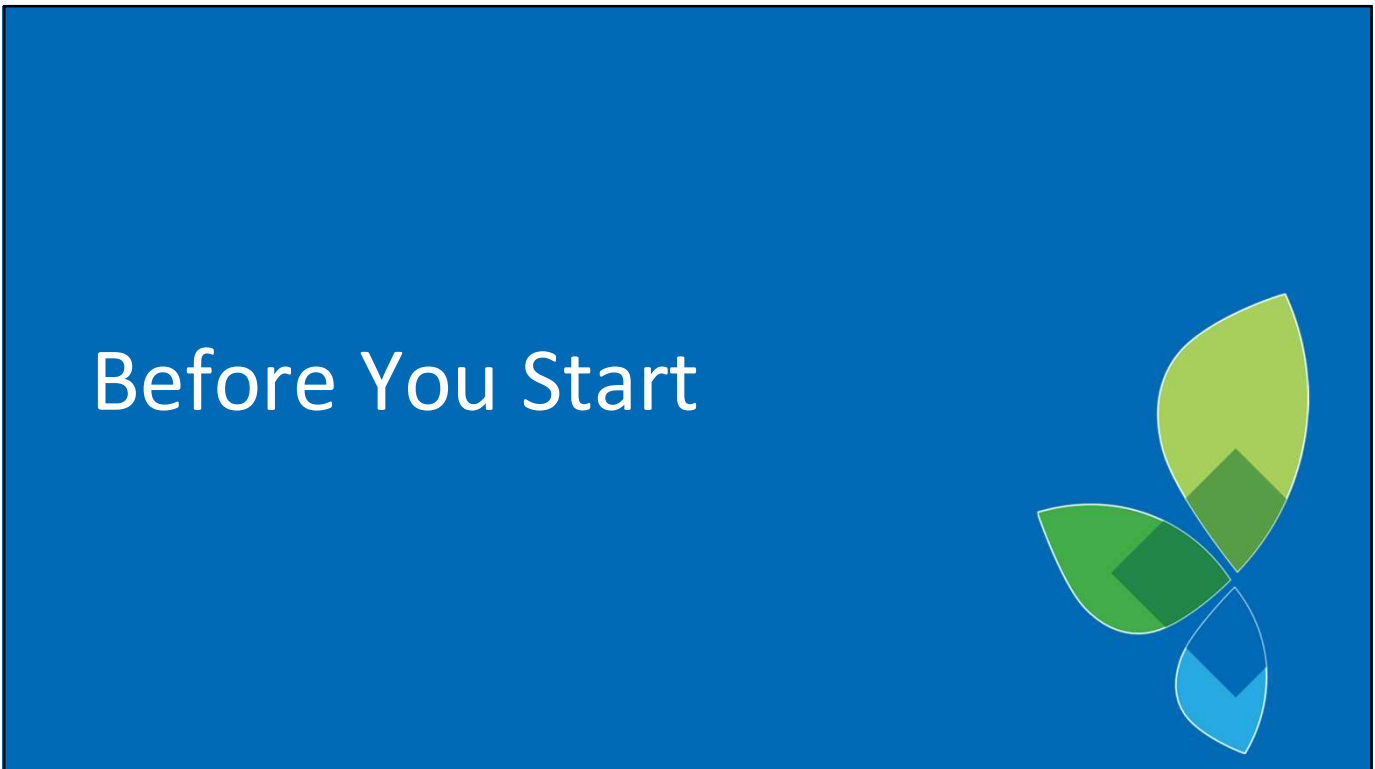




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Training

All staff members involved with packing and shipping hazardous materials must have the US-DOT Hazardous Materials Awareness Training. This includes those that:

- Pack drums and boxes
- Solicit transportation and sign manifests
- Order shipping supplies

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PPE

- Proper PPE required.
- Gloves, Tyvek apron or coveralls.
- Eye protection/face protection.
- Respiratory protection, including engineering controls.
- First aid supplies readily available.

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Spill Control

- Spill control supplies on hand.
- Absorbent spreads like clay litter.
- Absorbent pillows, pads, pigs.
- Neutralization supplies, such as sodium bicarbonate.
- Brooms/pans and other collection equipment.

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Containers

- Determine proper container for the job.
- Correct size.
- Correct container materials: steel, poly or fiber.
- UN-rated containers for hazardous materials.
- Proper way to transport filled container.

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Choosing The Container



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Packing Groups

Packing groups specify the characteristics of the containers used to ship the material.

- Packing Group I: Most dangerous
- Packing Group II: Medium danger
- Packing Group III: Least danger

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What is a Rated Container?

UN (United Nations) rated containers meet international standards for the safe transport of hazardous materials and are required. Rated containers will be marked as such with a detail code for its specifications.



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How to read the UN container code

On rated containers, an alphanumeric code describes the container and its characteristics for shipping materials.



3H1/X1.2/250
14/USA

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Packing Type

1A2/Y250/S/21/USA/63WBZ45

- 1: Drum/Pail
- 2: Barrel
- 3: Jerrycan
- 4: Box
- 5: Bag
- 6: Composite Packaging
- 7: Pressure Receptacle

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Container Material

1A2/Y250/S/USA/63WBZ45

A: Steel	H: Plastic
B: Aluminum	L: Textile
C: Natural Wood	M: Paper/Multiwall
D: Plywood	N: Other Metals
F: Reconstructed Wood	P: Glass, Porcelain, Stoneware
G: Fiberboard	

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Container Category

1A2/Y250/S/21/USA/63WBZ45

- Closed Head
- Open Head

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Packing Group Rating

1A2/Y250/S/21/USA/63WBZ45

- X: PG I, II, III
- Y: PG II, III
- Z: PG III

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Mass capacity

1A2/Y250/S/21/USA/63WBZ45

- Maximum mass in kilograms (kg) the container can hold
- For liquid containers, will be maximum specific gravity of liquid

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Packing Information

1A2/Y250/S/21/USA/63WBZ45

- S = packing for solids or liquids in containers. No free liquids
- Numbers will be the maximum hydrostatic test pressure in kilopascals kPa

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Year of Manufacture

1A2/Y250/S/21/USA/63WBZ45

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Nation of manufacture

- 1A2/Y250/S/21/USA/63WBZ45

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Steel Drums/Pails

- Good general purpose.
- Best for flammable liquids
- Tight head drums for bulking solvents
- Open head drums for loose/lab packing containers
- Significant cost increased the past couple years
- Many vendors now require liners

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Poly Drums/Pails

- Also good general purpose
- Best for corrosives and oxidizers
- Tight head for bulking things like photographic fixers or aqueous pesticides
- Open head for loose/lab packs
- Gaining more general use as prices have not increased as much as steel.
- Rated for lower container mass than steel
- Many vendors now require liners

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Boxes

- Excellent for solids, such as bagged pesticides
- Often most economical
- Cubic yard boxes best for bulk shipped materials like paint cans or aerosols
- Must be secured to pallet and closed by manufacturer's instructions
- Must have liner.

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My recommendations for on hand supplies

- 3-wall cubic yard boxes (rated and non-rated).
- 85-gallon steel overpack drums.
- 55-gallon steel open-head drums with bolt-ring lids.
- 55-gallon poly open-head drums with lever-lock lids.
- 55-gallon poly tight-head drums.
- 55-gallon hazmat boxes.
- 30-gallon poly open-head drums with lever-lock lids.
- 20-gallon hazmat boxes.
- 5-gallon poly pails with screw-on, latching lids.
- 5-gallon hazmat boxes.

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Packing and Shipping



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Liquid Bulking



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Liquid Bulking



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Loose Pack



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Lab Pack

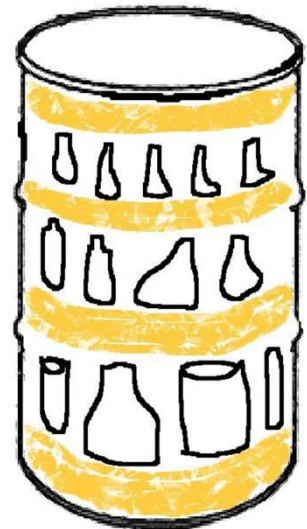


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Lab Pack

- Select proper packing material (usually vermiculite).
- 2"-4" packing material base layer.
- Place largest/heaviest items on bottom layer.
- Try to keep same container height per layer.
- Minimum 1" space between containers.
- 1"-2" between containers and drum wall.
- Minimum 2" packing material between stack layers.
- Minimum 2" packing material over top layer.
- Vendor may require different values.



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Secondary Containment



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Overpacking

- Secondary containment on larger scale.
- Not just for 55-gallon drums.
- Appropriate for any suspect/compromised container.
- Container must have sufficient integrity to be lifted or rolled into overpack.
- If rolled, any leaks must be plugged.
- Containers without sufficient integrity must have contents transferred to new container.
- This may be beyond the operational limits of an HHW facility and outside help required.



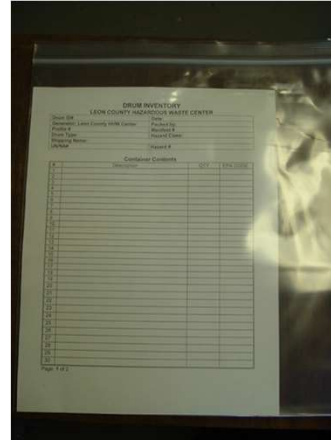
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Inventory Sheet

INVENTORY		LEON COUNTY HAZARDOUS WASTE CENTER	
Drum ID: LC001191-1	Date: 30 November 2009	Generator: Leon County HHW Center	Packed by: Richard Lobmaek
Profile #	Manifest #	Drum Type: 55 open steel	Hazard Class: Poison
Shipping Name: Lab Pack, Pesticides, Solid, n.o.s.	Hazard # 6	UN1911 2588	

#	Description	QTY	EPA CODE
1	Chlorpyrifos 1%	2 x 15 lb	
2	Diazinon 5%	2 x 3.5 lb	
3	Disulfoton 4%	2 x 3.5 lb	
4	Atrazine 1.055%	2 x 20.7 lb	
5	Chloridaz 10%	2 x 1 lb	
6	Copper sulfate	10 lb	
7	Glifosol 1.6%	15 lb	
8	Diazinon 5%	20 lb	
9	Diazinon 5%	10 lb	
10	Diazinon 1%	25 lb	
11	Spinosad 2%	15 lb	
12	Diflufenican 0.125%	12 lb	
13	Trifluralin 20%	5 lb	
14	Chlorpyrifos 0.5%	1 lb	
15	Fenoxycarb 1%	10 oz	
16	Unifluralin	3 x 1 lb	
17	Spinosad 2%	2 x 1 lb	
18	DOT 4 25% Chloridaz 5%	4 oz	
19	Diazinon 5%	4 lb	
20	Malathion 5%	3 x 4 lb	
21	Epistar 2.5%	4 lb	
22	Chlorpyrifos 1%	4 lb	
23	Rotenone 1%	4 lb	
24	Carbaryl 10%	5 lb	
25	Pyrethrin 2%	2 lb	
26	Amdro	2-3 oz	
27	Boric acid	1-2 oz	
28	Avermectin 0.011%	1 lb	
29	Acephate 7.5%	3 x 1 lb	
30	Manco 7%	1 lb	



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Labeling

- Proper DOT hazard class labels.
- Proper DOT hazardous material, regulated material, or universal waste labels (may be provided by vendor).
- Drum identity clearly marked.
- Inventory sheets attached to drum.

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Shipping Labels



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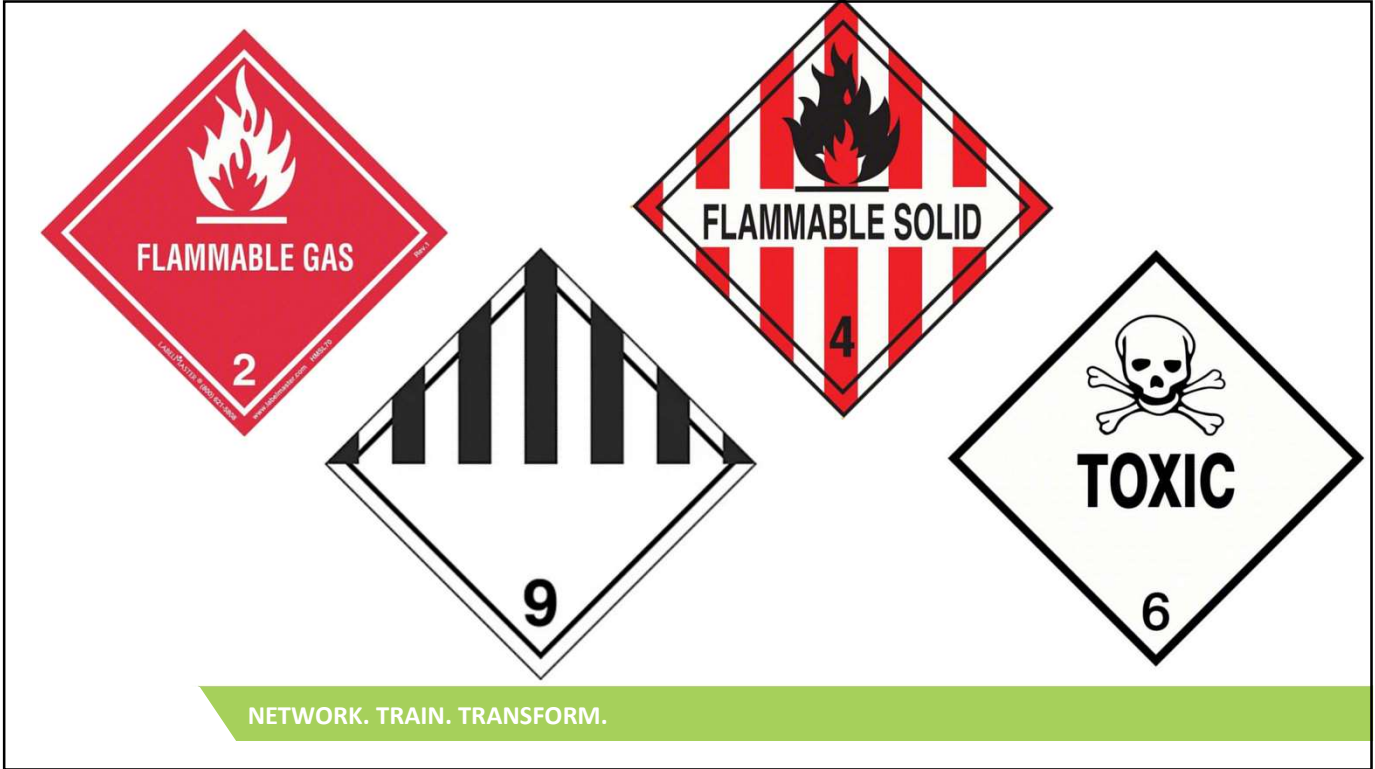
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DOT Diamonds

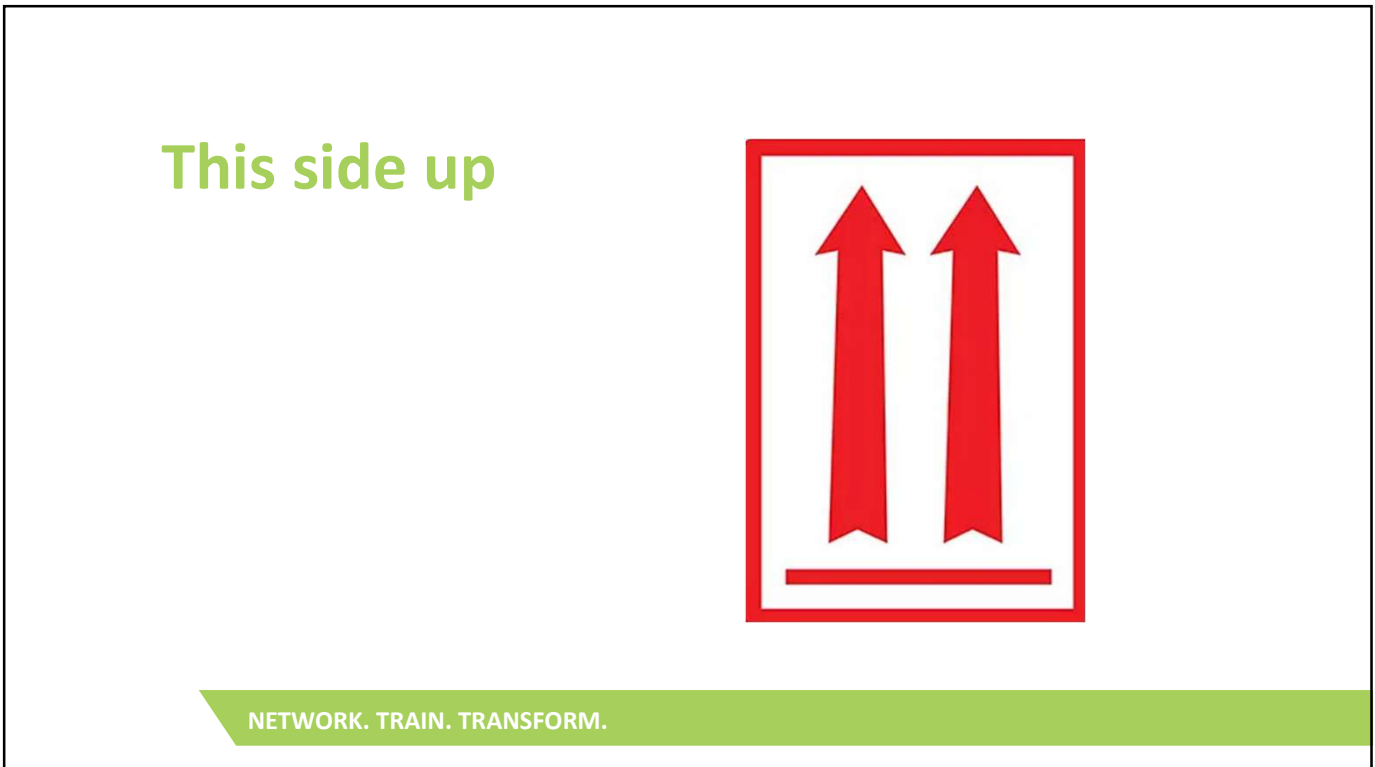
- 4-inch diamonds used on drums and non-bulk boxes
- 10-inch diamonds used on bulk containers, like cubic yard boxes or International Bulk Containers
- 10-inch diamond placards on all four sides of transport vehicle if material shipped is over 1000 lbs (or other amount as defined)

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Label placement

- Container must be placed so that labels are visible.
- Diamonds must be placed near label with shipping name.
- If multiple hazards, the diamonds must be next to each other, no more than six inches apart.

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Ship Safely

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Proper packing and shipping is a critical part of HHW operations that should be handled by properly trained staff.

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