



PRODUCT MANUAL FOR POLYETHYLENE PIPES FOR THE SUPPLY OF GASEOUS FUELS ACCORDING TO IS 14885:2001

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.

1.	Product	:	IS 14885:2001
	Title	:	POLYETHYLENE PIPES FOR THE SUPPLY OF GASEOUS FUELS
	No. of Amendments	:	3
2.	Sampling Guidelines:		
a)	Raw material	:	i) Polyethylene compound – Clause 5.1 of IS 14885 ii) Anti –oxidant – Clause 5.2 of IS 14885 iii) UV Stabilizer – Clause 5.3 of IS 14885 iv) Pigment dispersion – 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)
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day :		
	i) Dimensions of pipes (Clause 6) ii) Finish (Clause 7) iii) Reversion test (Clause 8.2) iv) Density (Clause 8.3) v) Melt Flow rate (Clause 8.4) vi) Thermal stability to oxidation (Clause 8.5) vii) Tensile test (Clause 8.7)		
6.	Scope of the Licence	:	Please refer ANNEX – D

ANNEX A**Grouping Guidelines**

1. Polyethylene pipes of supply of gases fuels as per IS 14885 : 2001 are categorized as given below:

- a) Grade of material – PE 80 and PE 100
- b) SDR classification – SDR 17.6 / SDR 13.6 / SDR 11.0 / 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) However, when samples of pipes are tested from different groups for the same grade of material manufactured by the same compound manufacturer, only one sample of pipe from any group shall be tested for long term hydraulic strength at 20 °C for 10000 h (as per clause 5.6 of IS 14885 : 2001).

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**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)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Right angle square - Vernier caliper
3	Hydraulic characteristics (Clause 8.1) Resistance to weathering (Clause 8.8)	<ul style="list-style-type: none"> - Hydraulic pressure testing equipment with timer and pressure gauges - End pugs of required sizes - Thermostatically controlled water bath with low and high temperature arrangement - Apparatus as per clause B-1 of IS 14885 : 2001
4	Reversion test (Clause 8.2)	<ul style="list-style-type: none"> - Hot air Oven - Vernier caliper - Thermometer - Timer
5	Density (Clause 8.3 and Clause 5.1, Table 2)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Differential Thermal Analyzer(DTA) - Pure indium and pure tin for calibration - Aluminium pans - Microtome cutter and scalpel - Analytical/digital weighing balance - Nitrogen gas cylinder with flow meter - Oxygen gas cylinder with flow meter - Timer
8	Volatile matter content (Clause 8.6)	<ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Arrangement for maintaining temperature of 23 ± 1 °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)
10	Resistance to weathering (Clause 8.8)	<ul style="list-style-type: none"> - Arrangement for holding the sample for exposing to sunlight (Clause F-1 to F-3 of IS 14885 : 2001)
11	Squeeze off (Clause 8.9)	<ul style="list-style-type: none"> - Squeeze off equipment as per clause G- 2.1 of IS 14885 : 2001 - Pressure tight and load bearing end caps or plugs for each size of pipe. - Deep freezer - Mandrels as per Table 11(A) of IS 14885 : 2001
12	Pigment Dispersion (Clause 5.1, Table 2)	<ul style="list-style-type: none"> - Microtome capable of cutting microtome section of 10 μm to 20 μm. - Microscope of at least X 100 linear magnification and circular field of view of 0.7 ± 0.07 mm diameter set for transmitted light - Microscope Slides and Cover slips

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

ANNEX C

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.

1.1The 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 : 2001.

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				
4.2	Grade of material	4.2	IS 14885	S	-	-	Test certificate of manufacturer shall be obtained for each consignment received.
4.4	Colour	4.4	IS 14885	-	Each pipe/coil	-	-
5	MATERIAL						
5.1	Polyethylene compound	5.1, Table 2	IS 14885	S	One	Each batch received	Further testing is not required, if material received along with test certificate of manufacturer.
5.2	Anti-oxidant	5.2	IS 14885	S	One	Each batch received	
5.3	U-V stabilizer	5.3	IS 14885	S	One	Each batch received	
5.4	Pigment dispersion	5.4	IS 14885	S	One	Each batch received	
5.5	Effect of Gas constituents on the Hydrostatic strength	5.5	IS 14885	S	Three samples of each pressure rating for each grade /class of material with highest size of pipe manufactured	Once in two years	Further testing is not required, if material received along with test certificate of manufacturer.

5.6	PE compound quality evaluation	5.6	IS 14885 Table 1 & 2	S	One sample shall be tested as type approval for each compound supplier, before going for regular production		Test certificate of compound supplier shall be obtained for each consignment received.
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 and notched pipes	8.1, Table 7, Annex A, Annex B	IS 14885	R	Three pipes drawn at regular interval	Each control unit	-
	Internal pressure creep rupture test for plain pipes at 20°C for ≥ 100h	8.1, Table 7, Annex A	IS 14885	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, Table 7, Annex A	IS 14885	S	Three pipes drawn at regular interval	Once in four years #	
8.2	Reversion Test	8.2, Annex C	IS 14885	R	Three pipes drawn at regular interval	Each control unit	In case of any failure the control unit shall not be marked
8.3	Density	8.3, Annex A	IS 14885	R	One composite sample of	Each control unit	
8.4	Melt Flow Rate	8.4	IS 14885	R	minimum three pipes drawn at regular interval	Each control unit	

8.5	Thermal Stability to Oxidation	8.5, Annex D	IS 14885	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
8.6	Volatile matter content	8.6, Annex H	IS 14885	S	Three pipes drawn at regular interval	Once in two years #	@
8.7	Tensile test	8.7.1, Annex J	IS 14885	R	Three pipes drawn at regular interval	Each control unit	In case of any failure the control unit shall not be marked
8.8	Resistance to weathering	8.8, 8.7.1, 8.1, 8.5, Annex F	IS 14885	S	Three pipes drawn at regular interval	Once in two years #	@
8.9	Squeeze off	8.9, Annex G	IS 14885	S	Three pipes drawn at regular interval	Once in two years #	@

Pipe of highest size of each pressure rating and each grade/class of material manufactured during the period shall be tested. This test shall be 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 D**Scope of the Licence :**

“Licence is granted to use Standard Mark as per IS 14885:2001 with the following scope:	
Name of the product	POLYETHYLENE PIPES FOR THE SUPPLY OF GASEOUS FUELS
Material Grade	PE 80/ PE 100
Standard Dimension Ratio (SDR)	SDR 9/SDR 11.0/SDR 13.6/ SDR 17.6
Sizes (Nominal Diameter)	DN -- mm to DN -- mm