

**PRODUCT MANUAL FOR
Specification for steel tubes for furniture purposes
According to IS 7138:1973**

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 7138 : 1973
	Title	:	Specification for steel tubes for furniture purposes
	No. of amendments	:	3
2.	Sampling Guidelines		
a)	Raw material	:	No specific requirement
b)	Grouping Guidelines	:	Please refer Annex – A
c)	Sample Size	:	For physical tests: 1.5 m X 2 No.s For chemical tests:5 Nos. of 5cms or 50 gm drillings
3.	List of Test Equipment	:	Please refer Annex – B
4.	Scheme of Inspection and Testing	:	Please refer Annex – C
5.	Possible tests in a day	:	Workmanship, Straightness, Dimensions and Tolerances, Tensile Test, Bend Test, Drift Test, Flattening Test, All Chemical tests.
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 7138:1973 with the following scope:		
	Name of the product	Specification for steel tubes for furniture purposes	
	Process of Manufacture	Hot finished, Electric Resistance Welded, Induction Welded	
	Condition	As-welded, Heat-treated..	
	OD (Thickness)	16mm(1mm,1.2mm),...	

ANNEXURE A
To PRODUCT MANUAL for
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GROUPING GUIDELINES

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1. To ensure uniform practice is followed across ROs/BOs, the following procedure to be adopted towards grant of licence & inclusion of additional varieties.
2. Steel tubes for furniture purposes according to IS 7138 are classified on the following basis :
 - Process of mfg - Hot finished/Electric resistance welded/Induction welded tubes (CI 1.1)
 - Condition - As welded / Heat treated Condition (CI 2)
 - Size- Nominal Diameter and thickness of tubes (CI 4)
3. Two samples, including one sample of lowest size and one sample of highest size, intended to be included in licence and manufactured by same process are to be drawn and tested so that sizes falling in the range including the sizes drawn by the same process of manufacture can be covered in licence scope.
4. Among the above samples drawn, it is to be ensured that thickness of the sample, for a given diameter, shall be the lowest thickness possible for the manufacturer at which tubes of that nominal diameter are supplied.

For example: If the lowest size that can be supplied by a manufacturer is 16mm OD, which is supplied by the manufacturer at thicknesses 1.0mm and 1.2mm respectively, then sample of 16mm OD, drawn for testing as above, shall be of 1.0mm thickness.

5. In case manufacturer can supply steel tubes in heat-treated condition as well, then one of the two samples, of a given process of manufacture drawn for independent testing, shall be of heat-treated condition.
6. A declaration shall be obtained from manufacturer on thicknesses at which the sizes(OD) of tubes can be supplied as per CI 4 of IS 7138:1973.
7. While considering Grant of licence/inclusion of additional varieties, it shall be ensured that the applicant/licensee has got the complete manufacturing and testing facilities for all the sizes/thickness applied.
8. During the operation of license, BO shall ensure that all the sizes/grades covered in the license are drawn for independent testing on rotation over a period of time.

ANNEXURE B
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LIST OF TEST EQUIPMENTS

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

Sr. No	Test Equipment/Chemicals	Tests Used in with Clause Reference
1	<p>Instrumental methods Spectrometer: atomic-absorption spectrometry, inductively coupled plasma atomic emission, inductively coupled plasma mass spectrometry techniques, spark source optical emission spectrometry.</p> <p>Spectrophotometer</p>	<p>7, 7.1, 7.2, 6.2 for C,S,P,Mn,Si,Al.</p> <p>S,P</p>
2	<p>Strohlein or Leco apparatus with all attachments Barometer with chart, Hot plate, Muffle furnace, Complete range of glass wares, measuring cylinders, Desiccator, porcelain boats or ceramic crucibles, Thermometer, Electronic Balance, Distilled Water, Hot air oven, Oxygen - 99.5 percent minimum purity, ether or acetone, Standard Reference Material (NML) with certificate</p> <p>Reagents for C: tin granules or pure iron fillings, acidulated water/brine water, methyl red, caustic potash</p> <p>Reagents for S: Ceramic boats/crucibles – desiccators, Fluxes -Low sulphur copper, tin or iron, Dilute hydrochloric acid, Starch Iodide solution, Potassium iodate</p>	<p>7, 7.1, 7.2 C & S (chemical method, alternative to instrumental method)</p>
3	<p>Weighing balance, Heater/ Heating element along with energy regulator, Ice water bath, Vol Flask Cap – 1 litre, (Whatman) filter paper No. 040, Suction Filtration Facility, Filter paper pulp pad, Standard Reference Material (NML) with certificate</p> <p>Potassium Permanganate (KMnO₄), Sodium Nitrite (Na₂NO₃), Ammonium Molybdate [(NH₄)₂ Mo₂O₇], Ammonium Phosphate [(NH₄)₃ PO₄], Potassium Nitrate (K₂NO₃), Phenolphthalein Solution, Rectified spirit or methyl alcohol, Sodium Hydroxide (NaOH), Hydrofluoric Acid (HF), Perchloric Acid (HClO₄), Sulphurous Acid, Hydrobromic Acid (HBr), other chemicals and reagent as applicable</p>	<p>7, 7.1, 7.2 Phosphorus content (chemical method, alternative to instrumental method)</p>
4	<p>Hot plate, Conical flask</p> <p>Reagents:</p> <p>silver nitrate, ammonium persulphate sodium arsenite solution, Dilute Nitric Acid, Phosphoric Acid, Dilute Sulphuric Acid, Concentrated Nitric Acid, NaCl Solution, Permanganic acid</p>	<p>7, 7.1, 7.2 Manganese content (chemical method, alternative to instrumental method)</p>

5	Medium textured filter paper, Porcelain casserole, platinum crucible, filter paper pulp, hot plate, hot air oven, muffle furnace Reagents: Silver nitrate solution, concentrated nitric acid, concentrated sulphuric acid, Dilute Hydrochloric Acid, Dilute Sulphuric Acid, Perchloric Acid, Tartaric acid and hydrofluoric acid	7, 7.1, 7.2 Silicon content (chemical method, alternative to instrumental method)
6	UTM	9.1 (Tensile Test)
7	Grooved Formers of six times OD of tubes of various sizes, Magnifying glass, macro etchant, Vice, UTM attachments/ clamps or Tube bending machine	9.2 (Bend Test)
8	Universal Tensile Testing Machine with drift test attachments or hydraulic press for applying load, Conical Mandrel of 30° included angle, Magnifying glass.	9.3.1(Drift Test)
9	Universal Tensile Testing Machine with flattening test such as platens, Magnifying glass.	9.3.2(Flattening Test)
10	Vernier Calipers , Ball-point and flat Micrometers, flat table, measuring tape, Magnifying glass, macro etchant, cord, Plunger dial gauge, Weighing Scale	4, 5,7,8 (Sizes & Tolerances, weight, workmanship, straightness, length)

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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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. PACKING & MARKING – The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated, and the packing, marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conforms to all the requirement of the specification. In addition, details of BIS website shall be marked as follows: “For details of BIS certification please visit www.bis.gov.in”

4. CONTROL UNIT – For the purpose of this Scheme, a control unit is defined as steel tubes of one size manufactured from same process in one shift from each production line by using steel of same cast under uniform conditions of production.

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. TEST CERTIFICATE- For each consignment of BIS Certified material conforming to IS 7138:1973 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 the provisions of BIS Act, 2016. A separate record shall be maintained giving information on quantity and control unit number, as applicable, relating to all such rejections/defective/sub-standard material of the production not conforming to the requirements of the Specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the Specification. The Standard Mark (if already applied) on rejected material should be defaced.

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SCHEME OF INSPECTION AND TESTING

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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				
3	Manufacture	3.1 3.1.1	IS 7138, IS 228 (Various Parts) / any established Chemical/ Instr. Method.	R	One	Each Cast	See Note-3
4	Dimensions	4.1,4.1.1, 4.1.2, 4.2 & Table-1	IS 7138	R	One	Every hour of production for each Control Unit	
5	Workmanship	5.1, 5.2, 5.3	IS 7138	R	Each Tube	Each Tube	
7	Straightness	7.1	IS 7138	R	Each Tube	Each Tube	
8	Length	8.1, 8.2	IS 7138	R	One	Every hour of production for each Control Unit	
9.1	Tensile Test	9.1, 9.1.1 & 10	IS 7138 1608(Pt.1)	R	Two	Each Control Unit	

9.2	Bend Test	9.2, 9.2.1 &10	IS 7138 IS 2329	R	One	Each Control Unit	
9.3	Drift test	9.3, 9.3.1 & 10	IS 7138 IS 2335	R	One	Each Control Unit	See Note-4
	Flattening Test	9.3, 9.3.2, 9.3.2.1 &10	IS 7138 IS 2328	R	One	Each Control Unit	
11	Protection and Packing	11.1, 11.2	IS 7138 IS 4740	R	-----	-----	
2	Supply Condition	2.1	IS 7138	R	-----	-----	

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.

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.

Note-3: No testing is required if the input steel used for forming tubes is ISI marked and received with test certificate mentioning the requirements.

Note -4: Among drift and flattening tests, steel tubes are to be tested for one of the requirement as agreed to between manufacturer and purchaser. Accordingly, the manufacturer may not be insisted upon having in-house test facilities for both the tests. ----- means the levels of control in Column(3) of Table-1 and the requirements are as agreed to between the manufacturer and purchaser.

Annexure-I**Page 4 of 4**

(Para 6 of the Scheme of Inspection and Testing)

XYZ IRON AND STEEL COMPANY

(Registered office Address and works address)

**TEST CERTIFICATE FOR SPECIFICATION FOR
Specification for steel tubes for furniture purposes**BIS
STANDARD
MARK

TEST CERTIFICATE No. _____

DATE _____

To M/s _____

We certified that the material described below fully conforms to IS 7138:1973 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 7138:1973 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	(nom Size)	Cast/ Control Unit No.	Quantity	CHEMICAL COMPOSITION							MECHANICAL PROPERTIES			Bend Test	Flattening /Drift Test [#]	Condition	Remarks
				#C %	S %	P %	#Si %	#Mn %	#Al %	#any other element %	TS	YS	Elongation				

[#] as agreed to between manufacturer and purchaser

REMARKS

WAGON NO.

TRUCK NO.

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

FOR XYZ IRON AND STEEL COMPANY