



PM/ IS 1879/ 1/ May 2020

**PRODUCT MANUAL FOR  
Malleable Cast Iron Pipe Fittings  
According to IS 1879:2010**

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>	:	<b>IS 1879:2010</b>
	<b>Title</b>	:	Malleable Cast Iron Pipe Fittings
	<b>No. of amendments</b>	:	5
2.	<b>Sampling Guidelines</b>		
a)	<b>Raw material</b>	:	Any grade as per IS 14329 or as per Cl 6.2 of IS 1879:2010.
b)	<b>Grouping Guidelines</b>	:	Please refer Annex - A
c)	<b>Sample Size</b>	:	3 nos. fittings, Black fittings for compression test, Tensile Test bars, 3 nos. fittings for galvanizing tests
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>	:	All tests
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS 1879:2010 with the following scope:		
	<b>Name of the product</b>	Malleable Cast Iron Pipe Fittings	
	Type of fitting	Equal Elbow A1, ..	
	Grade	Grade BM-300 (as per IS 14329)	
	Size Designations	½ upto and including 6	

**ANNEXURE A**  
**TOPRODUCT MANUAL FOR**  
**MALLEABLE CAST IRON PIPE FITTINGS**  
**According to IS 1879:2010**

**GROUPING GUIDELINES**

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For the purpose of grant of licence / change in scope of licence only one sample from each group of size for each type of fittings shall be tested for all the requirements of IS 1879. Size designation groups & type of fittings are as under:

**Groups for size designation:**

- Group 1 - below 2 x 2 x 2 (50 x 50 x 50mm)
- Group 2 - 2 x 2 x 2 (50 x 50 x 50mm) to 3 x 3 x 3 (80 x 80 x 80mm)
- Group 3 - above 3 x 3 x 3 (80 x 80 x 80mm)

**Type of fittings:** For the purpose of these Guidelines following are the nine types of MCI Pipe fittings:

1. **Elbows** - Equal, Reducing, 45°, Twin, Union & Side outlet
2. **Tees** - Equal, Reducing, Pitcher & Side outlet
3. **Crosses** - Equal & Reducing
4. **Bends** - Equal, Long sweep & Return
5. **Sockets** - Plain & Reducing
6. **Bushing & Nipples** - Hexagon, RH & LH & Reducing
7. **Backnuts**
8. **Caps & Plugs**
9. **Unions** - Flat seat, Male & Female Flat Seat, Taper Seat, Male & Female Taper Seat

As Elbows, tees, crosses, sockets and caps may be either plain or reinforced, in case samples drawn pertain to reinforced elbows, tees, crosses, sockets and caps, there is no need to draw separate samples for plain elbows, tees, crosses, sockets and caps as requirements for these are covered while testing for reinforced varieties and therefore, fittings for plain varieties can also be covered in the licence.

In addition to the above, following samples are also to be drawn:

- (a) One set of tensile test bars casted from material of same grade, annealed together, for tests as per IS 14329.
- (b) Annealed pieces for Compression tests as per IS 1879.
- (c) Galvanized & unthreaded pieces for test as per IS 1879.

In case, higher grade of material pertaining to the fittings is tested, the material of lower grade may also be covered in the licence.

It shall be ensured that the applicant / licensee has got adequate manufacturing and testing facilities for the sizes & types of fittings to be covered in the licence.

During the operation of license, BO shall ensure that all Grades & Product types covered in the license are drawn for independent testing on rotation over a period of time.

**ANNEXURE B**  
**TO PRODUCT MANUAL FOR**  
**MALLEABLE CAST IRON PIPE FITTINGS**  
**According to IS 1879:2010**

**LIST OF TEST EQUIPMENTS**

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Major test equipment required to test as per requirements of Indian Standard.

<b>Sl. No.</b>	<b>Test Equipment/Chemicals and Identification Numbers (Where applicable)</b>	<b>Tests Used in with Clause Reference</b>
1	Vernier caliper	dimensions and dimensional tolerances (7)
2	chamfer gauges	Chamfering (8.3)
3	Thread gauges for all sizes, Suitable Templates, Micrometer	Threads (8.1 and 8.2)
4	Antimony trioxide / Antimony tri chloride, HCl , Volatile organic solvent such as ether, trichloroethylene, carbon tetrachloride, etc. (Con. & Dil.) and other chemicals and reagents applicable, Weighing balance, Clean soft cotton cloth, 100 ml glass burette with stopcock, rubber tube, reservoir (for Volumetric method) and other glassware as applicable .	Mass of zinc coating (10)
5	Copper carbonate (laboratory grade) or Copper hydroxide ( laboratory grade ), Copper Sulphate Crystals – Technical grade, Ammonium Hydroxide, Alcohol, Distilled water, Volatile organic solvent such as ether, trichloroethylene, carbon tetrachloride, etc. and other chemicals and reagents applicable, brush, hydrometer, Room Air conditioner with temperature control facility, Thermometer.	Uniformity of zinc coating (10)
6	HST test equipment-Pump, Pressure Gauge, plugs as per size or  Hydraulic Air compressor, pressure gauge, water or light oil	Pressure Test (11)
7	Compression test- Bench vice with radiused jaws, Stop watch	Compression Test (12)

Note: The above is an indicative list for the purpose of guidance only

**ANNEXURE C**  
**TO PRODUCT MANUAL FOR**  
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**SCHEME OF INSPECTION AND TESTING**

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**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. PACKING AND MARKING** –

The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked and packed conforms to all the requirement of the specification.

**4. CONTROL UNIT** – For the purpose of this scheme all the pipe fittings heat treated together in one annealing chamber shall be taken as 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.

5.2 General requirements relating to the supply of material shall conform to IS 1387. The material used for the manufacture of malleable cast iron fittings shall conform to cl 6 of IS 1879:2010.

**6. TEST CERTIFICATE**-For each consignment of BIS Certified material conforming to IS 1879:2010 there shall be a test certificate which shall contain the Standard Mark, the cast/Control Unit number and the corresponding test results (as given in Annexure-I enclosed)

**7. 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: LEVELS OF CONTROL**

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
6	Material (Tensile test)	6.1 & 6.2	IS 1879: 2010 IS 14329	R	Three	Each control unit	All test bars shall be cast separately. Test bars shall be cast in green or dry sand moulds of the same material as the moulds used for castings they represent. Nine test bars shall be cast from each control unit, and shall in all cases undergo the malleablizing treatment together with the castings they represent. A set of three samples each shall be put in three different heating zones (i.e beginning, middle and far end) of the annealing furnace.
7 & 8.3	Dimensions Chamfering	7.1 to 7.7 Tables 2 to 28 8.3	IS 1879: 2010 IS 554 IS 8999	R	One	One hour's production of each designation of pipe fittings at each threading machine.	If a sample fails, production of pipe fittings during the hour prior to drawl of that sample on that particular machine shall be considered as not fit to be covered with ISI Mark. However, all production of the previous one hour may be sorted out by checking each piece and those found failing, shall be rejected. All the fittings threaded after this failure shall be tested till five consecutive samples pass and thereafter the frequency of one sample every hour may be resumed.
8.1 & 8.2	Threads and Alignment of Threads	8.2 8.3	IS 1879: 2010 IS 554 IS 8999	R	-do-	-do-	
9	Freedom from defects	9	IS 1879: 2010	R	Each Piece	Each Piece	
10	Galvanizing		IS 4759	R	Three	Fittings galvanised in one shift	one each being taken in the beginning, middle and end of the shift. In case of failure two more samples of the same shall be taken and tested for the requirement. If both passes, the material shall be considered as suitable for certification marking; otherwise to be rejected and standard mark from fittings to be defaced.

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
11	Pressure Test	11.1 to 11.2 Annex-B Table-30	IS 1879: 2010	R	5 pieces	Every Hour	
12.	Compression Test	12.1 12.1.1 Fig 5	IS 1879: 2010	R	Three	Each Control Unit	In case of any failure two more samples so prepared, shall be further tested in case of any failure in retest, the control unit shall not be marked with the standard mark.

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 empaneled 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.

**ANNEXURE I**

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(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR MALLEABLE CAST IRON PIPE FITTINGS**



TEST CERTIFICATE No. \_\_\_\_\_

DATE \_\_\_\_\_

To M/s \_\_\_\_\_ We certified that the material described below fully conforms to IS 1879:2010 Chemical composition and Physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L \_\_\_\_\_ are as indicated below against each order No.

(PLEASE REFER TO IS 1879:2010 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

**TEST RESULTS**

Order No. & Date	(Nom Size)	Control Unit No.	Grade	Tolerances	Qty in tonnes	CHEMICAL COMPOSITION <sup>#</sup>	PHYSICAL PROPERTIES				Remarks
							Tensile Test	Freedom from defects	Pressure test	Compression test	

<sup>#</sup> As and If agreed between

REMARKS

WAGON NO.

TRUCK NO. FOR XYZ IRON AND STEEL COMPANY

(It is suggested that size A4 paper be used for this test certificate)