

§ 173.27 General requirements for transportation by aircraft.

(a) The requirements of this section are in addition to the requirements in §173.24 and apply to packages offered or intended for transportation aboard aircraft. Except for materials not subject to performance packaging requirements in subpart E of this part, a packaging containing a Packing Group III material with a primary or subsidiary risk of Division 4.1, 4.2, 4.3, 5.1, or Class 8 must meet the Packing Group II performance level when offered or intended for transportation by aircraft.

(b) Packages authorized on board aircraft. (1) When Column 9a of the §172.101 table indicates that a material is “Forbidden”, that material may not be offered for transportation or transported aboard passenger-carrying aircraft.

(2) When Column 9b of the §172.101 table indicates that a material is “Forbidden”, that material may not be offered for transportation or transported aboard aircraft.

(3) The maximum quantity of hazardous material in a package that may be offered for transportation or transported aboard a passenger-carrying aircraft or cargo aircraft may not exceed that quantity prescribed for the material in Column 9a or 9b, respectively, of the §172.101 table.

(4) A package containing a hazardous material which is authorized aboard cargo aircraft but not aboard passenger aircraft must be labeled with the CARGO AIRCRAFT ONLY label required by §172.402(c) of this subchapter and may not be offered for transportation or transported aboard passenger-carrying aircraft.

(c) Pressure requirements. (1) Packagings must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during transportation aboard aircraft.

(2) Packagings for which retention of liquid is a basic function must be capable of withstanding without leakage the greater of—

(i) An internal pressure which produces a gauge pressure of not less than 75 kPa (11 psig) for liquids in Packing Group III of Class 3 or Division 6.1; or 95 kPa (14 psig) for other liquids; or

(ii) A pressure related to the vapor pressure of the liquid to be conveyed, determined by one of the following:

(A) The total gauge pressure measured in the receptacle (i.e., the vapor pressure of the material and the partial pressure of air or other inert gases, less 100 kPa (15 psia)) at 55 °C (131 °F), multiplied by a safety factor of 1.5; determined on the basis of a filling temperature of 15 °C (59 °F) and a degree of filling such that the receptacle is not completely liquid full at a temperature of 55 °C (131 °F) or less;

(B) 1.75 times the vapor pressure at 50 °C (122 °F) less 100 kPa (15 psia); or

(C) 1.5 times the vapor pressure at 55 °C (131 °) less 100 kPa (15 psia).

(3) Notwithstanding the provisions of paragraph (c)(2) of this section—

(i) Hazardous materials may be contained in an inner packaging which does not itself meet the pressure requirement provided that the inner packaging is packed within a supplementary packaging which does meet the pressure requirement and other applicable packaging requirements of this subchapter.

(ii) Packagings which are subject to the hydrostatic pressure test and marking requirements of §§178.605 and 178.503(a)(5), respectively, of this subchapter must have a marked test pressure of not less than 250 kPa (36 psig) for liquids in Packing Group I, 80 kPa (12 psig) for liquids in Packing Group III of Class 3 or Division 6.1, and 100 kPa (15 psig) for other liquids.

(d) Closures. Stoppers, corks or other such friction-type closures must be held securely, tightly and effectively in place by positive means. Each screw-type closure on any packaging must be secured to prevent closure from loosening due to vibration or substantial change in temperature.

(e) Absorbent materials. Except as otherwise provided in this subchapter, liquid hazardous materials of Class 3, 4, or 8, or Division 5.1, 5.2 or 6.1 that are packaged and offered for transport in glass, earthenware, plastic or metal inner packagings must be packaged using absorbent material as follows:

(1) Packing Group I liquids on passenger aircraft must be packaged using materials capable of absorbing the entire contents of the inner packagings.

(2) Packing Group I liquids on cargo aircraft, and Packing Group II liquids including Division 5.2 liquids on passenger and cargo aircraft, must be packaged using a sufficient quantity of absorbent material to absorb the entire contents of any one of the inner packagings containing such liquids. When the inner packagings are of different sizes and quantities, sufficient absorbent material must be used to absorb the entire contents of the inner packaging with the greatest volume of liquid.

(3) When absorbent materials are required and the outer packaging is not liquid tight, a means of containing the liquid in the event of a leakage must be provided in the form of a leakproof liner, plastic bag or other equally efficient means of containment.

(4) Absorbent material must not react dangerously with the liquid (see §§173.24 and 173.24a.).

(5) Absorbent material is not required if the inner packagings are so protected that they are unlikely to break and leak their contents from the outer packaging under normal conditions of transportation.

(f) Combination packagings. Unless otherwise specified in this part, or in §171.11 of this subchapter, when combination packagings are offered for transportation aboard aircraft, inner packagings must conform to the quantity limitations set forth in table 1 of this paragraph for transport aboard passenger-carrying aircraft and table 2 of this paragraph for transport aboard cargo aircraft only, as follows:

Table 1—Maximum Net Capacity of Inner Packaging for Transportation on Passenger-Carrying Aircraft

Maximum net quantity per package from Column 9a of the §172.101 table	Maximum authorized net capacity of each inner packaging	
	Glass, earthenware or fiber inner packagings	Metal or plastic inner packagings
Liquids:		
Not greater than 0.5L	0.5L	0.5L.
Greater than 0.5L, not greater than 1L	0.5L	1L.
Greater than 1L, not greater than 5L	1L	5L.
Greater than 5L, not greater than 60L	2.5L	10L.
Greater than 60L, not greater than 220L	5L	25L.
Greater than 220L	No limit	No limit.
Solids:		
Not greater than 5 kg	0.5 kg	1 kg.
Greater than 5 kg, not greater than 25 kg	1 kg	2.5 kg.
Greater than 25 kg, not greater than 200 kg	5 kg	10 kg.
Greater than 200 kg	No limit	No limit.

Table 2—Maximum Net Capacity of Inner Packaging for Transportation on Cargo Aircraft

Maximum net quantity per package from Column 9b of the §172.101 table	Maximum authorized net capacity of each inner packaging	
	Glass, earthenware or fiber inner packagings	Metal or plastic inner packagings
Liquids:		
Not greater than 2.5L	1L	1L.
Greater than 2.5L, not greater than 30L	2.5L	2.5L.
Greater than 30L, not greater than 60L	5L	10L.
Greater than 60L, not greater than 220L	5L	25L.
Greater than 220L	No limit	No limit.
Solids:		
Not greater than 15 kg	1 kg	2.5 kg.
Greater than 15 kg, not greater than 50 kg	2.5 kg	5 kg.
Greater than 50 kg, not greater than 200 kg	5 kg	10 kg.
Greater than 200 kg	No limit	No limit.

(g) Cylinders. For any cylinder containing hazardous materials and incorporating valves, sufficient protection must be provided to prevent operation of, and damage to, the valves during transportation, by one of the following methods:

(1) By equipping each cylinder with securely attached valve caps or protective headrings; or

(2) By boxing or crating the cylinder.

(h) Tank cars and cargo tanks. Any tank car or cargo tank containing a hazardous material may not be transported aboard aircraft.

(i) Effective October 1, 2006, each person who offers a hazardous material for transportation by aircraft must include the certification statement specified in §172.204(c)(3).

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