



उत्पाद मैनुअल

IS 17916:2022 के अनुसार

PRODUCT MANUAL

FOR TOLUENE DIISOCYANATE (TDI-80)

ACCORDING TO IS 17916: 2022

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in the operation of certification under Scheme-I of the Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining a BIS certification license/certificate.

1.	उत्पाद Product	:	IS 17916: 2022
	शीर्षक Title	:	Toluene Diisocyanate (TDI-80) – Specification
	संशोधनों की संख्या No. of amendments	:	0
2.	नमूना दिशानिर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	No specific requirements
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Not Applicable
c)	नमूने का आकार Sample Size	:	0.5 Litre
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex –A
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer Annex – B

5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests
6.	लाइसेंस का दायरा / Scope of the Licence		
	Licence is granted to use Standard Mark as per IS 17916: 2022 with the following scope:		
	Name of the product	Toluene Diisocyanate (TDI-80)	
	Type/ Grade	Type I	

BUREAU OF INDIAN STANDARDS

Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX – A
LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No.	Tests used in with Clause Reference	Test Equipment/ Chemicals
1.	Appearance, Cl.3.2 (Table 1, Sl. No. i)	Glass bottle 500 ml
2.	Colour, Pt-Co, Cl.3.2 (Table 1, Sl. No. ii)	Color comparison Tubes, Color comparator, Spectrophotometer, Spectrophotometer Cells, Volumetric flask 250ml & 500ml, Semi-Micro burette, Nessler tubes. Cobalt Chloride Hexahydrate, Hydrochloric acid of specific gravity 1.19, Chloroplatinic Acid or Potassium chloroplatinate, Platinum-Cobalt Reference Standards, Distilled Water
3.	Assay, percent by mass, Cl.3.2 (Table 1, Sl. No. iii)	Gas Chromatograph, equipped with an FID detector, a split-splitless injector and a suitable electronic integrator/software, Capillary Column, Syringe 10µl, Analytical Balance with least count of 0.1 mg., 80 : 20 Toluene Diisocyanate, o-Dichlorobenzene, m-phenylene Diisocyanate, 1,2,4-Trichlorobenzene and 1,2,3-Trichlorobenzene.
4.	Hydrolyzable Chlorine, Cl.3.2 (Table 1, Sl. No. iv)	Magnetic Stirrer, Titrator (Automatic), (with a silver electrode versus an Ag/AgCl reference electrode or combine silver ring electrode), Analytical Balance, Hotplate, Methanol, Silver Nitrate (0.0141 N), Nitric Acid, beaker, Glass sampling device, Measuring cylinder, Distilled water, Ice bath
5.	Acidity (as HCl), Cl.3.2 (Table 1, Sl. No. v)	Automatic Titrator (complete with reference and glass electrode for pH measurement), Buffer Solutions(pH 4 and 7), Glass Beaker 250ml, Potassium Hydroxide (0.01 N methanolic, standardized to $\pm 0.0001N$), Stopwatch, Stirrer, (Hydrochloric Acid, 0.01 N, standardized), n-Propanol, Pipette, Watch glass, Volumetric flask 250, 500, 1000ml
6.	Total Chlorine, Cl.3.2 (Table 1, Sl. No. vi)	Oxygen Combustion Bomb (as specified in ISS) and Ignition Unit (-as specified in ISS), Automatic Titrator w/t Electrode, reference and silver indicating or combine silver ring electrode, Micro Burette (5 ml capacity, 0.01 ml graduation), Weighing Bottle suitable for weighing a liquid sample by difference to the nearest 0.5 mg, Nichrome Fuse Wire, Sodium Carbonate, Oxygen(pure grade), Nitric Acid, Silver Nitrate (AgNO ₃), 0.014 1 N standard, Ethyl Alcohol, Methyl Red Indicator

7.	Isomer Ratio (2,4-TDI: 2,6-TDI), Cl.3.2 (Table 1, Sl. No. vii)	Method A-by Infrared spectroscopy: IR spectrophotometer w/t Cells (as per cl. 2.4.1 & 2.4.2) Volumetric flasks glass stoppered (25 ml), Vials glass stoppered 10 ml, Cyclohexane, Diisocyanate standards certified reference material of pure 2,4-toluene diisocyanate and 2,6- toluene diisocyanate Method B-by Gas chromatography: Gas Chromatograph equipped with an FID detector, a split-splitless injector and a suitable electronic integrator/software, Capillary Column (fused silica, with (5 percent-phenyl)-methyl polysiloxane phase with length 50 m; internal diameter 0.32 mm and film thickness 0.32 µm), Spoid 3 ml, Snap cover glasses, glass vial of 20 ml (for auto sampler), Analytical Balance with least count of 0.1 mg, Syringe, 10 µl, Toluene, Diisocyanate standards certified reference material of pure 2,4-toluene diisocyanate and 2,6- toluene diisocyanate, Nitrogen carried gas
8	Antioxidant or/and Performance Additives Cl.3.2 (Table 1, Sl. No. viii)	Name of the Antioxidant or/and Performance Additives, their levels and analysis methods shall be provided on mutual agreement between buyer and seller

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is the entire quantity of the Toluene Diisocyanate (TDI-80) produced in a single batch shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing commoncluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratoryor any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on the container transporting Toluene Diisocyanate (TDI-80), provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 If material is supplied in tank cars, tank trucks, container ships etc. the Standard Mark as given in Schedule of the licence and Licence Number (i.e. CM/L) shall be incorporated on a test certificate to be provided along with each tank car/tank truck/container ship as per the format at Appendix-1 enclosed, provided always that the product thus marked conforms to all the requirement of the specification. Packing shall be done as per provisions of Indian Standard and the marking details as per IS 17916:2022 shall also be indicated on the test certificate.

3.3 Additional Marking requirements: The material shall also be marked with the following additional requirement on each container transporting Toluene Diisocyanate (TDI-80):

- a) “For BIS certification details please visit www.bis.gov.in”
- b) KEEP WELL CLOSED.
- c) TOXIC AND AVOID CONTACT WITH SKIN

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act,2016.

TABLE 1
(Only for Guidance purpose)

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Clause	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
3.1	Description	3.1	IS 17916: 2022	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
3.2 and Table 1	i)Appearance	Annex A	IS 17916: 2022	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
	ii)Colour, Pt-Co	-	IS 8768	R	One	Each control unit	-
	iii)Assay, percent by mass	Annex B	IS 17916: 2022	R	One	Each Control Unit	-
	iv)Hydrolyzable Chlorine, percent by mass	Annex C	IS 17916:2022	R	One	Each Control Unit	-
	v)Acidity (as HCl), percent by mass	Annex D	IS 17916:2022	R	One	Each Control Unit	-

	vi)Total Chlorine, percent by mass	Annex E	IS 17916:2022	R	One	Each control unit	-
	vii)Isomer Ratio (2,4-TDI: 2,6-TDI), percent by mass	Annex F	IS 17916:2022	R	One	Each Control Unit	-
	viii)Antioxidant or/and Performance Additives	Name of the Antioxidant or/and Performance Additives, their levels and analysis methods shall be provided on mutual agreement between buyer and seller					

Appendix-1

TEST CERTIFICATE XYZ COMPANY

(REGISTERED OFFICE ADDRESS AND WORKS ADDRESS)

TEST CERTIFICATE FOR TOLUENE DIISOCYANATE (TDI-80) AS PER IS 17916:2022

TEST CERTIFICATE NO. _____

Dated: _____

SUPPLIED TO M/s _____ (Name and Address of Consignee)

It is certified that the material described below fully conforms to IS 17916 : 2022. The properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks License No. CM/L _____ are as indicated below against each order no. etc.

(PLEASE REFER TO IS 17916 : 2022 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no and date	Control Unit/ Batch Number	Month and Year of manufacture	Qty	Requirements							Remarks
				Appearance	Colour, Pt-Co,	Assay, percent by mass,	Hydrolyzable Chlorine, percent by mass, Max	Acidity (as HCl), percent by mass	Total Chlorine, percent by mass,	Isomer Ratio (2,4-TDI: 2,6-TDI), percent by mass	

The material supplied conforms to specified requirements of IS 17916 : 2022

REMARKS: Tank Car / Tank Truck / Container ship no.

(Signature)

For XYZ Company