



**PRODUCT MANUAL
FOR
CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER, GAS
AND SEWAGE — SPECIFICATION
ACCORDING TO IS 1538:1993**

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.	Product	:	IS 1538:1993
	Title	:	CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER, GAS AND SEWAGE — SPECIFICATION
	No. of Amendments	:	6
2.	Sampling Guidelines:		
a)	Raw material	:	<ul style="list-style-type: none"> • The metal used for manufacturing shall not be of quality less than that of grade FG 150 specified in IS 210 (<i>latest</i>).
b)	Grouping guidelines	:	<p>For the purpose of covering the entire range under certification at the time of grant of licence and inclusion of new varieties, the varieties in this standard are grouped into 3 categories:</p> <ul style="list-style-type: none"> • Group I Upto and including DN 300 • Group II Over DN 300 upto and including DN 600 • Group III Over DN 600 <p>In order to cover the entire range one sample from each group of similar fittings as indicated in Table 7 to Table 28 of IS 1538 shall be drawn and tested.</p> <p>For the purpose of drawl of sample out of similar fittings each item as referred in Table 7,8,9,14,15,16,17,18,19,20,24,25,26,27,28 and any one out of Table 10 to Table 13 and that of Table 21 to Table 23 may be considered.</p>

			The firm shall declare the Varieties of the product they intend to cover in the licence and the scope of licence shall be restricted based on the manufacturing and testing capabilities of the manufacturer.
c)	Sample Size	:	4 pcs x 10cm + 2 Nos
3.	List of Test Equipment	:	Please refer ANNEX – <u>A</u>
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – <u>B</u>
5.	Possible tests in a day :		
	<ul style="list-style-type: none"> (i) Tensile test (ii) Hardness test (iii) Sizes and Tolerances (iv) Mass (v) Coating (vi) Marking 		
6.	Scope of the Licence :		
	“Licence is granted to use Standard Mark as per IS 1538:1993 with the following scope:		
	Name of the product	CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER, GAS AND SEWAGE — SPECIFICATION	
	Type	As per tables 7 to 28	
	Sizes	As per tables 7 to 28	

ANNEX A**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	Tensile Test as per Cl 5.1	<ul style="list-style-type: none"> • Universal Testing Machine • Vernier Calipers
2	Hardness Test as per Cl 6.1	<ul style="list-style-type: none"> • Testing Machine • Indenter • Indentation diameter measuring system • Stopwatch
3	Hydrostatic Test as per Cl 8.1	<ul style="list-style-type: none"> • Hydrostatic test arrangement with pressure gauges • Stopwatch • 700 gm hammer
4	Sizes and Dimensions as per Cl 9	<ul style="list-style-type: none"> • Vernier Caliper • Thickness Gauge • Micrometer • Outside Diameter Gauge • Inner Diameter Gauge • Angle protector • Steel scale
5	Mass as per Cl 11	<ul style="list-style-type: none"> • Weighing Balance
6	Coating as per Cl 12	<ul style="list-style-type: none"> • Conditioning chamber • Pen knife

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 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 laid out in Cl 13 of IS 1538:1993.

4. CONTROL UNIT –Fittings of all sizes and types cast from the same heat in a 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 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				
4.1	Manufacture	-	IS 210 <i>(latest)</i>	S	One	Each lot of raw material	No testing is required if material is accompanied with manufacturer test certificate or outside lab test results.
4.2, 4.4, 4.5 & 4.6	Manufacture	4.2, 4.4, 4.5 & 4.6	IS 1538:1993	R	Each fittings		
5.1	Tensile test	-	IS 1608 (Part1) <i>latest</i>	R	2	Each control unit	
4.3 & 6.1	Hardness test	6.1	IS 1538:1993 IS 1500 (Part 1) <i>latest</i>	R	2	Each control unit	However, if any of the two samples fails, two additional samples shall be taken from the same melt and if either of the two samples fails the entire material shall not be considered fit for the purpose of marking.
8	Hydrostatic test	8.1 & Table 1	IS 1538:1993	R	Each Fitting		
9	Sizes and Dimensions	10.1 & Table 2 to 28	IS 1538:1993	R	2 pcs of each size and type of fittings from each control unit shall be checked for all dimensions.		In case of failure, all fittings shall be checked and those conforming to the specification shall be marked.
11	Mass	11 & Table 7 to 28	IS 1538:1993	R	1 samples of each size and type	Weekly	

12	Coating	12.1 to 12.7	IS 1538:1993	R	One	Daily	
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Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. 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.