भारतीय मानक

Indian Standard

IS 4026 : 2023

एल्यूमीनियम के इंगट, बिलेट एवं तार की छड़ें (ई सी ग्रेड)

(पाँचवा पुनरीक्षण)

Aluminium Ingots, Billets and Wire Bars (EC GRADE)

(Fifth Revision)

ICS 77.150.10

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

FOREWORD

This Indian Standard (Fifth 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 1967 and subsequently revised in 1969, 1978, 1987 and 2007. 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 changes have been made:

a) Definition of scrap added;

b) A new clause on ordering information added;

c) A new grade of aluminium alloy added; and

d) 'Rejection and retest' and 'Packaging clause' added.

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

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

ALUMINIUM INGOTS, BILLETS AND WIRE BARS (EC GRADE)

(Fifth Revision)

1 SCOPE

This standard covers the requirements of four EC grades of aluminium ingots, billets and wire bars.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicted 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 below:

IS No.	*Title*
IS 504 (Part 1 to 12) : 2002	Chemical analysis of aluminium and its alloys: Part 1 to 12 (*second revision*)
(Part 13 to 16) : 2003	Chemical analysis of aluminium and its alloys: Part 13 to 16 (*second revision*)
IS 1820 : 1979	Recommended shapes, sizes and mass of aluminium notched bars and ingots for remelting purposes (*first revision*)
IS 5047 (Part 1) : 1986	Glossary of terms relating to aluminium and aluminium alloys: Part 1 Unwrought and wrought metals (*second revision*)
IS 10259 : 1982	General condition for delivery and inspection of aluminium and aluminium alloy products

3 TERMINOLOGY

For the purpose of this standard, the following definition and the definitions given in IS 5047 (Part 1) shall apply.

3.1 Scrap — Scrap means excess/rejected material produced during the manufacturing of similar grade primary aluminium products as mentioned in this standard.

3.2 Cast

a) Product of one furnace melt; and

b) Product of a number of furnace melts mixed prior to casting.

4 ORDERING INFORMATION

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

a) Name of the material;
b) Grade;
c) Size and dimension;
d) Quantity of material; and
e) Other requirements, if any.

5 GRADES

The following four grades are covered in this standard (*see* Table 1):

a) 1981 — Ingots/billets/wire bars (Al 99.8 percent);
b) 1971 — Ingots/billets/wire bars (Al 99.7 percent);
c) 1961 — Ingots/billets/wire bars (Al 99.6 percent);
d) 1951 — Ingots/billets/wire bars (Al 99.5 percent).

6 SUPPLY OF MATERIAL

General requirements relating to the supply of material shall conform to IS 10259. The material shall be visibly free from slag or dross.

7 MANUFACTURE

7.1 The EC grade ingots/billets/wire bars shall be manufactured from primary aluminium.

7.2 Usage of scrap as defined in clause **3.1** is permitted.

8 SHAPES AND SIZES

8.1 Unless otherwise agreed, the shapes and sizes of ingots shall be in accordance with IS 1820.

8.2 Ingots, each weighing below 25 kg shall be stacked in a bundle weighing about in the range of 500 kg to 1 100 Kg each. The bundle shall be then strapped for ease of handling.

8.3 T-bars and sow ingots shall be sold as equivalent ingots with individual weights around 200 kg to 1 000 kg each. The shapes and size of T-bars and sow ingots are designed for ease of handling.

8.4 Shapes and sizes of billets and wire bars shall be as mutually agreed between the supplier and the purchaser.

9 CHEMICAL COMPOSITION

The material shall have the chemical composition as given in Table 1. The chemical composition shall be determined either by the method specified in IS 504

(Part 1 to 12) and IS 504 (Part 13 to 16) or any other established instrumental/chemical method. In case of dispute the procedure specified in IS 504 (Part 1 to 12) and IS 504 Part (13 to 16) shall be the referee method. However, when the method is not given in IS 504 Part (1 to 12) and IS 504 (Part 13 to 16), the referee method shall be as agreed to between the purchaser and the supplier.

10 SELECTION OF SAMPLES FOR ANALYSIS

10.1 At least three samples randomly shall be selected throughput the casting process for each furnace batch.

10.2 Samples shall be obtained from one of the following methods:

a) Wherever possible, directly from the stream of metal filling the moulds midway through the pours; and

b) By milling or any other suitable method, and taken throughout the thickness of the ingot/billet/wire bar after the skin has been removed.

11 REJECTION AND RETEST

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

12 PACKAGING

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

12.1 Ingots shall be strapped in bundles of weight around 1 MT.

12.2 Packaging of billets and wire bars shall be as mutually agreed between the supplier and the purchaser.

13 MARKING

13.1 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.

13.2 The supplier shall furnish along with each consignment a certificate giving chemical composition of all the casts to which the ingots belong in that consignment.

13.3 BIS Certification Marking

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

Table 1 Chemical Composition of EC Grade Aluminium Ingots, Billets and Wire Bars
(*Clause* 9)

Sl No.	Grade Element	1981	1971	1961	1951
(1)	(2)	(3)	(4)	(5)	(6)
i)	Aluminium, Min	99.8	99.7	99.6	99.5
ii)	Silicon	0.10	0.10	0.12	0.10
iii)	Iron	0.12	0.25	0.30	0.40
iv)	Copper	0.03	0.02	0.04	0.05
v)	Manganese	0.02	0.01	0.02	0.01
vi)	Magnesium	0.02	0.02	0.02	-
vii)	Chromium	-	0.01	0.01	0.01
viii)	Zinc	0.03	0.04	-	0.05
ix)	Titanium	0.02	-	-	-
x)	Boron	-	0.02	-	0.05
xi)	Gallium	0.03	0.03	-	0.03
xii)	Zirconium	-	-	0.01	-
xiii)	Titanium + Vanadium	0.02	0.02	-	0.02
xiv)	Other elements (each)	0.01	0.02	0.02	0.03
xv)	Other elements (Total)	0.1	0.1	0.1	0.1

NOTE — Aluminium shall be determined by difference. Impurity levels specified above are maximum values unless otherwise specified.

ANNEX A
(*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*)
Century Extrusions Limited, Kolkata	SHRI V. JHUNJHUNWALA SHRI SANJAY SINGH SEHRAWAT (*Alternate*)
Century Metal Recycling Limited, Faridabad	SHRI MOHAN AGARWAL
CSIR-Advanced Materials and Processes Research Institute, Bhopal	DR D. P. MONDAL
CSIR-National Metallurgical Laboratory, Jamshedpur	DR KANAI SAHOO DR V. C. SRIVASTAVA (*Alternate*)
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*)
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Indian Space Research Organization, Bengaluru	DR S. K. GHOSH
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Jindal Aluminium Limited, Bengaluru	SHRI O. K. SHARMA SHRI P. DEVARAJ (*Alternate*)
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*)

Organization	*Representative(s)*
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.

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.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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