



Designation: ~~D5998~~—~~10~~ **D5998 – 16**

Standard Specification for Molded Polyethylene Shipping and Storage Drums¹

This standard is issued under the fixed designation D5998; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers self supporting, molded polyethylene, tight head drums designed for surface and air shipment, ranging in size from 5 gal (19 L) to and including 55 gal (208 L).

1.2 Virgin or recycled polyethylene plastics² or combinations thereof can be used provided the finished product meets the requirements of this specification.

NOTE 1—There is no known ISO equivalent to this standard.

NOTE 2—This standard is intended to replace MIL-D-43703C.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are ~~for information only; mathematical conversions to SI units that provided for information only and are not considered standard.~~

1.4 *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:*³

[D883 Terminology Relating to Plastics](#)

[D1972 Practice for Generic Marking of Plastic Products](#) (Withdrawn 2014)⁴

[D3951 Practice for Commercial Packaging](#)

[D4504 Specification for Molded Polyethylene Open-Head-Pails for Industrial Shipping of Nonhazardous Goods](#)

[D4919 Guide for Testing of Hazardous Materials Packagings](#)

[D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products](#) (Withdrawn 2015)⁴

2.2 *ANSI Standards:*⁵

[ANSI Z1.4 Sampling Procedures and Tables for Inspection by Attributes](#)

2.3 *Federal Regulations:*⁶

[21 CFR 121 CFR 121](#)—Federal Food, Drug, and Cosmetic Act and Regulations Promulgated Thereunder

[21 CFR 177 CFR 177](#)—Indirect Food Additives: Polymers

[49 CFR 173 CFR 173](#)—Shippers—General Requirements for Shipments and Packagings

[49 CFR 178 CFR 178](#)—Specifications for Packaging

2.4 *Other:*

~~National Motor Freight Classification (NMFC-100)~~

~~Uniform Freight Classification (UFC)~~

¹ This specification is under the jurisdiction of ASTM Committee [D20](#) on Plastics and is the direct responsibility of Subcommittee ~~D20.15.01~~[D20.15](#) on Polyethylene Plastics (~~Disbanded 01/2012~~)[Thermoplastic Materials](#).

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² As defined in Guide [D7209](#).

³ 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.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁶ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

*A Summary of Changes section appears at the end of this standard

2.4 National Sanitation Foundation International:⁷

NSF Standard No. 2 Food Service Equipment

NSF Standard No. 51 Plastics Materials and Components Used in Food Service Equipment

3. Terminology

3.1 For definitions or terms, see Terminology D883 or Guide D7209.

4. Requirements

4.1 *Materials*—Drums shall conform to 49 CFR 173.24 and 178.509 Type 1H1. The drum material and components shall conform to the Federal Food, Drug and Cosmetic Act, Food Additive Amendment 21 CFR 177, 1520 and NSF International Standard No. 2 and 51 when used for food products. Recycled plastic can be used when practical as long as the finished product meets the requirements of this specification.

4.2 *Design and Construction*—Drums shall conform to 49 CFR 173.24 and 178.509, Type 1H1. Drums shall be molded of materials specified in 4.1. Five gallon (19 L) drums shall be furnished with one or two carrying handles. Fifteen gallon (57 L) drums shall be furnished with one or two handles on the top or without handles. Drums greater than 20 gal shall be fabricated so that they can be individually handled by customary handling devices. Handling devices shall withstand the combined lifted weight of the drum and contents. Rolling rings on drums are optional, and when specified, a minimum of two are required.

4.2.1 *Openings*—The 5-gal (19-L) drum shall have one opening on the top except when specified (see 7.2) an air vent shall be added diametrically opposite the top opening. The 15-gal, 30-gal, and 55-gal (57-L, 114-L, and 208-L) drums shall have two openings. The opening shall not exceed 2.7 in. (69 mm) in diameter, and when specified shall have either a commercial clinch-on closure (flexible or reversible spout) or molded-in opening. The molded-in opening for the 5-gal (19-L) drum shall be externally threaded to accept a buttress threaded cap closure, an internally threaded opening to accept an NPS plug, or a commercial clinch-on closure. The molded-in opening for the 15-gal, 30-gal, and 55-gal (57-L, 114-L, and 208-L) drums shall have molded-in internal NPS or buttress threads (see 4.2.1.1). There shall be not less than two and one half buttress threads. The closure for flexible spout shall be a metal or plastic screw cap or plug having not less than two continuous full threads that match the opening and of sufficient length to completely engage a minimum of two threads when the cap with gasket or cap liner in place is screwed in.

4.2.1.1 *Plug and Gasket*—The buttress plug and gasket shall be made of material resistant to the lading and shall have not less than two continuous external buttress threads that match the internal thread of the opening. The plug shall have a 3/4-in. (20-mm) NPS center reducer with molded-in diaphragm. The 3/4-in. (20-mm) center reducer without molded diaphragm shall accept a 3/4-in. (20-mm) NPT plug as allowed by appropriate shipping and storage regulations. Vented closure devices shall be used for surface shipments only as allowed by appropriate shipping and storage regulations.

4.2.1.2 *Safety Seals*—When specified, commercial safety seals shall be furnished with each drum for application to all openings of the drum. The safety seals shall either be fabricated from a corrosion-resistant material, or be coated with a corrosion-resistant finish. The safety seals shall be crimped onto the drums in such a manner that the seals are deformed and cannot be reused once they have been removed. The safety seals shall have instructions printed on them that describe the method of removal unless superseded by more important information such as a caution statement. Safety seals on drums containing food or potable water shall meet food contact requirements of 4.1.

4.2.1.3 *Torque Indicating or Torque Limiting Plug Wrench*—Torque wrenches capable of applying specified closure torque are to be used for tightening all closures as necessary.

4.3 *Marking*—Drum markings shall conform to 49 CFR Subpart L and other appropriate requirements. Also, the manufacturer's recommended closure torque range for prevention of leakage from threaded closure shall be durably marked by means of embossing, labeling, stenciling, lithographing, silk screening or stamping on the drum when a specified torque requirement is needed to meet performance requirements. Unless otherwise specified, the markings shall be embossed on the sidewall or bottom head of the drum in characters not less than 1/2 in. (13 mm) high. Unless otherwise specified, the top head of each drum shall be marked "DO NOT REUSE FOR FOOD." The marking shall be embossed or indelibly stenciled in a contrasting color in capital letters not less than 1/2 in. (13 mm) high.

4.4 *Capacity*—The minimum actual capacity shall be not less than rated capacity plus 4 %. The maximum actual capacity shall be not greater than the applicable rated capacity (see 1.2) plus 15 % for 5-gal (19-L) drums and shall not be greater than rated capacity plus 10 % for drums 15 gal (57 L) and over.

4.5 *Performance*—In addition to the requirements specified herein, drums shall not show cracks or leaks when subjected to tests specified in 5.3.5. Drums with repaired bodies and components shall not be acceptable.

4.6 *Workmanship*—The finished drums shall be free of lumps, blisters, or flash. The threads of the openings and plugs shall be clean, well formed, free of excess flash, and distortion. The seal of the openings and plugs shall be smooth and free of any defects

⁷ Available from NSF International, P.O. Box 130140, 789 N. Dixboro Rd., Ann Arbor, MI 48113-0140, <http://www.nsf.org>.