is, must be listed.

The employer is also responsible for taking inventory of all hazardous materials, and keeping an inventory list. There are two types of lists that can be developed. They are a:

- complete list of all materials used in the workplace.
- list of materials used in specific work areas.

Either list is acceptable. The list must include:

- the material name.
- where the chemical is used.
- quantity of hazardous material.
- who made the list and the date of creation or revision.
- the area of the facility the list refers to.

It is also recommended to include any other information that will help identify the hazardous material. Inventories can be done by:

- counting materials.
- referring to purchase invoices.
- looking at the SDS sheets.

Copies of every SDS used in the workplace should be readily available to those who use the hazardous materials.

Each workplace is responsible for starting and maintaining a written hazard communication program for all employees who work with hazardous materials. The program must include:

- a list of the hazards of the materials in the work area. This may be one list for the workplace as a whole, or different lists for individual work areas.
- methods used to inform employees of the hazards of non-routine tasks, such as changing brake fluid or recharging an air conditioning system.
- methods for labeling using an “other means of identification”

system, where this is used. There must also be procedures in place and used by the employer to ensure every hazardous material is properly labeled and has a current SDS.
- methods used by the employer to ensure the proper SDS copies are accessible in the work areas.

Employers need to let employees know what is expected of them for their own safety protection.

Employers are required to provide training on hazardous materials. This training must include:

- methods that may be used to detect the presence or release of a hazardous material in the work area.
- the physical and health hazards of the materials in the work area.
- measures employees can take to protect themselves from the hazards, such as proper work practices, emergency procedures, and personal protective equipment to be used.
- the information included in the Hazard Communication program developed by the employer, including an explanation of the labeling system, how to read an SDS, and how employees can locate and use the proper hazard information.

Employees must follow the safety programs and use the safety equipment made available to them.

To get the most out of a hazardous materials program, employees should:

- work with the employer to follow the hazardous materials program. This also includes knowing and understanding information on supplier and workplace labels.
- ensure all required labels are on the appropriate containers, follow directions on supplier and workplace labels, and not remove, deface, or change labels.
- follow procedures for safe use, storage, handling, and disposal of hazardous materials.
- know the location of the SDS file. Know how to use the SDS. Review the SDS for each material before using the material.

Employers should offer the proper protective equipment to employees as needed.

Employees must also:

- know emergency procedures involving a hazardous material.
- inform the employer if a material lacks hazard information.
- wear the required personal protective equipment.
- work with the employer on developing a safety program.

Module Wrap Up

Topics discussed in this module included:

- explaining the different repair facility safety practices when working with glass, engines, batteries, fuel, and welding equipment.
- properly responding to a hazardous materials emergency.
- identifying supplier, employer, and employee responsibilities in a hazardous material training program.

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Module 6 - Hazardous Wastes

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Waste Types

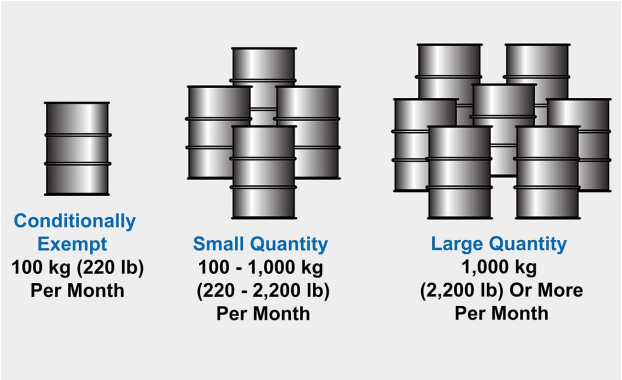
The learning objectives for this module include understanding:

- the different types of hazardous wastes in a collision repair facility.
- different regulations for how to handle hazardous waste.
- the storage and disposal requirements for hazardous waste.

Hazardous materials that are left over after use are considered hazardous waste.

When a hazardous material is used up, and can no longer be recycled, it is considered hazardous waste. Some common hazardous material wastes produced by collision repair facilities include:

- thinners, reducers, and excess refinish products.
- overspray dust.
- spraybooth filters.
- cleaning solvents.
- metal-etching acids.
- batteries.
- waste oil.
- antifreeze.



What category of hazardous waste generator your shop is depends on how much waste is generated each month.

The United States Environmental Protection Agency (EPA) groups hazardous waste generators into three categories. How a facility handles hazardous waste depends on the amount of waste generated each month. There are three categories of generators.

- Conditionally-exempt - up to 220 lb per month. This is about half of a 55 gal drum.
- Small quantity - 220 - 2,200 lb per month. This is about one-half to five, 55 gal drums, or 25 - 250 gal.
- Large quantity - 2,200 lb or more per month.

Conditionally-exempt generators only have to identify all hazardous waste that is generated and send the waste to an approved facility. A conditionally-exempt generator cannot accumulate more than 220 lb of hazardous waste on the property, or all other rules will apply.

Generators of more than 220 lb per month are regulated businesses, and must:

- have, or have applied for, an EPA / State Identification Number.
- submit an annual or bi-annual report using the correct form which documents the previous year's hazardous waste generation and accumulation, on-site recycling, and other hazardous waste management.

These are some examples of materials that may require a TCLP test.

It may not be clear whether certain wastes are hazardous. To determine if wastes can be disposed of as non-hazardous material, a TCLP can be performed by a licensed environmental laboratory. The TCLP is a one-time test that determines whether some types of materials must be considered hazardous, such as:

- dry paint.
- dry spraybooth filters.
- used masking materials.
- used sandpaper.
- used dust masks and respirator cartridges.

The TCLP does not have to be repeated unless different paint materials are used.

Hazardous Waste Regulations

There are storage laws for hazardous waste, just as there is for other hazardous materials.

Safety considerations when storing hazardous waste at the worksite include:

- following local or regional environmental rules. This includes following local fire, building, and electrical codes for inside storage.
- keeping flammable waste away from heat and sunlight and in a well-ventilated area, and providing the local fire department with a list of possible hazards, if wastes are stored inside.
- providing proper shelter from sun, adverse weather conditions, and the possibility of being damaged by a driven vehicle around the facility, if wastes are stored outside.

- storing hazardous materials on a concrete surface with the proper spill tray or containment curb.
- limiting access to the storage area to authorized, trained personnel. Label the hazardous waste area for "Authorized Personnel Only."

Properly label hazardous waste containers, and keep a record when waste started to be collected in the container.

Safety requirements for on-site hazardous waste containers include:

- labeling each container "Hazardous Waste." Labeling requirements will vary by area.
- listing the date the wastes started to be collected in the container.
- keeping each container closed.
- using non-corrosive containers for waterborne materials.
- using funnels for pouring in liquid materials, which must be secured to the drum and have a check valve to not allow solvents to escape.
- grounding containers to reduce the chance of fire or explosion from static electricity.

All storage containers should be properly marked and grounded.

Other requirements for on-site hazardous waste storage containers include:

- protecting containers from rain, snow, and standing water.
- replacing any leaking containers immediately.
- making sure there is enough room around the containers to allow for easy access.
- inspecting containers weekly. Document each inspection.
- keeping a written record of the types of hazardous wastes that are stored on the property and the contents of each container.
- following the limits for the quantities of hazardous waste that can be stored, and the maximum time the materials can be stored on site.

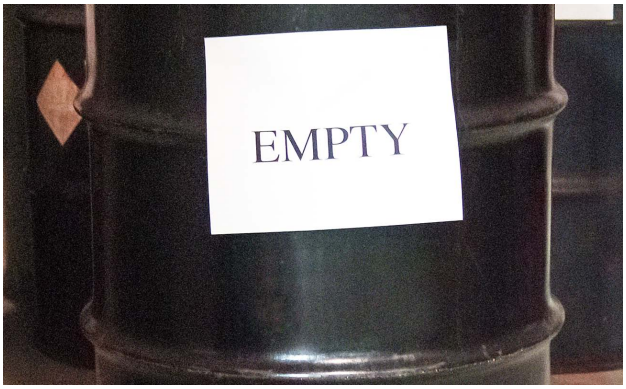
Keep separate types of waste separate, such as engine oils and waterborne materials.

Each type of hazardous waste must be stored separately. Separate containers are required for:

- brake fluid.
- engine and similar oils.
- engine coolant.
- solid waste, such as empty containers and spraybooth filters.
- solvent-borne waste.
- waterborne waste.

Ensure the containers of incompatible materials do not touch each other. An example of this includes not allowing acids and caustic material containers to contact each other.

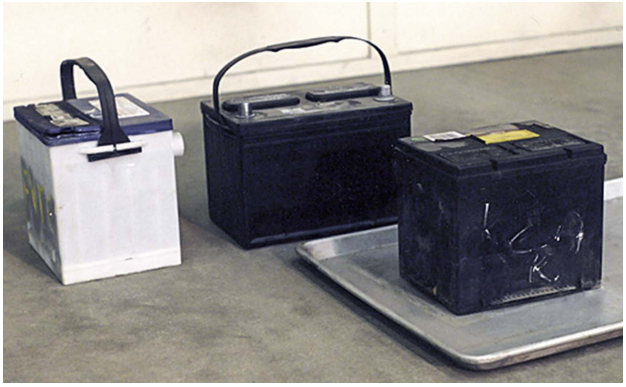
Hazardous waste must be stored separately from containers of unused material.



Empty drums must be labeled as such, and sent away for reconditioning or to be turned into scrap.

To safely handle empty drums:

- store them separate from full drums.
- cap and label “Empty.”
- send them back to the supplier for reconditioning or to be sold for scrap.
- do not sell them to the general public.
- do not dispose of empty drums or containers in public or private landfills.
- follow all federal and local regulations governing disposal.



Keep used batteries separate from other wastes, ideally in a separate room.

To safely store used lead-acid batteries:

- store separately from other wastes and in an area without a floor drain.
- choose a storage area that is well ventilated.
- store in a separate room, on pallets, on an acid-resistant floor. Storing batteries on pallets makes it easier to see if the batteries are leaking. If a battery is cracked or leaking, store it in an acid-resistant container.
- inspect stored batteries weekly. Document each inspection.

Use a trade-in / trade-out policy with a vendor to avoid improper disposal of batteries.

Waste oil is one hazardous waste that might be able to be treated on-site.

All hazardous waste must be safely stored on site until it is disposed of permanently. Permanent disposal methods include:

- on-site treatment.
- shipment to a commercial treatment, storage, or disposal facility.
- shipment to a recycling facility.

With the possible exceptions of burning used oil as heating fuel, or recycling wash solvents (allowed in some locations), on-site treatment is not feasible for most collision repair facilities.

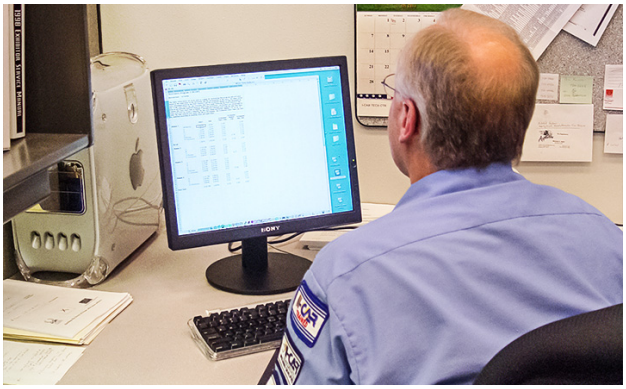
ABC Waste Haulers
124 Pine Road
Anytown, USA

Reference List:
PDQ Collision (123)-456-7890
XYZ Body Shop (098)-765-4321

Make sure the person hired to haul the shop's hazardous waste has credentials.

Commercial hauling of hazardous waste is the method commonly used by collision repair facilities. When choosing a hazardous waste hauler:

- ask for references from other businesses, trade associations, and environmental agencies.
- ask for credentials, such as an identification number.
- check expiration dates on proof of insurance and necessary permits.
- confirm that all required licenses are current.



Some hazardous waste records, such as hauling records and some required reports, must be kept for three years.

Records that require keeping for three years include:

- manifests, or hauling record sheets.
- required reports.
- inspection reports.
- chemical test results, if any.

Land ban notices require keeping for five years.

Module Wrap Up

Topics discussed in this module included:

- different types of hazardous wastes in a collision repair facility.
- different regulations for how to handle different types of hazardous waste.
- storage and disposal requirements for hazardous waste.