भारतीय मानक **IS 1285 : 2023**

Indian Standard

सामान्य इंजीनियरिंग अनुप्रयोगों हेतु पिटवाँ एल्यूमीनियम एवं एल्यूमीनियम मिश्र धातुओं से बनी एक्सटूडेड गोल नलियाँ एवं खोखले सेक्शन — विशिष्टि

(चौथा पुनरीक्षण)

Wrought Aluminium and Aluminium Alloys — Extruded Round Tube and Hollow Sections for General Engineering Purposes — Specification

(Fourth Revision)

ICS 77.150.10

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
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Ores and Feedstock for Aluminium Industry, its Metals/Alloys and Products Sectional Committee, MTD 07

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ores and Feedstock for Aluminium Industry, its Metals/Alloys and Products Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1956 and subsequently revised in 1968, 1975 and 2002. While reviewing this standard in the light of experience gained during these years, the Sectional Committee decided to revise the standard.

In this revision, the following significant modifications have been made:

a) A new clause on Ordering information added; and

b) Alloy grades are referred from IS 733.

The composition of the Committee, responsible for the formulation of this standard is listed in Annex B.

For the purpose of deciding whether particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

WROUGHT ALUMINIUM AND ALUMINIUM ALLOYS — EXTRUDED ROUND TUBE AND HOLLOW SECTIONS FOR GENERAL ENGINEERING PURPOSES — SPECIFICATION

(Fourth Revision)

1 SCOPE

This standard covers the requirements for wrought aluminium and aluminium alloy extrude round tubes and hollow sections for general engineering purposes.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definitions in addition to those given in IS 5047 (Parts 1) and IS 5047 (Parts 2) shall apply.

3.1 Extruded Round Tube — A circular hollow extrusion of uniform wall thickness not subjected to cold working.

3.2 Extruded Structural Tube — An extruded round tube brought to final dimensions by extruding through a bridge type die, port hole die or by similar method at the option of the producer.

3.3 Extruded Seamless Tubes — An extruded round tube brought to final dimensions by extrusion of hollow billet or by an extrusion process to be free of longitudinal seam welds.

3.4 Hollow Section — An extruded shape other than round tube, the cross-section of which completely encloses a void or voids.

3.5 Heat Treatment Batch — A quantity of material of one alloy, of the same dimensions and produced in the same way and complying one of the following conditions shall make a heat treatment batch:

a) The material solution treated in one furnace load;
b) The material charged consecutively in a continuous solution heat treatment furnace during an 8 h period;
c) The press heat-treated extrusions of one extrusion charge; and
d) Such material solution heat-treated by one of the above methods and subsequently precipitation treated in one furnace load.

However, a furnace load may comprise of more than one heat treatment batch.

4 ORDERING INFORMATION

For the benefit of the purchaser, to be specified while ordering for the material to this specification shall be as follows:

a) Alloy designation and temper condition;
b) Quantity, in pieces or kg;
c) Length and profile dimensions like diameter;
d) Packing mode; and
e) Detailed drawing of the required product including the weight of the product.

Any surface treatment like anodizing, powder coating or chromatising to be done by the customer

5 SUPPLY OF MATERIAL

General requirements for the supply of material shall conform to IS 10259.

6 FREEDOM FROM DEFECTS

6.1 The extruded round tube and hollow sections shall be sound and visually free from harmful defects.

6.2 Slight discoloration due to heat treatment, minor polishing marks and spiral marks due to roll straightening shall not be a cause for rejection.

7 CONDITIONS OF SUPPLY

The material shall be supplied in the condition as specified by the purchaser. While specifying the

condition, the temper designations as laid down in IS 5052 shall be followed.

8 DIMENSIONS AND TOLERANCES

Dimensions and tolerances of the material shall be as laid down in the Indian Standards indicated below:

a) Extruded round tube IS 2673; and
b) Extruded hollow sections IS 6477.

9 CHEMICAL COMPOSITION

9.1 Extruded round tubes and hollow sections shall be made from alloys specified in IS 733.

9.2 The chemical analysis of the material shall be carried out either in accordance with the methods specified in IS 504 (Part 1 to 12) and IS 504 (Part 13 to 16) or by any other established instrumental/chemical method. In case of any dispute the method specified in relevant parts of IS 504 shall be used as referee method. However, when the method is not given in IS 504, the referee method shall be as agreed to between the purchaser and the manufacturer.

10 MECHANICAL PROPERTIES

The material when tested in accordance with IS 1608 (Part 1), shall have the mechanical properties as given in IS 733.

11 SELECTION OF TEST SAMPLES

Extruded round tube and hollow sections of the same dimensions, produced in the same way and of the same alloy, shall be grouped into lots as given in Table 1.

11.1 Aluminium and Non-Heat Treatable Aluminium Alloy

11.1.1 One test sample shall be cut from an extruded round tube or hollow section selection from each lot.

11.1.2 Before the test samples are cut off, they shall be marked to identify them with the lot they represent.

11.1.3 The sample shall be taken from the material as supplied and shall not be annealed or mechanically worked (except for straightening and machining to the shape of the test piece) before they are tested.

11.2 Heat Treatable Aluminium Alloys

11.2.1 One test sample shall be cut from an extruded round tube or hollow section selected from each heat treatment batch.

11.2.2 Before any of the test samples are cut off, they shall be marked to identify them with the heat treatment batch.

11.2.3 The test samples after heat treatment shall not be mechanically worked (except for straightening and machining to the shape of the test piece) before they are tested.

11.2.4 For material supplied in the F condition, the test samples shall be heat treated and tested in the F or T4 or T6 condition as specified by the purchaser.

11.2.5 For material supplied in the T4 condition, the test samples shall be tested in the condition as supplied unless the purchaser has specified that he requires the test samples in the T6 condition.

12 REJECTION AND RETEST

For the purpose of this standard, the test certification and rejection and retest clauses as given in IS 10259 shall apply.

13 PACKAGING

For the purpose of this standard, the packaging methods given in IS 10259 shall apply.

14 MARKING

14.1 The material shall be marked with the following:

a) Indication of the source of manufacture;
b) Grade designation, cast or lot or heat treatment batch number and size details;
c) Quantity; and
d) Date of manufacture.

14.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provision of the *Bureau of Indian Standard Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

Table 1 Selection of Test Samples
(*Clause* 11)

Sl No.	Diameter or Equivalent Cross Section		Mass for	
	Over	Upto and including,	Aluminium and its Non-Heat-Treatable Alloys,	Heat Treatable Aluminium Alloys,
	mm	mm	kg	kg
(1)	(2)	(3)	(4)	(5)
i)	-	10	500	1 000
ii)	10	20	1 000	2 000
iii)	20	50	1 500	2 000
iv)	50	-	2 000	2 000

ANNEX A
(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 504 (Part 1 to 12) : 2002	Chemical analysis of aluminium and its alloys: Parts (1 to 12) (*second revision*)
IS 504 (Part 13 to 16) : 2003	Chemical analysis of aluminium and its alloys: Parts (13 to 16) (*second revision*)
IS 733 : 1983	Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purpose) (*third revision*)
IS 1608 (Part 1) : 2022/ISO 6892-2 : 2019	Metallic materials — Tensile testing: Part 1 Method of test at room temperature (*fifth revision*)
IS 2673 : 2002	Dimensions for wrought aluminium and aluminium alloys extruded round tube (*second revision*)
IS 5047	Glossary of terms relating to aluminium and aluminium alloys:
(Part 1) : 1986	Unwrought and wrought metals (*second revision*)
(Part 2) : 1979	Plant and operations, thermal treatment, control and testing, finishing
IS 5052 : 1993	Aluminium and its alloys — Temper designations (*first revision*)
IS 6477 : 1983	Dimensions for wrought aluminium and aluminium alloys extruded hollow sections (*first revision*)
IS 10259 : 1982	General conditions for delivery and inspection of aluminium and aluminium alloy products

ANNEX B
(*Foreword*)

COMMITTEE COMPOSITION

Ores and Feedstock for Aluminium Industry, its Metals/Alloys and Products Sectional Committee, MTD 07

Organization	*Representative(s)*
CSIR - Institute of Minerals and Materials Technology, Bhubaneswar	DR KALI SANJAY **(*Chairperson*)**
Aeronautical Development Establishment, Bengaluru	SHRI G. S. RAVINDRA SHRI T. MOHAN REDDY (*Alternate*)
Aluminium Association of India, Bengaluru	SHRI ANIL MATHEW SHRI T. VIMAL RAJ (*Alternate*)
Aluminium Secondary Manufacturers Association, New Delhi	SHRI NAVEEN PANT SHRI PRAVEEN DIXIT (*Alternate*)
Bharat Aluminium Company Limited, New Delhi	MS ANJALI PAWAR SHRI JITENDRA KUMAR VERMA (*Alternate*)
CSIR-National Metallurgical Laboratory, Jamshedpur	DR KANAI SAHOO DR V. C. SRIVASTAVA (*Alternate*)
CSIR-Advanced Materials and Processes Research Institute, Bhopal	DR D. P. MONDAL
Century Extrusions Limited, Kolkata	SHRI V. JHUNJHUNWALA SHRI SANJAY SINGH SEHRAWAT (*Alternate*)
Century Metal Recycling Limited, Faridabad	SHRI MOHAN AGARWAL
Defence Metallurgical Research Laboratory, Ministry of Defence, Hyderabad	DR G. JAGAN REDDY DR S. N. SAHU (*Alternate*)
Defence Research and Development Establishment, CEMILAC, Bengaluru	DR SHIRISH KALE DR T. RAM PRABHU (*Alternate*)
Defence Research and Development Laboratory, Ministry of Defence, Hyderabad	DR G. RAJA SINGH DR N. A. ARUN (*Alternate*)
Directorate General Quality Assurance, New Delhi	SHRI K. SAHA SHRI AJAY KUMAR (*Alternate*)
Hindalco Industries Limited, Mumbai	DR VIVEK SRIVASTAVA SHRI TUSHAR PANDA (*Alternate*)
Hindustan Aeronautics Limited, Bengaluru	SHRI R. R. BHAT
Indian Space Research Organization, Bengaluru	DR S. K. GHOSH
Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur Jindal	DR ANUPAM AGHINOTRI SHRI R. N. CHAUHAN (*Alternate*)
Aluminium Limited, Bengaluru	SHRI O. K. SHARMA SHRI P. DEVARAJ (*Alternate*)

Organization	*Representative(s)*
Material Recycling Association of India (MRAI), Mumbai	SHRI DHAWAL SHAH SHRI JAYANT JAIN (*Alternate*)
National Aluminium Company Limited, Bhubaneswar	SHRI S. NANDA
National Test House, Kolkata	DR NISHI SRIVASTAVA SHRI BUDDH PRAKASH (*Alternate*)
Shriram Institute for Industrial Research, Delhi	SHRI P. K. KAICHER SHRI B. GOVINDAN NAIR (*Alternate*)
Vedanta Limited, Mumbai	SHRI VIVEK SAXENA SHRI RAM SANDIPAM (*Alternate*)
BIS Directorate General	SHRI SANJIV MAINI, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (METALLURGICAL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRI V. K. RAWAT
SCIENTIST 'D'/JOINT DIRECTOR
(METALLURGICAL ENGINEERING), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

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