



Standard Specification for Epoxy Resins¹

This standard is issued under the fixed designation D 1763; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers totally reactive epoxy resins supplied as liquids or solids which can be used for castings, coatings, tooling, potting, adhesives, or reinforced applications. The addition of hardeners in the proper proportions causes these resins to polymerize into infusible products. The properties of these products can be modified by the addition of various fillers, reinforcements, extenders, plasticizers, thixotropic agents, etc. The epoxy resins described also can be used as stabilizers and cross-linking agents; and they can be combined with other reactive products.

1.2 It is not the function of this specification to provide engineering data or to guide the purchaser in the selection of a material for a specific end use. Ordinarily the properties listed in Table 1 and Table 2 are sufficient to characterize a material under this specification, and it is recommended that routine inspection be limited to testing for such properties.

1.3 The following safety hazards caveat pertains only to the test methods portion, Section 7, of this specification: *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.* For specific cautionary statement, see Note 2.

NOTE 1—ISO 3673/1-1980(E) is similar but not equivalent to this specification. Product classification and characterization are not the same.

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 883 Terminology Relating to Plastics³

¹ This specification is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.16 on Thermosetting Materials. This standard was revised in 1994 to include an ISO equivalency statement and keywords, to remove sections regarding purchaser/producer agreements outside Practice D 1898, and to remove quality assurance (QA) provisions for government/military procurement.

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² Annual Book of ASTM Standards, Vol 05.01.

³ Annual Book of ASTM Standards, Vol 08.01.

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

D 1652 Test Method for Epoxy Content of Epoxy Resins⁵

D 1898 Practice for Sampling of Plastics⁶

D 3892 Practice for Packaging/Packing of Plastics⁷

2.2 ISO Standard:⁸

ISO 3673/1-1980(E)

3. Terminology

3.1 Definitions:

3.1.1 *General*—Definitions of terms used in this specification are in accordance with Terminology D 883.

4. Classification

4.1 The resins covered contain no hardeners. Resin types covered are divided into specific groups by their chemical nature:

4.1.1 *Type I*—Bisphenol A and epichlorohydrin.

4.1.2 *Type II*—Reaction product of phenol and formaldehyde (novolac resin) and epichlorohydrin.

4.1.3 *Type III*—Cycloaliphatic and peracid epoxies.

4.1.4 *Type IV*—Glycidyl esters.

4.1.5 *Type V*—Reaction product of epichlorohydrin and *p*-aminophenol.

4.1.6 *Type VI*—Reaction product of epichlorohydrin and glyoxal tetraphenol.

4.2 These types may be further subdivided by grades:

4.2.1 *Grade 1*—Resins containing no diluent.

4.2.2 *Grade 2*—Resins modified with a reactive diluent. Each class of Grade 2 resin can be made from any class of Grade 1 resin.

4.2.3 Each grade may include as many classes as are shown in the tables.

5. Requirements

5.1 The resin shall be of uniform quality and as free of contamination as can be achieved by good manufacturing practice.

⁴ Annual Book of ASTM Standards, Vol 06.01.

⁵ Annual Book of ASTM Standards, Vol 06.03.

⁶ Annual Book of ASTM Standards, Vol 08.01.

⁷ Annual Book of ASTM Standards, Vol 08.02.

⁸ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.