Designation: D1786 – 16

Standard Specification for Toluene Diisocyanate[1]

This standard is issued under the fixed designation D1786; 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 toluene diisocyanate used as an ingredient in the production of polyurethane materials.

NOTE 1—The properties included in this specification are those required to characterize toluene diisocyanate. Other requirements are possible and will be added as the necessary test methods become available.

1.2 *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.*

NOTE 2—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D883 Terminology Relating to Plastics

D4660 Test Methods for Polyurethane Raw Materials: Determination of the Isomer Content of Toluenediisocyanate

D4661 Test Methods for Polyurethane Raw Materials: Determination of Total Chlorine in Isocyanates

D4663 Test Method for Polyurethane Raw Materials: Determination of Hydrolyzable Chlorine of Isocyanates

D4877 Test Method for Polyurethane Raw Materials: Determination of APHA Color in Isocyanates

D5155 Test Methods for Polyurethane Raw Materials: Determination of the Isocyanate Content of Aromatic Isocyanates

D5629 Test Method for Polyurethane Raw Materials: Determination of Acidity in Low-Acidity Aromatic Isocyanates and Polyurethane Prepolymers

2.2 *Federal Standard:*

49 CFR Transportation Part 172.01[3]

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminology D883.

4. Classification

4.1 This specification covers three classes of toluene diisocyanates, based on isomer ratio as described in Table 1.

4.2 Each class is subdivided into three types on the basis of acidity and hydrolyzable chloride differences as follows:

4.2.1 *Type I or A*—Acidity shall be less than 0.005 expressed as percent HCl. Hydrolyzable chloride shall be less than 0.01 %.

4.2.2 *Type II or B*—Acidity shall be between 0.0070 and 0.012 expressed as percent HCl. Hydrolyzable chloride shall be less than 0.015 %.

4.2.3 *Type III or C*—Acidity shall be greater than 0.012 expressed as percent HCl. Hydrolyzable chloride limits are set at the convenience of the supplier and purchaser.

4.2.4 Toluene diisocyanate that has an acidity value that falls between *Type I* (*Type A*) and *Type II* (*Type B*) is not currently included in this specification.

5. Requirements

5.1 These materials shall conform to the requirements prescribed in Table 1.

6. Sampling and Test Methods

6.1 The materials shall be sampled and tested in accordance with Test Methods D4660, D4661, D4663, D4877, D5155, and D5629.

7. Retest and Rejection

7.1 If any failure occurs, it is acceptable to retest the material to establish conformity to the specification approved by the purchaser and the supplier.

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Materials - Plastics and Elastomers.

Current edition approved April 1, 2016. Published April 2016. Originally approved in 1960. Last previous edition approved in 2010 as D1786 - 10. DOI: 10.1520/D1786-16.

[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.

[3] *Code of Federal Regulation* is available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

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

TABLE 1 Detail Requirements for Toluene Diisocyanate

	Class		
	100	80	65
Isomer ratio, 2, 4 isomer, %	97.5 min	80 ± 2	65 ± 2
Purity, min, %	99.5	99.5	99.5
APHA color, max	50	50	50
Total chlorine, max, %	0.2	0.2	0.2

8. Packaging and Package Marking

8.1 *Packaging*—The material shall be packaged in standard commercial containers so constructed as to ensure compliance with Department of Transportation standards for such containers and shall be suitable for safe transportation at the lowest rate to the point of delivery. Consult OSHA[4] and EPA[5] regulations to determine their applicability to this material.

8.2 *Marking*—Shipping containers/documents shall be marked with the name of the material, the type of material, and the quantity contained therein. Include the necessary hazard labels as defined by the Department of Transportation for this material, the number of the contact or order, and the manufacturer's name and emergency telephone number in case of accident. Consult OSHA[4] and EPA[5] regulations to determine their applicability to this material.

9. Keywords

9.1 polyurethane; raw materials; specification; TDI; toluene diisocyanate

[4] Available from U.S. Department of Labor, OSHA, 200 Constitution Ave. NW, Washington, DC 20210.

[5] Available from United States Environmental Protection Association (EPA), Ariel Rios Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460.

SUMMARY OF CHANGES

Committee D20 has identified the location of selected changes to this standard since the last issue (D1786 - 10) that may impact the use of this standard. (April 1, 2016)

(1) Subsection 4.2.1: Classification—Changed lower specification from 0.0045 to 0.005.