



**उत्पाद मैनुअल
आई एस 14885 : 2022 के अनुसार गैसीय ईंधन की आपूर्ति के लिए पोलिईथीलीन
पाइप के लिए**

दस्तावेज संख्या – पीएम/आईएस 14885/2/दिसंबर 2022

भारतीय मानक ब्यूरो की स्कीम-1 (अनुरूपता मूल्यांकन) विनियम, 2018 के तहत यह उत्पाद मैनुअल प्रमाणीकरण के प्रचालन में रीति और पारिश्रिता की सुसंगतता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसी द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस प्रमाणीकरण लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज का उपयोग किया जा सकता है।

**PRODUCT MANUAL FOR
POLYETHYLENE PIPES FOR THE SUPPLY OF
GASEOUS FUELS ACCORDING TO IS 14885 : 2022**

Document No.- PM/ IS 14885/2/Dec 20222

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence 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 licence/certificate.

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1.	Product	:	IS 14885:2022
	Title	:	POLYETHYLENE PIPES FOR THE SUPPLY OF GASEOUS FUELS
	No. of Amendments	:	Nil
2.	Sampling Guidelines:		
a)	Raw material	:	i) Polyethylene compound – Clause 5.1 of IS 14885 ii) Anti –oxidant – Clause 5.3 of IS 14885 iii) UV Stabilizer – Clause 5.4 of IS 14885
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Pipes - 6 Nos x 1 m (For acceptance test) Pipes - 6 Nos x 1 m (For type test)
d)	Sampling Guidelines During Operation of Licence	:	Please refer ANNEX – B
3.	List of Test Equipment	:	Please refer ANNEX – C
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – D
5.	Possible tests in a day :		
	i) Dimensions of pipes (Clause 6), Finish (Clause 7) ii) Reversion test (Clause 8.2), Density (Clause 8.3) iii) Melt Flow rate (Clause 8.4), Thermal stability to oxidation (Clause 8.5) iv) Tensile properties (Clause 8.7), Pigment Dispersion v) Volatile Matter Content		
6.	Scope of the Licence	:	Please refer ANNEX – E

ANNEX A

Grouping Guidelines

1. Polyethylene pipes of supply of gases fuels as per IS 14885 : 2022 are categorized as given below:

- a) Grade of material – PE 80 and PE 100
- b) SDR classification – SDR 17 / SDR 13.6 / SDR 11 / SDR 9
- c) Nominal diameter (DN) – 16 mm to 630 mm

2. Nominal diameter (DN) covered are sub-grouped as given below :

	Group I	Group II	Group III
Nominal diameter (DN) (mm)	16 - 110	125 -315	355 - 630

3. Considering the above, grouping guidelines given below shall be followed for GoL/CSoL:

- a) One sample of pipe of any diameter from each group, for each material grade and each SDR classification shall be tested for all requirements to cover all sizes of pipes in that particular group for that particular material grade and SDR classification tested.
- b) An additional type approval test for long-term hydrostatic strength at 20°C for 10000h shall be carried out once in order to establish the validity of classification for the grade of material received by the manufacturer and to get qualified for the production of polyethylene pipes for supply of gaseous fuel.

4. The Firm shall declare the varieties of polyethylene pipes they intend to cover in the Licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities of the manufacturer.

5. During the operation of the Licence, BO shall ensure that all varieties covered in the Licence are tested in rotation, to the extent possible.

ANNEX B

Sampling Guidelines During Operation of Licence

- (i) During an operative year of a licence, two Factory Samples and two Market Samples shall be drawn.
- (ii) One FS and one MS shall be drawn for independent testing for complete testing of the product. The other FS and other MS are to be drawn for independent testing for all tests except for – hydraulic characteristics-1000hr, resistance to weathering and slow crack growth rate test.
- (iii) During Factory Surveillance inspection, all tests as given in Annex-E are to be carried out.

ANNEX C**List of Test Equipments****Major test equipment required to test as per the Indian Standard**

Sl No.	Tests used in with Clause Reference	Test Equipment
1	Dimensions of pipes (Clause 6) - Nominal outside diameter, out of roundness (Clause 6.1), Wall thickness (Clause 6.2) Length of pipe (Clause 6.4), Ovality (Clause 6.1.2)	- Vernier caliper - Measuring Tape - PI Tape or Circometer - Ball ended Micrometer/Dial vernier - Continuous wall thickness measurement arrangement during production - Measuring scale/tape
2	Finish (Clause 7)	- Right angle square - Vernier caliper
3	Hydraulic characteristics (Clause 8.1)	- Hydraulic pressure testing equipment with timer and pressure gauges as per Annex-E of IS 4984 - End pugs of required sizes - Thermostatically controlled water bath with low and high temperature arrangement
4	Reversion test (Clause 8.2)	- Hot air Oven - Vernier caliper - Thermometer - Timer - Water bath
5	Density (Clause 8.3 and Clause 5.1, Table 2)	- Digital weighing balance - Distilled water, Butyl Acetate - Hydrometer, Glass beaker of 250ml capacity - Thermometer - Air conditioner - Heated press (Electrically) heated steam water cooled, digital temperature controller, with spacer frame 100 x 120 mm
6	Melt Flow rate (Clause 8.4 and Clause 5.1, Table 2)	- Melt flow rate Apparatus with digital temperature controller and timer and load of 5 kgf

7	Oxidation Induction Time (Clause 8.5) Resistance to weathering (Clause 8.8) Thermal stability (Clause 5.1, Table 2)	- Differential Thermal Analyzer(DTA) - Pure indium and pure tin for calibration - Aluminium pans, Timer - Microtome cutter and scalpel - Analytical/digital weighing balance - Nitrogen gas cylinder with flow meter - Oxygen gas cylinder with flow meter
8	Volatile matter content (Clause 8.6)	- Drying oven. - Weighing cup with diameter of 35 mm with lid of cup - Desiccators - Analytical/digital weighing balance
9	Tensile test (Clause 8.7) Resistance to weathering (Clause 8.8)	- Arrangement for maintaining temperature of $23 \pm 1^{\circ}\text{C}$ in testing room/ Air conditioner - Tensile testing machine - Vernier caliper, Micrometer - Cutting die and template for making test piece as per (as per Fig. 6, 7 and 8, as applicable)
11	Squeeze off (Clause 8.9)	- Squeeze off equipment as per clause C-3 of IS 14885 : 2022 - Pressure tight and load bearing end caps or plugs for each size of pipe. - Deep freezer
12	Pigment Dispersion (Table 2)	- Microtome capable of cutting microtome section of $10\text{ }\mu\text{m}$ to $20\text{ }\mu\text{m}$. - Microscope of at least X 100 linear magnification and circular field of view of $0.7 \pm 0.07\text{ mm}$ diameter set for transmitted light - Microscope Slides and Cover slips
13	Slow Crack Growth Rate test (Clause 8.10)	- As per J-1 of IS 4984
14	Resistance to Weathering (Clause 5.6 & 8.9)	- Specimen holder as per Annex-B of IS 14885:2022 - Tensile testing machine - Vernier scale - Hydrostatic pressure test apparatus with pressure gauge, timer and appropriate end fittings - Temperature controlled water bath - OIT tester

The above list is indicative only and may not be treated as exhaustive.

ANNEX D

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS –The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING–As per the requirements of IS 14885 : 2022.

4. CONTROL UNIT – Pipes of same designation from a continuous extrusion run of one machine manufactured from same batch of raw material upto maximum of 48 h duration shall constitute one control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control submitted by the manufacturer in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

6. REJECTIONS –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

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
4.4	Colour	4.4	IS 14885	-	Each pipe/coil	-	-
5	MATERIAL						
5.1	Polyethylene compound	5.1, Table 2 & Table 3	IS 14885	S	One	Each batch received	Further testing is not required, if material received along with test certificate of manufacturer. Pipe manufacturer shall also obtain test certificate from compound supplier that the PE compound are cadmium free pigmented compound as per clause 5.1 of IS 14885.
5.7	PE compound quality evaluation	5.7	IS 14885	S	One sample shall be tested once as type approval test for long-term hydrostatic strength at 20°C for 10000h in order to establish the validity of material classification received by the manufacturer, before goingfor regular production.		
5.3	Anti-oxidant	5.3	IS 14885	S	One	Each batch received	Further testing is not required, if material received along with test certificate of manufacturer.
5.4	U-V stabilizer	5.4	IS 14885	S	One	Each batch received	

4.4	Colour	4.4	IS 14885	-	Each pipe/coil	-	-
6	Dimensions of pipe	6.1 to 6.4, Table 4 & 5	IS 14885	R	10	Each control unit	-
7	Finish	7	IS 14885	-	Each pipe / coil	-	-
8	PERFORMANCE REQUIREMENTS						
8.1	Hydraulic characteristics						
8.1	Internal pressure creep rupture test for plain pipes at 80°C for 165h	8.1	IS 14885 Annex E of IS 4984	R	Three pipes drawn at regular interval	One Sample from each pipe designation produced in a month.	
	Internal pressure creep rupture test for plain pipes at 20°C for 100h	8.1	IS 14885 Annex E of IS 4984	S	Three pipes drawn at regular interval	Once in a two years #	-
	Internal pressure creep rupture test for plain pipes at 80°C for 1000 h	8.1	IS 14885 Annex E of IS 4984	S	Three pipes drawn at regular interval	Once in four years #	
8.2 .1	Longitudinal Reversion test	8.2.1, Annex F	IS 14885	R	Three pipes drawn at regular interval	Each control unit	In case of any failure the control unit shall not be marked
8.2 .2	Longitudinal Reversion test (pipes sizes $\geq$ 250mm)	8.2.2	IS 14885	R	Three pipes drawn at regular interval	Each control unit	
8.3	Density	8.3	IS 14885 IS 7328	R	One composite sample of minimum three pipes drawn at regular interval	Each control unit	
8.4	Melt Flow Rate	8.4	IS 14885	R		Each control unit	
8.5	Pigment Dispersion	8.5	Annex A of IS 14885	R	One	Once in a week	-

8.6	Thermal Stability (Oxidation Induction Time)	8.6	IS 14885 Annex-B of IS 4984	R	One composite sample of minimum three pipes drawn at regular interval	Each control unit	In case of any failure the control unit shall not be marked
8.7	Volatile matter content	8.7	IS 14885 Annex-C of IS 4984	S	Three pipes drawn at regular interval	Once in two years #	@
8.8	Tensile Properties (Tensile yield strength and elongation at break)	8.8	IS 14885 Annex-H of IS 4984	R	Three pipes drawn at regular interval	Each control unit	-
8.9	Resistance to weathering	8.9	Annex-B of IS 14885	S	One	Once in Three years	* Pipe sample needs to be kept on exposure for a period of two years at factory as per Annex-B and after exposure, it may be sent for testing.
8.10	Slow Crack Growth Rate Test	8.10	IS 14885 Annex-E of IS 4984	S	One	Once in two years or whenever there is any change in resin composition or method of manufacture	-
8.11	Squeeze off	8.11	IS 14885 Annex-C of IS 14885	S	Three pipes drawn at regular interval	Once in two years #	@

* One sample from pipe designation shall be tested at least once in three years. This test shall also be carried out whenever there is change in composition or method of manufacture or when a new size is to be introduced. Even if no change is envisaged, type test shall be done at least

once in three years on the highest size (lowest size for overall migration test) manufactured during the period.

Pipe of each grade of material and SDR manufactured during the period shall be tested. This test shall also be carried out whenever there is change in composition or method of manufacturing or when a new size of pipe is introduced.

@ In case of failure of sample, additional sample of same size shall be drawn and tested. The results of sample shall be accepted, if retested sample pass. In case of failure of retested sample, marking shall be stopped. Corrective actions shall be taken and marking may be resumed only after passing of improved sample.

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

ANNEX E**Scope of the Licence :**

“Licence is granted to use Standard Mark as per IS 14885:2022 with the following scope:	
Name of the product	Polyethylene Pipes for the Supply of Gaseous Fuels
Designation	Material Grade (PE)_ Nominal Diameter (DN)_ Nominal Wall Thickness (e _n)_ Standard Dimension Ratio (SDR)_