

Class Outline

Lab Pack History and Definitions **EPA Regulation** DOT Regulations

Over pack – Salvage Pack – Lab Pack

Covering: Packaging Materials Shipping Containers

- **Physical Packaging** •
- Maximum Allowable Volume/Weight Per Container
- Inner Containers •
- Packing List ٠
- •
- Waste Description Labeling and Marking •
- Review of practical procedure •

Possible Items for Lab Pack

Acids, bases and reagents. Toxic, flammable, corrosive, pyrophoric or explosive materials. Aerosols and compressed gases. Oxidizers. Solvents. Chemical reagents. Toxic Substances Control Act (TSCA) chemicals. Cleaning and disinfecting agents. Reactive materials from metals. Radioactive materials. Medical waste. Drug Enforcement Administration (DEA) substances. Inks, dyes, paints, paint thinners and varnish strippers. Organic peroxides Universal wastes. Mixed waste. Unknowns and unlabeled containers.



Basic Definitions

Over Pack

Lab Pack

Lab Pack

Over Pack (49CFR 171.8) Consolidation of DOT packages for handling

Overpack, except as provided in subpart K of part 178 of this subchapter [Class 7], means an enclosure that is used by a single consignor to provide protection or convenience in handling of a package or to consolidate two or more packages. Overpack does not include a transport vehicle, freight container, or aircraft unit load device.

Basic Definitions

Over Pack

Over Pack (49CFR 171.8) Consolidation of DOT packages for handling

(con't)

Examples of overpacks are one or more packages: (1) Placed or stacked onto a load board such as a pallet and secured by strapping, shrink wrapping, stretch wrapping, or other suitable means; or

(2) Placed in a protective outer packaging such as a box or crate.







Over Pack

Salvage Packaging (49CFR 171.8)

Salvage packaging means a special packaging conforming to § 173.3 of this subchapter into which damaged, defective, leaking, or non-conforming hazardous materials packages, or hazardous materials that have spilled or leaked, are placed for purposes of transport for



Basic Definitions

Over Pack

Salvage Pack

Salvage Packaging (49CFR 171.8)

§ 173.3 Packaging and exceptions (c) Salvage drums.

Packages of hazardous materials that are damaged, defective, or leaking; packages found to be not conforming to the requirements of this subchapter after having been placed in transportation; and, hazardous materials that have <u>spilled or leaked</u> may be placed in a metal or plastic removable head salvage drum that is compatible with the lading and shipped for repackaging or disposal under the following conditions:.....

Basic Definitions

Over Pack

Salvage Pack

Lab Pack

Lab Pack

Salvage Packaging (49CFR 171.8) (173.3(c) Salvage drum con't)

following conditions:

(1) UN 1A2, 1B2, 1N2 or 1H2 tested and marked for Packing Group III or higher performance standards for liquids or solids and a leakproofness test of 20 kPa (3 psig). Capacity of the drum may not exceed 450 L (119 gallons).



Basic Definitions

Over Pack

Salvage Pack

Salvage Packaging (49CFR 171.8) (173.3(c) Salvage drum con't)

following conditions:

(2) Each drum shall be provided when necessary with sufficient cushioning and absorption material to prevent excessive shifting of the damaged package and to eliminate the presence of any free liquid at the time the salvage drum is closed. All cushioning and absorbent material used in the drum must be compatible with the hazardous material.

Basic Definitions

Over Pack

Salvage Pack

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Salvage Packaging (49CFR 171.8) (173.3(c) Salvage drum co<u>n't)</u>

following conditions:

(3) Each salvage packaging must be marked with the proper shipping name of the hazardous material inside the packaging and the name and address of the consignee. In addition, the packaging must be marked "SALVAGE". The lettering of the marking must be at least 12 mm (0.5 inches) high.

Basic Definitions

Over Pack

Salvage Pack

Lab Pack

Lab Pack

Salvage Packaging (49CFR 171.8) (173.3(c) Salvage drum con't)

following conditions:

(4) Each drum shall be labeled as prescribed for the respective material.

(5) The shipper shall prepare shipping papers in accordance with subpart C of part 172 of this subchapter.



Basic Definitions

Over Pack

Salvage Pack

Salvage Packaging (49CFR 171.8) (173.3(c) Salvage drum con't)

following conditions:

(6) The overpack requirements of § 173.25 do not apply to drums used in accordance with this paragraph.

(7) A salvage packaging marked "T" in accordance with applicable provisions in the UN Recommendations may be used.

Basic Definitions

Over Pack

Oshusus Dash

Lab Pack

Lab Packaging

No definition for Lab Pack in 49CFR or 40CFR.

Both regulations describe just the procedure for disposing of small packages of hazardous waste.

Lab Pack History





Lab Pack History USEPA versus USDOT USEPA 40CFR 264.316 USDOT 49CFR 173.12 December 1990 Primary section is § 264.316 Disposal of small containers of hazardous waste in overpacked drums (lab packs). Exceptions for shipment of waste materials.

What about DTSC?

Question: Which regulation do you need to comply with?

Lab Pack EPA

General EPA Packaging Rule

USEPA 40CFR § 262.30 Packaging.

Before transporting hazardous waste or offering hazardous waste for transportation off-site, a generator must package the waste in accordance with the applicable Department of Transportation regulations on packaging under 49 CFR parts 173, 178, and 179.

Lab Pack EPA

USEPA 40CFR 264.316 Disposal of small containers of hazardous waste in overpacked drums (lab packs).

(a)Hazardous waste must be:

- ✤Packaged in non-leaking inside containers.
- Inside containers must be of a design and constructed of a material that will not react dangerously with, be decomposed by, or be ignited by the contained waste. and
- Must be tightly and securely sealed.
- Inside containers must be of the size and type specified in the Department of Transportation (DOT) hazardous materials regulations (49 CFR parts 173, 178, and 179), if those regulations specify a particular inside container for the waste.

Lab Pack EPA

USEPA 40CFR 264.316

(b) The inside containers must be overpacked

- in an open head DOT-specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and
- Surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with § <u>264.314(d)</u> [land disposal], to completely sorb all of the liquid contents of the inside containers.
- The metal outer container must be full after it has been packed with inside containers and sorbent material.

Lab Pack EPA

USEPA 40CFR 264.316

(c) The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers, in accordance with §264.17(b) [General rgmts for ignitable, reactive, or incompatible wastes.]

(d) **Incompatible wastes**, as defined in § 260.10 of this chapter, must **not** be placed in the same outside container.

260.10

Incompatible waste means a hazardous waste which is unsuitable for: (1) Placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., container inner liners or tank walls); or (2) Commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes, or gases, or flammable fumes or gases.

Lab Pack EPA

USEPA 40CFR 264.316

(e) Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in § 261.23(a)(5) of this chapter, must be treated or rendered non-reactive prior to packaging in accordance with paragraphs (a) through (d) of this section.

Cyanide- and sulfide-bearing reactive waste may be packed in accordance with paragraphs (a) through (d) of this section without first being treated or rendered non-reactive.



Lab Pack EPA

USEPA 40CFR 264.316

(f) Such disposal is in compliance with the requirements of part 268 Land Disposal Regulations.

Persons who incinerate lab packs according to the requirements in 40 CFR 268.42(c)(1) may use fiber drums in place of metal outer containers.

Such fiber drums must meet the DOT specifications in 49 CFR 173.12 [DOT lab pack exception] and be overpacked according to the requirements in paragraph (b) [inside containers] of this section.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(1) Waste materials prohibited by paragraph (b)(3) of this section are not authorized for transport in packages authorized by this paragraph (b).

(b)(3) Prohibited materials. The following waste materials may not be packaged or described under the provisions of this paragraph (b):

- Added of described under the provisions of this paragraph (b);
 a material poisonous-by-inhalation,
 a temperature-controlled material unless it complies with § 173.21(f)(1), [stabilized or inhibited]
 a Division 6.1, Packing Group I material, chloric acid, and
 oleum (fuming sulfuric acid).

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(a) Open head drums.

If a hazardous material that is a hazardous waste is required by this subchapter to be shipped in a closed head drum (i.e., a drum with a 7.0 cm (3 inches) or less bung opening) and

the hazardous waste contains solids or semisolids

that make its placement in a closed head drum impracticable,

an equivalent (except for closure) open head drum may be used for the hazardous waste.



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials (b) Lab packs.

(1) (<u>con't)</u>

Waste materials classed as Class or Division

4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, or

No 1, 2, or 7!!!!!!!

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(1) (con't)

are excepted from the specification packaging requirements of this subchapter for combination packagings [is there single packaging lab pack?]

if packaged in accordance with this paragraph (b) and transported for **disposal or recovery by highway**, rail or cargo vessel.

What is this "subchapter"

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(1) (con't)

In addition, a generic description from the § 172.101 Hazardous Materials Table may be used in place of specific chemical names, when:

- two or more chemically compatible waste materials
- in the same hazard class are
- ✤ packaged in the same outside packaging.



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

- (b) Lab packs.
- (2) Combination packaging requirements:(i) Inner packagings.

The inner packagings must be either glass, not exceeding 4 L (1 gallon) rated capacity,

or metal or plastic, not exceeding 20 L (5.3 gallons) rated capacity.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements:(i) Inner packagings. (con't)

Inner packagings containing liquid must be surrounded by a chemically compatible absorbent material

in sufficient quantity to absorb the total liquid contents.

Inner receptacle means a receptacle which requires an outer packaging in order to perform its containment function. The inner receptacle may be an inner packaging of a combination packaging or the inner receptacle of a composite packaging.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements: (ii) Outer packaging.

Each outer packaging may contain only **one class** of waste material.



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

- (2) Combination packaging requirements:
 (ii) Outer packaging. (con't)
 The following outer packagings are authorized (A)
 UN 1A2,
 UN 1B2 or
 UN 1N2 metal drum, a
 - UN 1D plywood drum, a
 - UN 1G fiber drum, or a
 - UN 1H2 plastic drum, tested and marked to at least the Packing Group III performance level for liquids or solids;

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements:(ii) Outer packaging. (con't)

(B) At a minimum, a <u>double-walled</u> UN 4G fiberboard box made out of 500 pound burst-strength fiberboard fitted with a polyethylene liner at least 3 mils (0.003 inches) thick and



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements: (ii) Outer packaging. (con't)

(B) con't

and when filled during testing to 95 percent capacity with a solid material, successfully passes the tests prescribed in §§ 178.603 (drop) and 178.606 (stacking), and is capable of passing the tests prescribed in § 178.608 (vibration) to at least the Packing Group II performance level for liquids or solids; or (C)...



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

- (b) Lab packs.
- (2) Combination packaging requirements:(ii) Outer packaging. (B con't)

except that Division 4.2 Packing Group I materials must be packaged using UN standard steel or plastic drums tested and marked to the Packing Group I performance level for liquids or solids; and ...

...bromine pentafluoride and bromine trifluoride may not be packaged using UN 4G fiberboard boxes

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements: (ii) Outer packaging. (con't)

(C) A UN 11G fiberboard intermediate bulk container (IBC)

or a UN 11HH2 composite IBC, fitted with a polyethylene liner at least 6 mils (0.006 inches) thick, that successfully passes the tests prescribed in subpart O of part 178 and § 178.603 to at least the Packing Group II performance level for liquids or solids;

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements: (ii) Outer packaging. (con't)

(C) (con't)

...or

a UN 11HH2 is composed of multiple layers of encapsulated corrugated fiberboard **between** inner and outer layers of woven coated polypropylene.



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(2) Combination packaging requirements: (iii) The gross weight of each completed combination package may not exceed 205 kg (452 lbs).

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(b) Lab packs.

(3) Prohibited materials.

The following waste materials may not be packaged or described under the provisions of this paragraph (b):

- a material poisonous-by-inhalation,
 a temperature-controlled material unless it complies with § 173.21(f)(1), [stabilized or inhibited]
 a Division 6.1, Packing Group I material, chloric acid, and
- oleum (fuming sulfuric acid).

Forbidden materials and packages, (I)(1) A package meeting the criteria of pa equired to be shipped under controlled temperature conditions. The control tem use for a package shall be as specified in the table in this paragraph base. The control temperature is the temperature above which a package of the ma cotabilon or transported in the entrogramy temperature is the temperature at mergency measures must be initiated. ing the criteria of parag ons. The control temper



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(c) Reuse of packagings.

A previously used packaging may be reused for the shipment of waste material transported for disposal or recovery, not subject to the reconditioning and reuse provisions contained in § 173.28 and part 178 of this subchapter, under the following conditions:

(1) Except as authorized by this paragraph, the waste must be packaged in accordance with this part and offered for transportation in accordance with the requirements of this subchapter.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(c) Reuse of packagings. (con't)

(2) Transportation is performed by highway only.

(3) A package is not offered for transportation less than 24 hours after it is finally closed for transportation, and each package is inspected for leakage and is found to be free from leaks immediately prior to being offered for transportation.

(4) Each package is loaded by the shipper and unloaded by the consignee, unless the motor carrier is a private or contract carrier.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(c) Reuse of packagings. (con't)

(5) The packaging may be used only once under this paragraph and may not be used again for shipment of hazardous materials except in accordance with § 173.28.



Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(d) Technical names for n.o.s. descriptions.

The requirements for the inclusion of technical names for n.o.s. descriptions on shipping papers and package markings, §§ 172.203 and 172.301 of this subchapter, respectively, **do not apply** to packages prepared in accordance with paragraph (b) of this section

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

 $(d) \ \mbox{Technical names for n.o.s. descriptions.}$

..except that packages containing materials meeting the definition of a hazardous substance

must be described as required in § 172.203 [shipping paper] of this subchapter and marked as required in § 172.324 [pkg marking] of this subchapter.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(e) Segregation requirements.

Waste materials packaged according to paragraph (b) of this section and transported in conformance with this paragraph (e) are **not subject to the segregation requirements** in §§174.81(d), 176.83(b), and **177.848(d)** if blocked and braced in such a manner that they are separated from incompatible materials by a minimum horizontal distance of 1.2 m (4 feet) and the packages are loaded at least 100 mm (4 inches) off the floor of the freight container, unit load device, transport yehicle, or rail car.

Applies only when packages are shipped in same truck or trailer!

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials (e) Segregation requirements. (con't)

The following conditions specific to incompatible materials also apply:

(1) General restrictions. The freight container, unit load device, transport vehicle, or rail car may not contain any Class 1 explosives, Class 7 radioactive material, or <u>uncontainerized</u> hazardous materials;

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(e) Segregation requirements. (con't)

The following conditions specific to incompatible materials also apply:

- (2) Waste cyanides and waste acids.
- (3) Waste Division 4.2 materials and waste Class 8 liquids.
- (4) Waste Division 6.1 Packing Group I, Hazard Zone A material and waste Class 3, Class 8 liquids, <u>or</u> Division 4.1, 4.2, 4.3, 5.1 and 5.2 materials

If listed: requires special handling -read entire section

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(f) Additional exceptions.

Lab packs conforming to the requirements of this section are *not subject* to the following:

(1) The overpack marking and labeling requirements in <u>of this subchapter</u> when secured to a pallet with shrink-wrap or stretch-wrap except that labels representative of each Hazard Class or Division in the overpack must be visibly displayed on <u>two</u> opposing sides.

* The overpack is marked with the proper shipping name and identification number, when applicable, and is labeled as required by this subchapter for each hazardous material contained therein, unless marking and labels representative of each hazardous material in the overpack are visible.

Lab Pack DOT

USDOT 49CFR 173.12 Exceptions for shipment of waste materials

(f) Additional exceptions.

Lab packs conforming to the requirements of this section are not subject to the following:

(2) The restrictions for overpacks containing Class 8, Packing Group I material and Division 5.1, Packing Group I material in <u>§ 173.25(a)(5)* of this subchapter</u>. These waste materials may be overpacked with other materials.

* Packages containing Class 8 (corrosive) materials in Packing Group I or Division 5.1 (oxidizing) materials in Packing Group I may not be overpacked with any other materials

Assembly



PRE-Packing

- ✤ Identify ALL material to be placed into Lab Pack
- ✤ Classify ALL material to be placed in Lab Pack
- Eliminate unauthorized materials
- Paper pre-pack list of items list all materials for a single lab pack
- Ensure authorized materials and compatibility
- Select appropriate outer packaging
- Select appropriate filler and cushioning material
- Ensure all inner containers have secure closures and are not leaking

Assembly



Assembly of contents

- Liquid contents do not exceed absorbent capabilities
- Ensure containers are spaced so there is no possibility of contact in ANY direction.
- Closures upright and tight.
- Fill package with inner containers and absorbent.
- Fill package to the top with absorbent
- Do not exceed DOT package max load and do not exceed closed lab pack package max weight (452#). Yes, you might have to weigh it!
- Follow outer package manufactures closing instructions.



Communications

Communication requirements

- ✤ Technical name is not required for lab packs or UHWM.
- RQ marking and UHWM is required if Hazardous Substance.
- Mark with completed EPA warning label containing proper shipping name, ID#, RQ if required.
- Place USDOT hazard warning label near proper shipping name marking.
- Two hazard warning labels opposing side if overpacked on pallet.
- Two orientation arrow marking on under 119-gallon outer container.
- Consider placing "lab pack" notation on UHWM

Basic Differences

| Overpack | Salvage Drum | Lab pack |
|--|---|--|
| Not a DOT specification packaging but may contain such | DOT specification Packaging | 1A2,1B2,1N2,1D,1G,1H2 11HH2, PGIII |
| No limit on size or capacity | Capacity limited to no more than 119 gallons | Max 452 lbs gross Inner glass 1 gal, metal/plastic 5.3 gal |
| May only be initiated by a single shipper | May be used by either the shipper or carrier | Generator as shipper |
| Its use determined by preference | Its use determined by necessity | Use optional- otherwise DOT spec for each HM |
| May be used for multiple hazmat | Intended for use of single hazmat | 3, 4.1, 4,.2, 4.3, 5.1, 5.2, 6.1, 8, 9. one HC/pkg |
| No limit on intended use | Hazmat must be sent for disposal or recovery | Haz Waste disposal only |

Stuff



Max weight for this package?

200kg max weight S = solids or inner containers

1.2/100 = max specific gravity and 100kPa -liquids









