



Standard Guide for Conducting Internal Pressure Tests on United Nations (UN) Packagings¹

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1. Scope

1.1 This guide is intended to provide a standardized method and a set of basic instructions for performing internal and hydrostatic pressure testing on packaging designs.

1.2 This guide provides information to help clarify various terms used as part of the United Nations (UN) certification process that may assist in determining the applicable test.

1.3 This guide provides the suggested minimum information that should be documented when conducting pressure testing.

1.4 This guide provides information for recommended equipment and fittings for conducting pressure tests.

1.5 This guide is based on the current information contained in 49 CFR, §173.27 and §178.605.

1.6 When testing packaging designs intended for hazardous materials (dangerous goods), the user of this guide shall be trained in accordance with 49 CFR §172.700 and other applicable hazardous materials regulations such as the ICAO Technical Instructions, IMDG Code, and carrier rules such as the IATA Dangerous Goods Regulations.

1.7 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D4919 Guide for Testing of Hazardous Materials Packagings

¹ This guide is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.21 on Shipping Containers and Systems - Application of Performance Test Methods.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D4991 Test Method for Leakage Testing of Empty Rigid Containers by Vacuum Method

2.2 *Federal Standard*.³

49 CFR U.S. Department of Transportation Code of Federal Regulations Title 49, Transportation Parts 100-185

2.3 *UN Standard*.⁴

UN United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations

2.4 *IATA Standard*.⁵

IATA Dangerous Goods Regulations

2.5 *ICAO Standard*.⁶

ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air

2.6 *IMDG Standard*.⁷

IMDG Code International Maritime Dangerous Goods Code

3. Terminology

3.1 Definitions:

3.1.1 *bar, n*—metric unit of atmospheric pressure equal to 14.50 psi (lb/in.²), 1.02 kg/cm², 29.53 in.-Hg, or 0.9869 atmosphere.

3.1.2 *hydrostatic pressure test, n*—internal pressure test conducted on a container or packaging filled with water and pressurized with water or other suitable means; regulatory reference sections: 49 CFR §178.605, UN 6.1.5.5, IMDG Code 6.1.5.5, ICAO 6.4.5, and IATA 6.3.5.

3.1.2.1 *Discussion*—This test is required for all single and composite packagings intended for shipping liquid dangerous goods (hazardous materials). For single and composite packagings, the test pressure rating will appear as part of the UN specification marking sequence. This test may also be used to comply with the pressure differential requirements for air

³ Available from U.S. Government Printing Office Superintendent of Documents, Washington, DC 20402-9371, <http://phmsa.dot.gov/hazmat>.

⁴ Available from the UN Economic Commission for Europe, Information Service, Palais des Nations, CH-1211 Geneva 10, Switzerland, <http://www.unece.org/trans/danger/danger.htm>.

⁵ Available from the International Air Transport Association (IATA), 800 Place Victoria, PO Box 113, Montreal, Quebec, H4Z 1M1, Canada, <http://www.iata.org>.

⁶ Available from the International Civil Aviation Organization (ICAO), 999 University St., Montreal, Quebec, H3C 5H7, Canada, <http://www.icao.org>.

⁷ Available from the International Marine Organization (IMO), 4 Albert Embankment, London, SE1 7SR, U.K., <http://www.imo.org>.