

§ 173.427 Transport requirements for low specific activity (LSA) Class 7 (radioactive) materials and surface contaminated objects (SCO).

(a) In addition to other applicable requirements specified in this subchapter, LSA materials and SCO, unless excepted by paragraph (c) or (d) of this section, must be packaged in accordance with paragraph (b) of this section and must be transported in accordance with the following conditions:

- (1) The external dose rate may not exceed an external radiation level of 10 mSv/h (1 rem/h) at 3 m from the unshielded material;
- (2) The quantity of LSA and SCO material in any single conveyance may not exceed the limits specified in Table 5;
- (3) LSA material and SCO that are or contain fissile material must conform to the applicable requirements of §173.453;
- (4) Packaged and unpackaged Class 7 (radioactive) materials must conform to the contamination control limits specified in §173.443;
- (5) External radiation levels may not exceed those specified in §173.441; and
- (6) For LSA material and SCO consigned as exclusive use:
 - (i) Shipments shall be loaded by the consignor and unloaded by the consignee from the conveyance or freight container in which originally loaded;
 - (ii) There may be no loose radioactive material in the conveyance; however, when the conveyance is the packaging, there may not be any leakage of radioactive material from the conveyance;
 - (iii) Packaged and unpackaged Class 7 (radioactive) materials must be braced so as to prevent shifting of lading under conditions normally incident to transportation;
 - (iv) Specific instructions for maintenance of exclusive use shipment controls shall be provided by the offeror to the carrier. Such instructions must be included with the shipping paper information;
 - (v) Except for shipments of unconcentrated uranium or thorium ores, the transport vehicle must be placarded in accordance with subpart F of part 172 of this subchapter;
 - (vi) For domestic transportation only, packaged and unpackaged Class 7 (radioactive) materials containing less than an A_2 quantity are excepted from the marking and labeling requirements of this subchapter. However, the exterior of each package or unpackaged Class 7 (radioactive) materials must be stenciled or otherwise marked "RADIOACTIVE—LSA" or "RADIOACTIVE—SCO", as appropriate, and packages or unpackaged Class 7 (radioactive) materials that contain a hazardous substance must be stenciled or otherwise marked with the letters "RQ" in association with the description in this paragraph (a)(6)(vi); and
 - (vii) Transportation by aircraft is prohibited except when transported in an industrial package in accordance with Table 6 of this section, or in an authorized Type A or Type B package.

(b) Except as provided in paragraph (c) of this section, LSA material and SCO must be packaged as follows:

- (1) In an industrial package (IP-1, IP-2 or IP-3; §173.411), subject to the limitations of Table 6;
- (2) In a DOT Specification 7A (§178.350 of this subchapter) Type A package;
- (3) In any Type B(U) or B(M) packaging authorized pursuant to §173.416;
- (4) In a packaging which meets the requirements of §§173.24, 173.24a, and 173.410, but only for domestic transportation of an

exclusive use shipment that is less than an A₂ quantity.

(5) For exclusive use transport of liquid LSA-I only, in either:

(i) Specification 103CW, 111A60W7 (§§173.31, and 179.201–1 to 179.201–11 of this subchapter) tank cars. Bottom openings in tanks are prohibited; or

(ii) Specification MC 310, MC 311, MC 312, MC 331 or DOT 412 (§178.348 or §178.337 of this subchapter) cargo tank motor vehicles. Bottom outlets are not authorized. Trailer-on-flat-car service is not authorized.

(c) LSA material and SCO in groups LSA-I and SCO-I may be transported unpackaged under the following conditions:

(1) All unpackaged material, other than ores containing only naturally occurring radionuclides, shall be transported in such a manner that under normal conditions of transport there will be no escape of the radioactive contents from the conveyance nor will there be any loss of shielding;

(2) Each conveyance must be under exclusive use, except when only transporting SCO-I on which the contamination on the accessible and the inaccessible surfaces is not greater than 4.0 Bq/cm² for beta and gamma emitters and low toxicity alpha emitters and 0.4 Bq/cm² for all other alpha emitters; and

(3) For SCO-I where it is suspected that non-fixed contamination exists on inaccessible surfaces in excess of the values specified in paragraph (c)(2) of this section, measures shall be taken to ensure that the radioactive material is not released into the conveyance or to the environment.

(d) LSA and SCO that exceed the packaging limits in this section must be packaged in accordance with 10 CFR part 71.

(e) Tables 5 and 6 are as follows:

Table 5—Conveyance Activity Limits for LSA Material and SCO

Nature of material	Activity limit for conveyances
1. LSA-I	No limit.
2. LSA-II and LSA-III; Non-combustible solids	No limit.
3. LSA-II and LSA-III; Combustible solids and all liquids and gases	100 A ₂
4. SCO	100 A ₂

Table 6—Industrial Package Integrity Requirements for LSA Material and SCO

Contents	Industrial packaging type	
	Exclusive use shipment	Non exclusive use shipment
1. LSA-I:		
Solid	IP-1	IP-1
Liquid	IP-1	IP-2
2. LSA-II:		
Solid	IP-2	IP-2

Liquid and gas	IP-2	IP-3
3. LSA-III	IP-2	IP-3
4. SCO-I	IP-1	IP-1
5. SCO-II	IP-2	IP-2

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