National Transportation Safety Board
Office of Highway Safety
Washington, DC 20594

HWY24MH013

HAZARDOUS MATERIALS ATTACHMENT

Brenntag HM-126F and HM-181 Training Presentation

(47 Pages)

General Hazardous Materials Drivers Training: HM-126/ HM-181

BRENNTAG

GREAT LAKES, LLC

Regulatory Requirement

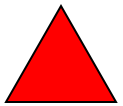
- Rules Enforced by the D.O.T
- Hazardous Materials General Awareness/Familiarization
  - Title 49 CFR Part 172.704
- Security of Hazardous Materials
  - Title 49 CFR Part 172 Subpart I

Training Objectives

- Basic Understanding of Hazardous Material Requirements During Transport:
  - Familiarity with the HMR (Parts 171-180)
  - Recognition of HAZMATs
  - Classification
  - Packaging
  - Transportation
  - Emergency Response Information
  - Incident Reporting

Hazardous Materials

- "A substance or material that can pose an unreasonable risk to health, safety, and property when transported in commerce."
- DOT's Hazardous Material Regulations (HMR) apply to anyone who:
  - **Offers or transports hazmat in the US**
  - **Manufacturers, reconditions, or retests packaging used to transport hazmat.**

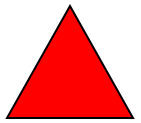


Hazmat Employees

- **Handles packaging used to transport HAZMAT**
- **Selects packaging, labels, markings, or placards**
- **Fills packaging with HAZMAT**
- **Loads or unloads HAZMAT**
- **Prepares shipping papers or emergency response information**
- **Operates a vehicle used to transport HAZMAT**
- **Supervises other HAZMAT employees**

Hazmat Employee Training

Knowledge	Training
Familiar with the HMR	**General Awareness**
Recognizes HAZMAT	**General Awareness**
Specific requirements of your job	**Function-Specific**
Emergency response information	**Safety**
Self protection and accident prevention measures	**Safety**



Training Frequency

- Required for new HAZMAT employees
- Required for employees changing HAZMAT job functions → 90 days
- Refresher training is required every 3 years

Pop Quiz # 1

- Training for HAZMAT employees must include:
  A. *General Awareness Training*
  B. *Function Specific Training*
  C. *Safety Training*
  D. *All of the above*

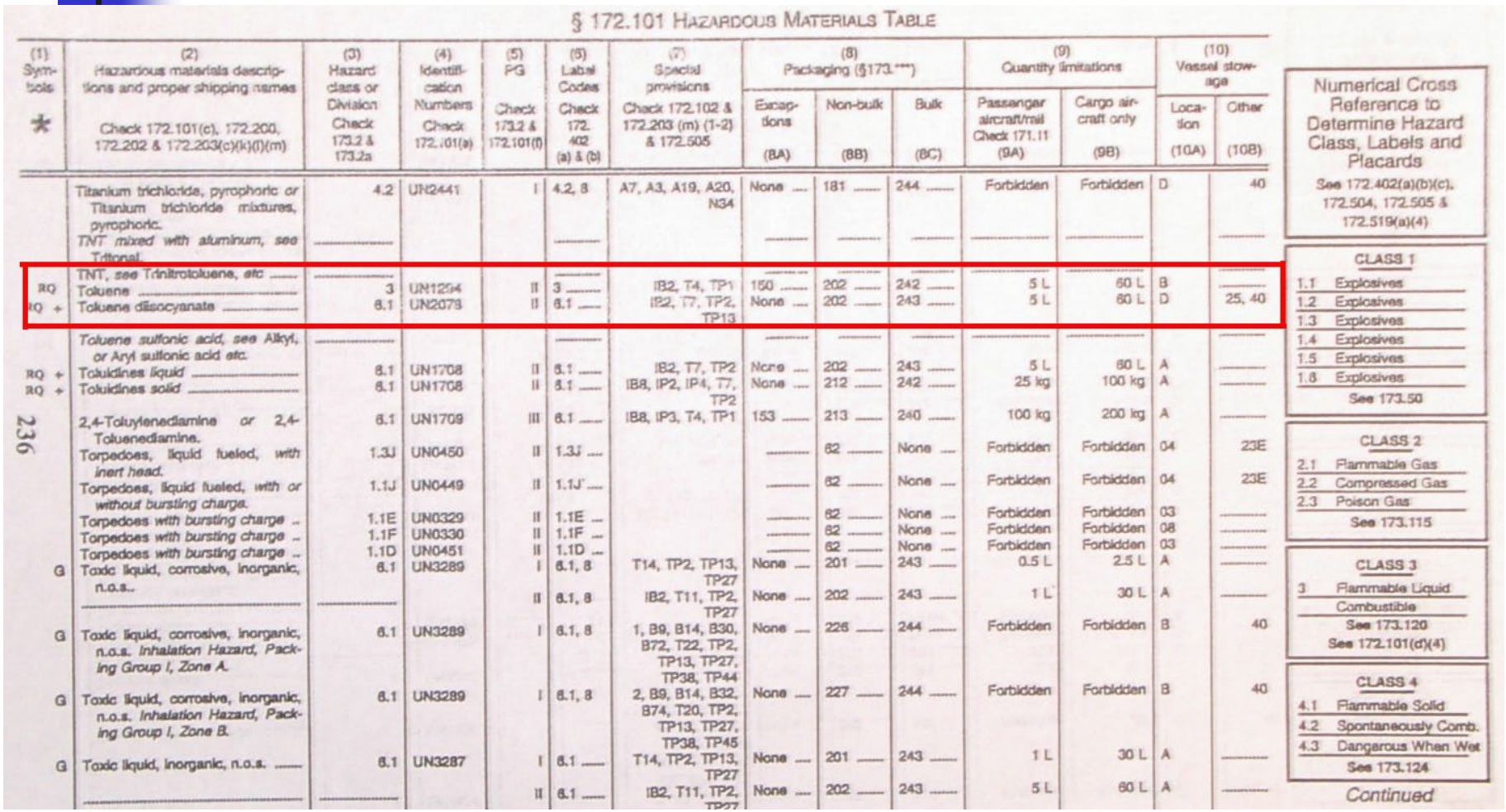
- DOT HAZMAT Regulations apply to:
  A. *Offers or transports hazmat in the US*
  B. *Manufacturers, reconditions, or retests packaging used to transport hazmat.*
  C. *End users of hazmat.*
  D. *All of the above*
  E. *Both A & B*

The HazMat Table (HMT)

- "A list of all the proper shipping names that can be used to describe HAZMAT for transportation in the U.S."

Do not ASSUME!

HazMat Table (HMT)



§ 172.101 HAZARDOUS MATERIALS TABLE

(1) Symbols *	(2) Hazardous materials descriptions and proper shipping names. Check 172.101(c), 172.200, 172.202 & 172.203(c)(k)(l)(m)	(3) Hazard class or Division. Check 173.2 & 173.2a	(4) Identification Numbers. Check 172.101(a)	(5) PG. Check 173.2 & 172.101(f)	(6) Label Codes. Check 172.402 (a) & (b)	(7) Special provisions. Check 172.102 & 172.203 (m) (1-2) & 172.505	(8) Packaging (§173.***) Exceptions (8A)	(8) Non-bulk (8B)	(8) Bulk (8C)	(9) Quantity limitations: Passenger aircraft/rail. Check 171.11 (9A)	(9) Cargo aircraft only (9B)	(10) Vessel stowage: Location (10A)	(10) Other (10B)
	Titanium trichloride, pyrophoric or Titanium trichloride mixtures, pyrophoric.	4.2	UN2441	I	4.2, 8	A7, A3, A19, A20, N34	None	181	244	Forbidden	Forbidden	D	40
	TNT mixed with aluminum, see Tritonal												
	TNT, see Trinitrotoluene, etc												
RQ	Toluene	3	UN1294	II	3	IB2, T4, TP1	150	202	242	5 L	60 L	B	
RQ +	Toluene diisocyanate	6.1	UN2078	II	6.1	IB2, T7, TP2, TP13	None	202	243	5 L	60 L	D	25, 40
	Toluene sulfonic acid, see Alkyl, or Aryl sulfonic acid etc.												
RQ +	Toluidines liquid	6.1	UN1708	II	6.1	IB2, T7, TP2	None	202	243	5 L	60 L	A	
RQ +	Toluidines solid	6.1	UN1708	II	6.1	IB8, IP2, IP4, T7, TP2	None	212	242	25 kg	100 kg	A	
	2,4-Toluylenediamine or 2,4-Toluenediamine.	6.1	UN1709	III	6.1	IB8, IP3, T4, TP1	153	213	240	100 kg	200 kg	A	
	Torpedoes, liquid fueled, *with inert head.*	1.3J	UN0450	II	1.3J			62	None	Forbidden	Forbidden	04	23E
	Torpedoes, liquid fueled, *with or without bursting charge.*	1.1J	UN0449	II	1.1J			62	None	Forbidden	Forbidden	04	23E
	Torpedoes *with bursting charge*	1.1E	UN0329	II	1.1E			62	None	Forbidden	Forbidden	03	
	Torpedoes *with bursting charge*	1.1F	UN0330	II	1.1F			62	None	Forbidden	Forbidden	08	
	Torpedoes *with bursting charge*	1.1D	UN0451	II	1.1D			62	None	Forbidden	Forbidden	03	
G	Toxic liquid, corrosive, inorganic, n.o.s.	6.1	UN3289	I	6.1, 8	T14, TP2, TP13, TP27	None	201	243	0.5 L	2.5 L	A	
				II	6.1, 8	IB2, T11, TP2, TP27	None	202	243	1 L	30 L	A	
G	Toxic liquid, corrosive, inorganic, n.o.s. *Inhalation Hazard, Packing Group I, Zone A.*	6.1	UN3289	I	6.1, 8	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44	None	226	244	Forbidden	Forbidden	B	40
G	Toxic liquid, corrosive, inorganic, n.o.s. *Inhalation Hazard, Packing Group I, Zone B.*	6.1	UN3289	I	6.1, 8	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45	None	227	244	Forbidden	Forbidden	B	40
G	Toxic liquid, inorganic, n.o.s.	6.1	UN3287	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 L	A	
				II	6.1	IB2, T11, TP2, TP27	None	202	243	5 L	60 L	A	

Numerical Cross Reference to Determine Hazard Class, Labels and Placards

See 172.402(a)(b)(c), 172.504, 172.505 & 172.519(a)(4)

CLASS 1
- 1.1 Explosives
- 1.2 Explosives
- 1.3 Explosives
- 1.4 Explosives
- 1.5 Explosives
- 1.6 Explosives

See 173.50

CLASS 2
- 2.1 Flammable Gas
- 2.2 Compressed Gas
- 2.3 Poison Gas

See 173.115

CLASS 3
- 3 Flammable Liquid
- Combustible

See 173.120
See 172.101(d)(4)

CLASS 4
- 4.1 Flammable Solid
- 4.2 Spontaneously Comb.
- 4.3 Dangerous When Wet

See 173.124

Continued

Hazardous Material Table

- Column 1 – Symbols

+	Fixed Hazard to Humans
A	Air
D	Domestic
G	Generic or n.o.s.
I	International
W	Water

- Column 2 – Proper Shipping Names
  - Roman type
  - Options indicated by “or”
  - Singular or plural
  - Upper or lower case
  - Supplemented by punctuation marks or words in italics

Hazardous Material Table

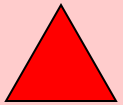
- Column 3 – Hazard Class
- Column 4 – Identification number – “a four digit number preceded by “NA” or “UN” that corresponds with the shipping name.”
- Column 5 – Packing Group I, II, III, if assigned.

DOT Hazard Classes

1. Explosive
2. Gases
3. Flammable and Combustible liquid
4. Flammable Solids
5. Oxidizers and Organic Peroxides
6. Poisons & Infectious Substances
7. Radioactive
8. Corrosive
9. Miscellaneous

UN/NA Numbers from ERG

- **Yellow Section**
  - UN Numbers identify Proper Shipping Names and Guide Number
- **Blue Section**
  - Alphabetized Proper Shipping Names identify Guide Number and UN Number
- **Orange Section**
  - Use Yellow and Blue Sections to find the Guide Number
  - Guide Numbers identify Potential Hazards, Public Safety, & Emergency Response information
  - Bold print denotes important infomation
- **Green Section**
  - Identifies Initial Isolation Distances



Packing Group (PG)

- Packing Groups (PG)

PG I – Most Danger

PG II – Medium Danger

PG III – Least Danger

Pop Quiz # 2

Corrosive

Oxidizer

Poison/Toxic

Flammable Liquid

Pop Quiz # 3

- Look up UN2051 and tell me what it is and which Guide Number to reference it.
  - Dimethylethanolamine
  - Guide # 132
- Look up Trichlorosilane and tell me what is its UN number, Guide Number and small spill isolation distance.
  - UN1295
  - Guide # 139
  - 30m or 100ft

Hazardous Material Table

- Column 6 – Label Codes
  - The first label code
    - Matches the hazard class or division in column 3.
    - Indicates the **PRIMARY** hazard label
  - Any other label codes
    - Indicate **SUBSIDIARY** labels
- Column 7 – Special Provisions

Hazardous Material Table

- Column 8 – Packaging
  - Exceptions (8A)
  - Non-bulk specification packaging (8B)
  - Bulk specification packaging (8C)
- Column 9 – Quantity Limitations for rail/air
- Column 10 – Vessel Stowage

Packaging

- Bulk
  - **Liquid** (>119 gal)
  - **Solid** (>882 lbs and capacity > 119 gal)
  - **Gas** (Water capacity > 1000 lbs)

- Non-Bulk
  - **Liquid** (<119 gal)
  - **Solid** (<882 lbs and capacity <119 gal)
  - **Gas** (Water capacity < 1000 lbs)

Additional Categories of Hazardous Materials

- Hazardous substance
- Marine pollutants
- Hazardous waste

Pop Quiz # 4

- What is the number of gallons that differentiates between bulk and non-bulk packages?
  - Greater than 119 gallons is Bulk
  - Less than 119 gallons is Non-Bulk

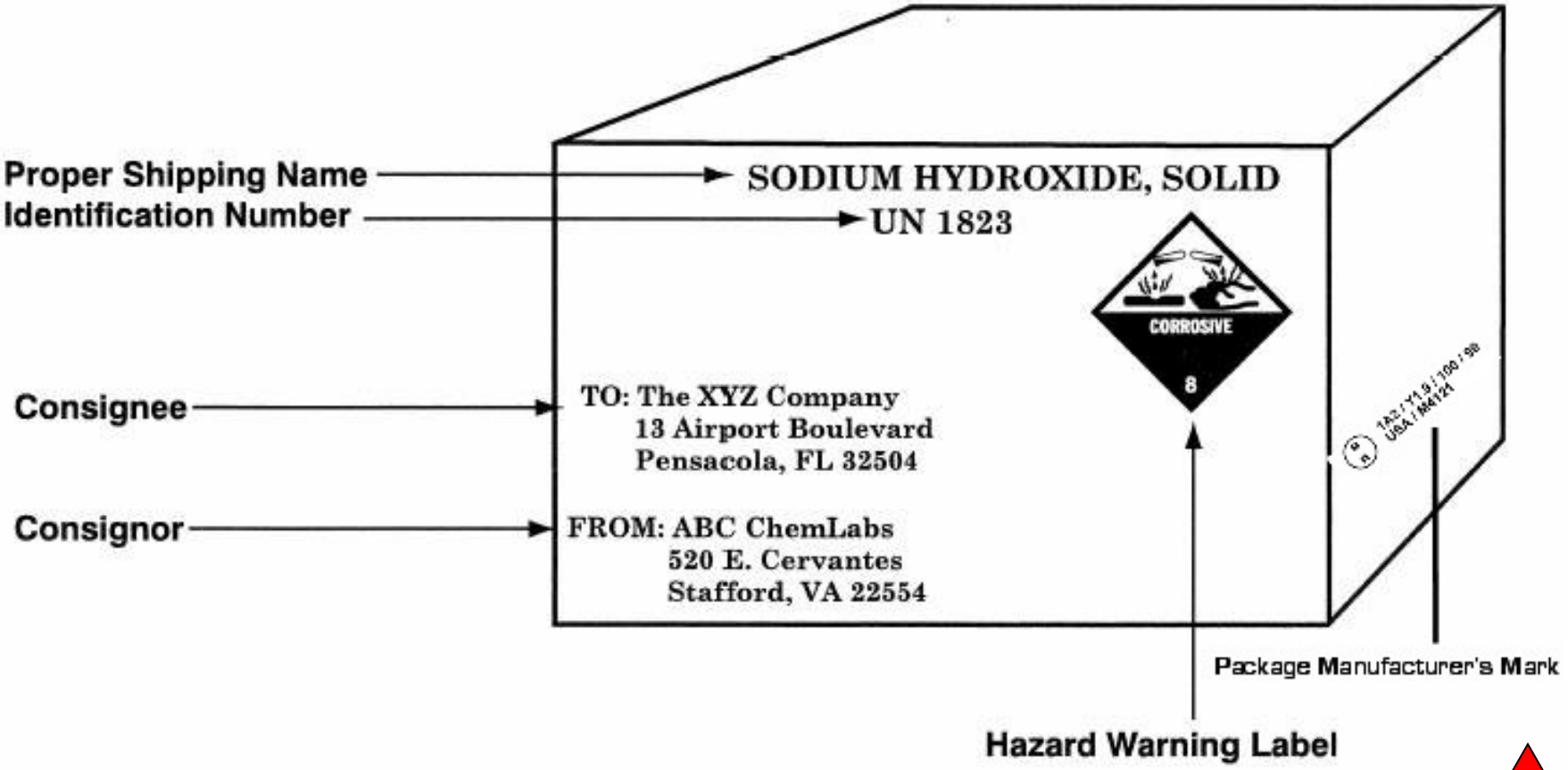
- In column 6 of the Hazardous Materials Table, the second label code listed (if any) is called what?

A. Tertiary
B. Subsidiary
C. Primary

Before Offering A Package – Mark it!

- The shipper must mark each:
  - Package
  - Freight Container
  - Transport Vehicle

Non-bulk Markings



Bulk Markings (<1000 Gallons)

- Totes must have:
  - Proper shipping name
  - Name of tote owner/lessee
  - UN Number on label
  - Must be labeled on 2 sides

Bulk Markings (>1000 Gallons)

- Tankers must have:
  - UN number on placard on all four sides
  - Tank Test/Inspection Information

Labels

- **The color, symbol, and class number indicate the hazard**
- **Primary labels display the class or division number**
- **Secondary labels display the class or division number as well.**
- **Labels are required on most non-bulk packaging**
- **Text is optional for most labels**

The Importance of Labeling

- *Receiving and Shipping Departments*
  - Review Supplier/Vendor Labels
  - Match the labels to the DOT description on our Purchase Orders.
  - Inform supervisors and HSQ Staff if Labels do not match Purchase Order descriptions.
  - Changes will be updated on the BUS by Regional HSQ Manager

Pop Quiz # 5

- Non-Bulk Markings must include:
  A. Proper Shipping Name and UN Number
  B. Name/Address of Consignee or Consigner
  C. Package Manufacturer's Mark
  D. Label/Placard
  E. Both A, B & D
  F. All of the Above

- True or False: Bulk Markings (>1000 Gallons) need only be on 2 sides.

Packaging

- Packaging – a receptacle & components for "containment" function
- Shippers responsibility to ensure a packaging is:
  - Properly classified
  - Proper description
  - Correct packaging
  - Correct packaging markings

Packaging Categories

- **Non-bulk packaging**
- **Bulk packaging**
- **Non-specification packaging**
- **Exemption packaging**

- **Exceptions**
  - **Limited quantity**
  - **Consumer commodity**
  - **Combustible liquid**

Pop Quiz # 6

- The following packaging types are exempt from labeling except for:
  A. Consumer Commodity
  B. Limited Quantity
  C. Combustible Liquids
  D. Non-Bulk Packages

Performance Oriented Packaging (POP)

- **Must pass performance tests:**
  - **Drop**
  - **Leakproofness**
  - **Hydrostatic pressure**
  - **Stacking**
  - **Vibration standard**

Performance Oriented Packaging (POP)

POP markings include:

- UN symbol
- Packaging code (1A1)
- Performance level
- Specific gravity or gross weight
- Year of manufacture
- Country of manufacture
- Name and address of manufacturer
- Minimum thickness (for reusable or reconditioned packages)

Order Picking

- *Batch Tickets must be followed to the letter.*
  - Do not substitute.
  - Substitutions affect JOB 7
  - Reduced quality for customers

Loading Packages

- All packages must be loaded properly
- Improper loading can be hazardous to you, the driver and the public.
- All loads must be secured by dunnage, load straps and load bars.
- Loads must be segregated IAW HazMat Load & Segregation Chart

Properly Secured Packages

Properly Balanced Load

- Ensure weight is equally distributed.
- Side to Side and Front to Back.
- Use dunnage if unevenly or mid-loaded.
- Use load bars and straps to secure.

Proper Segregation

- Class 8 Corrosives may not be loaded above or adjacent to Class 4 Flammables or Class 5 Oxidizing materials, unless physical barrier is provided to segregate the products.
- The Load and Segregation Chart is a tool designed to prevent the co-mingling of incompatible materials.

Pop Quiz # 7

- Class 8 Corrosives may be stored with Class 3 Flammables.
  A. True
  B. False

- Mid-Loading of Totes is perfectly acceptable if you use only load bars to secure the tote.
  A. True
  B. False

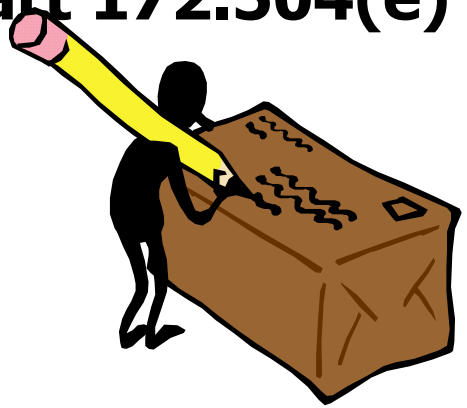
Placarding

- **Placed on bulk packaging, freight, transport vehicles, and railcars:**
  - **Alerts the public**
  - **Informs emergency responders**

- **Placards must be on both sides & both ends of any bulk packaging transport of HAZMAT**

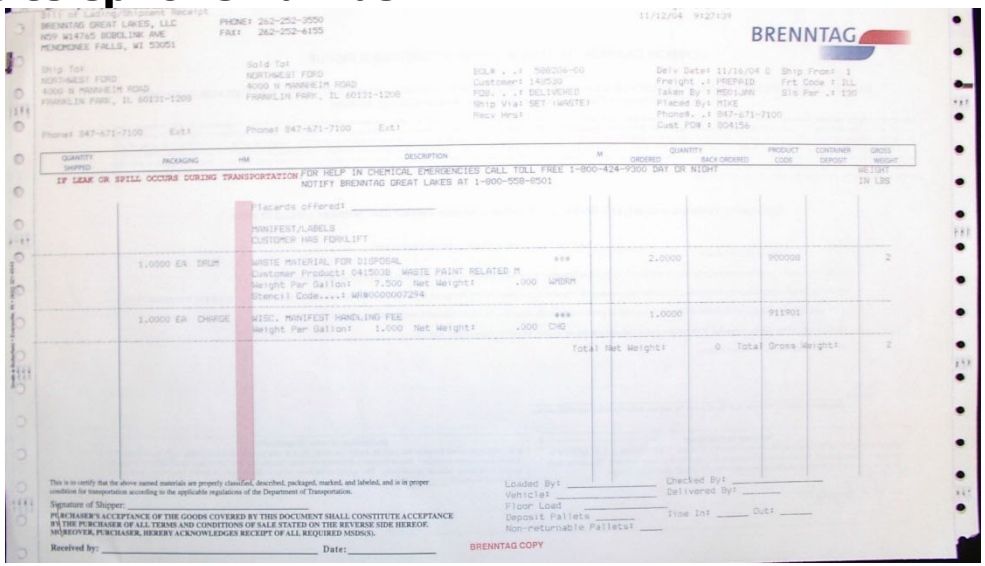
Placarding

- **Shipper must provide placards if offering HAZMAT for shipment**
- **Loading personnel must verify chocks under wheels and proper placards are placed prior to departure.**
- **Proper placards are identified in Tables located in 49 CFR Part 172.504(e)**



Shipping Papers

- **Shipping papers must include:**
  - **Proper shipping name**
  - **Hazard class or division**
  - **UN or NA identification number**
  - **Packing group, if applicable**
  - **Total quantity**
  - **24-hour emergency response telephone number**
  - **Certification statement**



Pop Quiz # 8

- It is the driver's responsibility to ensure the wheels are chocked before loading a trailer and placards are placed on the trailer prior to departure.
  A. True
  B. False

- The intent of the segregation chart is:
  A. Distribute the weight of the load
  B. Decrease transportation costs
  C. Prevent co-mingling of incompatible materials
  D. Allow employees to load as materials as they see fit.

Emergency Response Information

- **Provided on the shipping paper:**
  - **Material Listed**
  - **ERG guide number**
  - **Attach the MSDS**
- **Must include:**
  - **Basic description**
  - **Immediate health hazards**
  - **Risks of fire or explosion**
  - **Immediate precautions**
  - **Fire handling measures**
  - **Spill response**
  - **Basic first aid measures**