उत्पाद मैन्युअल
आई एस 15450:2022 के अनुसार
तप्त और अतप्त जल आपूर्ति के लिए पोलीएथीलीन-एल्युमीनियम-पोलीएथीलीन सम्मिश्र के दाब पाइप के लिए

दस्तावेज़ संख्या – पी एम/ आई एस 15450/2/जून 2022

भारतीय मानक ब्यूरो की स्कीम-I (अनुरूपता मूलयाांकन) विनियम, 2018 के तहत यह उत्पाद मैन्युअल प्रमाणीकरण के प्रचालन में रीति और पारिर्शिता 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 दस्तावेज़ का उपयोग किया जा सकता है ।

PRODUCT MANUAL FOR POLYETHYLENE-ALUMINIUM-POLYETHYLENE COMPOSITE PRESSURE PIPES FOR HOT AND COLD WATER SUPPLIES ACCORDING TO IS 15450:2022

Document No.- PM/IS 15450/2/June 2022

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 15450: 2022
	Title	:	Polyethylene-Aluminium-Polyethylene Composite Pressure Pipes for Hot and Cold Water Supplies
	No. of Amendments	:	Nil
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	a) Polyethylene – Clause 5.2 of IS 15450: 2022 b) UV Stabilizer – Clause 5.3 of IS 15450: 2022 c) Aluminium – Clause 5.4 of IS 15450: 2022
b)	**Grouping guidelines**	:	Please refer ANNEX – A
c)	**Sample Size**	:	Qty - 6 meter
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**	:	Please refer ANNEX – D
6.	**Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 15450: 2022 with the following scope:		
	Name of the product		Polyethylene-Aluminium-Polyethylene Composite Pressure Pipes for Hot and Cold Water Supplies
	Pipe Designation		

ANNEX- A

Grouping Guidelines

1. IS 15450 :2022 covers Polyethylene-Aluminium-Polyethylene (PE-Al-PE) Composite Pressure Pipes for Hot and Cold Water Supplies.

2. PE-Al-PE composite pipes are designated by nominal outside diameters. The Pipes are grouped as under based on Pipe Designation:

Group	**I**	**II**	**III**	**IV**
Pipe Designation	12, 14, and 16	20 and 25	32, 40 and 50	63 & 75

3. Considering the above, following grouping guidelines is developed for GoL/ CSoL:

- One sample with highest Pipe Designation from each group shall be tested for all requirements to cover all Pipe Designation from that particular group in the scope of licence.

4. The Firm shall declare the varieties of pipes they intend to cover in the licence. The scope of the Licence may be restricted on the Manufacturing and Testing capabilities of the Manufacturer.

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

ANNEX B

List of Test Equipment

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 9)	a) Vernier calliper b) Micrometer c) Steel tape d) Magnifying glass with graduated reticuleof Least count 0.10 mm
2	Density (Clause 11.1)	a) Steam or electrical heated press for sample preparation b) Analytical balance c) Butyl Acetate d) Thermometer, e) Hydrometer f) Glass beaker (250 ml) g) Air conditioned room to maintain temperature of 27 ± 2°C
3	Melt flow rate (Clause 11.2)	a) Melt flow index test apparatus with dead load of 5 kg b) Weighing balance c) Stopwatch
4	Carbon black content and dispersion (Clause 11.5)	a) Porcelain or silica combustion boats b) Combustion tube made of hard glass c) Gas flow meter d) Nitrogen gas. e) Thermometer f) Furnace g) Trichloroethylene h) Analytical balance i) Desiccator, Solid CO2. j) Fuming hood. k) Hot plate l) Glass slides m) Microscope with 10X and 20X magnification
5	Pigment dispersion (Clause 11.6)	a) Microtome i.e. microscope of at least 100X linear magnification and circular Field of view of 0.7+/- 0.07 mm dia. b) Microscope slides and cover slips.

6	Adhesion test (Delamination test) (Clause 11.8.1)	a) Sharp cutting tools and pliers
7	Apparent tensile strength test (Clause 11.9)	a) Tensile testing machine b) Protractor c) Steel rod of 4 mm dia d) Vernier calliper
8	Minimum burst pressure (Clause 11.10)	a) Hydrostatic pressure test apparatus with pressure gauge and appropriate end fittings b) Stopwatch c) Thermometer
9	Hydraulic Characteristics; Short term Hydraulic test (Clause11.11.1) Long term Hydrostatic test (Clause 11.11.2)	a) Hydrostatic pressure test apparatus with pressure gauge, timer and appropriate end fittings b) Temperature controlled water bath
10	Overall migration test (Clause 11.3)	a) Electric oven/Water bath with thermostat b) Hot plate with temperature regulator. c) Analytical balance d) Glass beaker e) Stainless steel evaporating dish
11	Thermal stability to oxidation (Clause 11.4)	a) Differential Thermal Analyzer or, Differential Scanning Calorimeter. b) Aluminium pan c) Nitrogen and Oxygen Gas cylinder with flow meter d) Core driller machine
12	For maintaining ambient temperature during various tests	a) Air Conditioner
13	Adhesion (Layer Separation Test) (Clause 11.8.2)	a) Set up for Layer Separation test (fig 3 of IS 15450:2022)
14	Resistance to Weathering (Clause 11.7)	a) Specimen holder as per Annex-B of IS 14885:2022 b) Tensile testing machine c) Vernier scale d) Hydrostatic pressure test apparatus with pressure gauge, timer and appropriate end fittings e) Temperature controlled water bath f) OIT tester

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.

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

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

3. LABELLING AND MARKING – As per the requirement of IS 15450:2022.

4. CONTROL UNIT – PE-Al-PE pipe of a particular Pipe Designation manufactured as a continuous roll in each consignment shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control 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 Standards 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 Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	**Material**						
	Polyethylene	5.2.1	IS 15450 IS 7328 IS 4984 IS 10146	-	-	Each consignment	Consignment received shall be received with manufacturers certificate
		5.2.1.1	IS 15450 IS 16738	S	One	Each consignment	$$
	U V Stabilizer	5.3.1	IS 15450	S	One	Each consignment	$$
		5.3.2	IS 15450	-	-	Each consignment	Consignment received shall be received with manufacturers certificate
	Aluminium (grade 31200)	5.4	IS 15450 IS 737	S	One	Each consignment	$$
8	Colour	8	IS 15450	R	Every coil or length of pipe extruded	-	-
9	Dimensions of pipe	9.1, 9.2, 9.3, 9.4, Annex- B	IS 15450	R	One	Every Three hours	-
10	Visual appearance	10	IS 15450	R	Every coil or length of pipe extruded	Each control unit	-
11.1	Density	11.1, Table3	IS 15450 IS 7328	R	One composite sample of minimum three pipes/coil drawn at regular interval	Each control unit	-

11.2	Melt flow rate		11.2, Table3	IS 15450 IS 2530	R	One composite sample of minimum three pipes/coil drawn at regular interval	Each control unit	-
11.3	Overall migration test		11.3	IS 15450 IS 9845 IS 10146	S	One	Once in Three years	##
11.4	Thermal stability to Oxidation		11.4, Table 3	IS 15450 IS 4984	S	One	Once in Three years	##
11.5	Carbon black contentand dispersion		11.5, Table 3	IS 15450 IS 2530 IS 7328	R	One composite sample of minimum three pipes/coil drawn at regular interval	Each control unit	-
11.6	Pigment dispersion (for coloured pipes)		11.6	IS 15450 IS 14885	R	One	Alternate control units	-
11.7	Resistance to Weathering		11.7		S	One	Once in Threeyears	##
11.8	Adhesion Test	De-lamination test (pipe size-12 to 32mm)	11.8.1 Annex C-1	IS 15450	R	One	Alternate control units	-
		Layer Separation test (pipe size- 40 mm and above)	11.8.2 Annex C-2 Table 4	IS 15450	R	One	Alternate control units	-
11.9	Apparent tensile strength of pipe		11.9, Annex D, Table-5	IS 15450	R	One	Each control unit	-
11.10	Minimum burst pressure		11.10, Annex E	IS 15450	R	One	Each control unit	-
11.11.1	Hydraulic characteristic: Short term hydrostatic tests		11.11.1, Annex F, Table-6	IS 15450	R	One	Each control unit	-
11.11.2	Hydraulic characteristic: Long term hydrostatictest		11.1.2, Annex F, Table 7	IS 15450	S	One	Once in Three years	##

$$ Further testing is not required, if consignment received is ISI marked or received with manufacturers' certificate.

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.

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

Possible tests in a day

(i) Colour (Clause 7)

(ii) Dimensions of pipes (Clause 8)

(iii) Visual appearance (Clause 9)

(iv) Density (Clause 10.1)

(v) Melt flow rate (Clause 10.2)

(vi) Carbon black content and dispersion. (Clause 10.3)

(vii) Adhesion test (clause 10.5)

(viii) Apparent tensile strength (Clause 10.6).

(ix) Minimum burst pressure (Clause 10.7)

(x) Hydraulic characteristics (Clause 10.8)