



Standard Specification for Toluene Diisocyanate¹

This standard is issued under the fixed designation D 1786; 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 cellular materials.

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

1.2 The following precautionary caveat pertains only to the test methods portion, Section 6, 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.*

NOTE 2—There is no equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

- D 883 Terminology Relating to Plastics²
- D 4660 Test Methods for Polyurethane Raw Materials: Determination of Isomer Content of Isocyanates³
- D 4661 Test Methods for Polyurethane Raw Materials: Determination of Total Chlorine in Isocyanates³
- D 4663 Test Method for Polyurethane Raw Materials: Determination of Hydrolyzable Chloride of Isocyanates³
- D 4667 Test Method for Polyurethane Raw Materials: Determination of Acidity in Toluene Diisocyanate⁴
- D 4877 Test Methods for Polyurethane Raw Materials: Determination of APHA Color in Isocyanates³
- D 5155 Test Method for Polyurethane Raw Materials: Determination of the Isocyanate Content of Aromatic Isocyanates³

2.2 Federal Standard:

49 CFR Transportation Part 172.01⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminology D 883.

4. Classification

4.1 This specification covers three classes of toluene diisocyanates, based on isomer ratio, and three types based on acidity and hydrolyzable chloride.

4.2 Each class may be subdivided into three types on the basis of acidity differences as follows:

4.2.1 *Type I or A*—Acidity shall be between 0.0015 and 0.0045 determined 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 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 as percent HCl. Hydrolyzable chloride limits may be set at the convenience of the supplier and purchaser.

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 D 4660, D 4661, D 4663, D 4667, D 4877, and D 5155.

7. Retest and Rejection

7.1 If any failure occurs, the material may be retested to establish conformity in accordance with agreement between the purchaser and the seller.

8. Packaging and Package Marking

8.1 *Packaging*—The material shall be packaged in standard commercial containers so constructed as to ensure compliance

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 November 10, 2001. Published January 2002. Originally published as D 1786 – 60 T. Last previous edition D 1786 – 96.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.03.

⁴ Discontinued; see 1998 *Annual Book of ASTM Standards*, Vol 08.03.

⁵ *Code of Federal Regulation* is available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.

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

with Department of Transportation standards for such containers and shall be suitable for safe transportation at the lowest rate to the point of delivery. OSHA⁶ and EPA⁷ regulations may also apply and should be consulted.

⁶ Available from U.S. Department of Labor, OSHA, 200 Constitution Ave. NW, Washington, DC 20210.

8.2 *Marking*—Shipping containers/documents shall be marked with the name of the material, type, and the quantity contained therein, and necessary hazard labels as defined by the Department of Transportation for this material, the name of the manufacturer, manufacturer’s emergency telephone number in case of accident, and the number of the contract or order. OSHA⁶ and EPA⁷ regulations may also apply and should be consulted.

9. Keywords

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

⁷ Available from Environmental Protection Agency, 401 M St., SW, Washington, DC 20460.

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).