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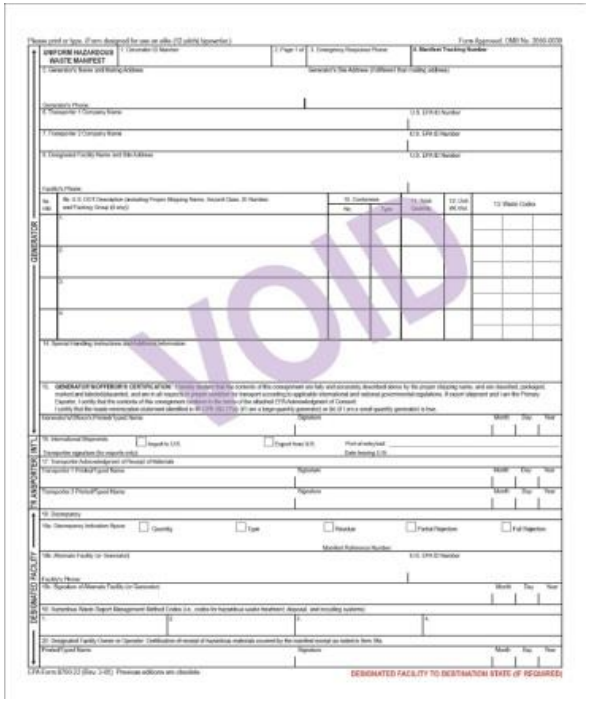
# • TRAINING POWERPOINT

- Department of Transportation Handling Hazardous Materials:

- Packaging
- Labeling
- Marking
- Manifesting
- Placarding





# Regulatory Overview

If anyone has ever tried to read the Code of Federal Regulations, you'll know it's no easy chore. Listed below is where to look for information regarding a specific agency.

- **What is a CFR?**

Code of Federal Regulations

- **What is Title 49 CFR?**

DOT Code of Federal Regulations (Safety in transit)

- **What is Title 29 CFR?**

OSHA Code of Federal Regulations (Safety of workers and people)

- **What is Title 40 CFR?**

EPA Code of Federal Regulations (air, land, water)

# Other Training Regulations

- OSHA
- EPA
- NFPA

WHAT DO THESE ACRONYMS STAND FOR?

# Acronyms

**ASOS-Automated Surface Observation System**

**CERCLA-Comprehensive Environmental Response and Compensation Liability Act**

**CFR-Code of Federal Regulations**

**CHEMTREC-Chemical Manufacturers Transportation Emergency Center**

**CONUS-Continental United States**

**COTR-Contracting Officer's Technical Representative**

**DOT-Department of Transportation**

**EPA-Environmental Protection Agency**

**ERG-Emergency Response Guidebook**

**HM- Hazardous Material**

**HMR-Hazardous Materials Regulations**

**HMT-Hazardous Materials Table**

**HMTA-Hazardous Materials Transportation Act**

**HMTUSA-Hazardous Materials Transportation Uniform Safety Act**

**LARC-Limited Access Remote Collector**

**MCE-Mercury Containing Equipment**

**n.o.s.-not otherwise specified**

**NWS-National Weather Service**

**NWSH-National Weather Service Headquarters**

# Acronyms additional

**NAPA-NATIONAL FIRE PROTECTION AGENCY**

**OSHA-OCCUPATIONAL SAFETY HEALTH ASSOCIATION**

**ORM-Other Regulated Material**

**PG-Packaging Group**

**RCRA-Resource Conservation and Recovery Act**

**RDA-Radar Data Acquisition**

**RQ-Reportable Quantity**

**TSDF-Treatment, Storage, and Disposal Facility**

**UN/NA-United Nations/North American (numbering system)**

# Regulations

- RCRA
- Goal to promote protection of human health and the environment
- Conserve valuable material and energy resources

- Federal Regulations
- RCRA requires the EPA to promulgate and enforce regulations regarding the management of hazardous waste
  - Mandatory procedures for compliance with RCRA, must be followed by facilities were haz waste is accumulated, transported, treated or disposed

- Cradle to Grave
- Compiled into Title 40 CFR

# Hazardous Communication/Right-to-Know 29CFR 1910.1200

- Right-to-Know
- SDS (1-16 sections)
  - Example Attached


- Right of employees to request
- Right of union reps to request
- Employer must have SDS “readily available”
- Employer must have an SDS for every hazardous chemical used
- Employer must provide SDS to employee or union rep when requested

# GHS Pictograms & Hazard Classes
see attached

# NFPA Section 704 Marking System


## HEALTH HAZARD

4 - Deadly
3 - Extreme danger
2 - Hazardous
1 - Slightly hazardous
0 - Normal material

## FIRE HAZARD

Flash Point
4 - Below 73° F
3 - Below 100° F
2 - Below 200° F
1 - Above 200° F
0 - Will not burn

## SPECIFIC HAZARD

| | |
|---|---|
| Oxidizer | OXY |
| Acid | ACID |
| Alkali | ALK |
| Corrosive | COR |
| Use NO WATER | W |
| Radiation Hazard | ☢ |

## REACTIVITY

4 - May detonate
3 - Shock and heat may detonate
2 - Violent Chemical change
1 - Unstable if heated
0 - Stable

# DOT Training Requirements
# 49 CFR 172 subpart H

**Apply to Employees who:**

- Determine hazard class
- Design, produce or sell packaging for HM
- Choose proper packaging
- Fill or put HM in packaging
- Close or secure closures
- Mark or label
- Select, provide or affix placards
- Fill out shipping papers
- Driver of vehicle carrying hazmat

**Apply Employees who:**

- Review shipping papers to verify compliance
- Certify HM are in proper condition for transport
- Load, segregate or unload HM
- Transfer HM from one package to another

Employers are responsible for compliance

Initial training is required and must be completed within 90 days of employment

Or when new regulation is finalized

Or changes job function within 90 days

Refresher every 3 years (by end of calendar month)

# Packaging

- Only containers that meet DOT specifications or UN performance standards may be used for the transportation of hazardous materials (see attached packaging codes flyer)
- **General Packaging Requirements:**
- Regulations, goal is to prevent releases of hazardous materials
- *It is the shippers' responsibility to select appropriate containers, load and close them securely, and secured aboard transport.*
- **Shipper's Responsibility:**
- Compatibility with contents
- Effectiveness of its closure
- Containers filling limits
- To choose authorized packaging that meet 49 CFR 173.24

# Container Condition Requirements

Containers used for hazardous materials and wastes must be in good condition

Containers must be free of

Severe rusting

Sharp edged creases or dents

Bulging heads by over pressuring

Severe structural defects

**Container Management Procedures**

Containers must not be stored or handled in a manner that may cause them to rupture or leak

**Protect from freezing**

Many materials go through a freeze/thaw cycle during changing weather conditions

Causes metal stress

Can result in leaking containers

# Packing Groups

- PG reflect the degree of danger
- PG 1 indicates great danger
- PG 2 indicates moderate danger
- PG 3 indicates minor danger

- PG correlates to the strength of the package
- The higher danger the stronger packaging used
- Assists first responder in determining hazards and risks present

# UN HAZARD CODES

- Each UN hazard code number has a hazard identifier, which encodes the general hazard class and subdivision. Each hazard code is divided further into sub-classes. As an example, the six hazard code divisions for Class One hazards are mass explosion, fragment producing non mass explosion, minor blast or fragment producing mass fire, moderate fore with no blast or fragment, very insensitive explosive substance (with a mass explosion hazard) and explosive article (extremely insensitive).


HAZARDOUS
WASTE
HANDLE WITH CARE!


NON-
HAZARDOUS
WASTE
OPTIONAL INFORMATION:
SHIPPER
ADDRESS
CITY, STATE, ZIP
CONTENTS
NON-HAZARDOUS WASTE

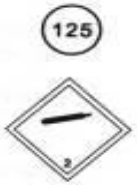
# Labeling

## TABLE OF PLACARDS AND INITIAL

USE THIS TABLE ONLY IF MATERIALS CANNOT BE SPECIFICALLY IDENTIFIED BY









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## RESPONSE GUIDES TO USE ON-SCENE

USING THE SHIPPING DOCUMENT, NUMBERED PLACARD, OR ORANGE PANEL NUMBER















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Marking and Labeling/Placarding


## Definition - What does *Hazard Codes* mean?

The United States Department of Transport Hazard Codes are a classification of dangerous materials relating to transportation. It is based on United Nations recommendations.

**The classifications are:**

**9 Hazard Classes**

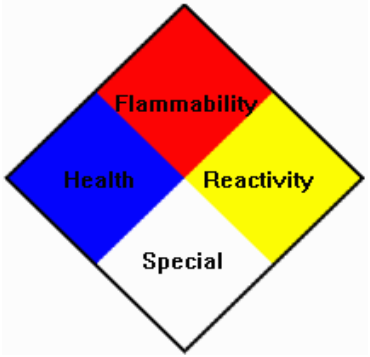
- Class 1 Explosive
- Class 2 Gas
- Class 3 Flammable Liquid
- Class 4 Flammable Solid
- Class 5 Oxidizer
- Class 6 Poison / Toxic
- Class 7 Radioactive
- Class 8 Corrosive
- Class 9 Miscellaneous

# Markings/Colors

- Markings



- National Fire Protection Agency (NFPA) 704 labels



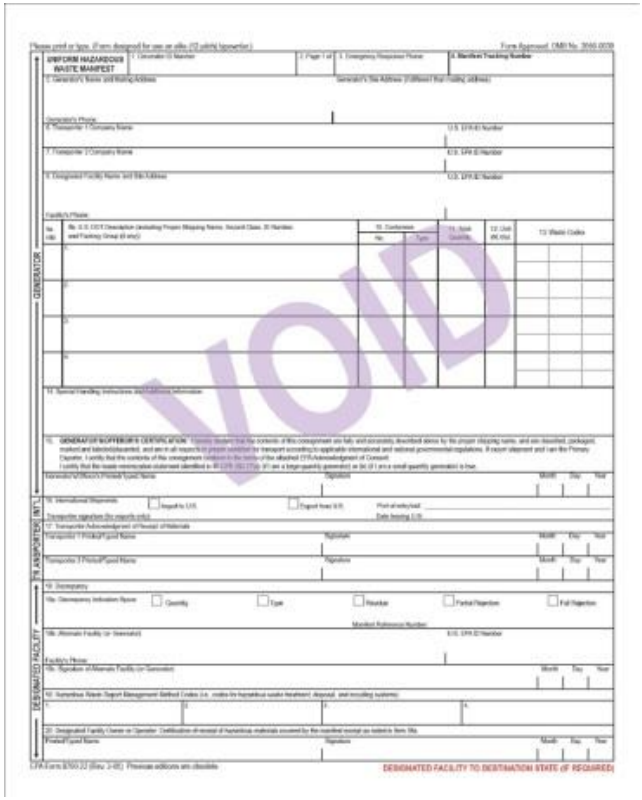

- Color of container (compressed gasses)


# Container Shape

- Drums
- Tanks
- Cylinders
- Boxes
- Container construction
  - Plastic
  - Stainless steel
  - Metal
  - Glass

  - **SEE HANDOUT ON PACKAGING**

Shipping Papers Subject to manifest requirements for Hazardous Materials/Wastes




- **Preparation**
- A trained shipper is responsible for properly completing the appropriate shipping documents
- **Types of Shipping Papers**
- Bill of Lading
- Air Bill
- EPA Hazardous Waste Manifest
- **Shipping Paper Requirements**
- Must include the following:
- Basic description
- Total quantity including unit of measure
- Shipper's certification statement
- Shipper's signature
- Emergency information
- Each person who offers a waste material for transport must certify that the material is offered in accordance with the HMR by printing on the shipping paper
- In addition, the emergency response telephone number must be placed on the shipping paperwork.

# Placarding

# Placard the Vehicle

- Shipper is responsible for determining and providing the necessary placards
- Placement of Placards
- Readily visible from the direction it faces (except where coupled)
- Placement of Placards
- The required placarding of the front of a motor vehicle may be on the front of a tractor instead of or in addition to the front of the cargo body
- Placard Exceptions
- Not required for:
- Infectious substances
- Limited Quantities identified on shipping papers
- Hermetically sealed in containers in accordance with173.13
- HM packaged as small quantities under 173.4
- combustible liquids in non-bulk containers
- PIH boxes

# Basic Description For Waste Shipping Paperwork (see attached manifest example)

- Must be in a set sequence
- 1.UN Identification number
- 2.Proper shipping name
- 3.Primary hazard / division
- 4.Subsidiary hazard / division
- 5.Packing group

- **Example:**
- UN3249, Waste Medicine, solid, toxic, n.o.s. (Warfarin), 6.1, PG II, **P001**

# Emergency Response Information

- HM shippers must provide a 24-hr ER phone number
- Number must appear on shipping papers
- Must be monitored at all times while in a phases of transport
- Pagers or call back numbers are not acceptable

  - Each person who offers a hazardous material for transport must certify that the material is offered in accordance with the HMR by printing on the shipping paper either of the following certifications:

- "This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation"

- "I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packed, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national government regulations"

- **Security:** Closure is a major factor in incidents investigated by DOT caused by human error in closures of packages
- Bung tightening -Outlet valves secured
- A container of hazardous materials or waste must always be kept closed except when it is necessary to add or remove materials or waste
- Closures on packages shall be designed and closed such that under conditions normally incident to transportation there is no identifiable release of hazardous materials to the environment
- Open head drum considered closed when lid on ring in place and bolt tightened to spec's
- **Filling**: Do not overfill container
- Overfilling can result in bulging heads and damage integrity of the container
- Safety hazard for personnel using the container
- Concern for both bulk and non bulk containers
- **Venting:** Venting of packaging, to reduce internal pressure that may develop by the evolution of gas from the contents is permitted only when:
- Not transporting by aircraft
- Evolved gases are not poisonous, create flammable mixture with air, or be an asphyxiate under normal conditions
- Packaging is designed to preclude an un-intentional release of hazardous materials from the receptacle

# Hazardous Waste Shipments

Subject to manifest requirements of 40 CFR 262 (EPA)

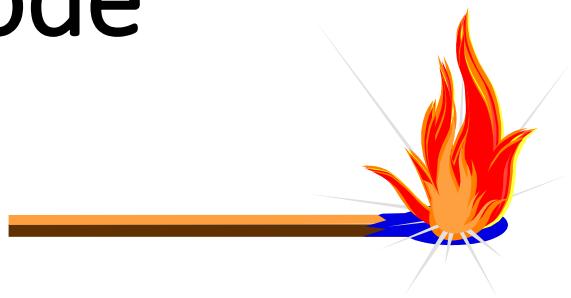
EPA definition: a solid waste that displays a hazardous characteristic or a waste that is on one of the hazardous waste lists.

All hazardous wastes are regulated as hazardous materials

**In addition to checking the *lists of hazardous wastes in the regulations*, a generator must determine if a waste exhibits one of the following characteristics:**

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

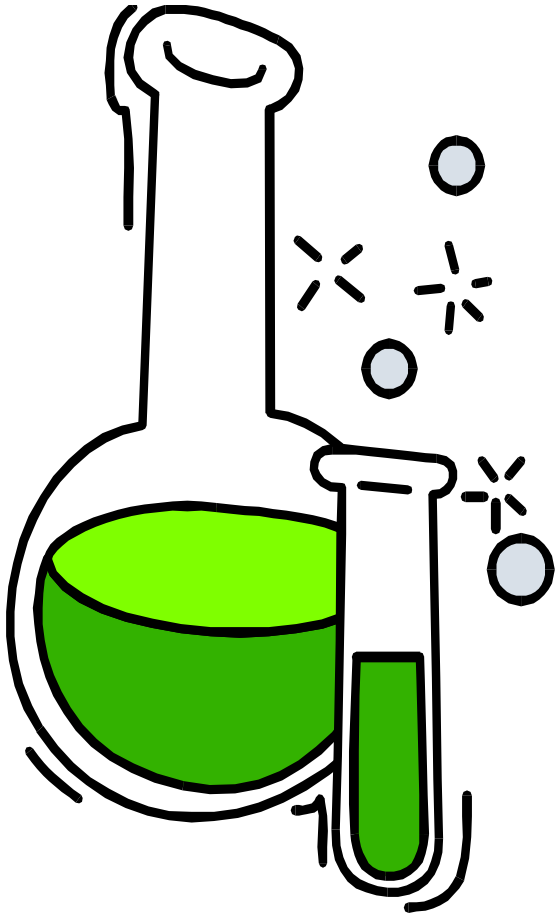
# Ignitability – EPA D001 code



- Liquids with a flash point less than 140° F (60 °C)
- Solids that can ignite under standard conditions
- Ignitable compressed gases or oxidizers

# Corrosivity – D002 code

- Liquids that have a pH less than or equal to 2.0 or greater than or equal to 12.5
- Liquids that corrode steel at a rate greater than 0.25 inches per year at a test temperature



# Reactivity- D003 code

- Contains Cyanides or Sulfides which can generate toxic fumes if exposed to pH conditions between 2.0 and 12.5
- React  violently to form potentially explosive mixtures or can generate toxic gases if mixed with water
- Are normally unstable and readily undergo violent change without detonating
- Can detonate or explode if heated or exposed to a strong igniting source
- Can detonate or explode under standard conditions
- Are classified by the Federal Department of Transportation as explosives

# TCLP Toxicity –D004-D043 codes

- A waste exhibits the characteristics of TCLP Toxicity if its extract [ from a precise extraction procedure called the Toxicity Characteristic Leaching Procedure (TCLP) ] contains any of 25 listed organic compounds, 8 metals, 4 pesticides and 2 herbicides in concentrations equal to or greater than the specified limits

# EXAMPLE

## Trichloroethylene (T.C.E.) may be:

- F001 solvent, if used in degreasing
- F002 solvent, if used for other solvent applications
- K030 if heavy ends from T.C.E. production
- U228 if discarded commercial chemical product, off-spec material, container or spill residue
- D040 if T.C.E.. concentration in TCLP extract>.5PPM, regardless of origin


# What are Universal Wastes? (cont.)

- Universal Wastes are certain hazardous wastes that are universally generated in large quantities by industrial facilities but present a <u>limited hazard</u>
- They are exempt from the hazardous waste regulations but must still be managed separately from general trash.

There are four (4) categories of universal waste, which include:

- lamps;
- batteries;
- pesticides; and
- mercury-containing equipment.


## Packaging/Labeling Universal Waste Bulbs and Batteries

1. Label universal waste containers with a standard "**Universal Waste Label**", noting the accumulation start date on the label.

To maintain Small Generator status, do not accumulate more than 5,000 kilograms (11,023 pounds) of universal waste throughout your facility at any one time.

***NOTE: Universal Waste may not be stored for longer than***

***1 year after accumulation start date.***

# Spills

1. Isolate spill area and do not allow anyone to walk through the area. Use barrier tape if necessary.

2. Notify the supervisor of the area of the spill.

- 3. All spill cleanup materials must be disposed of as hazardous waste spill debris.

# *What is toxicology?*

- *The study of the negative effects of chemicals on living things*
- *A chemical is considered toxic depending on*
  - *How much of it is necessary to cause harm*
  - *How easily it can enter the body*
  - ***Almost anything - even water - can cause illness if taken in large enough quantity. On the other hand, all hazardous chemicals are safe if the quantity taken into the body is small enough.***

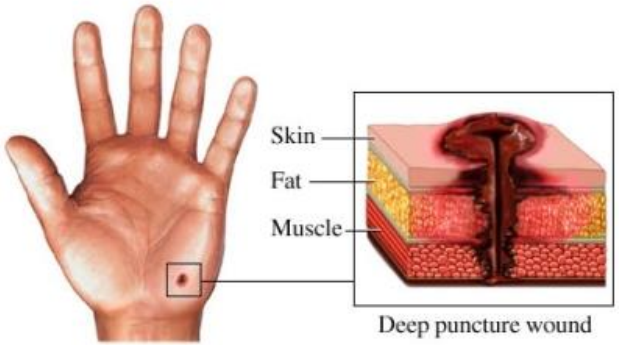
# Routes of Entry

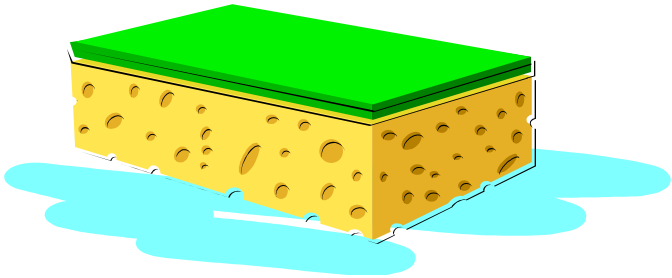
Inhalation

ingestion

Skin contact

Absorption



# Exposure  Chronic

- Long duration, low level exposure where the rate of exposure exceeds the bodies capacity for detoxification
  - Reproductive toxins
  - carcinogens

# Exposure  Acute


- A single exposure to a toxic substance which may result in severe biological harm or death. Acute exposures are usually characterized as lasting no longer than a day, as compared to longer, continuing exposure over a period of time.

# Senses

- Visual inspection
  - Bulging drums, stressed vegetation, etc.
- Audio observation
  - Popping drums, venting tanks, high pitch
- Do not rely on sense of smell, touch, or taste
  - Observations from victims may provide clues to the hazardous materials
- Don't forget to use common sense!