



उत्पाद मैनुअल
PROPYLENE GLYCOL, FOOD GRADE- SPECIFICATION
13702:1993 के अनुसार

PRODUCT MANUAL FOR
PROPYLENE GLYCOL, FOOD GRADE- SPECIFICATION
ACCORDING TO IS 13702:1993

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता 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 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 uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1	मानक संख्या IS No.	:	IS 13702:1993
	शीर्षक Title	:	PROPYLENE GLYCOL, FOOD GRADE- SPECIFICATION
	संशोधनों की संख्या No. of amendments	:	02
2	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	NA
c)	नमूने का परिमाण Sample Quantity	:	500mL
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	Name of the product Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
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 except Identification Test as per clause 3.2.1 Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6	लाइसेंस का दायरा/Scope of the Licence:		
	"Licence is granted to use Standard Mark as per IS 13702: 1993 with the following scope:		
	Name of the product		Propylene Glycol

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX-A
List of test equipment

Sl. No	Tests Used In With Clause Reference	Test Equipment/Chemical
1	Description, Cl. 3.1	<u>Method as per Clause 3.1 of IS 13702</u> <u>Apparatus</u> Glass beaker / clean test tubes, white background sheet, glass stopper, analytical balance, desiccator, Test tubes / pipettes / dropper <u>Reagents</u> Distilled or deionized water, Acetone, Chloroform, Diethyl ether, Essential oils (e.g., eucalyptus oil, peppermint oil), Fixed oil (e.g., castor oil / coconut oil / sunflower oil)
2	Identification, Cl. 3.2.1	<u>Method as per Clause 3.2.1 of IS 13702</u> <u>Apparatus</u> Conical flask / round-bottom flask (500 ml), Reflux condenser, Steam bath, measuring cylinders / pipettes, Magnetic stirrer or glass rod, Filter funnel and filter paper, Evaporating dish / beaker, Refrigerator / cold storage, Melting point apparatus <u>Reagents</u> Triphenylchloromethane, Pyridine, Acetone, activated charcoal, Distilled water
3	Identification, Cl. 3.2.2	<u>Method as per Clause 3.2.2 of IS 13702</u> <u>Apparatus</u> Hot Plate <u>Reagents</u> Pottasium Bisulphate
4	Specific Gravity, Cl. 3.3	Relative density bottle, 25 ml capacity, Water bath, Thermometer, Weighing balance. OR Digital density meter with temperature control (20 °C), Syringe / pipette
5	Distillation Range, Cl. 3.4	<u>Method as per Clause 3.4 of IS 13702</u> <u>Apparatus</u> Distillation flask (Round-bottom, 250 mL or 500 mL), Distillation column / still head, Thermometer (0–300°C, accuracy $\pm 1^\circ\text{C}$), Heating mantle / oil bath, Condenser (Liebig or Allihn type), Receiver / receiving cylinder (100 mL) Graduated flask / measuring cylinder (100 mL), Stand with clamps and clamps holder <u>Reagents</u> Cooling water for condenser
6	Purity, Cl. 3.5, Table 1, S.no.(i)	<u>Method as per Annex-A of IS 13702</u> <u>Apparatus</u> Gas Chromatograph having Stainless steel column of 1 m $\times$ 1/4 inch, packed with 4% carbowax compound 20M on 40/60

		mesh Chromosorb T (or equivalent packing), Temperature column having range of 120-200° programmed at the rate of 5° per minute, Thermal Conductivity Detector, Carrier helium Gas System, Gas flow regulators & pressure gauges, Syringe (micro-syringe 10 µL capacity) Reagents Helium (GC grade), Calibration standard of propylene glycol, Solvent (if dilution required) — e.g., methanol or acetone (GC grade), Cleaning solvent (acetone / methanol)
7	Moisture, Percent by mass, Cl. 3.5, Table 1, S.no.(ii)	Method as per IS 2362 Apparatus Karl Fischer Titrator, Weighing balance, Micro burette, Pipette, Titration Vessel Reagents Methanol, 2-Methoxyethanol (Ethylene Glycol Monomethyl Ether), Iodine, Pyridine, Sulphur Dioxide, Karl Fischer Reagent, Sodium Tartarate (crystalline), Water-Methanol Standard Solution - 10 mg/ml, Water-Methanol Solution – approximately 2 g/l, Aluminium Sodium Silicate/Activated Silica Gel, Silicone Base Grease
8	Arsenic, Cl. 3.5, Table 1, S.no.(iii)	Instrumental Method (Referee method): – Weighing balance – hot plate 50 ml one-mark graduated flask – 100 ml one-mark volumetric flasks – Modified Kjeldahl flask (as per Fig 4 of IS 1699), – Atomic absorption spectrophotometer (with Hydride generation vessel accessory and potentiometric recorder) – nitric acid – Perchloric acid – Sulphuric acid – Hydrochloric acid – metal-free Distilled water – Sodium sulphate – Sodium borohydride pellets – Potassium chloride – Standard lead solution Note: Reagents shall be of an order of purity higher than accepted analytical reagent grade quality. Chemical Method Method 1: – Distillation apparatus (as per Fig 6 of IS 1699) – Conical flask (as per Fig 7 of IS 1699) – Microburner, – Water bath – Sulphuric acid – Potassium permanganate, ferrous sulphate – Hydrochloric acid

		– Potassium bromide solution – Aluminium strips – Tin chloride solution – Test paper (dried strips of filter paper in saturated ethanolic solution of mercuric bromide) – Nitric acid – Distilled water Method 2 (Modified Gutzeit method): – Distillation setup – Modified Gutzeit Apparatus/Spectrophotometer – Weighing balance – Distilled water – Concentrated Hydrochloric acid – Hydrazine Sulphate – Sodium Bromide – Lead Acetate – Filter paper strips – Absorbent Cotton Wool – Mercuric Bromide Paper – Dilute Sulphuric Acid – Potassium Iodide – Stannous Chloride Zinc granules – Arsenic trioxide – Sodium hydroxide
9	Heavy Metals, Cl. 3.5, Table 1, S.no.(iv)	<u>Method as per Annex-B of IS 13702</u> <u>Apparatus</u> Nessler Tubes, Volumetric Flasks, pH Strips <u>Reagents</u> Ammonia Solution, Hydrochloric acid - 10 percent, Lead Nitrate Stock Solution, Nitric Acid - 10 percent, Sulphuric Acid - 94-5 to 95.5 percent, Acetic Acid - 6 percent (m/v), Hydrogen Sulphide
10	Acidity, Cl. 3.5, Table 1, S.no.(v)	<u>Method as per Annex-C of IS 13702</u> <u>Apparatus</u> Titration assembly, Pipettes <u>Reagents</u> Phenolphthalein, Sodium Hydroxide – 0.1 N
11	Sulphated Ash, Cl. 3.5, Table 1, S.no.(vi)	<u>Method as per Annex-D of IS 13702</u> <u>Apparatus</u> 100 mL shallow dish (tared), Analytical balance, Hot plate, Muffle furnace (800 ± 25 °C), Desiccator <u>Reagents</u> Dilute Sulphuric Acid — 10% (m/v)
12	Presence of other Polyhydroxy Compounds Cl. 3.5, Table 1, S.no.(vii)	<u>Method as per Annex-A of IS 13702</u> <u>Apparatus</u> Gas Chromatograph having Stainless steel column of 1 m × 1/4 inch, packed with 4% carbowax compound 20M on 40/60 mesh Chromosorb T (or equivalent packing), Temperature column having range of 120-200° programmed at the rate of 5°

		per minute, Thermal Conductivity Detector, Carrier helium Gas System, Gas flow regulators & pressure gauges, Syringe (micro-syringe 10 µL capacity) <u>Reagents</u> Helium (GC grade), Calibration standard of propylene glycol, Solvent (if dilution required) — e.g., methanol or acetone (GC grade), Cleaning solvent (acetone / methanol)
13	Ethylene Glycol Cl. 3.5, Table 1, S.no.(viii)	<u>Method as per Annex-A of IS 13702</u> <u>Apparatus</u> Gas Chromatograph having Stainless steel column of 1 m × 1/4 inch, packed with 4% carbowax compound 20M on 40/60 mesh Chromosorb T (or equivalent packing), Temperature column having range of 120-200° programmed at the rate of 5° per minute, Thermal Conductivity Detector, Carrier helium Gas System, Gas flow regulators & pressure gauges, Syringe (micro-syringe 10 µL capacity) <u>Reagents</u> Helium (GC grade), Calibration standard of propylene glycol, Solvent (if dilution required) — e.g., methanol or acetone (GC grade), Cleaning solvent (acetone / methanol)
14	Lead, Cl. 3.5, Table 1, S.no.(ix)	<u>Method-A as per clause 15.1.6 of IS 1699</u> <u>Atomic Absorption Spectrophotometry (AAS) – Flame</u> <u>Apparatus</u> Atomic Absorption Spectrophotometer (AAS) capable of operating in absorption mode with suitable oxidant/fuel gas combinations, Hollow Cathode Lamp / Element-specific source for Pb (lead lamp), Air–Acetylene burner / flame system, Volumetric flasks – 100 ml / 50 ml, Kjeldahl flask (when digestion is needed for insoluble sample), Glassware cleaned with acid and metal-free water, Analytical balance, Hot Plate/Digestion System, Pipettes & micropipettes <u>Reagents</u> Nitric acid (HNO₃) – sp. gr. 1.42, Hydrochloric acid (HCl) – sp. gr. 1.16–1.18, Sulphuric acid (H₂SO₄) – 98%, Metal-free distilled water, Standard Lead Solution (Pb), Air and acetylene gas cylinders <u>Method-B as per clause 15.1.7 of IS 1699</u> <u>Measurement of Lead by Inductively Coupled Plasma (ICP)</u> <u>Apparatus</u> Inductively Coupled Plasma(OES/AES) with Plasma torch & nebulizer / spray chamber assembly, High-purity argon gas supply with pressure regulators (for plasma, auxiliary and nebulizer gas), Volumetric flasks – 100 ml / 50 ml, High-purity polypropylene / glass sample containers, Kjeldahl flask (silica or borosilicate) — for wet digestion if sample is not acid-soluble, Hot Plate/Digestion System, Analytical balance, Pipettes & micropipettes <u>Reagents</u>

		Nitric acid (HNO₃) — sp. gr. 1.42, Sulphuric acid (H₂SO₄) — 98%, Hydrochloric acid (HCl) — sp. gr. 1.16–1.18, Metal-free distilled water, Standard Lead Solution, Argon gas — ultra-high purity, Mixed acid digestion reagents (if sample not directly soluble) — nitric + sulphuric + perchloric <u>Method-C as per clause 15.1.8 of IS 1699</u> <u>Furnace AAS (Electro-thermal / Graphite Furnace AAS – ETA-AAS)</u> <u>Apparatus</u> Atomic Absorption Spectrophotometer with Electro-thermal Atomizer (Graphite Furnace AAS), Graphite Furnace + Temperature Programmer (with controlled drying, ashing & atomization stages), Hollow Cathode Lamp / Pb lamp, Volumetric flasks — 100 ml / 50 ml, Micropipettes (5–50 µl) with metal-free tips, Kjeldahl flask / digestion assembly (when dissolution is not direct), Plastic / polypropylene bottles and acid-washed glassware, Graphite tube <u>Reagents</u> Nitric acid (HNO₃) — sp. gr. 1.42, Sulphuric acid (H₂SO₄) — 98%, Hydrochloric acid (HCl) — sp. gr. 1.16–1.18, Metal-free distilled water, Standard Lead Solution (Pb), Mixed acid digestion reagents (HNO₃ + H₂SO₄ + HClO₄), Matrix modifier (e.g., ammonium phosphate / magnesium nitrate)
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ANNEX-B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) 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 (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

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 material manufactured in a continuous run, using same raw material and under similar conditions of manufacturing in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

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.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared

QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 TEST RECORDS- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made 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 each container and on the label applied to the container, 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 **Additional Marking requirements:** Additionally, the following shall also be marked on each container and on the label applied to the container:

- a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - 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)		
Test Details				Levels of Control		
Cl.	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
3.1	Description	3.1	IS 13702	One	Each Control unit	
3.2.1	Identification	3.2.1	IS 13702	One	Each Control unit	
3.2.2	Identification	3.2.2	IS 13702	One	Each Control unit	
3.3	Specific Gravity	3.3	IS 13702	One	Each Control unit	
3.4	Distillation Range	3.4	IS 13702	One	Each Control unit	
3.5 & Table 1,	Purity	Annex-A	IS 13702	One	Each Control unit	
-do-	Moisture, Percent by mass	-	IS 2362:1993	One	Each Control unit	
-do-	Arsenic	15	IS 1699:2024	One	Each Control unit	
-do-	Heavy Metals	Annex-B	IS 13702	One	Each Control unit	
-do-	Acidity	Annex-C	IS 13702	One	Each Control unit	
-do-	Sulphated Ash	Annex-D	IS 13702	One	Each Control unit	
-do-	Presence of other Polyhydroxy Compounds	Annex-A	IS 13702	One	Each Control unit	
-do-	Ethylene Glycol	Annex-A	IS 13702	One	Each Control unit	
-do-	Lead	15	IS 1699:2024	One	Each Control unit	

Appendix-1

TEST CERTIFICATE

XYZ COMPANY (REGISTERED OFFICE ADDRESS AND WORKS ADDRESS)

TEST CERTIFICATE FOR PROPYLENE GLYCOL

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 13702:1993 for "Food Grade"

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 13702:1993 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no and date	Name of the material	Test	Requirement	Observed value	Control Unit/ Batch Number	Month and Year of manufacture	Quantity	Remarks
		Description						
		Specific Gravity						
		Distillation Range						
		Purity						
		Moisture, Percent by mass						
		Arsenic						
		Heavy Metals						
		Acidity						
		Sulphated Ash						
		Presence of other Polyhydroxy Compounds						
		Ethylene Glycol						
		Lead						

The Material supplied conforms to specified requirements of IS 13702:1993.

REMARKS:

Tank Car / Tank Truck / Container ship no.

(For details of BIS certification please visit www.bis.gov.in)

(Signature)
For XYZ Company