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## Standard Specification for PLASTIC CONTAINERS (JERRY CANS) FOR PETROLEUM PRODUCTS<sup>1</sup>

This standard is issued under the fixed designation D 3435; 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.

### 1. Scope

1.1 The purpose of this specification is to establish nationally recognized quality requirements for plastic containers (jerry cans) intended for use with petroleum products. This specification is intended to provide producers, distributors, users, and code officials with a basis for a common understanding of the characteristics of the product.

1.2 The specification includes requirements and test methods for the material, design, and performance properties of the containers.

1.3 This standard is not a specification for safety containers intended for use with flammable liquids.

1.4 This standard is not a fire hazard standard but a specification for portable plastic containers.

1.5 *The elevated temperature test methods discussed in 4.1.12 and 5.14.3 should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.*

### 2. Applicable Documents

#### 2.1 ASTM Standards:

- D 471 Test for Rubber Property—Effect of Liquids<sup>2</sup>
- D 618 Conditioning Plastics and Electrical Insulating Materials for Testing<sup>3</sup>
- D 635 Test for Rate of Burning and/or Extent and Time of Burning of Self-Support-

- ing Plastics in a Horizontal Position<sup>4</sup>
  - D 638 Test for Tensile Properties of Plastics<sup>4</sup>
  - D 746 Test for Brittleness Temperature of Plastics and Elastomers by Impact<sup>5</sup>
  - D 794 Recommended Practice for Determining Permanent Effect of Heat on Plastics<sup>4</sup>
  - D 999 Vibration Testing of Shipping Containers<sup>6</sup>
  - D 1525 Test for Vicat Softening Temperature of Plastics<sup>4</sup>
  - D 1708 Test for Tensile Properties of Plastics by Use of Microtensile Specimens<sup>4</sup>
  - D 2561 Test for Environmental Stress-Crack Resistance of Blow-Molded Polyethylene Containers<sup>7</sup>
  - D 2565 Recommended Practice for Operating Xenon Arc-Type (Water-Cooled) Light- and Water-Exposure Apparatus for Exposure of Plastics<sup>4</sup>
  - G 23 Recommended Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Non-metallic Materials<sup>8</sup>
- 2.2 *Other Standards:*
- CSA Standard B144-1972: Portable Plastic Containers for Petroleum Fuels<sup>9</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-20 on Plastics, and is the direct responsibility of Subcommittee D20.24 on Consumer Plastic Products.

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<sup>2</sup> *Annual Book of ASTM Standards*, Part 37.

<sup>3</sup> *Annual Book of ASTM Standards*, Parts 22, 30, 35, and 39.

<sup>4</sup> *Annual Book of ASTM Standards*, Part 35.

<sup>5</sup> *Annual Book of ASTM Standards*, Parts 35 and 38.

<sup>6</sup> *Annual Book of ASTM Standards*, Part 20.

<sup>7</sup> *Annual Book of ASTM Standards*, Part 36.

<sup>8</sup> *Annual Book of ASTM Standards*, Parts 27, 32, 35, and 41.

<sup>9</sup> Available from Canadian Standards Assn., 178 Rexdale Blvd., Rexdale, Ont., Canada M9W 1R3.



### 3. Materials

3.1 The plastic material used shall comply with the following requirements and be suitable for molding containers able to meet the additional requirements of Section 4:

3.1.1 *Burning Rate*—The burning rate of the material shall not exceed 25 mm (1 in.)/min when tested in accordance with 5.3.

3.1.2 *Brittleness Temperature*—The material shall have a brittleness temperature not higher than  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) when tested in accordance with 5.4.

3.1.3 *Vicat Softening Point*—The material shall have a minimum Vicat softening point of  $113^{\circ}\text{C}$  ( $235^{\circ}\text{F}$ ) when tested in accordance with 5.5.

### 4. Requirements

4.1 The containers shall evidence good workmanship and meet the following requirements:

4.1.1 *Color*—Each container shall be essentially opaque. If colored, the pigment shall not affect or be affected by petroleum products. The preferred color is red; however, state and local regulations may specify an alternative color.

4.1.2 *Capacity*—The containers shall have a nominal (approximate) capacity of 26.5 litres (7 gal) or less in 1.9-litre ( $\frac{1}{2}$ -gal) increments. The full capacity measured at  $23 \pm 3^{\circ}\text{C}$  ( $75 \pm 5^{\circ}\text{F}$ ) at the level of the lowest opening when the container is standing in its normal upright position, shall be at least 5% greater than the nominal capacity.

4.1.3 *Stability*—Each container shall be so designed that when filled to nominal capacity it will not upset when placed facing in any direction on a plane inclined at 20 deg with the horizontal.

4.1.4 *Pouring Opening and Closure*—Each container shall be provided with a pouring opening and a closure. The pouring opening shall have an integral pouring nozzle, or shall be designed to accept a pouring nozzle supplied with the container. The container may be provided with a vented pouring nozzle or other pouring vents. The nozzle shall not leak when liquid is poured from the container. The closures for the pouring opening and vents shall be made of metal or plastic material which is resistant to petroleum products. The closures

shall not leak when tested in accordance with 5.6.

4.1.5 *Handle*—Each container shall be provided with a handle suitable for use in carrying the filled container. The handle shall be an integral part of the container or shall be securely fastened thereto. The handle shall not crack or become loosened or detached from the container when tested in accordance with 5.7.

4.1.6 *Drop Strength*—The container shall show no evidence of rupture, cracks, or leakage when tested in accordance with 5.8.

4.1.7 *Resistance to Internal Pressure*—The container shall show no evidence of rupture, cracks, or leakage when tested in accordance with 5.9.

4.1.8 *Aging*—The material from the container shall retain at least 70% of its original tensile strength when tested in accordance with 5.10.

4.1.9 *Permeability*—The filled container shall not have a weight loss greater than 3% when tested in accordance with 5.11.

4.1.10 *Petroleum Resistance*—The material from the container shall show no pitting, crazing, softening, bubbling, cracking, tackiness, or decomposition when tested in accordance with 5.12.1. The material shall retain at least 60% of its tensile strength and elongation when tested in accordance with 5.12.2.

4.1.11 *Stress Cracking*—This requirement applies only to containers (jerry cans) molded of polyethylene. The container shall not crack in 120 h when tested in accordance with 5.13.

4.1.12 *Elevated Temperature Resistance of Containers*—The container shall not leak when tested in accordance with 5.14. Any burning that occurs during the test specified in 5.14.3.1 shall not continue for more than 5 s.

### 5. Test Methods

5.1 *General*—The test procedures identified in this section are to be used to determine the conformance of products to the requirements of this specification. Each producer or distributor who represents his products as conforming to this specification may utilize statistically based sampling plans which are appropriate for each particular manufacturing process but shall keep such essential records as are necessary to document with a high degree of assurance his claim that the requirements of the specification