



**उत्पाद मैनुअल  
आई एस 9271:2004 के अनुसार  
निकास के लिए असुघटित पोलिविन्ल क्लोराइड एकल  
दीवार वाले नालीदार पाइपों के लिए**

**दस्तावेज संख्या – पी एम/ आई एस 9271/2/जून 2021**

*भारतीय मानक ब्यूरो की स्कीम-I (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  
UNPLASTICIZED POLYVINYL CHLORIDE (UPVC) SINGLE  
WALL CORRUGATED PIPES FOR DRAINAGE  
ACCORDING TO IS 9271: 2004**

**Document No.- PM/ IS 9271/ 2/ June 2021**

*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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## PRODUCT MANUAL FOR UNPLASTICIZED POLYVINYL CHLORIDE (UPVC) SINGLE WALL CORRUGATED PIPES FOR DRAINAGE ACCORDING TO IS 9271: 2004

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1.	<b>Product</b>	:	IS 9271: 2004
	<b>Title</b>	:	Unplasticized Polyvinyl Chloride (UPVC) Single Wall Corrugated Pipes for Drainage
	<b>No. of Amendments</b>	:	3
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	PVC Compound – As per clause 5 of IS 9271: 2004
b)	<b>Grouping guidelines</b>	:	Please refer ANNEX – A
c)	<b>Sample Size</b>	:	Qty: 1 m x 6 Nos
3.	<b>List of Test Equipment</b>	:	Please refer ANNEX – B
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer ANNEX – C
5.	<b>Possible tests in a day:</b>		
	(i) Dimensions and Tolerances (Clause 7) (ii) Visual Appearance, workmanship and finish (Clause 8.1) (iii) Density (Clause 8.2) (iv) Pipe Stiffness (Clause 8.3) (v) Joints (Clause 8.7)		
6.	<b>Scope of the Licence:</b>		
	“Licence is granted to use Standard Mark as per IS 9271: 2004 with the following scope:		
	Name of the product	Unplasticized Polyvinyl Chloride (UPVC) Single Wall Corrugated Pipes for Drainage	
	Type	Perforated / Non-perforated	
	Nominal Outside Diameter		

## **ANNEX A**

### **Grouping Guidelines**

1. IS 9271: 2004 covers ‘Unplasticized Polyvinyl Chloride (UPVC) Single Wall Corrugated Pipes for Drainage’ which are as classified as given below:

*a) Type:*

- Perforated Pipe
- Non-perforated Pipe

*b) Nominal Outside Diameter:*

40, 50, 65, 80, 100, 125, 160, 200, 250, 294, 315, 355, 400, 455 and 500 mm

2. The pipes are categorized into the following groups:

<b>Group-1</b>	<b>Group-2</b>
40-160	200-500

3. For considering GoL/CSoL, testing shall be done as follows:

- Pipe of any nominal outside diameter from each size group for each type shall be tested for all requirements to cover pipes of all nominal outside diameters in that size group for the particular type of pipe tested.

4. The Firm shall declare the varieties intended to be covered 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 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>Sl. No.</b>	<b>Tests used in with Clause Reference</b>	<b>Test Equipment</b>
1	Dimensions and tolerances (Clause 7)	<ul style="list-style-type: none"> <li>- Pie tape (for nominal outside diameter)</li> <li>- Bore gauge (for inside diameter)</li> <li>- Vernier calliper (for perforation length)</li> <li>- Filler gauge (for perforation width)</li> <li>- Measuring tape (for length of pipes)</li> </ul>
2	Density (Clause 8.2)	<ul style="list-style-type: none"> <li>- Digital Balance with holding attachment</li> <li>- Distilled water</li> <li>- Butyl Acetate</li> <li>- Hydrometer</li> <li>- Glass beaker of 250 ml capacity</li> <li>- Thermometer</li> <li>- Air conditioner</li> <li>- Heated press (Steam or Electrical)</li> </ul>
3	Pipe Stiffness (Clause 8.3)	<ul style="list-style-type: none"> <li>- Air conditioner</li> <li>- Thermometer</li> <li>- compression-testing machine of the constant-rate of-cross-head movement type</li> <li>- Loading plate</li> <li>- Deflection indicator</li> </ul>
4	Impact Strength at 0 °C (Clause 8.4)	<ul style="list-style-type: none"> <li>- Falling weight test machine with main frame as per clause B-3.1 (a) and Fig 2 and striker of 2.5 kg mass as per clause B- 3.1 (b) and Fig 3 of IS 9271 : 2004</li> <li>- Conditioning chamber/Deep freezer</li> </ul>
5	Elongation test (Clause 8.5)	<ul style="list-style-type: none"> <li>- Air conditioner</li> <li>- Thermometer</li> <li>- Fixture for elongation as per clause C-3 and Fig 4 of IS 9271 : 2004</li> <li>- Weight boxes as per clause C-4.2 and Table 6 of IS 9271 : 2004</li> </ul>

6	Bending test (Clause 8.6)	<ul style="list-style-type: none"> <li>- Long deep-freezer to accommodate specimens of length 3 m and maximum nominal outside diameter of 500 mm</li> <li>- Cylindrical mandrels with clamping arrangement</li> </ul>
7	Strength of joints (Clause 8.7)	<ul style="list-style-type: none"> <li>- Air conditioner</li> <li>- Thermometer</li> <li>- Fixture for elongation as per clause C-3 and Fig 4 of IS 9271:2004</li> <li>- Weight boxes as per Table 6 of IS 9271 : 2004</li> </ul>
8	Effect on water (Clause 8.8)	<ul style="list-style-type: none"> <li>- Distilled water</li> <li>- Air conditioner</li> <li>- pH meter</li> <li>- Testing reagent and equipment for determination of cadmium, mercury, lead, tin and other toxic substances.</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 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 requirement of IS 9271: 2004.

**4. CONTROL UNIT** – All pipes of same type and nominal outside diameter manufactured from same PVC compound continuously under similar conditions of manufacturing for maximum period of forty-eight hour (48 h) 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	PVC Compound	5.1	IS 9271 IS 10151	S	One	Each consignment	Further testing is not required if material received with manufacturers test certificate or ISI marked.
5.1.3	PVC resin	5.1.3	IS 9271 IS 4669	S	One	Each consignment	
7	Dimensions and tolerances						
7	Diameter	7, 7.1.1, Table 1	IS 9271	R	One	Every hour	@
7.2	Wall thickness	7.2, 8.0	IS 9271	R	One	Every Hour	@
7.3	Length	7.3	IS 9271	R	One	Every hour	@
7.4	Perforation requirement	7.4.1 to 7.4.3, Table 2	IS 9271	R	One	Every hour	@
8	Physical Requirement						
8.1	Visual appearance, workmanship and finish	8.1.1, 8.1.2	IS 9271	R	Two	Every hour	@

8.2	Density	8.2	IS 9271 IS 13360 (Part 3/ Sec. 1)	R	One	Each control unit	-
8.3	Pipe Stiffness	8.3, Table 3, Annex-A,	IS 9271	R	One	Each control unit	-
8.4	Impact Strength at 0 °C	8.4, Annex-B	IS 9271	R	One	Each control unit	-
8.5	Elongation test	8.5, Annex-C	IS 9271	R	One	Each control unit	-
8.6	Bending test	8.6, Annex- D	IS 9271	R	One	Each control unit	-
8.7	Joints	8.7, Annex- E	IS 9271	R	Two	Each control unit	-
8.8	Effect on water	8.8	IS 9271 IS 12235 (Pt 4) IS 12235(Pt 10)	S	1	Once in six months	Smallest size pipe produced shall be tested *

@ In case of failure, previous one-hour production be segregated and rejected.

\*Additional sample shall be tested whenever there is a change in formulation/composition. Pipes from each type shall be tested in one year.

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.