



उत्पाद मैनुअल

गढ़ा एल्युमीनियम और एल्युमीनियम मिश्र धातु - सामान्य इंजीनियरिंग प्रयोजनों के लिए निकाली गई गोल

ट्यूब और खोखले अनुभाग

IS 1285:2023 के अनुसार

Product Manual for

Wrought Aluminium and Aluminium Alloys- Extruded Round Tube and Hollow Sections for General Engineering Purposes According to IS 1285:2023

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मैनुअल प्रमाणीकरण की संचालन रीति में सुसंगतता और पारदर्शिता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

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.	उत्पाद Product	:	IS 1285:2023
	शीर्षक Title	:	Wrought Aluminium and Aluminium Alloys-Extruded Round Tube and Hollow Sections for General Engineering Purposes
	संशोधन संख्या No. of amendments	:	NIL
2.	नमूनाकरण दिशानिर्देश Sampling Guidelines	:	
a)	कच्चा माल Raw material	:	No specific requirement for raw material
b)	समूहिकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex – A

c)	नमूने का परिमाण Sample Size	:	a) For Mechanical testing – 2 x 1 meter b) For chemical testing i) 50 gm for Chemical analysis Method(Wetanalysis) or ii) 50mm x 5 nos for Instrumental Method
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer Annex – B
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	Please refer Annex – C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests (if spectrometer is available for chemical tests)
6.	लाइसेन्स का कार्यक्षेत्र/Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 1285:2023 with the following scope:		
	Name of the product		Wrought Aluminium and Aluminium Alloys-Extruded Round Tube and Hollow Sections for General Engineering Purposes
	Type of section		Structural Tube/Seamless Tube/Hollow Sections
	Dimensions/Sizes		Outside Diameter, Width, thickness.
	Condition(s)		Temper designations such as F/ O/ T4/ T5/ T6.
	Designation (s)		19000, 19500, 19600, 24345, 24534, 43000, 46000, 52000, 53000, 54300, 63400, 64423, 64430, 65032, 74530, 76528.

ANNEXURE A**GROUPING GUIDELINES**

As the desired strength of the extruded round tubes and hollow sections depends upon the alloy composition and the temper i.e. the treatment carried out, the alloys have been grouped as follows into 6 groups for the purpose of grant of licence or change in scope of licence:

Group	Designation	Major Alloying element	Minor Alloying elements
1	19000	Unalloyed Al (99% Min)	--
	19500	Unalloyed Al (99.5% Min)	--
	19600	Unalloyed Al (99.6% Min)	--
2	24345	Copper (3.8-5.0%)	Mg, Si, Mn
	24534	Copper (3.5-4.7%)	Mg, Si, Mn
3	43000	Silicon (4.5-6%)	--
	46000	Silicon (10-13%)	--
4	52000	Magnesium (1.7-2.6%)	--
	53000	Magnesium (2.8-4%)	--
	54300	Magnesium (4-4.9%)	Mn
5	63400	Magnesium (0.4-0.9%) & Silicon (0.3-0.7%)	--
	64423	Magnesium (0.5-1.3%) & Silicon (0.7-1.3%)	Cu
	64430	Magnesium (0.4-1.2%) & Silicon (0.6-1.3%)	Fe, Mn
	65032	Magnesium (0.7-1.2%) & Silicon (0.4-0.8%)	Cu, Mn, Cr
6	74530	Zinc (4-5%)	Mg, Mn
	76528	Zinc (5.1-6.1%)	Cu, Mg, Cr

1. For Group 1:

Sample of grade designation having the highest purity of Aluminium shall be tested to cover all other designations having lower purity of Aluminium in the group.

2. For Groups 2,3,4,5 & 6:

To cover a range of alloy designations in the scope, from each group, one sample of alloy designation having the highest percentage composition of the major alloying element in that range shall be tested.

3. In order to cover temper designations, one sample of each temper designation (of any alloy designation) intended to be covered in the scope of licence shall be tested.
4. Sample of any one size for each of the following sections may be drawn to cover all these sections and sizes for which manufacturing and testing facility is available with firm:-
 - i. Structural Tubes
 - ii. Seamless Tubes
 - iii. Hollow Sections
5. 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.
6. During the operation of licence, it shall be ensured that samples of all the designations/temperatures covered in the scope of the licence shall be drawn in rotation, to the extent possible.

ANNEXURE B
LIST OF TESTING EQUIPMENTS

Major test equipment required to test as per requirements of Indian Standard is as follows:

Sr. No.	Tests used in with Clause Reference	Test Equipment
1	Dimensions and Tolerances (Clause 7)	Vernier Caliper
		Micrometer
		Steel Scale
		Right Angle
		Measuring Tape
		Feeler Gauge
		Straight Surface
2	Tensile Test (Clause 9) And Table 2	Universal Tensile Testing Machine
		Extensometer
3	Chemical Composition (Clause 8) and Table 1 – Instrumental method	Spectrometer
4	Chemical Composition (Clause 8) and Table 1 – Chemical Analysis (Wet) Method	Analytical Balance (0-200gm, LC- 0.1mg)
		Hot Plate
		Hot Air Oven
		Photometer (Absorption cell)
		Porcelain/Silica Crucible
		Platinum Crucible
		Thermometer
		Filter Paper including ashless filter paper pad
		Stainless steel/nickel beaker, Plastic/polyethylene/SS Beaker
		Pyrex beakers and other glassware
5	Copper (Below 0.1%)	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.
6	Copper (Above 0.1%)	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, Dilute Nitric Acid, Sulphurous Acid, Hydrogen Sulphide (gas), Hydrogen Sulphide Wash Solution

7	Magnesium (0.01 to 12 %)	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
8	Magnesium (0.5 to 11%)	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.
9	Silicon (0.02 to 0.3%)	Reagents- Sodium Hydroxide Solution, Dilute Nitric Acid, Ammonium Molybdate Solution, Standard Silicon Solution.
10	Silicon (Above 0.3%)	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
11	Iron (0.03 to 0.10%)	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.
12	Iron (0.01 to 2.0%)	Reagents -Concentrated Sulphuric Acid, Concentrated NitricAcid, 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.
13	Manganese (Mn contentbetween 0.01 to 0.1%)	Reagents – Sodium Hydroxide Solution, Sodium Nitrite Solution, Acid Mixture(Conc. Nitric Acid and PhosphoricAcid), Hydrofluoric Acid, Potassium Periodate Solution, Standard Manganese Solution

14	Manganese (Chromium Content up to 0.5%)	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.
15	Manganese (Mn content between 0.1 to 1.5%)	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.
16	Zinc (Photometric Method for Zn content below 0.1%)	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.
17	Zinc By Mercuric Thiocyanate Method	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.
18	Titanium	Reagents – Sodium Hydroxide Solution, Nitric Acid- Sulphuric Acid Mixture, Dilute Sulphuric Acid, Hydrogen Peroxide, Standard Titanium Solution.
19	Chromium	Reagents – Conc. Sulphuric Acid, Conc. Nitric Acid, Silver Nitrate, Hydrofluoric Acid, Ammonium persulphate, Dilute HCl, Standard Ferrous Ammonium Sulphate Solution, Standard Potassium Permanganate Solution.
20	Vanadium	Potassium permanganate, N-Cinnamoyl 1-N Phenyl Hydroxylamine, Chloroform, Dilute Hydrochloric acid, Dilute Sulphuric acid, Ammonium metavanadate

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 and implement the 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

(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	Freedom from Defects	5	IS 1285	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
8	Chemical Composition	8	IS 1285	R	1	Each Control Unit	
7	Dimensions and Tolerances	7	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
9	Mechanical Properties	9	-do-	R	1	Each Control Unit	

PM/ 1285/2

July 2023

**ISI Mark
with IS No.
and CM/L
No.**

**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 1285:2023. 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 1285:2023 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”

