FedEx Ground Package Systems Inc. is committed to the safe transportation of hazardous materials. It is very important that each person engaged in the transportation of hazardous materials become thoroughly familiar with the Title 49CFR (Code of Federal Regulations). This guide is intended only to assist you in your preparation of hazardous materials shipped via FedEx Ground Package Systems Inc. It is the shipper's responsibility to ensure each hazardous material package is in compliance with applicable Department of Transportation (D.O.T.) regulations and FedEx Ground Package Systems Inc. requirements. Failure to comply with these regulations and requirements may subject the shipper and carrier to fines and penalties.

Due to the changing nature of D.O.T. regulations and other information, it is impossible to guarantee absolute accuracy of the material contained in this guide. FedEx Ground Package Systems Inc., therefore, cannot assume any responsibility for omissions, errors, misprinting, or ambiguity contained within this guide and shall not be held liable in any degree for any loss or injury caused by such omission or error presented in this publication.

The *FedEx Ground Hazardous Materials Shipping Guide* is intended to simplify Title 49 CFR. FedEx Ground Package Systems Inc. reserves the right to be more restrictive than the federal regulations (49 CFR). Customers should be thoroughly familiar with the applicable sections of this guide when shipping hazardous materials via FedEx Ground Package Systems Inc. This guide reflects current dockets under final rule published on or before **August 1**, **2016**.

-TABLE OF CONTENTS-

TOPIC	Page #
FedEx Ground Prohibited & Allowable Hazardous Materials	3
FedEx SmartPost®	3
FedEx Ground Service Restrictions and Requirements	4
Shippers Responsibilities for Documentation	12
Completed Samples of Documentation	22
Definitions and Other Terms	31
49 CFR Sections	55
Identification Number Cross Reference Index	120
Hazardous Substance (RQ) Table	141

FedEx Ground Prohibited Hazardous Materials:

CLASS	NAME	LABEL CODE / LABEL
1.1	Explosives	1.1 / Explosive 1.1
1.2	Explosives	1.2 / Explosive 1.2
1.3	Explosives	1.3 / Explosive 1.3
1.5	Explosives	1.5 / Explosive 1.5
2.3	Poisonous Gas	2.3 / Poisonous Gas
4.2	Spontaneously Combustible Material	4.2 / Spontaneously Combustible
4.3 *	Dangerous When Wet	4.3 / Dangerous When Wet
6.1	Poisonous Materials (PG I & II, Inhalation Hazards)	6.1 / Poison
6.1 *	Poisonous Materials (PG I & II, Non-Inhalation Hazards)	6.1 / Poison
6.1 *	Poisonous Materials (PG III)	6.1 / Keep Away From Food
6.2	Infectious Substance	6.2 / Infectious Substance
7	Radioactive Material II and III	7 / Radioactive Yellow II & III

*FedEx Ground will handle these materials only when packaged according to a DOT Special Permit, or when packaged in accordance with DOT exception 49 CFR 173.13. FedEx Ground does not accept packages with the toxic/poison diamond label (skull and crossbones) affixed.

Important: Hazardous materials, including ORM-D and Limited Quantity, via FedEx Ground service are acceptable within the contiguous United States. Hazardous materials, including ORM-D and Limited Quantity materials, **cannot** be shipped to Alaska or Hawaii. Consumer Commodity ORM-D and Limited Quantity only, can be shipped into Canada. However, you cannot ship Cartridges, small arms or Cartridges, power devices to Canada.

FedEx SmartPost

FedEx SmartPost does not accept fully regulated hazardous materials. FedEx SmartPost does accept certain materials classed as limited quantity/ORM-D in accordance with USPS Publication 52.

FedEx Ground Acceptable Hazardous Materials:

CLASS	NAME	LABEL CODE / LABEL
1.4*	Explosives	1.4 / Explosive 1.4
1.6	Extremely Insensitive	1.6 / Explosive 1.6
2.1	Flammable Gas	2.1 / Flammable Gas
2.2	Non-Flammable Gas	2.2 / Non-Flammable Gas
3	Flammable Liquid	3 / Flammable Liquid
4.1	Flammable Solid	4.1 / Flammable Solid
5.1	Oxidizer	5.1 / Oxidizer
5.2	Organic Peroxide	5.2 / Organic Peroxide
7	Radioactive Material I	7 / Radioactive White I
8	Corrosive Material	8 / Corrosive
9	Miscellaneous Hazardous Materials	9 / Class 9
ORM-D	Consumer Commodity (ORM-D)	ORM-D/Consumer Commodity
ORM-D	Cartridges, small arms (ORM-D)	ORM-D/Cartridges, small arms

*Except fireworks

FedEx Ground Conditions and Requirements:

General

All packages containing hazardous materials must be properly classified, described, packaged, marked, labeled and in proper condition for transportation according to applicable DOT regulations and FedEx Ground requirements. FedEx Ground does not accept hazardous material packages prepared under the IATA/ICAO (International Air Transport Association/International Civil Aviation Organization) regulations.

All packages offered and prepared under a DOT Special Permit (DOT-SP) must provide a copy of the Special Permit paperwork to the accepting facility (origin station).

All shippers must be prepared to provide a copy of the Material Safety Data Sheet (MSDS) for their materials when requested by FedEx Ground.

Service

- Shippers must be properly qualified through a FedEx Account Executive before offering hazardous material packages via FedEx Ground. Please contact FedEx Ground Customer Service at 1-800-GO-FEDEX (1-800-463-3339) for more information.

- Hazardous materials, including ORM-D and Limited Quantity, via FedEx Ground service are acceptable within the contiguous United States. Hazardous materials, including ORM-D and Limited Quantity materials, **cannot** be shipped to Alaska or Hawaii. Consumer Commodity ORM-D and Limited Quantity only, can be shipped into Canada. However, you cannot ship Cartridges, small arms or Cartridges, power devices to Canada.

- Call Tag service is not available for hazardous materials, except ORM-D and Limited Quantity.

- Guaranteed service may not apply to packages not properly prepared in accordance with DOT regulations and FedEx Ground requirements.

- Hazardous material shipments, including shipments containing ORM-D materials, Limited Quantity materials or dry ice, **are not accepted** at FedEx Express Drop Box locations, FedEx Office Print and Ship Center locations, FedEx World Service Center locations, FedEx Express station or ramp locations, FedEx Authorized ShipCenter locations, and unstaffed FedEx locations.

Material Restrictions

Refer to column 9 of the FedEx Ground Hazardous Materials Table for additional restrictions and requirements for specific hazardous materials.

FedEx Ground does not accept:

- Reportable quantities (RQ)
- Hazardous Waste
- Any material that is an “Inhalation Hazard”
- Fireworks
- Biohazards such as blood, urine, fluids and other noninfectious diagnostic specimens.

Hazardous Materials Security

Shippers and carriers are required to develop and implement a security plan addressing risks related to the transportation of hazardous materials. FedEx Ground has a Security Plan in place and is in full compliance with this regulation, along with the security-training requirements specified in 49 CFR 172.704.

Note: Due to the sensitive nature of this information, we cannot make a copy of our security plan available to our customers.

Packaging

All hazardous materials must be packaged in United Nations Performance Oriented Packaging (UN POP) except when non-specification packaging is authorized by the 49 CFR. All packaging must meet the requirements set out in 49 CFR 173.24 and 173.24a. Packaging that is not in new or “like new” condition will not be accepted. In addition, the following requirements apply:

- FedEx Ground requires Fiberboard “Non-Specification Packaging” or “Strong Outer Packaging” to meet the following requirements:
    - For packages weighing up to 20 lbs. the outer package minimum requirements will be a 200 lb. Bursting test or 32 Edge Crush test package.
    - For packages weighing 21-50 lbs. a 250 lb. Bursting test or 44 Edge Crush test will be required.
    - For packages weighing 51-70 lbs. the outer container must be 275 lb. Bursting test or 55 Edge Crush test.

- Hazardous materials cannot be shipped in any FedEx packaging.

- Class 2 cylinders must be placed inside an overpack (outer package) marked “OVERPACK” unless specification markings on the cylinder inside are visible. Regardless, all cylinders must be placed in an outer package.

- Hazardous materials cannot be banded, strapped or taped to form a bundle.

- FedEx Ground does not accept pails or drums over 8 gallons (32 liters). All pails or drums must be UN POP. We will accept authorized pails or drums as single packaging, however an additional handling fee may apply to these shipments.

- FedEx Ground will accept up to three different hazardous materials inside one UN POP or an overpack containing the required UN POP provided the materials are compatible. The materials must be packaged separately then placed in one outer package and contain three OP-900LL's or OP-900LG's and the required marking and labels.

- FedEx Ground does not accept cryogenic liquids unless properly prepared and packaged under exception 49 CFR 173.320. FedEx Ground **does not accept** flammable (Class 2.1) cryogenic liquids.

- FedEx Ground does not accept radioactive fissile material unless properly prepared and packaged under exception 49 CFR 173.453.

- Maximum weight for a hazardous material package is 70 pounds total.

Combination packaging containing hazardous materials cannot exceed the inner-container requirements. The maximum size, number and total weight of glass, plastic or metal inner containers allowed in any one package are listed below:

Type of Container	**Max. Unit Size**	**Max. Volume per Carton**	**Max. Wt. (Net) per Package**
GLass	0.5 liters	3L (12pt)	Net 25 lb.
	1.0 liter (1 qt.)	6L (6 qt.)	Net 25 lb.
	2.0 liters (1/2 gal.)	8L (2 gal.)	Net 25 lb.
	4.0 liters (1 gal.)	8L (2 gal.)	Net 25 lb.
Plastic	8L (2 gal.)	16L (4 gal.)	Net 50 lb.
Metal	4.0 liters (1 gal.)	16L (4 gal.)	Net 50 lb.

ORM-D and Limited Quantity Shipments

Cartridges, small arms (ORM-D or Limited Quantity): Cartridges, small arms and cartridges, power devices which have been classed as a Division 1.4S explosive may be re-classed and offered for transportation as an ORM-D or Limited material when packaged in accordance with 49 CFR 173.63(b). Each package containing an ORM-D or Limited Quantity material must be marked on at least one side with the ORM-D or Limited Quantity marking. The proper shipping name of the material, **Cartridges, small arms** *or* **Cartridges, power devices**, as appropriate, must be marked above or before the ORM-D or Limited Quantity designation. No shipping paper (OP-900LL or OP-900LG) or hazardous material certification form is required for ORM-D or Limited Quantity materials transported via highway.

FedEx Fact: Cartridges, small arms or Cartridges, power device ORM-D or Limited Quantity materials are prohibited to Alaska, Hawaii, or Canada.

Consumer commodity (ORM-D): Hazardous materials that have been properly classed as a Consumer commodity (ORM-D) must be marked on at least one side with the ORM-D marking. The proper shipping name, **Consumer Commodity**, of the material must be marked above or before the ORM-D designation. No shipping paper (OP-900LL or OP-900LG) or hazardous material certification form is required for ORM-D materials transported via highway.

FedEx Fact: Consumer commodity ORM-D or Limited Quantity materials are prohibited to Alaska or Hawaii. Consumer commodities are acceptable into Canada.

LIMITED QUANTITY SHIPMENTS

Limited Quantity Shipments shipped without Shipping Papers:
As of Jan 1, 2011, DOT regulations permit shippers to ship Limited Quantity packages without any shipping papers. In this case, UNPOP packaging is not required. However, the specific Limited Quantity marking must be applied to the package. Shipped via this method, the packages will not incur the hazardous materials surcharge.

The Y denotes air shipping but may also be used for Ground Shipments.
This option is similar to the ORMD designation and will replace the ORMD classification by 2020. As a result, ORMD shipments will no longer be valid.

Paint Shipments

Paint *or* **Paint related material:** FedEx Ground will only accept metal paint-type cans with friction fitted lids packaged and prepared in fiberboard under one of two types of packaging methods:

Option 1:

- United Nations Performance Oriented Packaged (UNPOP).
- A retaining ring around the lid or:
    - For gallons, 6 lid clips
    - For quarts, 5 lid clips
    - For pints, 4 lid clips

Option 2: If authorized by 49 CFR §173.173 or limited quantity (Ltd. Qty.), the following packaging requirements must be met:

- Fiberboard packaging must meet the following requirements:
    - For packages weighing up to 20 lbs. the outer package minimum requirements will be a 200 lb. Bursting test or 32 Edge Crush Test package.
    - For packages weighing 21-50 lbs. a 250 lb. Bursting test or 44 Edge Crush Test will be required.
    - For packages weighing 51-70 lbs. the outer container must be 275 lb. or 55 Edge Crush Test.
- Full partitions between the inner containers and box sides.
- Fiberboard padding above and below the inner containers.
- A retaining ring around the lid or:
    - For gallons 6 lid clips
    - For quarts 5 lid clips
    - For pints 4 lid clips
- Absorbent material is required to fill the void spaces.

Batteries

It is recommended that, prior to offering batteries to FedEx Ground for transportation, customers first complete hazmat employee training pertaining to the shipment of batteries which satisfies the requirements set forth in 49 CFR 172.700 through 172.704.

All batteries (including lithium, alkaline, lead acid, etc.) must be packaged so that terminals do not contact electrically conductive material or other batteries during shipment. Loosely packaged batteries should be placed in plastic bags, or the battery terminals should be covered with tape or another non-conductive material.

Smaller sized lithium batteries that used to only have packaging requirements now have marking and documentation requirements as well. Please refer to 49 CFR173.185(c)

for more specific information and the size limitations (US Domestic Ground Shipping Limits: generally ≤300 watt hours for lithium ion batteries or ≤25 grams lithium metal per battery for lithium metal batteries). The marking and included document must indicate the following:

- An indication that the package contains “lithium metal” or “lithium ion” cells or batteries, as appropriate;
- An indication that the package is to be handled with care and that a flammable hazard exits if the package is damaged;
- An indication that special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- A telephone number for additional information.
- Lithium Metal Batteries only - A statement that the package is not to be loaded onto passenger aircraft

All lithium batteries must have successfully passed the UN safety testing and be packaged in a manner to prevent short circuits and damage that could lead to failure. Larger sized lithium batteries are fully regulated Class 9 hazardous materials. Due to the complex nature of shipping lithium batteries, it is strongly recommended that shippers take a specific lithium battery transportation course in addition to hazardous material general awareness training.

.

Packages shipped under 49 CFR 173.185 (e) with shipping papers and the Class 9 diamond would not need the statement. The shipper is required make this determination.

NOTE: For more information on shipping batteries, download the following job aids:

- Shipping Lithium Batteries via FedEx Ground
- Lithium Metal Battery Flowchart
- Lithium Ion Battery Flowchart

Radioactive Shipments

Radioactive material: FedEx Ground will only accept radioactive material, Type A quantity, in packaging required to be labeled RADIOACTIVE WHITE-I. FedEx Ground will not accept the RADIOACTIVE YELLOW II or YELLOW III hazard labels. If shipping a Radioactive material that requires the shipping paper (OP-900LL or OP-900LG) and hazardous materials certification form the following information must appear in the “Type DOT Label(s) Required, Ltd. Qty., or Special Permit” section of both forms:

- The name of each radionuclide, abbreviations are permitted.
- The physical and chemical form.
- The activity in becquerels, gigabecquerels or terabecquerels, abbreviations are permitted.
- The name of the label: RADIOACTIVE WHITE-I
- The words “Fissile Excepted” if packaged is excepted under 49 CFR 173.453.

FedEx Fact: FedEx Ground does not accept Radioactive Fissile material unless properly prepared and packaged under exception 49 CFR 173.453.

Radioactive material limited quantity (Ltd. Qty.): Radioactive materials in excepted packages for limited quantities do not require the RADIOACTIVE WHITE-I hazard label, hazardous material shipping paper (OP-900LL or OP-900LG) or hazardous materials certification form. Radioactive packages in limited quantities must conform to 49 CFR 173.421. The outside of the inner packaging or, if there is not inner packaging the outside of the package itself must have "Radioactive" marked on the package. The outside of each package must be marked with the four digit UN identification number for the material preceded by the letter UN.

Note: Radioactive material meeting the definition of another hazard class or division cannot be transported or prepared under the limited quantity exceptions.

Training

Hazardous material training is required for all employees who perform a hazardous material function. It is the duty of each hazmat employer to comply with the training requirements listed in 49 CFR 172.704.

FedEx Ground offers hazardous materials training via the online ShipSafeShipSmart. Hazardous Materials Training Program. The training curriculum includes the following:

- Rules and Regulations (Ground Shipping only)
- Hazard Classes and Divisions
- Shipping Papers
- Packaging (Non-Bulk Only)
- Marking and Labeling
- ORM-D/Limited Quantity Classification
- Security Awareness

The course is available at www.shipsafeshipsmart.com and is payable by credit card only. The cost for the class is $150.00. A discount is available for groups of three or more students. 3-7 students $50 discount per student, 8-24 students $75 discount per student, and 25 or more students $100 discount per student.
NOTE: These discounts only apply for a single purchase.

Material Exceptions

Carbon Dioxide, solid (Dry Ice)

Carbon Dioxide, solid or Dry Ice is not regulated as a hazardous material when shipped via highway transportation. Dry Ice is only regulated as a hazardous material when shipped via aircraft. However, caution should be considered when transporting large amounts of Dry Ice via highway.

Dry Ice used to refrigerate diagnostic specimens (BIO-HAZARDS), such as blood, urine, and tissues, are NOT ACCEPTED by FedEx Ground.

Dry Ice is not accepted to Alaska or Hawaii.

Small Quantity Exceptions

Hazardous materials that are less than 30 ml (1 ounce) may possibly be shipped as a small quantity. In order, to utilize the exception the package must be packaged and prepared according 49 CFR 173.4. Small quantities, when packaged and prepared under 49 CFR 173.4, do not require hazardous material shipping papers, certification forms, marking or labeling of the package.
However, the outer package must be marked as "This package conforms to 49 CFR 173. 4 for domestic highway or rail transport only." Lithium batteries and cells are not eligible for this exception. The following requirements must be met:

- Materials are packaged under 49 CFR 173.4
- Less than 1 oz. per inner container
- Gross weight of the completed package can not to exceed 64 pounds.
- Package must be marked with statement "This package conforms to 49 CFR 173.4 for domestic highway or rail transport only."
- No shipping papers required
- No hazard labels or Identification markings

Lighters or Lighter Refills

Lighters and lighter refills must be shipped as hazardous materials via FedEx Ground. FedEx Ground does not honor 49 CFR 173.308. Shipments require an Alpha number identifier (LAA-xxxx) marked on the outer package and shipping papers.

Safety Devices (Airbag Inflators, *or* Airbag Modules, *or* Seat-belt Pretensioners may be used until 1/1/2016)

The manufacturer must submit each design type of a safety device (air bag inflator, air bag module, or seat-belt pretensioner) to the Associate Administrator for examination and testing. The manufacturer will receive written notification from the Associate Administrator that the device has been approved for transportation. When recycling a safety device (air bag inflator, air bag module, or seat-belt pretensioner), "Recycled" must be listed on the shipping paper after the basic description."

Black/Smokeless Powder for Small Arms

Black powder for small arms and Smokeless powder for small arms are very similar commodities. Both powders can be reclassified from Class 1 to Class 4.1, Flammable Solids. Furthermore, one transport vehicle cannot carry more than 100 lbs of Black powder for small arms or Smokeless powder for small arms at any given time.

Matches, safety

Matches, safety (Class 4.1-Flammable Solid) may not be regulated as a hazardous material if packaged and prepared under certain conditions. The 49 CFR allows an exception to the hazardous material regulations. Matches, safety, when packaged and prepared under 49 CFR 173.186, do not require hazardous material shipping papers, certification forms or hazard diamond labels when properly prepared. The only requirement is the marking.
Refer to 49 CFR 173.186 for further details regarding matches.

Mercury

Mercury (Class -8- Corrosive) may not be regulated as a hazardous material if packaged and prepared under certain conditions. 49 CFR allows an exception to the hazardous material regulations. Mercury, when packaged and prepared under 49 CFR 173.164, do not require hazardous material shipping papers, certification forms, marking or labeling of the package when:
•The mercury is contained in instruments or articles (i.e. thermometers, barometers or fluorescent lights *or*
•The package does not contain more than 1lb. (.45kg) net quantity of mercury per package

Qualification Process

In order to ship hazardous materials via FedEx Ground, shippers must complete a qualification process before they can ship hazardous materials. To begin this process, contact your FedEx Account Executive who can assist you or call FedEx Customer Service at **1.800.GoFedEx (1.800.463.3339)**.

Qualification process:

- Complete a hazardous materials qualification form (OP-910).
- Provide proof that you have been trained in shipping hazardous materials in accordance with federal requirements (49 CFR 172.704). Acceptable forms of proof are:

    1. A certificate from a training company stating that you have completed its program. This certificate must contain the date in which the course was completed.

    2. A letter on company letterhead indicating who is responsible for hazardous materials training at your company and confirming that your employees have received the required training.

    3. Completing the ShipSafeShipSmart online hazardous materials training program.

Your FedEx Account Executive will forward this information to the FedEx Ground Safety Department for review and notify you once you've been approved to begin shipping.

FEDEX GROUND AUTOMATION

FedEx Ground will no longer accept any handwritten or manual paperwork for hazardous materials packages effective January 1, 2011. In order to process the appropriate paperwork for Hazmat shipments, customers have three options. These options are fedex.com, Fedex software (Ship Manager), or the use of a Server.

The shipper is required to transmit hazardous material shipping information using a FedEx electronic shipping solution, a FedEx-recognized hazardous materials vendor software application, a FedEx Compatible Solutions Program application or a custom solution that has the ability to transmit hazardous material shipping information electronically.

Fedex.com is useful for smaller shippers or those with smaller outbound shipments. This option features preferences and functionality that make the customers' relevant shipments easy, efficient and compliant. This option supports the OP-900LL and Hazardous Materials Certifications.

FedEx Ship Manager is ideal for medium to large shippers and provides fully integrated shipping capabilities. The software now supports using hazardous materials laser forms OP-900LL and OP-950 on all FedEx electronic shipping solutions. This software also allows the shipper to select up to three commodities per package from the hazardous materials table for printing on the OP-900LG, OP-900LL, and Hazardous Materials Certification.

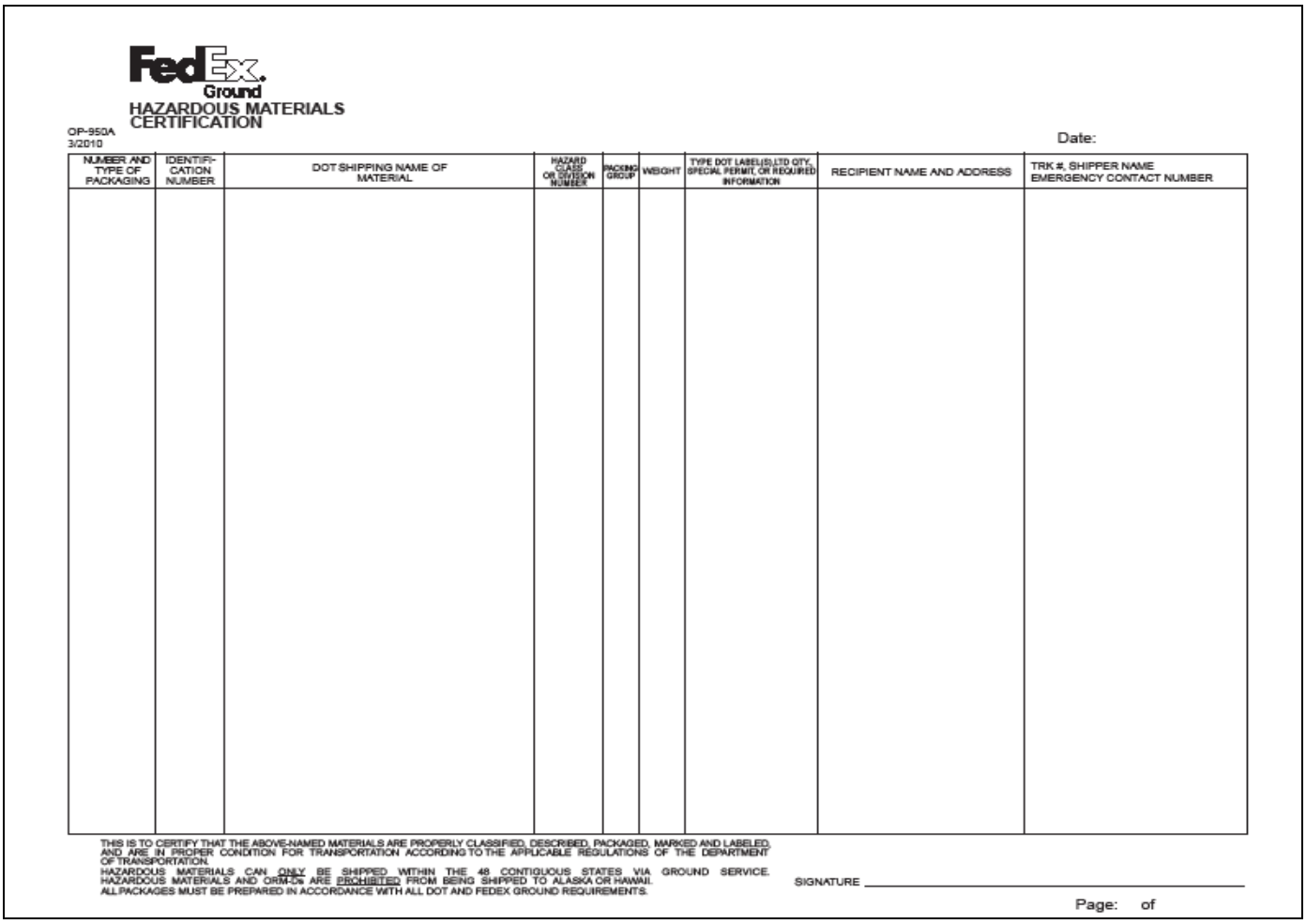
FedEx Server is an Interface to customer-hosted functionality and includes server software installed in customer's data center and integrated into their existing software. This is ideal for customers that have an absolute need for integration, and speed and that have IT/developer resources. It also offers a complete shipping solution for highest-volume environments.

Hazardous Materials Shipping Papers

A hazardous materials shipping paper (OP-900LL or OP-900LG) and hazardous material certification form are documents used to identify the hazardous materials package(s) being offered for transportation. It is the shipper's responsibility to ensure when offering hazardous material packages, that each package is accompanied with the appropriate documentation and that all forms are accurate and complete.

To meet DOT shipping paper and certification requirements, FedEx Ground uses the following forms:

- **Shipper's Hazardous Materials Certification:**



FedEx Ground

HAZARDOUS MATERIALS CERTIFICATION

OP-950A
3/2010

Date:

NUMBER AND TYPE OF PACKAGING	IDENTIFI-CATION NUMBER	DOT SHIPPING NAME OF MATERIAL	HAZARD CLASS OR DIVISION NUMBER	PACKING GROUP	WEIGHT	TYPE DOT LABEL(S),LTD QTY, SPECIAL PERMIT, OR REQUIRED INFORMATION	RECIPIENT NAME AND ADDRESS	TRK #, SHIPPER NAME EMERGENCY CONTACT NUMBER

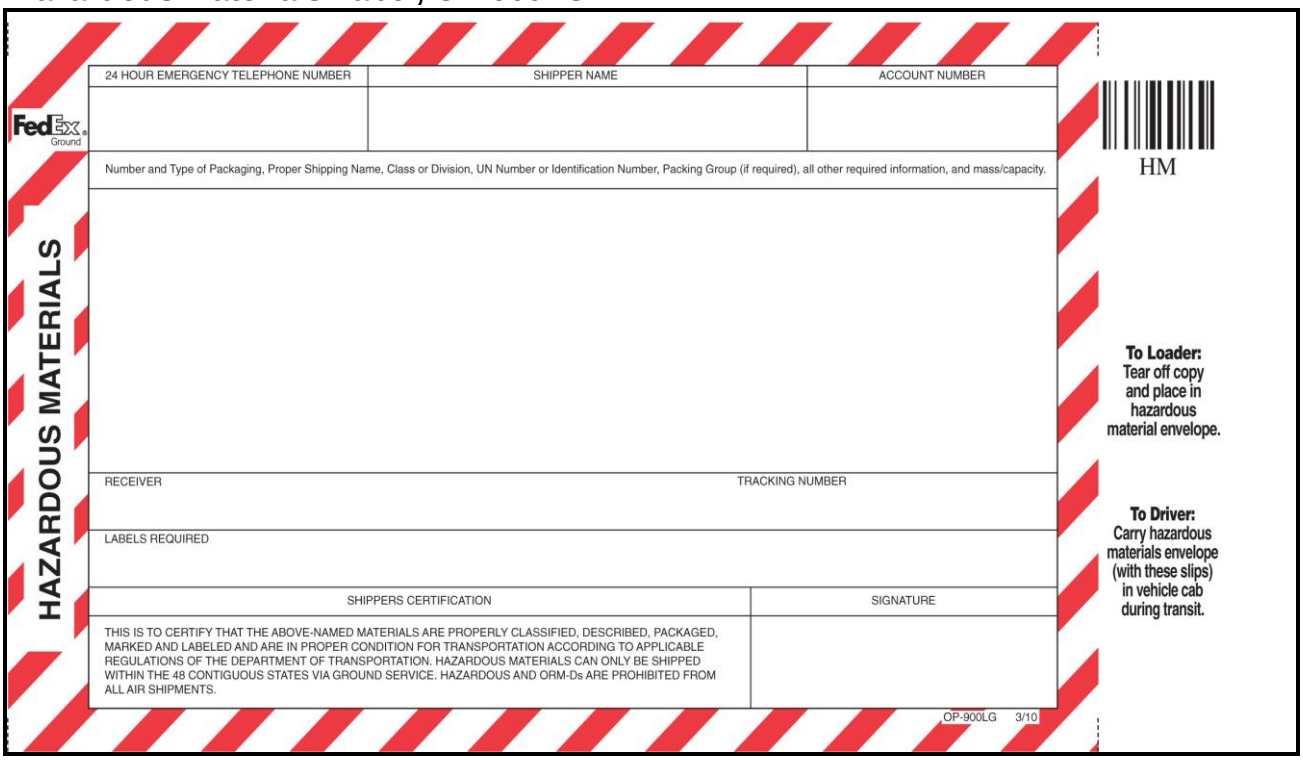
THIS IS TO CERTIFY THAT THE ABOVE-NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.
HAZARDOUS MATERIALS CAN ONLY BE SHIPPED WITHIN THE 48 CONTIGUOUS STATES VIA GROUND SERVICE. HAZARDOUS MATERIALS AND ORM-Ds ARE PROHIBITED FROM BEING SHIPPED TO ALASKA OR HAWAII.
ALL PACKAGES MUST BE PREPARED IN ACCORDANCE WITH ALL DOT AND FEDEX GROUND REQUIREMENTS.

SIGNATURE _____

Page: of

Note: All forms must have the appropriate DOT and FedEx Ground shipping information.

Hazardous Materials Label, OP-900LG:



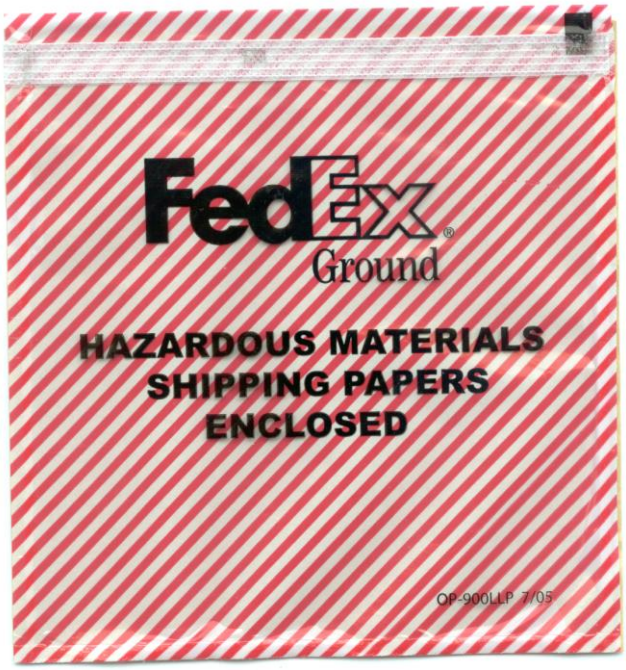
Note: The OP-900LG is designed to meet the specifications for specific hazardous material shipping systems. This form must be computer generated.

• **Hazardous Materials Label, OP-900LL:**

FedEx Ground offers a laser label OP-900LL shipping paper. The label must be placed into a pouch (OP900LLP) on the side of the package. The instructions for use are listed on the back of the laser label. The OP-900LL can be used with the FedEx Ship Manager or these compliance software providers:

DANGEROUS GOODS COUNCIL
1-800-652-9959
www.hazshipper.com

LABELMASTER SOFTWARE
1-800-578-4955
www.labelmaster.com/software



Note: The OP-900LL must be computer generated.

DOT Basic Description for Hazardous Materials

Basic Information:
The description of the hazardous material information on the shipping papers (OP-900LL or OP-900LG) and hazardous materials certification form must be as described in accordance to DOT regulations. There are twelve (12) basic items required on shipping papers accompanying hazardous materials packages. The shipper or the shipper's agent must supply this information. All entries on the shipping papers must be printed legibly and in English. The shipping papers cannot contain unauthorized abbreviations or information. The twelve basic items are:

1. **Name and address of the shipper.**

Note: The shipper's name and address is not on the FedEx Ground Hazardous Materials Shipping Paper (OP-900LL or OP-900LG). The shipper's address label on the package will suffice provided it identifies the shipper by name and address. The shipper's information must be completed on the hazardous materials certification form.

2. The **Number of and type of packaging(s)** must be indicated according to 172.202. The number of and type of package(s) must be indicated by description of the package (for example, 1 fiberboard box) Indication of the packaging specification number (4G) may be included (for example, 1 4G box). Abbreviations may be used for indicting packaging types (for example "cyl." for "cylinder") provided the abbreviations are commonly accepted and recognized.

3. The **UN/NA identification number** is listed in Column 4 of the Hazardous Materials Table.
Note: **The number must be preceded by the UN or NA prefix.**

4. The **DOT proper shipping name** as listed in Column 2 of the Hazardous Materials Table. Abbreviations and codes are not acceptable.
Note: Words shown in italics are not part of the shipping name, but can be used to further describe the material. The words in italics are optional.

5. The **Hazard Class or Division** is listed numerically as shown in Column 3 of the Hazardous Materials Table. The subsidiary hazard must appear in parentheses following the primary hazard. Abbreviations and codes are not acceptable.

6. The **Packing Group**, if required (see Column 5 of the Hazardous Materials Table). Packing groups must be roman type numbers (ex. I, II, III). Classes 2, 7 and some Class 1 and Class 9 materials are not assigned packing groups.

7. The **total quantity (weight)** by mass, capacity or as otherwise appropriate for the hazardous material including the unit of measurement.
Note: FedEx Ground requests the quantity (weight) of hazardous material be indicated in pounds (lbs). This is to allow FedEx Ground the ability to tally the weight of hazardous material on a vehicle. Units of measure may be abbreviated.

See the following examples.

Ounce = oz.	Pound = lb.	Gram = g.	Kilogram = kg.
Gallon = gal.	Liter = L	Quart = qt.	Pint = pt.
Milliliter = ml.			

Conversions:

1 kg. = 2.2 lb.	1 lb. = 0.454 kg.	1 kg = 1000 g.	1 lb. = 16 oz.
1 L. = 1.06 qt.	4 qt. = 1 gal.	1 qt. = 0.95 L.	1 qal. = 3.78 L.

Note: 1 Gallon of water weighs approximately 8 lbs.

8. The **Type DOT Label(s)** required from Column 6 of the Hazardous Materials Table. Abbreviations and codes are not acceptable.

Note: If a hazardous material requires more than one label on the package, all labels must be entered on the shipping papers.

Note: Other information may be required. No label name is required if a Special Permit or exception is used.

Note: If NONE appears in column 6 of the Hazardous Materials Table, then no label is required and this section of the shipping paper may be left blank.

9. The **Consignee's (Recipient's) name and address**.

Note: The consignee's (recipient's) name and address is not on the FedEx Ground Hazardous Material Shipping Paper (OP-900LL or OP-900LG). The shipper's address label will suffice provided it identifies the consignee (recipient) by name and address.

10. The **FedEx Ground barcode shipper and package number(s)** for the hazardous materials package(s).

11. The **Shipper's Certification** on the Shipper's Hazardous Materials Certification, OP-950, must be legibly signed by an authorized representative of the shipper.
Note: **The signature may be hand written or computer generated.**

12. **Emergency Response Telephone Number**.

Note: The emergency response telephone number section on the FedEx Ground Shippers Hazardous Materials Certification may be used only if the telephone number applies to all hazardous materials package listed. If not, a separate telephone number must be indicated for each package. This must be a number with English speaking representatives 24 hours per day.

Additional Description Information

1. If a hazardous material has a generic shipping name, the technical name of the hazardous component may be required to be entered in parentheses with the basic description. If the letter “G” appears in column 1 of the FedEx Ground Hazardous Material Table, a technical name is required.

   For example: **Compound Cleaning Liquids (hydrochloric acid).**

2. If the hazardous material is a mixture or solution of two or more hazardous components, the technical names of at least two components most predominantly contributing to the hazard must be entered. If the letter “G” appears in column 1 of the FedEx Ground Hazardous Material Table, a technical name is required.

   For example: **Flammable Liquids, corrosive, n.o.s. (Ethanol, Sodium Hydroxide).**

3. If the hazardous material meets the definition of a DOT Poison but the shipping name or hazard class does not indicate a Poison, the word "Poison" must be included on the shipping papers with the basic description. If the hazardous material has a N.O.S. generic shipping name, the technical name of the poison component must be entered in parentheses with the basic description. Materials, which pose an inhalation hazard, must have the notation "Poison Inhalation-Hazard Zone " entered on the shipping papers.

   Note: FedEx Ground **does not** accept hazardous materials, which require the "Poison Inhalation Hazard Zone" labeling.

   Note: FedEx Ground will only handle Poisonous materials if they are packed in an approved package that has been granted a DOT Special Permit (i.e., DOT-SP 9168) or exception which precludes the requirements for a "Poison" or "Poison PG III" Label.

4. Hazardous Materials which are shipped in a package which has a DOT authorized packaging Special Permit must bear the additional description "DOT-SP" followed by the assigned special permit number.

5. A hazardous material, which is labeled “Dangerous When Wet”, must have the same notation on the shipping papers.

   Note: FedEx Ground will only handle "Dangerous When Wet" materials if packed in an approved package that has been granted a DOT Special Permit or exception, which precludes the placarding requirements.

6. A hazardous materials package that contains a reportable quantity of a hazardous substance must be identified with the letters "RQ" before or after the proper shipping name on the shipping papers. Please refer to the RQ section for the list of hazardous substances (RQ).

   Note: FedEx Ground does not handle any hazardous material, containing a reportable quantity (RQ) of a hazardous substance.

7. Radioactive materials require additional shipping paper notations. Detailed information regarding shipping paper requirements for radioactive materials can be found in 49 CFR 172.203 (d) of the Hazardous Materials Regulations or in the Radioactive Shipments section of this guide.

Shipper Procedures for Hazardous Materials Documentation

Shippers Hazardous Material Certification:

The Shipper's Hazardous Materials Certification is a computer generated form which will be completed by the shipper via Ship Manager software or fedex.com and distributed as follows:

- The certification will be given to the FedEx Ground driver on pickup to be returned to the facility. The driver will turn in the FedEx Ground copy of the hazardous materials certification to the facility management to be filed in a Shipper's Hazardous Materials Certification file for 13 months.
- A copy will be retained by the shipper.

Note: The hazardous materials certification must be complete, agree with the Hazardous Materials Table, contain no unauthorized abbreviations, and be signed by the shipper. If the hazardous materials certification is not correct the incorrect items in the shipment will be returned; the correct items will be forwarded on. A Shipper Error Notification (OP-908) may be faxed to the shipper. (See example on the next page).

Hazardous Materials Shipper Error Notification

OP-908
Rev. 11/2012

Notification Via: ○ Fax ○ Email ○ Phone Date: Time:

To: Shipper Name or Account #:

From FedEx: Return Fax:

All fields in the box above are REQUIRED.

☐ The package(s) accompanying this notification are being returned in accordance with DOT-SP 14823. Please correct the non-compliant issues identified below before shipping or reshipping packages.

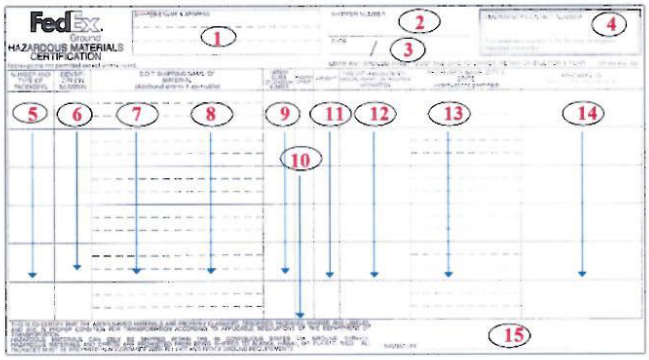
Fax:

Email: Return Email:

Phone: Return Phone:

If phoned, record name of person and choose one: ○ Left Message ○ Spoke With: (name of representative)

FedEx Address: City: State: ZIP:



☐ 1. The Shipper's Name is not provided.
☐ 2. The Shipper Number must be provided.
☐ 3. The pickup Date must be provided.
☐ 4. The Shipper must provide a 24-hour Emergency Contact Number (including area code) to use in case of an emergency involving the Hazmat listed.
☐ 5. Number and Type of Packaging.
☐ 6. The Identification Number must include the UN or NA prefix and a 4-digit number and match the Proper Shipping Name.
☐ 7. The Proper Shipping Name must be listed exactly as it is on the 49 CFR 172.101 Hazardous Materials Table. No misspellings or abbreviations.
☐ 8. The Technical Name must be listed in parentheses after the Proper Shipping Name if there is a 'G' in column 1 of the Hazardous Materials Table.
☐ 9. The Hazard Class must be listed numerically and the subsidiary hazard class, if applicable, must be listed in parentheses after the primary hazard class.
☐ 10. The Packing Group must be listed as Roman numeral I, II, or III. This can be left blank if not applicable.
☐ 11. The weight must contain the number and the unit of measure (lbs., gal., etc.)
☐ 12. The Type DOT Labels listed in Column 6 of the FedEx Ground Hazardous Materials Table cannot be abbreviated. Additional information, such as Limited Quantity, DOT Exemptions, LAA***, Ex-#s, and CA-#s may be listed in this column.
☐ 13. The Receiver's Name, City, and State must be listed here. Ditto marks are acceptable in this column only.
☐ 14. List the tracking ID here. 15-digits for the total tracking ID number or the last 8 digits, which is the package number.
☐ 15. An authorized representative of the shipper must legibly sign the Shipper's Certification on the Shipper's Hazardous Materials Certification. The signature may be mechanically typed or computer generated.
☐ 16. This is an incorrect or unauthorized form. Contact your account executive for an updated version.
☐ 17. No Hazardous Materials Certification provided for package numbers: _____
☐ 18. Improper packaging. Please retrieve package from FedEx Ground at the address above.
☐ 19. FedEx Ground Prohibited/Air Restricted Hazardous Materials. Please retrieve package from FedEx Ground at the address above, or package will be disposed.
☐ 20. More packages were listed on the Hazardous Materials Certification than were actually tendered to FedEx Ground. Compliant packages will be sent on. Missing packages will be marked off the Certification, and a copy of the Certification will be sent with the Shipper Error Notification.
☐ 21. Other / more information required: _____
☐ 22. OP-900 shipping paper does not match the Hazardous Materials Certification Book.

DOT regulations mandate that the shipper maintains a copy of the shipping papers for two years. Your noncompliant package(s) are being returned.

FedEx Ground Staff: This form must be kept on file with the daily Hazmat certifications and waiting package report for 13 months.

FedEx. Ground

HAZARDOUS MATERIALS CERTIFICATION

SHIPPER'S NAME & ADDRESS
YOUR COMPANY NAME
YOUR STREET ADDRESS
YOUR CITY, STATE, ZIP CODE

SHIPPER NUMBER: 1 2 3 4 5 6 7

DATE 10 / 01 / 07

EMERGENCY CONTACT NUMBER:
YOUR CONTACT NUMBER
This telephone number is for 24 hour emergency response information.

Abbreviations not permitted except where noted.

MARK ANY SPOILED SHEET "VOID" AND GIVE TO DRIVER. RETAIN ON FILE FOR 1-YEAR. OP-950 Rev. 8/07

NUMBER AND TYPE OF PACKAGING	IDENTIFICATION NUMBER	D.O.T. SHIPPING NAME OF MATERIAL (Additional entries if applicable)	HAZARD CLASS OR DIVISION NUMBER	PACKING GROUP	WEIGHT	TYPE DOT LABEL(S),LTD QTY, SPECIAL PERMIT, OR REQUIRED INFORMATION	RECEIVER'S NAME, CITY & STATE (Abbreviations permitted)	TRACKING I.D. BAR CODE PACKAGE #
1 DRUM	UN 1814	POSTASSIUM HYDROXIDE SOLUTION	8	III	40lbs	CORROSIVE	CHEMICAL CO. PHILADELPHIA, PA	996111526723458
1 BOX	UN 1760	CORROSIVE LIQUID n.o.s.(CAPRYLYL CHLORIDE)	8	II	14lbs	CORROSIVE	XYZ CO. BOSTON, MA	996111526723459
1 BOX	UN 2031	NITRIC ACID	8 (5.1)	I	20lbs	CORROSIVE OXIDZER	SAFETY CO. CHICAGO, IL	996111526724021
1 4G BOX	UN 1597	DINITROBENZENES	6.1	II	15oz	DOT-SP 8249	D & R POISONS BUFFALO, NY	996111526724022
1 4G BOX	UN 2790	ACETIC ACID SOLUTION	8	II	7lbs	LIMITED QUANTITY OR LTD QTY	NOW CO. YOUNGSTOWN, OR	996111526724128
1 BOX	UN 3268	AIR BAG MODULES	9	III	10lbs	CLASS 9 EX 123456789	SK MOTORS PARKERSBURG, WV	996111526724126

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 APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.
HAZARDOUS MATERIALS CAN ONLY BE SHIPPED WITHIN THE 48 CONTIGUOUS STATES VIA GROUND SERVICE. HAZARDOUS MATERIALS AND ORM-Ds ARE PROHIBITED FROM BEING SHIPPED TO ALASKA, HAWAII, OR PUERTO RICO. ALL PACKAGES MUST BE PREPARED IN ACCORDANCE WITH ALL DOT AND FEDEX GROUND REQUIREMENTS.

SIGNATURE YOUR SIGNATURE

Instructions for the use of the shipping papers (OP-900LL or OP-900LG):

The OP-900LL or OP-900LG is the basic Hazardous Materials Shipping Paper, which accompanies the hazardous materials shipment in transit. It consists of a multi-part label with five (5) "tear-off" parts. This form will be preprinted and attached to the hazardous materials package. The hazardous materials entries on the form must agree

with the information on the Shipper's Hazardous Materials Certification and the mandatory marking and labeling information on the hazardous materials package.

SAMPLE HAZARDOUS MATERIAL SHIPPING PAPERS (OP-900LL or OP-900LG):

OP-900LL or OP-900LG Example #1: Exception 49 CFR 173.13
Shipping papers prepared under 49 CFR 173.13. Packages prepared under this exception do not require DOT hazard labels. The statement “This package conforms to 49 CFR 173.13” must also be marked on the outer package.


REMOVE THIS COPY AND APPLY TO PACKAGE

Account Number	Emergency Contact Number	Shipper Name
123456789	8002225555	Company Name

Tracking ID
123456789101112

Hazardous Materials Description and Quantity
1 fiberboard box; UN 1888 Chloroform 6.1, III, 32oz, This package conforms to 49 CFR 173.13

FedEx Ground

HAZARDOUS MATERIALS SHIPPING PAPER

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.

John Doe 1/01/2001
Signature Date

Page 1 of 1

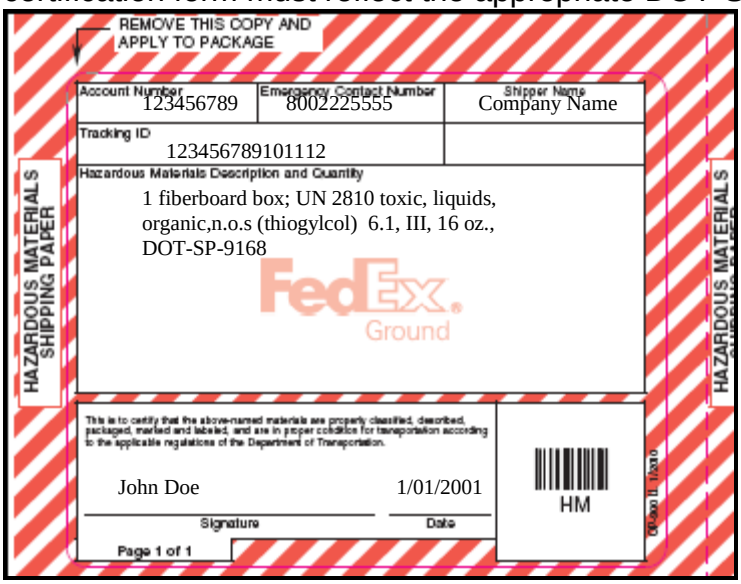
HM

HAZARDOUS MATERIALS SHIPPING PAPER

OP-900LL or OP-900LG Example #2: DOT Special Permit

FedEx Ground may require certain materials to be shipped using a DOT Special Permit or shippers may be utilizing a DOT Special Permit for other reasons. When shipments

are prepared under an applicable DOT Special Permit, the shipping papers and certification form must reflect the appropriate DOT-SP number.



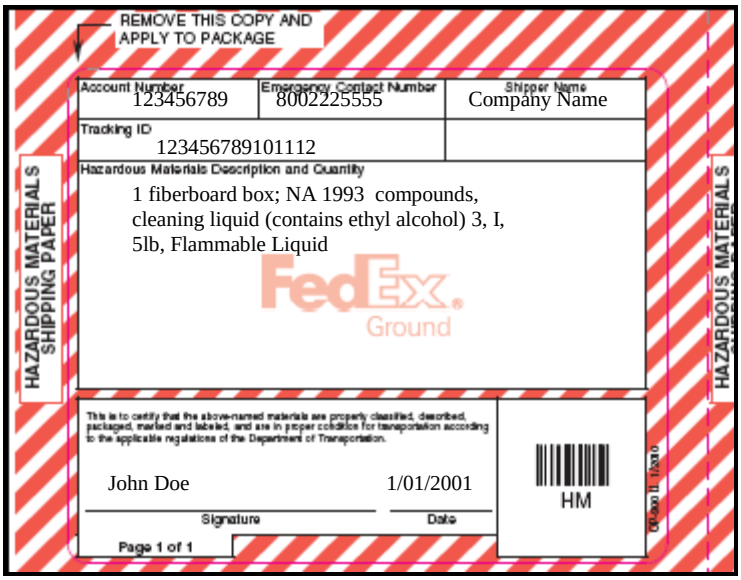
OP-900LL or OP-900LG Example #3: Radioactive

Radioactive shipments require important information in the Type DOT Label(s) Required, Ltd. Qty., or Special Permit field of the hazardous materials shipping papers. Please refer to the Radioactive section for more information concerning Radioactive shipments.

OP-900LL or OP-900LG Example #4: Technical name required

Some DOT Proper Shipping Names require a technical name to be included. Proper shipping names that must include a technical name in parentheses are indicated by the letter “G” in column 1 of the Hazardous Materials Table. Although the letters “n.o.s.”

often indicates a required technical name, not all shipping names with “n.o.s.” require them.



Marking

All packages must be properly marked in accordance with 49 CFR requirements. FedEx Ground requires all packages to have a minimum of four package markings.

1. Shippers Address
2. Consignee (Recipient) Address
3. The UN/NA Identification Number
4. The DOT Proper Shipping Name

Hazardous materials packages may be required to be marked with additional information depending on the contents.

- EX numbers, or Product Codes are required to be marked on the package and/or shipping papers for certain explosives. The shipping papers require the EX number or Product Code to be marked in the ‘Type DOT Label(s) required, Ltd. Qty. or Special Permit field’ of the OP-900LL or OP-900LG and Hazardous Materials Certification.
- Often, hazardous materials are authorized by the DOT to be transported under a Special Permit. This Special Permit may vary depending on the intent of the shipper. This Special Permit number must be marked on the shipping papers and the outer package. DOT-SP-#### must be legibly marked on the outside package. Packages shipped under a DOT Special Permit number must mark the DOT SP number on the shipping papers in the ‘Type DOT Label(s) required, Ltd. Qty. or Special Permit field’ of the OP-900LL or OP-900LG and Hazardous Materials Certification. For example, DOT-SP-9168.
- Packages shipped under the exception 49 CFR 173.13 must have marked on the shipping papers and package: “This package conforms to 49 CFR 173.13” in the same field on the OP-900LL or OP-900LG and Hazardous Materials Certification.
- When specification packaging is required, the UN POP marking will be embossed on the outer package. These codes will vary depending on the performance and type

of packaging. See the packaging section for further details. The UNPOP (United Nations Performance Oriented Packaging) markings are required to be permanently marked on the outer package. For example: UN 4G/X12/S/99/USA/M123. This mark should never be covered or obstructed by labels or other information.
- Class 2 cylinders must be placed inside an overpack (outer package) marked "OVERPACK" unless specification markings on the cylinder inside are visible. Regardless, all cylinders must be placed in an outer package.
- All Lighters or Lighter refills identified as UN1057 must have the appropriate "LAA alpha number" marked on the package.

Each package containing a material classed as an ORM-D or Limited Quantity must be marked on at least one side immediately following or below the proper shipping name: *Consumer Commodity, Cartridges, small arms* or *Cartridges, power device* as appropriate. The ORM-D or Limited Quantity designation may be handwritten or applied by label. The ORM-D or Limited Quantity designation must be placed within a rectangle that is approximately 6.3 mm (0.25 inches) or larger on each side. It is important to remember that the marking ORM-D or Limited Quantity is the certification by the person offering the packaging for transportation that the material is properly described, classed, packaged, marked and labeled (when appropriate) and in proper condition for transportation according to the 49 CFR.

All liquid hazardous materials and Class 7 Radioactive must be legibly marked, with package orientation arrows on two opposite vertical sides of the package. They may be hand drawn or affixed by a label and they must conform pictorially to ISO Standard 780-1985: two arrows up with a line underneath and enclosed within a rectangle. Depicting a rectangular border around the arrows is optional.

Labeling

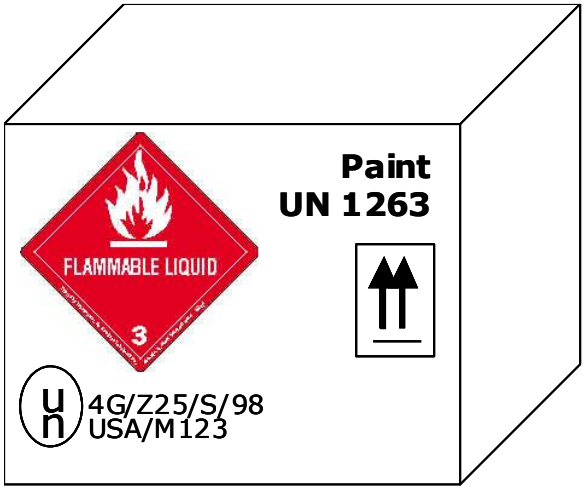
Hazardous Materials packages offered to FedEx Ground must be properly labeled. The hazard diamond label is the most prominent form of communication on a hazardous materials package. The label is diamond in shape and must be displayed on a package of contrasting color. The hazard label is associated with the hazard class and division of the material.
There are some hazardous materials that possess more than one hazard. For these packages the subsidiary hazard label must be displayed within 6 inches of the primary hazard label.

Exceptions to labeling:
- Packages offered and prepared under a DOT Special Permit may be exempted from labeling.
- Packages prepared under 49 CFR 173.13 do not require a hazard diamond label.

COMPLETED PACKAGE EXAMPLES:

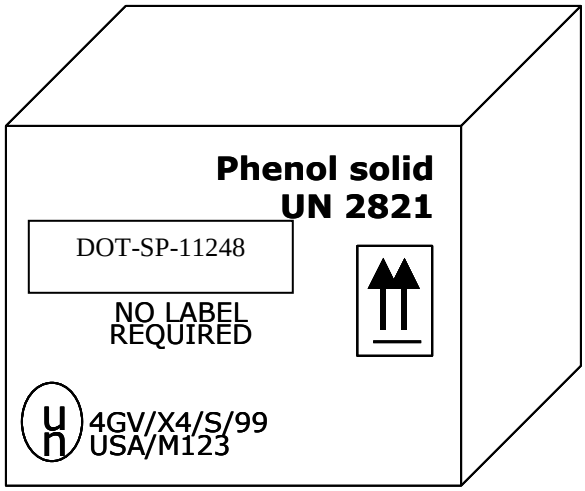
All packages must have the hazardous material shipping paper (OP-900LL or OP-900LG) properly prepared and attached on top of the outer package next to the address label and must include the 'TO' (recipient) and 'FROM' (shipper) addresses. These illustrations are for information purposes only.

Example #1: Flammable Liquid (Class 3)

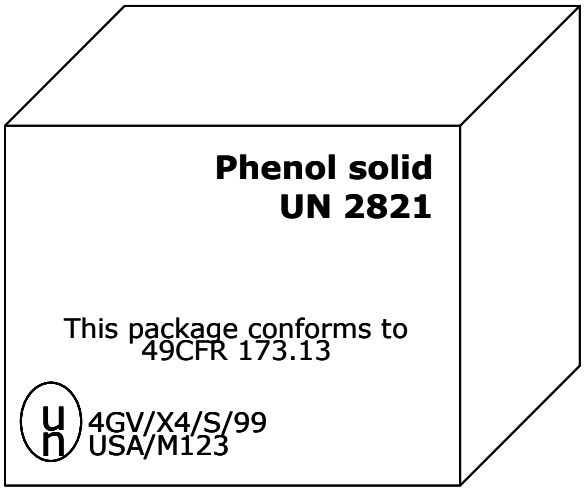


Example #2: Toxic (Class 6.1)

Option 1: DOT Special Permit 173.13

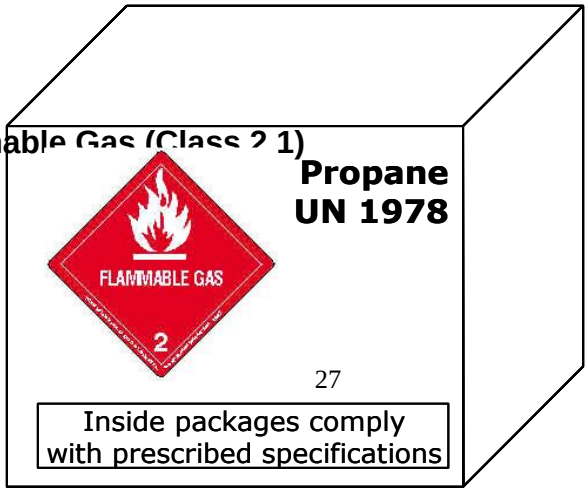


Option 2: 49CFR



Note: *In either option, the DOT diamond hazard label will not be affixed.*

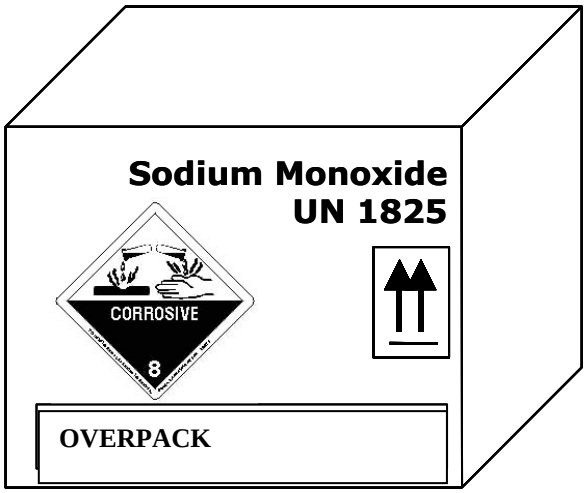
Example #3: Flammable Gas (Class 2.1)



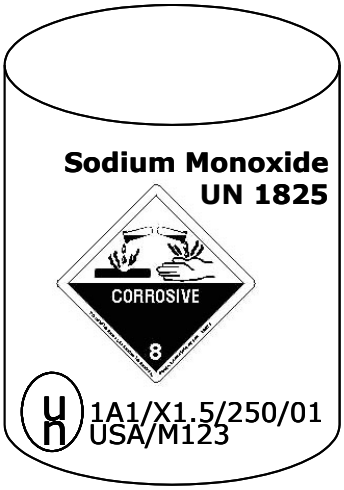
Note: *All Class 2 (except Lighters-UN1057) materials must be properly overpacked.*

Example #4: Authorized Single Packaging

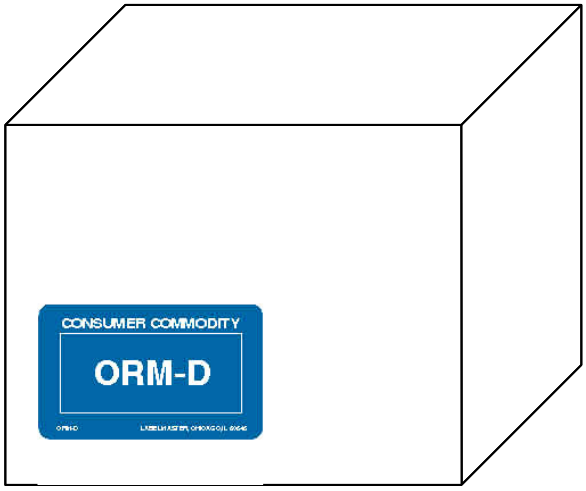
Option 1: Overpacked (49 CFR 173.25)

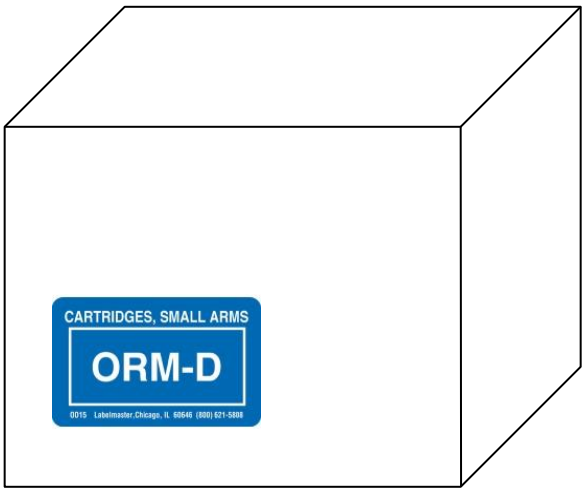


Option 2: Single (Standalone)



Example #5: ORM-D Shipments

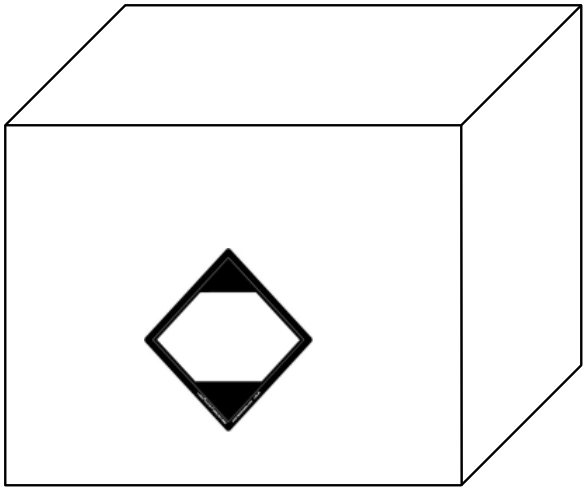


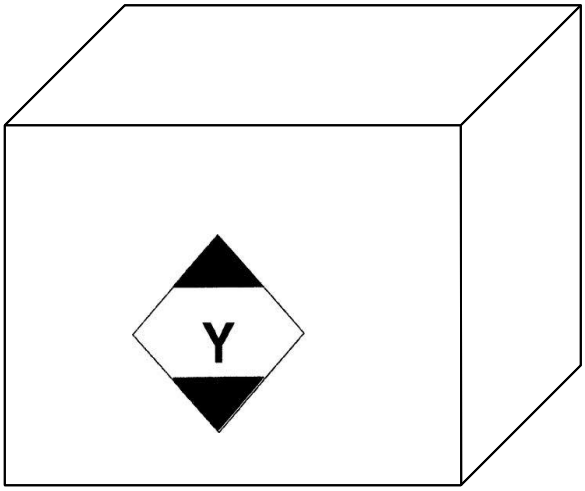


Note: *ORM-D shipments do NOT require the hazardous material shipping paper (OP-900LL or OP-900LG) and hazardous material certification form.*

Note: *All outer non-specification packaging (i.e. overpacks, ORM-D's packaging) must display a minimum 200 lb. Burst Strength Test Seal or 32 Edge Crush Test (ECT) Seal.*

Example #6: Limited Quantity Shipments (see 172.315 in Regulations)





NOTE: Limited Quantity shipments do NOT require the hazardous material shipping paper (OP-900LL or OP-900LG) and hazardous material certification.

Hazardous Material Support

The Dangerous Goods/Hazardous Materials hotline is available to answer questions about shipping hazardous materials via FedEx Ground. Please call 1-800-GO-FEDEX and press “81.”

Definitions and Other Terms

For the purpose of this guide, the following commonly used terms have been provided for your information. A complete list of definitions can be found in 49 CFR §171.8.

Administrator means the Administrator, Pipeline and Hazardous Materials Safety Administration.

Aerosol means any non-refillable receptacle containing a gas compressed, liquefied or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

Aggregate lithium content means the sum of the grams of lithium content or equivalent lithium content contained by the cells comprising a battery.

Agricultural product means a hazardous material, other than a hazardous waste, whose end use directly supports the production of an agricultural commodity including, but not limited to a fertilizer, pesticide, soil amendment or fuel. An agricultural product is limited to a material in Class 3, 8 or 9, Division 2.1, 2.2, 5.1, or 6.1, or an ORM-D material.

Approval means a written authorization, including a competent authority approval, from the Associate Administrator or other designated Department official, to perform a function for which prior authorization by the Associate Administrator is required under subchapter C of this chapter (49 CFR parts 171 through 180.)

Approved means approval issued or recognized by the Department unless otherwise specifically indicated in this subchapter.

Asphyxiant gas means a gas which dilutes or replaces oxygen normally in the atmosphere.

Associate Administrator means the Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration.

Atmospheric gases means air, nitrogen, oxygen, argon, krypton, neon and xenon.

Authorized Inspection Agency means: (1) A jurisdiction which has adopted and administers one or more sections of the ASME Boiler and Pressure Vessel Code as a legal requirement and has a representative serving as a member of the

ASME Conference Committee; or (2) an insurance company which has been licensed or registered by the appropriate authority of a State of the United States or a Province of Canada to underwrite boiler and pressure vessel insurance in such State or Province.

Authorized Inspector means an Inspector who is currently commissioned by the National Board of Boiler and Pressure Vessel Inspectors and employed as an Inspector by an Authorized Inspection Agency.

Bag means a flexible packaging made of paper, plastic film, textiles, woven material or other similar materials.

Bar means 1 BAR = 100 kPa (14.5 psi).

Barge means a non-selfpropelled vessel.

Biological product. See §173.134 of this subchapter.

Biological substances, Category B. See §173.134 of this subchapter.

Bottle means an inner packaging having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

Bottom shell means that portion of a tank car tank surface, excluding the head ends of the tank car tank, that lies within two feet, measured circumferentially, of the bottom longitudinal center line of the tank car tank.

Box means a packaging with complete rectangular or polygonal faces, made of metal, wood, plywood, reconstituted wood, fiberboard, plastic, or other suitable material. Holes appropriate to the size and use of the packaging, for purposes such as ease of handling or opening, or to meet classification requirements, are permitted as long as they do not compromise the integrity of the packaging during transportation, and are not otherwise prohibited in this subchapter.

Break-bulk means packages of hazardous materials that are handled individually, palletized, or unitized for purposes of transportation as opposed to bulk and containerized freight.

BTU means British thermal unit.

Bulk packaging means a packaging, other than a vessel or a barge, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment and which has:

(1) A maximum capacity greater than 450 L (119 gallons) as a receptacle for a liquid;

(2) A maximum net mass greater than 400 kg (882 pounds) and a maximum capacity greater than 450 L (119 gallons) as a receptacle for a solid; or

(3) A water capacity greater than 454 kg (1000 pounds) as a receptacle for a gas as defined in §173.115 of this subchapter.

Bundle of cylinders means assemblies of UN cylinders fastened together and interconnected by a manifold and transported as a unit. The total water capacity for the bundle may not exceed 3,000 L, except that a bundle intended for the transport of gases in Division 2.3 is limited to a water capacity of 1,000 L.

Bureau of Explosives means the Bureau of Explosives (B of E) of the Association of American Railroads.

C means Celsius or Centigrade.

Captain of the Port (COTP) means the officer of the Coast Guard, under the command of a District Commander, so designated by the Commandant for the purpose of giving immediate direction to Coast Guard law enforcement activities within an assigned area. As used in this subchapter, the term Captain of the Port includes an authorized representative of the Captain of the Port.

Carfloat means a vessel that operates on a short run on an irregular basis and serves one or more points in a port area as an extension of a rail line or highway over water, and does not operate in ocean, coastwise, or ferry service.

Cargo aircraft only means an aircraft that is used to transport cargo and is not engaged in carrying passengers. For purposes of this subchapter, the terms cargo aircraft only, cargo-only aircraft and cargo aircraft have the same meaning.

Cargo tank means a bulk packaging that:

(1) Is a tank intended primarily for the carriage of liquids or gases and includes appurtenances, reinforcements, fittings, and closures (for the definition of a tank, see 49 CFR 178.320, 178.337–1, or 178.338–1, as applicable);

(2) Is permanently attached to or forms a part of a motor vehicle, or is not permanently attached to a motor vehicle but which, by reason of its size, construction or attachment to a motor vehicle is loaded or unloaded without being removed from the motor vehicle; and

(3) Is not fabricated under a specification for cylinders, intermediate bulk containers, multi-unit tank car tanks, portable tanks, or tank cars.

Cargo tank motor vehicle means a motor vehicle with one or more cargo tanks permanently attached to or forming an integral part of the motor vehicle.

Cargo vessel means:

(1) Any vessel other than a passenger vessel; and

(2) Any ferry being operated under authority of a change of character certificate issued by a Coast Guard Officer-in-Charge, Marine Inspection.

Carrier means a person who transports passengers or property in commerce by rail car, aircraft, motor vehicle, or vessel.

CC means closed-cup.

Character of vessel means the type of service in which the vessel is engaged at the time of carriage of a hazardous material.

Class means hazard class. See hazard class.

Class 1. See §173.50 of this subchapter.

Class 2. See §173.115 of this subchapter.

Class 3. See §173.120 of this subchapter.

Class 4. See §173.124 of this subchapter.

Class 5. See §173.128 of this subchapter.

Class 6. See §173.132 of this subchapter.

Class 7. See §173.403 of this subchapter.

Class 8. See §173.136 of this subchapter.

Class 9. See §173.140 of this subchapter.

Closure means a device which closes an opening in a receptacle.

COFC means container-on-flat-car.

Combination packaging means a combination of packaging, for transport purposes, consisting of one or more inner packagings secured in a non-bulk outer packaging. It does not include a composite packaging.

Combustible liquid. See §173.120 of this subchapter.

Commerce means trade or transportation in the jurisdiction of the United States within a single state; between a place in a state and a place outside of the state; or that affects trade or transportation between a place in a state and place outside of the state.

Compatibility group letter means a designated alphabetical letter used to categorize different types of explosive substances and articles for purposes of stowage and segregation. See §173.52 of this subchapter.

Competent Authority means a national agency responsible under its national law for the control or regulation of a particular aspect of the transportation of hazardous materials (dangerous goods). The term Appropriate Authority, as used in the ICAO Technical Instructions (IBR, see §171.7), has the same meaning as Competent Authority. For purposes of this subchapter, the Associate Administrator is the Competent Authority for the United States.

Composite packaging means a packaging consisting of an outer packaging and an inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped and emptied as such.

Compressed gas. See §173.115 of this subchapter.

Consignee means the person or place shown on a shipping document, package marking, or other media as the location to which a carrier is directed to transport a hazardous material.

Consumer commodity means a material that is packaged and distributed in a form intended or suitable for sale through retail sales agencies or instrumentalities for consumption by individuals for purposes of personal care or household use. This term also includes drugs and medicines.

Containership means a cargo vessel designed and constructed to transport, within specifically designed cells, portable tanks and freight containers which are lifted on and off with their contents intact.

Corrosive material. See §173.136 of this subchapter.

Crate means an outer packaging with incomplete surfaces.

Crewmember means a person assigned to perform duty in an aircraft during flight time.

Cryogenic liquid. See §173.115(g) of this subchapter.

Cultures and stocks. See §173.134 of this subchapter.

Cylinder means a pressure vessel designed for pressures higher than 40 psia and having a circular cross section. It does not include a portable tank, multi-unit tank car tank, cargo tank, or tank car.

Dangerous when wet material. See §173.124 of this subchapter.

Design Certifying Engineer means a person registered with the Department in accordance with subpart F of part 107 of this chapter who has the knowledge and ability to perform stress analysis of pressure vessels and otherwise determine whether a cargo tank design and construction meets the applicable DOT specification. A Design Certifying Engineer meets the knowledge and ability requirements of this section by meeting any one of the following requirements:

(1) Has an engineering degree and one year of work experience in cargo tank structural or mechanical design;

(2) Is currently registered as a professional engineer by appropriate authority of a state of the United States or a province of Canada; or

(3) Has at least three years' experience in performing the duties of a Design Certifying Engineer prior to September 1, 1991.

Designated facility means a hazardous waste treatment, storage, or disposal facility that has been designated on the manifest by the generator.

District Commander means the District Commander of the Coast Guard, or his authorized representative, who has jurisdiction in the particular geographical area.

Division means a subdivision of a hazard class.

DOD means the U.S. Department of Defense.

Domestic transportation means transportation between places within the United States other than through a foreign country.

DOT or Department means U.S. Department of Transportation.

Drum means a flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastic, plywood, or other suitable materials. This definition also includes packagings of other shapes made of metal or plastic (e.g., round taper-necked packagings or pail-shaped packagings) but does not include cylinders, jerricans, wooden barrels or bulk packagings.

Elevated temperature material means a material which, when offered for transportation or transported in a bulk packaging:

(1) Is in a liquid phase and at a temperature at or above 100 °C (212 °F);

(2) Is in a liquid phase with a flash point at or above 38 °C (100 °F) that is intentionally heated and offered for transportation or transported at or above its flash point; or

(3) Is in a solid phase and at a temperature at or above 240 °C (464 °F).

Engine means a locomotive propelled by any form of energy and used by a railroad.

EPA means U.S. Environmental Protection Agency.

Equivalent lithium content means, for a lithium-ion cell, the product of the rated capacity, in ampere-hours, of a lithium-ion cell times 0.3, with the result expressed in grams. The equivalent lithium content of a battery equals the sum of the grams of equivalent lithium content contained in the component cells of the battery.

Etiologic agent. See §173.134 of this subchapter.

EX number means a number preceded by the prefix “EX”, assigned by the Associate Administrator, to an item that has been evaluated under the provisions of §173.56 of this subchapter.

Explosive. See §173.50 of this subchapter.

F means degree Fahrenheit.

Farmer means a person engaged in the production or raising of crops, poultry, or livestock.

Federal hazardous material transportation law means 49 U.S.C. 5101 et seq.

Ferry vessel means a vessel which is limited in its use to the carriage of deck passengers or vehicles or both, operates on a short run on a frequent schedule between two points over the most direct water route, other than in ocean or coastwise service, and is offered as a public service of a type normally attributed to a bridge or tunnel.

Filling density has the following meanings:

(1) For compressed gases in cylinders, see §173.304a(a)(2) table note 1.

(2) For compressed gases in tank cars, see §173.314(c) table note 1.

(3) For compressed gases in cargo tanks and portable tanks, see §173.315(a) table note 1.

(4) For cryogenic liquids in cylinders, except hydrogen, see §173.316(c)(1).

(5) For hydrogen, cryogenic liquid in cylinders, see §173.316(c)(3) table note 1.

(6) For cryogenic liquids in cargo tanks, see §173.318(f)(1).

(7) For cryogenic liquids in tank cars, see §173.319(d)(1).

Flammable gas. See §173.115 of this subchapter.

Flammable liquid. See §173.120 of this subchapter.

Flammable solid. See §173.124 of this subchapter.

Flash point. See §173.120 of this subchapter.

Freight container means a reusable container having a volume of 64 cubic feet or more, designed and constructed to permit being lifted with its contents intact and intended primarily for containment of packages (in unit form) during transportation.

Fuel cell means an electrochemical device that converts the energy of the chemical reaction between a fuel, such as hydrogen or hydrogen rich gases, alcohols, or hydrocarbons, and an oxidant, such as air or oxygen, to direct current (d.c.) power, heat, and other reaction products.

Fuel cell cartridge or fuel cartridge means an article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell.

Fuel cell system means a fuel cell with an installed fuel cell cartridge together with wiring, valves, and other attachments that connect the fuel cell or cartridge to the device it powers. The fuel cell or cartridge may be so constructed that it forms an integral part of the device or may be removed and connected manually to the device.

Fuel tank means a tank other than a cargo tank, used to transport flammable or combustible liquid, or compressed gas for the purpose of supplying fuel for propulsion of the transport vehicle to which it is attached, or for the operation of other equipment on the transport vehicle.

Fumigated lading. See §§172.302(g) and 173.9.

Gas means a material which has a vapor pressure greater than 300 kPa (43.5 psia) at 50 °C (122 °F) or is completely gaseous at 20 °C (68 °F) at a standard pressure of 101.3 kPa (14.7 psia).

Gross weight or Gross mass means the weight of a packaging plus the weight of its contents.

Hazard class means the category of hazard assigned to a hazardous material under the definitional criteria of part 173 of this subchapter and the provisions of the §172.101 table. A material may meet the defining criteria for more than one hazard class but is assigned to only one hazard class.

Hazard zone means one of four levels of hazard (Hazard Zones A through D) assigned to gases, as specified in §173.116(a) of this subchapter, and one of two levels of hazards (Hazard Zones A and B) assigned to liquids that are poisonous by inhalation, as specified in §173.133(a) of this subchapter. A hazard zone is based on the LC50 value for acute inhalation toxicity of gases and vapors, as specified in §173.133(a).

Hazardous material means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter.

Hazardous substance for the purposes of this subchapter, means a material, including its mixtures and solutions, that—

(1) Is listed in the appendix A to §172.101 of this subchapter;

(2) Is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in the appendix A to §172.101 of this subchapter; and

(3) When in a mixture or solution—

(i) For radionuclides, conforms to paragraph 7 of the appendix A to §172.101.

(ii) For other than radionuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material, as shown in the following table:

RQ pounds (kilograms)	Concentration by weight	
	Percent	PPM
5000 (2270)	10	100,000
1000 (454)	2	20,000
100 (45.4)	0.2	2,000
10 (4.54)	0.02	200
1 (0.454)	0.002	20

The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance in appendix A to §172.101 of this subchapter, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

Hazardous waste, for the purposes of this chapter, means any material that is subject to the Hazardous Waste Manifest Requirements of the U.S. Environmental Protection Agency specified in 40 CFR part 262.

Hazmat means a hazardous material.

Hazmat employee means:

(1) A person who is:

(i) Employed on a full-time, part time, or temporary basis by a hazmat employer and who in the course of such full time, part time or temporary employment directly affects hazardous materials transportation safety;

(ii) Self-employed (including an owner-operator of a motor vehicle, vessel, or aircraft) transporting hazardous materials in commerce who in the course of such self-employment directly affects hazardous materials transportation safety;

(iii) A railroad signalman; or

(iv) A railroad maintenance-of-way employee.

(2) This term includes an individual, employed on a full time, part time, or temporary basis by a hazmat employer, or who is self-employed, who during the course of employment:

(i) Loads, unloads, or handles hazardous materials;

(ii) Designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs, or tests a package, container or packaging component that is represented, marked, certified, or sold as qualified for use in transporting hazardous material in commerce.

(iii) Prepares hazardous materials for transportation;

(iv) Is responsible for safety of transporting hazardous materials;

(v) Operates a vehicle used to transport hazardous materials.

Hazmat employer means:

(1) A person who employs or uses at least one hazmat employee on a full-time, part time, or temporary basis; and who:

(i) Transports hazardous materials in commerce;

(ii) Causes hazardous materials to be transported in commerce; or

(iii) Designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs or tests a package, container, or packaging component that is represented, marked, certified, or sold by that person as qualified for use in transporting hazardous materials in commerce;

(2) A person who is self-employed (including an owner-operator of a motor vehicle, vessel, or aircraft) transporting materials in commerce; and who:

(i) Transports hazardous materials in commerce;

(ii) Causes hazardous materials to be transported in commerce; or

(iii) Designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs or tests a package, container, or packaging component that is represented, marked, certified, or sold by that person as qualified for use in transporting hazardous materials in commerce; or

(3) A department, agency, or instrumentality of the United States Government, or an authority of a State, political subdivision of a State, or an Indian tribe; and who:

(i) Transports hazardous materials in commerce;

(ii) Causes hazardous materials to be transported in commerce; or

(iii) Designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs or tests a package, container, or packaging component that is represented, marked, certified, or sold by that person as qualified for use in transporting hazardous materials in commerce.

Hermetically sealed means closed by fusion, gasketing, crimping, or equivalent means so that no gas or vapor can enter or escape.

Household waste means any solid waste (including garbage, trash, and sanitary waste from septic tanks) derived from households (including single and multiple residences, hotels and motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day-use recreation areas). This term is not applicable to consolidated shipments of household hazardous materials transported from collection centers. A collection center is a central location where household waste is collected.

HMR means the Hazardous Materials Regulations, Parts 171 through 180 of this chapter.

IAEA means International Atomic Energy Agency.

IATA means International Air Transport Association.

ICAO means International Civil Aviation Organization.

IMO means International Maritime Organization.

Incorporated by reference or IBR means a publication or a portion of a publication that is made a part of the regulations of this subchapter. See §171.7.

Infectious substance (etiologic agent). See §173.134 of this subchapter.

Inner packaging means a packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

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.

Intermediate bulk container or IBC means a rigid or flexible portable packaging, other than a cylinder or portable tank, which is designed for mechanical handling. Standards for IBCs manufactured in the United States are set forth in subparts N and O of part 178 of this subchapter.

Intermediate packaging means a packaging which encloses an inner packaging or article and is itself enclosed in an outer packaging.

Intermodal container means a freight container designed and constructed to permit it to be used interchangeably in two or more modes of transport.

Intermodal portable tank or IM portable tank means a specific class of portable tanks designed primarily for international intermodal use.

International transportation means transportation—

(1) Between any place in the United States and any place in a foreign country;

(2) Between places in the United States through a foreign country; or

(3) Between places in one or more foreign countries through the United States.

Irritating material. See §173.132(a)(2) of this subchapter.

Jerrican means a metal or plastic packaging of rectangular or polygonal cross-section.

Large packaging means a packaging that—

(1) Consists of an outer packaging which contains articles or inner packagings;

(2) Is designated for mechanical handling;

(3) Exceeds 400 kg net mass or 450 liters (118.9 gallons) capacity;

(4) Has a volume of not more than 3 m^3 (see §178.801(i) of this subchapter); and

(5) Conforms to the requirements for the construction, testing and marking of large packagings as specified in subparts P and Q of part 178 of this subchapter.

Limited quantity, when specified as such in a section applicable to a particular material, means the maximum amount of a hazardous material for which there is a specific labeling or packaging exception.

Lighter means a mechanically operated flame-producing device employing an ignition device and containing a Class 3 or a Division 2.1 material. For design, capacity, and filling density requirements for lighters containing a Division 2.1 material, see §173.308.

Lighter refill means a pressurized container that does not contain an ignition device but does contain a release device and is intended for use as a replacement cartridge in a lighter or to refill a lighter with a Division 2.1 flammable gas fuel. For capacity limits, see §173.306(h) of this subchapter.

Liquid means a material, other than an elevated temperature material, with a melting point or initial melting point of 20 °C (68 °F) or lower at a standard pressure of 101.3 kPa (14.7 psia). A viscous material for which a specific melting point cannot be determined must be subjected to the procedures specified in ASTM D 4359 “Standard Test Method for Determining Whether a Material is Liquid or Solid” (IBR, see §171.7).

Liquid phase means a material that meets the definition of liquid when evaluated at the higher of the temperature at which it is offered for transportation or at which it is transported, not at the 38 °C (100 °F) temperature specified in ASTM D 4359 (IBR, see §171.7).

Lithium content means the mass of lithium in the anode of a lithium metal or lithium alloy cell. The lithium content of a battery equals the sum of the grams of lithium content contained in the component cells of the battery. For a lithium-ion cell see the definition for “equivalent lithium content”.

Loading incidental to movement means loading by carrier personnel or in the presence of carrier personnel of packaged or containerized hazardous material onto a transport vehicle, aircraft, or vessel for the purpose of transporting it, including the loading, blocking and bracing a hazardous materials package in a freight container or transport vehicle, and segregating a hazardous materials package in a freight container or transport vehicle from incompatible cargo. For a bulk packaging, loading incidental to movement means filling the packaging with a hazardous material for the purpose of transporting it. Loading incidental to movement includes transloading.

Magazine vessel means a vessel used for the receiving, storing, or dispensing of explosives.

Magnetic material. See §173.21(d) of this subchapter.

Marine pollutant, means a material which is listed in appendix B to §172.101 of this subchapter (also see §171.4) and, when in a solution or mixture of one or more marine pollutants, is packaged in a concentration which equals or exceeds:

(1) Ten percent by weight of the solution or mixture for materials listed in the appendix; or

(2) One percent by weight of the solution or mixture for materials that are identified as severe marine pollutants in the appendix.

Marking means a descriptive name, identification number, instructions, cautions, weight, specification, or UN marks, or combinations thereof, required by this subchapter on outer packagings of hazardous materials.

Material of trade means a hazardous material, other than a hazardous waste, that is carried on a motor vehicle—

(1) For the purpose of protecting the health and safety of the motor vehicle operator or passengers;

(2) For the purpose of supporting the operation or maintenance of a motor vehicle (including its auxiliary equipment); or

(3) By a private motor carrier (including vehicles operated by a rail carrier) in direct support of a principal business that is other than transportation by motor vehicle.

Material poisonous by inhalation means:

(1) A gas meeting the defining criteria in §173.115(c) of this subchapter and assigned to Hazard Zone A, B, C, or D in accordance with §173.116(a) of this subchapter;

(2) A liquid (other than as a mist) meeting the defining criteria in §173.132(a)(1)(iii) of this subchapter and assigned to Hazard Zone A or B in accordance with §173.133(a) of this subchapter; or

(3) Any material identified as an inhalation hazard by a special provision in column 7 of the §172.101 table.

Maximum allowable working pressure or MAWP: For DOT specification cargo tanks used to transport liquid hazardous materials, see §178.320(a) of this subchapter.

Maximum capacity means the maximum inner volume of receptacles or packagings.

Maximum net mass means the allowable maximum net mass of contents in a single packaging, or as used in subpart M of part 178 of this subchapter, the maximum combined mass of inner packaging, and the contents thereof.

Metered delivery service means a cargo tank unloading operation conducted at a metered flow rate of 378.5 L (100 gallons) per minute or less through an attached delivery hose with a nominal inside diameter of 3.175 cm (11/4inches) or less.

Miscellaneous hazardous material. See §173.140 of this subchapter.

Mixture means a material composed of more than one chemical compound or element.

Mode means any of the following transportation methods; rail, highway, air, or water.

Motor vehicle includes a vehicle, machine, tractor, trailer, or semitrailer, or any combination thereof, propelled or drawn by mechanical power and used upon the highways in the transportation of passengers or property. It does not include a vehicle, locomotive, or car operated exclusively on a rail or rails, or a trolley bus operated by

electric power derived from a fixed overhead wire, furnishing local passenger transportation similar to street-railway service.

Movement means the physical transfer of a hazardous material from one geographic location to another by rail car, aircraft, motor vehicle, or vessel.

Multiple-element gas container or MEGC means assemblies of UN cylinders, tubes, or bundles of cylinders interconnected by a manifold and assembled within a framework. The term includes all service equipment and structural equipment necessary for the transport of gases.

Name of contents means the proper shipping name as specified in §172.101 of this subchapter.

Navigable waters means, for the purposes of this subchapter, waters of the United States, including the territorial seas.

Non-bulk packaging means a packaging which has:

(1) A maximum capacity of 450 L (119 gallons) or less as a receptacle for a liquid;

(2) A maximum net mass of 400 kg (882 pounds) or less and a maximum capacity of 450 L (119 gallons) or less as a receptacle for a solid; or

(3) A water capacity of 454 kg (1000 pounds) or less as a receptacle for a gas as defined in §173.115 of this subchapter.

Nonflammable gas. See §173.115 of this subchapter.

N.O.S. means not otherwise specified.

N.O.S. description means a shipping description from the §172.101 table which includes the abbreviation n.o.s.

NPT means an American Standard taper pipe thread conforming to the requirements of NBS Handbook H–28 (IBR, see §171.7).

NRC (non-reusable container) means a packaging (container) whose reuse is restricted in accordance with the provisions of §173.28 of this subchapter.

Occupied caboose means a rail car being used to transport non-passenger personnel.

Officer in Charge, Marine Inspection means a person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the supervision and direction of the Coast Guard District Commander is in charge of a designated inspection zone for the performance of duties with respect to the enforcement and administration of title 52, Revised Statutes, acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspection required thereby.

Offshore supply vessel means a cargo vessel of less than 500 gross tons that regularly transports goods, supplies or equipment in support of exploration or production of offshore mineral or energy resources.

Operator means a person who controls the use of an aircraft, vessel, or vehicle.

Organic peroxide. See §173.128 of this subchapter.

ORM means other regulated material. See §173.144 of this subchapter.

Outage or **ullage** means the amount by which a packaging falls short of being liquid full, usually expressed in percent by volume.

Outer packaging means the outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packagings.

Overpack, except as provided in subpart K of part 178 of this subchapter, 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. 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.

Oxidizer. See §173.127 of this subchapter.

Oxidizing gas means a gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does. Specifically, this means a pure gas or gas mixture with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156: or 10156-2: (IBR, see §171.7 of this subchapter) (see also §173.115(k)).

Oxygen generator (chemical) means a device containing chemicals that upon activation release oxygen as a product of chemical reaction.

Package or **Outside Package** means a packaging plus its contents. For radioactive materials, see §173.403 of this subchapter.

Packaging means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this subchapter. For radioactive materials packaging, see §173.403 of this subchapter.

Packing group means a grouping according to the degree of danger presented by hazardous materials. Packing Group I indicates great danger; Packing Group II, medium danger; Packing Group III, minor danger. See §172.101(f) of this subchapter.

Passenger (With respect to vessels and for the purposes of part 176 only) means a person being carried on a vessel other than:

(1) The owner or his representative;

(2) The operator;

(3) A bona fide member of the crew engaged in the business of the vessel who has contributed no consideration for his carriage and who is paid for his services; or

(4) A guest who has not contributed any consideration directly or indirectly for his carriage.

Passenger-carrying aircraft means an aircraft that carries any person other than a crewmember, company employee, an authorized representative of the United States, or a person accompanying the shipment.

Passenger vessel means—

(1) A vessel subject to any of the requirements of the International Convention for the Safety of Life at Sea, 1974, which carries more than 12 passengers;

(2) A cargo vessel documented under the laws of the United States and not subject to that Convention, which carries more than 16 passengers;

(3) A cargo vessel of any foreign nation that extends reciprocal privileges and is not subject to that Convention and which carries more than 16 passengers; and

(4) A vessel engaged in a ferry operation and which carries passengers.

Person means an individual, corporation, company, association, firm, partnership, society, joint stock company; or a government, Indian tribe, or authority of a government or tribe offering a hazardous material for transportation in commerce or transporting a hazardous material to support a commercial enterprise. This term does not include the United States Postal Service or, for purposes of 49 U.S.C. 5123 and 5124, a Department, agency, or instrumentality of the government.

Person who offers or **offeror** means:

(1) Any person who does either or both of the following:

(i) Performs, or is responsible for performing, any pre-transportation function required under this subchapter for transportation of the hazardous material in commerce.

(ii) Tenders or makes the hazardous material available to a carrier for transportation in commerce.

(2) A carrier is not an offeror when it performs a function required by this subchapter as a condition of acceptance of a hazardous material for transportation in commerce (e.g. , reviewing shipping papers, examining packages to ensure that they are in conformance with this subchapter, or preparing shipping documentation for its own use) or when it transfers a hazardous material to another carrier for continued transportation in commerce without performing a pre-transportation function.

PHMSA means the Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington, DC 20590.

Placarded car means a rail car which is placarded in accordance with the requirements of part 172 of this subchapter.

Poisonous gas. See §173.115 of this subchapter.

Poisonous materials. See §173.132 of this subchapter.

Portable tank means a bulk packaging (except a cylinder having a water capacity of 1000 pounds or less) designed primarily to be loaded onto, or on, or temporarily attached to a transport vehicle or ship and equipped with skids, mountings, or accessories to facilitate handling of the tank by mechanical means. It does not include a cargo tank, tank car, multi-unit tank car tank, or trailer carrying 3AX, 3AAX, or 3T cylinders.

Preferred route or **Preferred highway** is a highway for shipment of highway route controlled quantities of radioactive materials so designated by a State routing agency, and any Interstate System highway for which an alternative highway has not been designated by such State agency as provided by §397.103 of this title.

Pre-transportation function means a function specified in the HMR that is required to assure the safe transportation of a hazardous material in commerce, including—

(1) Determining the hazard class of a hazardous material.

(2) Selecting a hazardous materials packaging.

(3) Filling a hazardous materials packaging, including a bulk packaging.

(4) Securing a closure on a filled or partially filled hazardous materials package or container or on a package or container containing a residue of a hazardous material.

(5) Marking a package to indicate that it contains a hazardous material.

(6) Labeling a package to indicate that it contains a hazardous material.

(7) Preparing a shipping paper.

(8) Providing and maintaining emergency response information.

(9) Reviewing a shipping paper to verify compliance with the HMR or international equivalents.

(10) For each person importing a hazardous material into the United States, providing the shipper with timely and complete information as to the HMR requirements that will apply to the transportation of the material within the United States.

(11) Certifying that a hazardous material is in proper condition for transportation in conformance with the requirements of the HMR.

(12) Loading, blocking, and bracing a hazardous materials package in a freight container or transport vehicle.

(13) Segregating a hazardous materials package in a freight container or transport vehicle from incompatible cargo.

(14) Selecting, providing, or affixing placards for a freight container or transport vehicle to indicate that it contains a hazardous material.

Primary hazard means the hazard class of a material as assigned in the §172.101 table.

Private track or **Private siding** means: (i) Track located outside of a carrier's right-of-way, yard, or terminals where the carrier does not own the rails, ties, roadbed, or right-of-way, or

(ii) Track leased by a railroad to a lessee, where the lease provides for, and actual practice entails, exclusive use of that trackage by the lessee and/or a general system railroad for purpose of moving only cars shipped to or by the lessee, and where the lessor otherwise exercises no control over or responsibility for the trackage or the cars on the trackage.

Proper shipping name means the name of the hazardous material shown in Roman print (not italics) in §172.101 of this subchapter.

PSI means pounds per square inch.

PSIA means pounds per square inch absolute.

PSIG means pounds per square inch gauge.

Public vessel means a vessel owned by and being used in the public service of the United States. It does not include a vessel owned by the United States and engaged in a trade or commercial service or a vessel under contract or charter to the United States.

Pyrophoric liquid. See §173.124(b) of this subchapter.

Radioactive materials. See §173.403 of this subchapter for definitions relating to radioactive materials.

Rail car means a car designed to carry freight or non-passenger personnel by rail, and includes a box car, flat car, gondola car, hopper car, tank car, and occupied caboose.

Railroad means a person engaged in transportation by rail.

Receptacle means a containment vessel for receiving and holding materials, including any means of closing.

Registered Inspector means a person registered with the Department in accordance with subpart F of part 107 of this chapter who has the knowledge and ability to determine whether a cargo tank conforms to the applicable DOT specification. A Registered Inspector meets the knowledge and ability requirements of this section by meeting any one of the following requirements:

(1) Has an engineering degree and one year of work experience relating to the testing and inspection of cargo tanks;

(2) Has an associate degree in engineering and two years of work experience relating to the testing and inspection of cargo tanks;

(3) Has a high school diploma (or General Equivalency Diploma) and three years of work experience relating to the testing and inspection of cargo tanks; or

(4) Has at least three years' experience performing the duties of a Registered Inspector prior to September 1, 1991.

Regulated medical waste. See §173.134 of this subchapter.

Reportable quantity (RQ) for the purposes of this subchapter means the quantity specified in column 2 of the appendix to §172.101 for any material identified in column 1 of the appendix.

Research means investigation or experimentation aimed at the discovery of new theories or laws and the discovery and interpretation of facts or revision of accepted theories or laws in the light of new facts. Research does not include the application of existing technology to industrial endeavors.

Residue means the hazardous material remaining in a packaging, including a tank car, after its contents have been unloaded to the maximum extent practicable and before the packaging is either refilled or cleaned of hazardous material and purged to remove any hazardous vapors.

SADT means self-accelerated decomposition temperature. See §173.21(f) of this subchapter.

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 recovery or disposal.

SCF (standard cubic foot) means one cubic foot of gas measured at 60 °F. and 14.7 psia.

Secretary means the Secretary of Transportation.

Self-defense spray means an aerosol or non-pressurized device that:

(1) Is intended to have an irritating or incapacitating effect on a person or animal; and

(2) Meets no hazard criteria other than for Class 9 (for example, a pepper spray; see §173.140(a) of this subchapter) and, for an aerosol, Division 2.1 or 2.2 (see §173.115 of this subchapter), except that it may contain not more than two percent by mass of a tear gas substance (e.g., chloroacetophenone (CN) or 0-chlorobenzylmalonitrile (CS); see §173.132(a)(2) of this subchapter.)

Settled pressure means the pressure exerted by the contents of a UN pressure receptacle in thermal and diffusive equilibrium.

Sharps. See §173.134 of this subchapter.

Shipping paper means a shipping order, bill of lading, manifest or other shipping document serving a similar purpose and prepared in accordance with subpart C of part 172 of this chapter.

Siftproof packaging means a packaging impermeable to dry contents, including fine solid material produced during transportation.

Single packaging means a non-bulk packaging other than a combination packaging.

Solid means a material which is not a gas or a liquid.

Solution means any homogeneous liquid mixture of two or more chemical compounds or elements that will not undergo any segregation under conditions normal to transportation.

Special permit means a document issued by the Associate Administrator under the authority of 49 U.S.C. 5117 permitting a person to perform a function that is not otherwise permitted under subchapter A or C of this chapter, or other regulations issued under 49 U.S.C. 5101 et seq. (e.g., Federal Motor Carrier Safety routing requirements). The terms “special permit” and “exemption” have the same meaning for purposes of subchapter A or C of this chapter or other regulations issued under 49 U.S.C. 5101 through 5127. An exemption issued prior to October 1, 2005 remains valid until it is past its expiration date, terminated by the Associate Administrator, or issued as a special permit, whichever occurs first.

Specification packaging means a packaging conforming to one of the specifications or standards for packagings in part 178 or part 179 of this subchapter.

Spontaneously combustible material. See §173.124(b) of this subchapter.

Stabilized means that the hazardous material is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as adding an inhibiting chemical, degassing the hazardous material to remove dissolved oxygen and inerting the air space in the package, or maintaining the hazardous material under temperature control.

State means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, or any other territory or possession of the United States designated by the Secretary.

State-designated route means a preferred route selected in accordance with U.S. DOT “Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantities of Radioactive Materials” or an equivalent routing analysis which adequately considers overall risk to the public.

Storage incidental to movement means storage of a transport vehicle, freight container, or package containing a hazardous material by any person between the time that a carrier takes physical possession of the hazardous material for the purpose of transporting it in commerce until the package containing the hazardous material is

physically delivered to the destination indicated on a shipping document, package marking, or other medium, or, in the case of a private motor carrier, between the time that a motor vehicle driver takes physical possession of the hazardous material for the purpose of transporting it in commerce until the driver relinquishes possession of the package at its destination and is no longer responsible for performing functions subject to the HMR with respect to that particular package.

(1) Storage incidental to movement includes—

(i) Storage at the destination shown on a shipping document, including storage at a transloading facility, provided the shipping documentation identifies the shipment as a through-shipment and identifies the final destination or destinations of the hazardous material; and

(ii) Rail cars containing hazardous materials that are stored on track that does not meet the definition of “private track or siding” in §171.8, even if those cars have been delivered to the destination shown on the shipping document.

(2) Storage incidental to movement does not include storage of a hazardous material at its final destination as shown on a shipping document.

Stowage means the act of placing hazardous materials on board a vessel.

Strong outser packaging means the outermost enclosure that provides protection against the unintentional release of its contents. It is a packaging that is sturdy, durable, and constructed so that it will retain its contents under normal conditions of transportation. In addition, a strong outer packaging must meet the general packaging requirements of subpart B of part 173 of this subchapter but need not comply with the specification packaging requirements in part 178 of the subchapter. For transport by aircraft, a strong outer packaging is subject to §173.27 of this subchapter. The terms “strong outside container” and “strong outside packaging” are synonymous with “strong outer packaging”.

Subsidiary hazard means a hazard of a material other than the primary hazard. (See primary hazard).

Table in §172.101 or §172.101 table means the Hazardous Materials Table in §172.101 of this subchapter.

Technical name means a recognized chemical name or microbiological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized for use as technical names provided they readily identify the general chemical group, or microbiological group. Examples of acceptable generic chemical descriptions are organic phosphate compounds, petroleum aliphatic hydrocarbons and tertiary amines. For proficiency testing only, generic microbiological descriptions such as bacteria, mycobacteria, fungus, and viral samples may be used. Except for names which appear in subpart B of part 172 of this subchapter, trade names may not be used as technical names.

TOFC means trailer-on-flat-car.

Top shell means the tank car tank surface, excluding the head ends and bottom shell of the tank car tank.

Toxin. See §173.134 of this subchapter.

Trailership means a vessel, other than a carfloat, specifically equipped to carry motor transport vehicles and fitted with installed securing devices to tie down each vehicle. The term trailership includes Roll-on/Roll-off (RO/RO) vessels.

Train means one or more engines coupled with one or more rail cars, except during switching operations or where the operation is that of classifying and assembling rail cars within a railroad yard for the purpose of making or breaking up trains.

Trainship means a vessel other than a rail car ferry or carfloat, specifically equipped to transport railroad vehicles, and fitted with installed securing devices to tie down each vehicle.

Transloading means the transfer of a hazardous material by any person from one bulk packaging to another bulk packaging, from a bulk packaging to a non-bulk packaging, or from a non-bulk packaging to a bulk packaging for the purpose of continuing the movement of the hazardous material in commerce.

Transport vehicle means a cargo-carrying vehicle such as an automobile, van, tractor, truck, semitrailer, tank car or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, rail car, etc.) is a separate transport vehicle.

Transportation or **transport** means the movement of property and loading, unloading, or storage incidental to that movement.

UFC means Uniform Freight Classification.

UN means United Nations.

UN cylinder means a transportable pressure receptacle with a water capacity not exceeding 150 L that has been marked and certified as conforming to the applicable requirements in part 178 of this subchapter.

UN portable tank means an intermodal tank having a capacity of more than 450 liters (118.9 gallons). It includes a shell fitted with service equipment and structural equipment, including stabilizing members external to the shell and skids, mountings or accessories to facilitate mechanical handling. A UN portable tank must be capable of being filled and discharged without the removal of its structural equipment and must be capable of being lifted when full. Cargo tanks, rail tank car tanks, non-metallic tanks, non-specification tanks, bulk bins, and IBCs and packagings made to cylinder specifications are not UN portable tanks.

UN pressure receptacle means a UN cylinder or tube.

UN Recommendations means the UN Recommendations on the Transport of Dangerous Goods (IBR, see §171.7).

UN standard packaging means a packaging conforming to standards in the UN Recommendations (IBR, see §171.7).

UN tube means a seamless transportable pressure receptacle with a water capacity exceeding 150 L but not more than 3,000 L that has been marked and certified as conforming to the requirements in part 178 of this subchapter.

Undeclared hazardous material means a hazardous material that is: (1) Subject to any of the hazard communication requirements in subparts C (Shipping Papers), D (Marking), E (Labeling), and F (Placarding) of Part 172 of this subchapter, or an alternative marking requirement in Part 173 of this subchapter (such as §§173.4(a)(10) and 173.6(c)); and (2) offered for transportation in commerce without any visible indication to the person accepting the hazardous material for transportation that a hazardous material is present, on either an accompanying shipping document, or the outside of a transport vehicle, freight container, or package.

Unintentional release means the escape of a hazardous material from a package on an occasion not anticipated or planned. This includes releases resulting from collision, package failures, human error, criminal activity, negligence, improper packing, or unusual conditions such as the operation of pressure relief devices as a result of over-pressurization, overfill or fire exposure. It does not include releases, such as venting of packages, where allowed, and the operational discharge of contents from packages.

Unit load device means any type of freight container, aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo.

United States means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, or any other territory or possession of the United States designated by the Secretary.

Unloading incidental to movement means removing a packaged or containerized hazardous material from a transport vehicle, aircraft, or vessel, or for a bulk packaging, emptying a hazardous material from the bulk packaging after the hazardous material has been delivered to the consignee when performed by carrier personnel or in the presence of carrier personnel or, in the case of a private motor carrier, while the driver of the motor vehicle from which the hazardous material is being unloaded immediately after movement is completed is present during the unloading operation. (Emptying a hazardous material from a bulk packaging while the packaging is on board a vessel is subject to separate regulations as delegated by Department of Homeland Security Delegation No. 0170.1 at 2(103).) Unloading incidental to movement includes transloading.

Vessel includes every description of watercraft, used or capable of being used as a means of transportation on the water.

Viscous liquid means a liquid material which has a measured viscosity in excess of 2500 centistokes at 25 °C. (77 °F.) when determined in accordance with the procedures specified in ASTM Method D 445–72 “Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)” or **ASTM Method D 1200–70** “Viscosity of Paints, Varnishes, and Lacquers by Ford Viscosity Cup.”

Volatility refers to the relative rate of evaporation of materials to assume the vapor state.

Water reactive material. See §173.124(c) of this subchapter.

Water resistant means having a degree of resistance to permeability by and damage caused by water in liquid form.

Wooden barrel means a packaging made of natural wood, of round cross-section, having convex walls, consisting of staves and heads and fitted with hoops.

Working pressure for purposes of UN pressure receptacles, means the settled pressure of a compressed gas at a reference temperature of 15 °C (59 °F).

W.T. means watertight.

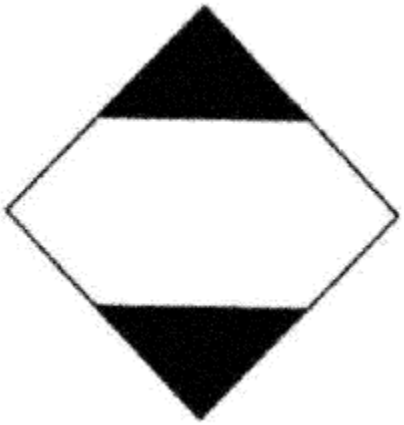
49 CFR (Code of Federal Regulations)

The following sections have been taken directly from 49CFR (Parts 100-185 revised as of October 1, 2010) and have been included in this guide as assistance to your questions and preparation of the hazardous material package. A complete print of all sections can be found in the latest hardcopy version or accessing the Internet through address http://hazmat.dot.gov.

Subpart D—Marking
§ 172.315 Packages containing limited quantities.

(a) *Modes other than air transport.* Except for an article or substance of Class 7 prepared in accordance with subpart I of part 173, a package prepared in accordance with applicable limited quantity requirements in part 173 of this subchapter and offered for transportation by a mode other than air must display the limited quantity marking shown in paragraph (a)(1) of this section. A package displaying this mark is not subject to the marking requirements of § 172.301 of this subpart unless the limited quantity package also contains a hazardous substance or a hazardous waste. Required markings need not be duplicated if already marked as prescribed elsewhere in this subpart. As an alternative, a packaging may display the limited quantity “Y” mark shown in paragraph (b) of this section if the package conforms to authorized substance and article provisions and the inner and outer package quantity limits in § 173.27(f) of this subchapter.

(1) *Marking description.* The top and bottom portions of the square-on-point and the border forming the square-on-point must be black and the center white or of a suitable contrasting background as follows:



(2) The square-on-point must be durable, legible and of a size relative to the packaging, readily visible, and must be applied on at least one side or one end of the outer packaging. The width of the border forming the square-on-point must be at least 2 mm and the minimum dimension of each side must be 100 mm unless the packaging size requires a reduced size marking that must be no less than 50 mm on each side. When intended for transportation by vessel, a cargo transport unit (see § 176.2 of this subchapter) containing packages of hazardous materials in only limited quantities must be marked once on each side and once on each end of the exterior of the unit with an identical mark which must have minimum dimensions of 250 mm on each side.

(b) *Air transport.* Except for an article or substance of Class 7 prepared in accordance with subpart I of part 173, a package prepared in accordance with air-specific limited quantity requirements prescribed in § 173.27 of this subchapter and intended for transportation by air must display the limited quantity mark prescribed in paragraph (b)(1) of this section in addition to other markings required by this subpart (*e.g.,* “RQ”, proper shipping name, identification number, as appropriate). Required markings need not be duplicated if already marked as prescribed elsewhere in this subpart.

(1) *Marking Description.* The top and bottom portions of the square-on-point and the border forming the square-on-point must be black and the center white or of a suitable contrasting background and the symbol “Y” must be black and located in the center of the square-on-point and be clearly visible as follows:

(2) The square-on-point must be durable, legible and of a size relative to the package as to be readily visible. The square-on-point must be applied on at least one side or one end of the outer packaging. The width of the border forming the square-on-

point must be at least 2 mm and the minimum dimension of each side must be 100 mm unless the package size requires a reduced size marking that must be no less than 50 mm on each side.

(c) Limited quantity markings prescribed in paragraphs (a) and (b) of this section may use the packaging itself as the contrasting background for the center portion of the marking if the color sufficiently contrasts so that the black border, top and bottom portions of the square-on-point, and the “Y” symbol, if applicable, are clearly recognizable.

(d) *Transitional exceptions* (1) *Alternative markings.* Except for transportation by aircraft and until December 31, 2014, a package containing a limited quantity may continue to be marked in accordance with the requirements of this section in effect on October 1, 2010 (i.e., square-on-point with identification number only) as an alternative to the marking required by paragraph (a) of this section.

(2) *ORM-D marked packaging.* Except for transportation by aircraft and until December 31, 2020, a packaging marked in accordance with § 172.316 of this part is not required to be marked with the limited quantity marking required by paragraph (a) of this section. For transportation by aircraft and until December 31, 2012, a packaging marked in accordance with § 172.316(a)(1) is not required to be marked with the limited quantity “Y” marking required by paragraph (b) of this section.

Subpart H—Training

§ 172.700 Purpose and scope.

(a) Purpose. This subpart prescribes requirements for training hazmat employees.

(b) Scope. Training as used in this subpart means a systematic program that ensures a hazmat employee has familiarity with the general provisions of this subchapter, is able to recognize and identify hazardous materials, has knowledge of specific requirements of this subchapter applicable to functions performed by the employee, and has knowledge of emergency response information, self-protection measures and accident prevention methods and procedures (see §172.704).

(c) Modal-specific training requirements. Additional training requirements for the individual modes of transportation are prescribed in parts 174, 175, 176, and 177 of this subchapter.

§ 172.701 Federal-State relationship*.*

This subpart and the parts referenced in §172.700(c) prescribe minimum training requirements for the transportation of hazardous materials. For motor vehicle drivers, however, a State may impose more stringent training requirements only if those requirements—

(a) Do not conflict with the training requirements in this subpart and in part 177 of this subchapter; and

(b) Apply only to drivers domiciled in that State.

§ 172.702 Applicability and responsibility for training and testing.

(a) A hazmat employer shall ensure that each of its hazmat employees is trained in accordance with the requirements prescribed in this subpart.

(b) Except as provided in §172.704(c)(1), a hazmat employee who performs any function subject to the requirements of this subchapter may not perform that function unless instructed in the requirements of this subchapter that apply to that function. It is the duty of each hazmat employer to comply with the applicable requirements of this subchapter and to thoroughly instruct each hazmat employee in relation thereto.

(c) Training may be provided by the hazmat employer or other public or private sources.

(d) A hazmat employer shall ensure that each of its hazmat employees is tested by appropriate means on the training subjects covered in §172.704.

§ 172.704 Training requirements.

(a) Hazmat employee training must include the following:

(1) *General awareness/familiarization training.* Each hazmat employee shall be provided general awareness/familiarization training designed to provide familiarity with the requirements of this subchapter, and to enable the employee to recognize and identify hazardous materials consistent with the hazard communication standards of this subchapter.

(2) *Function-specific training.* (i) Each hazmat employee must be provided function-specific training concerning requirements of this subchapter, or exemptions or special permits issued under subchapter A of this chapter, that are specifically applicable to the functions the employee performs.

(ii) As an alternative to function-specific training on the requirements of this subchapter, training relating to the requirements of the ICAO Technical Instructions and the IMDG Code may be provided to the extent such training addresses functions authorized by subpart C of part 171 of this subchapter.

(3) *Safety training.* Each hazmat employee shall receive safety training concerning—

(i) Emergency response information required by subpart G of part 172;

(ii) Measures to protect the employee from the hazards associated with hazardous materials to which they may be exposed in the work place, including specific measures the hazmat employer has implemented to protect employees from exposure; and

(iii) Methods and procedures for avoiding accidents, such as the proper procedures for handling packages containing hazardous materials.

(4) Each hazmat employee must receive training that provides an awareness of security risks associated with hazardous materials transportation and methods designed to enhance transportation security. This training must also include a component covering how to recognize and respond to possible security threats. New hazmat employees

must receive the security awareness training required by this paragraph within 90 days after employment.

(5) *In-depth security training. E*ach hazmat employee of a person required to have a security plan in accordance with subpart I of this part who handles hazardous materials covered by the plan, performs a regulated function related to the hazardous materials covered by the plan, or is responsible for implementing the plan must be trained concerning the security plan and its implementation. Security training must include company security objectives, specific security procedures, employee responsibilities, actions to take in the event of a security breach, and the organizational security structure.

(b) *OSHA, EPA, and other training.* Training conducted by employers to comply with the hazard communication programs required by the Occupational Safety and Health Administration of the Department of Labor (29 CFR 1910.120 or 1910.1200) or the Environmental Protection Agency (40 CFR 311.1), or training conducted by employers to comply with security training programs required by other Federal or international agencies, may be used to satisfy the training requirements in paragraph (a) of this section to the extent that such training addresses the training components specified in paragraph (a) of this section.

(c) *Initial and recurrent training* —(1) *Initial training.* A new hazmat employee, or a hazmat employee who changes job functions may perform those functions prior to the completion of training provided—

(i) The employee performs those functions under the direct supervision of a properly trained and knowledgeable hazmat employee; and

(ii) The training is completed within 90 days after employment or a change in job function.

(2) *Recurrent training.* A hazmat employee must receive the training required by this subpart at least once every three years. For in-depth security training required under paragraph (a)(5) of this section, a hazmat employee must be trained at least once every three years or, if the security plan for which training is required is revised during the three-year recurrent training cycle, within 90 days of implementation of the revised plan.

(3) *Relevant Training.* Relevant training received from a previous employer or other source may be used to satisfy the requirements of this subpart provided a current record of training is obtained from hazmat employees' previous employer.

(4) *Compliance.* Each hazmat employer is responsible for compliance with the requirements of this subchapter regardless of whether the training required by this subpart has been completed.

(d) *Recordkeeping.* A record of current training, inclusive of the preceding three years, in accordance with this section shall be created and retained by each hazmat employer for as long as that employee is employed by that employer as a hazmat employee and for 90 days thereafter. The record shall include:

(1) The hazmat employee's name;

(2) The most recent training completion date of the hazmat employee's training;

(3) A description, copy, or the location of the training materials used to meet the requirements in paragraph (a) of this section;

(4) The name and address of the person providing the training; and

(5) Certification that the hazmat employee has been trained and tested, as required by this subpart.

(e) *Limitations.* The following limitations apply:

(1) A hazmat employee who repairs, modifies, reconditions, or tests packagings, as qualified for use in the transportation of hazardous materials, and who does not perform any other function subject to the requirements of this subchapter, is not subject to the training requirement of paragraph (a)(3) of this section.

(2) A railroad maintenance-of-way employee or railroad signalman, who does not perform any function subject to the requirements of this subchapter, is not subject to the training requirements of paragraphs (a)(2), (a)(4), or (a)(5) of this section. Initial training for a railroad maintenance-of-way employee or railroad signalman in accordance with this section must be completed by October 1, 2006.

§ 173.4 Small quantity exceptions.

(a) When transported domestically by highway or rail in conformance with this section, quantities of Division 2.2 (except aerosols with no subsidiary hazard), Class 3, Division 4.1, Division 4.2 (PG II and III), Division 4.3 (PG II and III), Division 5.1, Division 5.2, Division 6.1, Class 7, Class 8, and Class 9 materials are not subject to any other requirements when—

(1) The maximum quantity of material per inner receptacle or article is limited to—

(i) Thirty (30) mL (1 ounce) for authorized liquids, other than Division 6.1, Packing Group I, Hazard Zone A or B materials;

(ii) Thirty (30) g (1 ounce) for authorized solid materials;

(iii) One (1) g (0.04 ounce) for authorized materials meeting the definition of a Division 6.1, Packing Group I, Hazard Zone A or B material; and

(iv) An activity level not exceeding that specified in §§173.421, 173.424, 173.425 or 173.426, as appropriate, for a package containing a Class 7 (radioactive) material.

(v) Thirty (30) mL water capacity (1.8 cubic inches) for authorized Division 2.2 materials

(2) With the exception of temperature sensing devices, each inner receptacle:

(i) Is not liquid-full at 55 °C (131 °F), and

(ii) Is constructed of plastic having a minimum thickness of no less than 0.2 mm (0.008 inch), or earthenware, glass, or metal;

(3) Each inner receptacle with a removable closure has its closure held securely in place with wire, tape, or other positive means;

(4) Unless equivalent cushioning and absorbent material surrounds the inside packaging, each inner receptacle is securely packed in an inside packaging with cushioning and absorbent material that:

(i) Will not react chemically with the material, and

(ii) Is capable of absorbing the entire contents (if a liquid) of the receptacle;

(5) The inside packaging is securely packed in a strong outside packaging;

(6) The completed package, as demonstrated by prototype testing, is capable of sustaining—

(i) Each of the following free drops made from a height of 1.8 m (5.9 feet) directly onto a solid unyielding surface without breakage or leakage from any inner receptacle and without a substantial reduction in the effectiveness of the package:

(A) One drop flat on bottom;

(B) One drop flat on top;

(C) One drop flat on the long side;

(D) One drop flat on the short side; and

(E) One drop on a corner at the junction of three intersecting edges; and

(ii) A compressive load as specified in §178.606(c) of this subchapter.

Note to paragraph (a)(6): Each of the tests in paragraph (a)(6) of this section may be performed on a different but identical package; i.e. , all tests need not be performed on the same package.

(7) Placement of the material in the package or packing different materials in the package does not result in a violation of §173.21;

(8) The gross mass of the completed package does not exceed 29 kg (64 pounds);

(9) The package is not opened or otherwise altered until it is no longer in commerce; and

(10) The shipper certifies conformance with this section by marking the outside of the package with the statement “This package conforms to 49 CFR 173.4 for domestic highway or rail transport only.”

(b) A package containing a Class 7 (radioactive) material also must conform to the requirements of §173.421(a)(1) through (a)(5) or §173.424(a) through (g), as appropriate.

(c) Packages which contain a Class 2 (other than those authorized in paragraph (a) of this section), Division 4.2 (PG I), or Division 4.3 (PG I) material conforming to paragraphs (a)(1) through (a)(10) of this section may be offered for transportation or transported if specifically approved by the Associate Administrator.

(d) Lithium batteries and cells are not eligible for the exceptions provided in this section.

§ 173.13 Exceptions for Class 3, Divisions 4.1, 4.2, 4.3, 5.1, 6.1, and Classes 8 and 9 materials

(a) A Class 3, 8 or 9, or Division 4.1, 4.2, 4.3, 5.1, or 6.1 material is excepted from the labeling (except for the CARGO AIRCRAFT ONLY label), placarding and segregation requirements of this subchapter if prepared for transportation in accordance with the requirements of this section. A material that meets the definition of a material poisonous by inhalation may not be offered for transportation or transported under provisions of this section.

(b) A hazardous material conforming to the requirements of this section may be transported by motor vehicle and rail car. In addition, packages prepared in accordance with this section may be transported by aircraft under the following conditions:

(1) *Cargo-only aircraft* . Only hazardous materials permitted to be transported aboard either a passenger or cargo-only aircraft by column (9A) or (9B) of the Hazardous Materials Table in §172.101 of this subchapter are authorized aboard cargo-only aircraft.

(2) *Passenger carrying aircraft* . Only hazardous materials permitted to be transported aboard a passenger aircraft by column (9A) of the Hazardous Materials Table in §172.101 of this subchapter are authorized aboard passenger aircraft. The completed package, assembled as for transportation, must be successfully tested in accordance with part 178 of this subchapter at the Packing Group I level. A hazardous material which meets the definition of a Division 5.1 (oxidizer) at the Packing Group I level in accordance with §173.127(b)(1)(i) of this subchapter may not be transported aboard a passenger aircraft.

(3) Packages offered for transportation aboard either passenger or cargo-only aircraft must meet the requirements for transportation by aircraft specified in §173.27 of this subchapter.

(c) A hazardous material permitted by paragraph (a) of this section must be packaged as follows:

(1) For liquids:

(i) The hazardous material must be placed in a tightly closed glass, plastic or metal inner packaging with a maximum capacity not exceeding 1.2 L. Sufficient outage must be provided such that the inner packaging will not become liquid full at 55 °C (130 °F). The net quantity (measured at 20 °C (68 °F)) of liquid in any inner packaging may not exceed 1 L. For transportation by aircraft, the net quantity in one package may not exceed the quantity specified in columns (9A) or (9B), as appropriate.

(ii) The inner packaging must be placed in a hermetically sealed barrier bag which is impervious to the lading, and then wrapped in a non-reactive absorbent material in sufficient quantity to completely absorb the contents of the inner packaging. Alternatively, the inner packaging may first be wrapped in a non-reactive absorbent material and then placed in the hermetically sealed barrier bag. The combination of inner packaging, absorbent material, and bag must be placed in a snugly fitting metal can.

(iii) The metal can must be securely closed. For liquids that are in Division 4.2 or 4.3, the metal can must be hermetically sealed. For Division 4.2 materials in Packing Group I, the metal can must be tested in accordance with part 178 of this subchapter at the Packing Group I performance level.

(iv) The metal can must be placed in a fiberboard box that is placed in a hermetically sealed barrier bag which is impervious to the lading.

(v) The intermediate packaging must be placed inside a securely closed, outer packaging conforming to §173.201.

(vi) Not more than four intermediate packagings are permitted in an outer packaging.

(2) For solids:

(i) The hazardous material must be placed in a tightly closed glass, plastic or metal inner packaging. The net quantity of material in any inner packaging may not exceed 2.85kg (6.25 pounds). For transportation by aircraft, the net quantity in one package may not exceed the quantity specified in columns (9A) or (9B), as appropriate.

(ii) The inner packaging must be placed in a hermetically sealed barrier bag which is impervious to the lading.

(iii) The barrier bag and its contents must be placed in a fiberboard box that is placed in a hermetically-sealed barrier bag which is impervious to the lading.

(iv) The intermediate packaging must be placed inside an outer packaging conforming to §173.211.

(v) Not more than four intermediate packagings are permitted in an outer packaging.

(d) The outside of the package must be marked, in association with the proper shipping name, with the statement: “This package conforms to 49 CFR 173.13.”

§ 173.24 General requirements for packagings and packages.

(a) Applicability. Except as otherwise provided in this subchapter, the provisions of this section apply to—

(1) Bulk and non-bulk packagings;

(2) New packagings and packagings which are reused; and

(3) Specification and non-specification packagings.

(b) Each package used for the shipment of hazardous materials under this subchapter shall be designed, constructed, maintained, filled, its contents so limited, and closed, so that under conditions normally incident to transportation—

(1) Except as otherwise provided in this subchapter, there will be no identifiable (without the use of instruments) release of hazardous materials to the environment;

(2) The effectiveness of the package will not be substantially reduced; for example, impact resistance, strength, packaging compatibility, etc. must be maintained for the minimum and maximum temperatures, changes in humidity and pressure, and shocks, loadings and vibrations, normally encountered during transportation;

(3) There will be no mixture of gases or vapors in the package which could, through any credible spontaneous increase of heat or pressure, significantly reduce the effectiveness of the packaging;

(4) There will be no hazardous material residue adhering to the outside of the package during transport.

(c) Authorized packagings. A packaging is authorized for a hazardous material only if—

(1) The packaging is prescribed or permitted for the hazardous material in a packaging section specified for that material in Column 8 of the §172.101 table and conforms to applicable requirements in the special provisions of Column 7 of the §172.101 table and, for specification packagings (but not including UN standard packagings manufactured outside the United States), the specification requirements in parts 178 and 179 of this subchapter; or

(2) The packaging is permitted under, and conforms to, provisions contained in subparts B or C of part 171 of this subchapter or §§173.3, 173.4, 173.4a, 173.4b, 173.5, 173.5a, 173.6, 173.7, 173.8, 173.27, or §176.11 of this subchapter.

(d) *Specification packagings and UN standard packagings manufactured outside the U.S.* —(1) *Specification packagings.* A specification packaging, including a UN standard packaging manufactured in the United States, must conform in all details to the applicable specification or standard in part 178 or part 179 of this subchapter.

(2) UN standard packagings manufactured outside the United States. A UN standard packaging manufactured outside the United States, in accordance with national or international regulations based on the UN Recommendations (IBR, see §171.7 of this subchapter), may be imported and used and is considered to be an authorized packaging under the provisions of paragraph (c)(1) of this section, subject to the following conditions and limitations:

(i) The packaging fully conforms to applicable provisions in the UN Recommendations and the requirements of this subpart, including reuse provisions;

(ii) The packaging is capable of passing the prescribed tests in part 178 of this subchapter applicable to that standard; and

(iii) The competent authority of the country of manufacture provides reciprocal treatment for UN standard packagings manufactured in the U.S.

(e) Compatibility. (1) Even though certain packagings are specified in this part, it is, nevertheless, the responsibility of the person offering a hazardous material for transportation to ensure that such packagings are compatible with their lading. This particularly applies to corrosivity, permeability, softening, premature aging and embrittlement.

(2) Packaging materials and contents must be such that there will be no significant chemical or galvanic reaction between the materials and contents of the package.

(3) Plastic packagings and receptacles.

(i) Plastic used in packagings and receptacles must be of a type compatible with the lading and may not be permeable to an extent that a hazardous condition is likely to occur during transportation, handling or refilling.

(ii) Each plastic packaging or receptacle which is used for liquid hazardous materials must be capable of withstanding without failure the procedure specified in appendix B of this part ("Procedure for Testing Chemical Compatibility and Rate of Permeation in Plastic Packagings and Receptacles"). The procedure specified in appendix B of this part must be performed on each plastic packaging or receptacle used for Packing Group I materials. The maximum rate of permeation of hazardous lading through or into the plastic packaging or receptacles may not exceed 0.5 percent for materials meeting the definition of a Division 6.1 material according to §173.132 and 2.0 percent for other hazardous materials, when subjected to a temperature no lower than—

(A) 18 °C (64 °F) for 180 days in accordance with Test Method 1 in appendix B of this part;

(B) 50 °C (122 °F) for 28 days in accordance with Test Method 2 in appendix B of this part; or

(C) 60 °C (140 °F) for 14 days in accordance with Test Method 3 in appendix B of this part.

(iii) Alternative procedures or rates of permeation are permitted if they yield a level of safety equivalent to or greater than that provided by paragraph (e)(3)(ii) of this section and are specifically approved by the Associate Administrator.

(4) Mixed contents. Hazardous materials may not be packed or mixed together in the same outer packaging with other hazardous or nonhazardous materials if such materials are capable of reacting dangerously with each other and causing—

(i) Combustion or dangerous evolution of heat;

(ii) Evolution of flammable, poisonous, or asphyxiant gases; or

(iii) Formation of unstable or corrosive materials.

(5) Packagings used for solids, which may become liquid at temperatures likely to be encountered during transportation, must be capable of containing the hazardous material in the liquid state.

(f) Closures. (1) Closures on packagings shall be so designed and closed that under conditions (including the effects of temperature, pressure and vibration) normally incident to transportation—

(i) Except as provided in paragraph (g) of this section, there is no identifiable release of hazardous materials to the environment from the opening to which the closure is applied; and

(ii) The closure is leakproof and secured against loosening. For air transport, stoppers, corks or other such friction closures must be held in place by positive means.

(2) Except as otherwise provided in this subchapter, a closure (including gaskets or other closure components, if any) used on a specification packaging must conform to all applicable requirements of the specification and must be closed in accordance with information, as applicable, provided by the manufacturer's notification required by §178.2 of this subchapter.

(g) *Venting.* Venting of packagings, to reduce internal pressure which may develop by the evolution of gas from the contents, is permitted only when—

(1) Except for shipments of cryogenic liquids as specified in §173.320(c) and of carbon dioxide, solid (dry ice), transportation by aircraft is not involved;

(2) Except as otherwise provided in this subchapter, the evolved gases are not poisonous, likely to create a flammable mixture with air or be an asphyxiant under normal conditions of transportation;

(3) The packaging is designed so as to preclude an unintentional release of hazardous materials from the receptacle;

(4) For bulk packagings, other than IBCs, venting is authorized for the specific hazardous material by a special provision in the §172.101 table or by the applicable bulk packaging specification in part 178 of this subchapter; and

(5) Intermediate bulk packagings (IBCs) may be vented when required to reduce internal pressure that may develop by the evolution of gas subject to the requirements of paragraphs (g)(1) through (g)(3) of this section. The IBC must be of a type that has successfully passed (with the vent in place) the applicable design qualification tests with no release of hazardous material.

(h) Outage and filling limits—(1) *General.* When filling packagings and receptacles for liquids, sufficient ullage (outage) must be left to ensure that neither leakage nor

permanent distortion of the packaging or receptacle will occur as a result of an expansion of the liquid caused by temperatures likely to be encountered during transportation. Requirements for outage and filling limits for non-bulk and bulk packagings are specified in §§173.24a(d) and 173.24b(a), respectively.

(2) *Compressed gases and cryogenic liquids.* Filling limits for compressed gases and cryogenic liquids are specified in §§173.301 through 173.306 for cylinders and §§173.314 through 173.319 for bulk packagings.

(i) *Air transportation.* Except as provided in subpart C of part 171 of this subchapter, packages offered or intended for transportation by aircraft must conform to the general requirements for transportation by aircraft in §173.27.

§ 173.24a Additional general requirements for non-bulk packagings and packages

(a) *Packaging design.* Except as provided in §172.312 of this subchapter:

(1) *Inner packaging closures.* A combination packaging containing liquid hazardous materials must be packed so that closures on inner packagings are upright.

(2) *Friction.* The nature and thickness of the outer packaging must be such that friction during transportation is not likely to generate an amount of heat sufficient to alter dangerously the chemical stability of the contents.

(3) *Securing and cushioning.* Inner packagings of combination packagings must be so packed, secured and cushioned to prevent their breakage or leakage and to control their shifting within the outer packaging under conditions normally incident to transportation. Cushioning material must not be capable of reacting dangerously with the contents of the inner packagings or having its protective properties significantly weakened in the event of leakage.

(4) *Metallic devices.* Nails, staples and other metallic devices shall not protrude into the interior of the outer packaging in such a manner as to be likely to damage inner packagings or receptacles.

(5) *Vibration.* Each non-bulk package must be capable of withstanding, without rupture or leakage, the vibration test procedure specified in §178.608 of this subchapter.

(b) *Non-bulk packaging filling limits.* (1) A single or composite non-bulk packaging may be filled with a liquid hazardous material only when the specific gravity of the material does not exceed that marked on the packaging, or a specific gravity of 1.2 if not marked, except as follows:

(i) A Packing Group I packaging may be used for a Packing Group II material with a specific gravity not exceeding the greater of 1.8, or 1.5 times the specific gravity marked

on the packaging, provided all the performance criteria can still be met with the higher specific gravity material;

(ii) A Packing Group I packaging may be used for a Packing Group III material with a specific gravity not exceeding the greater of 2.7, or 2.25 times the specific gravity marked on the packaging, provided all the performance criteria can still be met with the higher specific gravity material; and

(iii) A Packing Group II packaging may be used for a Packing Group III material with a specific gravity not exceeding the greater of 1.8, or 1.5 times the specific gravity marked on the packaging, provided all the performance criteria can still be met with the higher specific gravity material.

(2) Except as otherwise provided in this section, a non-bulk packaging may not be filled with a hazardous material to a gross mass greater than the maximum gross mass marked on the packaging.

(3) A single or composite non-bulk packaging which is tested and marked for liquid hazardous materials may be filled with a solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked. In addition:

(i) A single or composite non-bulk packaging which is tested and marked for Packing Group I liquid hazardous materials may be filled with a solid Packing Group II hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

(ii) A single or composite non-bulk packaging which is tested and marked for Packing Group I liquid hazardous materials may be filled with a solid Packing Group III hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 2.25, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

(iii) A single or composite non-bulk packaging which is tested and marked for Packing Group II liquid hazardous materials may be filled with a solid Packing Group III hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

(4) Packagings tested as prescribed in §178.605 of this subchapter and marked with the hydrostatic test pressure as prescribed in §178.503(a)(5) of this subchapter may be used for liquids only when the vapor pressure of the liquid conforms to one of the following:

(i) The vapor pressure must be such that the total pressure in the packaging (i.e., the vapor pressure of the liquid plus the partial pressure of air or other inert gases, less 100 kPa (15 psia)) at 55 °C (131 °F), determined on the basis of a maximum degree of filling in accordance with paragraph (d) of this section and a filling temperature of 15 °C (59 °F)), will not exceed two-thirds of the marked test pressure;

(ii) The vapor pressure at 50 °C (122 °F) must be less than four-sevenths of the sum of the marked test pressure plus 100 kPa (15 psia); or

(iii) The vapor pressure at 55 °C (131 °F) must be less than two-thirds of the sum of the marked test pressure plus 100 kPa (15 psia).

(5) No hazardous material may remain on the outside of a package after filling.

(c) *Mixed contents.* (1) An outer non-bulk packaging may contain more than one hazardous material only when—

(i) The inner and outer packagings used for each hazardous material conform to the relevant packaging sections of this part applicable to that hazardous material;

(ii) The package as prepared for shipment meets the performance tests prescribed in part 178 of this subchapter for the packing group indicating the highest order of hazard for the hazardous materials contained in the package;

(iii) Corrosive materials (except ORM-D) in bottles are further packed in securely closed inner receptacles before packing in outer packagings; and

(iv) For transportation by aircraft, the total net quantity does not exceed the lowest permitted maximum net quantity per package as shown in Column 9a or 9b, as appropriate, of the §172.101 table. The permitted maximum net quantity must be calculated in kilograms if a package contains both a liquid and a solid.

(2) A packaging containing inner packagings of Division 6.2 materials may not contain other hazardous materials except—

(i) Refrigerants, such as dry ice or liquid nitrogen, as authorized under the HMR;

(ii) Anticoagulants used to stabilize blood or plasma; or

(iii) Small quantities of Class 3, Class 8, Class 9, or other materials in Packing Groups II or III used to stabilize or prevent degradation of the sample, provided the quantity of such materials does not exceed 30 mL (1 ounce) or 30 g (1 ounce) in each inner packaging. The maximum quantity in an outer package, including a hazardous material used to preserve or stabilize a sample, may not exceed 4 L (1 gallon) or 4 kg (8.8 pounds). Such preservatives are not subject to the requirements of this subchapter.

(d) Liquids must not completely fill a receptacle at a temperature of 55 °C (131 °F) or less.

§ 173.29 Empty packagings.

(a) General. Except as otherwise provided in this section, an empty packaging containing only the residue of a hazardous material shall be offered for transportation and transported in the same manner as when it previously contained a greater quantity of that hazardous material.

(b) Notwithstanding the requirements of paragraph (a) of this section, an empty packaging is not subject to any other requirements of this subchapter if it conforms to the following provisions:

(1) Any hazardous material shipping name and identification number markings, any hazard warning labels or placards, and any other markings indicating that the material is hazardous (e.g., RQ, INHALATION HAZARD) are removed, obliterated, or securely covered in transportation. This provision does not apply to transportation in a transport vehicle or a freight container if the packaging is not visible in transportation and the packaging is loaded by the shipper and unloaded by the shipper or consignee;

(2) The packaging—

(i) Is unused;

(ii) Is sufficiently cleaned of residue and purged of vapors to remove any potential hazard;

(iii) Is refilled with a material which is not hazardous to such an extent that any residue remaining in the packaging no longer poses a hazard; or

(iv) Contains only the residue of—

(A) An ORM-D material; or

(B) A Division 2.2 non-flammable gas, other than ammonia, anhydrous, and with no subsidiary hazard, at an absolute pressure less than 280 kPa (40.6 psia); at 20 °C (68 °F); and

(3) Any material contained in the packaging does not meet the definitions in §171.8 of this subchapter for a hazardous substance, a hazardous waste, or a marine pollutant.

(c) A non-bulk packaging containing only the residue of a hazardous material covered by Table 2 of §172.504 of this subchapter that is not a material poisonous by inhalation or its residue shipped under the subsidiary placarding provisions of §172.505—

(1) Does not have to be included in determining the applicability of the placarding requirements of subpart F of part 172 of this subchapter; and

(2) Is not subject to the shipping paper requirements of this subchapter when collected and transported by a contract or private carrier for reconditioning, remanufacture or reuse.

(d) Notwithstanding the stowage requirements in Column 10a of the §172.101 table for transportation by vessel, an empty drum or cylinder may be stowed on deck or under deck.

(e) Specific provisions for describing an empty packaging on a shipping paper appear in §172.203(e) of this subchapter.

(f) [Reserved]

(g) A package which contains a residue of an elevated temperature material may remain marked in the same manner as when it contained a greater quantity of the material even though it no longer meets the definition in §171.8 of this subchapter for an elevated temperature material.

(h) A package that contains a residue of a hazardous substance, Class 9, listed in the §172.101 Table, Appendix A, Table I, that does not meet the definition of another hazard class and is not a hazardous waste or marine pollutant, may remain marked, labeled and, if applicable, placarded in the same manner as when it contained a greater quantity of the material even though it no longer meets the definition in §171.8 of this subchapter for a hazardous substance.

§ 173.56 New explosives—definition and procedures for classification and approval

(a) Definition of new explosive. For the purposes of this subchapter a *new explosive* means an explosive produced by a person who:

(1) Has not previously produced that explosive; or

(2) Has previously produced that explosive but has made a change in the formulation, design or process so as to alter any of the properties of the explosive. An explosive will not be considered a “new explosive” if an agency listed in paragraph (b) of this section has determined, and confirmed in writing to the Associate Administrator, that there are no significant differences in hazard characteristics from the explosive previously approved.

(b) Examination, classing and approval. Except as provided in paragraph (j) of this section, no person may offer a new explosive for transportation unless that person has specified to the examining agency the ranges of composition of ingredients and compounds, showing the intended manufacturing tolerances in the composition of substances or design of articles which will be allowed in that material or device, and unless it has been examined, classed and approved as follows:

(1) Except for an explosive made by or under the direction or supervision of the Department of Defense (DOD) or the Department of Energy (DOE), a new explosive must be examined and assigned a recommended shipping description, division and compatibility group, based on the tests and criteria prescribed in §§173.52, 173.57 and 173.58. The person requesting approval of the new explosive must submit to the Associate Administrator a report of the examination and assignment of a recommended shipping description, division, and compatibility group. If the Associate Administrator finds the approval request meets the regulatory criteria, the new explosive will be approved in writing and assigned an EX number. The examination must be performed by a person who is approved by the Associate Administrator under the provisions of subpart H of part 107 of this chapter and who—

(i) Has (directly, or through an employee involved in the examination) at least ten years of experience in the examination, testing and evaluation of explosives;

(ii) Does not manufacture or market explosives, and is not controlled by or financially dependent on any entity that manufactures or markets explosives, and whose work with respect to explosives is limited to examination, testing and evaluation; and

(iii) Is a resident of the United States.

(2) A new explosive made by or under the direction or supervision of a component of the DOD may be examined, classed, and concurred in by:

(i) U.S. Army Technical Center for Explosives Safety (SMCAC-EST), Naval Sea Systems Command (SEA–9934), or Air Force Safety Agency (SEW), when approved by the Chairman, DOD Explosives Board, in accordance with the DOD Explosives Hazard Classification Procedures (IBR, see §171.7 of the subchapter); or

(ii) The agencies and procedures specified in paragraph (b)(1) of this section.

(3) A new explosive made by or under the direction or supervision of the Department of Energy (DOE) may be—

(i) Examined by the DOE in accordance with the DOD Explosives Hazard Classification Procedures, and must be classed and approved by DOE; or

(ii) Examined, classed, and approved in accordance with paragraph (b)(1) of this section.

(4) For a material shipped under the description of “ammonium nitrate-fuel oil mixture (ANFO)”, the only test required for classification purposes is the Cap Sensitivity Test—Test Method 5(a) prescribed in the Explosive Test Manual (UN Manual of Tests and Criteria) (IBR, see §171.7 of the subchapter). The test must be performed by an agency listed in paragraph (b)(1), (b)(2), or (b)(3) of this section, the manufacturer, or the shipper. A copy of the test report must be submitted to the Associate Administrator before the material is offered for transportation, and a copy of the test report must be retained by the shipper for as long as that material is shipped. At a minimum, the test report must contain the name and address of the person or organization conducting the test, date of the test, quantitative description of the mixture, including prill size and porosity, and a description of the test results.

(c) Filing DOD or DOE approval report. DOD or DOE must file a copy of each approval, accompanied by supporting laboratory data, with the Associate Administrator and receive acknowledgement in writing before offering the new explosive for transportation, unless the new explosive is:

(1) Being transported under paragraph (d) or (e) of this section; or

(2) Covered by a national security classification currently in effect.

(d) Transportation of explosive samples for examination. Notwithstanding the requirements of paragraph (b) of this section with regard to the transportation of a new explosive that has not been approved, a person may offer a sample of a new explosive for transportation, by railroad, highway, or vessel from the place where it was produced to an agency identified in paragraph (b) of this section, for examination if—

(1) The new explosive has been assigned a tentative shipping description and class in writing by the testing agency;

(2) The new explosive is packaged as required by this part according to the tentative description and class assigned, unless otherwise specified in writing by the testing agency; and,

(3) The package is labeled as required by this subchapter and the following is marked on the package:

(i) The words “SAMPLE FOR LABORATORY EXAMINATION”;

(ii) The net weight of the new explosive; and

(iii) The tentative shipping name and identification number.

(e) Transportation of unapproved explosives for developmental testing. Notwithstanding the requirements of paragraph (b) of this section, the owner of a new explosive that has not been examined or approved may transport that new explosive from the place where it was produced to an explosives testing range if—

(1) It is not a primary (a 1.1A initiating) explosive or a forbidden explosive according to this subchapter;

(2) It is described as a Division 1.1 explosive (substance or article) and is packed, marked, labeled, described on shipping papers and is otherwise offered for transportation in conformance with the requirements of this subchapter applicable to Division 1.1;

(3) It is transported in a motor vehicle operated by the owner of the explosive; and

(4) It is accompanied by a person, in addition to the operator of the motor vehicle, who is qualified by training and experience to handle the explosive.

(f) Notwithstanding the requirements of paragraphs (b) and (d) of this section, the Associate Administrator may approve a new explosive on the basis of an approval issued for the explosive by the competent authority of a foreign government, or when examination of the explosive by a person approved by the Associate Administrator is impracticable, on the basis of reports of tests conducted by disinterested third parties, or may approve the transportation of an explosives sample for the purpose of examination by a person approved by the Associate Administrator.

(g) An explosive may be transported under subparts B or C of part 171 or §176.11 of this subchapter without the approval of the Associate Administrator as required by paragraph (b) of this section if the Associate Administrator has acknowledged in writing the acceptability of an approval issued by the competent authority of a foreign government pursuant to the provisions of the UN Recommendations, the ICAO Technical Instructions, the IMDG Code (IBR, see §171.7 of this subchapter), or other national or international regulations based on the UN Recommendations. In such a case, a copy of the foreign competent authority approval, and a copy of the written acknowledgement of its acceptance must accompany each shipment of that explosive.

(h) The requirements of this section do not apply to cartridges, small arms which are:

(1) Not a forbidden explosive under §173.54 of this subchapter;

(2) Ammunition for rifle, pistol, or shotgun;

(3) Ammunition with inert projectile or blank ammunition; and

(4) Ammunition not exceeding 50 caliber for rifle or pistol cartridges or 8 gauge for shotgun shells.

Cartridges, small arms meeting the criteria of this paragraph (h) may be assigned a classification code of 1.4S by the manufacturer.

(i) If experience or other data indicate that the hazard of a material or a device containing an explosive composition is greater or less than indicated according to the definition and criteria specified in §§173.50, 173.56, and 173.58 of this subchapter, the Associate Administrator may specify a classification or except the material or device from the requirements of this subchapter.

(j) Fireworks. Notwithstanding the requirements of paragraph (b) of this section, Division 1.3 and 1.4 fireworks may be classed and approved by the Associate Administrator without prior examination and offered for transportation if the following conditions are met:

(1) The fireworks are manufactured in accordance with the applicable requirements in APA Standard 87–1 (IBR, see §171.7 of this subchapter);

(2) A thermal stability test is conducted on the device by the BOE, the BOM, or the manufacturer. The test must be performed by maintaining the device, or a representative prototype of a large device such as a display shell, at a temperature of 75 °C (167 °F) for 48 consecutive hours. When a device contains more than one component, those components which could be in physical contact with each other in the finished device must be placed in contact with each other during the thermal stability test; and

(3) The manufacturer applies in writing to the Associate Administrator following the applicable requirements in APA Standard 87–1, and is notified in writing by the Associate Administrator that the fireworks have been classed, approved, and assigned an EX-number. Each application must be complete, including all relevant background data and copies of all applicable drawings, test results, and any other pertinent information on each device for which approval is being requested. The manufacturer must sign the application and certify that the device for which approval is requested conforms to APA Standard 87–1 and that the descriptions and technical information contained in the application are complete and accurate. If the application is denied, the manufacturer will be notified in writing of the reasons for the denial. The Associate Administrator may require that the fireworks be examined by an agency listed in paragraph (b)(1) of this section.

§ 173.63 Packaging exceptions

(a) Cord, detonating (UN 0065), having an explosive content not exceeding 6.5 g (0.23 ounces) per 30 centimeter length (one linear foot) may be offered for transportation domestically and transported as Cord, detonating (UN 0289), Division 1.4 Compatibility Group D (1.4D) explosives, if the gross weight of all packages containing Cord, detonating (UN 0065), does not exceed 45 kg (99 pounds) per:

(1) Transport vehicle, freight container, or cargo-only aircraft;

(2) Off-shore down-hole tool pallet carried on an off-shore supply vessel;

(3) Cargo compartment of a cargo vessel; or

(4) Passenger-carrying aircraft used to transport personnel to remote work sites, such as offshore drilling units.

(b) *Limited quantities of Cartridges, small arms, Cartridges, power devices, Cartridges for tools, blank, and Cases, cartridge, empty with primer.* (1)(i) Cartridges, small arms, Cartridges, power devices, Cartridges for tools, blank, and Cases, cartridge, empty with primer that have been classed as Division 1.4S explosive may be offered for transportation and transported as limited quantities when packaged in accordance with paragraph (b)(2) of this section. Packages containing such articles may be marked with either the marking prescribed in § 172.315(a) or (b) of this subchapter and offered for transportation and transported by any mode. For transportation by aircraft, the package must conform to the applicable requirements of § 173.27 of this part. In addition, packages containing such articles offered for transportation by aircraft must be marked with the proper shipping name as prescribed in the § 172.101 Hazardous Materials Table of this subchapter. Packages containing such articles are not subject to the shipping paper requirements of subpart C of part 172 of this subchapter unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel. Additionally, packages containing such articles are excepted from the requirements of subparts E (Labeling) and F (Placarding) of part 172 of this subchapter.

(ii) Until December 31, 2012, a package containing such articles may be marked with the proper shipping name “Cartridges, small arms” or “Cartridges, power device (*used to project fastening devices*)” and reclassed as “ORM-D-AIR” material if it contains properly packaged articles as authorized by this subchapter on October 1, 2010. Additionally, for transportation by aircraft, Cartridge, power devices must be successfully tested under the UN Test Series 6(d) criteria for reclassification as ORM-D-AIR material effective July 1, 2011. Until December 31, 2020, a package containing such articles may be marked with the proper shipping name “Cartridges, small arms” or “Cartridges, power device (*used to project fastening devices*)” and reclassed as “ORM-

D” material if it contains properly packaged articles as authorized by this subchapter on October 1, 2010.

(iii) Cartridges, small arms and Cartridges for tools, blank, and Cases, cartridge empty with primer that may be shipped as a limited quantity or ORM-D material are as follows:

(A) Ammunition for rifle, pistol or shotgun;

(B) Ammunition with inert projectiles or blank ammunition;

(C) Ammunition having no tear gas, incendiary, or detonating explosive projectiles;

(D) Ammunition not exceeding 12.7 mm (50 caliber or 0.5 inch) for rifle or pistol, cartridges or 8 gauge for shotshells;

(E) Cartridges for tools, blank; and

(F) Cases, cartridge, empty with primer.

(2) Packaging for cartridges, small arms, Cartridges for tools, blank, Cases, cartridge empty with primer as limited quantity or ORM-D material must be as follows:

(i) Ammunition must be packed in inside boxes, or in partitions which fit snugly in the outside packaging, or in metal clips;

(ii) Primers must be protected from accidental initiation;

(iii) Inside boxes, partitions or metal clips must be packed in securely-closed strong outside packagings;

(iv) Maximum gross weight is limited to 30 kg (66 pounds) per package; and

(v) Cartridges for tools, blank, Cases, cartridge, empty with primer, and 22 caliber rim-fire cartridges may be packaged loose in strong outside packagings.

(c)–(e) [Reserved]

(f) Detonators containing no more than 1 g explosive (excluding ignition and delay charges) that are electric blasting caps with leg wires 4 feet long or longer, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing 12 feet long or longer may be packed as follows in which case they are excepted from the packaging requirements of §173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container (IBR, see §171.7 of this subchapter) or compartment is used as the outer packaging;

(3) No more than 1000 detonators in one outer packaging; and

(4) No material may be loaded on top of the IME Standard 22 container and no material may be loaded against the outside door of the IME Standard 22 compartment.

(g) Detonators that are classed as 1.4B or 1.4S and contain no more than 1 g of explosive (excluding ignition and delay charges) may be packed as follows in which case they are excepted from the packaging requirements of §173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container is used as the outer packaging;

(3) No more than 1000 detonators in one outer packaging; and

(4) Each inner packaging is marked “l.4B Detonators” or “1.4S Detonators”, as appropriate.

§ 173.120 Class 3—Definitions

(a) *Flammable liquid.* For the purpose of this subchapter, a *flammable liquid* (Class 3) means a liquid having a flash point of not more than 60 °C (140 °F), or any material in a liquid phase with a flash point at or above 37.8 °C (100 °F) that is intentionally heated and offered for transportation or transported at or above its flash point in a bulk packaging, with the following exceptions:

(1) Any liquid meeting one of the definitions specified in §173.115.

(2) Any mixture having one or more components with a flash point of 60 °C (140 °F) or higher, that make up at least 99 percent of the total volume of the mixture, if the mixture is not offered for transportation or transported at or above its flash point.

(3) Any liquid with a flash point greater than 35 °C (95 °F) that does not sustain combustion according to ASTM D 4206 (IBR, see §171.7 of this subchapter) or the procedure in appendix H of this part.

(4) Any liquid with a flash point greater than 35 °C (95 °F) and with a fire point greater than 100 °C (212 °F) according to ISO 2592 (IBR, see §171.7 of this subchapter).

(5) Any liquid with a flash point greater than 35 °C (95 °F) which is in a water-miscible solution with a water content of more than 90 percent by mass.

(b) Combustible liquid. (1) For the purpose of this subchapter, a *combustible liquid* means any liquid that does not meet the definition of any other hazard class specified in this subchapter and has a flash point above 60 °C (140 °F) and below 93 °C (200 °F).

(2) A flammable liquid with a flash point at or above 38 °C (100 °F) that does not meet the definition of any other hazard class may be reclassed as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation is impracticable. An elevated temperature material that meets the definition of a Class 3 material because it is intentionally heated and offered for

transportation or transported at or above its flash point may not be reclassed as a combustible liquid.

(3) A combustible liquid that does not sustain combustion is not subject to the requirements of this subchapter as a combustible liquid. Either the test method specified in ASTM D 4206 or the procedure in appendix H of this part may be used to determine if a material sustains combustion when heated under test conditions and exposed to an external source of flame.

(c) Flash point. (1) *Flash point* means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. It shall be determined as follows:

(i) For a homogeneous, single-phase, liquid having a viscosity less than 45 S.U.S. at 38 °C (100 °F) that does not form a surface film while under test, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Tag Closed Tester, (ASTM D 56);

(B) Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester, (ASTM D 3278); or

(C) Standard Test Methods for Flash Point by Small Scale Closed Tester, (ASTM D 3828).

(ii) For a liquid other than one meeting all of the criteria of paragraph (c)(1)(i) of this section, one of the following test procedures shall be used:

(A) Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester, (ASTM D 93) (IBR; *see* § 171.7 of this subchapter). For cutback asphalt, use Method B of ASTM D 93 or alternative tests authorized in this standard;

(B) Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus (ASTM D 3278) (IBR; *see* § 171.7 of this subchapter);

(C) Determination of Flash/No Flash—Closed Cup Equilibrium Method (ISO 1516) (IBR; *see* § 171.7 of this subchapter);

(D) Determination of Flash point—Closed Cup Equilibrium Method (ISO 1523) (IBR; *see* § 171.7 of this subchapter);

(E) Determination of Flash Point—Pensky-Martens Closed Cup Method (ISO 2719) (IBR; *see* § 171.7 of this subchapter);

(F) Determination of Flash Point—Rapid Equilibrium Closed Cup Method (ISO 3679) (IBR; *see* § 171.7 of this subchapter);

(G) Determination of Flash/No Flash—Rapid Equilibrium Closed Cup Method (ISO 3680) (IBR; *see* § 171.7 of this subchapter); or

(H) Determination of Flash Point—Abel Closed-Cup Method (ISO 13736) (IBR; *see* § 171.7 of this subchapter).

(2) For a liquid that is a mixture of compounds that have different volatility and flash points, its flash point shall be determined as specified in paragraph (c)(1) of this section, on the material in the form in which it is to be shipped. If it is determined by this test that the flash point is higher than −7 °C (20 °F) a second test shall be made as follows: a portion of the mixture shall be placed in an open beaker (or similar container) of such dimensions that the height of the liquid can be adjusted so that the ratio of the volume of the liquid to the exposed surface area is 6 to one. The liquid shall be allowed to evaporate under ambient pressure and temperature (20 to 25 °C (68 to 77 °F)) for a period of 4 hours or until 10 percent by volume has evaporated, whichever comes first. A flash point is then run on a portion of the liquid remaining in the evaporation container and the lower of the two flash points shall be the flash point of the material.

(3) For flash point determinations by Setaflash closed tester, the glass syringe specified need not be used as the method of measurement of the test sample if a minimum quantity of 2 mL (0.1 ounce) is assured in the test cup.

(d) If experience or other data indicate that the hazard of a material is greater or less than indicated by the criteria specified in paragraphs (a) and (b) of this section, the Associate Administrator may revise the classification or make the material subject or not subject to the requirements of parts 170–189 of this subchapter.

§ 173.150 Exceptions for Class 3 (flammable and combustible liquids)

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 Table of this subchapter.

(b) *Limited quantities.* Limited quantities of flammable liquids (Class 3) and combustible liquids are excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, the package must also conform to applicable requirements of § 173.27 of this part (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) and only hazardous material authorized aboard passenger-carrying aircraft may be transported as a limited quantity. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, shipments of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For flammable liquids in Packing Group I, inner packagings not over 0.5 L (0.1 gallon) net capacity each, packed in strong outer packagings;

(2) For flammable liquids in Packing Group II, inner packagings not over 1.0 L (0.3 gallons) net capacity each, unless the material has a subsidiary hazard of Division 6.1, Packing Group II, in which case the inner packagings may not exceed 100 mL (3.38 ounces) net capacity each, packed in a strong outer packaging.

(3) For flammable liquids in Packing Group III and combustible liquids, inner packagings not over 5.0 L (1.3 gallons) net capacity each, packed in strong outer packagings.

(c) *Consumer commodities.* Until December 31, 2020, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

(d) *Alcoholic beverages.* An alcoholic beverage (wine and distilled spirits as defined in 27 CFR 4.10 and 5.11) is not subject to the requirements of this subchapter if it—

(1) Contains 24 percent or less alcohol by volume;

(2) Is in an inner packaging of 5 L (1.3 gallons) or less, and for transportation on passenger-carrying aircraft conforms to §175.10(a)(4) of this subchapter as checked or carry-on baggage; or

(3) Is a Packing Group III alcoholic beverage in a packaging of 250 L (66 gallons) or less, unless transported by air.

(e) *Aqueous solutions of alcohol.* An aqueous solution containing 24 percent or less alcohol by volume and no other hazardous material—

(1) May be reclassed as a combustible liquid.

(2) Is not subject to the requirements of this subchapter if it contains no less than 50 percent water.

(f) *Combustible liquids.* (1) A flammable liquid with a flash point at or above 38 °C (100 °F) that does not meet the definition of any other hazard class may be reclassed as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation is impracticable.

(2) The requirements in this subchapter do not apply to a material classed as a combustible liquid in a non-bulk packaging unless the combustible liquid is a hazardous substance, a hazardous waste, or a marine pollutant.

(3) A combustible liquid that is in a bulk packaging or a combustible liquid that is a hazardous substance, a hazardous waste, or a marine pollutant is not subject to the requirements of this subchapter except those pertaining to:

(i) Shipping papers, waybills, switching orders, and hazardous waste manifests;

(ii) Marking of packages;

(iii) Display of identification numbers on bulk packages;

(iv) For bulk packagings only, placarding requirements of subpart F of part 172 of this subchapter;

(v) Carriage aboard aircraft and vessels (for packaging requirements for transport by vessel, see §176.340 of this subchapter);

(vi) Reporting incidents as prescribed by §§171.15 and 171.16 of this subchapter;

(vii) Packaging requirements of subpart B of this part and, in addition, non-bulk packagings must conform with requirements of §173.203;

(viii) The requirements of §§173.1, 173.21, 173.24, 173.24a, 173.24b, 174.1, 177.804, 177.817, 177.834(j), and 177.837(d) of this subchapter;

(ix) The training requirements of subpart H of part 172 of this subchapter.

(x) Emergency response information requirements of subpart G of part 172.

(4) A combustible liquid that is not a hazardous substance, a hazardous waste, or a marine pollutant is not subject to the requirements of this subchapter if it is a mixture of one or more components that—

(i) Has a flash point at or above 93 °C (200 °F),

(ii) Comprises at least 99 percent of the volume of the mixture, and

(iii) Is not offered for transportation or transported as a liquid at a temperature at or above its flash point.

§ 173.151 Exceptions for Class 4

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 table of this subchapter.

(b) *Limited quantities of Division 4.1.* Limited quantities of flammable solids (Division 4.1) in Packing Groups II and III and, where authorized by this section, charcoal briquettes (Division 4.2) in Packing Group III, are excepted from labeling requirements unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. If authorized for transportation by aircraft, the package must also conform to applicable requirements of § 173.27 of this part (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) and only hazardous material authorized aboard passenger-carrying aircraft may be transported as a limited quantity. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, shipments of limited quantities are not

subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For flammable solids in Packing Group II, inner packagings not over 1.0 kg (2.2 pounds) net capacity each, unless the material has a subsidiary hazard of Division 6.1, Packing Group II, in which case the inner packagings may not exceed 0.5 kg (1.1 pounds) net capacity each, packed in a strong outer packaging.

(2) For flammable solids in Packing Group III, inner packagings not over 5.0 kg (11 pounds) net capacity each, packed in a strong outer packaging.

(c) *Consumer commodities.* Until December 31, 2020, Except for a material that has a subsidiary hazard of Division 6.1, Packing Group II, a limited quantity package (including Charcoal briquettes (NA1361)) containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010. For transportation by aircraft, the maximum net mass for Charcoal briquettes (NA1361) is 25 kg per package.

(d) *Limited quantities of Division 4.3.* Limited quantities of Division 4.3 (dangerous when wet) solids in Packing Group II or III are excepted from labeling requirements, unless the material also meets the definition of Division 6.1 or is offered for transportation or transported by aircraft, and the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, the package must also comply with the applicable requirements of §173.27 of this subchapter and only hazardous materials authorized aboard passenger-carrying aircraft may be transported as a limited quantity. In addition, shipments of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. The following combination packagings are authorized:

(1) For Division 4.3 solids in Packing Group II, inner packagings not over 0.5 kg (1.1 pound) net capacity each, packed in strong outer packagings; and

(2) For Division 4.3 solids in Packing Group III, inner packagings not over 1 kg (2.2 pounds) net capacity each, packed in strong outer packagings.

§ 173.152 Exceptions for Division 5.1 (oxidizers) and Division 5.2 (organic peroxides)

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 table of this subchapter.

(b) *Limited quantities.* Limited quantities of oxidizers (Division 5.1) in Packing Group II and III and organic peroxides (Division 5.2) are excepted from labeling requirements,

unless the material also meets the definition of Division 6.1 or is offered for transportation or transported by aircraft, and the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, the package must also comply with the applicable requirements of §173.27 of this subchapter and only hazardous materials authorized aboard passenger-carrying aircraft may be transported as a limited quantity. In addition, shipments of these limited quantities are not subject to subpart F of part 172 (Placarding) of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. The following combination packagings are authorized:

(1) For oxidizers in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, unless the material has a subsidiary hazard of Division 6.1, Packing Group II, in which case the inner packagings may not exceed 100 mL (3.38 ounces) for liquids or 0.5 kg (1.1 pounds) for solids, packed in a strong outer packaging.

(2) For oxidizers in Packing Group III, inner packagings not over 5 L (1.3 gallons) net capacity each for liquids or not over 5.0 kg (11 lbs) net capacity each for solids, and packed in strong outer packagings.

(3) For organic peroxides which do not require temperature control during transportation—

(i) For Type D, E, or F organic peroxides, inner packagings not over 125 mL (4.22 ounces) net capacity each for liquids or 500 g (17.64 ounces) net capacity for solids, packed in strong outer packagings.

(ii) For Type B or C organic peroxides, inner packagings not over 25 mL (0.845 ounces) net capacity each for liquids or 100 g (3.528 ounces) net capacity for solids, packed in strong outer packagings.

(c) *Consumer commodities.* Except for a material that has a subsidiary hazard of Division 6.1, Packing Group II, a limited quantity which conforms to the provisions of paragraph (b) of this section, and is a “consumer commodity” as defined in §171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM–D. In addition to the exceptions provided by paragraph (b) of this section, shipments of ORM–D materials are not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or are offered for transportation and transported by aircraft, and are eligible for the exceptions provided in §173.156.

§ 173.153 Exceptions for Division 6.1 (poisonous materials)

Note: FedEx Ground does not handle Division 6.1 material unless packaged by a Special Permit or 49 CFR 173.13.

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 table of this subchapter.

(b) *Limited quantities.* The exceptions in this paragraph do not apply to poison-by-inhalation materials. Limited quantities of poisonous material (Division 6.1) in Packing Groups II and III are excepted from the labeling requirements, unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, the package must also conform to applicable requirements of § 173.27 of this part (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) and only hazardous material authorized aboard passenger-carrying aircraft may be transported as a limited quantity. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, shipments of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For poisonous materials in Packing Group II, inner packagings not over 100 mL (3.38 ounces) each for liquids or 0.5 kg (1.1 pounds) each for solids, packed in a strong outer packaging.

(2) For poisonous materials in Packing Group III, inner packagings not over 4 L (1.0 gallon) each for liquids or 5.0 kg (11 pounds) each for solids, packed in a strong outer packaging.

(c) *Consumer commodities.* The following provisions apply to consumer commodities:

(1) A limited quantity of poisonous material in Packing Group III which conforms to the provisions of paragraph (b) of this section, and is a “consumer commodity” as defined in §171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM–D.

(2) A poisonous material which is a drug or medicine and is a “consumer commodity” as defined in §171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D material if packaged in a combination packaging not exceeding 30 kg (66 pounds) with inner packagings not over 250 mL (8 ounces) net capacity for liquids or 250 g (8.8 ounces) net capacity for solids packed in strong outer packagings. Each package must conform to the packaging requirements of subpart B of this part.

(3) *Consumer commodities.* Until December 31, 2020, a limited quantity package of poisonous material in Packing Group III or a drug or medicine in Packing Group II or III that is also a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

§ 173.154 Exceptions for Class 8 (corrosive materials)

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 table of this subchapter.

(b) *Limited quantities.* Limited quantities of corrosive material (Class 8) in Packing Groups II and III are excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, the package must also conform to the applicable requirements of § 173.27 of this part (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) and only hazardous material authorized aboard passenger-carrying aircraft may be transported as a limited quantity. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, shipments of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For corrosive materials in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, unless the material has a subsidiary hazard of Division 6.1, Packing Group II in which case the inner packagings may not exceed 100 mL (3.38 ounces) for liquids or 0.5 kg (1.1 pounds) for solids, packed in a strong outer packaging.

(2) For corrosive materials in Packing Group III, in inner packagings not over 5.0 L (1.3 gallons) net capacity each for liquids, or not over 5.0 kg (11 lbs) net capacity each for solids, and packed in strong outer packagings.

(c) *Consumer commodities.* Until December 31, 2020, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010

(d) *Materials corrosive to aluminum or steel only.* Except for a hazardous substance, a hazardous waste, or a marine pollutant, a material classed as a Class 8, Packing Group III, material solely because of its corrosive effect—

(1) On aluminum is not subject to any other requirements of this subchapter when transported by motor vehicle or rail car in a packaging constructed of materials that will not react dangerously with or be degraded by the corrosive material; or

(2) On steel is not subject to any other requirements of this subchapter when transported by motor vehicle or rail car in a bulk packaging constructed of materials that will not react dangerously with or be degraded by the corrosive material.

§ 173.155 Exceptions for Class 9 (miscellaneous hazardous materials)

(a) *General.* Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the §172.101 table of this subchapter.

(b) *Limited quantities of Class 9 materials.* Limited quantities of miscellaneous hazardous materials in Packing Groups II and III are excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. Unless otherwise specified in paragraph (c) of this section, packages of limited quantities intended for transportation by aircraft must conform to the applicable requirements (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) of § 173.27 of this part. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, packages of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For miscellaneous materials in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, packed in a strong outer packaging

(2) For miscellaneous materials in Packing Group III, inner packagings not over 5.0 L (1.3 gallons) net capacity each for liquids or not over 5.0 kg (11 lbs) net capacity each for solids, packed in a strong outer packaging.

(c) *Consumer commodities.* Until December 31, 2020, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

§ 173.156 Exceptions for limited quantity and ORM.

(a) Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the § 172.101 Table or in a packaging section in this part.

(b) Packagings for limited quantity and ORM-D are specified according to hazard class in §§ 173.150 through 173.155, 173.306 and 173.309(b). In addition to exceptions provided for limited quantity and ORM-D materials elsewhere in this part, the following are provided:

(1) Strong outer packagings as specified in this part, marking requirements specified in subpart D of part 172 of this subchapter, and the 30 kg (66 pounds) gross weight limitation are not required for packages of limited quantity materials marked in accordance with § 172.315 of this subchapter, or, until December 31, 2020, materials classed and marked as ORM-D and described as a Consumer commodity, as defined in § 171.8 of this subchapter, when—

(i) Unitized in cages, carts, boxes or similar overpacks;

(ii) Offered for transportation or transported by:

(A) Rail;

(B) Private or contract motor carrier; or

(C) Common carrier in a vehicle under exclusive use for such service; and

(iii) Transported to or from a manufacturer, a distribution center, or a retail outlet, or transported to a disposal facility from one offeror.

(2) The 30 kg (66 pounds) gross weight limitation does not apply to packages of limited quantity materials marked in accordance with § 172.315 of this subchapter, or, until December 31, 2020, materials classed and marked as ORM-D and described as a Consumer commodity, as defined in § 171.8 of this subchapter, when offered for transportation or transported by highway or rail between a manufacturer, a distribution center, and a retail outlet provided—

(i) Inner packagings conform to the quantity limits for inner packagings specified in §§ 173.150(b), 173.152(b), 173.154(b), 173.155(b), 173.306 (a) and (b), and 173.309(b), as appropriate;

(ii) The inner packagings are packed into corrugated fiberboard trays to prevent them from moving freely;

(iii) The trays are placed in a fiberboard box which is banded and secured to a wooden pallet by metal, fabric, or plastic straps, to form a single palletized unit;

(iv) The package conforms to the general packaging requirements of subpart B of this part;

(v) The maximum net quantity of hazardous material permitted on one palletized unit is 250 kg (550 pounds); and

(vi) The package is properly marked in accordance with § 172.315 or, until December 31, 2020, § 172.316 of this subchapter.

§ 173.159 Batteries, wet

(a) Electric storage batteries, containing electrolyte acid or alkaline corrosive battery fluid (wet batteries), may not be packed with other materials except as provided in paragraphs (g) and (h) of this section and in §§173.220 and 173.222; and any battery or battery-powered device must be prepared and packaged for transport in a manner to prevent:

(1) A dangerous evolution of heat (*i.e.* , an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence);

(2) Short circuits, including, but not limited to:

(i) Packaging each battery or each battery-powered device when practicable, in fully enclosed inner packagings made of non-conductive material;

(ii) Separating or packaging batteries and battery-powered devices in a manner to prevent contact with other batteries, devices or conductive materials (*e.g.* , metal) in the packagings; or

(iii) Ensuring exposed terminals are protected with non-conductive caps, non-conductive tape, or by other appropriate means; and

(3) *Damage to terminals.* If not impact resistant, the outer packaging must not be used as the sole means of protecting the battery terminals from damage or short circuiting. Batteries must be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals. Batteries contained in devices must be securely installed. Terminal protection methods include but are not limited to:

(i) Securely attaching covers of sufficient strength to protect the terminals;

(ii) Packaging the battery in a rigid plastic packaging; or

(iii) Constructing the battery with terminals that are recessed or otherwise protected so that the terminals will not be subjected to damage if the package is dropped.

(b) For transportation by aircraft:

(1) The packaging for wet batteries must incorporate an acid- or alkali-proof liner, or include a supplementary packaging with sufficient strength and adequately sealed to prevent leakage of electrolyte fluid in the event of spillage; and

(2) Any battery-powered device, equipment or vehicle must be packaged for transport in a manner to prevent unintentional activation or must have an independent means of preventing unintentional activation (*e.g.* , packaging restricts access to activation switch, switch caps or locks, recessed switches, trigger locks, temperature sensitive circuit breakers, etc.).

(c) The following specification packagings are authorized for batteries packed without other materials provided all requirements of paragraph (a) of this section, and for transportation by aircraft, paragraph (b) of this section are met:

(1) Wooden box: 4C1, 4C2, 4D, or 4F.

(2) Fiberboard box: 4G.

(3) Plywood drum: 1D.

(4) Fiber drum: 1G.

(5) Plastic drum: 1H2.

(6) Plastic jerrican: 3H2.

(7) Plastic box: 4H2.

(d) The following non-specification packagings are authorized for batteries packed without other materials provided all requirements of paragraph (a) of this section, and for transportation by aircraft, paragraph (b) of this section are met:

(1) Electric storage batteries are firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation are authorized for transportation by rail, highway, or vessel. The height of the completed unit must not exceed 11/2times the width of the skid or pallet. The unit must be capable of withstanding, without damage, a superimposed weight equal to two times the weight of the unit or, if the weight of the unit exceeds 907 kg (2,000 pounds), a superimposed weight of 1814 kg (4,000 pounds). Battery terminals must not be relied upon to support any part of the superimposed weight and must not short out if a conductive material is placed in direct contact with them.

(2) Electric storage batteries weighing 225 kg (500 pounds) or more, consisting of carriers' equipment, may be shipped by rail when mounted on suitable skids. Such shipments may not be offered in interchange service.

(3) One to three batteries not over 11.3 kg (25 pounds) each, packed in strong outer boxes. The maximum authorized gross weight is 34 kg (75 pounds).

(4) Not more than four batteries not over 7 kg (15 pounds) each, packed in strong outer fiberboard or wooden boxes. The maximum authorized gross weight is 30 kg (65 pounds).

(5) Not more than five batteries not over 4.5 kg (10 pounds) each, packed in strong outer fiberboard or wooden boxes. The maximum authorized gross weight is 30 kg (65 pounds).

(6) Single batteries not exceeding 34 kg (75 pounds) each, packed in 5-sided slip covers or in completely closed fiberboard boxes. Slip covers and boxes must be of solid or double-faced corrugated fiberboard of at least 91 kg (200 pounds) Mullen test strength. The slip cover or fiberboard box must fit snugly and provide inside top clearance of at least 1.3 cm (0.5 inch) above battery terminals and filler caps with

reinforcement in place. Assembled for shipment, the bottom edges of the slipcover must come to within 2.5 cm (1 inch) of the bottom of the battery. The completed package (battery and box or slip cover) must be capable of withstanding a top-to-bottom compression test of at least 225 kg (500 pounds) without damage to battery terminal caps, cell covers or filler caps.

(7) Single batteries exceeding 34 kg (75 pounds) each may be packed in completely closed fiberboard boxes. Boxes must be of double-wall corrugated fiberboard of at least 181 kg (400 pounds) test, or solid fiberboard testing at least 181 kg (400 pounds); a box may have hand holes in its ends provided that the hand holes will not materially weaken the box. Sides and ends of the box must have cushioning between the battery and walls of the box; combined thickness of cushioning material and walls of the box must not be less than 1.3 cm (0.5 inch); and cushioning must be excelsior pads, corrugated fiberboard, or other suitable cushioning material. The bottom of the battery must be protected by a minimum of one excelsior pad or by a double-wall corrugated fiberboard pad. The top of the battery must be protected by a wood frame, corrugated trays or scored sheets of corrugated fiberboard having minimum test of 91 kg (200 pounds), or other equally effective cushioning material.

Top protection must bear evenly on connectors and/or edges of the battery cover to facilitate stacking of batteries. No more than one battery may be placed in one box. The maximum authorized gross weight is 91 kg (200 pounds).

(e) When transported by highway or rail, electric storage batteries containing electrolyte or corrosive battery fluid are not subject to any other requirements of this subchapter, if all of the following are met:

(1) No other hazardous materials may be transported in the same vehicle;

(2) The batteries must be loaded or braced so as to prevent damage and short circuits in transit;

(3) Any other material loaded in the same vehicle must be blocked, braced, or otherwise secured to prevent contact with or damage to the batteries; and

(4) The transport vehicle may not carry material shipped by any person other than the shipper of the batteries.

(f) Batteries can be considered as non-spillable provided they are capable of withstanding the following two tests, without leakage of battery fluid from the battery:

(1) *Vibration test* . The battery must be rigidly clamped to the platform of a vibration machine, and a simple harmonic motion having an amplitude of 0.8 mm (0.03 inches) with a 1.6 mm (0.063 inches) maximum total excursion must be applied. The frequency must be varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return must be traversed in 95 ± 5 minutes for each mounting position (direction of vibrator) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

(2) *Pressure differential test* . Following the vibration test, the battery must be stored for six hours at 24 °C ± 4 °C (75 °F ± 7 °F) while subjected to a pressure differential of at least 88 kPa (13 psig). The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

(g) Electrolyte, acid or alkaline corrosive battery fluid, packed with batteries wet or dry, must be packed in one of the following specification packagings:

(1) In 4C1, 4C2, 4D, or 4F wooden boxes with inner receptacles of glass, not over 4.0 L (1 gallon) each with not over 8.0 L (2 gallons) total in each outside container. Inside containers must be well-cushioned and separated from batteries by a strong solid wooden partition. The completed package must conform to Packing Group III requirements.

(2) Electrolyte, acid, or alkaline corrosive battery fluid included with electric storage batteries and filling kits may be packed in strong rigid outer packagings when shipments are made by, for, or to the Departments of the Army, Navy, or Air Force of the United States. Packagings must conform to military specifications. The electrolyte, acid, or alkaline corrosive battery fluid must be packed in polyethylene bottles of not over 1.0 L (0.3 gallon) capacity each. Not more than 24 bottles, securely separated from electric storage batteries and kits, may be offered for transportation or transported in each package.

(3) In 4G fiberboard boxes with not more than 12 inside packagings of polyethylene or other material resistant to the lading, each not over 2.0 L (0.5 gallon) capacity each. Completed packages must conform to Packing Group III requirements. Inner packagings must be adequately separated from the storage battery. The maximum authorized gross weight is 29 kg (64 pounds). These packages are not authorized for transportation by aircraft.

(h) Dry batteries or battery charger devices may be packaged in 4G fiberboard boxes with inner receptacles containing battery fluid. Completed packagings must conform to Packing Group III requirements. Not more than 12 inner receptacles may be packed in one outer box. The maximum authorized gross weight is 34 kg (75 pounds).

(i) When approved by the Associate Administrator, electric storage batteries, containing electrolyte or corrosive battery fluid in a separate reservoir from which fluid is injected into the battery cells by a power device cartridge assembled with the battery, and which meet the criteria of paragraph (f) are not subject to any other requirements of this subchapter.

§ 173.161 Chemical kits and first aid kits.

(a) *Applicability.* Chemical kits and first aid kits contain one or more compatible items of hazardous materials in boxes, cases, *etc.* that, for example, are used for medical, analytical, diagnostic, testing, or repair purposes.

(b) *Authorized materials.* (1) The kits may only contain hazardous materials for which packaging exceptions are provided in column 8(A) of the § 172.101 Hazardous Materials Table in this subchapter. For transportation by aircraft, the kits may only contain quantities of hazardous materials authorized as excepted quantities or as limited quantities in §§ 173.4a and 173.27(f) of this part, respectively. Materials forbidden for transportation by passenger aircraft or cargo aircraft may not be included in the kits.

(2) The packing group assigned to the chemical kit and first aid kit as a whole must be the most stringent packing group assigned to any individual substance in the kit. The packing group must be shown on the shipping paper. Where the kit contains only hazardous materials to which no packing group is assigned, the packagings shall meet the Packing Group II performance level. Where the kit contains only hazardous materials to which no packing group is assigned, the packing group does not have to be indicated on the shipping paper.

(c) *Packaging.* Except for transportation by aircraft or vessel, chemical kits and first aid kits must be packaged in combination packagings conforming to the packaging requirements of subpart B of this part. For transportation by aircraft or vessel, chemical kits and first aid kits must be packaged in specification combination packagings based on the performance level of the most stringent packing group of material contained within the kit. For transportation by aircraft, friction-type closures must be secured by secondary means and inner packagings intended to contain liquids must be capable of meeting the pressure differential requirements prescribed in § 173.27(c) of this subchapter. Inner and outer packaging quantity limits for packages are as follows:

(1) Except for liquids of Division 5.2 (organic peroxide), inner packagings containing not more than 250 mL. Except for transportation by aircraft, for Division 5.2 (organic peroxide) liquids of Type B and C, inner packagings containing not more than 25 mL and for Division 5.2 (organic peroxide) liquids of Type D, E and F, inner packagings containing not more than 125 mL. For transportation by aircraft, for Division 5.2 (organic peroxide) liquids of Type D, E and F (only), inner packagings containing not more than 125 mL;

(2) Except for solids of Division 5.2 (organic peroxide) of Type B and C, inner packagings containing not more than 250 g. Except for transportation by aircraft, for a Division 5.2 (organic peroxide) solid of Type B and C, inner packagings containing not more than 100 g. For transportation by aircraft, for a Division 5.2 (organic peroxide) solid of Type D, E and F (only), inner packagings containing not more than 250 g;

(3) No more than 10 L or 10 kg of hazardous material may be contained in one outer package (excluding dry ice). For transportation by aircraft, no more than 1 L or 1 kg of hazardous material may be contained in one kit (excluding dry ice);

(4) Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight;

(5) Except for Carbon dioxide, solid (Dry ice), UN1845, no other hazardous materials may be packed within the same outer packaging as the kits. Dry ice must be packaged in accordance with § 173.217 of this subchapter;

(6) The kits must include sufficient absorbent material to completely absorb the contents of any liquid hazardous materials contained in the kits. The contents must be separated, placed, or packed, and closed with cushioning material to protect them from damage; and

(7) The contents of the kits must be packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

(d) *Exceptions.* (1)(i) Chemical kits and first aid kits are eligible for the excepted quantity exceptions provided in §§ 173.4 and 173.4a of this part. For transportation by aircraft, chemical kits and first aid kits are eligible for the limited quantity provisions provided in § 173.27(f) of this part. For inner packaging quantity limits, *see* § 173.27(f), Table 3.

(ii) A package conforming to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel. Chemical kits and First aid kits conforming to this section may be marked as a limited quantity as prescribed in § 172.315 of this subchapter and, if applicable, are eligible for the exceptions provided in § 173.156 of this part. Additionally, chemical and first aid kits conforming to this section are not subject to part 174 (carriage by rail) or part 177 (carriage by highway) of this subchapter when marked in accordance with § 172.315 of this subchapter.

(2) Consumer commodities. Until December 31, 2020, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

(3) Kits that are carried on board transport vehicles for first aid or operating purposes are not subject to the requirements of this subchapter.

§ 173.164 Mercury (metallic and articles containing mercury)

(a) For transportation by aircraft, mercury must be packaged in packagings which meet the requirements of part 178 of this subchapter at the Packing Group I performance level, as follows:

(1) In inner packagings of earthenware, glass or plastic containing not more than 3.5 kg (7.7 pounds) of mercury, or inner packagings that are glass ampoules containing not more than 0.5 kg (1.1 pounds) of mercury, or iron or steel quicksilver flasks containing not more than 35 kg (77 pounds) of mercury. The inner packagings or flasks must be packed in steel drums (1A1, 1A2), metal, other than steel or aluminum drums (1N1, 1N2), steel jerricans (3A2), wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), metal, other than steel or aluminum boxes (4N), plastic boxes (4H2), plywood drums (1D) or fiber drums (1G).

(2) [Reserved]

(3) When inner packagings of earthenware, glass or plastic are used, they must be packed in the outer packaging with sufficient cushioning material to prevent breakage.

(4) Either the inner packagings or the outer packagings must have inner linings or bags of strong leakproof and puncture-resistant material impervious to mercury, completely surrounding the contents, so that the escape of mercury will be prevented irrespective of the position of the package.

(5) When transported as cargo, lamps are excepted from the requirements of this subchapter provided, each lamp contains not more than 1 g of mercury and is packaged so that there is not more than 30 g of mercury per package. Packages must be so designed and constructed such that when dropped from a height of not less than 0.5 meter (1.5 feet) the packages must still be fit for transport and there must be no damage to the contents.

(b) When transported as cargo, manufactured articles or apparatuses, each containing not more than 100 mg (0.0035 ounce) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.035 ounce) are not subject to the requirements of this subchapter.

(c) Manufactured articles or apparatuses containing mercury are excepted from the specification packaging requirements of this subchapter when packaged as follows:

(1) Manufactured articles or apparatuses of which metallic mercury is a component part, such as manometers, pumps, thermometers, switches, etc. (for electron tubes, mercury vapor tubes and similar tubes, see paragraph (c)(3) of this section), must be in strong outer packagings, having sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position. Mercury switches and relays are excepted from

these packaging requirements, if they are totally enclosed, leakproof and in sealed metal or plastic units.

(2) Thermometers, switches and relays, each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are excepted from the requirements of this subchapter if installed as an integral part of a machine or apparatus and so fitted that shock of impact damage, leading to leakage of mercury, is unlikely to occur under conditions normally incident to transport.

(3) Electron tubes, mercury vapor tubes and similar tubes must be packaged as follows:

(i) Tubes which are packed in strong outer packagings with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the package, are authorized up to a total net quantity of 450 g (15.9 ounces) of mercury per package;

(ii) Tubes with more than 450 g (15.9 ounces) of mercury are authorized only when packed in strong outer packagings, having sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury which will prevent escape of mercury from the package irrespective of its position;

(iii) Tubes which do not contain more than 5 g (0.2 ounce) of mercury each and which are packed in the manufacturer's original packagings, are authorized up to a total net quantity of 30 g (1.1 ounces) of mercury per package;

(iv) Tubes which are completely jacketed in sealed leakproof metal cases are authorized in the manufacturer's original packagings.

(4) A person offering for transportation electron tubes, mercury vapor tubes, and similar tubes shall indicate the quantity of mercury therein on the shipping paper.

(5) Mercurial barometers conforming to paragraph (c)(1) of this section, which are loaded and unloaded from an aircraft under the supervision of, and accompanied in flight by, a National Weather Service official or similar United States agency official, are excepted from any other requirements of this subchapter.

(d) For transportation by other than aircraft, mercury must be packaged—

(1) In any packaging which meets the requirements of part 178 of this subchapter at the Packing Group III performance level; or

(2) In non-specification reusable metal packagings.

(e) Except for a hazardous substance or a hazardous waste or for transportation by aircraft or vessel, packages containing less than 0.45 kg (1.0 pound) net weight of mercury are not subject to the requirements of this subchapter.

§ 173.166: Safety Devices

For the purpose of this section, safety devices are articles which contain pyrotechnic substances or hazardous materials of other classes and are used in vehicles, vessels or aircraft to enhance safety to persons. Examples are: air bag inflators, air bag modules, seat-belt pretensioners and pyromechanical devices.

Pyromechanical devices are assembled components for tasks such as but not limited to separation, locking, release-and-drive or occupant restraint. The term includes "Safety devices, pyrotechnic."

(a) Definitions. An air bag inflator (consisting of a casing containing an igniter, a booster material, a gas generant and, in some cases, a pressure receptacle (cylinder)) is a gas generator used to inflate an air bag in a supplemental restraint system in a motor vehicle. An air bag module is the air bag inflator plus an inflatable bag assembly. A seat-belt pretensioner contains similar hazardous materials and is used in the operation of a seat-belt restraining system in a motor vehicle.

(b) Classification. (1) Safety devices, excluding those which contain flammable or toxic gases or mixtures thereof, may be classed as Class 9 (UN3268) if the safety device, or if more than a single safety device is involved then the representative of the maximum parameters of each design type, is examined and successfully tested by a person or agency who is authorized by the Associate Administrator to perform examination and testing of explosives under §173.56(b)(1), and who:

(i) Does not manufacture or market explosives or safety devices, is not owned in whole or in part, or is not financially dependent upon any entity that manufactures or markets explosives or safety devices;

(ii) Performs all examination and testing in accordance with the applicable requirements as specified in special provision 160 (see §172.102 of this subchapter); and

(iii) Maintains records in accordance with paragraph (g) of this section.

(iv) By adhering to all the provisions specified in paragraph (b)(1) of this section, a Class 9 (UN3268) air bag inflator, air bag module or seat-belt pretensioner design is not required to be submitted to the Associate Administrator for approval or assigned an EX number. All other Class 9 (UN3268) safety device designs are required to be submitted to the Associate Administrator for approval and assigned an EX number;

(2) A safety device may be classed as Division 1.4G if the maximum parameters of each design type have been examined and successfully tested by a person or agency who is authorized by the Associate Administrator to perform such examination and testing of explosives under §173.56(b)(1). As a Class 1 explosive, the manufacturer must submit to the Associate Administrator a report of the examination and assignment of a recommended shipping description, division, and compatibility group, and if the Associate Administrator finds the approval request meets the regulatory criteria, the explosive may be approved in writing and assigned an EX number; or

(3) The manufacturer has submitted an application, including a classification issued by the competent authority of a foreign government to the Associate

Administrator, and received written notification from the Associate Administrator that the device has been approved for transportation and assigned an EX number.

(c) EX numbers. (1) When a safety device is classed and approved as a Division 1.4G and offered for transportation, the shipping paper must contain the EX number or product code for each approved device in association with the basic description required by §172.202(a) of this subchapter. Product codes must be traceable to the specific EX number assigned to the device by the Associate Administrator. Further, if the EX number or product code is contained on the shipping paper then it is not required to be marked on the outside package.

(2) A safety device, when classed as a Class 9 (UN3268), is excepted from the EX number, or product code shipping paper requirements of paragraph (c) of this section.

(d) Exceptions. (1) A safety device that is classed as a Class 9 (UN3268) under the terms of paragraph (b)(1) of this section and is installed in a motor vehicle, aircraft, boat or other transport conveyance or its completed components, such as steering columns or door panels, is not subject to the requirements of this subchapter. A safety device that has been classed as a Division 1.4G and approved by the Associate Administrator and is installed in a motor vehicle, aircraft, boat or other transport conveyance or its completed components, such as steering columns or door panels, is not subject to the requirements of this subchapter.

(2) An air bag module containing an inflator that has been previously approved by the Associate Administrator for transportation is not required to be submitted for further examination or approval. For classifications granted after July 30, 2013, if the Class 9 designation for the inflator is contingent upon packaging or other special means specified by the authorized testing agency, the modules must be tested and certified separately to determine if they can be shipped as "UN3268, Safety Devices, 9, PG III".

(3) An air bag module containing an inflator that has previously been approved by the Associate Administrator as a Division 2.2 material is not required to be submitted for further examination to be reclassed as a Class 9 material.

(4) Shipments to recycling or waste disposal facilities. When offered for domestic transportation by highway, rail freight, cargo vessel or cargo aircraft, a serviceable safety device classed as either Class 9 (UN3268) or Division 1.4G removed from a motor vehicle that was manufactured as required for use in the United States may be offered for transportation and transported without compliance with the shipping paper requirement prescribed in paragraph (c) of this section. However, when these articles are shipped to a recycling facility, the word "Recycled" must be entered on the shipping paper immediately after the basic description prescribed in §172.202 of this subchapter. No more than one device is authorized in the packaging prescribed in paragraph (e)(1), (2) or (3) of

this section. The device must be cushioned and secured within the package to prevent movement during transportation.

(5) An air bag inflator, air bag module, or seat-belt pretensioner that was classed and approved for transportation prior to January 1, 2015 may continue to be transported under the terms of the existing approval, using the appropriate proper shipping name "Safety Devices" or "Safety Devices, Pyrotechnic" based on the classification of the device as assigned by PHMSA or the authorized person or agency that examined and tested the design type.

(6) Until January 1, 2016, for domestic transportation by highway, rail, and vessel, packages containing air bag inflators, air bag modules, or seat-belt pretensioners may be;

(i) Marked with either the appropriate proper shipping name, or an appropriate proper shipping name authorized by §172.101 in effect on December 31, 2014; and

(ii) Described on a shipping paper with either the appropriate proper shipping name, or an appropriate proper shipping name authorized by §172.101 in effect on December 31, 2014.

(e) Packagings. Rigid, outer packagings, meeting the general packaging requirements of part 173 are authorized as follows. Additionally, the UN specification packagings listed in paragraphs (e)(1), (2), and (3) of this section must meet the packaging specification and performance requirements of part 178 of this subchapter at the Packing Group III performance level. The packagings must be designed and constructed to prevent movement of the articles and inadvertent activation. Further, if the Class 9 designation is contingent upon packaging specified by the authorized testing agency, shipments of the safety device must be in compliance with the prescribed packaging.

(1) 1A2, 1B2, 1N2, 1D, 1G, or 1H2 drums.

(2) 3A2, 3B2, or 3H2 jerricans.

(3) 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, or 4H2 boxes.

(4) Reusable high-strength containers or dedicated handling devices. (i) Reusable containers manufactured from high-strength plastic, metal, or other suitable material, or other dedicated handling devices are authorized for shipment of safety devices from a manufacturing facility to the assembly facility, subject to the following conditions:

(A) The gross weight of the containers or handling devices may not exceed 1000 kg (2205 pounds). Containers or handling devices must provide adequate support to allow stacking at least three units high with no resultant damage;

(B) If not completely enclosed by design, the container or handling device must be covered with plastic, fiberboard, metal, or other suitable material. The covering must be secured to the container by banding or other comparable methods; and

(C) Internal dunnage must be sufficient to prevent movement of the devices within the container.

(ii) Reusable containers manufactured from high-strength plastic, metal, or other suitable material, or other dedicated handling devices are authorized for shipment of safety devices only to, between, and from, intermediate handling locations, provided they meet the conditions specified in paragraphs (e)(4)(i)(A) through (C) of this section and:

(A) The packages may be opened and re-packed by an intermediate handler as long as no modifications or changes are made to the packagings; and

(B) Transportation must be made by private or contract carrier.

(5) Packagings which were previously authorized in an approval issued by the Associate Administrator may continue to be used, provided a copy of the approval is maintained while such packaging is being used.

(6) Safety Devices removed from a vehicle. When removed from, or were intended to be used in, a motor vehicle that was manufactured as required for use in the United States and offered for domestic transportation by highway to Recycling or Waste Disposal facilities, a serviceable safety device classed as Class 9 UN3268 may be offered for transportation and transported in the following additional packaging:

(i) Specification and non-specification steel drums with a wall and lid thickness not less than 20 gauge. The lid must be securely affixed with a lever-locking or bolted-ring assembly. The lid of the drum must provide ventilation of the drum contents in a fire. The drum may be filled with any combination of safety devices to a capacity not greater than fifty (50) percent of the drum's total volume. In addition, inner packagings or cushioning may not be used to fill the void space; or

(ii) Outer packaging consisting of 4H2 solid plastic boxes or non-specification rugged reusable plastic outer packaging and inner static-resistant plastic bags or trays. If not completely enclosed by design, the container or handling device must be covered with plastic, fiberboard, metal or other suitable material. The covering must be secured to the container by banding or other comparable methods. The articles must be packed to prevent movement within the container during transportation.

(f) Labeling. Notwithstanding the provisions of §172.402, each package or handling device must display a CLASS 9 label. Additional labeling is not required when the package contains no hazardous materials other than the devices.

(g) Recordkeeping requirements. (1) Following the examination of each new design type classed as a Class 9 in accordance with paragraph (b)(1) of this section, the person that conducted the examination must prepare a test report and provide the test report to the manufacturer of the safety device. At a minimum, the test report must contain the following information:

(i) Name and address of the test facility;

(ii) Name and address of the applicant;

(iii) Manufacturer of the device. For a foreign manufacturer, the U.S. agent or importer must be identified;

(iv) A test report number, drawing of the device, and description of the safety device in sufficient detail to ensure that the test report is traceable (e.g. a unique product identifier) to a specific design;

(v) The tests conducted and the results; and

(vi) A certification that the safety device is classed as a Class 9 (UN3268).

(2) For at least fifteen (15) years after testing, a copy of each test report must be maintained by the authorizing testing agency. For as long as any safety device design is being manufactured, and for at least fifteen (15) years thereafter, a copy of each test report must be maintained by the manufacturer of the product.

(3) Test reports must be made available to a representative of the Department upon request

.§ 173.167 Consumer commodities.

(a) Effective January 1, 2013, a “consumer commodity” (see § 171.8 of this subchapter) when offered for transportation by aircraft may only include articles or substances of Class 2 (non-toxic aerosols only), Class 3 (Packing Group II and III only), Division 6.1 (Packing Group III only), UN3077, UN3082, UN3175, UN3334, and UN3335, provided such materials do not have a subsidiary risk and are authorized aboard a passenger-carrying aircraft. Consumer commodities are excepted from the specification outer packaging requirements of this subchapter. Packages prepared under the requirements of this section are excepted from labeling and shipping papers when transported by highway or rail. Except for § 173.27(f)(2), packages prepared under the requirements of this section are not subject to Subpart B of this part. Additionally, packages prepared under the requirements of this section may be offered for transportation and transported by all modes. As applicable, the following apply:

(1) *Inner and outer packaging quantity limits.* (i) Non-toxic aerosols, as defined in § 171.8 of this subchapter and constructed in accordance with § 173.306 of this part, in non-refillable, non-metal containers not exceeding 120 mL (4 fluid ounces) each, or in

non-refillable metal containers not exceeding 820 mL (28 ounces) each, except that flammable aerosols may not exceed 500 mL (16.9 ounces) each;

(ii) Liquids, in inner packagings not exceeding 500 mL (16.9 ounces) each. Liquids must not completely fill an inner packaging at 55 °C;

(iii) Solids, in inner packagings not exceeding 500 g (1.0 pounds) each; or

(iv) Any combination thereof not to exceed 30 kg (66 pounds) gross weight as prepared for shipment.

(2) *Closures.* Friction-type closures must be secured by positive means. The body and closure of any packaging must be constructed so as to be able to adequately resist the effects of temperature and vibration occurring in conditions normally incident to air transportation. The closure device must be so designed that it is unlikely that it can be incorrectly or incompletely closed.

(3) *Absorbent material.* Inner packagings must be tightly packaged in strong outer packagings. Absorbent and cushioning material must not react dangerously with the contents of inner packagings. Glass or earthenware inner packagings containing liquids of Class 3 or Division 6.1, sufficient absorbent material must be provided to absorb the entire contents of the largest inner packaging contained in the outer packaging. Absorbent material is not required if the glass or earthenware inner packagings are sufficiently protected as packaged for transport that it is unlikely a failure would occur and, if a failure did occur, that it would be unlikely that the contents would leak from the outer packaging.

(4) *Drop test capability.* Breakable inner packagings (e.g., glass, earthenware, or brittle plastic) must be packaged to prevent failure under conditions normally incident to transport. Packages of consumer commodities as prepared for transport must be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage.

(5) *Stack test capability.* Packages of consumer commodities must be capable of withstanding, without failure or leakage of any inner packaging and without any significant reduction in effectiveness, a force applied to the top surface for a duration of 24 hours equivalent to the total weight of identical packages if stacked to a height of 3.0 m (including the test sample).

(b) When offered for transportation by aircraft:

(1) Packages prepared under the requirements of this section are to be marked as a limited quantity in accordance with § 172.315(b)(1) and labeled as a Class 9 article or substance, as appropriate, in accordance with subpart E of part 172 of this subchapter; and

(2) Pressure differential capability: Except for UN3082, inner packagings intended to contain liquids must be capable of meeting the pressure differential requirements (75 kPa) prescribed in § 173.27(c) of this part. The capability of a packaging to withstand an

internal pressure without leakage that produces the specified pressure differential should be determined by successfully testing design samples or prototypes.

§ 173.170 Black powder for small arms

Black powder for small arms that has been classed in Division 1.1 may be reclassed as a Division 4.1 material, for domestic transportation by motor vehicle, rail freight, and cargo vessel only, subject to the following conditions:

(a) The powder must be examined and approved for Division 1.1 and Division 4.1 classification in accordance with §§173.56 and 173.58;

(b) The total quantity of black powder in one transport vehicle, rail car, or freight container may not exceed 45.4 kg (100 pounds) net mass, and no more than four freight containers may be on board one cargo vessel;

(c) The black powder must be packed in inner metal or heavy wall conductive plastic receptacles not over 454 g (16 ounces) net capacity each, with no more than 25 cans in one outer UN 4G fiberboard box. The inner packagings must be arranged and protected so as to prevent simultaneous ignition of the contents. The complete package must be of the same type which has been examined as required in §173.56;

(d) Each completed package must be marked “BLACK POWDER FOR SMALL ARMS” and “NA 0027”; and

(e) Each package must bear the FLAMMABLE SOLID label.

§ 173.171 Smokeless powder for small arms

Smokeless powder for small arms which has been classed in Division 1.3 may be reclassed in Division 4.1, for transportation by motor vehicle, rail car, vessel, or cargo-only aircraft, subject to the following conditions:

(a) The powder must be examined and approved for a Division 1.3 and Division 4.1 classification in accordance with §§173.56 and 173.58 of this part.

(b) The total quantity of smokeless powder may not exceed 45.4 kg (100 pounds) net mass in:

(1) One rail car, transport vehicle, or cargo-only aircraft; or

(2) One freight container on a vessel, not to exceed four freight containers per vessel.

(c) Only combination packagings with inner packagings not exceeding 3.6 kg (8 pounds) net mass are authorized. Inner packagings must be arranged and protected so as to prevent simultaneous ignition of the contents. The complete package must be of the same type which has been examined as required in §173.56 of this part.

(d) Inside packages that have been examined and approved by the Associate Administrator may be packaged in UN 4G fiberboard boxes meeting the Packing Group

I performance level, provided all inside containers are packed to prevent shifting and the net weight of smokeless powder in any one box does not exceed 7.3 kg (16 pounds).

Battery Shipments via FedEx Ground:

Most batteries are regulated in some way when shipped via highway transport. Shippers should refer to the most current DOT regulation to ensure compliance to marking, packaging, and labeling requirements.

Any time a battery is shipped, the terminals must be protected against short circuiting. Terminals must be completely covered, and batteries should be individually packaged in nonconductive materials. Care is to be taken to ensure no movement of batteries within packaging and no contact with metal objects is possible.

Special regulations apply to lithium battery shipments. Refer to 49CFR 173.185. Additional restrictions may apply for lithium batteries for ground shipments between the continental US and Alaska and Hawaii.

§ 173.185 Lithium batteries and cells

(a) *Cells and batteries.* A lithium cell or battery, including a lithium polymer cell or battery and a lithium-ion cell or battery, must conform to all of the following requirements:

(1) Be of a type proven to meet the requirements of each test in the UN Manual of Tests and Criteria (IBR; see § 171.7 of this subchapter). A cell or battery and equipment containing a cell or battery that was first transported prior to January 1, 2006 and is of a type proven to meet the criteria of Class 9 by testing in accordance with the tests in the UN Manual of Tests and Criteria, Third Revised Edition, 1999, need not be retested.

(2) Incorporate a safety venting device or otherwise be designed in a manner that will preclude a violent rupture under conditions normally incident to transportation.

(3) Be equipped with an effective means to prevent dangerous reverse current flow (e.g., diodes, fuses, etc.) if a battery contains cells or series of cells that are connected in parallel.

(4) Be packaged in combination packagings conforming to the requirements of part 178, subparts L and M, of this subchapter at the Packing Group II performance level. The lithium battery or cell must be packed in inner packagings in such a manner as to prevent short circuits, including movement which could lead to short circuits. The inner packaging must be packed within one of the following outer packagings: metal boxes (4A or 4B); wooden boxes (4C1, 4C2, 4D, or 4F); fiberboard boxes (4G); solid plastic boxes (4H2); fiber drums (1G); metal drums (1A2 or 1B2); plywood drums (1D); plastic jerricans (3H2); or metal jerricans (3A2 or 3B2).

(5) Be equipped with an effective means of preventing external short circuits.

(6) Except as provided in paragraph (d) of this section, cells and batteries with a liquid cathode containing sulfur dioxide, sulfuryl chloride or thionyl chloride may not be offered for transportation or transported if any cell has been discharged to the extent

that the open circuit voltage is less than two volts or is less than ⅔ of the voltage of the fully charged cell, whichever is less.

(b) *Lithium cells or batteries packed with equipment.* Lithium cells or batteries packed with equipment may be transported as Class 9 materials if the batteries and cells meet all the requirements of paragraph (a) of this section. The equipment and the packages of cells or batteries must be further packed in a strong outer packaging. The cells or batteries must be packed in such a manner as to prevent short circuits, including movement that could lead to short circuits.

(c) *Lithium cells or batteries contained in equipment* . Lithium cells or batteries contained in equipment may be transported as Class 9 materials if the cells and batteries meet all the requirements of paragraph (a) of this section, except paragraph (a)(4) of this section, and the equipment is packed in a strong outer packaging that is waterproof or is made waterproof through the use of a liner unless the equipment is made waterproof by nature of its construction. The equipment and cells or batteries must be secured within the outer packaging and be packed so as to prevent movement, short circuits, and accidental operation during transport.

(d) *Cells and batteries, for disposal or recycling.* A lithium cell or battery offered for transportation or transported by motor vehicle to a permitted storage facility, disposal site or for purposes of recycling is excepted from the specification packaging requirements of paragraph (a)(4) of this section and the requirements of paragraphs (a)(1) and (a)(6) of this section when protected against short circuits and packed in a strong outer packaging conforming to the requirements of §§ 173.24 and 173.24a.

(e) *Shipments for testing (prototypes).* A lithium cell or battery is excepted from the requirements of (a)(1) of this section when transported by motor vehicle for purposes of testing. The cell or battery must be individually packed in an inner packaging, surrounded by cushioning material that is non-combustible and nonconductive. The cell or battery must be transported as a Class 9 material.

(f) A lithium cell or battery that does not comply with the provisions of this subchapter may be transported only under conditions approved by the Associate Administrator.

(g) Batteries employing a strong, impact-resistant outer casing and exceeding a gross weight of 12 kg (26.5 lbs.), and assemblies of such batteries, may be packed in strong outer packagings, in protective enclosures (for example, in fully enclosed wooden slatted crates) or on pallets. Batteries must be secured to prevent inadvertent movement, and the terminals may not support the weight of other superimposed elements. Batteries packaged in this manner are not permitted for transportation by passenger aircraft, and may be transported by cargo aircraft only if approved by the Associate Administrator prior to transportation.

§ 173.186 Matches

(a) Matches must be of a type which will not ignite spontaneously or undergo marked decomposition when subjected for 8 consecutive hours to a temperature of 93 °C (200 °F).

(b) *Definitions.* (1) *Fusee matches* are matches the heads of which are prepared with a friction-sensitive igniter composition and a pyrotechnic composition which burns with little or no flame, but with intense heat.

(2) *Safety matches* are matches combined with or attached to the box, book or card that can be ignited by friction only on a prepared surface.

(3) *Strike anywhere* matches are matches that can be ignited by friction on a solid surface.

(4) *Wax "Vesta"* matches are matches that can be ignited by friction either on a prepared surface or on a solid surface.

(c) Safety matches and wax "Vesta" matches must be tightly packed in securely closed inner packagings to prevent accidental ignition under conditions normally incident to transportation, and further packed in outer fiberboard, wooden, or other equivalent-type packagings. These matches in outer packagings not exceeding 23 kg (50 pounds) gross weight are not subject to any other requirement (except marking) of this subchapter. These matches may be packed in the same outer packaging with materials not subject to this subchapter.

(d) Strike-anywhere matches may not be packed in the same outer packaging with any material other than safety matches or wax "Vesta" matches, which must be packed in separate inner packagings.

(e) Packagings. Strike-anywhere matches must be tightly packed in securely closed chipboard, fiberboard, wooden, or metal inner packagings to prevent accidental ignition under conditions normally incident to transportation. Each inner packaging may contain no more than 700 strike-anywhere matches and must be packed in outer steel drums (1A2), aluminum drums (1B2), steel jerricans (3A2), wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F) or fiberboard (4G) boxes, plywood (1D) or fiber (1G) drums. Gross weight of fiberboard boxes (4G) must not exceed 30 kg (66 pounds). Gross weight of other outer packagings must not exceed 45 kg (100 pounds).

§ 173.217 Carbon dioxide, solid (dry ice)

(a) Carbon dioxide, solid (dry ice), when offered for transportation or transported by aircraft or water, must be packed in packagings designed and constructed to permit the release of carbon dioxide gas to prevent a buildup of pressure that could rupture the packagings. Packagings must conform to the general packaging requirements of subpart B of this part but need not conform to the requirements of part 178 of this subchapter.

(b) For transportation by vessel:

(1) Each transport vehicle and freight container containing solid carbon dioxide must be conspicuously marked on two sides "WARNING CO2SOLID (DRY ICE)."

(2) Other packagings containing solid carbon dioxide must be marked "CARBON DIOXIDE, SOLID—DO NOT STOW BELOW DECKS."

(c) For transportation by aircraft:

(1) In addition to the applicable marking requirements in subpart D of part 172, the net mass of the carbon dioxide, solid (dry ice) must be marked on the outside of the package. This provision also applies to unit load devices (ULDs) when the ULD contains dry ice and is considered the packaging.

(2) The shipper must make arrangements with the operator for each shipment.

(3) The quantity limits per package shown in Columns (9A) and (9B) of the Hazardous Materials Table in §172.101 are not applicable to dry ice being used as a refrigerant for other than hazardous materials loaded in a unit load device or other type of pallet. In such a case, the unit load device or other type of pallet must allow the venting of the carbon dioxide gas to prevent a dangerous build up of pressure, and be identified to the operator.

(4) Dry ice is excepted from the shipping paper requirements of subpart C of part 172 of this subchapter provided alternative written documentation is supplied containing the following information: proper shipping name (Dry ice or Carbon dioxide, solid), class 9, UN number 1845, the number of packages, and the net quantity of dry ice in each package. The information must be included with the description of the materials.

(5) Carbon dioxide, solid (dry ice), in quantities not exceeding 2.5 kg (5.5 pounds) per package and used as a refrigerant for the contents of the package is excepted from all other requirements of this subchapter if the requirements of paragraph (a) of this section are complied with and the package is marked “Carbon dioxide, solid” or “Dry ice”, is marked with the name of the contents being cooled, and is marked with the net weight of the dry ice or an indication that the net weight is 2.5 kg (5.5 pounds) or less.

(d) Carbon dioxide, solid (dry ice), when used to refrigerate materials being shipped for diagnostic or treatment purposes (*e.g.* , frozen medical specimens), is excepted from the shipping paper and certification requirements of this subchapter if the requirements of paragraphs (a) and (c)(2) of this section are met and the package is marked “Carbon dioxide, solid” or “Dry ice” and is marked with an indication that the material being refrigerated is being transported for diagnostic or treatment purposes.

§ 173.306 Limited quantities of compressed gases

(a) Limited quantities of compressed gases for which exceptions are permitted as noted by reference to this section in §172.101 of this subchapter are excepted from labeling, except when offered for transportation or transported by air, and, unless required as a condition of the exception, specification packaging requirements of this subchapter when packaged in accordance with the following paragraphs. For transportation by aircraft, the package must also comply with the applicable requirements of §173.27 of this subchapter and only hazardous materials authorized aboard passenger-carrying aircraft may be transported as a limited quantity. In addition, shipments are not subject to subpart F (Placarding) of part 172 of this subchapter, to part 174 of this subchapter except §174.24, and to part 177 of this subchapter except § 177.817. Each package may not exceed 30 kg (66 pounds) gross weight.

(1) When in containers of not more than 4 fluid ounces capacity (7.22 cubic inches or less) except cigarette lighters. Additional exceptions for certain compressed gases in limited quantities and the ORM-D hazard class are provided in paragraph (i) of this section.

(2) When in metal containers filled with a material that is not classed as a hazardous material to not more than 90 percent of capacity at 70 °F. and then charged with nonflammable, nonliquefied gas. Each container must be tested to three times the pressure at 70 °F. and, when refilled, be retested to three times the pressure of the gas at 70 °F. Also, one of the following conditions must be met:

(i) Container is not over 0.95 L (1 quart) capacity and charged to not more than 11.17 bar (482.63 kPa, 170 psig) at 21 °C (70 °F), and must be packed in a strong outer packaging, or

(ii) Container is not over 30 gallons capacity and charged to not more than 75 psig at 70 °F.

(3) When in a metal container for the sole purpose of expelling a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste or powder, provided all of the following conditions are met. Additional exceptions for certain compressed gases in limited quantities and the ORM-D hazard class are provided in paragraph (i) of this section.

(i) Capacity must not exceed 1 L(61.0 cubic inches).

(ii) Pressure in the container must not exceed 180 psig at 130 °F. If the pressure exceeds 140 psig at 130 °F., but does not exceed 160 psig at 130 °F., a specification DOT 2P (§ 178.33 of this subchapter) inside metal container must be used; if the pressure exceeds 160 psig at 130 °F., a specification DOT 2Q (§ 178.33a of this subchapter) inside metal container must be used. In any event, the metal container must be capable of withstanding without bursting a pressure of one and one-half times the equilibrium pressure of the content at 130 °F.

(iii) Liquid content of the material and gas must not completely fill the container at 130 °F.

(iv) The container must be packed in strong outside packagings.

(v) Each container, after it is filled, must be subjected to a test performed in a hot water bath; the temperature of the bath and the duration of the test must be such that the internal pressure reaches that which would be reached at 55 °C (131 °F) (50 °C (122 °F) if the liquid phase does not exceed 95% of the capacity of the container at 50 °C (122 °F)). If the contents are sensitive to heat, the temperature of the bath must be set at between 20 °C (68 °F) and 30 °C (86 °F) but, in addition, one container in 2,000 must be tested at the higher temperature. No leakage or permanent deformation of a container may occur.

(vi) Each outside packaging must be marked “INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS.”

(4) Gas samples must be transported under the following conditions:

(i) A gas sample may only be transported as non-pressurized gas when its pressure corresponding to ambient atmospheric pressure in the container is not more than 105 kPa absolute (15.22 psia).

(ii) Non-pressurized gases, toxic (or toxic and flammable) must be packed in hermetically sealed glass or metal inner packagings of not more than one L (0.3 gallons) overpacked in a strong outer packaging.

(iii) Non-pressurized gases, flammable must be packed in hermetically sealed glass or metal inner packagings of not more than 5 L (1.3 gallons) and overpacked in a strong outer packaging.

(5) For limited quantities of Division 2.2 gases with no subsidiary risk, when in a plastic container for the sole purpose of expelling a liquid, paste or powder, provided all of the following conditions are met. Additional exceptions for certain compressed gases in limited quantities and the ORM-D hazard class are provided in paragraph (i) of this section.

(i) Capacity must not exceed 1 L (61.0 cubic inches).

(ii) Pressure in the container must not exceed 160 psig at 130 °F. If the pressure in the container is less than 140 psig at 130 °F, a non-DOT specification container may be used. If the pressure in the container exceeds 140 psig at 130 °F but does not exceed 160 psig at 130 °F, the container must conform to specification DOT 2S. All non-DOT specification and specification DOT 2S containers must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 130 °F.

(iii) Liquid content of the material and gas must not completely fill the container at 130 °F.

(iv) The container must be packed in strong outside packagings.

(v) Except as provided in paragraph (a)(5)(vi) of this section, each container must be subjected to a test performed in a hot water bath; the temperature of the bath and the duration of the test must be such that the internal pressure reaches that which would be reached at 55 °C (131 °F) or 50 °C (122 °F) if the liquid phase does not exceed 95% of the capacity of the container at 50 °C (122 °F). If the contents are sensitive to heat, or if the container is made of plastic material which softens at this test temperature, the temperature of the bath must be set at between 20 °C (68 °F) and 30 °C (86 °F) but, in addition, one container in 2,000 must be tested at the higher temperature. No leakage or permanent deformation of a container may occur except that a plastic container may be deformed through softening provided that it does not leak.

(vi) As an alternative to the hot water bath test in paragraph (a)(5)(v) of this section, testing may be performed as follows:

(A) *Pressure and leak testing before filling.* Each empty container must be subjected to a pressure equal to or in excess of the maximum expected in the filled containers at 55 °C (131 °F) (or 50 °C (122 °F) if the liquid phase does not exceed 95 percent of the capacity of the container at 50 °C (122 °F). This must be at least two-thirds of the design pressure of the container. If any container shows evidence of leakage at a rate equal to or greater than 3.3×10^{-2} mbar L/s at the test pressure, distortion or other defect, it must be rejected; and

(B) *Testing after filling.* Prior to filling, the filler must ensure that the crimping equipment is set appropriately and the specified propellant is used before filling the container. Once filled, each container must be weighed and leak tested. The leak detection equipment must be sufficiently sensitive to detect at least a leak rate of 2.0×10^{-3} mbar L/s at 20 °C (68 °F). Any filled container which shows evidence of leakage, deformation, or excessive weight must be rejected.

(vi) Each outside packaging must be marked “INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS.”

(b) *Exceptions for foodstuffs, soap, biologicals, electronic tubes, and audible fire alarm systems*. Limited quantities of compressed gases (except Division 2.3 gases) for which exceptions are provided as indicated by reference to this section in § 172.101 of this subchapter, when accordance with one of the following paragraphs, are excepted from labeling, except when offered for transportation or transported by aircraft, and the specification packaging requirements of this subchapter. For transportation by aircraft, the package must conform to the applicable requirements of § 173.27 of this subchapter and only packages of hazardous materials authorized aboard passenger-carrying aircraft may be transported as a limited quantity. In addition, shipments are not subject to subpart F (Placarding) of part 172 of this subchapter, to part 174 of this subchapter, except § 174.24, and to part 177 of this subchapter, except § 177.817. Additional exceptions for certain compressed gases in limited quantities and the ORM-D hazard class are provided in paragraph (i) of this section.

(1) Foodstuffs or soaps in a nonrefillable metal or plastic container not exceeding 1 L (61.0 cubic inches), with soluble or emulsified compressed gas, provided the pressure in the container does not exceed 140 psig at 130 °F. Plastic containers must only contain Division 2.2 non-flammable soluble or emulsified compressed gas. The metal or plastic container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 130 °F.

(i) Containers must be packed in strong outside packagings.

(ii) Liquid content of the material and the gas must not completely fill the container at 130 °F.

(iii) Each outside packaging must be marked “INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS.”

(2) Cream in refillable metal or plastic containers with soluble or emulsified compressed gas. Plastic containers must only contain Division 2.2 non-flammable soluble or emulsified compressed gas. Containers must be of such design that they will hold pressure without permanent deformation up to 375 psig and must be equipped with a device designed so as to release pressure without bursting of the container or dangerous projection of its parts at higher pressures. This exception applies to shipments offered for transportation by refrigerated motor vehicles only.

(3) Nonrefillable metal or plastic containers charged with a Division 6.1 Packing Group III or nonflammable solution containing biological products or a medical preparation which could be deteriorated by heat, and compressed gas or gases. Plastic containers must only contain 2.2 non-flammable soluble or emulsified compressed gas. The capacity of each container may not exceed 35 cubic inches (19.3 fluid ounces). The pressure in the container may not exceed 140 psig at 130 °F, and the liquid content of the product and gas must not completely fill the containers at 130 °F. One completed container out of each lot of 500 or less, filled for shipment, must be heated, until the pressure in the container is equivalent to equilibrium pressure of the contents at 130 °F. There must be no evidence of leakage, distortion, or other defect. The container must be packed in strong outside packagings.

(4) Electronic tubes, each having a volume of not more than 30 cubic inches and charged with gas to a pressure of not more than 35 psig and packed in strong outside packagings.

(5) Audible fire alarm systems powered by a compressed gas contained in an inside metal container when shipped under the following conditions:

(i) Each inside container must have contents which are not flammable, poisonous, or corrosive as defined under this part,

(ii) Each inside container may not have a capacity exceeding 35 cubic inches (19.3 fluid ounces),

(iii) Each inside container may not have a pressure exceeding 70 psig at 70 °F. and the liquid portion of the gas may not completely fill the inside container at 130 °F., and

(iv) Each nonrefillable inside container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 130 °F. Each refillable inside container must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 130 °F.

(c)-(d) [Reserved]

(e) *Refrigerating machines.* (1) New (unused) refrigerating machines or components thereof are excepted from the specification packaging requirements of this part if they meet the following conditions. In addition, shipments are not subject to subpart F of part 172 of this subchapter, to part 174 of this subchapter except § 174.24 and to part 177 of this subchapter except § 177.817.

(i) Each pressure vessel may not contain more than 5,000 pounds of Group A1 refrigerant as classified in ANSI/ASHRAE Standard 15 or not more than 50 pounds of refrigerant other than Group A1.

(ii) Machines or components having two or more charged vessels may not contain an aggregate of more than 2,000 pounds of Group I refrigerant or more than 100 pounds of refrigerant other than Group I.

(iii) Each pressure vessel must be equipped with a safety device meeting the requirements of ANSI/ASHRAE 15 (IBR, see § 171.7 of this subchapter).

(iv) Each pressure vessel must be equipped with a shut-off valve at each opening except openings used for safety devices and with no other connection. These valves must be closed prior to and during transportation.

(v) Pressure vessels must be manufactured, inspected and tested in accordance with ANSI/ASHRAE 15, or when over 6 inches internal diameter, in accordance with Section VIII of the ASME Code (IBR, see § 171.7 of this subchapter).

(vi) All parts subject to refrigerant pressure during shipment must be tested in accordance with ANSI/ASHRAE 15.

(vii) The liquid portion of the refrigerant, if any, may not completely fill any pressure vessel at 130 °F.

(viii) The amount of refrigerant, if liquefied, may not exceed the filling density prescribed in § 173.304.

(f) *Accumulators (Articles, pressurized pneumatic or hydraulic containing non-flammable gas).* The following applies to accumulators, which are hydraulic accumulators containing nonliquefied, nonflammable gas, and nonflammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials which will not fragment upon rupture.

(1) Accumulators installed in motor vehicles, construction equipment, and assembled machinery and designed and fabricated with a burst pressure of not less than five times their charged pressure at 70 °F., when shipped, are not subject to the requirements of this subchapter.

(2) Accumulators charged with limited quantities of compressed gas to not more than 200 p.s.i.g. at 70 °F. are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter when shipped under the following conditions. In addition, shipments are not subject to subpart F of part 172 of this subchapter, to part 174 of this subchapter except § 174.24 and to part 177 of this subchapter except § 177.817.

(i) Each accumulator must be shipped as an inside packaging,

(ii) Each accumulator may not have a gas space exceeding 2,500 cubic inches under stored pressure, and

(iii) Each accumulator must be tested, without evidence of failure or damage, to at least three times its charged pressure of 70 °F., but not less than 120 p.s.i. before initial shipment and before each refilling and reshipment.

(3) Accumulators with a charging pressure exceeding 200 p.s.i.g. at 70 °F. are excepted from labeling (except when offered for transportation by air) and the specification packaging requirements of this subchapter when shipped under the following conditions:

(i) Each accumulator must be in compliance with the requirements stated in paragraph (f)(2), (i), (ii), and (iii) of this section, and

(ii) Each accumulator must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 70 °F. when shipped.

(4) Accumulators intended to function as shock absorbers, struts, gas springs, pneumatic springs or other impact or energy-absorbing devices are not subject to the requirements of this subchapter provided each:

(i) Has a gas space capacity not exceeding 1.6 L and a charge pressure not exceeding 280 bar, where the product of the capacity expressed in liters and charge pressure expressed in bars does not exceed 80 (for example, 0.5 L gas space and 160 bar charge pressure);

(ii) Has a minimum burst pressure of 4 times the charge pressure at 20 °C for products not exceeding 0.5 L gas space capacity and 5 times the charge pressure for products greater than 0.5 L gas space capacity;

(iii) Design type has been subjected to a fire test demonstrating that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, such that the article will not fragment and that the article does not rocket; and

(iv) Accumulators must be manufactured under a written quality assurance program which monitors parameters controlling burst strength, burst mode and performance in a fire situation as specified in paragraphs (f)(4)(i) through (f)(4)(iii) of this section. A copy of the quality assurance program must be maintained at each facility at which the accumulators are manufactured.

(5) Accumulators not conforming to the provisions of paragraphs (f)(1) through (f)(4) of this section, may only be transported subject to the approval of the Associate Administrator.

(g) *Water pump system tank.* Water pump system tanks charged with compressed air or limited quantities of nitrogen to not over 40 psig for single-trip shipment to installation sites are excepted from labeling (transportation by air not authorized) and the specification packaging requirements of this subchapter when shipped under the following conditions. In addition, shipments are not subject to subpart F of this subchapter, to part 174 of this subchapter except § 174.24 and part 177 except § 177.817.

(1) The tank must be of steel, welded with heads concave to pressure, having a rated water capacity not exceeding 120 gallons and with outside diameter not exceeding 24 inches. Safety relief devices not required.

(2) The tank must be pneumatically tested to 100 psig. Test pressure must be permanently marked on the tank.

(3) The stress at prescribed pressure must not exceed 20,000 psi using formula:

$S = Pd / 2t$

where:

S = wall stress in psi:

P = prescribed pressure for the tank of at least 3 times charged pressure at 70 °F or 100 psig, whichever is greater;

d = inside diameter in inches;

t = minimum wall thickness, in inches.

(4) The burst pressure must be at least 6 times the charge pressure at 70 °F.

(5) Each tank must be overpacked in a strong outer packaging in accordance with § 173.301(h).

(h) *Lighter refills.* (1) Lighter refills (see § 171.8 of this subchapter) must not contain an ignition element but must contain a release device. Lighter refills offered for transportation under this section may not exceed 4 fluid ounces capacity (7.22 cubic inches) or contain more than 65 grams of a Division 2.1 fuel. For transportation by highway or rail, lighter refills must be tightly packed and secured against movement in strong outer packagings. For transportation by aircraft or vessel, lighter refills must be tightly packed and secured against movement in any rigid specification outer packaging authorized in Subpart L of Part 178 of this subchapter at the Packing Group II performance level.

(2) *Exceptions.* (i) For other than transportation by aircraft, exceptions for certain compressed gases in limited quantities and the ORM-D hazard class are provided in paragraph (i) of this section.

(ii) For highway transportation, when no more than 1,500 lighter refills covered by this paragraph are transported in one motor vehicle, the requirements of subparts C through H of part 172, and Part 177 of this subchapter do not apply. Lighter refills covered under this paragraph must be packaged in rigid, strong outer packagings meeting the general packaging requirements of subpart B of this part. Outer packagings must be plainly and durably marked on two opposing sides or ends with the words “LIGHTER REFILLS” and the number of devices contained therein in letters measuring at least 20 mm (0.79 in) in height. No person may offer for transportation or transport

the lighter refills or prepare the lighter refills for shipment unless that person has been specifically informed of the requirements of this section.

(i) *Limited quantities.* (1) A limited quantity that conforms to the provisions of paragraph (a)(1), (a)(3), (a)(5), (b) or, except for transportation by aircraft, paragraph (h) of this section is excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. Packages must be marked in accordance with § 172.315(a) or (b), as appropriate, or as authorized in paragraph (i)(2) of this section. Unless otherwise specified in paragraph (i)(2) of this section, packages of limited quantities intended for transportation by aircraft must conform to the applicable requirements (*e.g.,* authorized materials, inner packaging quantity limits and closure securement) of § 173.27 of this part. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. Outside packagings conforming to this paragraph are not required to be marked “INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS.” In addition, packages of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight.

(2) Consumer commodities. Until December 31, 2020, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter may be renamed “Consumer commodity” and reclassed as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

(j) *Aerosols and receptacles small, containing gas with a capacity of less than 50 mL.* Aerosols, as defined in § 171.8 of this subchapter, and receptacles, small, containing gas, with a capacity not exceeding 50 mL (1.7 fluid oz.) and with a pressure not exceeding 970 kPa (141 psig) at 55 °C (131 °F), containing no hazardous materials other than a Division 2.2 gas, are not subject to the requirements of this subchapter except that for transport by aircraft, such aerosols and receptacles must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10. The pressure limit may be increased to 2,000 kPa (290 psig) at 55 °C (131 °F) provided the aerosols are transported in outer packages that conform to the packaging requirements of Subpart B of this part. This paragraph (j) does not apply to a self-defense spray (e.g., pepper spray).

(k) *Aerosols for recycling or disposal.* Aerosols, as defined in § 171.8 of this subchapter, containing a limited quantity which conforms to the provisions of paragraph (a)(3), (a)(5), (b)(1), (b)(2), or (b)(3) of this section are not subject to the 30 kg (66 pounds) gross weight limitation when transported by motor vehicle for purposes of recycling or disposal under the following conditions:

(1) The strong outer packaging and its contents must not exceed a gross weight of 500 kg (1,100 pounds);

(2) Each aerosol container must be secured with a cap to protect the valve stem or the valve stem must be removed; and

(3) The packaging must be offered for transportation or transported by—

(i) Private or contract motor carrier; or

(ii) Common carrier in a motor vehicle under exclusive use for such service.

(l) For additional exceptions, *see* § 173.307.

§ 173.308 Lighters.

(a) *General requirements.* No person may offer for transportation or transport a lighter (see § 171.8 of this subchapter) containing a Division 2.1 (flammable gas) material except under the following conditions:

(1) The lighter must contain a fuel reservoir not exceeding 4 fluid ounces capacity (7.22 cubic inches), and must contain not more than 10 grams (0.35 ounce) of flammable gas.

(2) The maximum filling density may not exceed 85 percent of the volumetric capacity of each fluid reservoir at 15 °C (59 °F).

(3) Each lighter design, including closures, must be capable of withstanding, without leakage or rupture, an internal pressure of at least two times the pressure of the flammable gas at 55 °C (131 °F).

(4) Each appropriate lighter design must be examined and successfully tested by a person or agency (authorized testing agency) who is authorized by the Associate Administrator to perform such examination and testing under the provisions of subpart E of part 107 of this chapter and who—

(i) Has the equipment necessary to perform the testing required to the level of accuracy required;

(ii) Is able to demonstrate, upon request, the knowledge of the testing procedures and requirements of the HMR relative to lighters;

(iii) Does not manufacture or market lighters, is not financially dependent or owned in whole or in part, by any entity that manufactures or markets lighters;

(iv) Is a resident of the United States; and

(v) Performs all examination and testing in accordance with the requirements of paragraph (b)(3) and (4) of this section.

(5) The Associate Administrator will assign an identification code to each person who is authorized to examine and test lighters. This identification code must be

incorporated into a unique test report identifier for each successfully tested lighter design.

(b) *Examination and testing of lighter design types* —(1) *Lighter design type definition.* A new lighter design is one that has never been examined and tested or one that differs from a previous design in any manner that may affect the escape (leakage) of gas. Lighter characteristics that may affect the escape of gas include changes in materials of construction, ignition mechanism, burner valve design, wall thickness, sealing materials, and type of fuel (e.g., vapor pressure differences).

(2) *Lighter samples submitted for examination and testing.* Samples of a new lighter design are excepted from the requirements of (a)(4) and (d) of this section and may be offered for transportation and transported under the following conditions:

(i) The samples must be transported only to an authorized testing agency;

(ii) No more than 12 lighters may be packaged in a single outer packaging;

(iii) Inner packagings must conform to the requirements of paragraph (c)(1) of this section. For transportation by aircraft, intermediate or outer packagings must meet the pressure differential requirements of § 173.27(c) of this part;

(iv) The outer packaging must conform to the requirements of Subpart M of Part 178 of this subchapter at the Packing Group I performance level and to the requirements of § 173.24 of this subpart;

(v) The word “sample” must appear on the shipping paper as part of the proper shipping name or in association with the basic description; and

(vi) In addition to other required markings and labels, the package must be marked “SAMPLE FOR EXAMINATION AND TESTING.”

(vii) All other applicable requirements of this subchapter must be met.

(3) *Examination and testing of sample lighters by an authorized testing agency.* Each sample lighter must be examined for conformance with paragraph (a) of this section by a person authorized by the Associate Administrator. In addition, lighters must be subjected to the following leakage test:

(i) A minimum of six lighters must be examined and tested at one time. Store the lighters in a desiccator for 24 hours. After drying, weigh each lighter on an analytical balance capable of accurately measuring to within $\frac{1}{10}$ of a milligram (0.0001 grams).

(ii) After weighing, place the lighters together in an explosion-proof, controlled-temperature laboratory oven capable of maintaining 38 ±1 °C (100 ±2 °F) for 96 continuous hours (4 days). At the end of 96 hours, remove the lighters from the oven and place them in the same desiccator and allow the lighters to cool to ambient temperature.

(iii) After cooling, weigh each lighter and determine the net weight differences for each lighter tested (subtract the mass after oven exposure from the original mass before oven exposure).

(iv) Weight losses must be assessed to determine the quantity of gas that leaked from the lighters and from the weight change as a result of absorbed moisture. If the net weight has increased, the test facility must run the required test using six empty lighters in parallel with the six filled lighters. The parallel tests are conducted to determine the weight of moisture absorbed in the plastic in order to determine the weight loss of the lighters from gas leakage.

(v) If the net weight loss for any one of the six lighters exceeds 20 milligrams (0.020 grams), the design must be rejected.

(vi) Lighters manufactured to a rejected lighter design may not be offered for transportation or transported in commerce unless approved in writing by the Associate Administrator.

(4) *Recordkeeping requirements.* (i) Following the examination of each new lighter design, the person or agency that conducted the examination and test must prepare a test report and make that test report available to the manufacturer. At a minimum, the test report must contain the following information:

(A) Name and address of test facility;

(B) Name and address of applicant;

(C) A test report identifier, that is, the authorized person or agency identifier code immediately followed by an alpha/numeric identifier of four or more characters assigned to the specific lighter design by the authorized person or agency (e.g., “LAA****,” where, “LAA” is the identification code assigned to the authorized person or agency by the Associate Administrator and “****” is replaced with the unique test report identifier assigned to the specific lighter design by the authorized person or agency);

(D) Manufacturer of the lighter. For a foreign manufacturer, the U.S. agent or importer must be identified;

(E) Description of the lighter design type (e.g., model, dimensions, ignition mechanism, reservoir capacity, lot/batch number) in sufficient detail to ensure conformance with paragraph (b)(4)(iii) of this section; and

(F) A certification by the authorized testing agency that the lighter design conforms to paragraph (a) of this section and passes or does not pass the required leakage test in paragraph (b) of this section.

(ii) For as long as any lighter design is in production and for at least three years thereafter, a copy of each lighter's test report must be maintained by the authorized testing agency that performed the examination and testing and the manufacturer of the design. For a foreign manufacturer, each test report must be maintained in accordance with this paragraph by the foreign manufacturer's U.S. agent or importer.

(iii) Test reports must be traceable to a specific lighter design and must be made available to a representative of the Department upon request.

(5) *Transitional provisions*. Until January 1, 2012, approval numbers issued by the Associate Administrator prior to January 1, 2007 may continue to be marked on packages and annotated on shipping papers, where applicable. After that time, previously issued approvals (*i.e.,* LAA-***) will no longer be valid and each lighter design currently in production must be re-examined and tested under the provisions of this section.

(c) *Packaging requirements* —(1) *Inner containment.* Lighters must be placed in an inner packaging that is designed to prevent movement of the lighters and inadvertent ignition or leakage. The ignition device and gas control lever of each lighter must be designed, or securely sealed, taped, or otherwise fastened or packaged to protect against accidental functioning or leakage of the contents during transport. If lighters are packed vertically in a plastic tray, a plastic, fiberboard or paperboard partition must be used to prevent friction between the ignition device and the inner packaging.

(2) *Outer packaging.* Lighters and their inner packagings must be tightly packed and secured against movement in any rigid specification outer packaging authorized in Subpart L of Part 178 of this subchapter at the Packing Group II performance level.

(d) *Shipping paper and marking requirements.* (1) In addition to the requirements of subpart C of part 172, shipping papers must be annotated with the lighter design test report identifier (see paragraph (b)(4)(i)(C) of this section) traceable to the test report assigned to the lighters or, if applicable, the previously issued approval number (*i.e.,* LAA***), in association with the basic description.

(2) In addition to the requirements of subpart D of part 172, a lighter design test report identifier (see paragraph (b)(4)(i)(C) of this section) or, if applicable, the previously issued approval number (*i.e.,* LAA***), must be marked on a package containing lighters.

(3) For transportation by vessel in a closed transport vehicle or a closed freight container, the following warning must be affixed to the access doors:

WARNING—MAY CONTAIN EXPLOSIVE MIXTURES WITH AIR—KEEP IGNITION SOURCES AWAY WHEN OPENING

The warning must be on a contrasting background and must be in letters measuring at least 12.7 mm (0.5 inch) in height.

(e) *Exceptions* —(1) *Common or contract carriage.* For highway transportation by common or contract carrier, when no more than 1,500 lighters covered by this section are transported in one motor vehicle, the requirements of subparts C through H of part 172, and Part 177 of this subchapter do not apply. Lighters transported in accordance with this paragraph are also excepted from the specification packaging, shipping paper, and marking requirements specified in §§ 173.308(c) and (d). Inner packagings must conform to paragraph (c)(1) of this section. Lighters must be further packaged in rigid, strong outer packagings meeting the general packaging requirements of subpart B of part 173. Outer packagings must be plainly and durably marked, on two opposing sides

or ends, with the word “LIGHTERS” and the number of devices contained therein in letters measuring at least 20 mm (0.79 in) in height. In addition, the package must include the test report identifier for each lighter design as specified in paragraph (b)(4)(i)(C) of this section or, if applicable, the previously issued approval number (*i.e.,* LAA***). The test report identifier or approval number must be durable, legible, in English, and located in, attached to, or marked directly on the package. No person may offer for transportation or transport the lighters or prepare the lighters for shipment unless that person has been specifically informed of the requirements of this section.

(2) *Private carriage.* For highway transportation by a private carrier, lighters that have been examined and successfully tested in accordance with this section are not subject to any other requirements of this subchapter under the following conditions:

(i) No person may offer for transportation or transport the lighters or prepare the lighters for shipment unless that person has been specifically informed of the requirements of this section;

(ii) Lighters must be placed in an inner packaging that is designed to prevent accidental activation of the ignition device or valve, release of gas, and movement of the lighters (*e.g.,* tray, blister pack, etc.);

(iii) Inner packagings must be placed in a securely closed rigid outer packaging that limits movement of the inner packagings and protects them from damage;

(iv) The outer package may contain not more than 300 lighters;

(v) A transport vehicle may carry not more than 1,500 lighters at any one time;

(vi) The lighters may not be placed in an outer packaging with other hazardous materials; and

(vii) Outer packagings must be plainly and durably marked with the words “LIGHTERS, excepted quantity.”

§ 173.320 Cryogenic liquids; exceptions

(a) Atmospheric gases and helium, cryogenic liquids, in Dewar flasks, insulated cylinders, insulated portable tanks, insulated cargo tanks, and insulated tank cars, designed and constructed so that the pressure in such packagings will not exceed 25.3 psig under ambient temperature conditions during transportation are not subject to the requirements of this subchapter when transported by motor vehicle or railcar except as specified in paragraphs (a)(1), (a)(2), and (a)(3) of this section.

(1) Sections 171.15 and 171.16 of this subchapter pertaining to the reporting of incidents, not including a release that is the result of venting through a pressure control valve, or the neck of the Dewar flask.

(2) Subparts A, B, C, D, G and H of part 172, (§§174.24 for rail and 177.817 for highway) and in addition, part 172 in its entirety for oxygen.

(3) Subparts A and B of part 173, and §§174.1 and 177.800, 177.804, and 177.823 of this subchapter.

(b) The requirements of this subchapter do not apply to atmospheric gases and helium:

(1) During loading and unloading operations (pressure rises may exceed 25.3 psig); or

(2) When used in operation of a process system; such as a refrigeration system (pressure may exceed 25.3 psig).

(c) For transportation aboard aircraft, see the ICAO Technical Instructions (IBR, see §171.7 of this subchapter), Packing Instruction 202 and the packaging specifications in part 6, chapter 5.

§ 173.421 Excepted packages for limited quantities of Class 7 (radioactive) materials

(a) A Class 7 (radioactive) material with an activity per package which does not exceed the limited quantity package limits specified in Table 4 in § 173.425, and its packaging, are excepted from requirements in this subchapter for specification packaging, labeling, marking (except for the UN identification number marking requirement described in § 173.422(a)), and if not a hazardous substance or hazardous waste, shipping papers, and the requirements of this subpart if:

(1) Each package meets the general design requirements of § 173.410;

(2) The radiation level at any point on the external surface of the package does not exceed 0.005 mSv/hour (0.5 mrem/ hour);

(3) The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in § 173.443(a);

(4) The outside of the inner packaging or, if there is no inner packaging, the outside of the packaging itself bears the marking “Radioactive”;

(5) The package does not contain fissile material unless excepted by § 173.453.

(6) The material is otherwise prepared for shipment as specified in accordance with § 173.422.

(b) A limited quantity of Class 7 (radioactive) material that is a hazardous substance or a hazardous waste, is not subject to the provisions in § 172.203(d) or § 172.204(c)(4) of this subchapter.

§ 173.422 Additional requirements for excepted packages containing Class 7 (radioactive) materials

An excepted package of Class 7 (radioactive) material that is prepared for shipment under the provisions of §173.421, §173.424, §173.426, or §173.428 is not subject to any additional requirements of this subchapter, except for the following:

(a) The outside of each package must be marked with the four digit UN identification number for the material preceded by the letters UN, as shown in column (4) of the Hazardous Materials Table in §172.101 of this subchapter;

(b) Sections 171.15 and 171.16 of this subchapter, pertaining to the reporting of incidents;

(c) Sections 174.750, 175.700(b), and 176.710 of this subchapter (depending on the mode of transportation), pertaining to the reporting of decontamination;

(d) The training requirements of subpart H of part 172 of this subchapter; and

(e) For materials that meet the definition of a hazardous substance or a hazardous waste, the shipping paper requirements of subpart C of part 172 of this subchapter.

§ 173.423 Requirements for multiple hazard limited quantity Class 7 (radioactive) materials

(a) Except as provided in §173.4, when a limited quantity radioactive material meets the definition of another hazard class or division, it must be—

(1) Classed for the additional hazard;

(2) Packaged to conform with the requirements specified in §173.421(a)(1) through (a)(5) or §173.424(a) through (g), as appropriate; and

(3) Offered for transportation in accordance with the requirements applicable to the hazard for which it is classed.

(b) A limited quantity Class 7 (radioactive) material which is classed other than Class 7 in accordance with this subchapter is excepted from the requirements of §§173.422(a), 172.203(d), and 172.204(c)(4) of this subchapter if the entry “Limited quantity radioactive material” appears on the shipping paper in association with the basic description.

§ 173.424 Excepted packages for radioactive instruments and articles

A radioactive instrument or article and its packaging are excepted from requirements in this subchapter for specification packaging, labeling, marking (except for the UN identification number marking requirement described in §173.422(a)), and if not a hazardous substance or hazardous waste, shipping papers and the requirements of this subpart if:

(a) Each package meets the general design requirements of §173.410;

(b) The activity of the instrument or article does not exceed the relevant limit listed in Table 4 in §173.425;

(c) The total activity per package does not exceed the relevant limit listed in Table 4 in §173.425;

(d) The radiation level at 10 cm (4 in) from any point on the external surface of any unpackaged instrument or article does not exceed 0.1 mSv/hour (10 mrem/hour);

(e) The active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material shall not be considered to be an instrument or manufactured article);

(f) The radiation level at any point on the external surface of a package bearing the article or instrument does not exceed 0.005 mSv/hour (0.5 mrem/hour), or, for exclusive use domestic shipments, 0.02 mSv/hour (2 mrem/hour);

(g) The nonfixed (removable) radioactive surface contamination on the external surface of the package does not exceed the limits specified in §173.443(a);

(h) Except as provided in §173.426, the package does not contain more than 15 g of uranium-235; and

(i) The package is otherwise prepared for shipment as specified in §173.422.

§ 173.453 Fissile materials—exceptions

Fissile materials meeting the requirements of at least one of the paragraphs (a) through (f) of this section are excepted from the requirements of this subpart for fissile materials, including the requirements of §§173.457 and 173.459, but are subject to all other requirements of this subpart, except as noted.

(a) An individual package containing 2 grams or less of fissile material.

(b) An individual or bulk packaging containing 15 grams or less of fissile material provided the package has at least 200 grams of solid nonfissile material for every gram of fissile material. Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but must not be included in determining the required mass for solid nonfissile material.

(c) Low concentrations of solid fissile material commingled with solid nonfissile material, provide that:

(1) There is at least 2000 grams of nonfissile material for every gram of fissile material, and

(2) There is no more than 180 grams of fissile material distributed within 360 kg of contiguous nonfissile material. Lead, beryllium, graphite, and hydrogenous material enriched in deuterium may be present in the package but must not be included in determining the required mass of solid nonfissile material.

(d) Uranium enriched in uranium-235 to a maximum of 1 percent by weight, and with total plutonium and uranium-233 content of up to 1 percent of the mass of uranium-235, provided that the mass of any beryllium, graphite, and hydrogenous material enriched in deuterium constitute less than 5 percent of the uranium mass.

(e) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 percent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 percent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2. The material must be contained in at least a DOT Type A package.

(f) Packages containing, individually, a total plutonium mass of not more than 1000 grams, of which not more than 20 percent by mass may consist of plutonium-239, plutonium-241, or any combination of these radionuclides.

Identification Number-Cross Reference Index

The identification number cross reference index to proper shipping names in 172.101 is provided for information purposes only. Words in italics are not part of the shipping name, but may be used in addition to the proper shipping name.

Identification Number Cross Reference	
Identification Number	**Proper Shipping Name**
NA0027	Black powder for small arms
NA0124	Jet perforating guns, charged oil well, with detonator
NA0276	Model rocket motor
NA0323	Model rocket motor
NA0331	Ammonium nitrate-fuel oil mixture
NA0337	Toy Caps
NA0494	Jet perforating guns, charged oil well, with detonator
NA1057	Lighters
NA1203	Gasohol, *gasoline mixed with ethyl alcohol, with not more than 10% percent alcohol*
NA1270	Petroleum oil
NA1325	Fusee
NA1350	Sulfur
NA1361	Charcoal
NA1365	Cotton
NA1556	Methyldichloroarsine
NA1613	Hydrocyanic acid, aqueous solutions
NA1693	Tear gas devices
NA1759	Ferrous chloride, solid
NA1760	Chemical kit
NA1760	Compounds, cleaning liquid
NA1760	Compounds, tree killing, liquid or Compounds, weed killing, liquid
NA1760	Ferrous chloride, solution
NA1911	Diborane mixtures
NA1954	Refrigerant gases, n.o.s. or Dispersant gases, n.o.s.
NA1955	Organic phosphate, mixed with compressed gas or Organic phosphate compound, mixed with compressed gas or Organic phosphorus compound, mixed with compressed gas
NA1961	Ethane-Propane mixture, refrigerated liquid
NA1967	Parathion and compressed gas mixture
NA1987	Denatured alcohol
NA1993	Combustible liquid, n.o.s.
NA1993	Compounds, cleaning liquid
NA1993	Compounds, tree killing, liquid or Compounds, weed killing, liquid
NA1993	Diesel fuel
NA1993	Fuel oil
NA1999	Asphalt
NA2212	Asbestos
NA2448	Sulfur, molten
NA2810	Compounds, tree killing, liquid or Compounds, weed killing, liquid
NA2845	Ethyl phosphonous dichloride, anhydrous, *pyrophoric liquid*
NA2845	Methyl phosphonous dichloride, *pyrophoric liquid*
NA2927	Ethyl phosphonothioic dichloride, anhydrous
NA2927	Ethyl phosphorodichloridate
NA3077	Hazardous waste, solid, n.o.s.
NA3077	Other regulated substances, solid, n.o.s.
NA3082	Hazardous waste, liquid, n.o.s.
NA3082	Other regulated substances, liquid, n.o.s.
NA3178	Smokeless powder for small arms
NA3334	Self-defense spray, non-pressurized
NA3356	Oxygen generator, chemical, spent
NA9035	Gas identification set
NA9191	Chlorine dioxide, hydrate, frozen
NA9202	Carbon monoxide, refrigerated liquid
NA9206	Methyl phosphonic dichloride
NA9260	Aluminum, molten
NA9263	Chloropivaloyl chloride
NA9264	3,5-Dichloro-2,4,6-trifluoropyridine
NA9269	Trimethoxysilane
UN0004	Ammonium picrate
UN0005	Cartridges for weapons
UN0006	Cartridges for weapons
UN0007	Cartridges for weapons
UN0009	Ammunition, incendiary
UN0010	Ammunition, incendiary
UN0012	Cartridges for weapons, inert projectile or Cartridges, small arms
UN0014	Cartridges for weapons, blank or Carttridges, small arms blank
UN0015	Ammunition, smoke
UN0016	Ammunition, smoke
UN0018	Ammunition, tear-producing
UN0019	Ammunition, tear-producing
UN0020	Ammunition, toxic
UN0021	Ammunition, toxic
UN0027	Black powder or Gunpowder
UN0028	Black powder, compressed or Gunpowder, compressed or Black powder, in pellets or Gunpowder, in pellets
UN0029	Detonators, non-electric
UN0030	Detonators, electric
UN0033	Bombs
UN0034	Bombs
UN0035	Bombs
UN0037	Bombs, photo-flash
UN0038	Bombs, photo-flash
UN0039	Bombs, photo-flash
UN0042	Boosters
UN0043	Bursters
UN0044	Primers, cap type
UN0048	Charges, demolition
UN0049	Cartridges, flash

UN0050	Cartridges, flash
UN0054	Cartridges, signal
UN0055	Cases, cartridge, empty with primer
UN0056	Charges, depth
UN0059	Charges, shaped
UN0060	Charges, supplementary explosive
UN0065	Cord, detonating
UN0066	Cord, igniter
UN0070	Cutters, cable, explosive
UN0072	Cyclotrimethylenetrinitramine, wetted or Cyclonite, wetted or Hexogen, wetted or RDX, wetted
UN0073	Detonators for ammunition
UN0074	Diazodinitrophenol, wetted
UN0075	Diethyleneglycol dinitrate, desensitized
UN0076	Dinitrophenol
UN0077	Dinitrophenolates
UN0078	Dinitroresorcinol
UN0079	Hexanitrodiphenylamine or Dipicrylamine or Hexyl
UN0081	Explosive, blasting, type A
UN0082	Explosive, blasting, type B
UN0083	Explosive, blasting, type C
UN0084	Explosive, blasting, type D
UN0092	Flares, surface
UN0093	Flares, aerial
UN0094	Flash powder
UN0099	Fracturing devices, explosive
UN0101	Fuse, non-detonating
UN0102	Cord detonating or Fuse detonating
UN0103	Fuse, igniter
UN0104	Cord, detonating, mild effect or Fuse, detonating, mild effect
UN0105	Fuse, safety
UN0106	Fuzes, detonating
UN0107	Fuzes, detonating
UN0110	Grenades, practice
UN0113	Guanyl nitrosaminoguanylidene hydrazine, wetted
UN0114	Guanyl nitrosaminoguanylidene hydrazine, wetted or Tetrazene, wetted
UN0118	Hexolite, or Hexotol
UN0121	Igniters
UN0124	Jet perforating guns, charged
UN0129	Lead azide, wetted
UN0130	Lead styphnate, wetted or Lead trinitroresorcinate, wetted
UN0131	Lighters, fuse
UN0132	Deflagrating metal salts of aromatic nitroderivatives, n.o.s
UN0133	Mannitol hexanitrate, wetted or Nitromannite, wetted
UN0135	Mercury fulminate, wetted
UN0136	Mines
UN0137	Mines
UN0138	Mines
UN0143	Nitroglycerin, desensitized
UN0144	Nitroglycerin, solution in alcohol
UN0146	Nitrostarch
UN0147	Nitro urea
UN0150	Pentaerythrite tetranitrate, wetted or Pentaerythritol tetranitrate, wetted, or PETN, wetted or Pentaerythrite tetranitrate, or Pentaerythritol tetranitrate or PETN, desensitized
UN0151	Pentolite
UN0153	Trinitroaniline or Picramide
UN0155	Trinitrochlorobenzene or Picryl chloride
UN0159	Powder cake, wetted or Powder paste, wetted
UN0160	Powder, smokeless
UN0161	Powder, smokeless
UN0167	Projectiles
UN0168	Projectiles
UN0169	Projectiles
UN0171	Ammunition, illuminating
UN0173	Release devices, explosive
UN0174	Rivets, explosive
UN0180	Rockets
UN0181	Rockets
UN0182	Rockets
UN0183	Rockets
UN0186	Rocket motors
UN0190	Samples, explosive
UN0191	Signal devices, hand
UN0192	Signals, railway track, explosive
UN0193	Signals, railway track, explosive
UN0194	Signals, distress
UN0195	Signals, distress
UN0196	Signals, smoke
UN0197	Signals, smoke
UN0204	Sounding devices, explosive
UN0207	Tetranitroaniline
UN0208	Trinitrophenylmethylnitramine or Tetryl
UN0209	Trinitrotoluene or TNT
UN0212	Tracers for ammunition
UN0213	Trinitroanisole
UN0214	Trinitrobenzene
UN0215	Trinitrobenzoic acid
UN0216	Trinitro-meta-cresol
UN0217	Trinitronaphthalene
UN0218	Trinitrophenetole
UN0219	Trinitroresorcinol or Styphnic acid
UN0220	Urea nitrate
UN0221	Warheads, torpedo
UN0222	Ammonium nitrate
UN0224	Barium azide
UN0225	Boosters with detonator
UN0226	Cyclotetramethylenetetranitramine, wetted or HMX, wetted or Octogen, wetted
UN0234	Sodium dinitro-o-cresolate
UN0235	Sodium picramate
UN0236	Zirconium picramate
UN0237	Charges, shaped, flexible, linear
UN0238	Rockets, line-throwing
UN0240	Rockets, line-throwing
UN0241	Explosive, blasting, type E
UN0242	Charges, propelling, for cannon
UN0243	Ammunition, incendiary, white phosphorus
UN0244	Ammunition, incendiary, white phosphorus
UN0245	Ammunition smoke, white phosphorus
UN0246	Ammunition smoke, white phosphorus
UN0247	Ammunition, incendiary
UN0248	Contrivances, water-activated
UN0249	Contrivances, water-activated
UN0250	Rocket motors with hypergolic liquids
UN0254	Ammunition, illuminating
UN0255	Detonators, electric
UN0257	Fuzes, detonating
UN0266	Octolite or Octol
UN0267	Detonators, non-electric
UN0268	Boosters with detonator
UN0271	Charges, propelling
UN0272	Charges, propelling
UN0275	Cartridges, power device
UN0276	Cartridges, power device
UN0277	Cartridges, oil well

UN0278	Cartridges, oil well
UN0279	Charges, propelling, for cannon
UN0280	Rocket motors
UN0281	Rocket motors
UN0282	Nitroguanidine or Picrite
UN0283	Boosters
UN0284	Grenades
UN0285	Grenades
UN0286	Warheads, rocket
UN0287	Warheads, rocket
UN0288	Charges, shaped, flexible, linear
UN0289	Cord, detonating
UN0290	Cord detonating or Fuse detonating
UN0291	Bombs
UN0292	Grenades
UN0293	Grenades
UN0294	Mines
UN0295	Rockets
UN0296	Sounding devices, explosive
UN0297	Ammunition, illuminating
UN0299	Bombs, photo-flash
UN0300	Ammunition, incendiary
UN0301	Ammunition, tear-producing
UN0303	Ammunition, smoke
UN0305	Flash powder
UN0306	Tracers for ammunition
UN0312	Cartridges, signal
UN0313	Signals, smoke
UN0314	Igniters
UN0315	Igniters
UN0316	Fuzes, igniting
UN0317	Fuzes, igniting
UN0318	Grenades, practice
UN0319	Primers, tubular
UN0320	Primers, tubular
UN0321	Cartridges for weapons
UN0322	Rocket motors with hypergolic liquids
UN0323	Cartridges, power device
UN0324	Projectiles
UN0325	Igniters
UN0326	Cartridges for weapons, blank
UN0327	Cartridges for weapons, blank or Carttridges, small arms blank
UN0328	Cartridges for weapons, inert projectile
UN0329	Torpedoes
UN0330	Torpedoes
UN0331	Explosive, blasting, type B or Agent blasting, Type B
UN0332	Explosive, blasting, type E or Agent blasting, Type E
UN0333	Fireworks
UN0334	Fireworks
UN0335	Fireworks
UN0336	Fireworks
UN0337	Fireworks
UN0338	Cartridges for weapons, blank or Carttridges, small arms blank
UN0339	Cartridges for weapons, inert projectile or Cartridges, small arms
UN0340	Nitrocellulose
UN0341	Nitrocellulose
UN0342	Nitrocellulose, wetted
UN0343	Nitrocellulose, plasticized
UN0344	Projectiles
UN0345	Projectiles
UN0346	Projectiles
UN0347	Projectiles
UN0348	Cartridges for weapons
UN0349	Articles, explosive, n.o.s.
UN0350	Articles, explosive, n.o.s.
UN0351	Articles, explosive, n.o.s.
UN0352	Articles, explosive, n.o.s.
UN0353	Articles, explosive, n.o.s.
UN0354	Articles, explosive, n.o.s.
UN0355	Articles, explosive, n.o.s.
UN0356	Articles, explosive, n.o.s.
UN0357	Substances, explosive, n.o.s.
UN0358	Substances, explosive, n.o.s.
UN0359	Substances, explosive, n.o.s.
UN0360	Detonator assemblies, non-electric
UN0361	Detonator assemblies, non-electric
UN0362	Ammunition, practice
UN0363	Ammunition, proof
UN0364	Detonators for ammunition
UN0365	Detonators for ammunition
UN0366	Detonators for ammunition
UN0367	Fuzes, detonating
UN0368	Fuzes, igniting
UN0369	Warheads, rocket
UN0370	Warheads, rocket
UN0371	Warheads, rocket
UN0372	Grenades, practice
UN0373	Signal devices, hand
UN0374	Sounding devices, explosive
UN0375	Sounding devices, explosive
UN0376	Primers, tubular
UN0377	Primers, cap type
UN0378	Primers, cap type
UN0379	Cases, cartridges, empty with primer
UN0380	Articles, pyrophoric
UN0381	Cartridges, power device
UN0382	Components, explosive train, n.o.s.
UN0383	Components, explosive train, n.o.s.
UN0384	Components, explosive train, n.o.s.
UN0385	5-Nitrobenzotriazol
UN0386	Trinitrobenzenesulfonic acid
UN0387	Trinitrofluorenone
UN0388	Trinitrotoluene and Trinitrobenzene mixtures or TNT and trinitrobenzene mixtures or TNT and hexanitrostilbene mixtures or Trinitrotoluene and hexanitrostilene mixtures
UN0389	Trinitrotoluene mixtures containing Trinitrobenzene and Hexanitrostilbene or TNT mixtures containing trinitrobenzene and hexanitrostilbene
UN0390	Tritonal
UN0391	RDX and HMX mixtures, wetted or RDX and HMX mixtures, desensitized
UN0392	Hexanitrostilbene
UN0393	Hexotonal
UN0394	Trinitroresorcinol, wetted or Styphnic acid
UN0395	Rocket motors, liquid fueled
UN0396	Rocket motors, liquid fueled
UN0397	Rockets, liquid fueled
UN0398	Rockets, liquid fueled
UN0399	Bombs with flammable liquid
UN0400	Bombs with flammable liquid
UN0401	Dipicryl sulfide
UN0402	Ammonium perchlorate
UN0403	Flares, aerial
UN0404	Flares, aerial
UN0405	Cartridges, signal
UN0406	Dinitrosobenzene
UN0407	Tetrazol-1-acetic acid
UN0408	Fuzes, detonating
UN0409	Fuzes, detonating

UN0410	Fuzes, detonating
UN0411	Pentaerythrite tetranitrate or Pentaerythritol tetranitrate or PETN
UN0412	Cartridges for weapons
UN0413	Cartridges for weapons, blank
UN0414	Charges, propelling, for cannon
UN0415	Charges, propelling
UN0417	Cartridges for weapons, inert projectile or Cartridges, small arms
UN0418	Flares, surface
UN0419	Flares, surface
UN0420	Flares, aerial
UN0421	Flares, aerial
UN0424	Projectiles
UN0425	Projectiles
UN0426	Projectiles
UN0427	Projectiles
UN0428	Articles, pyrotechnic
UN0429	Articles, pyrotechnic
UN0430	Articles, pyrotechnic
UN0431	Articles, pyrotechnic
UN0432	Articles, pyrotechnic
UN0433	Powder cake, wetted or Powder paste, wetted
UN0434	Projectiles
UN0435	Projectiles
UN0436	Rockets
UN0437	Rockets
UN0438	Rockets
UN0439	Charges, shaped
UN0440	Charges, shaped
UN0441	Charges, shaped
UN0442	Charges, explosive, commercial
UN0443	Charges, explosive, commercial
UN0444	Charges, explosive, commercial
UN0445	Charges, explosive, commercial
UN0446	Cases, combustible, empty, without primer
UN0447	Cases, combustible, empty, without primer
UN0448	5-Mercaptotetrazol-1-acetic acid
UN0449	Torpedoes, liquid fueled
UN0450	Torpedoes, liquid fueled
UN0451	Torpedoes
UN0452	Grenades, practice
UN0453	Rockets, line-throwing
UN0454	Igniters
UN0455	Detonators, non-electric
UN0456	Detonators, electric
UN0457	Charges, bursting, plastics bonded
UN0458	Charges, bursting, plastics bonded
UN0459	Charges, bursting, plastics bonded
UN0460	Charges, bursting, plastics bonded
UN0461	Components, explosive train, n.o.s.
UN0462	Articles, explosive, n.o.s.
UN0463	Articles, explosive, n.o.s.
UN0464	Articles, explosive, n.o.s.
UN0465	Articles, explosive, n.o.s.
UN0466	Articles, explosive, n.o.s.
UN0467	Articles, explosive, n.o.s.
UN0468	Articles, explosive, n.o.s.
UN0469	Articles, explosive, n.o.s.
UN0470	Articles, explosive, n.o.s.
UN0471	Articles, explosive, n.o.s.
UN0472	Articles, explosive, n.o.s.
UN0473	Substances, explosive, n.o.s.
UN0474	Substances, explosive, n.o.s.
UN0475	Substances, explosive, n.o.s.
UN0476	Substances, explosive, n.o.s.
UN0477	Substances, explosive, n.o.s.
UN0478	Substances, explosive, n.o.s.
UN0479	Substances, explosive, n.o.s.
UN0480	Substances, explosive, n.o.s.
UN0481	Substances, explosive, n.o.s.
UN0482	Substances, explosive, very insensitive, n.o.s. or Substances, EVI n.o.s.
UN0483	Cyclotrimethylenetrinitramine, desensitized or Cyclonite, desensitized or Hexogen, desensitized or RDX, desensitized
UN0484	Cyclotetramethylenetetranitramine, desensitized or Octogen, desensitized or HMX, desensitized
UN0485	Substances, explosive, n.o.s.
UN0486	Articles, explosive, extremely insensitive or Articles, EEI
UN0487	Signals, smoke
UN0488	Ammunition, practice
UN0489	Dinitroglycoluril or Dingu
UN0490	Nitrotriazolone or NTO
UN0491	Charges, propelling
UN0492	Signals, railway track, explosive
UN0493	Signals, railway track, explosive
UN0494	Jet perforating guns, charged
UN0495	Propellant, liquid
UN0496	Octonal
UN0497	Propellant, liquid
UN0498	Propellant, solid
UN0499	Propellant, solid
UN0500	Detonator assemblies, non-electric
UN0501	Propellant, solid
UN0502	Rockets
UN0503	Safety Devices, pyrotechnic
UN0504	1H-Tetrazole
UN0505	Signals, distress, *ship*
UN0506	Signals, distress, *ship*
UN0507	Signals, smoke
UN0508	1-Hydroxybenzotriazole, anhydrous, *dry or wetted with less than 20 percent water, by mass*
UN0509	Powder, smokeless
UN1001	Acetylene, dissolved
UN1002	Air, compressed
UN1003	Air, refrigerated liquid
UN1003	Air, refrigerated liquid
UN1005	Ammonia, anhydrous
UN1006	Argon, compressed
UN1008	Boron trifluoride
UN1009	Bromotrifluoromethane or Refrigerant gas, R 13B1
UN1010	Butadienes, stabilized
UN1011	Butane
UN1012	Butylene
UN1013	Carbon dioxide
UN1016	Carbon monoxide, compressed
UN1017	Chlorine
UN1018	Chlorodifluoromethane or Refrigerant gas R 22
UN1020	Chloropentafluoroethane or Refrigerant gas R 115
UN1021	1-Chloro-1,2,2,2-tetrafluoroethane or Regrigerant gas R 124
UN1022	Chlorotrifluoromethane or Refrigerant gas R 13
UN1023	Coal gas, compressed
UN1026	Cyanogen
UN1027	Cyclopropane
UN1028	Dichlorodifluoromethane or Refrigerant

	gas R 12
UN1029	Dichlorofluoromethane or Refrigerant gas R21
UN1030	1,1-Difluoroethane or Refrigerant gas R 152a
UN1032	Dimethylamine, anhydrous
UN1033	Dimethyl ether
UN1035	Ethane
UN1036	Ethylamine
UN1037	Ethyl chloride
UN1038	Ethylene, refrigerated liquid
UN1039	Ethyl methyl ether
UN1040	Ethylene oxide or Ethylene oxide with nitrogen
UN1041	Ethylene oxide and carbon dioxide mixtures
UN1043	Fertilizer ammoniating solution
UN1044	Fire extinguishers
UN1045	Fluorine, compressed
UN1046	Helium, compressed
UN1048	Hydrogen bromide, anhydrous
UN1049	Hydrogen, compressed
UN1050	Hydrogen chloride, anhydrous
UN1051	Hydrogen cyanide, stabilized
UN1052	Hydrogen fluoride, anhydrous
UN1053	Hydrogen sulfide
UN1055	Isobutylene
UN1056	Krypton, compressed
UN1057	Lighters or Lighter refills
UN1058	Liquefied gases
UN1060	Methyl acetylene and propadiene mixtures, stabilized
UN1061	Methylamine, anhydrous
UN1062	Methyl bromide
UN1063	Methyl chloride or Refrigerant gas R 40
UN1064	Methyl mercaptan
UN1065	Neon, compressed
UN1066	Nitrogen, compressed
UN1067	Dinitrogen tetroxide
UN1069	Nitrosyl chloride
UN1070	Nitrous oxide
UN1071	Oil gas, compressed
UN1072	Oxygen, compressed
UN1073	Oxygen, refrigerated liquid
UN1075	Petroleum gases, liquefied or Liquefied petroleum gas
UN1076	Phosgene
UN1077	Propylene
UN1078	Refrigerant gases, n.o.s.
UN1079	Sulfur dioxide
UN1080	Sulfur hexafluoride
UN1081	Tetrafluoroethylene, stabilized
UN1082	Trifluorochloroethylene, stabilized
UN1083	Trimethylamine, anhydrous
UN1085	Vinyl bromide, stabilized
UN1086	Vinyl chloride, stabilized
UN1087	Vinyl methyl ether, stabilized
UN1088	Acetal
UN1089	Acetaldehyde
UN1090	Acetone
UN1091	Acetone oils
UN1092	Acrolein, stabilized
UN1093	Acrylonitrile, stabilized
UN1098	Allyl alcohol
UN1099	Allyl bromide
UN1100	Allyl chloride
UN1104	Amyl acetates
UN1105	Pentanols
UN1106	Amylamines
UN1107	Amyl chlorides
UN1108	1-Pentene
UN1109	Amyl formates
UN1110	n-Amyl methyl ketone
UN1111	Amyl mercaptans
UN1112	Amyl nitrate
UN1113	Amyl nitrites
UN1114	Benzene
UN1120	Butanols
UN1123	Butyl acetates
UN1125	n-Butylamine
UN1126	1-Bromobutane
UN1127	Chlorobutanes
UN1128	n-Butyl formate
UN1129	Butyraldehyde
UN1130	Camphor oil
UN1131	Carbon disulfide
UN1133	Adhesives, *containing a flammable liquid*
UN1134	Chlorobenzene
UN1135	Ethylene chlorohydrin
UN1136	Coal tar distillates, flammable
UN1139	Coating solution
UN1143	Crotonaldehyde *or* Crotonaldehyde, stabilized
UN1144	Crotonylene
UN1145	Cyclohexane
UN1146	Cyclopentane
UN1147	Decahydronaphthalene
UN1148	Diacetone alcohol
UN1149	Dibutyl ethers
UN1150	1,2-Dichloroethylene
UN1152	Dichloropentanes
UN1153	Ethylene glycol diethyl ether
UN1154	Diethylamine
UN1155	Diethyl ether or Ethyl ether
UN1156	Diethyl ketone
UN1157	Diisobutyl ketone
UN1158	Diisopropylamine
UN1159	Diisopropyl ether
UN1160	Dimethylamine solution
UN1161	Dimethyl carbonate
UN1162	Dimethyldichlorosilane
UN1163	Dimethylhydrazine, unsymmetrical
UN1164	Dimethyl sulfide
UN1165	Dioxane
UN1166	Dioxolane
UN1167	Divinyl ether, stabilized
UN1169	Extracts, aromatic, liquid
UN1170	Ethanol or Ethyl alcohol or Ethanol solutions or Ethyl alcohol solutions
UN1171	Ethylene glycol monoethyl ether
UN1172	Ethylene glycol monoethyl ether acetate
UN1173	Ethyl acetate
UN1175	Ethylbenzene
UN1176	Ethyl borate
UN1177	2-Ethylbutyl acetate
UN1178	2-Ethylbutyraldehyde
UN1179	Ethyl butyl ether
UN1180	Ethyl butyrate
UN1181	Ethyl chloroacetate
UN1182	Ethyl chloroformate
UN1183	Ethyldichlorosilane
UN1184	Ethylene dichloride
UN1185	Ethyleneimine, stabilized
UN1188	Ethylene glycol monomethyl ether
UN1189	Ethylene glycol monomethyl ether acetate
UN1190	Ethyl formate

UN1191	Octyl aldehydes
UN1192	Ethyl lactate
UN1193	Ethyl methyl ketone or Methyl ethyl ketone
UN1194	Ethyl nitrite solutions
UN1195	Ethyl propionate
UN1196	Ethyltrichlorosilane
UN1197	Extracts, flavoring, liquid
UN1198	Formaldehyde, solutions, flammable
UN1199	Furaldehydes
UN1201	Fusel oil
UN1202	Diesel fuel
UN1202	Gas oil
UN1202	Heating oil, light
UN1203	Gasoline, *includes gasoline mixed with ethyly alcohol, with not more than 10% percent ; alcohol*
UN1204	Nitroglycerin solution in alcohol
UN1206	Heptanes
UN1207	Hexaldehyde
UN1208	Hexanes
UN1210	Printing ink or Printing ink related material
UN1212	Isobutanol or Isobutyl alcohol
UN1213	Isobutyl acetate
UN1214	Isobutylamine
UN1216	Isooctenes
UN1218	Isoprene, stabilized
UN1219	Isopropanol or Isopropyl alcohol
UN1220	Isopropyl acetate
UN1221	Isopropylamine
UN1222	Isopropyl nitrate
UN1223	Kerosene
UN1224	Ketones, liquid, n.o.s.
UN1228	Mercaptans, liquid, flammable, toxic, n.o.s. or Mercaptan mixtures, liquid, flammable, toxic, n.o.s.
UN1229	Mesityl oxide
UN1230	Methanol
UN1231	Methyl acetate
UN1233	Methylamyl acetate
UN1234	Methylal
UN1235	Methylamine, aqueous solution
UN1237	Methyl butyrate
UN1238	Methyl chloroformate
UN1239	Methyl chloromethyl ether
UN1242	Methyldichlorosilane
UN1243	Methyl formate
UN1244	Methylhydrazine
UN1245	Methyl isobutyl ketone
UN1246	Methyl isopropenyl ketone, stabilized
UN1247	Methyl methacrylate monomer, stabilized
UN1248	Methyl propionate
UN1249	Methyl propyl ketone
UN1250	Methyltrichlorosilane
UN1251	Methyl vinyl ketone, stabilized
UN1259	Nickel carbonyl
UN1261	Nitromethane
UN1262	Octanes
UN1263	Paint
UN1263	Paint related material
UN1264	Paraldehyde
UN1265	Pentanes
UN1266	Perfumery products
UN1267	Petroleum crude oil
UN1268	Petroleum distillates, n.o.s. or Petroleum products, n.o.s.
UN1272	Pine oil
UN1274	n-Propanol or Propyl alcohol, normal
UN1275	Propionaldehyde
UN1276	n-Propyl acetate
UN1277	Propylamine
UN1278	1-Chloropropane
UN1279	1,2-Dichloropropane
UN1280	Propylene oxide
UN1281	Propyl formates
UN1282	Pyridine
UN1286	Rosin oil
UN1287	Rubber solution
UN1288	Shale oil
UN1289	Sodium methylate solutions
UN1292	Tetraethyl silicate
UN1293	Tinctures, medicinal
UN1294	Toluene
UN1295	Trichlorosilane
UN1296	Triethylamine
UN1297	Trimethylamine, aqueous solutions
UN1298	Trimethylchlorosilane
UN1299	Turpentine
UN1300	Turpentine substitute
UN1301	Vinyl acetate, stabilized
UN1302	Vinyl ethyl ether, stabilized
UN1303	Vinylidene chloride, stabilized
UN1304	Vinyl isobutyl ether, stabilized
UN1305	Vinyltrichlorosilane, stabilized
UN1306	Wood preservatives, liquid
UN1307	Xylenes
UN1308	Zirconium suspended in a liquid
UN1309	Aluminum powder, coated
UN1310	Ammonium picrate, wetted
UN1312	Borneol
UN1313	Calcium resinate
UN1314	Calcium resinate, fused
UN1318	Cobalt resinate, precipitated
UN1320	Dinitrophenol, wetted
UN1321	Dinitrophenolates, wetted
UN1322	Dinitroresorcinol, wetted
UN1323	Ferrocerium
UN1324	Films, nitrocellulose base
UN1325	Flammable solids, organic, n.o.s.
UN1326	Hafnium powder, wetted
UN1328	Hexamethylenetetramine
UN1330	Manganese resinate
UN1331	Matches, strike anywhere
UN1332	Metaldehyde
UN1333	Cerium
UN1334	Naphthalene, crude or Naphthalene
UN1336	Nitroguanidine, wetted or Picrite, wetted *with not less than 20 percent water, by mass*
UN1337	Nitrostarch, wetted *with not less than 20 percent water, by mass*
UN1338	Phosphorus, amorphous
UN1339	Phosphorus heptasulfide
UN1340	Phosphorus pentasulfide
UN1341	Phosphorus sesquisulfide
UN1343	Phosphorus trisulfide
UN1345	Rubber scrap or Shoddy
UN1346	Silicon powder, amorphous
UN1347	Silver picrate, wetted
UN1348	Sodium dinitro-o-cresolate, wetted
UN1349	Sodium picramate, wetted
UN1350	Sulfur
UN1352	Titanium powder, wetted
UN1353	Fibers or Fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.
UN1355	Trinitrobenzoic acid, wetted
UN1356	Trinitrotoluene, wetted *or* TNT wetted ,

	with not less than 30 percent water, by mass
UN1357	Urea nitrate, wetted
UN1358	Zirconium powder, wetted
UN1360	Calcium phosphide
UN1361	Carbon
UN1362	Carbon, activated
UN1363	Copra
UN1364	Cotton waste, oily
UN1365	Cotton, wet
UN1372	Fibers, animal or Fibers, vegetable
UN1373	Fibers or Fabrics, animal or vegetable or Synthentic, n.o.s.
UN1374	Fish meal, unstablized or Fish scrap, unstablilized
UN1376	Iron oxide, spent, or Iron sponge, spent
UN1378	Metal catalyst, wetted
UN1379	Paper, unsaturated oil treated
UN1380	Pentaborane
UN1381	Phosphorus, white dry or Phosphorus, white, under water or Phosphorus white, in solution or Phosphorus, yellow dry or Phosphorus, yellow, under water or Phosphorus, yellow, in solution
UN1382	Potassium sulfide, anhydrous or Potassium sulfide
UN1383	Pyrophoric metals, n.o.s. or Pyrophoric alloys, n.o.s.
UN1384	Sodium dithionite or Sodium hydrosulfite
UN1385	Sodium sulfide, anhydrous or Sodium sulfide
UN1386	Seed cake
UN1387	Wool waste, wet
UN1389	Alkali metal amalgam, liquid
UN1390	Alkali metal amides
UN1391	Alkali metal dispersions, or Alkaline earth metal dispersions
UN1392	Alkaline earth metal amalgams, liquid
UN1393	Alkaline earth metal alloys, n.o.s.
UN1394	Aluminum carbide
UN1395	Aluminum ferrosilicon powder
UN1396	Aluminum powder, uncoated
UN1397	Aluminum phosphide
UN1398	Aluminum silicon powder, uncoated
UN1400	Barium
UN1401	Calcium
UN1402	Calcium carbide
UN1403	Calcium cyanamide
UN1404	Calcium hydride
UN1405	Calcium silicide
UN1407	Cesium or Caesium
UN1408	Ferrosilicon
UN1409	Metal hydrides, water reactive, n.o.s.
UN1410	Lithium aluminum hydride
UN1411	Lithium aluminum hydride, ethereal
UN1413	Lithium borohydride
UN1414	Lithium hydride
UN1415	Lithium
UN1417	Lithium silicon
UN1418	Magnesium, powder or Magnesium alloys, powder
UN1419	Magnesium aluminum phosphide
UN1420	Potassium, metal alloys, liquid
UN1421	Alkali metal alloys, liquid, n.o.s.
UN1422	Potassium sodium alloys, liquid
UN1423	Rubidium
UN1426	Sodium borohydride
UN1427	Sodium hydride
UN1428	Sodium
UN1431	Sodium methylate
UN1432	Sodium phosphide
UN1433	Stannic phosphide
UN1435	Zinc ashes
UN1436	Zinc powder or Zinc dust
UN1437	Zirconium hydride
UN1438	Aluminum nitrate
UN1439	Ammonium dichromate
UN1442	Ammonium perchlorate
UN1444	Ammonium persulfate
UN1445	Barium chlorate, solid
UN1446	Barium nitrate
UN1447	Barium perchlorate, solid
UN1448	Barium permanganate
UN1449	Barium peroxide
UN1450	Bromates, inorganic, n.o.s.
UN1451	Cesium nitrate or Caesium nitrate
UN1452	Calcium chlorate
UN1453	Calcium chlorite
UN1454	Calcium nitrate
UN1455	Calcium perchlorate
UN1456	Calcium permanganate
UN1457	Calcium peroxide
UN1458	Chlorate and borate mixtures
UN1459	Chlorate and magnesium chloride mixtures, solid
UN1461	Chlorates, inorganic, n.o.s.
UN1462	Chlorites, inorganic, n.o.s.
UN1463	Chromium trioxide, anhydrous
UN1465	Didymium nitrate
UN1466	Ferric nitrate
UN1467	Guanidine nitrate
UN1469	Lead nitrate
UN1470	Lead perchlorate, solid
UN1471	Lithium hypochlorite, dry or Lithium hypochlorite mixtures, dry
UN1472	Lithium peroxide
UN1473	Magnesium bromate
UN1474	Magnesium nitrate
UN1475	Magnesium perchlorate
UN1476	Magnesium peroxide
UN1477	Nitrates, inorganic, n.o.s.
UN1479	Oxidizing solid, n.o.s.
UN1481	Perchlorates, inorganic, n.o.s.
UN1482	Permanganates, inorganic, n.o.s.
UN1483	Peroxides, inorganic, n.o.s.
UN1484	Potassium bromate
UN1485	Potassium chlorate
UN1486	Potassium nitrate
UN1487	Potassium nitrate and sodium nitrite mixtures
UN1488	Potassium nitrite
UN1489	Potassium perchlorate
UN1490	Potassium permanganate
UN1491	Potassium peroxide
UN1492	Potassium persulfate
UN1493	Silver nitrate
UN1494	Sodium bromate
UN1495	Sodium chlorate
UN1496	Sodium chlorite
UN1498	Sodium nitrate
UN1499	Sodium nitrate and potassium nitrate mixtures
UN1500	Sodium nitrite
UN1502	Sodium perchlorate
UN1503	Sodium permanganate
UN1504	Sodium peroxide
UN1505	Sodium persulfate

UN1506	Strontium chlorate
UN1507	Strontium nitrate
UN1508	Strontium perchlorate
UN1509	Strontium peroxide
UN1510	Tetranitromethane
UN1511	Urea hydrogen peroxide
UN1512	Zinc ammonium nitrite
UN1513	Zinc chlorate
UN1514	Zinc nitrate
UN1515	Zinc permanganate
UN1516	Zinc peroxide
UN1517	Zirconium picramate, wetted
UN1541	Acetone cyanohydrin, stabilized
UN1544	Alkaloids, solid, n.o.s. or Alkaloid salts, solid, n.o.s.
UN1545	Allyl isothiocyanate, stabilized
UN1546	Ammonium arsenate
UN1547	Aniline
UN1548	Aniline hydrochloride
UN1549	Antimony compounds, inorganic, solid, n.o.s.
UN1550	Antimony lactate
UN1551	Antimony potassium tartrate
UN1553	Arsenic acid, liquid
UN1554	Arsenic acid, solid
UN1555	Arsenic bromide
UN1556	Arsenic compounds, liquid, n.o.s.
UN1557	Arsenic compounds, solid, n.o.s.
UN1558	Arsenic
UN1559	Arsenic pentoxide
UN1560	Arsenic trichloride
UN1561	Arsenic trioxide
UN1562	Arsenical dust
UN1564	Barium compounds, n.o.s.
UN1565	Barium cyanide
UN1566	Beryllium compounds, n.o.s.
UN1567	Beryllium, powder
UN1569	Bromoacetone
UN1570	Brucine
UN1571	Barium azide, wetted
UN1572	Cacodylic acid
UN1573	Calcium arsenate
UN1574	Calcium arsenate and calcium arsenite, mixtures, solid
UN1575	Calcium cyanide
UN1577	Chlorodinitrobenzenes, liquid
UN1578	Chloronitrobenzene, solid
UN1579	4-Chloro-o-toluidine hydrochloride, solid
UN1580	Chloropicrin
UN1581	Chloropicrin and methyl bromide mixtures
UN1582	Chloropicrin and methyl chloride mixtures
UN1583	Chloropicrin mixtures, n.o.s.
UN1585	Copper acetoarsenite
UN1586	Copper arsenite
UN1587	Copper cyanide
UN1588	Cyanides, inorganic, solid, n.o.s.
UN1589	Cyanogen chloride, stabilized
UN1590	Dichloroanilines, liquid
UN1591	o-Dichlorobenzene
UN1593	Dichloromethane
UN1594	Diethyl sulfate
UN1595	Dimethyl sulfate
UN1596	Dinitroanilines
UN1597	Dinitrobenzenes, liquid
UN1598	Dinitro-o-cresol
UN1599	Dinitrophenol solutions
UN1600	Dinitrotoluenes, molten
UN1601	Disinfectants, solid, toxic, n.o.s.
UN1602	Dyes, liquid, toxic, n.o.s. or Dye intermediates, liquid, toxic, n.o.s.
UN1603	Ethyl bromoacetate
UN1604	Ethylenediamine
UN1605	Ethylene dibromide
UN1606	Ferric arsenate
UN1607	Ferric arsenite
UN1608	Ferrous arsenate
UN1611	Hexaethyl tetraphosphate
UN1612	Hexaethyl tetraphosphate and compressed gas mixtures
UN1613	Hydrocyanic acid, aqueous solutions or hydrogen cyanide, aqueous solutions
UN1614	Hydrogen cyanide, stabilized
UN1616	Lead acetate
UN1617	Lead arsenates
UN1618	Lead arsenites
UN1620	Lead cyanide
UN1621	London purple
UN1622	Magnesium arsenate
UN1623	Mercuric arsenate
UN1624	Mercuric chloride
UN1625	Mercuric nitrate
UN1626	Mercuric potassium cyanide
UN1627	Mercurous nitrate
UN1629	Mercury acetate
UN1630	Mercury ammonium chloride
UN1631	Mercury benzoate
UN1634	Mercury bromides
UN1636	Mercury cyanide
UN1637	Mercury gluconate
UN1638	Mercury iodide
UN1639	Mercury nucleate
UN1640	Mercury oleate
UN1641	Mercury oxide
UN1642	Mercury oxycyanide, desensitized
UN1643	Mercury potassium iodide
UN1644	Mercury salicylate
UN1645	Mercury sulfates
UN1646	Mercury thiocyanate
UN1647	Methyl bromide and ethylene dibromide mixtures, liquid
UN1648	Acetonitrile
UN1649	Motor fuel anti-knock mixtures
UN1650	beta-Naphthylamine
UN1650	beta-Naphthylamine, solid
UN1651	Naphthylthiourea
UN1652	Naphthylurea
UN1653	Nickel cyanide
UN1654	Nicotine
UN1655	Nicotine compounds, solid, n.o.s. or Nicotine preparations, solid, n.o.s.
UN1656	Nicotine hydrochloride liquid or solution
UN1657	Nicotine salicylate
UN1658	Nicotine sulfate solution
UN1659	Nicotine tartrate
UN1660	Nitric oxide, compressed
UN1661	Nitroanilines (o-; m-; p-;)
UN1662	Nitrobenzene
UN1663	Nitrophenols (o-; m-; p-;)
UN1664	Nitrotoluenes, liquid
UN1665	Nitroxylenes, liquid
UN1669	Pentachloroethane
UN1670	Perchloromethyl mercaptan
UN1671	Phenol, solid
UN1672	Phenylcarbylamine chloride
UN1673	Phenylenediamines (o-; m-; p-;)
UN1674	Phenylmercuric acetate
UN1677	Potassium arsenate
UN1678	Potassium arsenite

UN1679	Potassium cuprocyanide
UN1680	Potassium cyanide, solid
UN1683	Silver arsenite
UN1684	Silver cyanide
UN1685	Sodium arsenate
UN1686	Sodium arsenite, aqueous solutions
UN1687	Sodium azide
UN1688	Sodium cacodylate
UN1689	Sodium cyanide, solid
UN1690	Sodium fluoride, solid
UN1691	Strontium arsenite
UN1692	Strychnine or Strychnine salts
UN1693	Tear gas substances, liquid, n.o.s.
UN1694	Bromobenzyl cyanides, liquid
UN1695	Chloroacetone, stabilized
UN1697	Chloroacetophenone, solid (CN)
UN1698	Diphenylamine chloroarsine
UN1699	Diphenylchloroarsine, liquid
UN1700	Tear gas candles
UN1701	Xylyl bromide, liquid
UN1702	1, 1, 2, 2-Tetrachloroethane
UN1704	Tetraethyl dithiopyrophosphate
UN1707	Thallium compounds, n.o.s.
UN1708	Toluidines , liquid
UN1709	2,4-Toluylenediamine, solid or 2,4-Toluenediamine, solid
UN1710	Trichloroethylene
UN1711	Xylidines, liquid
UN1712	Zinc arsenate or Zinc arsenite or Zinc arsenate and zinc arsenite mixtures
UN1713	Zinc cyanide
UN1714	Zinc phosphide
UN1715	Acetic anhydride
UN1716	Acetyl bromide
UN1717	Acetyl chloride
UN1718	Butyl acid phosphate
UN1719	Caustic alkali liquids, n.o.s.
UN1722	Allyl chloroformate
UN1723	Allyl iodide
UN1724	Allyltrichlorosilane, stabilized
UN1725	Aluminum bromide, anhydrous
UN1726	Aluminum chloride, anhydrous
UN1727	Ammonium hydrogendifluoride, solid
UN1728	Amyltrichlorosilane
UN1729	Anisoyl chloride
UN1730	Antimony pentachloride, liquid
UN1731	Antimony pentachloride, solutions
UN1732	Antimony pentafluoride
UN1733	Antimony trichloride, liquid
UN1733	Antimony trichloride, solid
UN1736	Benzoyl chloride
UN1737	Benzyl bromide
UN1738	Benzyl chloride *unstabilized*
UN1738	Benzyl chloride
UN1739	Benzyl chloroformate
UN1740	Hydrogendifluoride, solid, n.o.s
UN1741	Boron trichloride
UN1742	Boron trifluoride acetic acid complex, liquid
UN1743	Boron trifluoride propionic acid complex, liquid
UN1744	Bromine solutions
UN1744	Bromine
UN1745	Bromine pentafluoride
UN1746	Bromine trifluoride
UN1747	Butyltrichlorosilane
UN1748	Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry
UN1749	Chlorine trifluoride
UN1750	Chloroacetic acid, solution
UN1751	Chloroacetic acid, solid
UN1752	Chloroacetyl chloride
UN1753	Chlorophenyltrichlorosilane
UN1754	Chlorosulfonic acid (*with or without sulfur trioxide)*
UN1755	Chromic acid solution
UN1756	Chromic fluoride, solid
UN1757	Chromic fluoride, solution
UN1758	Chromium oxychloride
UN1759	Corrosive solids, n.o.s.
UN1760	Corrosive liquids, n.o.s.
UN1761	Cupriethylenediamine solution
UN1762	Cyclohexenyltrichlorosilane
UN1763	Cyclohexyltrichlorosilane
UN1764	Dichloroacetic acid
UN1765	Dichloroacetyl chloride
UN1766	Dichlorophenyltrichlorosilane
UN1767	Diethyldichlorosilane
UN1768	Difluorophosphoric acid, anhydrous
UN1769	Diphenyldichlorosilane
UN1770	Diphenylmethyl bromide
UN1771	Dodecyltrichlorosilane
UN1773	Ferric chloride, anhydrous
UN1774	Fire extinguisher charges
UN1775	Fluoroboric acid
UN1776	Fluorophosphoric acid anhydrous
UN1777	Fluorosulfonic acid
UN1778	Fluorosilicic acid
UN1779	Formic acid
UN1780	Fumaryl chloride
UN1781	Hexadecyltrichlorosilane
UN1782	Hexafluorophosphoric acid
UN1783	Hexamethylenediamine solution
UN1784	Hexyltrichlorosilane
UN1786	Hydrofluoric acid and Sulfuric acid mixtures
UN1787	Hydriodic acid
UN1788	Hydrobromic acid
UN1789	Hydrochloric acid
UN1790	Hydrofluoric acid
UN1791	Hypochlorite solutions
UN1792	Iodine monochloride
UN1793	Isopropyl acid phosphate
UN1794	Lead sulfate
UN1796	Nitrating acid mixtures *with more than 50 percent nitric acid*
UN1796	Nitrating acid mixtures *with not more than 50 percent nitric acid*
UN1798	Nitrohydrochloric acid
UN1799	Nonyltrichlorosilane
UN1800	Octadecyltrichlorosilane
UN1801	Octyltrichlorosilane
UN1802	Perchloric acid
UN1803	Phenolsulfonic acid, liquid
UN1804	Phenyltrichlorosilane
UN1805	Phosphoric acid solution
UN1806	Phosphorus pentachloride
UN1807	Phosphorus pentoxide
UN1808	Phosphorus tribromide
UN1809	Phosphorus trichloride
UN1810	Phosphorus oxychloride
UN1811	Potassium hydrogendifluoride solid
UN1812	Potassium fluoride, solid
UN1813	Potassium hydroxide, solid
UN1814	Potassium hydroxide, solution
UN1815	Propionyl chloride
UN1816	Propyltrichlorosilane

UN1817	Pyrosulfuryl chloride
UN1818	Silicon tetrachloride
UN1819	Sodium aluminate, solution
UN1823	Sodium hydroxide, solid
UN1824	Sodium hydroxide solution
UN1825	Sodium monoxide
UN1826	Nitrating acid mixtures, spent *with not more than 50 percent nitric acid*
UN1826	Nitrating acid mixtures, spent *with more than 50 percent nitric acid*
UN1827	Stannic chloride, anhydrous
UN1828	Sulfur chlorides
UN1829	Sulfur trioxide, stabilized
UN1830	Sulfuric acid *with more than 51 percent acid*
UN1831	Sulfuric acid, fuming *with 30 percent or more free sulfur trioxide*
UN1831	Sulfuric acid, fuming *with less than 30 percent free sulfur trioxide*
UN1832	Sulfuric acid, spent
UN1833	Sulfurous acid
UN1834	Sulfuryl chloride
UN1835	Tetramethylammonium hydroxide solution
UN1836	Thionyl chloride
UN1837	Thiophosphoryl chloride
UN1838	Titanium tetrachloride
UN1839	Trichloroacetic acid
UN1840	Zinc chloride, solution
UN1841	Acetaldehyde ammonia
UN1843	Ammonium dinitro-o-cresolate, solid
UN1845	Carbon dioxide, solid or Dry ice
UN1846	Carbon tetrachloride
UN1847	Potassium sulfide, hydrated
UN1848	Propionic acid
UN1849	Sodium sulfide, hydrated
UN1851	Medicine, liquid, toxic, n.o.s.
UN1854	Barium alloys, pyrophoric
UN1855	Calcium, pyrophoric or Calcium alloys, pyrophoric
UN1856	Rags, oily
UN1857	Textiles waste, wet
UN1858	Hexafluoropropylene, compressed or Refrigerant gas R 1216
UN1859	Silicon tetrafluoride
UN1860	Vinyl fluoride, stabilized
UN1862	Ethyl crotonate
UN1863	Fuel, aviation, turbine engine
UN1865	n-Propyl nitrate
UN1866	Resin solution
UN1868	Decaborane
UN1869	Magnesium or Magnesium alloys
UN1870	Potassium borohydride
UN1871	Titanium hydride
UN1872	Lead dioxide
UN1873	Perchloric acid *with more than 50 percent but not more than 72 percent acid, by mass*
UN1884	Barium oxide
UN1885	Benzidine
UN1886	Benzylidene chloride
UN1887	Bromochloromethane
UN1888	Chloroform
UN1889	Cyanogen bromide
UN1891	Ethyl bromide
UN1892	Ethyldichloroarsine
UN1894	Phenylmercuric hydroxide
UN1895	Phenylmercuric nitrate
UN1897	Tetrachloroethylene
UN1898	Acetyl iodide
UN1902	Diisooctyl acid phosphate
UN1903	Disinfectant, liquid, corrosive n.o.s.
UN1905	Selenic acid
UN1906	Sludge, acid
UN1907	Soda lime
UN1908	Chlorite solution
UN1910	Calcium oxide
UN1911	Diborane
UN1912	Methyl chloride and methylene chloride mixtures
UN1913	Neon, refrigerated liquid
UN1914	Butyl propionates
UN1915	Cyclohexanone
UN1916	2,2'-Dichlorodiethyl ether
UN1917	Ethyl acrylate, stabilized
UN1918	Isopropylbenzene
UN1919	Methyl acrylate, stabilized
UN1920	Nonanes
UN1921	Propyleneimine, stabilized
UN1922	Pyrrolidine
UN1923	Calcium dithionite or Calcium hydrosulfite
UN1928	Methyl magnesium bromide, in ethyl ether
UN1929	Potassium dithionite or Potassium hydrosulfite
UN1931	Zinc dithionite or Zinc hydrosulfite
UN1932	Zirconium scrap
UN1935	Cyanide solutions, n.o.s.
UN1938	Bromoacetic acid solution
UN1939	Phosphorus oxybromide
UN1940	Thioglycolic acid
UN1941	Dibromodifluoromethane
UN1942	Ammonium nitrate
UN1944	Matches, safety
UN1945	Matches, wax, Vesta
UN1950	Aerosols
UN1950	Aerosols, flammable, n.o.s.
UN1951	Argon, refrigerated liquid
UN1952	Ethylene oxide and carbon dioxide mixtures
UN1953	Compressed gas, toxic, flammable, n.o.s.
UN1954	Compressed gases, flammable, n.o.s.
UN1955	Compressed gas, toxic, n.o.s.
UN1956	Compressed gas, n.o.s.
UN1957	Deuterium, compressed
UN1958	1,2-Dichloro-1,1,2,2-Tetrafluoroethane or Refrigerant gas, R114
UN1959	1,1-Difluoroethylene or Refrigerant gas R 1132a
UN1961	Ethane, refrigerated liquid
UN1962	Ethylene
UN1963	Helium, refrigerated liquid
UN1964	Hydrocarbon gas mixture, compressed, n.o.s.
UN1965	Hydrocarbon gas mixture, liquefied, n.o.s.
UN1966	Hydrogen, refrigerated liquid
UN1967	Insecticide gases, toxic, n.o.s.
UN1968	Insecticide gases, n.o.s.
UN1969	Isobutane
UN1970	Krypton, refrigerated liquid (*cryogenic liquid)*
UN1971	Methane, compressed or Natural gas, compressed
UN1972	Methane, refrigerated liquid or Natural gas, refrigerated liquid
UN1973	Chlorodifluoromethane and chloropentafluoroethane mixture or Refrigerant gas R 502

UN1974	Chlorodifluorobromomethane or Refrigerant gas R 12B1
UN1975	Nitric oxide and dinitrogen tetroxide mixtures or Nitric oxide and nitrogen dioxide mixtures
UN1976	Octafluorocyclobutane or Refrigerant gas R C318
UN1977	Nitrogen, refrigerated liquid
UN1978	Propane see also Petroleum gases, liquefied
UN1982	Tetrafluoromethane or Refrigerant gas R 14
UN1983	1-Chloro-2,2,2-trifluoroethane or Refrigerant gas R 133a
UN1984	Trifluoromethane or Refrigerant gas R 23
UN1986	Alcohols, flammable, toxic, n.o.s.
UN1987	Alcohols, n.o.s
UN1988	Aldehydes, flammable, toxic, n.o.s.
UN1989	Aldehydes, n.o.s.
UN1990	Benzaldehyde
UN1991	Chloroprene, stabilized
UN1992	Flammable liquids, toxic, n.o.s.
UN1993	Flammable liquids, n.o.s.
UN1994	Iron pentacarbonyl
UN1999	Tars, liquid
UN2000	Celluloid
UN2001	Cobalt naphthenates, powder
UN2002	Celluloid, scrap
UN2004	Magnesium diamide
UN2006	Plastics, nitrocellulose-based, self-heating, n.o.s.
UN2008	Zirconium powder, dry
UN2009	Zirconium, dry
UN2010	Magnesium hydride
UN2011	Magnesium phosphide
UN2012	Potassium phosphide
UN2013	Strontium phosphide
UN2014	Hydrogen peroxide, aqueous solutions
UN2015	Hydrogen peroxide, stabilized or Hydrogen peroxide aqueous solutions, stabilized
UN2016	Ammunition, toxic, non-explosive
UN2017	Ammunition, tear-producing, non-explosive
UN2018	Chloroanilines, solid
UN2019	Chloroanilines, liquid
UN2020	Chlorophenols, solid
UN2021	Chlorophenols, liquid
UN2022	Cresylic acid
UN2023	Epichlorohydrin
UN2024	Mercury compounds, liquid, n.o.s.
UN2025	Mercury compounds, solid, n.o.s.
UN2026	Phenylmercuric compounds, n.o.s.
UN2027	Sodium arsenite, solid
UN2028	Bombs, smoke, non-explosive
UN2029	Hydrazine, anhydrous
UN2030	Hydrazine aqueous solutions
UN2031	Nitric acid *other than red fuming , with at least 65 percent, but not more than 70 percent nitric acid*
UN2031	Nitric acid *other than red fuming, with less than 65 percent nitric acid*
UN2031	Nitric acid *other than red fuming, with more than 70 percent nitric acid*
UN2031	Nitric acid *other than red fuming, with not more 20 percent nitric acid*
UN2032	Nitric acid, red fuming
UN2033	Potassium monoxide
UN2034	Hydrogen and Methane mixtures, compressed
UN2035	1,1,1-Trifluoroethane, compressed or Refrigerant gas R 143a
UN2036	Xenon, compressed
UN2037	Gas cartridges
UN2037	Receptacles, small, containing gas *or* gas cartridges *(flammable) without release device, not refillable and not exceeding 1 L capacity*
UN2037	Receptacles, small, containing gas *or* gas cartridges (*non-flammable) without release device, not refillable and not exceeding 1 L capacity*
UN2037	Receptacles, small, containing gas *or* gas cartridges (*oxidizing) without release device, not refillable and not exceeding 1 L capacity*
UN2038	Dinitrotoluenes
UN2044	2,2-Dimethylpropane
UN2045	Isobutyraldehyde or Isobutyl aldehyde
UN2046	Cymenes
UN2047	Dichloropropenes
UN2048	Dicyclopentadiene
UN2049	Diethylbenzene
UN2050	Diisobutylene, isomeric compounds
UN2051	2-Dimethylaminoethanol
UN2052	Dipentene
UN2053	Methyl isobutyl carbinol
UN2054	Morpholine
UN2055	Styrene monomer, stabilized
UN2056	Tetrahydrofuran
UN2057	Tripropylene
UN2058	Valeraldehyde
UN2059	Nitrocellulose, solution, flammable *with not more than 12.6 percent nitrogen, by mass, and not more than 55 percent nitrocellulose*
UN2067	Ammonium nitrate based fertilizers
UN2071	Ammonium nitrate based fertilizers
UN2073	Ammonia solutions
UN2074	Acrylamide, solid
UN2075	Chloral, anhydrous, stabilized
UN2076	Cresols, liquid
UN2077	alpha-Naphthylamine
UN2078	Toluene diisocyanate
UN2079	Diethylenetriamine
UN2186	Hydrogen chloride, refrigerated liquid
UN2187	Carbon dioxide, refrigerated liquid
UN2188	Arsine
UN2189	Dichlorosilane
UN2190	Oxygen difluoride, compressed
UN2191	Sulfuryl fluoride
UN2192	Germane
UN2193	Hexafluoroethane or Refrigerant gas R 116
UN2194	Selenium hexafluoride
UN2195	Tellurium hexafluoride
UN2196	Tungsten hexafluoride
UN2197	Hydrogen iodide, anhydrous
UN2198	Phosphorus
UN2199	Phosphine
UN2200	Propadiene, stabilized
UN2201	Nitrous oxide, refrigerated liquid
UN2202	Hydrogen selenide, anhydrous
UN2203	Silane
UN2204	Carbonyl sulfide
UN2205	Adiponitrile
UN2206	Isocyanates, toxic, n.o.s. or Isocyanate, solutions, toxic, n.o.s.
UN2208	Calcium hypochlorite mixtures, dry
UN2209	Formaldehyde, solutions

UN2210	Maneb or Maneb preparations
UN2211	Polymeric beads, expandable
UN2212	Blue asbestos or Brown asbestos
UN2213	Paraformaldehyde
UN2214	Phthalic anhydride
UN2215	Maleic anhydride
UN2215	Maleic anhydride, molten
UN2216	Fish meal, stabilized or Fish scrap, stabilized
UN2217	Seed cake
UN2218	Acrylic acid, stabilized
UN2219	Allyl glycidyl ether
UN2222	Anisole
UN2224	Benzonitrile
UN2225	Benzene sulfonyl chloride
UN2226	Benzotrichloride
UN2227	n-Butyl methacrylate, stabilized
UN2232	2-Chloroethanal
UN2233	Chloroanisidines
UN2234	Chlorobenzotrifluorides
UN2235	Chlorobenzyl chlorides, liquid
UN2236	3-Chloro-4-methylphenyl isocyanate, liquid
UN2237	Chloronitroanilines
UN2238	Chlorotoluenes
UN2239	Chlorotoluidines, solid
UN2240	Chromosulfuric acid
UN2241	Cycloheptane
UN2242	Cycloheptene
UN2243	Cyclohexyl acetate
UN2244	Cyclopentanol
UN2245	Cyclopentanone
UN2246	Cyclopentene
UN2247	n-Decane
UN2248	Di-n-butylamine
UN2249	Dichlorodimethyl ether, symmetrical
UN2250	Dichlorophenyl isocyanates
UN2251	Bicyclo[2,2,1]hepta-2,5-diene, stabilized or 2,5-Norbornadiene stabilized
UN2252	1,2-Dimethoxyethane
UN2253	N,N-Dimethylaniline
UN2254	Matches, fusee
UN2256	Cyclohexene
UN2257	Potassium
UN2258	1,2-Propylenediamine
UN2259	Triethylenetetramine
UN2260	Tripropylamine
UN2261	Xylenols, solid
UN2262	Dimethylcarbamoyl chloride
UN2263	Dimethylcyclohexanes
UN2264	N,N-Dimethylcyclohexylamine
UN2265	N,N-Dimethylformamide
UN2266	Dimethyl-N-propylamine
UN2267	Dimethyl thiophosphoryl chloride
UN2269	3,3'-Iminodipropylamine
UN2270	Ethylamine, aqueous solution
UN2271	Ethyl amyl ketone
UN2272	n-Ethylaniline
UN2273	2-Ethylaniline
UN2274	N-Ethyl-N-benzylaniline
UN2275	2-Ethylbutanol
UN2276	2-Ethylhexylamine
UN2277	Ethyl methacrylate, stabilized
UN2278	n-Heptene
UN2279	Hexachlorobutadiene
UN2280	Hexamethylenediamine, solid
UN2281	Hexamethylene diisocyanate
UN2282	Hexanols
UN2283	Isobutyl methacrylate, stabilized
UN2284	Isobutyronitrile
UN2285	Isocyanatobenzotrifluorides
UN2286	Pentamethylheptane
UN2287	Isoheptenes
UN2288	Isohexenes
UN2289	Isophoronediamine
UN2290	Isophorone diisocyanate
UN2291	Lead compounds, soluble, n.o.s.
UN2293	4-Methoxy-4-methylpentan-2-one
UN2294	N-Methylaniline
UN2295	Methyl chloroacetate
UN2296	Methylcyclohexane
UN2297	Methylcyclohexanone
UN2298	Methylcyclopentane
UN2299	Methyl dichloroacetate
UN2300	2-Methyl-5-ethylpyridine
UN2301	2-Methylfuran
UN2302	5-Methylhexan-2-one
UN2303	Isopropenylbenzene
UN2304	Naphthalene, molten
UN2305	Nitrobenzenesulfonic acid
UN2306	Nitrobenzotrifluorides, liquid
UN2307	3-Nitro-4-chlorobenzotrifluoride
UN2308	Nitrosylsulfuric acid, liquid
UN2309	Octadiene
UN2310	Pentane-2,4-dione
UN2311	Phenetidines
UN2312	Phenol, molten
UN2313	Picolines
UN2315	Polychlorinated biphenyls, liquid
UN2316	Sodium cuprocyanide, solid
UN2317	Sodium cuprocyanide, solution
UN2318	Sodium hydrosulfide
UN2319	Terpene hydrocarbons, n.o.s.
UN2320	Tetraethylenepentamine
UN2321	Trichlorobenzenes, liquid
UN2322	Trichlorobutene
UN2323	Triethyl phosphite
UN2324	Triisobutylene
UN2325	1,3,5-Trimethylbenzene
UN2326	Trimethylcyclohexylamine
UN2327	Trimethylhexamethylenediamines
UN2328	Trimethylhexamethylene diisocyanate
UN2329	Trimethyl phosphite
UN2330	Undecane
UN2331	Zinc chloride, anhydrous
UN2332	Acetaldehyde oxime
UN2333	Allyl acetate
UN2334	Allylamine
UN2335	Allyl ethyl ether
UN2336	Allyl formate
UN2337	Phenyl mercaptan
UN2338	Benzotrifluoride
UN2339	2-Bromobutane
UN2340	2-Bromoethyl ethyl ether
UN2341	1-Bromo-3-methylbutane
UN2342	Bromomethylpropanes
UN2343	2-Bromopentane
UN2344	Bromopropanes
UN2345	3-Bromopropyne
UN2346	Butanedione
UN2347	Butyl mercaptans
UN2348	Butyl acrylates, stabilized
UN2350	Butyl methyl ether
UN2351	Butyl nitrites
UN2352	Butyl vinyl ether, stabilized
UN2353	Butyryl chloride
UN2354	Chloromethyl ethyl ether
UN2356	2-Chloropropane

UN2357	Cyclohexylamine
UN2358	Cyclooctatetraene
UN2359	Diallylamine
UN2360	Diallylether
UN2361	Diisobutylamine
UN2362	1,1-Dichloroethane
UN2363	Ethyl mercaptan
UN2364	n-Propyl benzene
UN2366	Diethyl carbonate
UN2367	alpha-Methylvaleraldehyde
UN2368	alpha-Pinene
UN2370	1-Hexene
UN2371	Isopentenes
UN2372	1,2-Di-(dimethylamino)ethane
UN2373	Diethoxymethane
UN2374	3,3-Diethoxypropene
UN2375	Diethyl sulfide
UN2376	2,3-Dihydropyran
UN2377	1,1-Dimethoxyethane
UN2378	2-Dimethylaminoacetonitrile
UN2379	1,3-Dimethylbutylamine
UN2380	Dimethyldiethoxysilane
UN2381	Dimethyl disulfide
UN2382	Dimethylhydrazine, symmetrical
UN2383	Dipropylamine
UN2384	Di-n-propyl ether
UN2385	Ethyl isobutyrate
UN2386	1-Ethylpiperidine
UN2387	Fluorobenzene
UN2388	Fluorotoluenes
UN2389	Furan
UN2390	2-Iodobutane
UN2391	Iodomethylpropanes
UN2392	Iodopropanes
UN2393	Isobutyl formate
UN2394	Isobutyl propionate
UN2395	Isobutyryl chloride
UN2396	Methacrylaldehyde, stabilized
UN2397	3-Methylbutan-2-one
UN2398	Methyl tert-butyl ether
UN2399	1-Methylpiperidine
UN2400	Methyl isovalerate
UN2401	Piperidine
UN2402	Propanethiols
UN2403	Isopropenyl acetate
UN2404	Propionitrile
UN2405	Isopropyl butyrate
UN2406	Isopropyl isobutyrate
UN2407	Isopropyl chloroformate
UN2409	Isopropyl propionate
UN2410	1,2,3,6-Tetrahydropyridine
UN2411	Butyronitrile
UN2412	Tetrahydrothiophene
UN2413	Tetrapropylorthotitanate
UN2414	Thiophene
UN2416	Trimethyl borate
UN2417	Carbonyl fluoride
UN2418	Sulfur tetrafluoride
UN2419	Bromotrifluoroethylene
UN2420	Hexafluoroacetone
UN2421	Nitrogen trioxide
UN2422	Octafluorobut-2-ene or Refrigerant gas R 1318
UN2424	Octafluoropropane or Refrigerant gas R 218
UN2426	Ammonium nitrate, liquid
UN2427	Potassium chlorate, aqueous solution
UN2428	Sodium chlorate, aqueous solution
UN2429	Calcium chlorate aqueous solution
UN2430	Alkylphenols, solid, n.o.s.
UN2431	Anisidines
UN2432	N,N-Diethylaniline
UN2433	Chloronitrotoluenes, liquid
UN2434	Dibenzyldichlorosilane
UN2435	Ethylphenyldichlorosilane
UN2436	Thioacetic acid
UN2437	Methylphenyldichlorosilane
UN2438	Trimethylacetyl chloride
UN2439	Sodium hydrogendifluoride
UN2440	Stannic chloride, pentahydrate
UN2441	Titanium trichloride, pyrophoric or Titanium trichloride mixtures, pyrophoric
UN2442	Trichloroacetyl chloride
UN2443	Vanadium oxytrichloride
UN2444	Vanadium tetrachloride
UN2446	Nitrocresols, solid
UN2447	Phosphorus white, molten
UN2448	Sulfur, molten
UN2451	Nitrogen trifluoride
UN2452	Ethylacetylene, stabilized
UN2453	Ethyl fluoride or Refrigerant gas R 161
UN2454	Methyl fluoride or Refrigerant gas R 41
UN2456	2-Chloropropene
UN2457	2,3-Dimethylbutane
UN2458	Hexadienes
UN2459	2-Methyl-1-butene
UN2460	2-Methyl-2-butene
UN2461	Methylpentadienes
UN2463	Aluminum hydride
UN2464	Beryllium nitrate
UN2465	Dichloroisocyanuric acid, dry or Dichloroisocyanuric acid salts
UN2466	Potassium superoxide
UN2468	Trichloroisocyanuric acid, dry
UN2469	Zinc bromate
UN2470	Phenylacetonitrile, liquid
UN2471	Osmium tetroxide
UN2473	Sodium arsanilate
UN2474	Thiophosgene
UN2475	Vanadium trichloride
UN2477	Methyl isothiocyanate
UN2478	Isocyanates, flammable, toxic, n.o.s. or Isocyanate solutions, flammable, toxic, n.o.s.
UN2480	Methyl isocyanate
UN2481	Ethyl isocyanate
UN2482	n-Propyl isocyanate
UN2483	Isopropyl isocyanate
UN2484	tert-Butyl isocyanate
UN2485	n-Butyl isocyanate
UN2486	Isobutyl isocyanate
UN2487	Phenyl isocyanate
UN2488	Cyclohexyl isocyanate
UN2490	Dichloroisopropyl ether
UN2491	Ethanolamine or Ethanolamine solutions
UN2493	Hexamethyleneimine
UN2495	Iodine pentafluoride
UN2496	Propionic anhydride
UN2498	1,2,3,6-Tetrahydrobenzaldehyde
UN2501	Tris-(1-aziridinyl)phosphine oxide, solution
UN2502	Valeryl chloride
UN2503	Zirconium tetrachloride
UN2504	Tetrabromoethane
UN2505	Ammonium fluoride
UN2506	Ammonium hydrogen sulfate
UN2507	Chloroplatinic acid, solid
UN2508	Molybdenum pentachloride

UN2509	Potassium hydrogen sulfate
UN2511	2-Chloropropionic acid
UN2513	Bromoacetyl bromide
UN2514	Bromobenzene
UN2515	Bromoform
UN2516	Carbon tetrabromide
UN2517	1-Chloro-1,1-difluoroethanes or Regrigerant gas R 142b
UN2518	1,5,9-Cyclododecatriene
UN2520	Cyclooctadienes
UN2521	Diketene, stabilized
UN2522	2-Dimethylaminoethyl methacrylate
UN2524	Ethyl orthoformate
UN2525	Ethyl oxalate
UN2526	Furfurylamine
UN2527	Isobutyl acrylate, stabilized
UN2528	Isobutyl isobutyrate
UN2529	Isobutyric acid
UN2531	Methacrylic acid, stabilized
UN2533	Methyl trichloroacetate
UN2534	Methylchlorosilane
UN2535	4-Methylmorpholine or n-methylmorpholine
UN2536	Methyltetrahydrofuran
UN2538	Nitronaphthalene
UN2541	Terpinolene
UN2542	Tributylamine
UN2545	Hafnium powder, dry
UN2546	Titanium powder, dry
UN2547	Sodium superoxide
UN2548	Chlorine pentafluoride
UN2552	Hexafluoroacetone hydrate, liquid
UN2554	Methyl allyl chloride
UN2555	Nitrocellulose with water *with not less than 25 percent water, by mass*
UN2556	Nitrocellulose with alcohol *with not less than 25 percent alcohol by mass, and with not more than 12.6 percent nitrogen, by dry mass*
UN2557	Nitrocellulose, *with not more than 12.6 percent, by dry mass* mixture with *or* without plasticizer, with *or* without pigment
UN2558	Epibromohydrin
UN2560	2-Methylpentan-2-ol
UN2561	3-Methyl-1-butene
UN2564	Trichloroacetic acid, solution
UN2565	Dicyclohexylamine
UN2567	Sodium pentachlorophenate
UN2570	Cadmium compounds
UN2571	Alkylsulfuric acids
UN2572	Phenylhydrazine
UN2573	Thallium chlorate
UN2574	Tricresyl phosphate
UN2576	Phosphorus oxybromide, molten
UN2577	Phenylacetyl chloride
UN2578	Phosphorus trioxide
UN2579	Piperazine
UN2580	Aluminum bromide, solution
UN2581	Aluminum chloride, solution
UN2582	Ferric chloride, solution
UN2583	Alkyl sulfonic acids, solid or Aryl sulfonic acids, solid
UN2584	Alkyl sulfonic acids, liquid or Aryl sulfonic acids, liquid *with more than 5 percent free sulfuric acid*
UN2585	Alkyl sulfonic acids, solid or Aryl sulfonic acids, solid
UN2586	Alkyl sulfonic acids, liquid or Aryl sulfonic acids, liquid
UN2587	Benzoquinone
UN2588	Pesticides, solid, toxic, n.o.s.
UN2589	Vinyl chloroacetate
UN2590	White asbestos
UN2591	Xenon, refrigerated liquid
UN2599	Chlorotrifluoromethane and trifluoromethane azeotropic mixture or Refrigerant gas R 503
UN2601	Cyclobutane
UN2602	Dichlorodifluoromethane and difluoroethane azeotropic mixture or Refrigerant gas R 500
UN2603	Cycloheptatriene
UN2604	Boron trifluoride diethyl etherate
UN2605	Methoxymethyl isocyanate
UN2606	Methyl orthosilicate
UN2607	Acrolein dimer, stabilized
UN2608	Nitropropanes
UN2609	Triallyl borate
UN2610	Triallylamine
UN2611	Propylene chlorohydrin
UN2612	Methyl propyl ether
UN2614	Methallyl alcohol
UN2615	Ethyl propyl ether
UN2616	Triisopropyl borate
UN2617	Methylcyclohexanols
UN2618	Vinyltoluenes, stabilized
UN2619	Benzyldimethylamine
UN2620	Amyl butyrates
UN2621	Acetyl methyl carbinol
UN2622	Glycidaldehyde
UN2623	Firelighters, solid
UN2624	Magnesium silicide
UN2626	Chloric acid aqueous solution
UN2627	Nitrites, inorganic, n.o.s.
UN2628	Potassium fluoroacetate
UN2629	Sodium fluoroacetate
UN2630	Selenates or Selenites
UN2642	Fluoroacetic acid
UN2643	Methyl bromoacetate
UN2644	Methyl iodide
UN2645	Phenacyl bromide
UN2646	Hexachlorocyclopentadiene
UN2647	Malononitrile
UN2648	1,2-Dibromobutan-3-one
UN2649	1,3-Dichloroacetone
UN2650	1,1-Dichloro-1-nitroethane
UN2651	4,4'-Diaminodiphenyl methane
UN2653	Benzyl iodide
UN2655	Potassium fluorosilicate
UN2656	Quinoline
UN2657	Selenium disulfide
UN2659	Sodium chloroacetate
UN2660	Nitrotoluidines (mono)
UN2661	Hexachloroacetone
UN2664	Dibromomethane
UN2667	Butyltoluenes
UN2668	Chloroacetonitrile
UN2669	Chlorocresols solution
UN2670	Cyanuric chloride
UN2671	Aminopyridines (o-; m-; p-)
UN2672	Ammonia solutions
UN2673	2-Amino-4-chlorophenol
UN2674	Sodium fluorosilicate
UN2676	Stibine
UN2677	Rubidium hydroxide solution
UN2678	Rubidium hydroxide
UN2679	Lithium hydroxide, solution
UN2680	Lithium hydroxide

UN2681	Caesium hydroxide solution
UN2682	Caesium hydroxide
UN2683	Ammonium sulfide solution
UN2684	3-Diethylamino-propylamine
UN2685	N,N-Diethylethylenediamine
UN2686	2-Diethylaminoethanol
UN2687	Dicyclohexylammonium nitrite
UN2688	1-Bromo-3-chloropropane
UN2689	Glycerol alpha-monochlorohydrin
UN2690	N-n-Butyl imidazole
UN2691	Phosphorus pentabromide
UN2692	Boron tribromide
UN2693	Bisulfites, aqueous solutions, n.o.s.
UN2698	Tetrahydrophthalic anhydrides
UN2699	Trifluoroacetic acid
UN2705	1-Pentol
UN2707	Dimethyldioxanes
UN2709	Butyl benzenes
UN2710	Dipropyl ketone
UN2713	Acridine
UN2714	Zinc resinate
UN2715	Aluminum resinate
UN2716	1,4-Butynediol
UN2717	Camphor
UN2719	Barium bromate
UN2720	Chromium nitrate
UN2721	Copper chlorate
UN2722	Lithium nitrate
UN2723	Magnesium chlorate
UN2724	Manganese nitrate
UN2725	Nickel nitrate
UN2726	Nickel nitrite
UN2727	Thallium nitrate
UN2728	Zirconium nitrate
UN2729	Hexachlorobenzene
UN2730	Nitroanisole, liquid
UN2732	Nitrobromobenzenes, liquid
UN2733	Amines, flammable, corrosive, n.o.s. or Polyamines, flammable, corrosive, n.o.s.
UN2734	Amines, liquid, corrosive, flammable, n.o.s. or Polyamines, liquid, corrosive, flammable, n.o.s.
UN2735	Amines, liquid, corrosive, n.o.s. or Polyamines, liquid, corrosive, n.o.s.
UN2738	N-Butylaniline
UN2739	Butyric anhydride
UN2740	n-Propyl chloroformate
UN2741	Barium hypochlorite *with more than 22 percent available chlorine*
UN2742	Chloroformates, toxic, corrosive, flammable, n.o.s.
UN2743	n-Butyl chloroformate
UN2744	Cyclobutyl chloroformate
UN2745	Chloromethyl chloroformate
UN2746	Phenyl chloroformate
UN2747	tert-Butylcyclohexylchloroformate
UN2748	2-Ethylhexyl chloroformate
UN2749	Tetramethylsilane
UN2750	1,3-Dichloropropanol-2
UN2751	Diethylthiophosphoryl chloride
UN2752	1,2-Epoxy-3-ethoxypropane
UN2753	N-Ethylbenzyltoluidines liquid
UN2754	N-Ethyltoluidines
UN2757	Carbamate pesticides, solid, toxic
UN2758	Carbamate pesticides, liquid, flammable, toxic
UN2759	Arsenical pesticides, solid, toxic
UN2760	Arsenical pesticides, liquid, flammable, toxic
UN2761	Organochlorine pesticides, solid toxic
UN2762	Organochlorine pesticides liquid, flammable, toxic
UN2763	Triazine pesticides, solid, toxic
UN2764	Triazine pesticides, liquid, flammable, toxic
UN2771	Thiocarbamate pesticides, solid, toxic
UN2772	Thiocarbamate pesticide, liquid, flammable, toxic
UN2775	Copper based pesticides, solid, toxic
UN2776	Copper based pesticides, liquid, flammable, toxic
UN2777	Mercury based pesticides, solid, toxic
UN2778	Mercury based pesticides, liquid, flammable, toxic
UN2779	Substituted nitrophenol pesticides, solid, toxic
UN2780	Substituted nitrophenol pesticides, liquid, flammable, toxic
UN2781	Bipyridilium pesticides, solid, toxic
UN2782	Bipyridilium pesticides, liquid, flammable, toxic
UN2783	Organophosphorus pesticides, solid, toxic
UN2784	Organophosphorus pesticides, liquid, flammable, toxic
UN2785	4-Thiapentanal
UN2786	Organotin pesticides, solid, toxic
UN2787	Organotin pesticides, liquid, flammable, toxic
UN2788	Organotin compounds, liquid, n.o.s.
UN2789	Acetic acid, glacial or Acetic acid solution
UN2790	Acetic acid solution
UN2793	Ferrous metal borings or Ferrous metal shavings or Ferrous metal turnings or Ferrous metal cuttings
UN2794	Batteries, wet, filled with acid, *electric storage*
UN2795	Batteries, wet, filled with alkali, *electric storage*
UN2796	Battery fluid, acid
UN2796	Sulfuric acid *with not more than 51% percent; acid*
UN2797	Battery fluid, alkali
UN2798	Phenyl phosphorus dichloride
UN2799	Phenyl phosphorus thiodichloride
UN2800	Batteries, wet, non-spillable, *electric storage*
UN2801	Dyes, liquid, corrosive n.o.s. or Dye intermediates, liquid, n.o.s.
UN2802	Copper chloride
UN2803	Gallium
UN2805	Lithium hydride, fused solid
UN2806	Lithium nitride
UN2809	Mercury
UN2810	Toxic, liquids, organic, n.o.s.
UN2811	Toxic solids, organic, n.o.s.
UN2812	Sodium aluminate, solid
UN2813	Water-reactive solid, n.o.s.
UN2814	Infectious substances, affecting humans
UN2815	N-Aminoethylpiperazine
UN2817	Ammonium hydrogendifluoride, solution
UN2818	Ammonium polysulfide, solution
UN2819	Amyl acid phosphate
UN2820	Butyric acid
UN2821	Phenol solutions
UN2822	2-Chloropyridine
UN2823	Crotonic acid

UN2826	Ethyl chlorothioformate
UN2829	Caproic acid
UN2830	Lithium ferrosilicon
UN2831	1,1,1-Trichloroethane
UN2834	Phosphorous acid
UN2835	Sodium aluminum hydride
UN2837	Bisulfate, aqueous solution
UN2838	Vinyl butyrate, stabilized
UN2839	Aldol
UN2840	Butyraldoxime
UN2841	Di-n-amylamine
UN2842	Nitroethane
UN2844	Calcium manganese silicon
UN2845	Pyrophoric liquids, organic, n.o.s.
UN2846	Pyrophoric solids, organic, n.o.s.
UN2849	3-Chloropropanol-1
UN2850	Propylene tetramer
UN2851	Boron trifluoride dihydrate
UN2852	Dipicryl sulfide, wetted
UN2853	Magnesium fluorosilicate
UN2854	Ammonium fluorosilicate
UN2855	Zinc fluorosilicate
UN2856	Fluorosilicates, n.o.s.
UN2857	Refrigerating machines
UN2858	Zirconium, dry
UN2859	Ammonium metavanadate
UN2861	Ammonium polyvanadate
UN2862	Vanadium pentoxide
UN2863	Sodium ammonium vanadate
UN2864	Potassium metavanadate
UN2865	Hydroxylamine sulfate
UN2869	Titanium trichloride mixtures
UN2870	Aluminum borohydride or Aluminum borohydride in devices
UN2871	Antimony powder
UN2872	Dibromochloropropane
UN2873	Dibutylaminoethanol
UN2874	Furfuryl alcohol
UN2875	Hexachlorophene
UN2876	Resorcinol
UN2878	Titanium sponge granules or Titanium sponge powders
UN2879	Selenium oxychloride
UN2880	Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixtures
UN2881	Metal catalyst, dry
UN2900	Infectious substances, affecting animals
UN2901	Bromine chloride
UN2902	Pesticides, liquid, toxic, n.o.s.
UN2903	Pesticides, liquid, toxic, flammable, n.o.s.
UN2904	Chlorophenolates, liquid or Phenolates, liquid
UN2905	Chlorophenolates, solid or Phenolates, solid
UN2907	Isosorbide dinitrate mixture
UN2908	Radioactive material,excepted package-empty packaging
UN2909	Radioactive material, execpted package-articles maufactured from natural uranium or depleted uranium or natural thorium
UN2910	Radioactive material, excepted package-limited quantity of material
UN2911	Radioactive material, excepted package-instruments or articles
UN2912	Radioactive material, low specific activity (LSA-I).
UN2913	Radioactive material, surface contaminated objects (SCO-I or SCO-II)
UN2915	Radioactive material, Type A package
UN2916	Radioactive material, Type B(U) package
UN2917	Radioactive material, Type B(M) package
UN2919	Radioactive material, transported under special arrangement
UN2920	Corrosive liquids, flammable, n.o.s.
UN2921	Corrosive solids, flammable, n.o.s.
UN2922	Corrosive liquids, toxic, n.o.s.
UN2923	Corrosive solids, toxic, n.o.s.
UN2924	Flammable liquids, corrosive, n.o.s.
UN2925	Flammable solids, corrosive, organic, n.o.s.
UN2926	Flammable solids, toxic, organic, n.o.s.
UN2927	Toxic liquids, corrosive, organic, n.o.s.
UN2928	Toxic solids, corrosive, organic, n.o.s.
UN2929	Toxic liquids, flammable, organic, n.o.s.
UN2930	Toxic solids, flammable, organic, n.o.s.
UN2931	Vanadyl sulfate
UN2933	Methyl 2-chloropropionate
UN2934	Isopropyl 2-chloropropionate
UN2935	Ethyl 2-chloropropionate
UN2936	Thiolactic acid
UN2937	alpha-Methylbenzyl alcohol, liquid
UN2940	9-Phosphabicyclononanes or Cyclooctadiene phosphines
UN2941	Fluoroanilines
UN2942	2-Trifluoromethylaniline
UN2943	Tetrahydrofurfurylamine
UN2945	N-Methylbutylamine
UN2946	2-Amino-5-diethylaminopentane
UN2947	Isopropyl chloroacetate
UN2948	3-Trifluoromethylaniline
UN2949	Sodium hydrosulfide
UN2950	Magnesium granules, coated
UN2956	5-tert-Butyl-2,4,6-trinitro-m-xylene or Musk xylene
UN2965	Boron trifluoride dimethyl etherate
UN2966	Thioglycol
UN2967	Sulfamic acid
UN2968	Maneb stabilized or Maneb preparations, stabilized
UN2969	Castor beans or Castor meal or Castor pomace or Castor flake
UN2977	Radioactive material, uranium hexafluoride, fissile
UN2978	Radioactive material,uranium hexafluoride
UN2983	Ethylene oxide and propylene oxide mixtures
UN2984	Hydrogen peroxide, aqueous solutions
UN2985	Chlorosilanes, flammable, corrosive, n.o.s.
UN2986	Chlorosilanes, corrosive, flammable, n.o.s.
UN2987	Chlorosilanes, corrosive, n.o.s.
UN2988	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s.
UN2989	Lead phosphite, dibasic
UN2990	Life-saving appliances, self inflating
UN2991	Carbamate pesticides, liquid, toxic, flammable
UN2992	Carbamate pesticides, liquid, toxic
UN2993	Arsenical pesticides, liquid, toxic, flammable
UN2994	Arsenical pesticides, liquid, toxic
UN2995	Organochlorine pesticides, liquid, toxic, flammable
UN2996	Organochlorine pesticides, liquid, toxic
UN2997	Triazine pesticides, liquid, toxic, flammable

UN2998	Triazine pesticides, liquid, toxic
UN3002	Phenyl urea pesticides, liquid, toxic
UN3005	Thiocarbamate pesticide, liquid, toxic, flammable
UN3006	Thiocarbamate pesticide, liquid, toxic
UN3009	Copper based pesticides, liquid, toxic, flammable
UN3010	Copper based pesticides, liquid, toxic
UN3011	Mercury based pesticides, liquid, toxic, flammable
UN3012	Mercury based pesticides, liquid, toxic
UN3013	Substituted nitrophenol pesticides, liquid, toxic, flammable
UN3014	Substituted nitrophenol pesticides, liquid, toxic
UN3015	Bipyridilium pesticides, liquid, toxic, flammable
UN3016	Bipyridilium pesticides, liquid, toxic
UN3017	Organophosphorus pesticides, liquid, toxic, flammable
UN3018	Organophosphorus pesticides, liquid, toxic
UN3019	Organotin pesticides, liquid, toxic, flammable
UN3020	Organotin pesticides, liquid, toxic
UN3021	Pesticides, liquid, flammable, toxic
UN3022	1,2-Butylene oxide, stabilized
UN3023	2-Methyl-2-heptanethiol
UN3024	Coumarin derivative pesticides, liquid, flammable, toxic
UN3025	Coumarin derivative pesticides, liquid, toxic, flammable
UN3026	Coumarin derivative pesticides, liquid, toxic
UN3027	Coumarin derivative pesticides, solid, toxic
UN3028	Batteries, dry, containing potassium hydroxide solid, *electric storage*
UN3048	Aluminum phosphide pesticides
UN3054	Cyclohexyl mercaptan
UN3055	2-(2-Aminoethoxy) ethanol
UN3056	n-Heptaldehyde
UN3057	Trifluoroacetyl chloride
UN3064	Nitroglycerin, solution in alcohol
UN3065	Alcoholic beverages
UN3066	Paint or Paint related material
UN3070	Ethylene oxide and dichlorodifluoromethane mixture
UN3071	Mercaptans, liquid, toxic, flammable, n.o.s. or Mercaptan mixtures, liquid, toxic, flammable, n.o.s.
UN3072	Life-saving appliances, not self inflating
UN3073	Vinylpyridines, stabilized
UN3077	Environmentally hazardous substances, solid, n.o.s.
UN3078	Cerium
UN3079	Methacrylonitrile, stabilized
UN3080	Isocyanates, toxic, flammable, n.o.s. or Isocyanate solutions, toxic, flammable, n.o.s.
UN3082	Environmentally hazardous substances, liquid, n.o.s.
UN3083	Perchloryl fluoride
UN3084	Corrosive solids, oxidizing, n.o.s.
UN3085	Oxidizing solid, corrosive, n.o.s.
UN3086	Toxic solids, oxidizing, n.o.s.
UN3087	Oxidizing solid, toxic, n.o.s.
UN3088	Self-heating, solid, organic, n.o.s.
UN3089	Metal powders, flammable, n.o.s.
UN3090	Lithium battery
UN3090	Lithium metal batteries *including lithium alloy batteries*
UN3091	Lithium batteries, contained in equipment
UN3091	Lithium batteries packed with equipment
UN3091	Lithium metal batteries contained in equipment *including lithium alloy batteries*
UN3091	Lithium metal batteries packed with equipment *including lithium alloy batteries*
UN3092	1-Methoxy-2-propanol
UN3093	Corrosive liquids, oxidizing, n.o.s.
UN3094	Corrosive liquids, water-reactive, n.o.s.
UN3095	Corrosive solids, self-heating, n.o.s.
UN3096	Corrosive solids, water-reactive, n.o.s.
UN3097	Flammable solid, oxidizing, n.o.s.
UN3098	Oxidizing liquid, corrosive, n.o.s.
UN3099	Oxidizing liquid, toxic, n.o.s.
UN3100	Oxidizing solid, self-heating, n.o.s.
UN3101	Organic peroxide type B, liquid
UN3102	Organic peroxide type B, solid
UN3103	Organic peroxide type C, liquid
UN3104	Organic peroxide type C, solid
UN3105	Organic peroxide type D, liquid
UN3106	Organic peroxide type D, solid
UN3107	Organic peroxide type E, liquid
UN3108	Organic peroxide type E, solid
UN3109	Organic peroxide type F, liquid
UN3110	Organic peroxide type F, solid
UN3111	Organic peroxide type B, liquid, temperature controlled
UN3112	Organic peroxide type B, solid, temperature controlled
UN3113	Organic peroxide type C, liquid, temperature controlled
UN3114	Organic peroxide type C, solid, temperature controlled
UN3115	Organic peroxide type D, liquid, temperature controlled
UN3116	Organic peroxide type D, solid, temperature controlled
UN3117	Organic peroxide type E, liquid, temperature controlled
UN3118	Organic peroxide type E, solid, temperature controlled
UN3119	Organic peroxide type F, liquid, temperature controlled
UN3120	Organic peroxide type F, solid, temperature controlled
UN3121	Oxidizing solid, water-reactive, n.o.s.
UN3122	Toxic liquids, oxidizing, n.o.s.
UN3123	Toxic liquids, water-reative, n.o.s.
UN3124	Toxic solids, self-heating, n.o.s.
UN3125	Toxic solids, water-reative, n.o.s.
UN3126	Self-heating, solid, corrosive, organic, n.o.s.
UN3127	Self-heating, solid, oxidizing, n.o.s.
UN3128	Self-heating, solid, toxic, organic, n.o.s.
UN3129	Water-reactive liquid, corrosive, n.o.s.
UN3130	Water-reactive liquid, toxic, n.o.s.
UN3131	Water-reactive solid, corrosive, n.o.s.
UN3132	Water-reactive solid, flammable, n.o.s.
UN3133	Water-reactive solid, oxidizing, n.o.s.
UN3134	Water-reactive solid, toxic, n.o.s.
UN3135	Water-reactive solid, self-heating, n.o.s.
UN3136	Trifluoromethane, refrigerated liquid
UN3137	Oxidizing solid, flammable, n.o.s.
UN3138	Ethylene, acetylene and propylene mixtures, refrigerated liquid
UN3139	Oxidizing liquid, n.o.s.

UN3140	Alkaloids, liquid, n.o.s. or Alkaloid salts, liquid, n.o.s.
UN3141	Antimony compounds, inorganic, liquid, n.o.s.
UN3142	Disinfectants, liquid, toxic, n.o.s.
UN3143	Dyes, solid, toxic, n.o.s. or Dye intermediates, solid, toxic, n.o.s.
UN3144	Nicotine compounds, liquid, n.o.s. or Nicotine preparations, liquid, n.o.s.
UN3145	Alkylphenols, liquid, n.o.s.
UN3146	Organotin compounds, solid, n.o.s.
UN3147	Dyes, solid, corrosive, n.o.s. or Dye intermediates, solid, corrosive, n.o.s.
UN3148	Water-reactive liquid, n.o.s.
UN3149	Hydrogen peroxide and peroxyacetic acid mixtures, stabilized
UN3150	Devices, small, hydrocarbon gas powered or Hydrocarbon gas refills for small devices
UN3151	Polyhalogenated biphenyls, liquid or Polyhalogenated terphenyls liquid
UN3152	Polyhalogenated biphenyls, solid or Polyhalogenated terphenyls, solid
UN3153	Perfluoro (methyl vinyl ether)
UN3154	Perfluoro (ethyl vinyl ether)
UN3155	Pentachlorophenol
UN3156	Compressed gas, oxidizing, n.o.s.
UN3157	Liquefied gas, oxidizing, n.o.s.
UN3158	Gas, refrigerated liquid, n.o.s.
UN3159	1,1,1,2-Tetrafluoroethane or Refrigerant gas R 134a
UN3160	Liquefied gas, toxic, flammable, n.o.s.
UN3161	Liquefied gas, flammable, n.o.s.
UN3162	Liquefied gas, toxic, n.o.s.
UN3163	Liquefied gas, n.o.s.
UN3164	Articles, pressurized pneumatic or Hydraulic
UN3165	Aircraft hydraulic power unit fuel tank
UN3166	Engines, internal combustion
UN3166	Vehicle, flammable liquid powered
UN3166	Vehicle, flammable gas powered
UN3167	Gas sample, non-pressurized, flammable, n.o.s.
UN3168	Gas sample, non-pressurized, toxic, flammable, n.o.s.
UN3169	Gas sample, non-pressurized, toxic, n.o.s.
UN3170	Aluminum smelting by-products or Aluminum remelting by-products
UN3171	Battery-powered vehicle or Battery-powered equipment
UN3172	Toxins, extracted from living sources , liquid, n.o.s.
UN3174	Titanium disulphide
UN3175	Solids containing flammable liquid, n.o.s.
UN3176	Flammable solid, organic, molten, n.o.s.
UN3178	Flammable solid, inorganic, n.o.s.
UN3179	Flammable solid, toxic, inorganic, n.o.s.
UN3180	Flammable solid, corrosive, inorganic, n.o.s.
UN3181	Metal salts of organic compounds, flammable, n.o.s.
UN3182	Metal hydrides, flammable, n.o.s.
UN3183	Self-heating liquid, organic, n.o.s.
UN3184	Self-heating liquid, toxic, organic, n.o.s.
UN3185	Self-heating liquid, corrosive, organic, n.o.s.
UN3186	Self-heating liquid, inorganic, n.o.s.
UN3187	Self-heating liquid, toxic, inorganic, n.o.s.
UN3188	Self-heating liquid, corrosive, inorganic, n.o.s.
UN3189	Metal powder, self-heating, n.o.s.
UN3190	Self-heating solid, inorganic, n.o.s.
UN3191	Self-heating solid, toxic, inorganic, n.o.s.
UN3192	Self-heating solid, corrosive, inorganic, n.o.s.
UN3194	Pyrophoric liquid, inorganic, n.o.s.
UN3200	Pyrophoric solid, inorganic, n.o.s.
UN3205	Alkaline earth metal alcoholates, n.o.s.
UN3206	Alkali metal alcoholates, self-heating, corrosive, n.o.s.
UN3208	Metallic substance, water-reactive, n.o.s.
UN3209	Metallic substance, water-reactive, self-heating, n.o.s.
UN3210	Chlorates, inorganic, aqueous solution, n.o.s.
UN3211	Perchlorates, inorganic, aqueous solution, n.o.s.
UN3212	Hypochlorites, inorganic, n.o.s.
UN3213	Bromates, inorganic, aqueous solution, n.o.s.
UN3214	Permanganates, inorganic, aqueous solution, n.o.s.
UN3215	Persulfates, inorganic, n.o.s.
UN3216	Persulfates, inorganic, aqueous solution, n.o.s.
UN3218	Nitrates, inorganic, aqueous solution, n.o.s.
UN3219	Nitrites, inorganic, aqueous solution, n.o.s.
UN3220	Pentafluoroethane or Refrigerant gas R 125
UN3221	Self-reactive liquid type B
UN3222	Self-reactive solid type B
UN3223	Self-reactive liquid type C
UN3224	Self-reactive solid type C
UN3225	Self-reactive liquid type D
UN3226	Self-reactive solid type D
UN3227	Self-reactive liquid type E
UN3228	Self-reactive solid type E
UN3229	Self-reactive liquid type F
UN3230	Self-reactive solid type F
UN3231	Self-reactive liquid type B, temperature controlled
UN3232	Self-reactive solid type B, temperature controlled
UN3233	Self-reactive liquid type C, temperature controlled
UN3234	Self-reactive solid type C, temperature controlled
UN3235	Self-reactive liquid type D, temperature controlled
UN3236	Self-reactive solid type D, temperature controlled
UN3237	Self-reactive liquid type E, temperature controlled
UN3238	Self-reactive solid type E, temperature controlled
UN3239	Self-reactive liquid type F, temperature controlled
UN3240	Self-reactive solid type F, temperature controlled
UN3241	2-Bromo-2-nitropropane-1,3-diol
UN3242	Azodicarbonamide
UN3243	Solids containing toxic liquid, n.o.s.
UN3244	Solids containing corrosive liquid, n.o.s.
UN3246	Methanesulfonyl chloride
UN3247	Sodium peroxoborate, anhydrous
UN3248	Medicine, liquid, flammable, toxic, n.o.s.
UN3249	Medicine, solid, toxic, n.o.s.

UN3250	Chloroacetic acid, molten
UN3251	Isosorbide-5-mononitrate
UN3252	Difluoromethane or Refrigerant gas R 32
UN3253	Disodium trioxosilicate
UN3254	Tributylphosphane
UN3255	tert-Butyl hypochlorite
UN3256	Elevated temperature liquid, flammable, n.o.s.
UN3257	Elevated temperature liquid, n.o.s
UN3258	Elevated temperature solid, n.o.s.
UN3259	Amines, solid, corrosive, n.o.s. or Polyamines, solid, corrosive n.o.s.
UN3260	Corrosive solid, acidic, inorganic, n.o.s.
UN3261	Corrosive solid, acidic, organic, n.o.s.
UN3262	Corrosive solid, basic, inorganic, n.o.s.
UN3263	Corrosive solid, basic, organic, n.o.s.
UN3264	Corrosive liquid, acidic, inorganic, n.o.s.
UN3265	Corrosive liquid, acidic, organic, n.o.s.
UN3266	Corrosive liquid, basic, inorganic, n.o.s.
UN3267	Corrosive liquid, basic, organic, n.o.s.
UN3268	Safety Devices, *electrically initiated*
UN3269	Polyester resin kit
UN3270	Nitrocellulose membrane filters
UN3271	Ethers, n.o.s.
UN3272	Esters, n.o.s.
UN3273	Nitriles, flammable, toxic, n.o.s.
UN3274	Alcoholates solution, n.o.s.
UN3275	Nitriles, toxic, flammable, n.o.s.
UN3276	Nitriles, toxic, n.o.s.
UN3277	Chloroformates, toxic, corrosive, n.o.s.
UN3278	Organophosphorus compound, toxic, liquid n.o.s.
UN3279	Organophosphorus compound, toxic, flammable, n.o.s.
UN3280	Organoarsenic compound, liquid n.o.s.
UN3281	Metal carbonyls, n.o.s.
UN3282	Organometallic compound, toxic liquid n.o.s.
UN3283	Selenium compound, solid, n.o.s.
UN3284	Tellurium compound, n.o.s.
UN3285	Vanadium compound, n.o.s.
UN3286	Flammable liquid, toxic, corrosive, n.o.s.
UN3287	Toxic liquid, inorganic, n.o.s.
UN3288	Toxic solid, inorganic, n.o.s.
UN3289	Toxic liquid, corrosive, inorganic, n.o.s.
UN3290	Toxic solid, corrosive, inorganic, n.o.s.
UN3291	Regulated medical waste n.o.s. *or* Clinical waste, unspecified, n.o.s. *or* (BIO)Medical waste, n.o.s. *or* Biomedical waste, n.o.s. *or* Medical waste, n.o.s.
UN3292	Batteries, containing sodium
UN3292	Cells, containing sodium
UN3293	Hydrazine, aqueous solution
UN3294	Hydrogen cyanide, solution in alcohol *with not more than 45 percent hydrogen cyanide*
UN3295	Hydrocarbons, liquid, n.o.s.
UN3296	Heptafluoropropane or Refrigerant gas R 227
UN3297	Ethylene oxide and chlorotetrafluoroethane mixture
UN3298	Ethylene oxide and pentafluoroethane mixture
UN3299	Ethylene oxide and tetrafluoroethane mixture
UN3300	Ethylene oxide and carbon dioxide mixture
UN3301	Corrosive liquid, self-heating, n.o.s.
UN3302	2-Dimethylaminoethyl acrylate
UN3303	Compressed gas, toxic, oxidizing, n.o.s.
UN3304	Compressed gas, toxic, corrosive, n.o.s.
UN3305	Compressed gas, toxic, flammable, corrosive, n.o.s.
UN3306	Compressed gas, toxic, oxidizing, corrosive, n.o.s.
UN3307	Liquefied gas, toxic, oxidizing, n.o.s.
UN3308	Liquefied gas, toxic, corrosive, n.o.s.
UN3309	Liquefied gas, toxic, flammable, corrosive, n.o.s.
UN3310	Liquefied gas, toxic, oxidizing, corrosive, n.o.s.
UN3311	Gas, refrigerated liquid, oxidizing, n.o.s.
UN3312	Gas, refrigerated liquid, flammable, n.o.s.
UN3313	Organic pigments, self-heating
UN3314	Plastic molding compound
UN3316	Chemical kits or First aid kits
UN3317	2-Amino-4,6-Dinitrophenol, wetted
UN3318	Ammonia, solution
UN3319	Nitroglycerin mixture desensitized, solid, n.o.s.
UN3320	Sodium borohydride and sodium hydroxide solution
UN3321	Radioactive material, low specific activity (LSA-II)
UN3322	Radioactive material, low specific activity (LSA-III)
UN3327	Radioactive material, Type A package, fissle
UN3328	Radioactive material, Type B(U) package, fissle
UN3329	Radioactive material, Type B(M) package, fissle
UN3331	Radioactive material, transported under special arrangement, fissle
UN3332	Radioactive material, Type A package, special form
UN3333	Radioactive material, Type A package, special form, fissle
UN3334	Aviation regulated liquid, n.o.s.
UN3335	Aviation regulated solid, n.o.s.
UN3336	Mercaptans, liquid, flammable, n.o.s. or Mercaptan mixtures, liquid, flammable, n.o.s.
UN3337	Refrigerant gas R 404A
UN3338	Refrigerant gas R 407A
UN3339	Refrigerant gas R 407B
UN3340	Refrigerant gas R 407C
UN3341	Thiourea dioxide
UN3342	Xanthates
UN3343	Nitroglycerin mixture desensitized, liquid, flammable, n.o.s.
UN3344	Pentaerythrite tetranitrate mixture, desensitized, solid, n.o.s. *or* Pentaerythritol tetranite mixture, desensitized, solid, n.o.s. *or* PETN mixture, desensitized, solid, n.o.s. *with more than 10 percent but not more than 20 percent PETN, by mass*
UN3345	Phenoxyacetic acid derivative pesticide, solid, toxic
UN3346	Phenoxyacetic acid derivative pesticide, liquid, flammable, toxic
UN3347	Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable
UN3348	Phenoxyacetic acid derivative pesticide, liquid, toxic
UN3349	Pyrethroid pesticide, solid, toxic
UN3350	Pyrethroid pesticide, liquid, flammable, toxic
UN3351	Pyrethroid pesticide, liquid, flammable,

	toxic
UN3352	Pyrethroid pesticide, liquid, toxic
UN3354	Insecticide gases, flammable, n.o.s.
UN3355	Insecticide gases, toxic, flammable, n.o.s.
UN3356	Oxygen generator chemical *(including when contained in associated equipment, e.g., passenger service units (PSUs), portable breathing equipment (PBE), etc).*
UN3357	Nitroglycerin mixture, desensitized, liquid n.o.s.
UN3358	Refrigerating machines
UN3360	Fibers, vegetable
UN3361	Chlorosilanes, toxic, corrosive, n.o.s.
UN3362	Chlorosilanes, toxic, corrosive, flammable, n.o.s.
UN3363	Dangerous Goods in Machinery or Dangerous Goods in Apparatus
UN3364	Trinitrophenol (picric acid), wetted
UN3365	Trinitrobenzene (picryl chloride), wetted
UN3366	Trinitrotoluene (TNT), wetted
UN3367	Trinitrobenzene, wetted
UN3368	Trinitrobenzoic acid, wetted
UN3369	Sodium dinitro-o-cresolate, wetted
UN3370	Urea nitrate, wetted
UN3371	2-Methlybutanal
UN3373	Biological substance, Category B
UN3375	Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel
UN3376	4-Nitrophenylhydrazine, *with not less than 30% percent; water, by mass*
UN3377	Sodium perborate monohydrate
UN3378	Sodium carbonate peroxyhydrate
UN3379	Desensitized explosive, liquid, n.o.s.
UN3380	Desensitized explosive, solid, n.o.s.
UN3381	Toxic by inhalation liquid, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50*
UN3382	Toxic by inhalation liquid, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 10 LC50*
UN3383	Toxic by inhalation liquid, flammable, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50*
UN3384	Toxic by inhalation liquid, flammable, n.o.s. *with an inhalation toxicity lower than or equal to 1000 ml/m3 and saturated vapor concentration greater than or equal to 10 LC50*
UN3385	Toxic by inhalation liquid, water-reactive, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50*
UN3386	Toxic by inhalation liquid, water-reactive, n.o.s. *with an inhalation toxicity lower than or equal to 1000 ml/m3 and saturated vapor concentration greater than or equal to 10 LC50*
UN3387	Toxic by inhalation liquid, oxidizing, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50*
UN3388	Toxic by inhalation liquid, oxidizing, n.o.s.
UN3389	Toxic by inhalation liquid, corrosive, n.o.s. *with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50*
UN3390	Toxic by inhalation liquid, corrosive, n.o.s. *with an inhalation toxicity lower than or equal to 1000 ml/m3 and saturated vapor concentration greater than or equal to 10 LC50*
UN3391	Organometallic substance, solid, pyrophoric
UN3392	Organometallic substance, liquid, pyrophoric
UN3393	Organometallic substance, solid, pyrophoric, water-reactive
UN3394	Organometallic substance, liquid, pyrophoric, water-reactive
UN3395	Organometallic substance, solid, water-reactive
UN3396	Organometallic substance, solid, water-reactive, flammable
UN3397	Organometallic substance, solid, water-reactive, self-heating
UN3398	Organometallic substance, liquid, water-reactive
UN3399	Organometallic substance, liquid, water-reactive, flammable
UN3400	Organometallic substance, solid, self-heating
UN3401	Alkali metal amalgam, solid
UN3402	Alkaline earth metals amalgams, solid
UN3403	Potassium, metal alloys, solid
UN3404	Potassium sodium alloys, solid
UN3405	Barium chlorate, solution
UN3406	Barium perchlorate, solution
UN3407	Chlorate and magmesium chloride mixture solution
UN3408	Lead perchlorate, solution
UN3409	Chloronitrobenzene, liquid
UN3410	4-Chloro-o-toluidine hydrochloride, solution
UN3411	beta-Naphthylamine solution
UN3412	Formic acid
UN3413	Potassium cyanide solution
UN3414	Sodium cyanide solution
UN3415	Sodium fluoride solution
UN3416	Chloroacetophenone, liquid
UN3417	Xylyl bromide, solid
UN3418	2, 4-Toluylenediamine solution or 2, 4-Toluenediamine solution
UN3419	Boron trifluoride acetic acid complex, solid
UN3420	Boron trifluoride propionic acid complex, solid
UN3421	Potassium hydrogendifluoride solution
UN3422	Potassium fluoride solution
UN3423	Tetramethylammonium hydroxide, solid
UN3424	Ammonium dinitro-o-cresolate solution
UN3425	Bromoacetic acid, solid
UN3426	Acrylamide solution
UN3427	Chlorobenzl chlorides, solid
UN3428	3-Chloro-4-methylphenyl isocyanate, solid
UN3429	Chlorotoluidines, liquid
UN3430	Xylenols, liquid
UN3431	Nitrobenzotrifluorides, solid
UN3432	Polychlorinated biphenyls, solid

UN3434	Nitrocresols, liquid
UN3436	Hexafluoroacetone hydrate, solid
UN3437	Chlorocresols, solid
UN3438	alpha-Methylbenzyl alcohol, solid
UN3439	Nitriles, toxic, solid, n.o.s.
UN3440	Selenium compound, liquid, n.o.s.
UN3441	Chlorodinitro-benzenes, solid
UN3442	Dichloroanilines, solid
UN3443	Dinitrobenzenes, solid
UN3444	Nicotine hydrochloride, solid
UN3445	Nicotine sulphate, solid
UN3446	Nitrotoluenes, solid
UN3447	Nitroxylenes, solid
UN3448	Tear gas substance, solid, n.o.s.
UN3449	Bromobenzyl cyanides, solid
UN3450	Diphenyl-chloroarsine, solid
UN3451	Toluidines, solid
UN3452	Xylidines, solid
UN3453	Phosphoric acid, solid
UN3454	Dinitrotoluenes, solid
UN3455	Cresols, solid
UN3456	Nitrosylsulphuric acid, solid
UN3457	Chloronitroltoluenes, solid
UN3458	Nitroanisoles, solid
UN3459	Nitrobromobenzenes, solid
UN3460	N-Ethylbenzyltoluidines, solid
UN3462	Toxins, extracted from living source, solid, n.o.s.
UN3463	Propionic acid
UN3464	Organophosphorus compound, toxic, solid, n.o.s.
UN3465	Organoarsenic compound, solid, n.o.s.
UN3466	Metal carbonyls, solid, n.o.s.
UN3467	Organometallic compound, toxic, solid, n.o.s.
UN3468	Hydrogen in a metal hydride storage system *or* Hydrogen in a metal hydride storage system contained in equipment *or* Hydrogen in a metal hydride storage system packed with equipment
UN3469	Paint, flammable, corrosive
UN3469	Paint related material, flammable, corrosive
UN3470	Paint related material corrosive, flammable or Paint, corrosive, flammable
UN3471	Hydrogendifluoride solution, n.o.s
UN3472	Crotonic acid
UN3473	Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing flammable liquids*
UN3474	1-Hydroxybenzotriazole, monohydrate
UN3475	Ethanol and gasoline mixture or Ethanol and motor spirit mixture or Ethanol and petrol mixture
UN3476	Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing water-reactive substances*
UN3477	Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing corrosive substances*
UN3478	Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing liquefied flammable gas*
UN3479	Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing hydrogen in metal hydride*
UN3480	Lithium ion batteries, *including lithium ion polymer batteries*
UN3481	Lithium ion batteries contained in equipment *including lithium ion polymer batteries*
UN3481	Lithium ion batteries packed with equipment *including lithium ion polymer batteries*
UN3482	Alkali metal dispersions, flammable *or* Alkaline earth metal dispersions, flammable
UN3483	Motor fuel anti-knock mixture, flammable
UN3484	Hydrazine aqueous solution, flammable
UN3485	Calcium hypochlorite, dry, corrosive *or* Calcium hypochlorite mixture, dry, corrosive
UN3486	Calcium hypochlorite mixture, dry, corrosive
UN3487	Calcium hypochlorite, hydrated, corrosive *or* Calcium hypochlorite, hydrated mixture, corrosive
UN3488	Toxic by inhalation liquid, flammable, corrosive, n.o.s.
UN3489	Toxic by inhalation liquid, flammable, corrosive, n.o.s.
UN3490	Toxic by inhalation water reactive, flammable, corrosive, n.o.s.
UN3491	Toxic by inhalation water reactive, flammable, corrosive, n.o.s.
UN3494	Petroleum sour crude oil, flammable, toxic
UN3495	Iodine
UN3496	Batteries, nickel-metal hydride
UN3497	Krill meal
UN3498	Iodine monochloride, liquid
UN3499	Capacitor, electric double layer
UN3500	Chemical under pressure, n.o.s.
UN3501	Chemical under pressure, flammable, n.o.s.
UN3502	Chemical under pressure, toxic, n.o.s.
UN3503	Chemical under pressure, corrosive, n.o.s.
UN3504	Chemical under pressure,flammable, toxic, n.o.s.
UN3505	Chemical under pressure, flammable, corrosive, n.o.s.
UN3506	Mercury contained in manufactured articles

Appendix A to 172.101
List of Hazardous Substances and Reportable Quantities (RQ)

This Appendix lists materials and their corresponding reportable quantities (RQ) that are listed or designated as “Hazardous Substances” and are further regulated by other federal and state authorities. This list contains only substances with a one (1) or ten (10) pound RQ rating. Please refer to 49CFR 172.101 Appendix A for materials with higher RQ ratings. This list **does not** include radionuclides. FedEx Ground does not accept packages that have a net weight equal to or more than the applicable RQ number. Except for those materials listed in the FedEx Ground Hazardous Material Table by name, the material may not be regulated if the material has a net weight prepackage less then the RQ rating. It is the shipper’s responsibility to determine if their material, when packaged, meets or exceeds the RQ rating.

Hazardous substance	Reportable Quantity (RQ) in pounds (kilograms)
Acetamide, N-9H-fluoren-2-yl-	1 (0.454)
Acetic acid, fluoro-, sodium salt	10 (4.54)
Acetic acid, lead(2+) salt	10 (4.54)
Acetone cyanohydrin	10 (4.54)
2-Acetylaminofluorene	1 (0.454)
Acrolein	1 (0.454)
Aldicarb	1 (0.454)
Aldrin	1 (0.454)
4-Aminobiphenyl	1 (0.454)
Amitrole	10 (4.54)
Ammonium bichromate	10 (4.54)
Ammonium chromate	10 (4.54)
Ammonium dichromate[@]	10 (4.54)
Ammonium picrate	10 (4.54)
Argentate(1-), bis(cyano-C)-, potassium	1 (0.454)
Aroclor 1016	1 (0.454)
Aroclor 1221	1 (0.454)
Aroclor 1232	1 (0.454)
Aroclor 1242	1 (0.454)
Aroclor 1248	1 (0.454)
Aroclor 1254	1 (0.454)
Aroclor 1260	1 (0.454)
Aroclors	1 (0.454)
Arsenic[¢]	1 (0.454)
Arsenic acid H_3AsO_4	1 (0.454)
Arsenic disulfide	1 (0.454)
Arsenic oxide As_2O_3	1 (0.454)
Arsenic oxide As_2O_5	1 (0.454)
Arsenic pentoxide	1 (0.454)
Arsenic trichloride	1 (0.454)
Arsenic trioxide	1 (0.454)
Arsenic trisulfide	1 (0.454)
Arsine, diethyl-	1 (0.454)

Arsinic acid, dimethyl-	1 (0.454)
Arsonous dichloride, phenyl-	1 (0.454)
Asbestos¢¢	1 (0.454)
Azaserine	1 (0.454)
Aziridine	1 (0.454)
Aziridine, 2-methyl-	1 (0.454)
Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha,8beta,8aalpha, 8balpha)]-	10 (4.54)
Barban	10 (4.54)
Barium cyanide	10 (4.54)
Benomyl	10 (4.54)
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	10 (4.54)
Benz[a]anthracene	10 (4.54)
1,2-Benzanthracene	10 (4.54)
Benz[a]anthracene, 7,12-dimethyl-	1 (0.454)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	10 (4.54)
Benzenamine, 4,4'-methylenebis[2-chloro-	10 (4.54)
Benzene	10 (4.54)
Benzeneacetic acid, 4-chloro-α-(4-chlorophenyl)-α-hydroxy-, ethyl ester	10 (4.54)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	10 (4.54)
Benzenediamine, ar-methyl-	10 (4.54)
1,2-Benzenedicarboxylic acid, dibutyl ester	10 (4.54)
Benzene, 1,1'-(2,2-dichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene, hexachloro-	10 (4.54)
Benzene, 1-methyl-2,4-dinitro-	10 (4.54)
Benzene, pentachloro-	10 (4.54)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene,1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	1 (0.454)
Benzene, (trichloromethyl)-	10 (4.54)
Benzene, 1,3,5-trinitro-	10 (4.54)
Benzidine	1 (0.454)
Benzo[a]anthracene	10 (4.54)
1,3-Benzodioxole, 5-propyl-	10 (4.54)
Benzo[b]fluoranthene	1 (0.454)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-	10 (4.54)
7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate	10 (4.54)
Benzo[rst]pentaphene	10 (4.54)
Benzo[a]pyrene	1 (0.454)
3,4-Benzopyrene	1 (0.454)
p-Benzoquinone	10 (4.54)
Benzotrichloride	10 (4.54)
Beryllium¢	10 (4.54)
Beryllium chloride	1 (0.454)
Beryllium fluoride	1 (0.454)
Beryllium nitrate	1 (0.454)
Beryllium powder¢	10 (4.54)
alpha-BHC	10 (4.54)
beta-BHC	1 (0.454)

delta-BHC	1 (0.454)
gamma-BHC	1 (0.454)
2,2'-Bioxirane	10 (4.54)
[1,1'-Biphenyl]-4,4'-diamine	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-	1 (0.454)
[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethyl-	10 (4.54)
Bis(2-chloroethyl) ether	10 (4.54)
Bis(chloromethyl) ether	10 (4.54)
1,3-Butadiene	10 (4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	10 (4.54)
2-Butanone peroxide	10 (4.54)
2-Butene, 1,4-dichloro-	1 (0.454)
2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy] methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7(2S*,3R*),7aalpha]]-	10 (4.54)
n-Butyl phthalate	10 (4.54)
Cacodylic acid	1 (0.454)
Cadmium¢	10 (4.54)
Cadmium acetate	10 (4.54)
Cadmium bromide	10 (4.54)
Cadmium chloride	10 (4.54)
Calcium arsenate	1 (0.454)
Calcium arsenite	1 (0.454)
Calcium carbide	10 (4.54)
Calcium chromate	10 (4.54)
Calcium cyanide $Ca(CN)_2$	10 (4.54)
Calcium hypochlorite	10 (4.54)
Captan	10 (4.54)
Carbamic acid, 1H-benzimidazol-2-yl, methyl ester	10 (4.54)
Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester	10 (4.54)
Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester	10 (4.54)
Carbamic acid, dimethyl-,1-[(dimethyl-amino)carbonyl]-5-methyl-1H-pyrazol-3-yl ester	1 (0.454)
Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)] bis-, dimethyl ester	10 (4.54)
Carbamic chloride, dimethyl-	1 (0.454)
Carbendazim	10 (4.54)
Carbofuran	10 (4.54)
Carbofuran phenol	10 (4.54)
Carbonic dichloride	10 (4.54)
Carbon tetrachloride	10 (4.54)
Chlorambucil	10 (4.54)
Chlordane	1 (0.454)
Chlordane, alpha & gamma isomers	1 (0.454)
CHLORDANE (TECHNICAL MIXTURE AND METABOLITES)	1 (0.454)
Chlorinated camphene	1 (0.454)
Chlorine	10 (4.54)

Chlorobenzilate	10 (4.54)
Chloroform	10 (4.54)
Chloromethyl methyl ether	10 (4.54)
Chlorpyrifos	1 (0.454)
Chromic acid	10 (4.54)
Chromic acid H_2CrO_4, calcium salt	10 (4.54)
Coke Oven Emissions	1 (0.454)
Copper chloride[@]	10 (4.54)
Copper cyanide Cu(CN)	10 (4.54)
Coumaphos	10 (4.54)
Creosote	1 (0.454)
m-Cumenyl methylcarbamate	10 (4.54)
Cupric acetoarsenite	1 (0.454)
Cupric chloride	10 (4.54)
Cupric sulfate	10 (4.54)
Cyanides (soluble salts and complexes) not otherwise specified	10 (4.54)
Cyanogen chloride (CN)Cl	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	10 (4.54)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1α, 2α, 3β-, 4α, 5α, 6β)	1 (0.454)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	10 (4.54)
Cyclophosphamide	10 (4.54)
Daunomycin	10 (4.54)
DDD	1 (0.454)
4,4'-DDD	1 (0.454)
DDE (72-55-9)[#]	1 (0.454)
4,4'-DDE	1 (0.454)
DDT	1 (0.454)
4,4'-DDT	1 (0.454)
Diazinon	1 (0.454)
Dibenz[a,h]anthracene	1 (0.454)
1,2:5,6-Dibenzanthracene	1 (0.454)
Dibenzo[a,h]anthracene	1 (0.454)
Dibenzo[a,i]pyrene	10 (4.54)
1,2-Dibromo-3-chloropropane	1 (0.454)
Dibromoethane	1 (0.454)
Dibutyl phthalate	10 (4.54)
Di-n-butyl phthalate	10 (4.54)
Dichlone	1 (0.454)
3,3'-Dichlorobenzidine	1 (0.454)
1,4-Dichloro-2-butene	1 (0.454)
Dichloroethyl ether	10 (4.54)
Dichloromethyl ether	10 (4.54)
Dichlorophenylarsine	1 (0.454)
Dichlorvos	10 (4.54)
Dicofol	10 (4.54)
Dieldrin	1 (0.454)
1,2:3,4-Diepoxybutane	10 (4.54)
Diethylarsine	1 (0.454)
N,N'-Diethylhydrazine	10 (4.54)
Diethylstilbestrol	1 (0.454)

Diethyl sulfate	10 (4.54)
Dihydrosafrole	10 (4.54)
1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha, 4alpha, 4abeta, 5alpha, 8alpha, 8abeta)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2aalpha, 3beta, 6beta, 6aalpha, 7beta, 7aalpha)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2, 3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha, 2beta, 2abeta, 3alpha, 6alpha, 6abeta, 7beta, 7aalpha)-, & metabolites	1 (0.454)
Dimethoate	10 (4.54)
Dimethyl aminoazobenzene	10 (4.54)
p-Dimethylaminoazobenzene	10 (4.54)
7,12-Dimethylbenz[a]anthracene	1 (0.454)
3,3'-Dimethylbenzidine	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Dimethylcarbamoyl chloride	1 (0.454)
1,1-Dimethylhydrazine	10 (4.54)
1,2-Dimethylhydrazine	1 (0.454)
Dimethylhydrazine, unsymmetrical[@]	10 (4.54)
Dimetilan	1 (0.454)
4,6-Dinitro-o-cresol, and salts	10 (4.54)
Dinitrogen tetroxide[@]	10 (4.54)
Dinitrophenol	10 (4.54)
2,4-Dinitrophenol	10 (4.54)
Dinitrotoluene	10 (4.54)
2,4-Dinitrotoluene	10 (4.54)
1,2-Diphenylhydrazine	10 (4.54)
Diphosphoric acid, tetraethyl ester	10 (4.54)
Di-n-propylnitrosamine	10 (4.54)
Disulfoton	1 (0.454)
Endosulfan	1 (0.454)
alpha-Endosulfan	1 (0.454)
beta-Endosulfan	1 (0.454)
Endosulfan sulfate	1 (0.454)
Endrin	1 (0.454)
Endrin aldehyde	1 (0.454)
Endrin, & metabolites	1 (0.454)
Ethanamine, N-ethyl-N-nitroso-	1 (0.454)
Ethane, 1,2-dibromo-	1 (0.454)
Ethane, 1,1'-oxybis[2-chloro-	10 (4.54)
Ethane, pentachloro-	10 (4.54)
Ethanethioamide	10 (4.54)
Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
Ethene, chloro-	1 (0.454)
Ethion	10 (4.54)
Ethyl cyanide	10 (4.54)
Ethylene dibromide	1 (0.454)
Ethylene oxide	10 (4.54)

Ethylenethiourea	10 (4.54)
Ethylenimine	1 (0.454)
Ethyl methanesulfonate	1 (0.454)
Fluorine	10 (4.54)
Fluoroacetic acid, sodium salt	10 (4.54)
Fulminic acid, mercury(2+)salt	10 (4.54)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-	1 (0.454)
D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-	1 (0.454)
Glycidylaldehyde	10 (4.54)
Guanidine, N-methyl-N'-nitro-N-nitroso-	10 (4.54)
Guthion	1 (0.454)
Heptachlor	1 (0.454)
Heptachlor epoxide	1 (0.454)
Hexachlorobenzene	10 (4.54)
Hexachlorobutadiene	1 (0.454)
Hexachlorocyclopentadiene	10 (4.54)
Hexamethylphosphoramide	1 (0.454)
Hydrazine	1 (0.454)
Hydrazine, 1,2-diethyl-	10 (4.54)
Hydrazine, 1,1-dimethyl-	10 (4.54)
Hydrazine, 1,2-dimethyl-	1 (0.454)
Hydrazine, 1,2-diphenyl-	10 (4.54)
Hydrazine, methyl-	10 (4.54)
Hydrocyanic acid	10 (4.54)
Hydrogen cyanide	10 (4.54)
Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
2-Imidazolidinethione	10 (4.54)
Isodrin	1 (0.454)
3-Isopropylphenyl N-methylcarbamate	10 (4.54)
Kepone	1 (0.454)
Lasiocarpine	10 (4.54)
Lead[¢]	10 (4.54)
Lead acetate	10 (4.54)
Lead arsenate	1 (0.454)
Lead, bis(acetato-O)tetrahydroxytri-	10 (4.54)
Lead chloride	10 (4.54)
Lead fluoborate	10 (4.54)
Lead fluoride	10 (4.54)
Lead iodide	10 (4.54)
Lead nitrate	10 (4.54)
Lead phosphate	10 (4.54)
Lead stearate	10 (4.54)
Lead subacetate	10 (4.54)
Lead sulfate	10 (4.54)
Lead sulfide	10 (4.54)
Lead thiocyanate	10 (4.54)
Lindane	1 (0.454)
Lindane (all isomers)	1 (0.454)
Lithium chromate	10 (4.54)
Manganese, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)

Manganese dimethyldithiocarbamate	10 (4.54)
Melphalan	1 (0.454)
Mercaptodimethur	10 (4.54)
Mercuric cyanide	1 (0.454)
Mercuric nitrate	10 (4.54)
Mercuric sulfate	10 (4.54)
Mercuric thiocyanate	10 (4.54)
Mercurous nitrate	10 (4.54)
Mercury	1 (0.454)
Mercury fulminate	10 (4.54)
Methanamine, N-methyl-N-nitroso-	10 (4.54)
Methane, chloromethoxy-	10 (4.54)
Methane, isocyanato-	10 (4.54)
Methane, oxybis(chloro-	10 (4.54)
Methanesulfonic acid, ethyl ester	1 (0.454)
Methane, tetrachloro-	10 (4.54)
Methane, tetranitro-	10 (4.54)
Methane, trichloro-	10 (4.54)
6,9-Methano-2,4,3-benzodioxathiepin,6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	1 (0.454)
4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	1 (0.454)
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	1 (0.454)
1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-	1 (0.454)
Methiocarb	10 (4.54)
Methoxychlor	1 (0.454)
2-Methyl aziridine	1 (0.454)
Methyl chloromethyl ether@	10 (4.54)
3-Methylcholanthrene	10 (4.54)
4,4'-Methylenebis(2-chloroaniline)	10 (4.54)
4,4'-Methylenedianiline	10 (4.54)
Methyl ethyl ketone peroxide	10 (4.54)
Methyl hydrazine	10 (4.54)
Methyl isocyanate	10 (4.54)
2-Methyllactonitrile	10 (4.54)
Methylthiouracil	10 (4.54)
Mevinphos	10 (4.54)
Mitomycin C	10 (4.54)
MNNG	10 (4.54)
Naled	10 (4.54)
5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	10 (4.54)
2-Naphthalenamine	10 (4.54)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	10 (4.54)
beta-Naphthylamine	10 (4.54)
Nickel carbonyl Ni(CO)4, (T-4)-	10 (4.54)

Nickel cyanide $Ni(CN)_2$	10 (4.54)
Nickel hydroxide	10 (4.54)
Nitric oxide	10 (4.54)
4-Nitrobiphenyl	10 (4.54)
Nitrogen dioxide	10 (4.54)
Nitrogen oxide NO	10 (4.54)
Nitrogen oxide NO_2	10 (4.54)
Nitroglycerine	10 (4.54)
2-Nitropropane	10 (4.54)
N-Nitrosodi-n-butylamine	10 (4.54)
N-Nitrosodiethanolamine	1 (0.454)
N-Nitrosodiethylamine	1 (0.454)
N-Nitrosodimethylamine	10 (4.54)
N-Nitroso-N-ethylurea	1 (0.454)
N-Nitroso-N-methylurea	1 (0.454)
N-Nitroso-N-methylurethane	1 (0.454)
N-Nitrosomethylvinylamine	10 (4.54)
N-Nitrosomorpholine	1 (0.454)
N-Nitrosopiperidine	10 (4.54)
N-Nitrosopyrrolidine	1 (0.454)
1,2-Oxathiolane, 2,2-dioxide	10 (4.54)
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-, 2-oxide	10 (4.54)
Oxirane	10 (4.54)
Oxiranecarboxyaldehyde	10 (4.54)
Parathion	10 (4.54)
PCBs	1 (0.454)
Pentachlorobenzene	10 (4.54)
Pentachloroethane	10 (4.54)
Pentachlorophenol	10 (4.54)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1 (0.454)
Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate	10 (4.54)
Phenol, 2,4-dinitro-	10 (4.54)
Phenol, 2-methyl-4,6-dinitro-, & salts	10 (4.54)
Phenol, 3-(1-methylethyl)-, methyl carbamate	10 (4.54)
Phenol, pentachloro-	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Phenol, 2,4,5-trichloro-	10 (4.54)
Phenol, 2,4,6-trichloro-	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-	1 (0.454)
Phorate	10 (4.54)
Phosgene	10 (4.54)
Phosphoric acid, lead(2+) salt (2:3)	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-[(ethylthio)methyl] ester	10 (4.54)
Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	10 (4.54)
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	10 (4.54)
Phosphorus	1 (0.454)

Piperidine, 1-nitroso-	10 (4.54)
Plumbane, tetraethyl-	10 (4.54)
POLYCHLORINATED BIPHENYLS	1 (0.454)
Potassium arsenate	1 (0.454)
Potassium arsenite	1 (0.454)
Potassium bichromate	10 (4.54)
Potassium chromate	10 (4.54)
Potassium cyanide K(CN)	10 (4.54)
Potassium silver cyanide	1 (0.454)
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	1 (0.454)
1-Propanamine, N-nitroso-N-propyl-	10 (4.54)
Propane, 1,2-dibromo-3-chloro-	1 (0.454)
Propanenitrile	10 (4.54)
Propanenitrile, 2-hydroxy-2-methyl-	10 (4.54)
Propane, 2-nitro-	10 (4.54)
1,3-Propane sultone	10 (4.54)
1,2,3-Propanetriol, trinitrate	10 (4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	10 (4.54)
Propargite	10 (4.54)
2-Propenal	1 (0.454)
beta-Propiolactone	10 (4.54)
1,2-Propylenimine	1 (0.454)
Pyrethrins	1 (0.454)
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	10 (4.54)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	10 (4.54)
Pyrrolidine, 1-nitroso-	1 (0.454)
Quinone	10 (4.54)
RADIONUCLIDES	See Table 2
Selenious acid	10 (4.54)
Selenium dioxide	10 (4.54)
Selenium oxide	10 (4.54)
Selenium sulfide SeS2	10 (4.54)
L-Serine, diazoacetate (ester)	1 (0.454)
Silver cyanide Ag(CN)	1 (0.454)
Silver nitrate	1 (0.454)
Sodium	10 (4.54)
Sodium arsenate	1 (0.454)
Sodium arsenite	1 (0.454)
Sodium bichromate	10 (4.54)
Sodium chromate	10 (4.54)
Sodium cyanide Na(CN)	10 (4.54)
Streptozotocin	1 (0.454)
Strontium chromate	10 (4.54)
Strychnidin-10-one, & salts	10 (4.54)
Strychnine, & salts	10 (4.54)
TCDD	1 (0.454)
TDE	1 (0.454)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1 (0.454)
2,3,4,6-Tetrachlorophenol	10 (4.54)

Tetraethyl pyrophosphate	10 (4.54)
Tetraethyl lead	10 (4.54)
Tetranitromethane	10 (4.54)
Thioacetamide	10 (4.54)
Thioperoxydicarbonic diamide $[(H_2N)C(S)]_2S_2$, tetramethyl-	10 (4.54)
Thiophanate-methyl	10 (4.54)
Thiourea	10 (4.54)
Thiram	10 (4.54)
Toluenediamine	10 (4.54)
2,4-Toluene diamine	10 (4.54)
Toxaphene	1 (0.454)
1H-1,2,4-Triazol-3-amine	10 (4.54)
Trichlorophenol	10 (4.54)
2,4,5-Trichlorophenol	10 (4.54)
2,4,6-Trichlorophenol	10 (4.54)
Trifluralin	10 (4.54)
1,3,5-Trinitrobenzene	10 (4.54)
Tris(2,3-dibromopropyl) phosphate	10 (4.54)
Trypan blue	10 (4.54)
Uracil mustard	10 (4.54)
Urea, N-ethyl-N-nitroso-	1 (0.454)
Urea, N-methyl-N-nitroso-	1 (0.454)
Vinylamine, N-methyl-N-nitroso-	10 (4.54)
Vinyl chloride	1 (0.454)
Zinc, bis(dimethylcarbamodithioato-S,S')-	10 (4.54)
Zinc cyanide $Zn(CN)_2$	10 (4.54)
Ziram	10 (4.54)
¢The RQ for these hazardous substances is limited to those pieces of the metal having a diameter smaller than 100 micrometers (0.004 inches)	
¢¢The RQ for asbestos is limited to friable forms only.	
The @Indicates that the name was added by PHMSA because (1) the name is a synonym for a specific hazardous substance and (2) the name appears in the Hazardous Materials Table as a proper shipping name.	
#To provide consistency with EPA regulations, two entries with different CAS numbers are provided. Refer to the EPA Table 302.4—List of Hazardous Substances and Reportable Quantities for an explanation of the two entries.	