www.bis.gov.in

उत्पाद मैन्युअल

कृषि सिंचाई उपकरण -मैन्युअल रूप से संचालित सर्वीसेबल प्लास्टिक वाल्व- विशिष्टि IS 18286: 2023 के अनुसार

PRODUCT MANUAL
for Agricultural Irrigation Equipment — Manually Operated Serviceable Plastics Valves — Specification According to IS 18286: 2023

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

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

1.	**मानक संख्या** **IS No.**	:	IS 18286 : 2023
	शीर्षक **Title**	:	Agricultural Irrigation Equipment - Manually Operated Serviceable Plastics Valves — Specification
	संशोधनों की संख्या **No. of amendments**	:	01
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	The Material of construction shall include PVC (Polyvinyl chloride), PE (Polyethylene), PP (Polypropylene) and Elastomer like EPDM (Ethylene propylene diene monomer), PTFE (Polytetrafluoroethylene), NBR (Nitrile rubber), Poly Amide, POM (Polyoxymethylene), ABS (Acrylonitrile Butadiene Styrene).

			i) PVC shall be as per clause 5.2.1 of IS 18286: 2013 ii) ii) PE shall be as per clause 5.2.2 of IS 18286: 2013 iii) iii) PP shall be as per clause 5.2.3 of IS 18286: 2013 To establish conformity, a report of conformance certificate shall be obtained from the raw material and master batch manufacturer. Conformity may also be established through test report issued by BIS recognized/empanelled lab, or any accredited lab, or in house testing or combination thereof A declaration from the manufacturer should be taken in lieu of conformity to the following requirements i) All valve components that come into contact with water shall not support the growth of algae and bacteria, nor be of metal which will corrode. Plastic parts of the valve that are exposed to sunlight shall be opaque and protected against UV degradation and All parts of valves that are of the same size, type and model produced by the same manufacturer shall be interchangeable (Cl. 5.1) ii) The materials from which the valve body parts are produced shall consist essentially of polyvinyl chloride, to which may be added only those additives that are needed to facilitate the manufacture of sound and durable valves of good surface finish, mechanical strength and opacity (Cl. 5.2.1) iii) Clean, reprocessed material generated from a manufacture's own production and work testing of product according to this standard may be used if it is derived from the same raw material as used for relevant production. Reprocessed material obtained from external sources and recycled material shall not be used. (Cl. 5.2.2.2) iv) The addition of not more than 10 percent of the manufacturer's own rework material from the manufacturer of valves is permissible. No other reworked or recycled material shall be used. (Cl. 5.2.3.7) Note: This section indicates the requirements for raw material(if specified in the IS)for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.

b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	Please refer ANNEX – A
c)	**नमूने का परिमाण** **Sample Quantity**	:	7 Nos valves + 4 pipes of 1-meter length + Test buttons of O –rings + 1 kg resin and/or 1 kg Granules Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** Parameters to be Declared in Test Request	**:**	i. Model No. ii. Valve Materials iii. Type of valve iv. Type of End connection v. Class of valve vi. Type of Construction vii. Nominal Size (DN) Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	**परीक्षण उपकरणों की सूची** **List of Test Equipment**	:	Please refer to Annex-B
4.	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	Please refer to Annex-C
5.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**		
	All tests are possible to be carried out in a day except Shell Test (1000 hr), Seat Test (100 hr) and Endurance Testing Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	**लाइसेंस का दायरा/Scope of the Licence:**		
	"Licence is granted to use Standard Mark as per IS 18286: 2023 with the following scope:		

	उत्पाद का नाम Name of the product	Agricultural Irrigation Equipment - Manually Operated Serviceable Plastics Valves

Model No.	**Valve Materials**	**Type of valve**	**Type of End connection**	**Class of valve**	**Type of Construction**	**Nominal Size (DN)**
To be declared by manufacturer	PVC, PP, PE etc.	Angle valve, Globe valve, Diaphragm valve, Ball valve	Threaded, PVC Solvent cement welded type (Plain Socket Connection) Flanged Fusion weld	Class 1 Class 2 Class 3 Class 4	Type A Type B Type C	20, 25, 32, 40, 50, 63, 75, 90, 110 mm

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9, BAHADURSHAH ZAFAR MARG,
NEW DELHI-110002

ANNEX A
Grouping Guidelines

For the purpose of Grant of Licence/Change in Scope of Licence, the following grouping guidelines shall apply:

1. The valve manufacturer shall declare the model nos. of each distinct model of valves intended to be covered in the scope of the licence, and shall declare the following information w.r.t each unique model

Valve Material	PVC (Polyvinyl chloride), PE (Polyethylene), PP (Polypropylene) and Elastomer like EPDM (Ethylene propylene diene monomer), PTFE (Polytetrafluoroethylene), NBR (Nitrile rubber), Poly Amide, POM (Polyoxymethylene), ABS (Acrylonitrile Butadiene Styrene)
Type of valve	Angle valve, Globe valve, Diaphragm valve, Ball valve
Type of End connection	Threaded, PVC Solvent cement welded type (Plain Socket Connection) Flanged Fusion weld
Class of valve	Class 1 Class 2 Class 3 Class 4
Type of Construction	Type A Type B Type C
Nominal Size (DN), mm	20, 25, 32, 40, 50, 63, 75, 90, 110

2. Highest size of valve of each model intended to be covered in the scope of licence, shall be tested, to cover all the sizes of that model, upto the size tested.

3. The Firm shall declare the varieties of valves intended to be covered in the Licence. The Scope of Licence shall be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

4. 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 EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	**Tests used in with Clause Reference**	**Test Equipment**
1	Connections to pipeline/ Dimensions (Clause 5.4, 5.5, 5.6, 5.7, 5.8, 5.9)	- Vernier caliper - Measuring Tape - Pi Tape or Circometer - Ball ended Micrometer - Measuring scale
2.	Specific Construction Requirements for Globe, Oblique and Angle Valves (cl. 5.10) and Specific Construction Requirements for Ball Valves (Cl. 5.11)	Shore hardness tester, Compression assembly as per 5.1 of IS 3400 (Part 10):Sec 1, Oven, Pair of tongs, Thickness gauge, Stopwatch, Wooden bench, Arrangement for maintaining lab temperature at 27 degree centigrade
3,	Operating Torque (Cl. 6.2), Pressure Loss (Cl. 6.3) and Valve Performance at Increased Hydraulic Pressure (Cl. 6.6)	Test Setup for Operating Torque including water supply connection, electric pump, Pressure Gauge, Flow meter and Flow Control Valve Torque wrench Stop Watch Adaptor
4.	Resistance of Valve and Valve Material to Internal Hydrostatic Pressure (Cl. 6.4) and Seat and Stem sealing test (Cl. 6.5)	Hydrostatic pressure testing machine with pressure gauge & timer Hot water bath Torque wrench Stop Watch Adaptor
5.	Endurance testing (Cl. 6.7)	Test set up for endurance testing as per cl. 6.7 and Annex E.

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: All valves of same model produced from same consignment of raw material and assembled in a day.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 **Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as "R" in Column 2 of Table 1)**, where different tests given in the specification shall be carried out in accordance with the method given in the specification**.** They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 **TEST RECORDS**- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each valve, provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements**: The material shall also be marked with the following additional requirement on <insert the place where marking can be done>:

a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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

(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		
Test Details				**Test equipment requirement R: required (or) S: Subcontracting permitted**	**Levels of Control**		
Cl.	**Requirement**	**Test Methods**			**No. of Sample**	**Frequency**	**Remarks**
		Clause	**Reference**				
5.1	General	5.1	IS 18286	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
5.2	Material	5.2.1 to 5.2.3.7	IS 18286	S	One	Each consignment	No further testing is required, if accompanied with the test certificate or ISI Marked.
5.3	Colour	5.3	IS 18286	R	All		-
5.4	**Connections to pipeline**						
5.4.1	Dimensions of End connections	5.4.1	IS 18286	R	10	Each Control Unit	

5.4.2	Dimensions of Threaded End connections	-	IS 2643/ IS 554	R	10	Each Control unit	
5.4.3	Dimensions of PVC solvent cement welded type End Connections (Plain Socket Connection)						
5.4.3.1	Inside Diameter	5.4.3.1	IS 18286	R	10	Each Control unit	
5.4.3.2	Thickness	5.4.3.2	IS 18286	R	10	Each Control unit	
5.4.3.3	Plain Socket length & diameter at midpoint	5.4.3.3 to 5.4.3.6	IS 18286	R	10	Each Control unit	
5.4.3.7	Out of Roundness	5.4.3.7	IS 18286	R	10	Each Control unit	
5.5	**Flange connection**						
5.5.1	Dimensions of Flanges	5.5.1	IS 18286	R	10	Each Control unit	
5.5.2	Thickness of flange and number of bolts	5.5.2	IS 18286	R	10	Each Control unit	
5.5.3	Shape of bolt circle	5.5.3	IS 18286	R	10	Each Control unit	
5.6	**Fusion weld End Connection**	5.6	IS 18286	R	10	Each Control unit	
5.7	Spigot End Dimensions Suitable for Butt Fusion and Compression Fittings (External Grip)	5.7	IS 18286	R	10	Each Control unit	
5.8	End Connections Suitable for Internal Grip Fittings	5.8	IS 18286	R	10	Each Control unit	

5.9	Hand Wheel or Handle	5.9	IS 18286	R	All		
5.10	Specific Construction Requirements for Globe, Oblique and Angle Valves	5.10	IS 18286	R	10	Each Control unit	
5.11	Specific Construction Requirements for Ball Valves	5.11	IS 18286	R	10	Each Control unit	
6.2	Operating Torque						
6.2.1	Closing Torque	6.2.1	IS 18286	R	3	Each Control unit	
6.2.3	Resistance to Increased Torque	6.2.3	IS 18286	R	3	Each Control Unit	
6.3	Pressure Loss	6.3	IS 18286	R	3	Each Control Unit	
6.4	Resistance of Valve and Valve material to Internal Hydrostatic Pressure Test						
6.4, D-1	Moulded Plastics Material of Valve Body - Pressure Test	Annex D , Table 10	IS 18286	R	1	Once in 6 months	
6.4, D-2	Shell Test						
	For 1 hr. at 27^{o}C	Annex D , Table 11	IS 18286	R	1	Each Control Unit	
	For 1000 hr. at 27^{o}C	Annex D , Table 11	IS 18286	R	1	Once in 6 months	

6.5	Seat and Stem Sealing Test						
6.5.1	Seat Test						
	For 1 hr at 27^{o}C	6.5.1, Table 9	IS 18286	R	1	Each Control Unit	
	for 100 hr at 27^{o}C)	6.5.1, Table 9	IS 18286	R	1	Once in 3 months	
6.5.2	Stem Sealing Test	6.5.2	IS 18286	R	1	Each Control Unit	
6.6	Valve Performance at Increased Hydraulic Pressure	6.6	IS 18286	R	1	Each Control Unit	
6.7	Endurance Testing	6.7	IS 18286	S	1	Once in 6 months	