§ 178.607 Cooperage test for bung-type wooden barrels.

(a) Number of samples. One barrel is required for each different packaging.

(b) Method of testing. Remove all hoops above the blige of an empty barrel at least two days old.

(c) Criteria for passing the test. A packaging passes the cooperage test only if the diameter of the cross-section of the upper part of the barrel does not increase by more than 10 percent.

§ 178.608 Vibration standard.

(a) Each packaging must be capable of withstanding, without rupture or leakage, the vibration test procedure outlined in this section.

(b) Test method. (1) Three sample packagings, selected at random, must be filled and closed as for shipment.

(2) The three samples must be placed on a vibrating platform that has a vertical or rotary double-amplitude (peak-to-peak displacement) of one inch. The packages should be constrained horizontally to prevent them from falling off the platform, but must be left free to move vertically, bounce and rotate.

(3) The test must be performed for one hour at a frequency that causes the package to be raised from the vibrating platform to such a degree that a piece of material of approximately 1.6 mm (0.063 inch) thickness (such as steel strapping or paperboard) can be passed between the bottom of any package and the platform.

(4) Immediately following the period of vibration, each package must be removed from the platform, turned on its side and observed for any evidence of leakage.

(5) Other methods, at least equally effective, may be used, if approved by the Associate Administrator.

(c) Criteria for passing the test. A packaging passes the vibration test if there...
is no rupture or leakage from any of the packages. No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.


§ 178.609 Test requirements for packagings for infectious substances.

(a) Samples of each packaging must be prepared for testing as described in paragraph (b) of this section and then subjected to the tests in paragraphs (d) through (i) of this section.

(b) Samples of each packaging must be prepared as for transport except that a liquid or solid infectious substance should be replaced by water or, where conditioning at −18 °C (0 °F) is specified, by water/antifreeze. Each primary receptacle must be filled to 98 percent capacity. Packagings for live animals should be tested with the live animal being replaced by an appropriate dummy of similar mass.

(c) Packagings prepared as for transport must be subjected to the tests in Table I of this paragraph (c), which, for test purposes, categorizes packagings according to their material characteristics. For outer packagings, the headings in Table I relate to fiberboard or similar materials whose performance may be rapidly affected by moisture; plastics that may embrittle at low temperature; and other materials, such as metal, for which performance is not significantly affected by moisture or temperature. Where a primary receptacle and a secondary packaging of an inner packaging are made of different materials, the material of the primary receptacle determines the appropriate test. In instances where a primary receptacle is made of more than one material, the material most likely to be damaged determines the appropriate test.

### Table I—Tests Required

<table>
<thead>
<tr>
<th>Material of Outer packaging</th>
<th>Material of Inner packaging</th>
<th>Tests required</th>
<th>Refer to para. (d)</th>
<th>Refer to para. (h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiberboard</td>
<td>Plastics</td>
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(d) Samples must be subjected to free-fall drops onto a rigid, nonresilient, flat, horizontal surface from a height of 9 m (30 feet).

The drops must be performed as follows:

1. Where the samples are in the shape of a box, five samples must be dropped, one in each of the following orientations:
   (i) Flat on the base;
   (ii) Flat on the top;
   (iii) Flat on the longest side;
   (iv) Flat on the shortest side; and
   (v) On a corner.
2. Where the samples are in the shape of a drum, three samples must be dropped, one in each of the following orientations:
   (i) Diagonally on the top chime, with the center of gravity directly above the point of impact;
   (ii) Diagonally on the base chime; and
   (iii) Flat on the side.
3. While the sample should be released in the required orientation, it is accepted that for aerodynamic reasons the impact may not take place in that orientation.
4. Following the appropriate drop sequence, there must be no leakage from the primary receptacle(s) which should remain protected by absorbent material in the secondary packaging.