



**PRODUCT MANUAL FOR  
PLASTIC FLUSHING CISTERNS FOR  
WATER CLOSETS AND URINALS  
ACCORDING TO IS 7231:1994**

*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 7231 : 1994
	<b>Title</b>	:	PLASTIC FLUSHING CISTERNS FOR WATER CLOSETS AND URINALS
	<b>No. of Amendments</b>	:	6
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	As per clause 4 and Table 1 of IS 7231 : 1994
b)	<b>Grouping guidelines</b>	:	Flushing cistern of each discharge capacity shall be tested to cover that discharge capacity flushing cistern in the scope of licence.
c)	<b>Sample Size</b>	:	2 cisterns for all tests
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – A</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – B</a>
5.	<b>Possible tests in a day</b> : Please refer ANNEX – C		
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 7231 : 1994 with the following scope:		
	Name of the product	PLASTIC FLUSHING CISTERNS FOR WATER CLOSETS AND URINALS	
	Type	Dual-Flush cistern, Discharge capacity ----- litre	

**ANNEX A**  
**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	Construction (Clause 5)	Micrometre
		Wire of diameter 1.6 mm
		Vernier calliper
		Thread ring gauges
		Steel scale
2	Opacity (Clause 6)	Opacity meter with standard
3	Discharge capacity (Clause 7.5)	Measuring jar
4	Discharge rate (Clause 7.6)	Measuring jar
		Stop watch
5	Endurance test (Clause 9.3)	Endurance test setup
6	Distortion resistance test (Clause 8.1)	Solid background for fixing cistern
7	Dead load test (Clause 8.2)	Dead load of 250 N
		Vernier calliper
		Stop watch
8	Front thrust test (clause 8.3)	Arrangement for front thrust test with soft facing load disc of 150 diameter for applying thrust of 110 N.
		Stop watch
9	Impact test (Clause 8.4)	Steel ball of 1 kg
		Steel scale
		Air conditioner
	Endurance test (Clause 9.3)	Endurance test setup with counter

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

**ANNEX B**

**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 7231:1994.

**4. CONTROL UNIT** – All cisterns of same discharge capacity produced in one day 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**

(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	Material	4 Table 1	IS 7231	S	1	Each consignment	No further testing is required if accompanied with the Test Certificate or ISI marked
5	<b>CONSTRUCTION</b>						
5.1	Cistern	5.1	IS 7231	R	5% of the control unit	Each control unit	In case any cistern fails in any of these requirements, further 10% of cisterns shall be drawn and tested for the requirements. The day's production shall be marked if all samples pass.
5.2	Cover	5.2	IS 7231	R			
5.3	Flush pipe and flush pipe connection to cistern	5.3 5.3.1	IS 7231	R			
5.4	Inlet and overflow holes	5.4	IS 7231	R			
5.5	Float valve	5.5	IS 7231 IS 1703 IS 12234 IS 13049	S	-	-	Please see Note below the table (\$)
5.6	Operating mechanism lever	5.6.1 5.6.2	IS 7231	R	5% of the control unit	Each control unit	In case any cistern fails in any of these requirements, further 10% of cisterns shall be drawn and tested for the requirements. The day's production shall be marked if all samples pass.
5.7	String	5.7.1 5.7.1	IS 7231	R			
5.8	Overflow pipe	5.8.1 5.8.2	IS 7231	R			
6	Finish	6	IS 7231	-	Each cistern	-	-

	Opacity	6	IS 7231 IS 12235 (Part 3)	S	One sample each from cistern and cover	Once in six months	Additional sample shall be tested whenever there is any change in raw material mix or source of supply of raw material for these components.
7	<b>OPERATIONAL AND PERFORMANCE REQUIREMENTS</b>						
7.1	Flushing arrangement	7.1	IS 7231	R	5% of the control unit	Each control unit	In case any cistern fails in any of these requirements further 10% of cisterns shall be drawn and tested for all the requirements. The day's production shall be marked if all the samples pass.
7.2	Working water level	7.2	IS 7231	R			
7.3	Freedom from self siphonage	7.3	IS 7231	R			
7.4	Reduced water level	7.4	IS 7231	R			
7.5	Discharge capacity	7.5 9.1	IS 7231	R			
7.6	Discharge rate	7.6 9.2	IS 7231	R			
8	<b>SPECIAL REQUIREMENTS</b>						
8.1	Distortion Resistance test	8.1 Annex-B	IS 7231	R	Four Cisterns	Each Control Unit	From each day's production, two samples during the starting of production, one at the mid and one at the end of production shall be tested.  In case any cistern fails in any of these requirements further twice the No. of cisterns shall be drawn and tested for all the requirements. The day's production shall be marked if all the samples pass.
8.2	Dead load test	8.2 Annex-B	IS 7231	R			
8.3	Front thrust test	8.3 Annex-C	IS 7231	R			
8.4	Impact test	8.4 Annex-D	IS 7231	R			

9.3	Endurance test	9.3	IS 7231	S	One	Once in three months	This is a type test and shall be carried out once in three months or earlier for each variety manufactured and records maintained. Further, this test shall also be conducted whenever there are changes in the design, material, manufacture or construction. (BIS shall be informed for re-verification in case of such changes.)
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**\$ Float valve:**

- a) No testing is necessary if float valves carry the Standard Mark. A record of purchases, batch numbers and its usage shall be kept.
- b) In case float valves are manufactured by the firm in the same premises, the tests as indicated in Table 2/Table 3/Table 4 (as applicable) shall be carried out on whole production of float valves used in certified cisterns.
- c) In case the float valves are purchased from outside, the licensee shall ensure that these valves are made from material as specified. Each valve shall be examined for conformity to manufacture, workmanship, construction, Hydrostatic test. Ten percent of the valves from each batch of valves received shall be tested for ensuring conformity to other clauses of IS 1703/ IS 12234/IS 13049 before accepting for use in certified cisterns. In case of any failure the batch shall be rejected.
  - For IS 12234 valves, Antisiphonage test shall be conducted on one sample from every batch procured and endurance test shall be done once in six months and also whenever there is change of source.
  - For IS 13049 valves, Antisiphonage test shall be conducted on one sample from every batch procured; deflection test for assembly and endurance test shall be conducted on one sample once in a month and also whenever there is change of source.

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.

**TABLE 2**  
**BALL/FLOAT VALVES AS PER IS 1703: 1989**

(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				
5.1	Material for body & parts of fitting (except lever rod and back nut)  i) Tensile Test.  ii) Chemical composition	5.1	IS 292 IS 318 IS1264*  IS292 IS318 IS1264	S	3 Tensile test pieces  One sample	Every 1000 kg.  Every 5 <sup>th</sup> /10 <sup>th</sup> Melt	One test piece shall be tested at the first instance. If it fails the other two pieces should be tested and both should pass the requirements  *To be tested if specified by the purchaser. See Note 1 below.
5.1	Material for Level rod, Back nut, Washer, Inlet pipe	–	–	S	–	–	See Note 2 below.
6	Manufacture and Workmanship	6.1 and 6.2	IS 1703	R	–	Each piece	–
7	Construction	7.2 and 7.3	IS 1703	R	–	Each piece	Templates, micrometer and Visual Examination
7	Dimensions  i) Body.  ii) Piston, cap & Washer.	7.4, 7.5, 7.9.2 Table 2 and Table 3  7.6,7.8 and Table 4	IS 1703	R	One	Every twentieth piece after machining	In case of failure, all pieces represented by the sample shall be checked & cause of defect located & removed before resuming to original frequency.

	iii) Lever & piston travel. iv) Back nuts	7.7 and Table 5 7.11 and Table 6					
7.10	Floats	–	IS 9762	R	One	Each control Unit **	One sample shall be tested from each control unit. No further testing is required if floats carry ISI mark.
8.1	Hydraulic Test	8.1	IS 1703	R	Each value	–	–
8.2	Shutting off test	8.2	IS 1703	R	One	One out of every ten pieces	If a sample fails in any of these tests two more samples shall be selected and subject to that test. The original frequency may be retained if neither of these samples fails. Otherwise, the valve/lever represented by the sample shall be rejected and investigations carried out to find the cause of defects. Original frequency as stated be resumed if 5 consecutive sample pass after carrying out improvements
8.3	Mechanical Strength of lever	8.3	IS 1703		One	One out of every ten pieces	

Note 1: In case of both the type of materials (namely, the melt obtained from pre-analysed ingots and the melt obtained from scrap) to start with every melt shall be tested till three consecutive melts are found satisfactory. On finding three consecutive melts to be satisfactory, the relaxed frequency of testing may be applied. The relaxed frequency of testing shall be every tenth melt in respect of melts obtained from pre-analysed ingots and every fifth melt in respect of melts obtained from scrap received from same source. The relaxed frequency of testing will, however, be withdrawn as soon as a failure is encountered in which case testing of every melt will be continued till three consecutive melts are found satisfactory.

Note 2: Raw materials for the manufacture of components of float valves shall conform to the relevant standards as referred to in Table 1 of IS1703. The raw materials used should either be standard marked or accompanied by a test certificate showing their conformity to relevant Indian Standard. Alternatively, each consignment received may be tested in the laboratory of the firm or in an independent laboratory for ascertaining conformity to the Indian Standard.

Note 3: Each value shall be suitably marked with code or otherwise to enable to trace back the date of casting and other records, in addition to marking as per clause 9 of IS 1703.

\*\* 50 Floats or part thereof of same type continuously manufactured from same material shall constitute a control unit. Each float shall be suitably marked with control unit number to trace back to the test records in addition to markings as per clause 10 of IS 9762.



TABLE 3

## PLASTIC EQUILIBRIUM FLOAT VALVES FOR COLD WATER SERVICES AS PER IS 12234 : 1988

(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	Material	4.1 and 4.2	IS 12234	S	–	Each Consignment	Evidence shall be produced that the material used is as per Table 1 of IS 12234. Record shall also be maintained for rework material (if used).
5	Manufacture and workmanship (visual)	5.1	IS 12234	-	Each valve	–	–
6	Construction	6.1 to 6.3 and 6.5 to 6.10	IS 12234	R	Each valve	–	–
6.4	Dimensions	6.4	IS 12234	R	One	Each Control unit.	–
7.1.1	Hydraulic test	7.1.1	IS 12234	R	One	Each Control unit.	–
7.1.2	Shut Off Test	7.1.2	IS 12234	R	One	Each Control unit.	–
7.2	Anti Siphonage test	Appendix A	IS 12234	S	One	Once in a month (Type test)	–
7.3	Flow Test	Appendix B	IS 12234	R	One	Each Control unit	–
7.4	Endurance test	Appendix C	IS 12234	S	One	Once in six months (Type test)	–

NOTE: For purpose of these tests, 50 valves or part thereof continuously manufactured shall constitute a control unit. Each valve shall be suitably marked with control unit number to trace back to the test records in addition to markings as per clause 9 of IS 12234.

TABLE 4

## DIAPHRAGM TYPE (PLASTIC BODY) FLOAT OPERATED VALVES FOR COLD WATER SERVICES AS PER IS 13049:1991

(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				
5	Material	5.1, 5.2, 5.3 and 6.2	IS13049	S	–	Each consignment	Evidence shall be produced that the material used is as per Table-1 of IS13049. Records shall also be maintained for rework material (if used).
6	Manufacture and workmanship	6.1	IS13049	R	Each valve	–	In case of any failure, those not conforming shall be rejected.
7	Construction	7.1 to 7.4	IS13049	-	Each valve	–	–
7.2	Seat and Body	7.2.3	IS13049	R	Two	Each control unit	In case of any failure, the control unit shall be rejected.
7.5.1	Floats	7.5.1 8.1 to 8.4	IS13049 IS 9762	R	One	Each control unit/Each consignment	No testing necessary if floats carry Standard Mark.
7.5.3	Deflection test for float Arm and Assembly.	Annex B	IS13049	R	One	Once in a month or every 1000 valves manufactured from the same material and of same consignment whichever is earlier.	In case of any failure, corrective actions be taken & test repeated before accepting valves.

8	Performance Tests						
8.1	Hydraulic test.	8.1	IS13049	R	Two	Each control unit	In case of any failure, control unit shall be considered as defective and rejected.
8.2	Shut Off Test	Annex C	IS13049	R	Two	Each control unit	
8.4	Flow test	Annex E	IS13049	R	Two	Each control unit	
8.6	Hydraulic Pressure on Discharge Arrangements.	Annex G	IS13049	R	Two	Each control unit	In case of failure, corrective actions shall be taken and performance tests shall also be repeated before accepting valves.
8.3	Anti Siphonage test.	Annex D	IS13049	S	One	Once in a Month (Type test)	
8.5	Endurance test*	Annex F	IS13049	S	One		

## Endurance test shall also be conducted whenever there is a change in material, construction or manufacturing process.

NOTE : For purpose of these tests, 50 valves/floats or part thereof of same type continuously manufactured from same material shall constitute a control unit. Each valves/float shall be suitably marked with control unit number to trace back the test records, in addition to markings as per clause 10 of IS 13049.

**ANNEX- C**

**POSSIBLE TESTS IN A DAY**

1. Construction (Clause 5)
2. Finish (Clause 6)
3. Operational and performance requirements (Clause 7)
  - a) Flushing arrangement (Clause 7.1)
  - b) Working water level (Clause 7.2)
  - c) Freedom from self siphonage (Clause 7.3)
  - d) Reduced water level (Clause 7.4)
  - e) Discharge capacity (Clause 7.5)
  - f) Discharge rate (Clause 7.6)
4. Special requirements (Clause 8)
  - a) Distortion resistance test (Clause 8.1)
  - b) Dead load test (Clause 8.2)
  - c) Front thrust test (Clause 8.3)
  - d) Impact test (Clause 8.4)
5. Supply condition (Clause 11)