

§ 178.810 Drop test.

- (a) *General.* The drop test must be conducted for the qualification of all IBC design types and performed periodically as specified in §178.801(e) of this subpart.
- (b) *Special preparation for the drop test.* (1) Metal, rigid plastic, and composite IBCs intended to contain solids must be filled to not less than 95 percent of their maximum capacity, or if intended to contain liquids, to not less than 98 percent of their maximum capacity. Pressure relief devices must be removed and their apertures plugged or rendered inoperative.
- (2) Fiberboard and wooden IBCs must be filled with a solid material to not less than 95 percent of their maximum capacity; the contents must be evenly distributed.
- (3) Flexible IBCs must be filled to the maximum permissible gross mass; the contents must be evenly distributed.
- (4) Rigid plastic IBCs and composite IBCs with plastic inner receptacles must be conditioned for testing by reducing the temperature of the packaging and its contents to $-18\text{ }^{\circ}\text{C}$ ($0\text{ }^{\circ}\text{F}$) or lower. Test liquids must be kept in the liquid state, if necessary, by the addition of anti-freeze. Water/anti-freeze solutions with a minimum specific gravity of 0.95 for testing at $-18\text{ }^{\circ}\text{C}$ ($0\text{ }^{\circ}\text{F}$) or lower are considered acceptable test liquids, and may be considered equivalent to water for test purposes. IBCs conditioned in this way are not required to be conditioned in accordance with §178.802.
- (c) *Test method.* Samples of all IBC design types must be dropped onto a rigid, non-resilient, smooth, flat and horizontal surface. The point of impact must be the most vulnerable part of the base of the IBC being tested. Following the drop, the IBC must be restored to the upright position for observation.
- (d) *Drop height.* (1) For all IBCs, drop heights are specified as follows:
- (i) Packing Group I: 1.8 m (5.9 feet).
- (ii) Packing Group II: 1.2 m (3.9 feet).
- (iii) Packing Group III: 0.8 m (2.6 feet).
- (2) Drop tests are to be performed with the solid or liquid to be transported or with a non-hazardous material having essentially the same physical characteristics.
- (3) The specific gravity and viscosity of a substituted non-hazardous material used in the drop test for liquids must be similar to the hazardous material intended for transportation. Water also may be used for the liquid drop test under the following conditions:
- (i) Where the substances to be carried have a specific gravity not exceeding 1.2, the drop heights must be those specified in paragraph (d)(1) of this section for each IBC design type; and
- (ii) Where the substances to be carried have a specific gravity exceeding 1.2, the drop heights must be as follows:
- (A) Packing Group I: $\text{SG} \times 1.5\text{ m}$ (4.9 feet).
- (B) Packing Group II: $\text{SG} \times 1.0\text{ m}$ (3.3 feet).
- (C) Packing Group III: $\text{SG} \times 0.67\text{ m}$ (2.2 feet).
- (e) *Criteria for passing the test.* For all IBC design types there may be no loss of contents. A slight discharge from a closure upon impact is not considered to be a failure of the IBC provided that no further leakage occurs. A slight discharge (e.g., from closures or stitch holes) upon impact is not considered a failure of the flexible IBC provided that no further leakage occurs after the IBC has been raised clear of the ground.

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