



**PRODUCT MANUAL FOR  
UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PIPES FOR  
SOIL AND WASTE DISCHARGE SYSTEM FOR INSIDE AND  
OUTSIDE BUILDINGS INCLUDING VENTILATION  
AND RAIN WATER SYSTEM  
ACCORDING TO IS 13592: 2013**

*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.	<b>Product</b>	:	IS 13592 : 2013
	<b>Title</b>	:	UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PIPES FOR SOIL AND WASTE DISCHARGE SYSTEM FOR INSIDE AND OUTSIDE BUILDINGS INCLUDING VENTILATION AND RAIN WATER SYSTEM
	<b>No. of Amendments</b>	:	1
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	PVC resin and additives – Clause 6 of IS 13592
b)	<b>Grouping guidelines</b>	:	Please refer <a href="#">ANNEX – A</a>
c)	<b>Sample Size</b>	:	1 mtr x 6 nos ( 3 nos with socket ) for all tests
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – B</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – C</a>
5.	<b>Possible tests in a day :</b>	:	Please refer <a href="#">ANNEX – D</a>
6.	<b>Scope of licence :</b>	:	Please refer <a href="#">ANNEX – E</a>

**ANNEX A****Grouping Guidelines**

1. Unplasticized polyvinyl chloride (PVC-U) pipes as per IS 13592:2013 are classified as follows :

<b><i>Type of pipes</i></b>	Type A and Type B
<b><i>Size Designation (Nominal Outside Diameter DN)</i></b>	40 to 160 mm (Type A ) 40 to 315 mm (Type B)
<b><i>Ends of pipes</i></b>	Plain ended pipes Socket ended for solvent cementing Grooved socket

2. PVC-U pipes are categorized into the following groups:

	<b><i>Type A</i></b>	<b><i>Type B</i></b>
<b><i>Group 1</i></b>	40 to 125 mm	40 to 125 mm
<b><i>Group 2</i></b>	140 to 160 mm	140 to 315 mm

3. For considering GoL/CSoL, testing shall be done as follows:
- Pipe of any size from each size group for each type shall be tested for all requirements to cover pipes of all sizes in that size group for the particular type of pipe tested.
  - Separate pipes for each ends shall be tested.
  - However, if socket ended pipe is tested, plain ended pipe in that size group and type may also be covered.
  - If plain ended pipe is covered in the licence and extension of Scope is requested for socket ended pipe, only applicable tests for socket shall be carried out.
2. The Firm shall declare the varieties of Pipes intended to be covered in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
3. During the operation of the Licence, BO shall ensure that all the types and sizes 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*

<b>S. No.</b>	<b>Tests used in with Clause Reference</b>	<b>Test Equipment</b>
1	Mean outside diameter & Diameter at any point (Clause 7 & 7.1)	- Vernier Calipers or outside caliper - Pi Tape or flexible tape
2	Wall thickness (Clause 7.1)	- Dial Gauge - Micrometer - Ultrasonic gauge
3	Length of pipe (Clause 7.2)	- Tape
4	Dimension of Socket (Clause 7.3)	- Vernier Caliper or Vernier depth gauge - Inside Caliper - Micrometer
5	Visual appearance & Pipe Ends (Clause 8.1)	- Angle Protractor
6	Reversion test (Clause 8.2)	- Thermostatically Control oil bath - Mono-polyethylene glycol, glycerol or mineral oil free from aromatic hydrocarbons - Vernier Calipers - Stop watch
7	Stress Relief Test (Clause 8.3)	- Circulating Hot Air Oven with digital temperature controller & indicator - Vernier Caliper - Stop watch
8	Vicat softening temperature (Clause 8.4)	- Oil heating Bath equipped with means to raise the temperature at uniform rate of $50 \pm 5^\circ \text{C/hr}$ with suitable stirrer - Rod with loading plate, loads and indenting tips - Micrometer dial gauge - Thermometer or temperature measuring equipment
9	Effect of Sunlight (Clause 8.5)	- Measuring Tape - Vernier Caliper - Thick Paper - Thermometer - Weatherometer of equivalent exposure

10	Resistance of Sulphuric Acid (Clause 9)	<ul style="list-style-type: none"> <li>- Muffle Furnace</li> <li>- Weighing balance</li> <li>- Silica crucible</li> <li>- Sulphuric Acid</li> <li>- Desiccators</li> <li>- Pipette</li> <li>- Drying agent</li> <li>- Bunsen Burner, Triangle, Tripod device</li> </ul>
11	Impact Strength at 0 °C (Clause 10.1)	<ul style="list-style-type: none"> <li>- Falling Weight testing machine from height 2000 mm</li> <li>- Striker of weight 0.25, 0.50 &amp; 1.00 kg</li> <li>- Digital watch</li> <li>- Liquid bath or freezer for conditioning of samples</li> </ul>
12	Tensile Strength (Clause 10.2)	<ul style="list-style-type: none"> <li>- Digital Tensile Testing machine</li> <li>- Dumb bell Die along with Hydraulic jack</li> <li>- Vernier Caliper</li> <li>- Micrometer Ball ended</li> <li>- Air Conditioner</li> </ul>
13	Axial Shrinkage (Only For Type-B) (Clause 10.3)	<ul style="list-style-type: none"> <li>- Water bath with Thermostatically controlled with stirrer and digital temperature controller</li> <li>- Vernier Caliper</li> <li>- Steel Scale</li> <li>- Stop watch</li> <li>- Thermometer</li> </ul>
14	Water tightness of joint (Clause 11)	<ul style="list-style-type: none"> <li>- Hydrostatic pressure testing apparatus with pressuring unit and multiple outlets</li> <li>- Water bath with temperature control</li> <li>- Thermometer</li> <li>- End plugs</li> </ul>
15	Resistance to Dichloromethane at specified temperature (Clause 12)	<ul style="list-style-type: none"> <li>- Dichloromethane test apparatus (Bath) thermostatically controlled digital temperature indicator.</li> <li>- Dichloromethane, Analytical grade</li> </ul>

*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 requirements of IS 13592: 2013.

**4. CONTROL UNIT** – Pipes of same size and type extruded from same compound under similar conditions from same machine in eight hours 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 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**

<b>(1)</b>				<b>(2)</b>	<b>(3)</b>		
<b>Test Details</b>				<b>Test equipment requirement</b> R: required (or) S: Sub-contracting permitted	<b>Levels of Control</b>		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Colour of pipes	5	IS 13592	-	Each pipe	-	-
6	Materials	6.1 to 6.3	IS 13592	S	One	Each consignment	#
7	Dimensions	7.1 to 7.3	IS 13592 IS 12235 (Part 1)	R	10	Each control unit	-
8	<b>Physical requirements</b>						
8.1	Visual appearance	8.1	IS 13592	-	Each pipe	-	-
8.2	Reversion test	8.2	IS 13592 IS 12235 (Part 5)	R	3	Each control unit	-
8.3	Stress relief test	8.3	IS 13592 IS 12235 (Part 6)	R	3	Each control unit	-
8.4	Vicat softening temperature	8.4	IS 13592 IS 12235 (Part 2)	S	1	Once in six month	\$
8.5	Effect of sunlight	8.5	IS 13592 IS 12235 (Part 13)	S	2	Once in six month	\$
9	Resistance to sulphuric acid	9	IS 13592 IS 12235 (Part 7)	S	1	Once in six month	\$
10	<b>Mechanical properties</b>						
10.1	Resistance to external blows at 0°C	10.1	IS 13592 Annex-A IS 12235 (Part 9)	R	Adequate pieces	Each control unit	-
10.2	Tensile strength	10.2	IS 13592 IS 12235 (Part 13)	R	3	Each control unit	-

10.3	Axial shrinkage (For Type B pipes only)	10.3	IS 13592 Annex –B	R	3	Each control unit	-
11	Water tightness of joints	11	IS 13592	R	3	Each control unit	-
12	Resistance to dichloromethane at specified temperature	12	IS 13592 IS 12235 (Part 11)	R	3	Each control unit	-

# No further testing is required if accompanied with the Test Certificate.

\$ Additional test shall be carried out whenever new size is manufactured or there is change in composition/method of manufacture.

Note-1: In case of failure of sample in tests other than those mentioned at clause 8.4, 8.5 and 9, twice the number of samples shall be tested from same control unit and the control unit shall be accepted if retested samples pass.

Note- 2: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note- 3: 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**

- a) Measurement of Outside diameter (Clause 7.1)
- b) Measurement of wall Thickness of pipes and socket (Clause 7.1, 7.3)
- c) Measurement of length (Clause 7.2)
- d) Visual appearance and Colour (Clause 5 and 8.1)
- e) Reversion Test (Clause 8.2)
- f) Stress relief Test (Clause 8.3)
- g) Vicat softening Temperature test (Clause 8.4)
- h) Resistance to sulphuric Acid (Clause 9)
- i) Resistance to External Blows at 0°C (Clause 10.1)
- j) Axial Shrinkage (for type B pipes only) (Clause 10.3)
- k) Water tightness of Joint (clause 11)



**ANNEX- E****SCOPE OF THE LICENCE**

“Licence is granted to use Standard Mark as per IS 13592 : 2013 with the following scope:	
Name of the product	UNPLASTICIZED POLYVINYL CHLORIDE (PVC-U) PIPES FOR SOIL AND WASTE DISCHARGE SYSTEM FOR INSIDE AND OUTSIDE BUILDINGS INCLUDING VENTILATION AND RAIN WATER SYSTEM
Type of pipes	Type A/Type B
Size Designation	
End of pipes	<ul style="list-style-type: none"> <li>a) Plain ended pipes</li> <li>b) Socket ended for solvent cementing</li> <li>c) Grooved socket</li> </ul>