



PM/ IS 1285/1 September 2020

**PRODUCT MANUAL FOR  
Wrought Aluminium and Aluminium Alloys- Extruded Round Tube and Hollow  
Sections for General Engineering Purposes  
According to IS 1285:2002**

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 1285:2002</b>
	<b>Title</b>	:	<b>Wrought Aluminium and Aluminium Alloys-Extruded Round Tube and Hollow Sections for General Engineering Purposes</b>
	<b>No. of amendments</b>	:	<b>NIL</b>
2.	<b>Sampling Guidelines</b>		
a)	<b>Raw material</b>	:	<b>No specific requirement for raw material</b>
b)	<b>Grouping Guidelines</b>	:	Please refer Annex - A
c)	<b>Sample Size</b>	:	a) For Mechanical testing – 2 x 1 meter b) For chemical testing i) 50 gm for Chemical analysis Method(Wet analysis) or ii) 50mm x 5 nos for Instrumental Method
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 (if spectrometer is available for chemical tests)
6.	<b>Scope of the Licence :</b>		
	Licence is granted to use Standard Mark as per IS <b>1285:2002</b> with the following scope:		
	<b>Name of the product</b>		<b>Wrought Aluminium and Aluminium Alloys-Extruded Round Tube and Hollow Sections for General Engineering Purposes</b>
	<b>Type of section</b>		Structural Tube/Seamless Tube/Hollow Sections
	<b>Dimensions/Sizes</b>		Outside Diameter, Width, thickness etc.
	<b>Condition(s)</b>		Temper designations such as F, O, T5 etc.
	<b>Designation (s)</b>		19000, 19500, 63400 etc.

**ANNEXURE A****GROUPING GUIDELINES**

Designations have been divided into different groups and are arranged in order of least to most stringent based on tensile properties as given below: -

Less Stringent	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
	19000	24345	31000	52000	62400	63400	65028	74530
↓	19500			53000		64423	65032	
More stringent				54300		64430		

1. In each group if sample of more stringent designation is drawn the lower designations may be covered for same temper designation.
2. Separate samples under each group are to be drawn for each Temper Condition to be included in Scope of Licence.
3. Sample of any one size for each of the following sections may be drawn to cover all the sections and sizes for which manufacturing and testing facility is available with firm:-
  - i. Structural Tubes
  - ii. Seamless Tubes
  - iii. Hollow Sections
4. However, it shall be ensured that the firm is having all the necessary manufacturing and testing facilities for the manufacture and testing of the varieties to be included in the licence.

**ANNEXURE B**  
**LIST OF TESTING EQUIPMENTS**

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

Sr. No.	Test Equipment	Tests used in with Clause Reference
1	Vernier Caliper	Dimensions and Tolerances (Clause 7)
2	Micrometer	
3	Steel Scale	
4	Right Angle	
5	Measuring Tape	
6	Feeler Gauge	
7	Straight Surface	
8	Universal Tensile Testing Machine	Tensile Test (Clause 9) And Table 2
9	Extensometer	
10	Spectrometer	Chemical Composition (Clause 8) and Table 1 – Instrumental method
11	Analytical Balance(0-200gm, LC- 0.1mg)	Chemical Composition (Clause 8) and Table 1 – Chemical Analysis(Wet) Method
12	Hot Plate	
13	Hot Air Oven	
14	Photometer (Absorption cell)	
15	Porcelain/Silica Crucible	
16	Platinum Crucible	
17	Thermometer	
18	Filter Paper including ashless filter paper pad	
19	Stainless steel/nickelbeaker, Plastic/polyethene/SSBeaker	
20	Pyrex beakers and other glassware	
21	Reagents-Mixed Acid(Conc.HCL, Conc. Sulphuric Acid, Conc. Nitric Acid), Dilute Sulphuric Acid, Hydrofluoric Acid, Hydrogen Sulphide(gas), Hydrogen Sulphide Wash Solution, Dilute Nitric Acid, Concentrated Ammonium Hydroxide, Dilute Ammonium Hydroxide Wash Solution, Citric Acid Solution, Sodium-Diethyl-Dithiocarbonate solution, Carbon Tetrachloride, Sodium Sulphate, Standard Copper Solution, silicabasin.	Copper (Below 0.1%)
22	Reagents – Concentrated Sulphuric Acid, Concentrated Nitric Acid, Concentrated Hydrochloric Acid, Mixed Acids(Conc.HCL, Conc. Sulphuric Acid, Conc. Nitric Acid), Hydrofluoric Acid, Dilute Sulphuric Acid, Ammonium Fluoride, Concentrated Ammonium Hydroxide, Acetic Acid, Urea Solution, Potassium Iodide Solution, Standard Sodium Thiosulphate Solution, Starch solution, ammonium thiocyanate, Sodium Hydroxide Solution, Sodium Sulphate Solution, Sodium Hydroxide-Sodium Sulphate Wash Solution, DiluteNitricAcid,SulphurousAcid,Hydrogen	Copper (Above 0.1%)

	Sulphide(gas), Hydrogen Sulphide Wash Solution	
23	Reagents – Sodium Hydroxide, Hydrogen Peroxide, Sodium Carbonate, Methyl Red Indicator Solution, Conc. Ammonium Hydroxide, Ammonium Chloride Wash Solution, Ammonium Chloride, Conc. Hydrochloric Acid, Ammonium Sulphide Solution, Ammonium Persulphate, Ammonium Sulphide Wash Solution, Bromine Water, 8-Hydroxyquinoline Solution, Dilute Ammonium Hydroxide, Methyl Orange Indicator Solution, Potassium Bromate- Potassium Bromide Solution, Potassium Iodide Solution, Starch Solution, Standard Potassium Iodate Solution, Standard SodiumThiosulphate Solution	Magnesium (0.01 to 12 %)
24	Reagents – Sodium Hydroxide Solution, Hydrogen Peroxide, Potassium Cyanide Solution, Dilute Hydrochloric Acid, Ammonium Chloride, Bromine Water, Conc. Ammonium Hydroxide, Sodium Acetate, Tartaric Acid, Chrome Blank T Indicator, Standard Magnesium Sulphate, Standard EDTA Solution.	Magnesium (0.5 to 11%)
25	Reagents- Sodium Hydroxide Solution, Dilute Nitric Acid, Ammonium Molybdate Solution, Standard Silicon Solution.	Silicon (0.02 to 0.3%)
26	Reagents – Sodium Hydroxide Solution, Hydrogen Peroxide, Conc. Sulphuric Acid, Sulphuric Acid-Perchloric Acid Mixture, Perchloric Acid Solution, Conc. Nitric Acid, Sulphurous Acid, Dilute Sulphuric Acid, Conc. Hydrochloric Acid, Ammonium Acetate Solution, Dilute Hydrochloric Acid, HydrofluoricAcid	Silicon (Above 0.3%)
27	Reagents-Sodium Hydroxide Solution, Finely granulated lead containing under 0.001% iron, Acetate Buffer Solution, Hydroxylamine Hydrochloride Solution, O-phenanthrolinesolution,Standard Iron Solution.  Equipment – Magnet, Nickel Beaker.	Iron (0.03 to 0.10%)
28	Reagents -Concentrated Sulphuric Acid, Concentrated Nitric Acid, Concentrated Hydrochloric Acid, Mixed Acids(Conc.HCL, Conc. Sulphuric Acid, Conc. Nitric Acid), Dilute Sulphuric Acid, Hydrofluoric Acid, Potassium Bisulphate, Hydrogen Sulphide, Hydrogen Sulphide Wash Solution, Potassium Permanganate Solution, Potassium Thiocyanate Solution, Standard Titanous Chloride Solution. Equipment – Apparatus for Storing Titanous Chloride Solution, Solid Glass Beads.	Iron (0.01 to 2.0%)
29	Reagents – Sodium Hydroxide Solution, Sodium Nitrite Solution, Acid Mixture(Conc. Nitric Acid and Phosphoric Acid), Hydrofluoric Acid, Potassium Periodate Solution, Standard Manganese Solution	Manganese (Mn content between 0.01 to 0.1%)

30	Reagents - Sodium Hydroxide Solution, Acid Mixture(Conc. Sulphuric Acid, Phosphoric Acid and Nitric Acid), Silver Nitrate Solution, Ammonium Persulphate Solution, Ammonium Chloride Solution, Standard Arsenite-Nitrite Mixture, Sodium Arsenite, Standard Manganese Solution.	Manganese (Chromium Content up to 0.5%)
31	Reagents – Conc. Nitric Acid, Sodium Bismuthate, Sulphurous Acid, Dilute Nitric Acid, Phosphoric Acid, Standard Ferrous Ammonium Sulphate Solution, Standard Sodium Oxalate Solution, Standard Potassium Permanganate Solution.  Equipment- Asbestos Gooch Crucible.	Manganese (Mn content between 0.1 to 1.5%)
32	Reagents – Dilute Hydrochloric Acid, Potassium Chlorate, Carbon Tetrachloride, Complex Forming Solution (Conc. Ammonium Hydroxide, Ammonium Oxalate, HCl acid, sodium acetate, sodium thiosulphate solution and sodium sulphide solution), Dithizone Solution, Sodium Sulphide Wash Solution, Standard Zinc Solution.	Zinc (Photometric Method for Zn content below 0.1%)
33	Reagents – Mixed Acid(Conc. Sulphuric Acid, Conc. HCl and Conc. Nitric Acid), Dilute Sulphuric Acid, Hydrogen Sulphide(gas), Hydrogen Sulphide Wash Solution, Tartaric Acid Solution, Conc. Ammonium Hydroxide, Methyl Red Indicator Solution, Formic Acid Mixture, Formic Acid Wash Solution, Dilute Hydrochloric Acid, Ammonium Nitrate, Methylated Spirit, Mercuric Potassium Thiocyanate Solution, Chloroform, Standard Zinc Solution, Standard Potassium Iodate Solution.	Zinc By Mercuric Thiocyanate Method
34	Reagents – Sodium Hydroxide Solution, Nitric Acid-Sulphuric Acid Mixture, Dilute Sulphuric Acid, Hydrogen Peroxide, Standard Titanium Solution.	Titanium
35	Reagents – Conc. Sulphuric Acid, Conc. Nitric Acid, Silver Nitrate, Hydrofluoric Acid, Ammonium persulphate, Dilute HCl, Standard Ferrous Ammonium Sulphate Solution, Standard Potassium Permanganate Solution.	Chromium

This is an indicative list for the purpose of guidance only and may not be taken as exhaustive

**ANNEXURE C  
SCHEME OF INSPECTION AND TESTING**

**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.

**1. TEST RECORDS** –The manufacturer shall maintain test records for the tests carried out to establish conformity.

**2. LABELLING 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 shall be done as per the provisions of the Indian Standard on each lot of Structural Tubes, Seamless Tubes or Hollow Sections, provided always that the product thus marked and packed conforms to all the requirement of the specification.

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

**3. CONTROL UNIT** –For the purpose of this scheme Structural Tubes, Seamless Tubes or Hollow Sections of the same dimensions, and condition produced continuously from the same cast and of the same alloy shall be taken as one control unit.

**4. 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.

4.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

**5. 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.

**SCHEME OF INSPECTION AND TESTING**

**TABLE 1**  
**LEVELS OF CONTROL**

<b>(1)</b>				<b>(2)</b>	<b>(3)</b>		
<b>Test Details</b>				<b>Test equipment requirement</b> R: required (or)S: Sub-contracting permitted	<b>Levels of Control</b>		
Cl.	Requirement	Test Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Freedom from Defects	5	IS 1285	R	100% visual inspection has to be done for identification of any harmful defects.		
8	Chemical Composition	8	IS 1285	R	2	Each Control Unit	At equally distributed time intervals
7	Dimensions and Tolerances	7	-do-	R	4	Each Control Unit	
9	Mechanical Properties	9	-do-	R	2	Each Control Unit	

<b>ISI Mark with IS No. and CM/L No.</b>
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**ANNEXURE I  
TEST CERTIFICATE FORMAT  
XYZ COMPANY  
TEST CERTIFICATE**

**Wrought Aluminium and Aluminium Alloys - Extruded Round Tube and Hollow Sections for General Engineering Purposes**

TEST CERTIFICATE NO. \_\_\_\_\_ DATED \_\_\_\_\_  
TO M/s \_\_\_\_\_

It is certified that the material described below fully conforms to IS 1285:2002. Chemical composition 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. etc.

(PLEASE REFER TO IS 1285:2002 FOR DETAILS OF SPECIFICATION REQUIREMENTS) TEST RESULTS

Order no and date	Type (Structural Tube, Seamless Tube or Hollow section )and nominal size	Designation (19000, 19500 etc) and condition	Cast No./Lot No.	Quantity (in tonnes)	Chemical Analysis (in %)													Tensile properties			Remarks							
					Al	Cu	Mg	Si	Fe	Mn	Zn	Ti and/or other grain refining elements	Cr	Ti+V	Total impurities	Cr+Mn	0.2% proof stress (Mpa)	Tensile strength (Mpa)	Elongation (%)									

The material supplied conforms to specified tolerances

REMARKS

SHIPPING ADVICE NO.

WAGON NOS

FOR XYZ Company

**"For details of BIS certification please visit [www.bis.gov.in](http://www.bis.gov.in)**



