# Appendix J

**Hazardous Materials Group Factual**

Title 49 CFR Regulatory Information

Title 49 CFR Regulatory excerpts affecting the transportation of DG by air operators prepared by TSA.

# HAZARDOUS MATERIALS REGULATIONS

Title 49, Code of Federal Regulations

(Specific to Federal Express Flight 1478 - DCA-02-MA-054)

**171.11**

**Use of ICAO Technical Instructions.**

Notwithstanding the requirements of parts 172 and 173 of this subchapter, a hazardous material may be transported by aircraft, and by motor vehicle either before or after being transported by aircraft, in accordance with the ICAO Technical Instructions (see § 171.7) if the hazardous material;

(a) Is packaged, marked, labeled, classified, described and certified on a shipping paper and otherwise in a condition for shipment as required by the ICAO Technical Instructions;

(b) Is within the quantity limits prescribed for transportation by either passenger-carrying or cargo aircraft, as appropriate, as specified in the ICAO Technical Instructions;

(c) Is not a forbidden material or package according to §173.21 of this subchapter or Column 3 of the §172.101 Table; and

(d) Fulfills the following additional requirements as applicable:

(1) For a material that meets the definition of a hazardous substance as defined in this subchapter, the shipping paper and package markings must conform to the provisions in §§172.203(c) and 172.324, respectively, of this subchapter.

(2) When a hazardous material, which is subject to the requirements of the ICAO Technical Instructions, is also a hazardous waste as defined in this subchapter:

(i) The word ``Waste'' must precede the proper shipping name on shipping papers and package markings; and

(ii) It must comply with §172.205 with respect to the hazardous waste manifests.

(3) When a hazardous material is not subject to the requirements of the ICAO Technical Instructions, it must be transported as required by this subchapter.

(4) When a hazardous material that is regulated by this subchapter for transportation by highway is transported by motor vehicle on a public highway under the provisions of this section, the following requirements apply:

(i) The motor vehicle must be placarded in accordance with subpart F of part 172 of this subchapter; and

(ii) The shipping paper may include an indication that the shipment is being made under the provisions of this section or the letters "ICAO."

(5) Except for a Division 2.2 air bag, air bag module, or seat-belt pretensioner, the shipping paper description must conform to the requirements of § 173.166(c) of this subchapter.

(6) For radioactive materials:

(i) Shipping papers for highway route controlled quantity radioactive materials shipments must meet the requirements of §172.203(d)(4) of this subchapter.
(ii) Competent authority certification and any necessary revalidation for Type B, Type B(U), Type B(M), and fissile materials packages must be obtained from the appropriate authorities as specifed in §§173.471, 173.472 and 173.473 of this subchapter, and all requirements of the certificates and revalidations must be met.
(iii) Except for limited quantities of Class 7 (radioactive) material, the provisions of §§172.204(c)(4), 173.448(e), (f) and (g)(3) of this subchapter apply.
(iv) Limited quantities of radioactive materials must meet the provisions of §173.421, §173.424 or §173.426 as appropriate of this subchapter.
(v) Type A package contents shall be limited in accordance with §173.431 of this subchapter.
(vi) The definition for "radioactive material" in § 173.403 of this subchapter applies to radioactive materials transported under the provisions of this section.

(7) If a United States variation is indicated in the ICAO Technical Instructions for any provision governing the transport of the hazardous material, the hazardous material is transported in conformance with that variation.

(8) Abbreviations may not be used in shipping paper entries or package markings unless they are specifically authorized by this subchapter. ICAO class or division numbers are not considered to be abbreviations.

**171.2**

**General requirements.**

(a) No person may offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance with subpart G of part 107 of this chapter, if applicable, and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by applicable requirements of this subchapter, or an exemption, approval or registration issued under this subchapter or subchapter A of this chapter.

**172.101**

**Hazardous Materials Tables**

```
Adhesives, [containing a flamm
================================================================================
Symbol                    (1):
Description, ship. name   (2):  Adhesives, [containing a flammable
                                liquid]
Hazard class or Division (3):  3
Identification Numbers    (4):  UN1133
PG (Packing Group)        (5):  II
Label Codes               (6):  3
Special provision         (7):  B52, IB2, T4, TP1, TP8
Packaging (173.***)       (8)
  Exceptions             (8A):  150
```

```
  Nonbulk               (8B):  173
  Bulk                  (8C):  242
Quantity limitations     (9)
  Passngr aircraft/rail (9A):  5 L
  Cargo aircraft only   (9B):  60 L
Vessel Stowage           (10)
  Location             (10A):  B
  Other                (10B):
```

**********

```
Seat-belt pretensioners, [pyrotechnic]
Air bag inflators, [pyrotechni
================================================================================
Symbol                    (1):
Description, ship. name   (2):  Air bag inflators, [pyrotechnic or]
                                Air bag modules, [pyrotechnic or]
                                Seat-belt pretensioner, [pyrotechnic]
Hazard class or Division  (3):  9
Identification Numbers    (4):  UN3268
PG (Packing Group)        (5):  III
Label Codes               (6):  9
Special provision         (7):
Packaging (173.***)       (8)
  Exceptions              (8A):  166
  Nonbulk                 (8B):  166
  Bulk                    (8C):  166
Quantity limitations      (9)
  Passngr aircraft/rail   (9A):  25 kg
  Cargo aircraft only     (9B):  100 kg
Vessel Stowage            (10)
  Location                (10A):  A
  Other                   (10B):
```

**********

**From ICAO Technical Instructions (See 171.11 above):**

```
Batteries, wet, filled with alkali
================================================================================
Description, ship. name    (Col. B):  Batteries, wet, filled with alkali
Hazard class or Division   (Col. C):  8
Identification Numbers     (Col. A):  UN2795
PG (Packing Group)         (Col. F):  N/A
Label Codes                (Col. E):  8
Special Provision:         (Col. M):  A51 (applies only to passenger a/c)
For Cargo Aircraft Only:
Packaging Instruction      (Col. K):  800
    Max Qty per Pkg        (Col. L):  No Limit
```

**********

```
Carbon dioxide, solid [or] Dry
================================================================================
Symbol                    (1):  A W
Description, ship. name   (2):  Carbon dioxide, solid [or] Dry ice
Hazard class or Division  (3):  9
```

| | | |
|---|---|---|
| Identification Numbers | (4): | UN1845 |
| PG (Packing Group) | (5): | III |
| Label Codes | (6): | None |
| Special provision | (7): | |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | 217 |
| Nonbulk | (8B): | 217 |
| Bulk | (8C): | 240 |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 200 kg |
| Cargo aircraft only | (9B): | 200 kg |
| Vessel Stowage | (10) | |
| Location | (10A): | C |
| Other | (10B): | 40 |

**********

Chemical kits

==========

| | | |
|---|---|---|
| Symbol | (1): | |
| Description, ship. name | (2): | Chemical kits |
| Hazard class or Division | (3): | 9 |
| Identification Numbers | (4): | UN3316 |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | 9 |
| Special provision | (7): | 15 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | None |
| Nonbulk | (8B): | None |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 10 kg |
| Cargo aircraft only | (9B): | 10 kg |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | |

**********

Compressed gas, n.o.s.

==========

| | | |
|---|---|---|
| Symbol | (1): | G |
| Description, ship. name | (2): | Compressed gas, n.o.s. |
| Hazard class or Division | (3): | 2.2 |
| Identification Numbers | (4): | UN1956 |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | 2.2 |
| Special provision | (7): | |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | 306, 307 |
| Nonbulk | (8B): | 302, 305 |
| Bulk | (8C): | 314, 315 |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 75 kg |
| Cargo aircraft only | (9B): | 150 kg |
| Vessel Stowage | (10) | |
| Location | (10A): | A |

| | | |
|---|---|---|
| Other | (10B): | |

**********

Consumer commodity

| | | |
|---|---|---|
| Symbol | (1): | D |
| Description, ship. name | (2): | Consumer commodity |
| Hazard class or Division | (3): | ORM-D |
| Identification Numbers | (4): | - |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | None |
| Special provision | (7): | |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | 156, 306 |
| Nonbulk | (8B): | 156, 306 |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 30 kg gross |
| Cargo aircraft only | (9B): | 30 kg gross |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | |

**********

Corrosive liquid, acidic, orga

| | | |
|---|---|---|
| Symbol | (1): | G |
| Description, ship. name | (2): | Corrosive liquid, acidic, organic, n.o.s. |
| Hazard class or Division | (3): | 8 |
| Identification Numbers | (4): | UN3265 |
| PG (Packing Group) | (5): | III |
| Label Codes | (6): | 8 |
| Special provision | (7): | IB3, T7, TP1, TP28 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | 154 |
| Nonbulk | (8B): | 203 |
| Bulk | (8C): | 241 |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 5 L |
| Cargo aircraft only | (9B): | 60 L |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | 40 |

**********

Dangerous Goods in Machinery [

| | | |
|---|---|---|
| Symbol | (1): | |
| Description, ship. name | (2): | Dangerous Goods in Machinery [or] Dangerous Goods in Apparatus |
| Hazard class or Division | (3): | 9 |
| Identification Numbers | (4): | UN3363 |

| | | |
|---|---|---|
| PG (Packing Group) | (5): | |
| Label Codes | (6): | |
| Special provision | (7): | 136 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | None |
| Nonbulk | (8B): | 222 |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | No limit |
| Cargo aircraft only | (9B): | No limit |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | |

**********

Fire extinguishers [containing

| | | |
|---|---|---|
| Symbol | (1): | |
| Description, ship. name | (2): | Fire extinguishers [containing compressed or liquefied gas] |
| Hazard class or Division | (3): | 2.2 |
| Identification Numbers | (4): | UN1044 |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | 2.2 |
| Special provision | (7): | 18, 110 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | 309 |
| Nonbulk | (8B): | 309 |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 75 kg |
| Cargo aircraft only | (9B): | 150 kg |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | |

**********

Fuzes, detonating

| | | |
|---|---|---|
| Symbol | (1): | |
| Description, ship. name | (2): | Fuzes, detonating |
| Hazard class or Division | (3): | 1.4S |
| Identification Numbers | (4): | UN0367 |
| PG (Packing Group) | (5): | II |
| Label Codes | (6): | 1.4S |
| Special provision | (7): | 116 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | None |
| Nonbulk | (8B): | 62 |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | 25 kg |
| Cargo aircraft only | (9B): | 100 kg |

| | | |
|---|---|---|
| Vessel Stowage | (10) | |
| Location | (10A): | 5 |
| Other | (10B): | |

**********

Life-saving appliances, self i

| | | |
|---|---|---|
| Symbol | (1): | |
| Description, ship. name | (2): | Life-saving appliances, self inflating |
| Hazard class or Division | (3): | 9 |
| Identification Numbers | (4): | UN2990 |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | None |
| Special provision | (7): | |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | None |
| Nonbulk | (8B): | 219 |
| Bulk | (8C): | None |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | No limit |
| Cargo aircraft only | (9B): | No limit |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | |

**********

Radioactive material, Type A p

| | | |
|---|---|---|
| Symbol | (1): | I |
| Description, ship. name | (2): | Radioactive material, Type A package [non-special form, non fissile or fissile-excepted] |
| Hazard class or Division | (3): | 7 |
| Identification Numbers | (4): | UN2915 |
| PG (Packing Group) | (5): | |
| Label Codes | (6): | 7 |
| Special provision | (7): | W7, W8 |
| Packaging (173.***) | (8) | |
| Exceptions | (8A): | |
| Nonbulk | (8B): | 415 |
| Bulk | (8C): | 415 |
| Quantity limitations | (9) | |
| Passngr aircraft/rail | (9A): | |
| Cargo aircraft only | (9B): | |
| Vessel Stowage | (10) | |
| Location | (10A): | A |
| Other | (10B): | 95 |

**********

1,1,1,2-Tetrafluoroethane [or]

| | | |
|---|---|---|
| Symbol | (1): | |

```
Description, ship. name  (2):  1,1,1,2-Tetrafluoroethane [or]
                               Refrigerant gas R 134a
Hazard class or Division (3):  2.2
Identification Numbers   (4):  UN3159
PG (Packing Group)       (5):
Label Codes              (6):  2.2
Special provision        (7):  T50
Packaging (173.***)      (8)
  Exceptions            (8A):  306
  Nonbulk               (8B):  304
  Bulk                  (8C):  314, 315
Quantity limitations     (9)
  Passngr aircraft/rail (9A):  75 kg
  Cargo aircraft only   (9B):  150 kg
Vessel Stowage           (10)
  Location             (10A):  A
  Other                (10B):

********************************************************************************
```

**172.200**

**Applicability.**

(a) *Description of hazardous materials required.* Except as otherwise provided in this subpart, each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper in the manner required by this subpart.

**172.202**

**Description of hazardous material on shipping papers.**

(a) The shipping description of a hazardous material on the shipping paper must include:
(1) The proper shipping name prescribed for the material in Column 2 of the §172.101 Table;
(2) The hazard class or division prescribed for the material as shown in Column 3 of the §172.101 Table (class names or subsidiary hazard class or division number may be entered following the numerical hazard class, or following the basic description). The hazard class need not be included for the entry ``Combustible liquid, n.o.s.";
(3) The identification number prescribed for the material as shown in Column 4 of the §172.101 Table;
(4) The packing group in Roman numerals, as designated for the hazardous material in Column 5 of the § 172.101 Table. Class 1 (explosives) materials, self-reactive substances, organic peroxides and entries that are not assigned a packing group are excepted from this requirement. The packing group may be preceded by the letters "PG" (for example, "PG II"); and
(5) Except for empty packagings (see §173.29 of this subchapter), cylinders for Class 2 (compressed gases) materials, and bulk packagings, the total quantity (by net or gross mass, capacity, or as otherwise appropriate), including the unit of measurement, of the hazardous material covered by the description (e.g., ``800 lbs", ``55 gal.",

``3629 kg", or ``208 L"). For cylinders for Class 2 (compressed gases) materials and bulk packagings, some indication of total quantity must be shown (e.g., ``10 cylinders" or ``1 cargo tank").

**172.203**

**Additional description requirements.**

(a) *Exemptions.* Each shipping paper issued in connection with a shipment made under an exemption must bear the notation ``DOT-E" followed by the exemption number assigned and so located that the notation is clearly associated with the description to which the exemption applies.

(b) *Limited quantities.* The description for a material offered for transportation as ``limited quantity," as authorized by this subchapter, must include the words ``Limited Quantity" or ``Ltd Qty" following the basic description.

(c) *Hazardous substances.*

(1) Except for Class 7 (radioactive) materials described in accordance with paragraph (d) of this section, if the proper shipping name for a material that is a hazardous substance does not identify the hazardous substance by name, the name of the hazardous substance must be entered in parentheses in association with the basic description. If the material contains two or more hazardous substances, at least two hazardous substances, including the two with the lowest reportable quantities (RQs), must be identified. For a hazardous waste, the waste code (e.g., D001), if appropriate, may be used to identify the hazardous substance.

(2) The letters ``RQ" shall be entered on the shipping paper either before or after, the basic description required by §172.202 for each hazardous substance (see definition in §171.8 of this subchapter). For example: ``RQ, Allyl alcohol, 6.1, UN 1098, I"; or ``Environmentally hazardous substance, solid, n.o.s., 9, UN 3077, III, RQ (Adipic acid)".

(d) *Radioactive material.* The description for a shipment of a Class 7 (radioactive) material must include the following additional entries as appropriate:

(1) The words ``RADIOACTIVE MATERIAL" unless these words are contained in the proper shipping name.

(2) The name of each radionuclide in the Class 7 (radioactive) material that is listed in §173.435 of this subchapter. For mixtures of radionuclides, the radionuclides that must be shown must be determined in accordance with §173.433(f) of this subchapter. Abbreviations, e.g., ``$^{99}$Mo", are authorized.

(3) A description of the physical and chemical form of the material, if the material is not in special form (generic chemical description is acceptable for chemical form).

(4) The activity contained in each package of the shipment in terms of the appropriate SI units (e.g. Becquerel, Terabecquerel, etc.) or in terms of the appropriate SI units followed by the customary units (e.g. Curies, millicuries, etc.). Abbreviations are authorized. Except for plutonium-238, plutonium-239, and plutonium-241, the weight in grams or kilograms of fissile radionuclides may be inserted instead of activity units. For plutonium-238, plutonium-239, and plutonium-241 the weight in grams or

kilograms of fissile radionuclides may be inserted in addition to the activity units. For the shipment of a package containing a highway route controlled quantity of Class 7 (radioactive) materials (see §173.403 of this subchapter) the words ``Highway route controlled quantity" must be entered in association with the basic description.

(5) The category of label applied to each package in the shipment. For example: ``RADIOACTIVE WHITE-I."

(6) The transport index assigned to each package in the shipment bearing RADIOACTIVE YELLOW-II or RADIOACTIVE YELLOW-III labels.

(7) For a shipment of fissile Class 7 (radioactive) materials:

(i) The words ``Fissile Excepted" if the package is excepted pursuant to §173.453 of this subchapter;

(ii) For a fissile material, controlled shipment, the additional notation: ``Warning-Fissile material, controlled shipment. Do not load more than * * * packages per vehicle." (Asterisks to be replaced by appropriate number.) ``In loading and storage areas, keep at least 6 meters (20 feet) from other packages bearing radioactive labels"; and

(iii) If a fissile material, controlled shipment is to be transported by water, the supplementary notation must also include the following statement: ``For shipment by water, only one fissile material, controlled shipment is permitted in each hold."

(8) For a package approved by the U.S. Department of Energy (DOE) or U.S. Nuclear Regulatory Commission (USNRC), a notation of the package identification marking as prescribed in the applicable DOE or USNRC approval. (See §173.471 of the subchapter.)

(9) For an export shipment or a shipment in a foreign made package, a notation of the package identification marking as prescribed in the applicable International Atomic Energy Agency (IAEA) Certificate of Competent Authority which has been issued for the package. (See §173.473 of the subchapter.)

(10) For a shipment required by this subchapter to be consigned as exclusive use:

(i) An indication that the shipment is consigned as exclusive use; or

(ii) If all the descriptions on the shipping paper are consigned as exclusive use, then the statement ``Exclusive Use Shipment" may be entered only once on the shipping paper in a clearly visible location.

(11) For a shipment of low specific activity material or surface contaminated objects, the appropriate group notation of LSA-I, LSA-II, LSA-III, SCO-I, or SCO-II, unless the group notation is contained in the proper shipping name as described in the § 172.101 Table.

(e) *Empty packagings.*

(1) The description on the shipping paper for a packaging containing the residue of a hazardous material may include the words ``RESIDUE: Last Contained * * *" in association with the basic description of the hazardous material last contained in the packaging.

(2) The description on the shipping paper for a tank car containing the residue of a hazardous material must include the phrase, ``RESIDUE: LAST CONTAINED * * *" before the basic description.

(f) *Transportation by air*. When a package containing a hazardous material is offered for transportation by air and this subchapter prohibits its transportation aboard passenger-carrying aircraft, the words ``Cargo aircraft only" must be entered after the basic description.

(k) *Technical names for ``n.o.s." and other generic descriptions.* Unless otherwise excepted, if a material is described on a shipping paper by one of the proper shipping names identified by the letter "G" in Column (1) of the § 172.101 Table, the technical name of the hazardous material must be entered in parentheses in association with the basic description. For example ``Corrosive liquid, n.o.s., (Caprylyl chloride), 8, UN 1760, II", or ``Corrosive liquid, n.o.s., 8, UN 1760, II (contains Caprylyl chloride)". The word ``contains" may be used in association with the technical name, if appropriate. For organic peroxides which may qualify for more than one generic listing depending on concentration, the technical name must include the actual concentration being shipped or the concentration range for the appropriate generic listing. For example, ``Organic peroxide type B, solid, 5.2, UN 3102 (dibenzoyl peroxide, 52-100%)" or ``Organic peroxide type E, solid, 5.2, UN 3108 (dibenzoyl peroxide, paste, <52%)". Shipping descriptions for toxic materials that meet the criteria of Division 6.1, PG I or II (as specified in § 173.132(a) of this subchapter) or Division 2.3 (as specified in § 173.115(c) of this subchapter) and are identified by the letter "G" in Column (1) of the § 172.101 Table, must have the technical name of the toxic constituent entered in parentheses in association with the basic description.

(1) If a hazardous material is a mixture or solution of two or more hazardous materials, the technical names of at least two components most predominately contributing to the hazards of the mixture or solution must be entered on the shipping paper as required by paragraph (k) of this section. For example, ``Flammable liquid, corrosive, n.o.s., 3, UN 2924, II (contains Methanol, Potassium hydroxide)".

(2) The provisions of this paragraph do not apply-

(i) To a material that is a hazardous waste and described using the proper shipping name ``Hazardous waste, liquid *or* solid, n.o.s.", classed as a miscellaneous Class 9, provided the EPA hazardous waste number is included on the shipping paper in association with the basic description, or provided the material is described in accordance with the provisions of §172.203(c) of this part.

(ii) To a material for which the hazard class is to be determined by testing under the criteria in §172.101(c)(11).

(iii) If the n.o.s. description for the material (other than a mixture of hazardous materials of different classes meeting the definitions of more than one hazard class) contains the name of the chemical element or group which is primarily responsible for the material being included in the hazard class indicated.

(iv) If the n.o.s. description for the material (which is a mixture of hazardous materials of different classes meeting the definition of more than one hazard class) contains the name of the chemical element or group responsible for the material meeting the definition of one of these classes. In such cases, only the technical name of the component that is not appropriately identified in the n.o.s. description shall be entered in parentheses.

**172.204**

## Shipper's certification.

(a) *General.* Except as provided in paragraphs (b) and (c) of this section, each person who offers a hazardous material for transportation shall certify that the material is offered for transportation in accordance with this subchapter by printing (manually or mechanically) on the shipping paper containing the required shipping description the certification contained in paragraph (a)(1) of this section or the certification (declaration) containing the language contained in paragraph (a)(2) of this section.

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

**Note**: In line one of the certification the words ``herein-named" may be substituted for the words ``above-named".

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

(c) *Transportation by air-*

(1) *General.* Certification containing the following language may be used in place of the certification required by paragraph (a) of this section:

I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packaged, marked and labeled, and in proper condition for carriage by air according to applicable national governmental regulations.

Note to Paragraph (c)(1): In the certification, the word "packed" may be used instead of the word "packaged" until October 1, 2010.

(2) *Certificate in duplicate.* Each person who offers a hazardous material to an aircraft operator for transportation by air shall provide two copies of the certification required in this section. (See §175.30 of this subchapter.)

(3) *Passenger and cargo aircraft.* Each person who offers for transportation by air a hazardous material authorized for air transportation shall add to the certification required in this section the following statement:

This shipment is within the limitations prescribed for passenger aircraft/cargo aircraft only (delete nonapplicable).

(4) *Radioactive material.* Each person who offers any radioactive material for transportation aboard a passenger-carrying aircraft shall sign (mechanically or manually) a printed certificate stating that the shipment contains radioactive material intended for use in, or incident to, research, or medical diagnosis or treatment.

(d) *Signature.* The certifications required by paragraph (a) or (c) of this section:

(1) Must be legibly signed by a principal, officer, partner, or employee of the shipper or his agent; and

(2) May be legibly signed manually, by typewriter, or by other mechanical means.

**172.300**

**Applicability.**

(a) Each person who offers a hazardous material for transportation shall mark each package, freight container, and transport vehicle containing the hazardous material in the manner required by this subpart.

**172.301**

**General marking requirements for non-bulk packagings.**

(a) *Proper shipping name and identification number.*

(1) Except as otherwise provided by this subchapter, each person who offers for transportation a hazardous material in a non-bulk packaging shall mark the package with the proper shipping name and identification number (preceded by "UN" or "NA", as appropriate) for the material as shown in the § 172.101 Table. Identification numbers are not required on packages which contain only limited quantities, as defined in § 171.8 of this subchapter, or ORM-D materials.

(b) *Technica1 names.* In addition to the marking required by paragraph (a) of this section, each non-bulk packaging containing hazardous materials subject to the provisions of §172.203(k) of this part shall be marked with the technical name in parentheses in association with the proper shipping name in accordance with the requirements and exceptions specified for display of technical descriptions on shipping papers in §172.203(k) of this part.

**172.312**

**Liquid hazardous materials in non-bulk packagings.**

(a) Except as provided in this section, each non-bulk combination package having inner packagings containing liquid hazardous materials must be:

(1) Packed with closures upward, and

(2) Legibly marked, with package orientation markings that conform pictorially to the illustration shown in this paragraph, on two opposite vertical sides of the package with the arrows pointing in the correct upright direction. Depicting a rectangular border around the arrows is optional.

(b) Arrows for purposes other than indicating proper package orientation may not be displayed on a package containing a liquid hazardous material.

(c) The requirements of paragraph (a) of this section do not apply to-

(1) A non-bulk package with inner packagings which are cylinders.

(2) Except when offered or intended for transportation by aircraft, packages containing flammable liquids in inner packagings of one liter or less prepared in accordance with §173.150 (b) or (c) of this subchapter.
(3) When offered or intended for transportation by aircraft, packages containing flammable liquids in inner packagings of 120 ml (4 fluid oz.) or less prepared in accordance with §173.150 (b) or (c) of this subchapter when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents.
(4) Liquids contained in manufactured articles (e.g., alcohol or mercury in thermometers) which are leak-tight in all orientations.
(5) A non-bulk package with hermetically-sealed inner packagings.

**172.400**

**General labeling requirements.**

(a) Except as specified in §172.400a, each person who offers for transportation or transports a hazardous material in any of the following packages or containment devices, shall label the package or containment device with labels specified for the material in the §172.101 Table and in this subpart:
(1) A non-bulk package;
(2) A bulk packaging, other than a cargo tank, portable tank, or tank car, with a volumetric capacity of less than 18$m^3$ (640 cubic feet), unless placarded in accordance with subpart F of this part;
(3) A portable tank of less than 3785 L (1000 gallons) capacity, unless placarded in accordance with subpart F of this part;
(4) A DOT Specification 106 or 110 multi-unit tank car tank, unless placarded in accordance with subpart F of this part; and
(5) An overpack, freight container or unit load device, of less than 18 $m^3$ (640 cubic feet), which contains a package for which labels are required, unless placarded or marked in accordance with §172.512 of this part.

**172.402**

**Additional labeling requirements.**

(c) *Cargo Aircraft Only label.* Each person who offers for transportation or transports by aircraft a package containing a hazardous material which is authorized on cargo aircraft only shall label the package with a CARGO AIRCRAFT ONLY label specified in §172.448 of this subpart.

**172.403**

## Class 7 (radioactive) material.

(a) Unless excepted from labeling by §§ 173.421 through 173.427 of this subchapter, each package of radioactive material must be labeled as provided in this section.
(b) The proper label to affix to a package of Class 7 (radioactive) material is based on the radiation level at the surface of the package and the transport index. The proper category of label must be determined in accordance with paragraph (c) of this section. The label to be applied must be the highest category required for any of the two determining conditions for the package. RADIOACTIVE WHITE-I is the lowest category and RADIOACTIVE YELLOW-III is the highest. For example, a package with a transport index of 0.8 and a maximum surface radiation level of 0.6 millisievert (60 millirems) per hour must bear a RADIOACTIVE YELLOW-III label.
(c) Category of label to be applied to Class 7 (radioactive) materials packages:

| Transport index | Maximum radiation level at any point on the external surface | Label category[1] |
|---|---|---|
| 0[2] | Less than or equal to 0.005 mSv/h (0.5 mrem/h) | WHITE-I. |
| More than 0 but not more than 1 | Greater than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h) | YELLOW-II. |
| More than 1 but not more than 10 | Greater than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h) | YELLOW-III. |
| More than 10 (Must be shipped under | Greater than 2 mSv/h (200 mrem/h) but less than or equal to 10 mSv/h (1,000 mrem/h) | YELLOW-III exclusive use provisions; see 173.441(b) of this subchapter). |

[1] Any package containing a "highway route controlled quantity" ( 173.403 of this subchapter) must be labelled as RADIOACTIVE YELLOW-III.

[2] If the measured TI is not greater than 0.05, the value may be considered to be zero.

(d) *EMPTY* label. See §173.428(d) of this subchapter for EMPTY labeling requirements.
(e) [Reserved]
(f) Each package required by this section to be labeled with a RADIOACTIVE label must have two of these labels, affixed to opposite sides of the package. (See §172.406(e)(3) for freight container label requirements).
(g) The following applicable items of information must be entered in the blank spaces on the RADIOACTIVE label by legible printing (manual or mechanical), using a durable weather resistant means of marking:

(1) *Contents.* The name of the radionuclides as taken from the listing of radionuclides in §173.435 of this subchapter (symbols which conform to established radiation protection terminology are authorized, i.e., \99\Mo, \60\Co, etc.). For mixtures of radionuclides, with consideration of space available on the label, the radionuclides

that must be shown must be determined in accordance with §173.433(f) of this subchapter.

(2) *Activity.* Activity units must be expressed in appropriate SI units (e.g., Becquerels (Bq), Terabecquerels (Tbq), etc.) or in both appropriate SI units and appropriate customary units (Curies (Ci), MilliCuries (mCi) microCuries (uCi), etc.). Abbreviations are authorized. Except for plutonium-238, plutonium-239, and plutonium-241, the weight in grams or kilograms of fissile radionuclides may be inserted instead of activity units. For plutonium-238, plutonium-239, and plutonium-241, the weight in grams or kilograms of fissile radionuclides may be inserted in addition to the activity units.

(3) *Transport index.* (See §173.403 of this subchapter.)

**172.600**

**Applicability and general requirements.**

(a) *Scope.* Except as provided in paragraph (d) of this section, this subpart prescribes requirements for providing and maintaining emergency response information during transportation and at facilities where hazardous materials are loaded for transportation, stored incidental to transportation or otherwise handled during any phase of transportation.

(b) *Applicability.* This subpart applies to persons who offer for transportation, accept for transportation, transfer or otherwise handle hazardous materials during transportation.

(c) *General requirements.* No person to whom this subpart applies may offer for transportation, accept for transportation, transfer, store or otherwise handle during transportation a hazardous material unless:

(1) Emergency response information conforming to this subpart is immediately available for use at all times the hazardous material is present; and

(2) Emergency response information, including the emergency response telephone number, required by this subpart is immediately available to any person who, as a representative of a Federal, State or local government agency, responds to an incident involving a hazardous material, or is conducting an investigation which involves a hazardous material.

(d) *Exceptions.* The requirements of this subpart do not apply to hazardous material which is excepted from the shipping paper requirements of this subchapter or a material properly classified as an ORM-D.

**172.602**

**Emergency response information.**

(a) *Information required.* For purposes of this subpart, the term ``emergency response information" means information that can be used in the mitigation of an incident

involving hazardous materials and, as a minimum, must contain the following information:

(1) The basic description and technical name of the hazardous material as required by §§172.202 and 172.203(k), the ICAO Technical Instructions, the IMDG Code, or the TDG Regulations, as appropriate;

(2) Immediate hazards to health;

(3) Risks of fire or explosion;

(4) Immediate precautions to be taken in the event of an accident or incident;

(5) Immediate methods for handling fires;

(6) Initial methods for handling spills or leaks in the absence of fire; and

(7) Preliminary first aid measures.

(b) *Form of information.* The information required for a hazardous material by paragraph (a) of this section must be:

(1) Printed legibly in English;

(2) Available for use away from the package containing the hazardous material; and

(3) Presented-

(i) On a shipping paper;

(ii) In a document, other than a shipping paper, that includes both the basic description and technical name of the hazardous material as required by §§172.202 and 172.203(k), the ICAO Technical Instructions, the IMDG Code, or the TDG Regulations, as appropriate, and the emergency response information required by this subpart (e.g., a material safety data sheet); or

(iii) Related to the information on a shipping paper, a written notification to pilot-in-command, or a dangerous cargo manifest, in a separate document (e.g., an emergency response guidance document), in a manner that cross-references the description of the hazardous material on the shipping paper with the emergency response information contained in the document. Aboard aircraft, the ICAO ``Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods" and, aboard vessels, the IMO ``Emergency Procedures for Ships Carrying Dangerous Goods", or equivalent documents, may be used to satisfy the requirements of this section for a separate document.

(c) *Maintenance of information.* Emergency response information shall be maintained as follows:

(1) *Carriers.* Each carrier who transports a hazardous material shall maintain the information specified in paragraph (a) of this section and § 172.606 of this part in the same manner as prescribed for shipping papers, except that the information must be maintained in the same manner aboard aircraft as the notification of pilot-in-command, and aboard vessels in the same manner as the dangerous cargo manifest. This information must be immediately accessible to train crew personnel, drivers of motor vehicles, flight crew members, and bridge personnel on vessels for use in the event of incidents involving hazardous materials.

(2) *Facility operators.* Each operator of a facility where a hazardous material is received, stored or handled during transportation, shall maintain the information required by paragraph (a) of this section whenever the hazardous material is present.

This information must be in a location that is immediately accessible to facility personnel in the event of an incident involving the hazardous material.

**172.604**

**Emergency response telephone number.**

(a) A person who offers a hazardous material for transportation must provide an emergency response telephone number, including the area code or international access code, for use in the event of an emergency involving the hazardous material. The telephone number must be -

(1) Monitored at all times the hazardous material is in transportation, including storage incidental to transportation;

(2) The number of a person who is either knowledgeable of the hazardous material being shipped and has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information; and

(3) Entered on a shipping paper, as follows:

(i) Immediately following the description of the hazardous material required by subpart C of this part; or

(ii) Entered once on the shipping paper in a clearly visible location. This provision may be used only if the telephone number applies to each hazardous material entered on the shipping paper, and if it is indicated that the telephone number is for emergency response information (for example: ``EMERGENCY CONTACT: * * *).

(b) The telephone number required by paragraph (a) of this section must be the number of the person offering the hazardous material for transportation or the number of an agency or organization capable of, and accepting responsibility for, providing the detailed information concerning the hazardous material. A person offering a hazardous material for transportation who lists the telephone number of an agency or organization shall ensure that agency or organization has received current information on the material, as required by paragraph (a)(2) of this section before it is offered for transportation.

(c) The requirements of this section do not apply to-

(1) Hazardous materials that are offered for transportation under the provisions applicable to limited quantities; and

(2) Materials properly described under the following shipping names:

Battery powered equipment
Battery powered vehicle
Carbon dioxide, solid
Castor bean
Castor flake
Castor meal
Castor pomace
Consumer commodity
Dry ice

Engines, internal combustion
Fish meal, stabilized
Fish scrap, stabilized
Refrigerating machine
Wheelchair, electric

**172.606**

**Carrier information contact.**

(a) Each carrier who transports or accepts for transportation a hazardous material for which a shipping paper is required shall instruct the operator of a motor vehicle, train, aircraft, or vessel to contact the carrier (e.g., by telephone or mobile radio) in the event of an incident involving the hazardous material.
(b) For transportation by highway, if a transport vehicle, (e.g., a semi-trailer or freight container-on-chassis) contains hazardous material for which a shipping paper is required and the vehicle is separated from its motive power and parked at a location other than a facility operated by the consignor or consignee or a facility (e.g., a carrier's terminal or a marine terminal) subject to the provisions of § 172.602(c)(2), the carrier shall -

(1) Mark the transport vehicle with the telephone number of the motor carrier on the front exterior near the brake hose and electrical connections or on a label, tag, or sign attached to the vehicle at the brake hose or electrical connection; or

(2) Have the shipping paper and emergency response information readily available on the transport vehicle.

(c) The requirements specified in paragraph (b) of this section do not apply to an unattended motor vehicle separated from its motive power when the motor vehicle is marked on an orange panel, a placard, or a plain white square-on-point configuration with the identification number of each hazardous material loaded therein, and the marking or placard is visible on the outside of the motor vehicle.

**173.3**

**Packaging and exceptions.**

(a) The packaging of hazardous materials for transportation by air, highway, rail, or water must be as specified in this part. Methods of manufacture, packing, and storage of hazardous materials, that affect safety in transportation, must be open to inspection by a duly authorized representative of the initial carrier or of the Department. Methods of manufacture and related functions necessary for completion of a DOT specification or U.N. standard packaging must be open to inspection by a representative of the Department.

**173.22**

**Shipper's responsibility.**

(a) Except as otherwise provided in this part, a person may offer a hazardous material for transportation in a packaging or container required by this part only in accordance with the following:

(1) The person shall class and describe the hazardous material in accordance with parts 172 and 173 of this subchapter, and

(2) The person shall determine that the packaging or container is an authorized packaging, including part 173 requirements, and that it has been manufactured, assembled, and marked in accordance with:

(i) Section 173.7(a) and parts 173, 178, or 179 of this subchapter;

(ii) A specification of the Department in effect at the date of manufacture of the packaging or container;

(iii) National or international regulations based on the UN Recommendations on the Transport of Dangerous Goods, as authorized in §173.24(d)(2);

(iv) An approval issued under this subchapter; or

(v) An exemption issued under subchapter A of this chapter.

**173.24**

**General requirements for packagings and packages.**

(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 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.

(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 §§171.11, 171.12, 171.12a, 173.3, 173.4, 173.5, 173.7, 173.27, or 176.11 of this subchapter.

**173.50**

**Class 1-definitions.**

(a) Explosive. For the purpose of this subchapter, an *explosive* means any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classed under the provision of this subchapter.

(b) Explosives in Class 1 are divided into six divisions as follows:

(1) *Division 1.1* consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

(2) *Division 1.2* consists of explosives that have a projection hazard but not a mass explosion hazard.

(3) *Division 1.3* consists of explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

(4) *Division 1.4* consists of explosives that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

(5) [1]Division 1.5[1] *consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.*

(6) [2]Division 1.6[2] consists of extremely insensitive articles which do not have a mass explosive hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

**173.62**

**Specific packaging requirements for explosives.**

(a) Except as provided in paragraph (d) of this section, when the § 172.101 Table specifies that an explosive must be packaged in accordance with this section, only non-bulk packagings which conform to the provisions of paragraphs (b), (c) and (d) of this section and the applicable requirements in §§ 173.60 and 173.61 may be used unless otherwise approved by the Associate Administrator. Intermediate bulk packagings may be used for explosives assigned to Packing Instruction 117 in paragraph (b) of this section. Intermediate bulk packagings must conform with the requirements of this subchapter.

(b) Explosives Table. The Explosives Table specifies the Packing Instructions assigned to each explosive. Explosives are identified in the first column in numerical sequence by their identification number (ID #), which is listed in column 4 of the § 172.101 Table, of this subchapter. The second column of the Explosives Table specifies the Packing Instruction (PI) which must be used for packaging the explosive. The Explosives Packing Method Table in paragraph (c) of this section defines the methods of packaging. The Packing Instructions are identified using a 3 digit designation. The Packing Instruction prefixed by the letters "US" is particular to the United States and not found in applicable international regulations.

**Explosives Table**

| | | | |
|---|---|---|---|
| UN0367 | 141 | | |
| 141 | Receptacles fibreboard metal plastics wood plastics wood | Not necessary | Boxes.steel (4A).aluminium (4B).wood, natural, ordinary (4C1).wood, natural, sift proof walls (4C2).plywood (4D).reconstituted wood (4F).fibreboard (4G).plastics, solid (4H2).steel, removable head (1A2).aluminium, removable head (1B2).fibre (1G).plastics, removable head (1H2). Drums. plywood (1D) |

**173.159**

## Batteries, wet.

(a) Electric storage batteries, containing electrolyte acid or alkaline corrosive battery fluid, must be completely protected so that short circuits will be prevented; they 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.

(b) The following specification packagings are authorized for batteries packed without other materials:

(1) 4C1, 4C2, 4D, or 4F wooden boxes.

(2) 4G fiberboard boxes.

(3) 1D plywood drums.

(4) 1G fiber drums.

(5) 1H2 and 3H2 plastic drums and jerricans.

(6) 4H2 plastic boxes.

(c) The following non-specification packagings are authorized for batteries packed without other materials:

(1) Electric storage batteries protected against short circuits and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation, are authorized for transportation by rail, highway, or water. The height of the completed unit must not exceed 1\1/2\ times 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 (2000 pounds), a superimposed weight of 1814 kg (4000 pounds). Battery terminals must not be relied upon to support any part of the superimposed weight.

(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 and protected against short circuits. Such shipments may not be offered in interchange service.

(3) One to three batteries not over 11.3 kg (25 pounds) each, packed in 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. Batteries must be securely cushioned and packed to prevent short circuits. 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. Batteries must be securely cushioned and packed to prevent short circuits. 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 terminals, cell covers or filler caps.

(7) Sinÿ7Egle 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 handholes 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 or 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).

(d) A nonspillable wet electric storage battery is excepted from all other requirements of this subchapter under the following conditions:

(1) The battery must be protected against short circuits and securely packaged;

(2) For batteries manufactured after September 30, 1995, the battery and the outer packaging must be plainly and durably marked ``NONSPILLABLE" or ``NONSPILLABLE BATTERY"; and

(3) The battery must be capable of withstanding the following two tests, without leakage of battery fluid from the battery:

(i) *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.

(ii) *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 psi). 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.

(e) Electric storage batteries containing electrolyte or corrosive battery fluid are not subject to the requirements of this subchapter for transportation by highway or rail if all of the following requirements 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) Electric storage batteries, containing electrolyte or corrosive battery fluid in a coil from which it is injected into the battery cells by a gas generator and initiator assembled with the battery, and which are nonspillable under the criteria of paragraph (d) of this section, are excepted from other requirements of this subchapter when examined by the Bureau of Explosives and approved by the Associate Administrator for Hazardous Materials Safety.

(g) Electrolyte, acid, or alkaline corrosive battery fluid, packed with storage 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 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 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 storage 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).

**173.166**

**Air bag inflators, air bag modules and seat-belt pretensioners.**

(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 vessel (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 pre-tensioner contains similar hazardous materials and is used in the operation of a seat-belt restraining system in a motor vehicle.

(b) *Classification.* An air bag inflator, air bag module, or seat-belt pre-tensioner may be classed as Class 9 (UN3268) or Division 2.2 (UN3353) if it meets the following requirements-

(1) The manufacturer has submitted each design type air bag inflator or seat-belt pre-tensioner to a person approved by the Associate Administrator for Hazardous Materials Safety for examination and testing. The submission must contain a detailed description of the inflator or pre-tensioner (or, if more than a single inflator or pre-tensioner is involved, the maximum parameters of each particular inflator or pre-tensioner design type for which approval is sought) and details on the complete package.

(2) Samples of the inflator or pre-tensioner, packaged as for transport, have been subjected to test series 6(c) of the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (see § 171.7 of this subchapter), with no explosion of the device, no fragmentation of device casings, and no projection hazard or thermal effect which would significantly hinder fire-fighting or other emergency response efforts in the immediate vicinity.

(3) The manufacturer submits an application, including-

(i) The test results and report recommending the shipping description and classification for each device or design type; or

(ii) An approved classification issued by the competent authority of a foreign government, to the Associate Administrator for Hazardous Materials Safety, and is notified in writing by the Associate Administrator that the device has been classed as Class 9 or Division 2.2 and approved for transportation.

(4) No approval applications are required for air bag modules containing an approved air bag inflator.

(5) Air bag inflators or seat belt pre-tensioners previously reclassed from Class 1 to Division 4.1 under the terms of an exemption may be reclassed as Class 9 materials without further testing.

(c) *EX numbers*. When offered for transportation, the shipping paper must contain the EX number or product code for each approved inflator 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 inflator, module or pre-tensioner by the Associate Administrator for Hazardous Materials Safety. Marking the EX number or product code on the outside package is not required. This paragraph (c) does not apply to a device classed as Division 2.2.

(d) *Exceptions*.

(1) An air bag module or seat-belt pretensioner that has been approved by the Associate Administrator for Hazardous Materials Safety and is installed in a motor

vehicle or in completed vehicle 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 previously been examined and approved for transportation as a Division 4.1 material, is not required to be submitted for examination or approval.

(3) Shipments for recycling. When offered for domestic transportation by highway, rail freight, cargo vessel or cargo aircraft only, a serviceable air bag module or seat-belt pretensioner 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, 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.

(e) *Packagings*. The following packagings at the Packing Group III performance level are authorized for Class 9 devices:

(1) 1A2, 1B2, 1G or 1H2 drums.

(2) 3A2 or 3H2 jerricans.

(3) 4C1, 4C2, 4D, 4F, 4G or 4H2 boxes.

(4) Reusable high strength plastic or metal containers or dedicated handling devices are authorized for shipment of air bag inflators, air bag modules, and seat-belt pretensioners from a manufacturing facility to the assembly facility, subject to the following conditions:

(i) The gross weight of the container or handling device may not exceed 1000 kg (2205 pounds). The container or handling device structure must provide adequate support to allow them to be stacked at least three high with no damage to the containers or devices.

(ii) If not completely enclosed by design, the container or handling device must be covered with plastic, fiberboard, or metal. The covering must be secured to the container by banding or other comparable methods.

(iii) Internal dunnage must be sufficient to prevent movement of the devices within the container.

(f) *Labeling*. Notwithstanding the provisions of §172.402 of this subchapter, or handling device each package must display a CLASS 9 or NON-FLAMMABLE GAS label. Additional labeling is not required when the package contains no hazardous materials other than the devices.

**173.173**

**Paint, paint-related material, adhesives, ink and resins.**

(a) When the §172.101 Table specifies that a hazardous material be packaged under this section, the following requirements apply. Except as otherwise provided in this part, the description ``Paint'' is the proper shipping name for paint, lacquer, enamel, stain, shellac,

varnish, liquid aluminum, liquid bronze, liquid gold, liquid wood filler, and liquid lacquer base. The description ``Paint-related material'' is the proper shipping name for a paint thinning, drying, reducing or removing compound. However, if a more specific description is listed in the §172.101 Table of this subchapter, that description must be used.

(b) Paint, paint-related material, adhesives, ink and resins must be packaged as follows:

(1) As prescribed in §173.202 of this part if it is a Packing Group II material or §173.203 of this part if it is a Packing Group III material; or

(2) In inner glass packagings of not over 1 L (0.3 gallon) capacity each or inner metal packagings of not over 5 L (1 gallon) each, packed in a strong outer packaging. Packages must conform to the packaging requirements of subpart B of this part but need not conform to the requirements of part 178 of this subchapter.

**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 build-up 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. For each shipment by air exceeding 2.3 kg (5 lbs) per package, advance arrangements must be made between the shipper and each carrier.

(b) Railroad cars and motor vehicles containing solid carbon dioxide, when accepted for transportation on board ocean vessels, must be conspicuously marked on two sides ``WARNING $CO_2$ SOLID (DRY ICE).''

(c) Other packagings containing solid carbon dioxide, when offered or accepted for transportation on board ocean vessels, must be marked ``CARBON DIOXIDE, SOLID-DO NOT STOW BELOW DECKS.''

(d) Not more than 200 kg (441 pounds) of solid carbon dioxide may be transported in any one cargo compartment or bin on any aircraft except by specific and special written arrangement between the shipper and the aircraft operator.

(e) Carbon dioxide, solid (dry ice) is excepted from the shipping paper and certification requirements of this subchapter if the requirements of paragraphs (a) and (d) of this section are complied with and the package is marked ``Carbon dioxide, solid'' or ``Dry ice'' and marked with an indication that the material being refrigerated is used for diagnostic or treatment purposes (e.g., frozen medical specimens).

**173.401**

**Scope.**

(a) This subpart sets forth requirements for the packaging and transportation of Class 7 (radioactive) materials by offerors and carriers subject to this subchapter. The requirements prescribed in this subpart are in addition to, not in place of, other requirements set forth in this subchapter for Class 7 (radioactive) materials and those of the Nuclear Regulatory Commission in 10 CFR Part 71.

(b) This subpart does not apply to:

(1) Class 7 (radioactive) materials produced, used, transported, or stored within an establishment other than during the course of transportation, including storage in transportation.

(2) Class 7 (radioactive) materials contained in a medical device, such as a heart pacemaker, which is implanted in a human being or live animal.

(3) Class 7 (radioactive) materials that have been injected into, ingested by, or are otherwise placed into, and are still in, human beings or live animals.

**175.30**

**Accepting and inspecting shipments.**

(a) No person may accept a hazardous material for transportation aboard an aircraft unless the hazardous material is:

(1) Authorized, and is within the quantity limitations specified for carriage aboard aircraft according to §172.101 of this subchapter or as otherwise specifically provided by this subchapter.

(2) Described and certified on a shipping paper prepared in duplicate in accordance with subpart C of part 172 or as authorized by §171.11 of this subchapter. The originating aircraft operator must retain one copy of each shipping paper for 90 days;

(3) Labeled and marked in accordance with subparts D and E of part 172 or as authorized in §171.11 of this subchapter, and placarded (when required) in accordance with subpart F of part 172 of this subchapter; and,

(4) Labeled with a ``CARGO AIRCRAFT ONLY'' label (see §172.448 of this subchapter) if the material as presented is not permitted aboard passenger-carrying aircraft.

(b) Except as provided in paragraph (d) of this section, no person may carry a hazardous material in a package, outside container, or overpack aboard an aircraft unless the package, outside container, or overpack is inspected by the operator of the aircraft immediately before placing it:

(1) Aboard the aircraft; or,

(2) In a unit load device or on a pallet prior to loading aboard the aircraft.

(c) A hazardous material may only be carried aboard an aircraft if, based on the inspection prescribed in paragraph (b) of this section, the operator determines that the package, outside container, or overpack containing the hazardous material:

(1) Has no holes, leakage or other indication that its integrity has been compromised; and

(2) For Class 7 (radioactive) materials, does not have a broken seal, except that packages contained in overpacks need not be inspected for seal integrity.

(d) The requirements of paragraphs (b) and (c) of this section do not apply to:

(1) An ORM-D material packed in a freight container and offered for transportation by one consignor;

(2) Dry ice (carbon dioxide, solid); or

(e) An overpack containing packages of hazardous materials may be accepted only if the operator has taken all reasonable steps to establish that:

(1) The overpack does not contain a package bearing the ``CARGO AIRCRAFT ONLY" label unless-

(i) The overpack affords clear visibility of and easy access to the package; or

(ii) The package contains a material which may be carried inaccessibly under the provisions of §175.85(c)(1); or

(iii) Not more than one package is overpacked.

(2) The proper shipping names, identification numbers, labels and special handling instructions appearing on the inside packages are clearly visible or reproduced on the outside of the overpack, and

(3) Has determined that a statement to the effect that the inside packages comply with the prescribed specifications appears on the outside of the overpack, when specification packagings are prescribed.

**175.33**

**Notification of pilot-in-command.**

(a) Except as provided in § 175.10, when a hazardous material subject to the provisions of this subchapter is carried in an aircraft, the operator of the aircraft must provide the pilot-in-command with accurate and legible written information as early as practicable before departure of the aircraft, which specifies at least the following:

(1) The proper shipping name, hazard class and identification number of the material as specified in §172.101 of this subchapter or the ICAO Technical Instructions. In the case of Class 1 material, the compatibility group letter also must be shown. If a hazardous material is described by the proper shipping name, hazard class, and identification number appearing in:

(i) Section 172.101 of this subchapter, any additional description requirements provided in §§172.202 and 172.203 of this subchapter must also be shown in the notification.

(ii) The ICAO Technical Instructions, any additional information required to be shown on shipping papers by §171.11 of this subchapter must also be shown in the notification.

(2) The total number of packages;

(3) The net quantity or gross weight, as applicable, for each package except those containing Class 7 (radioactive) materials and those for which there is no limit imposed on the maximum net quantity per package;

(4) The location of the packages aboard the aircraft;

(5) Confirmation that no damaged or leaking packages have been loaded on the aircraft;
(6) For Class 7 (radioactive) materials, the number of packages, overpacks or freight containers their category, transport index (if applicable), and their location aboard the aircraft;
(7) Confirmation that the package must be carried on cargo aircraft only if its transportation aboard passenger-carrying aircraft is forbidden; and
(8) An indication, when applicable, that a hazardous material is being carried under terms of an exemption.

(b) A copy of the written notification to pilot-in-command shall be readily available to the pilot-in-command during flight. Emergency response information required by subpart G of part 172 of this subchapter must be maintained in the same manner as the written notification to pilot-in-command during transport of the hazardous material aboard the aircraft.

**175.35**

**Shipping papers aboard aircraft.**

(a) A copy of the shipping papers required by §175.30(a)(2) must accompany the shipment it covers during transportation aboard an aircraft.
(b) The documents required by paragraph (a) of this section and §175.33 may be combined into one document if it is given to the pilot-in-command before departure of the aircraft.

**175.85**

**Cargo location.**

(a) Except as provided in § 175.10, no person may carry a hazardous material subject to the requirements of this subchapter in the cabin of a passenger-carrying aircraft or on the flight deck of any aircraft. Hazardous materials may be carried in a main deck cargo compartment of a passenger aircraft provided that the compartment is inaccessible to passengers and that it meets all certification requirements for a Class B aircraft cargo compartment in 14 CFR 25.857(b)or for a Class C aircraft cargo compartment in 14 CFR 25.857(c).
(b) Each package containing a hazardous material acceptable only for cargo aircraft must be loaded in such a manner that a crew member or other authorized person can see, handle and when size and weight permit, separate such packages from other cargo during flight.
(c) Notwithstanding the provisions of paragraph (b) of this section:
(1) When packages of the following hazardous materials are carried on cargo aircraft only, they may be carried in a location which is inaccessible to a crewmember during

flight and are not subject to the weight limitation specified in paragraph (a)(2) of §175.75 of this subchapter.

(i) Class 7 (radioactive) materials,

(ii) Division 6.1 (poisonous) materials (except those labeled FLAMMABLE),

(iii) Materials in Division 6.2 (etiologic or infectious substances),

(iv) Class 3 (flammable liquid) materials with a flashpoint above 23 °C (73 °F) that do not meet the definition of another hazardous class,

(v) Class 9 (miscellaneous hazardous) materials, and ORM-D materials.

(2) When packages of hazardous materials acceptable for cargo-only or passenger-carrying aircraft are carried on cargo aircraft only where other means of transportation are impracticable or not available, packages may be carried in accordance with procedures approved in writing by the FAA Air Transportation Security Field Office responsible for the operator's overall aviation security program or the FAA Air Transportation Security Division in the region where the operator is located.

(3) When packages of hazardous materials acceptable for cargo-only or passenger-carrying aircraft are carried on small, single pilot, cargo aircraft only being used where other means of transportation are impracticable or not available, they may be carried without quantity limitation as specified in §175.75 in a location that is not accessible to the pilot if:

(i) No person other than the pilot, an FAA inspector, the shipper or consignee of the material or a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material is carried on the aircraft;

(ii) The pilot is provided with written instructions on characteristics and proper handling of the materials; and

(iii) Whenever a change of pilots occurs while the material is on board, the new pilot is briefed under a hand-to-hand signature service provided by the operator of the aircraft.

(d) [Reserved]

(e) No person may carry a material subject to the requirements of this subchapter that is acceptable for carriage in a passenger-carrying aircraft (other than magnetized materials) unless it is located in the aircraft in a place that is inaccessible to persons other than crew-members.

(f) Paragraphs (a) and (e) of this section do not apply to a person operating an aircraft under §175.310 which, because of its size and configuration, makes it impossible for that person to comply.

(g) No person may load magnetized material (which might cause an erroneous magnetic compass reading) on an aircraft, in the vicinity of a magnetic compass, or compass master unit, that is a part of the instrument equipment of the aircraft, in a manner that affects its operation. If this requirement cannot be met, a special aircraft swing and compass calibration may be made.

(h) Compressed oxygen, when properly labeled Oxidizer or Oxygen, may be loaded and transported as provided in paragraph (i) of this section. No person may load or transport any other package containing a hazardous material for which an OXIDIZER label is required under this subchapter in an inaccessible cargo compartment that does not have a fire or smoke detection system and a fire suppression system.

(i) In addition to the quantity limitations prescribed in § 175.75, cylinders of compressed oxygen must be stowed in accordance with the following:

(1) No more than a combined total of six cylinders of compressed oxygen may be stowed on an aircraft in the inaccessible aircraft cargo compartment(s) that do not have fire or smoke detection systems and fire suppression systems.

(2) When loaded into a passenger-carrying aircraft or in an inaccessible cargo location on a cargo-only aircraft, cylinders of compressed oxygen must be stowed horizontally on the floor or as close as practicable to the floor of the cargo compartment or unit load device. This provision does not apply to cylinders stowed in the cabin of the aircraft in accordance with § 175.10(b).

(3) When transported in a Class B aircraft cargo compartment (see 14 CFR 25.857(b)) or its equivalent (i.e., an accessible cargo compartment equipped with a fire or smoke detection system but not a fire suppression system), cylinders of compressed oxygen must be loaded in a manner that a crew member can see, handle and, when size and weight permit, separate the cylinders from other cargo during flight. No more than six cylinders of compressed oxygenand, in addition, one cylinder of medical-use compressed oxygen per passenger needing oxygen at destination - with a rated capacity of 850 liters (30 cubic feet) or less of oxygen - may be carried in a Class B aircraft cargo compartment or its equivalent.

---

[11]The probability of transition from burning to detonation is greater when large quantities are transported in a vessel.

[22]The risk from articles of Division 1.6 is limited to the explosion of a single article.