

Transportation of Hazardous Materials

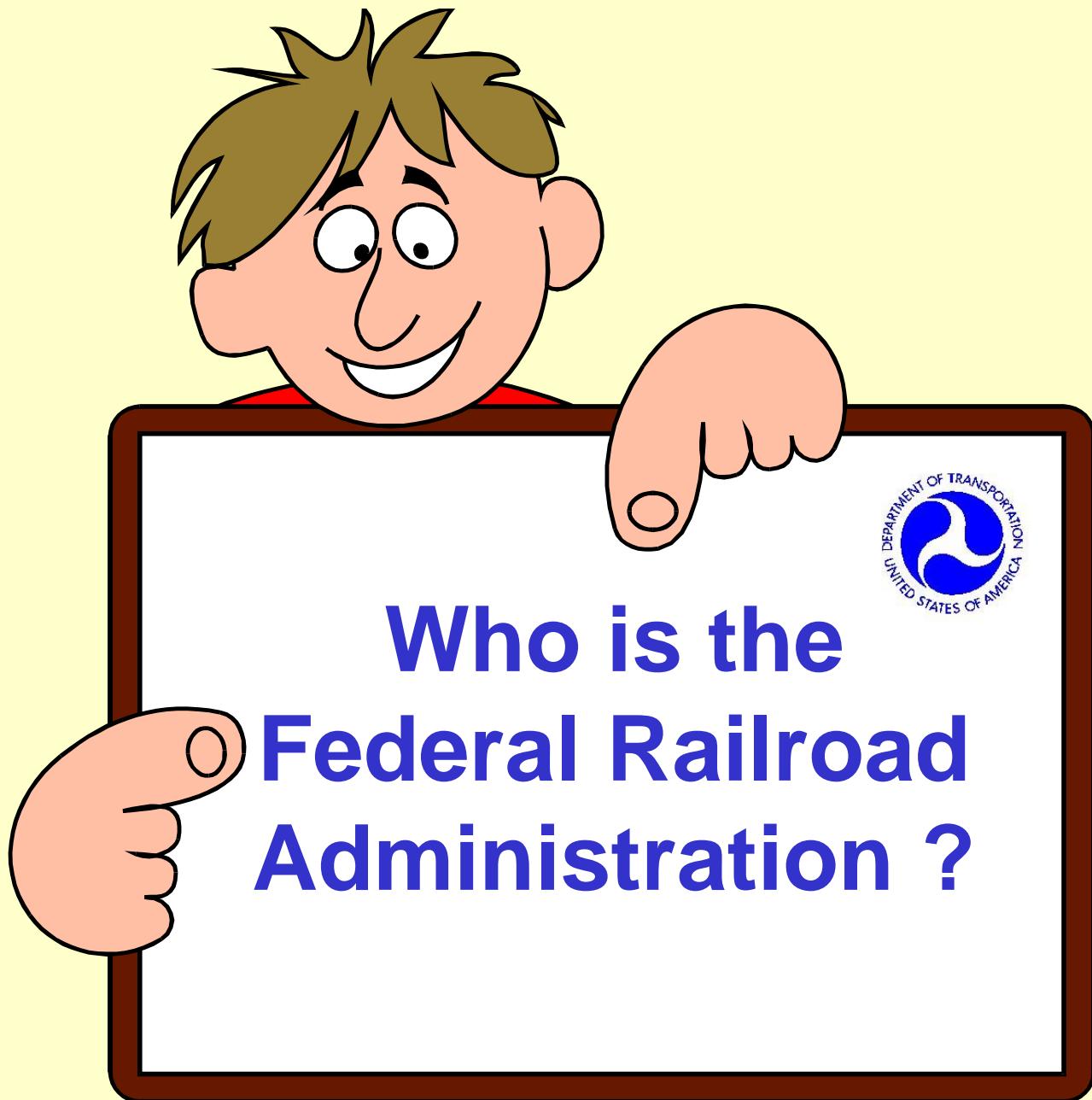


Why do we have hazardous materials safety regulations?



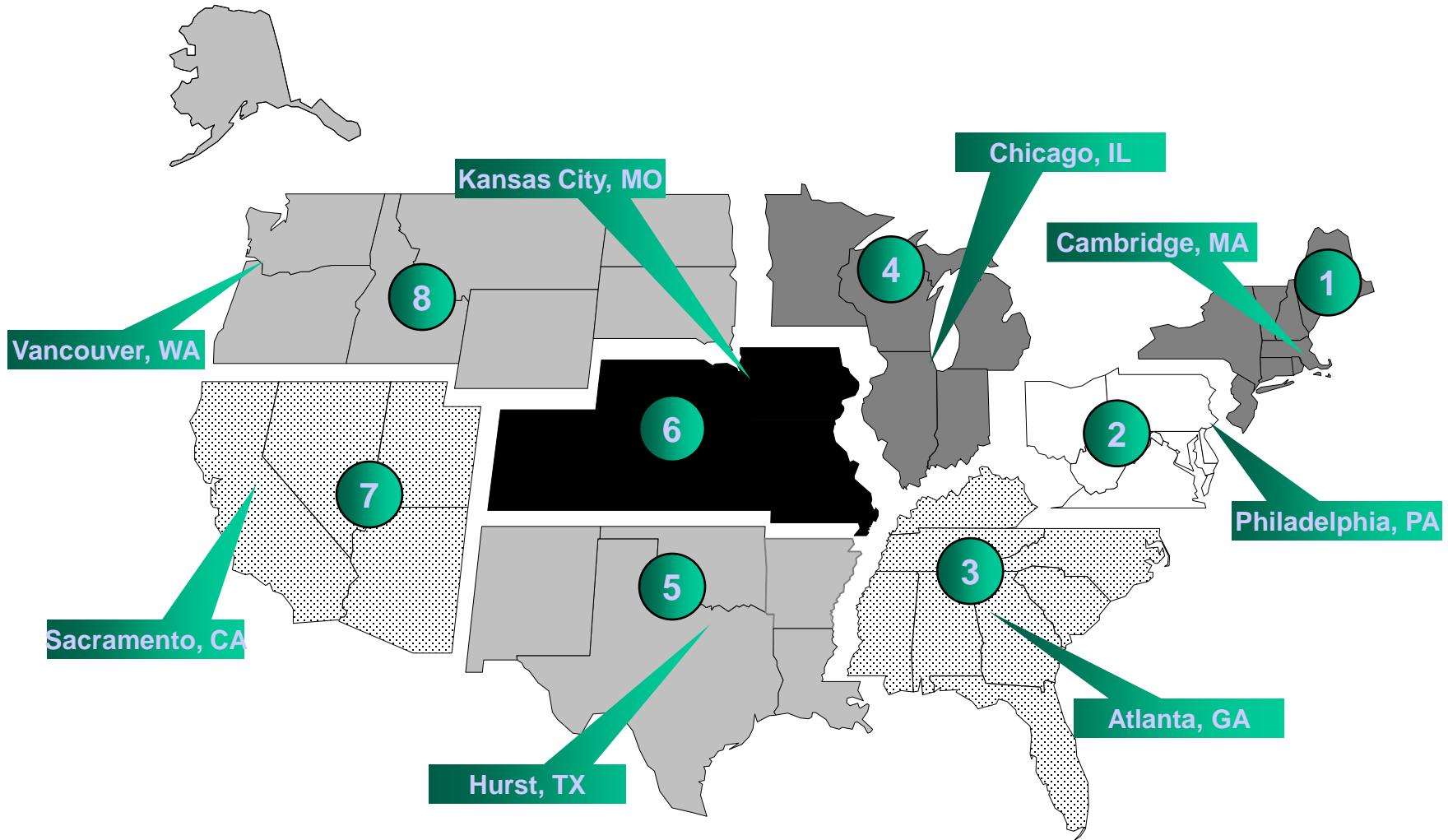
Where do I find federal Hazmat transportation regulations?

	<p>Title 49 CFR Parts 100-185</p> <ul style="list-style-type: none">○ Part 107 - Hazmat Program Procedures○ Part 171 – General Information○ Part 172 – Hazmat Communications/Training○ Part 173 – Shipper/Packaging Requirements○ Part 174 – Hazmat by Rail○ Part 178 – Specifications for Non-Bulk & Portable Tanks○ Part 179 – Specifications for Tank Cars○ Part 180 – Qualification & Maintenance for Tank Cars & IBC's
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**Who is the
Federal Railroad
Administration ?**

Federal Railroad Administration Regions



Hazardous
Materials

Grade
Crossing
Safety

Operating
Practices

Federal Railroad Administration

Track

Motive
Power &
Equipment

Signal

FRA's Role



- 1) Enforce Federal Regulations**
- 2) Investigate accidents, incidents & injuries**
- 3) Promote a safer, more productive rail industry**
- 4) Provide funding for rail system development & testing of new, improved equipment**
- 5) Work in Partnership with the Rail Industry**
- 6) Facilitate commerce**

FRA's Web Site

FRA Web Address: fra.dot.gov

- ✓ Team – Administrators/ Dept. Personnel/ phone #/ address
- ✓ Click on **Office of Safety** → **Hazardous Materials**
 - ✓ Staff Director / Specialist / Phones / Faxes
 - ✓ FRA One Time Movement Approval Requests
 - ✓ Current programs in progress
- ✓ Regulations, Emergency Orders & Notices
- ✓ Current HOT items !
- ✓ Research & Development
- ✓ High Speed Ground Transportation

Registration of Persons Who Offer or Transport Hazmat [CFR 107.601]

The registration & fee requirements of this subpart apply to any person who **offers for transportation**, or **transports**, in foreign, interstate or intrastate commerce:

- (a) Any highway route-controlled quantity of **Class 7** (Radioactive)
- (b) More than **55 lbs.** Of Div. 1.1, 1.2 or 1.3
- (c) More than **1 liter** (1.06 qts) per package of **PIH, Zone A**
- (d) **A bulk packaging** of Hazmat for liquids or gases having a capacity equal to or greater than 13,248 L (**3,500 gals**) or more than 13.24 cubic meters (**468 cubic feet**) for solids, *or*
- (e) A shipment in other than a bulk packaging of 2,268 kg (**5000 lbs**) gross wt. or more of one class of hazmat for which placarding is required for that class.
- (f) A quantity of hazmat that requires **placarding**, except farming operations.

Exceptions to Registering

- ❑ An agency of the **Federal Government**
- ❑ An agency of the **State**
- ❑ An agency of a political subdivision of a State
- ❑ An employee of any of the agencies above
- ❑ A hazmat employee if the vehicle that transports hazmat is leased to a registered motor carrier under a 30-day or longer lease per 49 CFR Part 1057
- ❑ A person domiciled outside the U.S., who offers solely from a location outside the U.S., provided that country does not require those persons to register with DOT in the U.S.

DOT Hazmat Registration Certificate

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION



HAZARDOUS MATERIALS
CERTIFICATE OF REGISTRATION

Registrant:
**Dirty Dan's Dangerous Products, Inc.
2300 Disaster Drive
Deserted, Delaware 91100**

This certifies that the registrant is registered with the U.S. Department of Transportation as required by 49 CFR Part 107, Subpart G.

This certificate is issued under the authority of Section 106(c)(1) of the Hazardous Materials Transportation Act, 49 App. U.S.C. 1801, et seq. It is unlawful to alter or falsify this document.

Reg. No.: 062593 003 036B Issued: 06/28/00 Expires: 06/30/01

Recordkeeping Requirements for the Registration Program

The following must be maintained at the principal place of business for a period of three years from the date of issuance of this Certificate of Registration:

- (1) A copy of the registration statement filed with RSPA, and
- (2) This Certificate of Registration.

Each person subject to the registration requirement must furnish that person's Certificate of Registration (or a copy) and all other records and information pertaining to the information contained in the registration statement to an authorized representative or special agent of the U.S. Department of Transportation upon request.

Each motor carrier (private or for-hire) subject to the registration requirement must keep a copy of that carrier's current Certificate of Registration or another document bearing the registration number identified as the "U.S. DOT Hazmat Reg. No." in each truck and truck tractor (trailers and semi-trailers not included) used to transport hazardous materials subject to the registration requirement. The Certificate of Registration or document bearing the registration number must be made available, upon request, to enforcement personnel.

For information, contact the Hazardous Materials Registration Manager, DHM-60 Research and Special Programs Administration, U.S. Department of Transportation, 400 Seventh Street, SW, Washington, DC 20590, telephone (202)366-4109.

The Person in Physical Possession of a Hazardous Material has the Responsibility to Report Hazmat Incidents !!!



Reporting Hazmat Incidents

* Immediate Notification *

(No later than 12 hours)

- As a direct result of Hazmat:
 - A person is **killed** *or,*
 - Injury requiring **hospitalization**
 - Estimated damages > \$50,000
 - **Evacuation** lasting > 1 hour
 - **Radioactive** contamination
 - **Etiologic** contamination
 - Release of a **Marine Pollutant**
> 119 gal (liquid) or 882 lbs.
(solid)



Reporting Hazmat Incidents

* In Writing or PHMSA Web *

Carriers who transport hazmat shall report on **DOT Form F 5800.1** to the DOT within **30 days** of the date of discovery, each incident that occurs during transportation* involving an unintentional release of hazmat from a packaging.

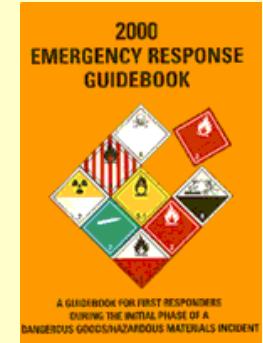
<http://www.phmsa.dot.gov/hazmat/incident-report>

* Definition of transportation means the movement of property, including the loading, unloading, or storage incidental to the movement

Pipeline Hazardous Materials Safety Administration

PHMSA Web page: phmsa.dot.gov

- **Form 5800.1** – Hazmat Incident Reporting (*Form & Instructions*)
- **DOT Registration** – (*Form & Instructions*)
- **DOT Special Permits Exemptions & Approvals**
- Hazmat Regulations e-cfr – (**49 CFR Parts 100-185**)
- Emergency Response Guidebook & app – (**ERG 2012**)
- Hazmat **Interpretations**
- Hazmat **Incident** Statistics
- Penalty Actions Report
- Hazmat Question Phone Number or Web Question
- Available Hazmat Publications, training modules, & Reports
- Large list of other transportation links



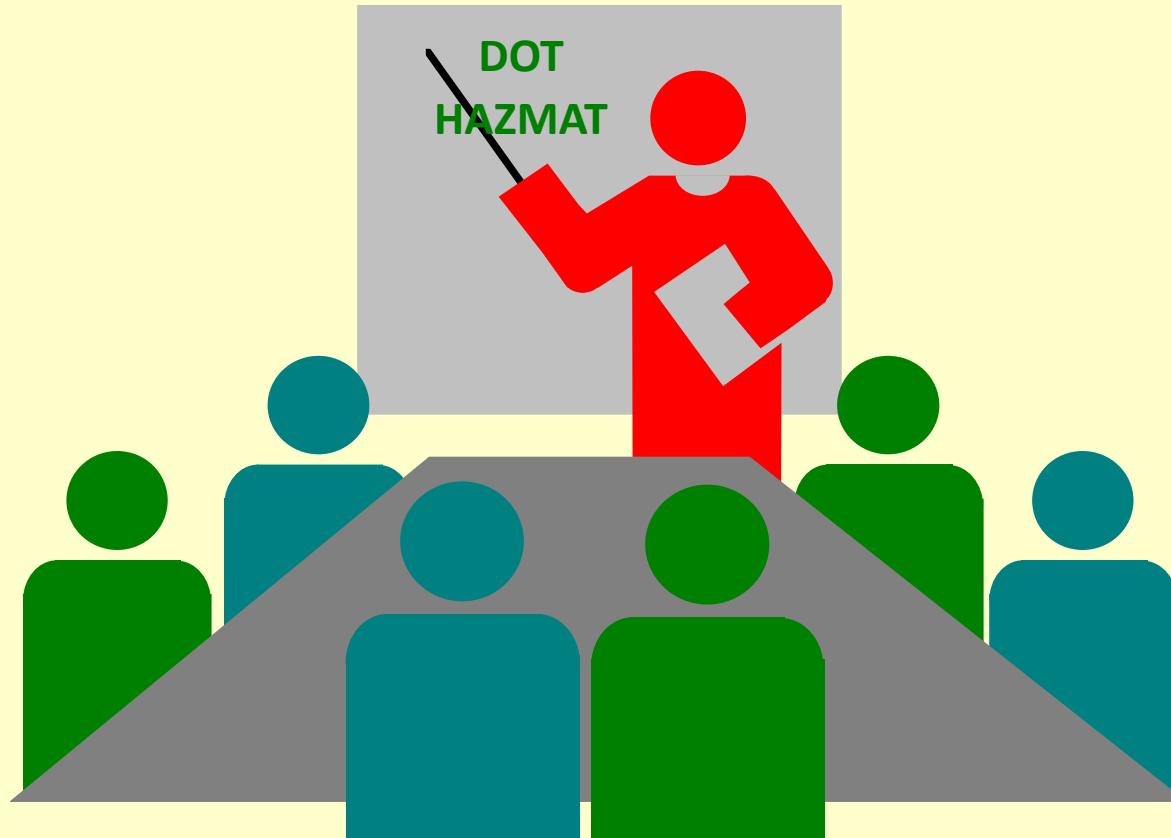
Civil Penalties



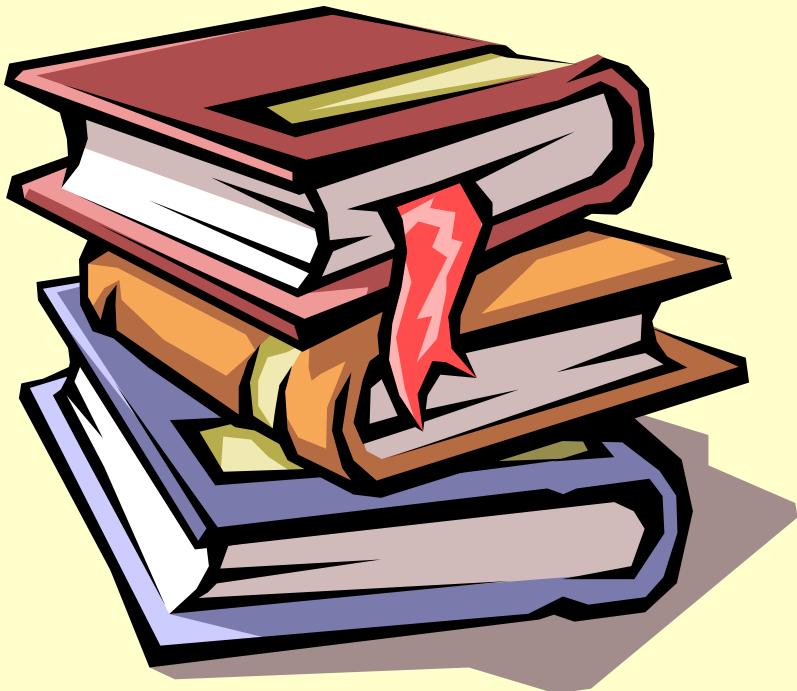
A person who knowingly violates a requirement of the Federal hazardous material transportation law is liable for a civil penalty of not more than \$75,000 and not less than \$450 for each violation. Each day of the violation constitutes a separate offense. Results in serious injury or death \$175,000

DOT Hazmat Training

49 CFR Part 172 Subpart H



Hazmat Employers must:



- Provide training
- Test employees
- Certify
- Develop & maintain records

Definition of a **Hazmat Employee**

- Loads, unloads or handles hazmat
- Prepares the shipment for transport
- Responsible for transportation safety
- Requalifies hazmat packagings
- Operates vehicles transporting hazmat



Hazmat Training Requirements

General Awareness / Familiarization

Basic generic hazmat training designed to provide the employee with sufficient information to recognize & identify hazardous materials consistent with the hazard communication standards.

Function – Specific

Specialized training designed to provide sufficient information, skills & knowledge of federal requirements for an individual to safely function in a particular job.

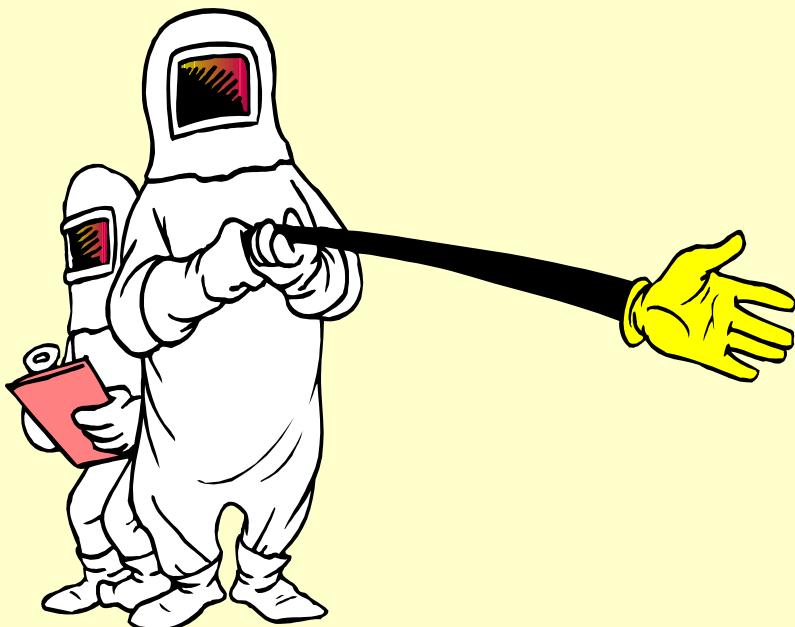
Safety

Designed for employees who handle or transport hazmat & persons with the potential for exposure to hazmat, as a result of a transportation accident. [** Those who repair & test hazmat packagings are not subject to the safety training requirements*]

Who May Provide the Training?

- **Company Employee**
- **Outside Training Firms**
- **Federal or State Agencies**
- **Colleges & Universities**
- **Any other organization that can meet
the objectives of the training
requirements**
- **Computer-based training programs**

Acceptable Methods of Accomplishing the Training & Testing



- Written
- Verbal
- Performance
- Combination
of these

Duplicate Training



New Hire



- New hazmat employees or an employee who changes job functions that requires DOT training “**may**” perform those functions **only under the direct supervision of a properly trained & knowledgeable hazmat employee.**
- DOT training received from other sources “**may**” be used to satisfy the training requirements; however, the current hazmat employer must determine that the DOT training previously received was adequate & the employer must still **certify** that the new hazmat employee has been trained & tested.
- The employer has **90 days** to complete the new hire’s DOT training !

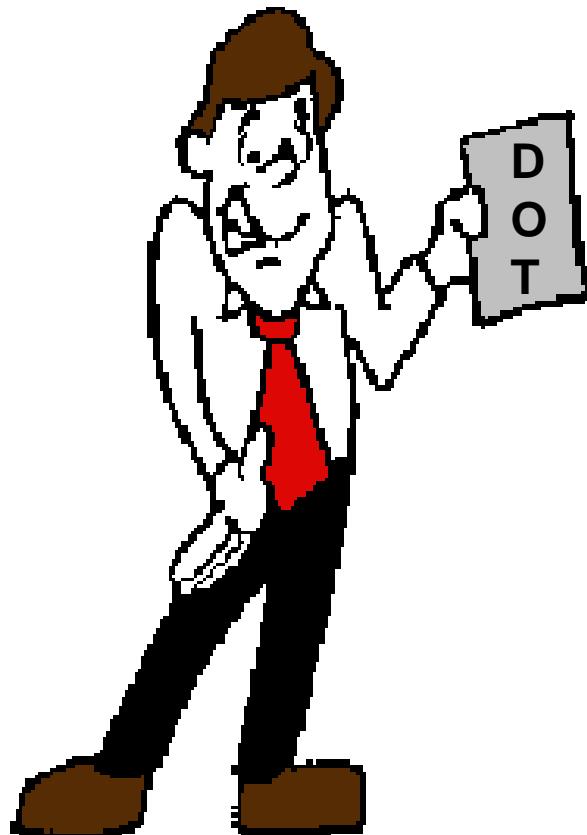
Recurrent DOT Training

- Hazmat employees are required to receive DOT hazmat training at least once every:

3 Years

- If the training in the 3 required areas (*Gen. Awareness, Function-Specific & Safety*) are completed on **separate dates**, then each area of training would have a separate anniversary date.
- If the training is provided in segments on separate dates, then the “**completion date of the training**” is determined by the employer based on the **last date** of the segmented training that satisfies the minimum DOT training requirements.

Recordkeeping



1. Hazmat employee's name
2. Most recent training completion date
3. A copy, description or location of the training materials
4. Name & address of the trainer(s)
5. Certification that the hazmat employee has been **trained** & **tested**

Certification of DOT Hazmat Training

- ✓ DOT requires that a hazmat employer must “**certify**” that the hazmat employee has been **trained** & **tested** per DOT requirements.
- ✓ A “**Certification**” is a formal assertion, in writing, that the employee has been trained & tested per DOT requirements.
- ✓ A **single** certification may be maintained on record that identifies the employees that were trained & tested.

Example

DOT Hazmat Training

Birdsong Enterprises, Inc.

Name of Employee	Training Completion Date		
	Gen. Awareness	Function-Specific	Safety Training
Billy Bob Birdsong, Sr	7-1-00	6-22-99	2-10-00
Billy Bob Birdsong II	7-7-00	8-12-99	4-10-01
Billy Bob Birdsong III	7-7-00	8-12-99	4-10-01

I certify that the above named hazmat employees have been trained & tested per 49 CFR Part 172 Subpart H.

Belinda B. Birdsong

(Certification Signature)

Ona Ornsby, 600 Chipmunk Circle, Shrub, TX 72663

(Name & Address of Trainer(s))

Training Room, Main Office Bldg., Birdsong Enterprises, Inc.

(Location of Training Materials)

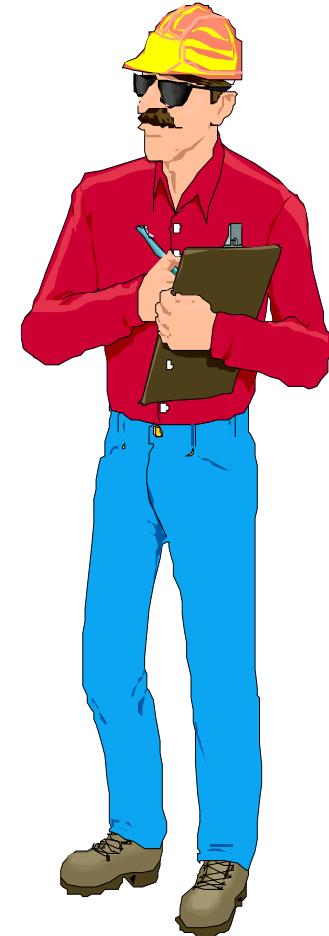
Contractors Sub-contractors / Agents

✓ Each **Contracting** company that performs a service for a primary company is responsible to see that each of their hazmat employees are **trained** & **tested** per DOT requirements.

– **CFR 172.702 (a)**

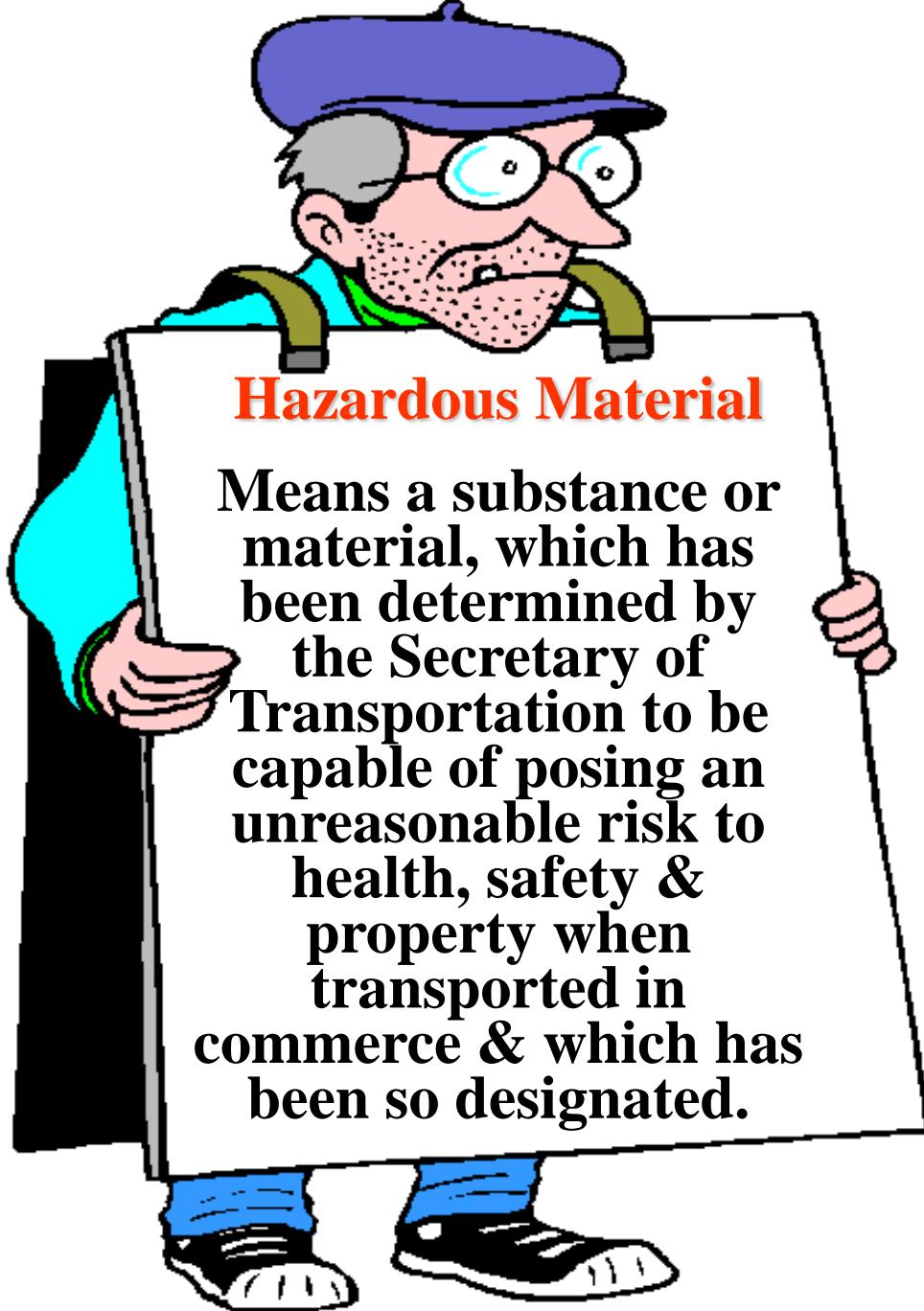
✓ It is the duty of each person who **offers** hazmat for transportation to instruct each of his officers, **agents** & employees having any responsibility for preparing hazmat for shipment as to applicable regulations.

– **CFR 173.1 (b)**





Exactly
what is a
**Hazardous
Material?**



Hazardous Material

Means a substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety & property when transported in commerce & which has been so designated.

Elevated
Temperature
Material

Hazmat
Table by
Name

Meets
Definition
of a
Hazard
Class

Hazardous Material

Marine
Pollutant

Hazardous
Waste

Hazardous
Substance

§172.101 Hazardous Materials Table

SYMBOLS (1)	Hazardous Materials Description and Proper Shipping Name (2)	Hazard Class or Division (3)	Identification Number (4)	PG (5)	Label Codes (6)
	Acetone	3	UN1090	II	3
D	Asphalt, at or above its flashpoint	3	NA1990	III	3
	Barium chlorate	5.1	UN1445	II	5.1, 6.1

If it's listed by Name in the Table, then it is a Hazardous Material !

If the product meets the definition of a hazard class, but is not listed in the Hazmat Table by Name, then it is a Hazardous Material !



EPA LIST



Hazardous Substances

If it meets all 3 requirements, then it's Hazmat!

A material (including its mixture & solutions) that:

1. Is listed in **Appendix A** to CFR 172.101
2. Is in a quantity, in **one package**, that equals or exceeds the **Reportable Quantity** in Appendix A
3. When in a mixture or solution is in a concentration by weight which **equals** or **exceeds** the concentration corresponding to the RQ of the material as shown:

RQ (Pounds)	Concentration by Weight Percent	Concentration by Weight Parts per Million
5000	10	100,000
1000	2	20,000
100	.2	2,000
10	.02	200
1	.002	20

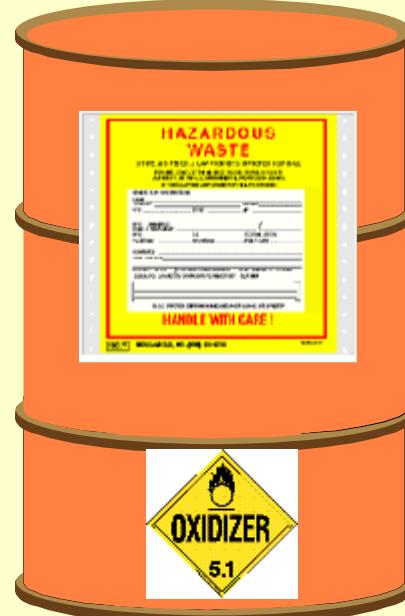
Appendix A to § 172.101

List of Hazardous Substances & Other Reportable Quantities

TABLE 1 – Hazardous Substances Other Than Radionuclides

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kg)
Acrolein	1 (.454)
Acetone cyanohydrin	10 (4.54)
Ammonia	100 (45.4)
Ally Chloride	1000 (454)
Acetone	5000 (2270)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
F001 Spent halogenated solvents	10 (4.54)
K002 Wastewater treatment sludge	10 (4.54)

Hazardous Waste



If it requires a
Hazardous
Waste Manifest,
then it's Hazmat!

An **EPA** regulated material
offered & transported by the use
of a **Hazardous Waste Manifest**
under *Title 40 CFR Part 262*.

Marine Pollutant



A material which is listed in **Appendix B** of CFR 172.101 & when in a solution or mixture of 1 or more marine pollutants is packaged in a concentration which **equals** or **exceeds**:

- (1) **10%** by **weight** of the solution or mixture; or
- (2) **1%** by **weight** of the solution or mixture that are identified as Severe Marine Pollutants (pp) in the appendix.

If it meets the definition,
then it's Hazmat!

Appendix B to § 172.101

Example

List of Marine Pollutants	
(1) S.M.P.	(2) Marine Pollutants
	Acetal
PP	Aldrin
	Chlorine
PP	DDT

*PP – denotes a “**Severe Marine Pollutant**” in Column 1



Elevated Temperature Material



A material when offered for transportation is:

- At or above **212°F** for a liquid
- At or above **464°F** for a solid, or
- Intentionally heated at or above its **flash point**

If it meets the definition,
then it's Hazmat!

THE

HAZMAT



Hazmat Table – CFR 172.101

Column 1 – Symbols

- + - Fixes the proper shipping name, haz. class & packing group without regard to whether the material meets any other hazard class.
- A - Applicable to shipments offered or intended by *Air*.
- D - *Domestic* transportation & may not be appropriate for International.
- G - Identifies proper shipping names requiring *technical names* entered in parentheses, in association with the basic description.
- I - *International* transportation, but may be used for Domestic.
- W - Applicable to shipments offered or intended by *Water*.

Hazmat Table – *Column 2*

Column 2 – Hazmat descriptions & Proper Shipping Names

- ✓ Shown in Roman type (**bold**), not *italics*
- ✓ May use singular or plural
- ✓ The word “**Poison**” & “**Toxic**” are interchangeable
- ✓ The abbreviation “**n.o.i.** or **n.o.i.b**” may be interchangeable with “**n.o.s.**”
- ✓ The word “**mono**” is optional in any shipping name
- ✓ For a Hazardous Waste shipment, the word “**Waste**” must be shown preceding the PSN (if not already shown in the PSN)
- ✓ If the PSN does not include the words “**mixture**” or “**solution**”, then (if applicable) the words **must** be added to the PSN (some exceptions apply)
- ✓ **Technical** or **Chemical** names may be required in addition to the PSN listed in column 2 [See CFR 172.203 (k)]
- ✓ The word “**liquid**” or “**solid**” may be added to the PSN when the material may have differing physical states

Hazmat Table – *Columns 3,4,5*

Column 3 – Hazard class or Division

- ✓ Primary hazard class associated with the corresponding PSN
- ✓ “**Forbidden**” means that the materials may not be offered or transported !!!
- ✓ If a Class 3 (Flammable liquid) material is reclassified to a “Combustible liquid”, then the applicable hazard class would be shown as “**Combustible liquid**”

Column 4 – Identification number

- ✓ **UN** notation is associated with both international & domestic transportation
- ✓ **NA** notation is not recognized for international transportation, except Canada

Column 5 – Packing group

- ✓ Indicates the **degree of danger** (I – Great, II – Medium, III – Minor)
- ✓ **Class 2** (gases), **Class 7** (Radioactive), Div. **6.2** (other than medical waste), **ORM-D** & some **Class 9** materials do not have packing groups assigned.

Hazmat Table – Columns 6,7,8

Column 6 – Labels

- ✓ Identifies the **labels** required for non-bulk packages
- ✓ The first code is indicative of the **primary hazard** & additional codes are indicative of **subsidiary hazards**
- ✓ Note that no label code is assigned to **Combustible liquids** !

Column 7 – Special provisions

- ✓ See **CFR 172.102** (Numeric codes are “**Multi-modal**” & apply to **Bulk** & **Non- bulk** packagings)
- ✓ Any packaging requirements in this column takes **precedence** over any requirements identified in Column 8 (Pkg authorizations)

Column 8 – Packaging authorizations (3 sub-columns)

- ✓ Identifies the **Section** of **Part 173** which contains the applicable requirements
- ✓ **8A** – contains **Exceptions**, if any. The word “**None**” means no packaging exceptions are authorized
- ✓ **8B** – references the applicable **Non-Bulk** packaging requirements
- ✓ **8C** – references the applicable **Bulk** packaging requirements

Hazmat Table – *Columns 9,10,11*

Column 9 – Quantity limitations

- ✓ Maximum quantities that may be offered for transportation in one package by **passenger-carrying aircraft or passenger-carrying railcar or cargo aircraft only**.

Column 10 – Vessel stowage requirements

- ✓ Specifies the authorized **stowage location** on board cargo & passenger vessels
- ✓ The meaning of each code in column **10A** is found in **CFR 172.101 (k)**
- ✓ The meaning of each code in column **10B** is found in **CFR 176.84**

Column 11 – Emergency Response Guidebook *(Offered only in BOE-6000)*

- ✓ Specifies the **ERG reference number**
- ✓ A “**P**” following the number indicates that the material may undergo violent polymerization if subjected to heat or contamination.

§172.101 Hazardous Materials Table

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§173.***)			Quantity limitations (see §§173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Acetaldehyde		3 UN1089	I	3	A3, B16, T11, None TP2, TP7	201	243		Forbidden	30 L E		
A	Acetaldehyde ammonia		9 UN1841	III	9	IB8, IP3, IP7, T1, TP33	155	204	240	200 kg	200 kg A		34
	Acetaldehyde oxime		3 UN2332	III	3	B1, IB3, T4, TP1	150	203	242	60 L	220 L A		
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass		8 UN2789	II	8, 3	A3, A6, A7, A10, B2, IB2, 154 T7, TP2	202	243		1 L	30 L A		



SIX

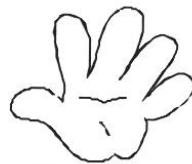


TEN

**How many
hazard classes
are there in the
U.S. ?**



EIGHT



FIVE

Hazard Classes / Divisions in the U.S.

Class 1	1.1	Explosives (with a mass explosion hazard)
	1.2	Explosives (with a projection hazard)
	1.3	Explosives (with predominately a fire hazard)
	1.4	Explosives (with no significant blast hazard)
	1.5	Very insensitive explosives (blasting agents)
	1.6	Extremely insensitive detonating substances
Class 2	2.1	Flammable Gas
	2.2	Non-flammable / Non-Poisonous Gas
	2.3	Poisonous Gas
Class 3		Flammable Liquid
Class 4	4.1	Flammable Solid
	4.2	Spontaneously Combustible Material
	4.3	Dangerous When Wet
Class 5	5.1	Oxidizer
	5.2	Organic Peroxide

Hazard Classes / Divisions in the U.S.

- | | | |
|---------------------------|---|--|
| Class 6 | 6.1 | Poisonous Material |
| | 6.2 | Infectious Substance (<i>Etiologic Agent</i>) |
| Class 7 | Radioactive Material | |
| Class 8 | Corrosive Material | |
| Class 9 | Miscellaneous Hazardous Material | |
| Combustible Liquid | | |
| ORM-D | Consumer Commodities | |

Total = 11 Hazard Classes in the U.S.

What is the difference
between a Flammable
Liquid & a Combustible
Liquid ?





Flammable vs Combustible

Class 3 – Flammable Liquid

A liquid having a flash point **141°F or less** (**60.5°C**), or any liquid with a flash point at or above **100°F** that is intentionally heated **above its flash point** in a bulk packaging - (some exceptions apply).

See CFR 173.120 (a)

Per IMDG Code 2.3.1.2, a liquid having a flash point **61°C (141°F) or less**, including liquids offered **at or above its flash point** & substances transported at elevated temperatures that give off vapors at or below the **maximum transport temperature**.



Combustible Liquid

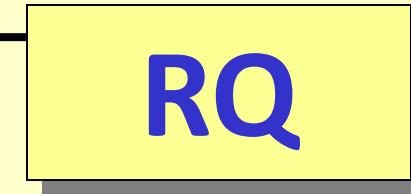
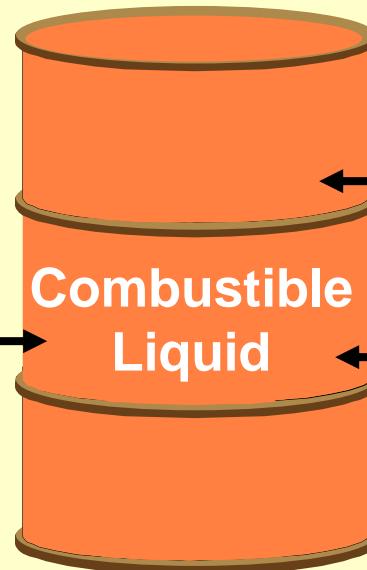
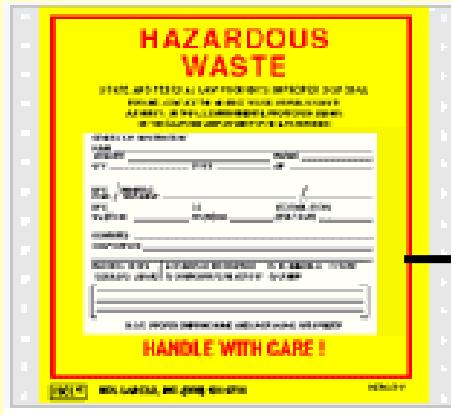
A liquid having a flash point **above 141°F** & **below 200°F** (which is 142°F → 199°F) & does not meet the definition of any other hazard class.

Reclassifying a Flammable Liquid to a Combustible Liquid

For **domestic transportation only** & transported by **rail** or **highway**, a Flammable Liquid "may" be reclassified to a **Combustible Liquid** if the flash point is at or above **100°F**. – *See CFR 173.150 (f)(1)*

* **Exception:** A Combustible Liquid which does not sustain combustion is not subject to the requirements of DOT regulations. *See CFR 173.120 (b)(3)*

Combustible Liquids in Non-Bulk Packagings



Non-Bulk Packagings of Combustible Liquids are NOT subject to hazmat regulations, except:

- Hazardous Substances
- Hazardous Waste
- Marine Pollutant

CFR 173.150 (f)(2)

Primary vs Subsidiary Hazard Classes

If the product meets **more than one** hazard class, then the **primary** hazard class will be determined by one of the following:

- ✓ Designated in **Column 3** of the Hazmat Table, if the material has a PSN.
- ✓ If the material does **not** have a known PSN, then the product must be **tested** to determine which hazard classes, if any, the material meets.
- ✓ If the material meets **more than one hazard**, the shipper must determine the **primary** hazard based on **precedence** requirements in CFR 173.2a :

- (1) **Class 7** (Radioactive materials, other than limited quantities)
- (2) **Division 2.3** (Poisonous gases)
- (3) **Division 2.1** (Flammable gases)
- (4) **Division 2.2** (Non-Flammable gases)
- (5) **Division 6.1, PG I, PIH**
- (6) **Division 4.2** [pyrophoric per 173.124 (b)(1)]
- (7) **Division 4.1** [self-reactive per 173.124 (a)(2)]
- (8) **Precedence Table** (Classes 3,8,4.1,4.2,4.3,5.1,6.1)
- (9) **Combustible liquids**
- (10) **Class 9** (Miscellaneous hazardous materials)

- ✓ Additional hazard classes (**Subsidiary**) are denoted in **Column 6** (Labels) of the Hazmat Table.

Packaging Groups

Associated with Hazard Classes, representing the degree of danger !

PG I - indicates a “**Great**” hazard

PG II – indicates a “**Medium**” hazard

PG III – indicates a “**Minor**” hazard

Hazard Classes “**NOT**” assigned Packing Groups

- **Class 2** (Gases)
- **Class 7** (Radioactive)
- **ORM-D** (Consumer Commodities)

A few important
definitions when
dealing with Federal
Regulations

or

CFR 101

Non-Bulk Packaging



- A packaging which has:
- Max. capacity of **119 gals or less** as a receptacle for a **liquid**
- Max. capacity of **882 lbs or less** & a max. capacity of **119 gals or less** as a receptacle for a **solid**
- Max. capacity of **1000 lbs or less** as a receptacle for a **gas**

Bulk Packaging

- A cargo carrying body (such as a tank car, rail car, van, truck, cargo tank, portable tank or freight container) used for transportation, in which hazardous materials are loaded with **no intermediate form of containment** & which has:
- Max. capacity **> 119 gals** as a receptacle for a **liquid**
- Max. capacity **> 882 lbs** & a max. capacity **> 119 gals** as a receptacle for a **solid**
- A water capacity **>1000 lbs** as a receptacle for a **gas**



Intermediate Bulk Container (IBC)



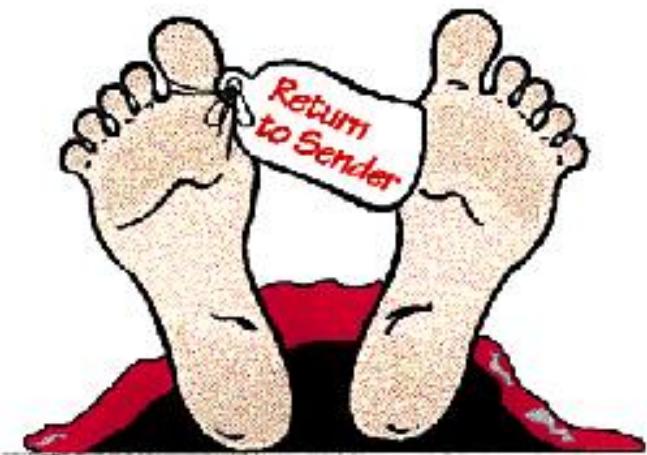
A rigid or flexible portable bulk packaging (other than cylinders & portable tanks) which is designed for **mechanical handling**.

Max. capacity **between 119 gals** (450 liters) and **793 gals** (3000 liters) for a **liquid** or, max. net mass **> 882 lbs** (400 kg) as a receptacle for a **solid**.

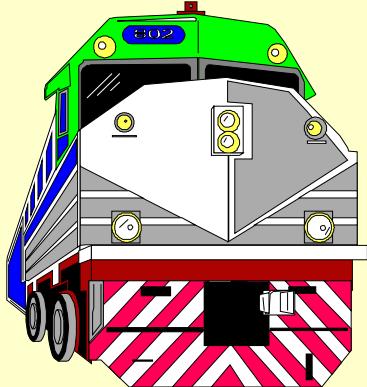
* See **CFR 173.35**

* Not suitable for **Packing Group 1 liquids** !

Poison Inhalation Hazard (PIH)

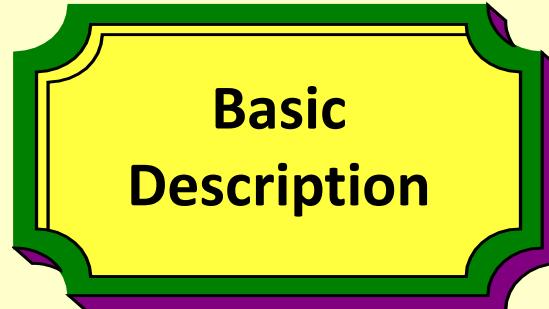


- PIH are **gases & liquids** that meet the definition for inhalation toxicity based on an **LC₅₀** standard.
- Known PIH materials are identified in the Hazmat Table in **Column 7 (Special Provisions)** with the notation **1 thru 6 & 13** (*Anhydrous Ammonia*).
- **Hazard Zones** are assigned to denote the level of toxicity. Zones **A,B,C,D** are assigned to gases, and Zones **A & B** assigned to liquids, with **Zone A** being the most lethal.

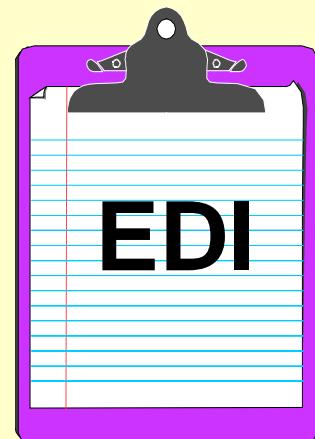
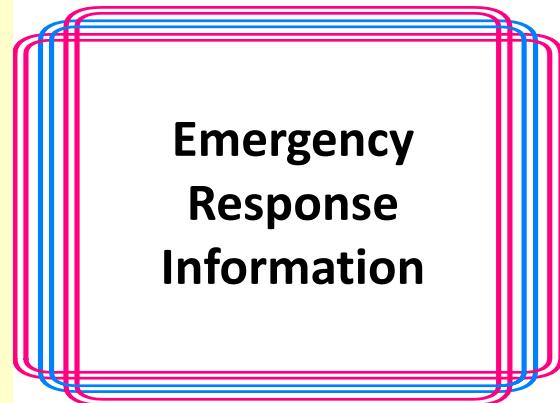


Hazmat Communication during Transportation

- ✓ Shipping Papers
- ✓ Marking
- ✓ Placarding / Labeling
- ✓ Emergency Response Information



SHIPPING PAPERS



Shipping Paper

Basic Description (*in sequence*)

- Identification Number
- Proper Shipping Name
- Hazard Class & Division (*if applicable*)
- Packing Group (*if applicable*)

Emergency Response Telephone Number
and contract number if applicable

Signed Certification for loaded shipments

Reporting mark & number (*by rail*)

Additional information may be required !

Additional Description Requirements

- ✓ “**RESIDUE : Last Contained**” (required for tank cars and tanks)
- ✓ “**Waste**” – precedes PSN for Haz. Waste shipment
- ✓ “**HOT**” precedes PSN for Elevated Temperature Material
- ✓ Technical names for certain “**N.O.S.**”
- ✓ “**Poison-Inhalation Hazard**” & “**Zone ***”
(The word Toxic & Poison are interchangeable !)
- ✓ “**Marine Pollutant**” – in parentheses
- ✓ **DOT Special Permit Number**
- ✓ “**Limited Quantity**” or “**Ltd Qty**”
- ✓ “**DOT 113 – Do Not hump or cut off car in motion**”

Shipping Paper General Entries

When the **Hazmat** shipment is described on the same shipping paper with other **Non-Hazardous** shipments :

- ✓ Must be entered **first**, or
- ✓ Must be entered in a **color** that clearly contrast with any Non-HM descriptions, or
- ✓ Must be identified by an “**X**” or an “**RQ**” (*if appropriate*) placed before the proper shipping name in a column captioned “**HM**”

- ✓ Printed in **English**
- ✓ No abbreviations or codes , unless **authorized by the CFR**
- ✓ May contain **additional information** providing the information is **not inconsistent** with the required description & must be placed **after** the basic description.

SHRAIGHT BILL OF LADING - SHORT FORM

Original - Non Negotiable

Received, subject to the classifications and tariffs in effect on the date of issue

(Name of Carrier) East Texas Pacific R.R.		DATE:	July 4, 2001	
TO: Bubba's Sushi Bar & Bait Shop, Inc.		FROM:	Exotic Fish & Chemical Co.	
STREET 1 Possum Hollow Expressway		STREET	500 Chemical Row Dr.	
CITY Cut & Shoot	STATE TX	ZIP 77223	CITY Delbert	STATE TX ZIP 76611

DESCRIPTIONS OF ARTICLES

Reporti ng Mark	No. Shippi ng Units	(X) HM	KIND OF PACKAGING, DESCRIPTION OF ARTICLES, SPECIAL MARKS & EXCEPTIONS	WEIGHT	FREIGHT CHARGES
GATX 88744	1 T/C		UN 1090, Acetone, 3, PG II, RQ	100,000 lbs	PREPAID
					COLLECT
GATX 88744	1 T/C		UN 1090, Acetone, 3, PG II, RQ	100,000 lbs	
GATX 88744	1 T/C	X	UN 1090, Acetone, 3, PG II, RQ	100,000 lbs	Subject to Sec. 7 of the conditions. The carrier shall not make delivery of this shipment without payment of freight
GATX 88744	1 T/C	RQ	UN 1090, Acetone, 3, PG II, RQ	100,000 lbs	
ACFX 55621	1 T/C		Corn Syrup	90,000 lbs	
					COD AMT \$ ____

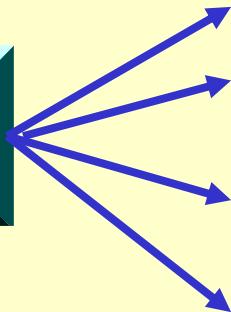
This is to certify that the above-named articles are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNATURE: *Freddy Fender*

DATE:

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted, marked, consigned and destined as indicated above which said carrier agrees to carry to its usual place of delivery at said destination.

EMERGENCY CONTACT: Chemtrec 1-800-4249300

Examples

Shipper's Certification



- Required on the shipping paper offered by the Shipper for all “**loaded**” shipments !
- May be signed manually *or* by mechanical means!
- **Not required for:**
 - ✓ ***Residue shipments***
 - ✓ ***Cleaned & purged tanks***
- DOT provides for an abbreviated certification for Electronic Data Interchange transactions, Example:
“Bill Smith, on behalf of Bubba Chemical Avers Certification specified in § 172.204(a)”

Option 1: 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.

Option 2: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Emergency Response Information

- Made **immediately available** to responders!
- Entered on the **shipping paper**, or
- In a **document, other than a shipping paper** (e.g. SDS), or
- **Cross reference** with acceptable emergency response material (e.g. ERG, IMO, AAR, etc)
- Maintained **at the facility** & immediately accessible
- In the **possession of transporters !!!**



Emergency Response Telephone Number



- ✓ Entered on the **Shipping Paper** !
- ✓ Monitored at all times **during transportation** !
- ✓ Responsible & knowledgeable party with **detailed information** !
- ✓ Shipper may use **contractors** that are capable & accept responsibility. Contract number is required
- ✓ Both **Shipper & Carrier** are responsible !

STCC Codes

Standard
Transportation
Commodity Codes



- Utilized in the **RAIL** industry
- *Not regulated* by DOT
- 7 digit code
 - 49 ***** denotes Hazmat shipment
 - 48 ***** denotes a Hazardous Waste shipment

Hazmat Shipping Description

NATX 36214

Reporting Mark & Number

1 Tank Car

Proper Shipping Name

Hazardous Substance

ID Number

Hazard Class
& Subsidiary

RQ/ UN1017/Chlorine/ 2.3 (8)/ Poison-Inhalation
Hazard, Zone B/ Marine Pollutant

PIH Material

Marine Pollutant

EMERGENCY Contact: (800) 424-9300 CR1675B

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.

Elmer Fudd

Carrier Waybill

802 - UNION PACIFIC RAILROAD COMPANY - 802

* DANGEROUS *

TXPX33021 T 194000

4711 05 14 01 758706

52628 HOUSTON TX 52628 HOUSTON TX
6465 ST LOUIS MO 63103
13TH & OLIVE, ROOM 400

UP, TCT DELIVERY

STAN TRANS, INC.
P.O.BOX3608
TEXAS CITY TX

WEIGHED AT SETTEGAST
GROSS = 240,900
TARE = 111,000
NET = 129,900

4905781

PREPAID
WEIGHT AND CHARGES TO FOLLOW

1 T/C
PROPANE

2.1
UN1075

EMERGENCY CONTACT:

800-4249300

HAZMAT STCC = 4905781

PROPANE (LPG)

WEIGHT AND CHARGES TO

FOLLOW PREPAID

1 CAR LOAD

802 — UNION PACIFIC RAILROAD COMPANY — 802

Retention Requirements for Hazmat Shipping Papers

Shipping Papers (*Shipper & Carrier*) =

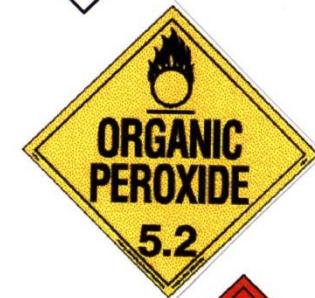
2 Year

* The year begins when the act of transportation ends !

Hazardous Waste Manifest (*Generator & Carrier*) =

3 Years

* The period begins when the initial carrier accepts the shipment !



PLACARDS



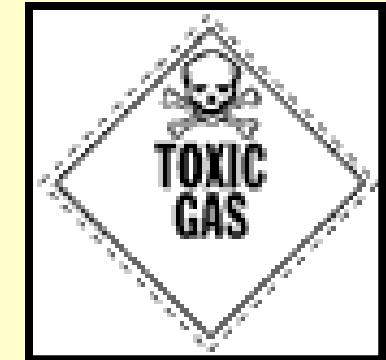
Placarding Requirements

General Placarding Requirements

- ✓ Bulk packages – **Both sides & both ends**
- ✓ Following may be placarded on **2 opposing sides** or may be **labeled**:
 - ✓ Portable tanks < 1,000 gal capacity
 - ✓ DOT 106 or DOT110 multi-unit tank car tanks
 - ✓ Bulk package other than a portable tank, cargo tank or tank car 640 cu. ft. capacity

Removal of Placards

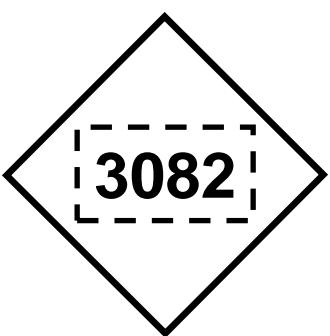
- ✓ Sufficiently **cleaned** of residue & purged of vapors
- ✓ **Refilled** with a **non-hazardous** material



Exceptions to Placarding Requirements

- ✓ Certain **2.2** atmospheric gases, such as Argon
- ✓ **Combustible liquids** in **non-bulk** packages
- ✓ Limited quantities, small quantities, ORM-D materials

Placarding Exceptions



Class 9 (Miscellaneous Hazardous Materials) placards are "Optional" for **domestic transportation** ! However, **ID numbers** are still required !



FLAMMABLE placards may be used in place of **COMBUSTIBLE** placards on compartmented tank cars containing both flammable & combustible ! Also, applies to cargo tanks & portable tanks.



OXYGEN placards may be used in place of **NON-FLAMMABLE GAS** placards for domestic transportation !

Visibility of Placards



Readily visible !



Securely attached/affixed or placed in a holder



Clear of appurtenances & devices such as ladders



Located clear of dirt & water from wheels



Maintained to preserve the format, legibility & color



Displayed horizontally, reading from left to right



Located clear of any other markings

Primary vs Subsidiary Placards

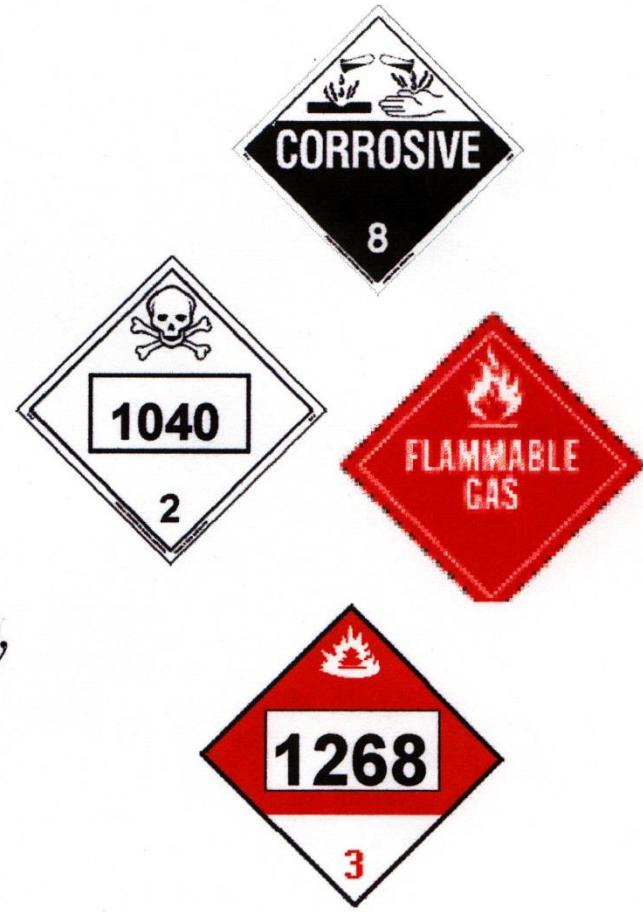
*The **primary** placard **must** have the hazard class or division displayed in the lower corner of the placard !*

The hazard class or division may not be ~~displayed~~ in the lower corner of the subsidiary placard !

*The identification number may be displayed only on the **primary** placard & may not be displayed on the subsidiary placard !*

Subsidiary Placards are required on the following shipments :

- ✓ **Poison-Inhalation Hazards** or **Poison Gas**, if not the primary hazard class)
- ✓ **Dangerous When Wet** (Class 4.3)
- ✓ **Uranium hexafluoride** must display **CORROSIVE** subsidiary placards if > 1,001 lbs.
- ✓ **Permissible** on any shipment identified as having a subsidiary hazard



Dangerous Placard



Used on freight containers, unit load devices, transport vehicles or rail cars which contain non-bulk packagings with **2 or more** categories of **Table 2** hazardous materials!

A **DANGEROUS** placard may not be used, when **2,205 lbs** (1000 kg) aggregate gross wt. or more of **one category** of material is loaded at **one loading facility**. The placard specified for the category in Table 2 must be applied ! *Not authorized for transportation transportation!*

Placarding Table 1 - CFR 172.504 (e)

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard design section references (\$)
1.1	EXPLOSIVES 1.1	172.522
1.2	EXPLOSIVES 1.2	172.522
1.3	EXPLOSIVES 1.3	172.522
2.3	POISON GAS	172.540
4.3	DANGEROUS WHEN WET	172.548
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE	172.552
6.1 (Inhalation hazard, Zone A or B)	POISON INHALATION HAZARD	172.556
7 (Radioactive Yellow III label only)	RADIOACTIVE	172.556

* Placard for “any quantity” of Table 1 material !

Placarding Table 2 - CFR 172.504 (e)

Category of material (Hazard class or division number and additional description, as appropriate)	Placard name	Placard design section references (\$)
1.4	EXPLOSIVES 1.4	172.523
1.5	EXPLOSIVES 1.5	172.524
1.6	EXPLOSIVES 1.6	172.525
2.1	FLAMMABLE GAS	172.532
2.2	NON-FLAMMABLE GAS	172.528
3	FLAMMABLE	172.542
Combustible liquid	COMBUSTIBLE	172.544
4.1	FLAMMABLE SOLID	172.546
4.2	SPONTANEOUSLY COMBUSTIBLE	172.547
5.1	OXIDIZER	172.550
5.2 (Other than organic peroxide Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE	172.552
6.1 (Other than Inhalation hazard, Zone A or B)	POISON	172.554
6.2	(none)	
8	CORROSIVE	172.558
9	CLASS 9	172.560
ORM-D	(none)	

* When transported by highway or rail, Table 2 materials are subject to the 1,001 lb exception !

Special Rail Placarding

White Square Background

- Explosives 1.1 & 1.2
- 2.3, Zone A
(load or residue)
- 6.1, PG I, Zone A
(load or residue)
- DOT 113 tank cars
transporting 2.1
(load or residue)



“Poison Inhalation Hazard” Placard

For domestic transportation, PIH (Class 2) placards & POISON GAS placards are interchangeable !

The package is not required to have INHALATION HAZARD marking, if placarded with “worded” PIH placards !

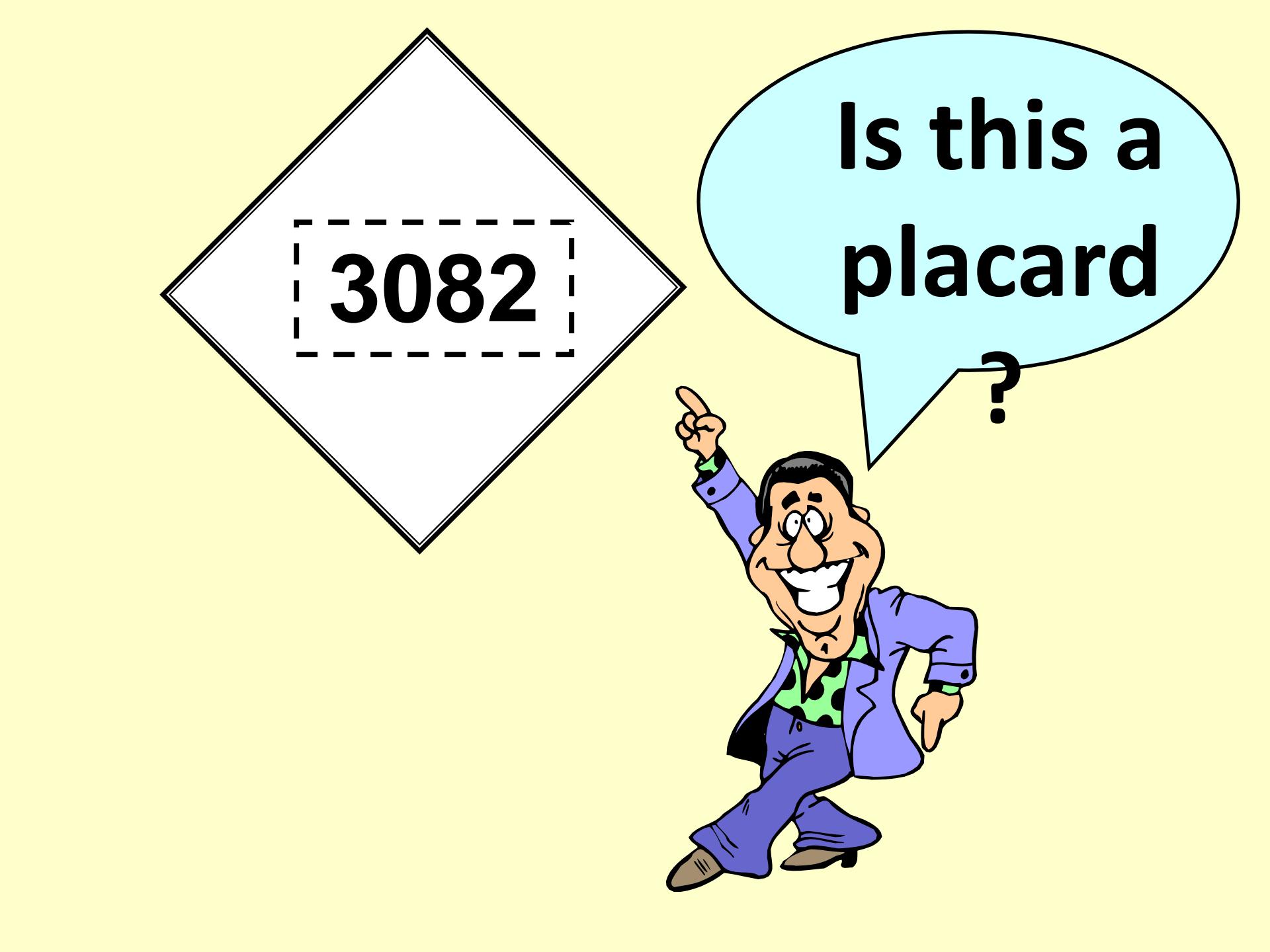


Empty Non-Bulk Packages



Non-Bulk packagings
that contain only the
residue of a
hazardous material
covered by Table 2
need not be included
in determining
placarding
requirements !

-CFR 172.504 (d)



Is this a
placard

3082



The following are examples
of Non-compliance placards
actually found during rail
transportation. Can you find
what's wrong with
these placards?

Placard #2



**Professional
made placard
with the wrong
hazard class –
UN1993 is a
Class 3
Flammable
Liquid**

Placard #4



Arrived in the U.S.
from Mexico, the
use of the word
"INFLAMABLE"
is illegal in U.S.
and Canada !

Placard #5



**Homemade Class 9
placard that does
not meet
specifications in
CFR 172.560. Also,
an old ID number,
which no longer
exist !**

Placard #6



The shipper
reclassified a
Class 3 material to
a **Combustible
Liquid**, then used
solvent to make
**Combustible
placards !**

Placard #9



White square-on-point configuration with an ID number that no longer exist !

Placard #10



**Professionally
made placard
with the **wrong**
hazard class –
**UN 1017 is
Chlorine, a
Class 2.3 gas !****

Placard #11



**It's a good
placard in
Canada & U.S.
(if traveling to or
from Canada),
Chlorine is
classified as a **2.4**
(Corrosive Gas)
in Canada !**

Placard #14



**Illegally displayed
in placard holders
on a tank car, see
*CFR 172.502 (a)(2)***

Placard #15



**It's a legal Class 9
placard from
Canada !**

Placard #18



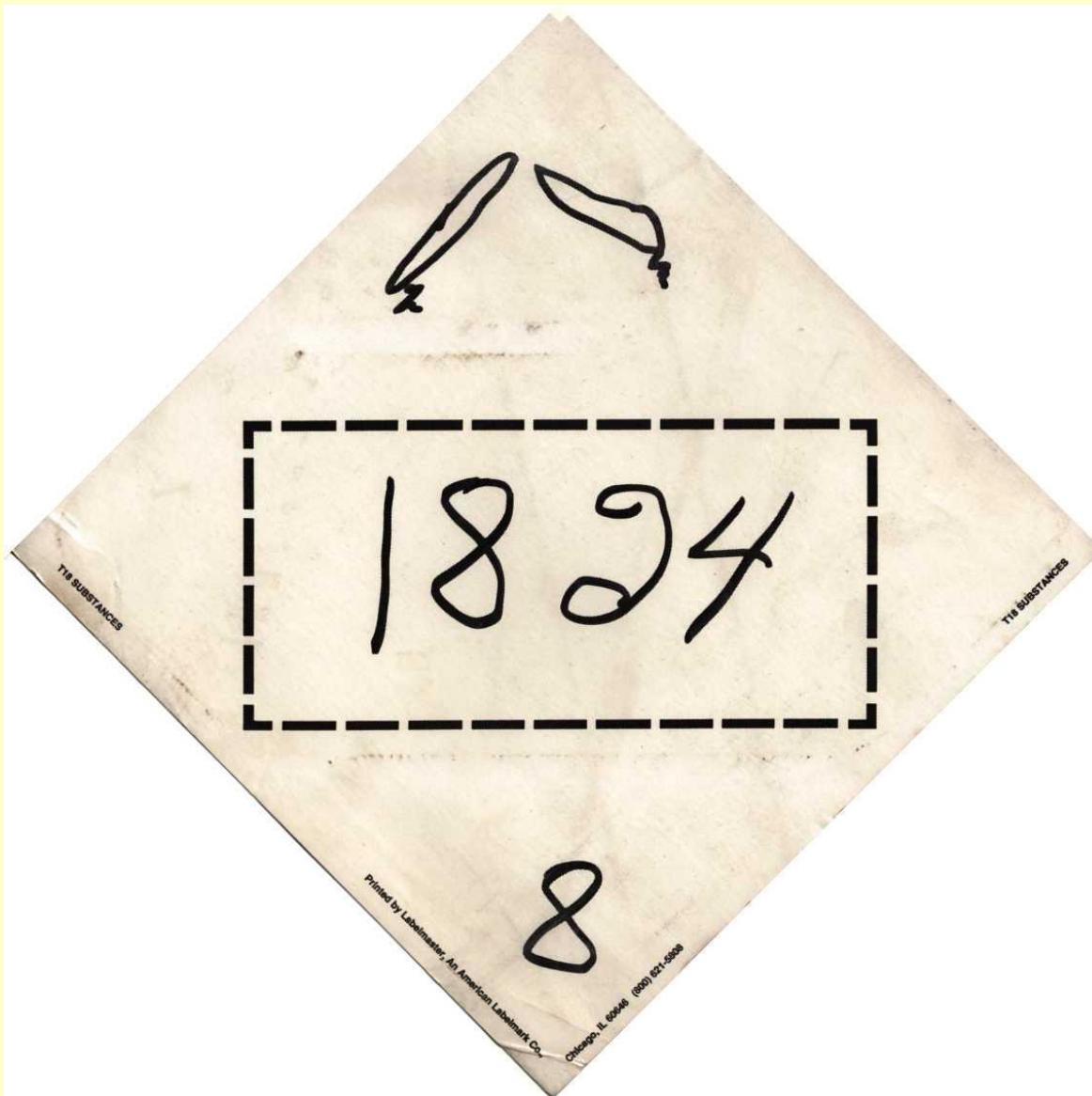
Professional made
placard with the
**wrong hazard
class – UN 1010
is Butadiene,
inhibited a
Class 2.1
(Flammable Gas)**

Placard #19



Professional made Flammable Gas placard; however, the Hazard Class in the lower corner must be a “**2**”, instead of “**2.1**” per placard specifications !

Placard #20



**Homemade
placard displayed
on a Class 8
(Corrosive
Material)
shipment ?**



Labels

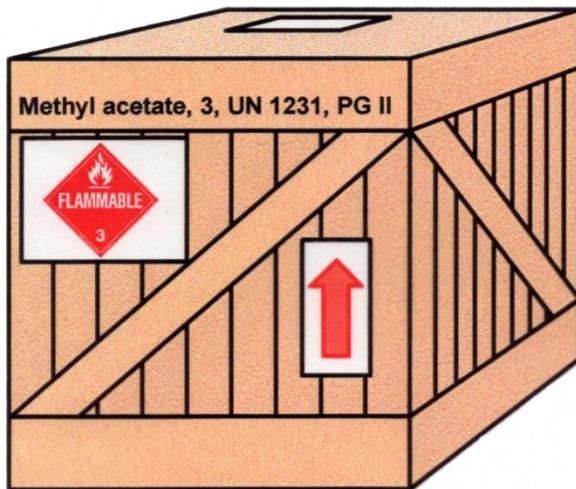
Required to be displayed on:

- ✓ Non-bulk packages (*if not placarded*)
- ✓ Bulk packagings (other than cargo tank, portable tank or tank car) with a capacity < 640 cu. ft.
- ✓ Portable tanks of < 1000 gal. capacity

* *Some exceptions apply !*

Additional Labeling Requirements

- ✓ Must be labeled for primary & subsidiary hazard classes per **Column 6** of CFR 172.101 Table.
- ✓ Each **primary** label and **subsidiary** label must display the hazard class in the lower corner
- ✓ When **more than 1 hazmat** having different hazard classes are packed within the same packaging or outside package, the **outside package** must be label (*as required*) with **each class** of hazardous material contained therein.



Placement of Labels

- ✓ May be printed or affixed to the surface, except on the bottom of the package.
- ✓ Located near the Proper Shipping Name marking (if the package dimensions permit).
- ✓ Labels must be clearly visible & not obscured by markings or attachments.
- ✓ Placed on a background of contrasting color.
- ✓ When primary & subsidiary labels are required, they must be placed next to each other (within 6 inches).

The label may be printed or affixed to a TAG, if:

- ✓ A cylinder
- ✓ Irregular surfaced package, or
- ✓ Package is smaller than the label & contains no Radioactive Material



Labels are NOT Required If:

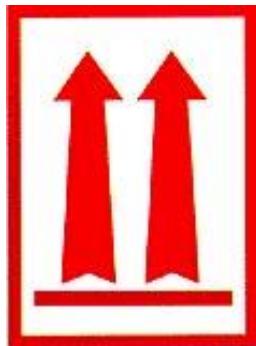


- An exception is specified (i.e.: Small Quantities, Ltd Qty, etc.)
- Certain compressed gas cylinders of Div. 2.1 or 2.2 that are carried by private or contract motor carrier & not overpacked & durably and legibly marked per CGA Pamphlet C-7, App. A
- Compressed gas cylinders permanently mounted on a vehicle
- Certain Dept. of Defense shipments
- ORM-D materials that do not contain any other HM that requires labeling
- **Combustible liquids**
- Certain Low Specific Activity RADIOACTIVE materials
- Overpack or unit load device where labels n the packages are visible
- Shipments already placarded !



Inhalation
Hazard

DOT SP-14572



MARKING

HOT

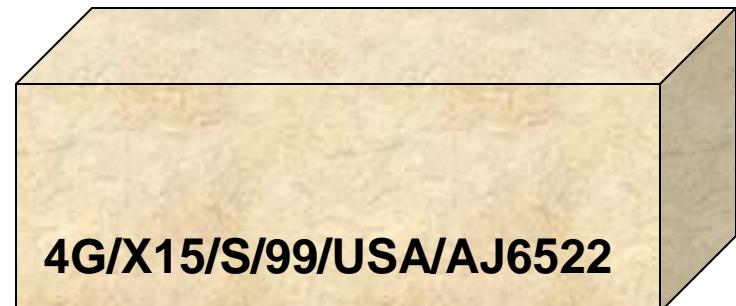
DOT 111A100W1

1075

2448



Liquefied
Petroleum Gas



Definition of a Marking

Means a descriptive name, identification number, and other instructions that are “required by the regulations**”, on the outer packagings of hazardous materials !**

General Marking Requirements

- ✓ Durable

Liquefied Petroleum Gas

?

- ✓ In English

CALIENTE'

?

- ✓ On contrasting background

INHALATION
HAZARD

?

- ✓ Unobscured

Propane

H

?

- ✓ Away from other markings



?

- ✓ Printed on/affixed to a surface, label, tag or sign

CHLORINE

Prohibited Marking



Styrene Monomer

No person may offer for transportation or transport a package which is marked with the **Proper Shipping Name** or **Identification Number** of a hazardous material, unless the packaging contains the identified hazardous material or its residue. - **CFR172.303 (a)**

* Exception – if the markings are not visible
(i.e.: enclosed or covered !

Identification Numbers

May only be displayed on :

Orange Panels



Placards

White square-on-point configuration



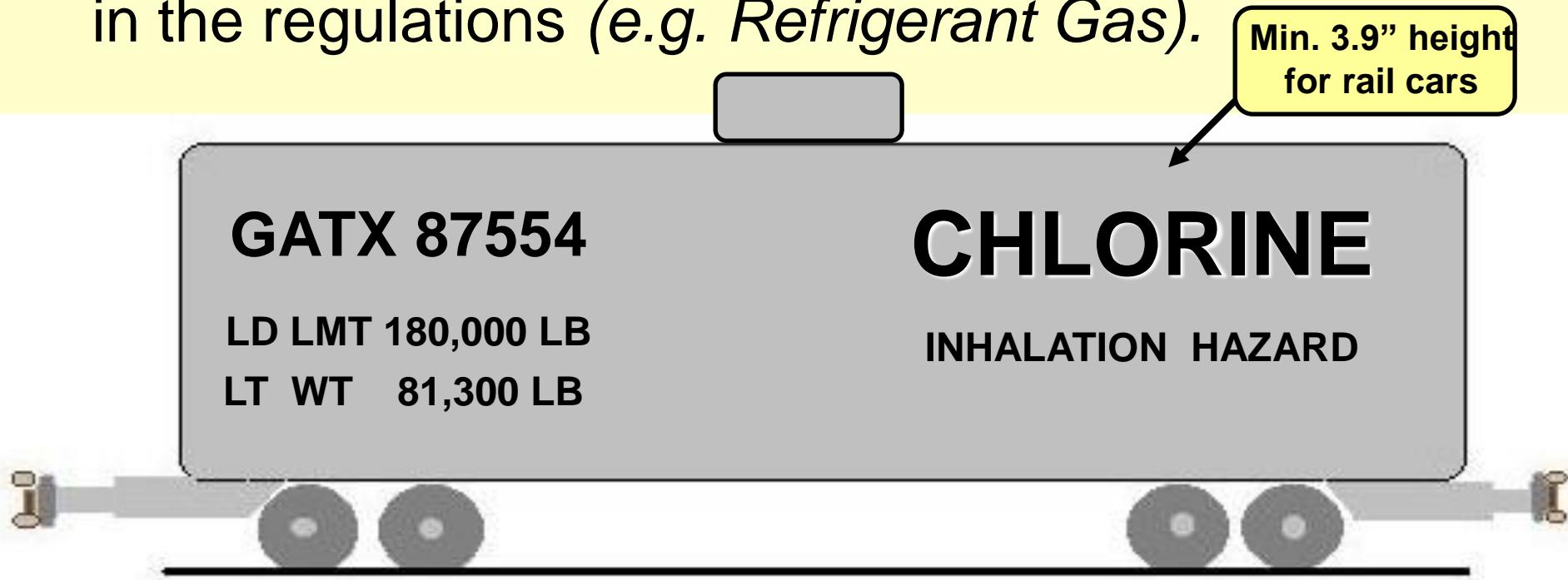
Identification Numbers are not required on:

- ✓ On ends of **compartmented tanks** when material having **different ID numbers** are transported therein.
- ✓ On cargo tanks marked “**Gasoline**” or “**Fuel Oil**”.
- ✓ For different Distillate Fuels if ID number is shown for the **lowest flash point** fuel carried.
- ✓ On nurse tanks.



Commodity Name Markings on Tank Cars

A tank car containing certain materials listed in CFR 172.330 must be **marked** on each side with the “**key words**” of the **Proper Shipping Name** specified in CFR 172.101 Table or a **common name** authorized in the regulations (e.g. *Refrigerant Gas*).



Poisonous by Inhalation Marking

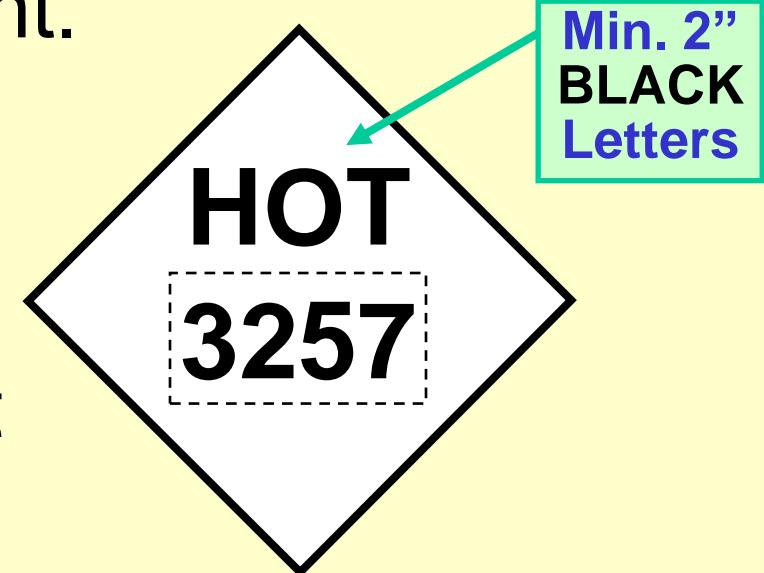
- ✓ Packages must be marked :
“INHALATION HAZARD” !
- ✓ Marked on **2 opposing sides** for bulk packagings in letters at least **3.9”** in height for rail cars, at least **2”** in height for other bulk packagings & at least **1”** for portable tanks < 1,000 gals & IBC's.
- ✓ Transport vehicles & freight containers containing PIH materials in non-bulk packagings must be marked on each side & each end with the **IDENTIFICATION NUMBER** for each PIH material if:
 - ✓ Material is in Hazard Zone A or B and,
 - ✓ Loaded at one facility with 2,205 lbs or more with the same PIH material



HOT Marking

- ✓ Marked “**HOT**” on 2 opposing sides of rail cars in at least **3.9"** in height.
- ✓ May be displayed in conjunction with the identification number on a white-square-on-point configuration.

Elevated Temperature Material



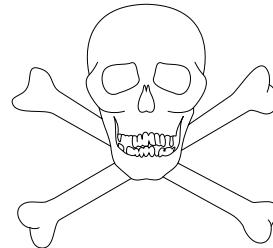
Marine Pollutant Marking



- ✓ Not applicable to Bulk or Non-Bulk packagings, except when transported by vessel !
- ✓ Must meet the CFR 171.8 definition for a Marine Pollutant
- ✓ Marking placed in association with labels or proper shipping name for Non-Bulk packagings.
- ✓ Marking of Bulk Packagings:
 - ✓ 2 opposing sides if < 1000 gals
 - ✓ Both sides & both ends if 1000 gals or greater

Fumigant Marking

DANGER



THIS UNIT IS UNDER FUMIGATION
WITH * _____ APPLIED ON

Date _____

Time _____

DO NOT ENTER

* Technical Name of the fumigant

- ✓ Required on rail cars, freight containers, truck bodies or trailers in which lading has been fumigated or is undergoing fumigation.
- ✓ Employees handling fumigants do not require DOT Hazmat Training

Marking Non-Bulk Packagings

Consignee or
Consignor's Name
& Address

Proper
Shipping Name

Identification
Number

Exemption
Number, if
applicable

Consignor:
Bubba's Chemicals, Inc.
Rt. 1, Henweigh, TX 72553

DOT SP - 35633

u
n

4G / Y 25/ S/ 99 /USA/ AJ3112/ 1.0

Acetone / UN1090



Performance Packaging Marking

Package
Orientation
(liquids)

Marking of Portable Tanks



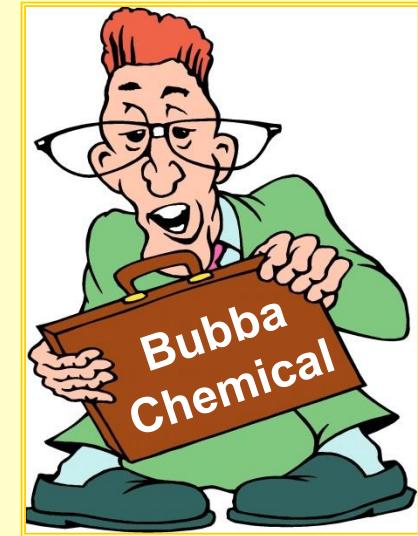
Proper Shipping Name displayed on 2 opposing sides: At least 2" in height if 1000 gal. capacity or more & 1" in height if < 1000 gals.

AAR-600 not required , but you will see it on tanks

ID Number on both sides & both ends, if 1000 gal capy or more

Name of Owner or Lessee

Shipper's Responsibilities



- **Class & describe** the hazardous material
- Choose an **authorized packaging**
- Properly **communicate** the hazard of the material
- Comply with all applicable **exemptions**
- Instruct each of their officers, employees & agents / contractors as to applicable regulations
- Limit the quantity of the product loaded per DOT standards
- Comply with applicable **loading & unloading** requirements
- Examine the shipment before offering into transportation

FRA Authorization Approval for transporting Nonconforming or Leaking Bulk Packagings

A **bulk packaging** that no longer conforms to the regulations may NOT be forwarded by rail unless repaired or approved for movement by the **Associate Administrator for Safety, FRA, Washington, D.C.**
Notification & approval must be furnished in writing or through telephonic or electronic means. - **CFR174.50**

Web Base One Time Movement Approval (OTMA) Application
<https://www.fra.dot.gov/Page/P0516>

FRA Authorization Approvals - #2

Emergency Telephone: (24 hrs/day)

U.S. Coast Guard National Response Center, Washington, D.C.

(800) 424-8802 or (202) 267-2675

FRA Website Address:

FRA Home Page - www.fra.dot.gov

FRA OTMA Web Base Application–

<https://www.fra.dot.gov/Page/P0516>

FRA Mailing Address

(Hazmat) Federal Railroad Administration

RRS 12, Mail Stop 25

1120 Vermont Ave. NW

Washington, D.C. 20590

A leaking bulk package containing hazmat may be moved without repair or approval “only so far as necessary to reduce or to eliminate an immediate threat of harm to human health or the environment, when it is determined its movement would provide greater safety than allowing the package to remain in place”. In the case of a liquid leak, measures must be taken to prevent the spread of the liquid.



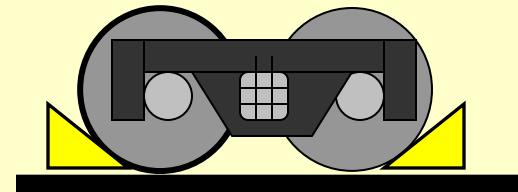
Tank Car Unloading

CFR 174.67



Reliable & Trained Unloaders

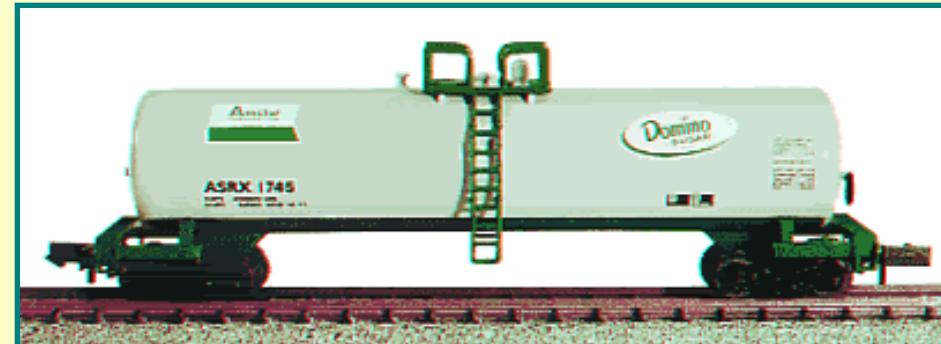
**Set brakes & block wheels
on ALL cars being unloaded**



Place “Caution Sign**” on the
track or cars from the open
end. May use the words
“**STOP – Men at Work**”.**

Tank Car Unloading # 2

CFR 174.67



- ✓ The unloading connections must be attached **before** any discharge valves are “**opened**”.
- ✓ Tank cars may **NOT** be allowed to stand with unloading connections attached **after unloading is complete**.
- ✓ If the unloading is discontinued, all unloading connections must be **disconnected**.
- ✓ All valves & closures must be secured using a **suitable tool**.
 - ✓ Magnetic gauging devices & thermometer well caps are **NOT** considered as openings to the tank & are **NOT** required to be secured using tools !



Attendance during the Unloading Process

For transloading operations throughout the entire period of unloading, & while the car is connected to unloading device, the car must be **attended** by the unloader ! - CFR 174.67 (i)

However, the attendance requirements **may** be met by:

- A **signaling system** including surveillance equipment (e.g. TV monitors & video) & remote shut-off equipment.
- Monitored from a **remote location** within the facility.
- Monitoring equipment must provide an **unobstructed view**.
- Signaling equipment must provide **immediate notification** of a malfunction **or** the flow of product **immediately halted**.
- If the equipment malfunctions, **physical attendance** is required

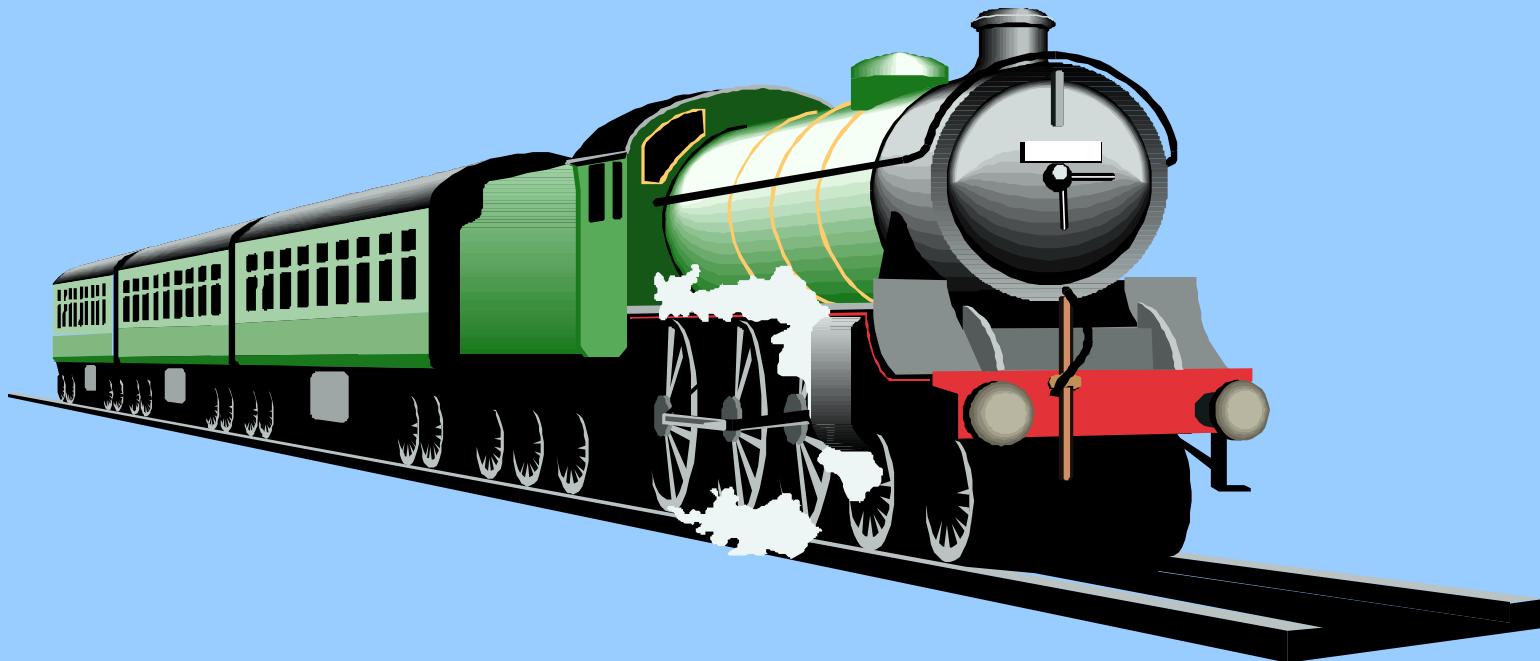


Examining Tank Cars Before Shipping

- Requirements apply to both **loads & residue** shipments !
- External inspection of shell & heads for abrasion, corrosion, cracks, dents, distortions, defects in welds, or any unsafe condition
- Inspection of piping, valves, fittings & gaskets
- Missing or loose bolts & nuts
- Closures & fastenings properly tightened by a **suitable tool**
- **Protective housings** secured
- Pressure relief devices inspected & removal of **frangible disc** in non-closing pressure relief devices for inspection
- **Tell-tale indicators** on combination PRD opened to check integrity of the rupture disc
- Thermal protection, tank-head puncture, coupler vertical restraint system, bottom discontinuity protection inspected
- **Markings** for legibility & **current** periodic inspection dates

Part 174

Carriage by Rail





The Eleventh Commandment

No person may accept for transportation or transport by rail any shipment of hazardous material that is NOT in conformance with the requirements of this subchapter.

CFR 174.3

Carrier's Responsibilities for Inspecting Hazardous Materials



At each location where a hazardous material is accepted for transportation or placed in train, the carrier shall inspect each rail car containing hazardous material, at ground level, for required:

- ✓ **Markings**
- ✓ **Labels**
- ✓ **Placards**
- ✓ **Securement of closures & leakage**

This inspection may be performed in conjunction with inspections required under Parts 215 & 232 of this title.

CFR 174.9

Carrier's Responsibilities for Placards



- ✓ May **NOT** accept or transport a shipment improperly placarded !
- ✓ Must **replace** placards lost in transit at the **next inspection point**.
- ✓ During transportation, the carrier must **maintain** the condition of placards so that the format, legibility, **color** and visibility of the placard is not substantially reduced due to damage, deterioration or obscurement by dirt or other matter.

Carrier's Responsibilities for Shipping Papers

BILL OF LADING

GATX 83447

1 T/C Liquefied Petroleum Gas/
2.1/ UN1075

EMERGENCY CONTACT 1-800-4249300

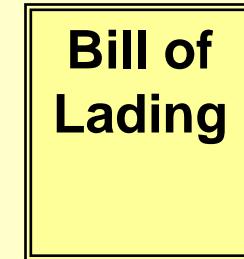
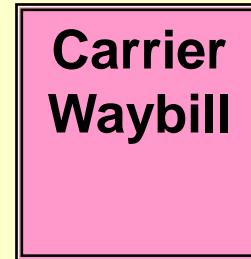
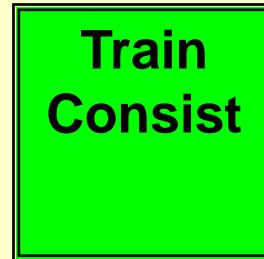
This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Amanda Blake

A person may not accept or transport a hazardous material by rail unless that person **receives a shipping paper** that properly conveys the information required by Part 172 of this subchapter. Only an initial carrier within the United States must receive and retain a copy of the shipper's certification as required by CFR 172.204 of this subchapter.

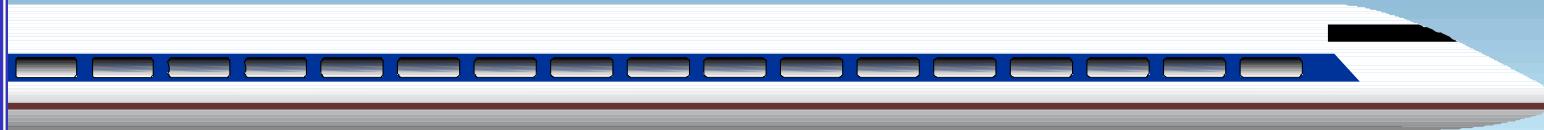
- *CFR 174.24*

Notice to Train Crews of Placarded Cars



The train crew must have a **document** that reflects the **current position** in the train of each rail car containing Hazmat (*load or residue*). In addition, a member of the crew of a train transporting Hazmat must have a **copy** of a document for the Hazmat being transported showing the information required by Part 172 of the subchapter (i.e., full **Hazmat shipping description**, including any **additional description requirements**).

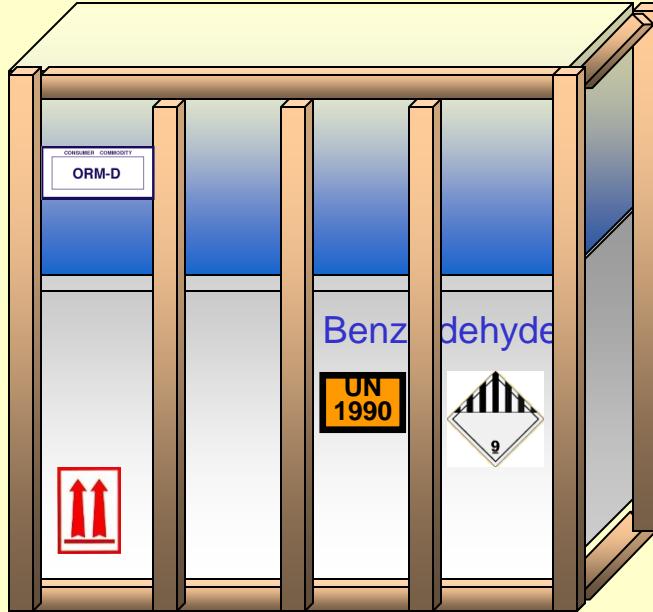
Expedited Movements



A carrier must **forward** each shipment of Hazmat promptly and within **48 hours** (Sat., Sun. & Holidays excluded) after acceptance at the originating point or receipt at any yard, transfer station, or interchange point, except that where biweekly or weekly service only is performed, a shipment of Hazmat must be forwarded on the first available train.

- **CFR 174.14 (a)**

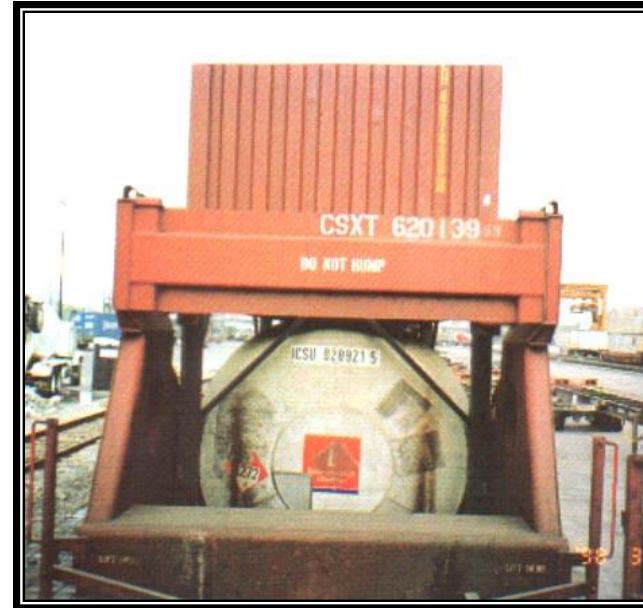
Blocking & Bracing



Each package containing a hazardous material being transported by rail in a freight container or transport vehicle must be loaded so that it can not fall or slide and must be safeguarded in such a manner that other freight cannot fall onto or slide into it under conditions normally incident to transportation. - CFR 174.55 (a)

* BOE Pamphlet Nos. 6 & 6C recommended !

Transporting Portable Tanks by Rail



- ✓ When transported in a well car:
 - 1) The tank is **NOT** in a double-stacked configuration
 - 2) The tank is transported in a well with its outlet valve facing **outward** towards the end of the well
- ✓ When transported in a well car, the **carrier** has the obligation to insure that all placards "**must be readily visible from the direction it faces**" !!
- ✓ The tank & flatcar must conform to **AAR 600** requirements !

How can the Railroad handle **OVERLOADED** hazmat shipments?

- Must **NOT** accept for transportation a shipment that is known to be overloaded !
- Obtain an **FRA One Time Movement Approval** from the Associate Administrator for Safety, FRA, Wash. D.C. - **CFR 174.50**
- Utilize the FRA's track scale tolerance without securing an FRA Movement Approval:
 - ☒ **1,000 lbs** for static track scales
 - ☒ **1%** for weigh-in-motion scales (*applies to both coupled & uncoupled*)
- Arrange for the safe **transfer** of the product overage before continuing the shipment in transportation

Unloading of Hazardous Materials in Tank Cars



On Rail Carrier's Property



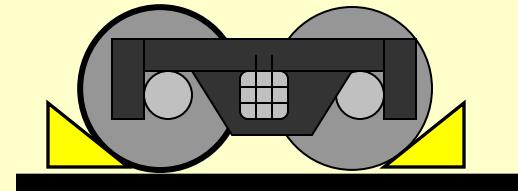
Tank Car Unloading

CFR 174.67 Transloading
CFR 173.31 non-Transload



Reliable & Trained Unloaders

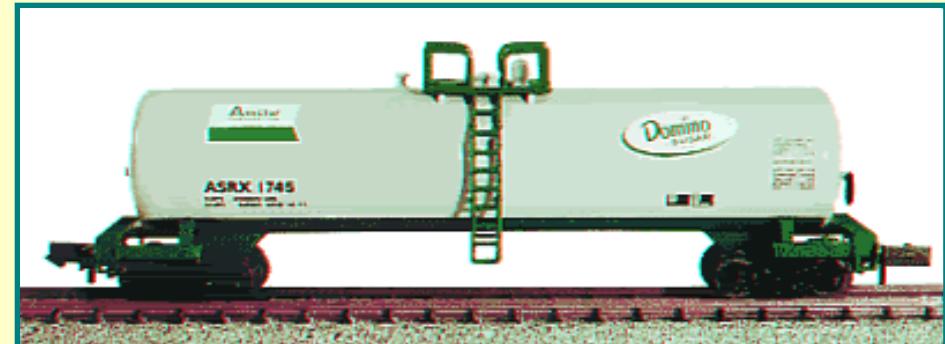
Set brakes & block wheels
on ALL cars being unloaded



Place “**Caution Sign**” on the track or cars from the open end. May use the words “**STOP – Men at Work**”.

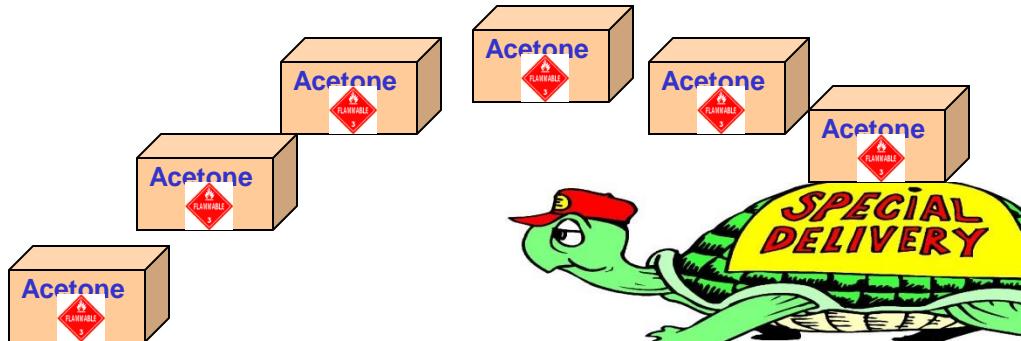
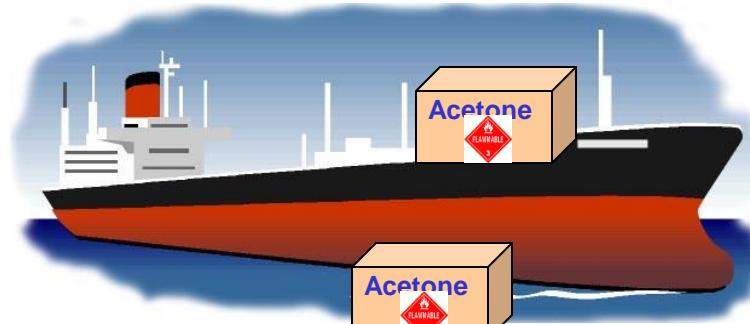
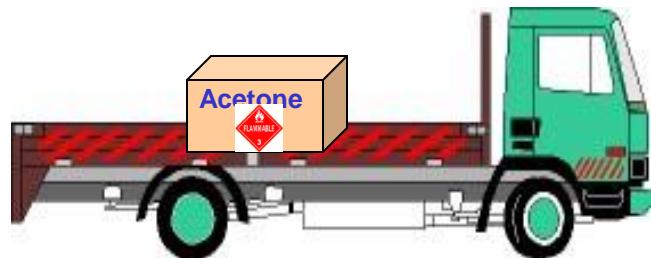
Tank Car Unloading # 2

CFR 174.67



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 - ✓ Magnetic gauging devices & thermometer well caps are **NOT** considered as openings to the tank & are **NOT** required to be secured using tools !

Intermodal Shipments



Intermediate Bulk Container (IBC)



A rigid or flexible portable bulk packaging (other than cylinders & portable tanks) which is designed for **mechanical handling**.

Max. capacity **between 119 gals (450 liters)** and **793 gals (3000 liters)** for a **liquid** or, max. net mass **> 882 lbs (400 kg)** as a receptacle for a **solid**.

* See CFR 173.35

* Not suitable for **Packing Group 1 liquids** !



Types of IBC's



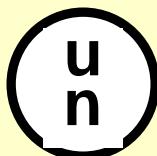
Marking of IBC's

- 11- Rigid (gravity discharge for solids)
- 21- Rigid (solids w/pressure > 1.45psi)
- 31- Rigid (for liquids)
- 13- Flexible (gravity discharge)

Mo & Yr of manufacture

Authorizing Country

Manufacturer
(Registered)



11A/Y/02 92/USA/ABC/5500/1500

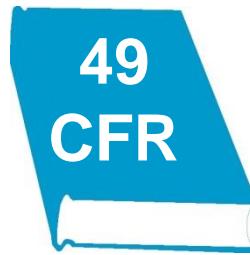
- A- Steel
- B- Aluminum
- C- Wood
- D- Plywood
- F- Reconstituted wood
- G- Fiberboard
- H- Plastic
- L- Textile
- M- Multi-wall paper
- N- Metal (other than steel or aluminum)

Performance Standard

- X – for PG I, II & III
- Y – for PG II & III
- Z – for PG III only

Stacking test load in kg

Max. permissible gross mass in kg or, Max. permissible net mass in kg for flexible IBC's



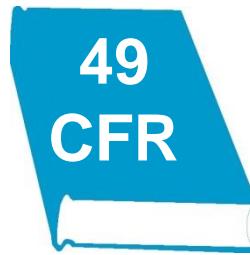
vs



Rule of Thumb

May be shipped IMDG, if 49 CFR does not apply !
Must be shipped 49 CFR, if IMDG does not apply !

1. Applicable if **any part** of the transportation is by vessel !
2. **Forbidden materials** per 49 CFR are prohibited in transportation.
3. **Bulk packagings**, except for *IBC's & UN Portable tanks*, must conform to **49 CFR**.
4. **PIH materials** must be marked, packaged & identified on shipping papers. The word “Poison” & “Toxic” are interchangeable.
5. **Radioactive materials, Poisonous materials & Hazardous Substances** must conform to **49 CFR**.



vs



6. Hazardous Waste must be transported with a **Hazardous Waste Manifest** & must have the word "**Waste**" preceding the Proper Shipping Name on shipping papers & packages.
7. **Ammonium nitrate fertilizer** or mixture must **NOT** meet the definition of Class 1.
8. **Aerosols** must meet the definition of "**Aerosols**" in CFR 171.8, except for certain limited quantities.
9. **Oxygen generators (chemical)** must be classed, approved & described in accordance with 49 CFR.
10. Emergency Response Information & an Emergency Response Telephone Number, per Part 172 Subpart G, **must be immediately available during transportation**.
11. All shipping paper information must be in **English** !

Differences between IMDG placarding requirements vs 49 CFR requirements

- IMDG placards (enlarged labels) may be smaller in size (250 mm vs 273 mm)



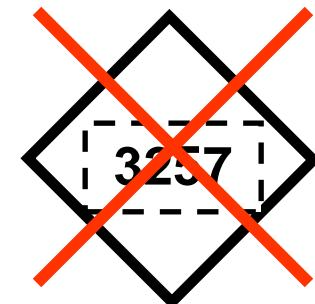
- IMDG does NOT authorize the use of Combustible, Dangerous & PIH placards



- IMDG does NOT authorize a **1,001 lb placarding exception** for CTU's packed with mixed non-bulk shipments of dangerous goods
- IMDG requires **subsidiary placarding** for **ALL subsidiary hazard classes**, unless *the same class placard is displayed for the primary class of another shipment within the same CTU*
- IMDG requires placards to be durable enough to survive at least **3 months** immersed in the sea, while 49 CFR requires a 30-day exposure to open weather conditions

Differences between IMDG Marking requirements vs 49 CFR requirements

- Unless specifically excluded, IMDG requires that Proper Shipping Names & Identification Numbers be marked on ALL packages, including freight containers packed with a single commodity for which NO placard or marine pollutant mark is required.
- When Identification Numbers are displayed on cargo transport units, the number must be displayed on either a placard or an orange panel. IMDG does NOT recognize white square-on-point configurations.

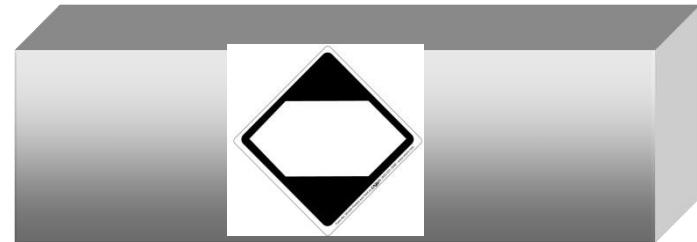


IMDG requires that orange panels measure at least 120 mm high & 300 mm wide, with a 10 mm black border. 49 CFR requires that orange panels measure at least 160 mm high & 400 mm wide, with a 15 mm black border. IMDG also requires that UN numbers measure at least 65 mm high, while 49 CFR requires UN numbers measure 100 mm (3.9")

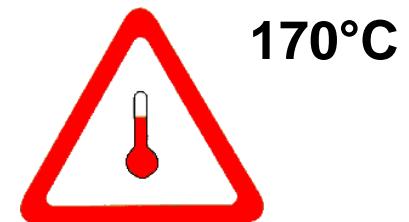


Differences between IMDG Marking requirements vs 49 CFR requirements

- IMDG requires that cargo transport units containing only Limited Quantities be marked on the exterior as “**LIMITED QUANTITIES**”



- IMDG requires that cargo transport units containing Elevated Temperature Materials be marked with the international triangular shaped mark. Except for Molten Sulfur & Molten Aluminum, **49 CFR** requires all bulk packagings containing ETM be marked “**HOT**”.

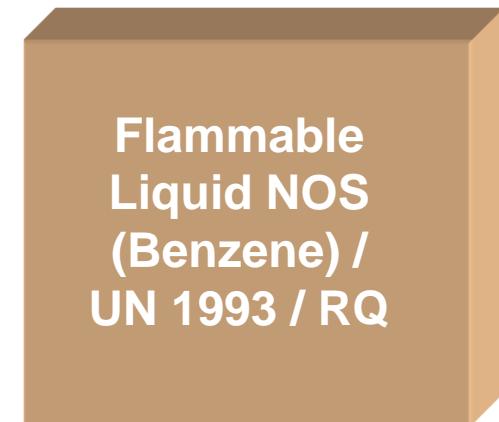


- Except for provisions in 5.2.1.6.1, ALL* packages containing a Marine Pollutant must bear the MP mark. 49 CFR does **NOT** require MP marks on bulk packagings, freight containers or transport vehicles that bear labels or placards; and all non-bulk packagings, *unless the shipment is being transported by vessel.*
See **CFR 171.4 & 172.322**



Differences between IMDG Marking requirements vs 49 CFR requirements

- IMDG does **NOT** recognize Poison-Inhalation Hazards, however PIH materials transported within the U.S. must bear “**INHALATION HAZARD**” marking.
- 49 CFR requires that non-bulk packagings transported within the U.S. containing **Hazardous Substances** (as defined in CFR 171.8) must bear the **Name of the Hazardous Substance** (unless identified by the PSN) in parentheses in association with the PSN. In addition, the letters “**RQ**” must be marked on the package in association with the PSN.
- 49 CFR requires that non-bulk packagings transported within the U.S. containing ORM-D materials bear the **ORM-D** mark. IMDG does **NOT** recognize ORM-D as a hazard class.



Questions ?

