

(3) For the dynamic compression test, a container passes the test if, after application of the required load, there is no permanent deformation to the Large Packaging which renders the whole Large Packaging; including the base pallet, unsafe for transportation; in no case may the maximum deflection exceed one inch.

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§ 178.985 Vibration test.

(a) *General.* All rigid Large Packaging and flexible Large Packaging design types must be capable of withstanding the vibration test.

(b) *Test method.* (1) A sample Large Packaging, selected at random, must be filled and closed as for shipment. Large Packagings intended for liquids may be tested using water as the filling material for the vibration test.

(2) The sample Large Packaging must be placed on a vibrating platform that has a vertical or rotary double-amplitude (peak-to-peak displacement) of one inch. The Large Packaging must be

constrained horizontally to prevent it from falling off the platform, but must be left free to move vertically and bounce.

(3) The sample Large Packaging must be placed on a vibrating platform that has a vertical double-amplitude (peak-to-peak displacement) of one inch. The Large Packaging must be constrained horizontally to prevent it from falling off the platform, but must be left free to move vertically and bounce.

(4) 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) in thickness (such as steel strapping or paperboard) can be passed between the bottom of the Large Packaging and the platform. Other methods at least equally effective may be used (see § 178.801(i)).

(c) *Criterion for passing the test.* A Large Packaging passes the vibration test if there is no rupture or leakage.

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APPENDIX A TO PART 178—SPECIFICATIONS FOR STEEL

TABLE 1

[Open-hearth, basic oxygen, or electric steel of uniform quality. The following chemical composition limits are based on ladle analysis.]

Designation	Chemical composition, percent-ladle analysis		
	Grade 1 ¹	Grade 2 ^{1,2}	Grade 3 ^{2,4,5}
Carbon	0.10/0.20	0.24 maximum	0.22 maximum.
Manganese	1.10/1.60	0.50/1.00	1.25 maximum.
Phosphorus, maximum	0.04	0.04	0.045, ⁶
Sulfur, maximum	0.05	0.05	0.05.
Silicon	0.15/0.30	0.30 maximum	
Copper, maximum	0.40		
Columbium		0.01/0.04	
Heat treatment authorized	(³)	(³)	(³).
Maximum stress (p.s.i.)	35,000	35,000	35,000.

¹ Addition of other elements to obtain alloying effect is not authorized.

² Ferritic grain size 6 or finer according to ASTM E 112-96 (IBR, see § 171.7 of this subchapter).

³ Any suitable heat treatment in excess of 1,100 °F., except that liquid quenching is not permitted.

⁴ Other alloying elements may be added and shall be reported.

⁵ For compositions with a maximum carbon content of 0.15 percent of ladle analysis, the maximum limit for manganese on ladle analysis may be 1.40 percent.

⁶ Rephosphorized Grade 3 steels containing no more than 0.15 percent phosphorus are permitted if carbon content does not exceed 0.15 percent and manganese does not exceed 1 percent.