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Standard Specification for Dehydrated Castor Oil[1]

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1. Scope

1.1 This specification covers a drying oil made from castor oil that has been treated to remove the elements of water. Two types of dehydrated castor oil are covered: unbodied and Z-3 bodied.

NOTE 1—Other types of bodied dehydrated castor oil are commercially available but are not covered by this specification.

2. Referenced Documents

2.1 *ASTM Standards:*

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)[2]

D 555 Guide for Testing Drying Oils[3]

D 1475 Test Method for Density of Liquid Coatings, Inks, and Related Products[4]

D 1544 Test Method for Color of Transparent Liquids (Gardner Color Scale)[4]

D 1545 Test Method for Viscosity of Transparent Liquids by Bubble Time Method[3]

D 1639 Test Method for Acid Value of Organic Coating Materials[3]

D 1640 Test Methods for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature[3]

D 1955 Test Method for Gel Time of Drying Oils[3]

D 1959 Test Method for Iodine Value of Drying Oils and Fatty Acids[3]

D 1962 Test Method for Saponification Value of Drying Oils, Fatty Acids, and Polymerized Fatty Acids[3]

D 1963 Test Method for Specific Gravity of Drying Oils, Varnishes, Resins, and Related Materials at 25/25°C[3]

D 2090 Test Method for Clarity and Cleanness of Paint and Ink Liquids[3]

E 1 Specification for ASTM Thermometers[5]

3. Properties

3.1 Dehydrated castor oil shall conform to the requirements prescribed in Table 1.

4. Test Methods

4.1 The properties enumerated in this specification shall be determined in accordance with the appropriate methods given in Table 1 with the following exceptions:

4.1.1 *Gel Time*—Determine the gel time in accordance with Test Method D 1955 but with the following changes:

4.1.1.1 Use an ASTM Partial Immersion Thermometer having a range from 20 to 760°F and conforming to the requirements for Thermometer 3F as prescribed in Specification E 1.

4.1.1.2 Heat the bath to 600 ± 1°F (315 ± 0.5°C), insert the tubes containing the oil in the bath, maintain the bath at 600 ± 1°F for the duration of the test, and

4.1.1.3 Raise the glass rods a fraction of an inch at 1-min intervals after 125 min in the case of the unbodied oil or after 25 min in the case of the bodied oil.

4.1.2 *Iodine Value*—Use the procedure described in Method D 1959, to determine the iodine value, except that the specimen weights shall be 0.11 to 0.13 g of oil.

4.2 The significance of and comments on the referenced methods are discussed in Guide D 555.

5. Keywords

5.1 castor oil; dehydrated; dehydrated castor oil

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[2] *Annual Book of ASTM Standards,* Vol 05.01.

[3] *Annual Book of ASTM Standards,* Vol 06.03.

[4] *Annual Book of ASTM Standards,* Vol 06.01.

[5] *Annual Book of ASTM Standards,* Vol 14.03.

TABLE 1 Requirements for Dehydrated Castor Oil

	Unbodied	Bodied	ASTM Method
Viscosity at 25°C	F to I	Z2 to Z4	D 1545, D 445
Specific gravity, 25/25°C	0.926 to 0.937	0.944 to 0.966	D 1963, D 1475
Acid value, max	6	6	D 1639
Saponification value	188 to 195	188 to 195	D 1962
Iodine value (Wijs)	125 to 145	100 min	D 1959
Color No. (Gardner), max	6	7	D 1544
Gel time at 600°F (315°C), min	145, approximately	63, approximately	D 1955
Set-to-touch time, h	2.5, approximately	1.4, approximately	D 1640
Refractive index at 25°C	1.4805 to 1.4825	1.4860 to 1.4890	...
Clarity	clear and transparent at 25°C	clear and transparent at 25°C	D 2090