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उत्पाद मैन्युअल
एल्युमिनियम सिल्लियां, बिलेट्स और वायर बार्स
(ईसी ग्रेड)
IS 4026:2023
के अनुसार
PRODUCT MANUAL FOR
ALUMINIUM INGOTS, BILLETS AND WIRE BARS
(EC GRADE)
ACCORDING TO IS 4026:2023

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मैनुअल प्रमाणीकरण की संचालन रीति में सुसंगता और पारदर्शिता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप मे 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 4026:2023
	शीर्षक **Title**	:	ALUMINIUM INGOTS, BILLETS AND WIRE BARS (EC GRADE)
	संशोधन संख्या **No. of Amendments**	:	NIL

2.	**नमुनाकरण दिशानिर्देश** **Sampling Guidelines:**		
a)	**कच्चा माल** **Raw material**	:	Raw material as per Cl. 7 of IS 4026:2023 shall be used.
b)	**समूहिकरण दिशानिर्देश** **Grouping guidelines**	:	Sample of each grade to be tested for Chemical composition and Shapes and sizes (Cl. 8) shall be tested in factory.
c)	**नमूने का परिमाण** **Sample Size**	:	5 pcs of 50 mm X 50 mm
3.	**परीक्षण उपकरणो की सूची** **List of Test Equipment**	:	Please refer ANNEX – A
4.	**निरीक्षण व परीक्षण स्कीम** **Scheme of Inspection and Testing**	:	Please refer ANNEX – B
5.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**	:	Silicon, Iron, Copper, Manganese, Shapes & Sizes
6.	**लाइसेन्स का कार्यक्षेत्र** **Scope of the Licence :**		
	Licence is granted to use Standard Mark as per IS 4026:2023 with the following scope:		
	Name of the product		Aluminium ingots, billets and wire bars (ECGrade)
	Form		Ingot and/or Billet and/or Wire Bar and/or T-Bars and/or Sow Ingots
	Grades		1981/1971/1961/1951

ANNEX A
TO PRODUCT MANUAL FOR
ALUMINIUM INGOTS, BILLETS AND WIRE BARS
(EC GRADE) According to IS 4026:2023

List of Test Equipment

Sl No.	Test Used in with Clause Reference	Test Equipment/Chemicals
1	Shapes and Sizes, Cl. 8	i) Micrometer ii) Vernier Calliper iii) Measuring Tape iv) Straight Edge v) Feeler Gauge **vi)** Weighing Scale
2	**Chemical Composition** Cl. 9	**Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels and Certified/Standard Reference Materials** OR **Chemicals and Reagents for Chemical method as per IS 504 for each element given below****
	Silicon, Sl. No. ii), Table-1	• Concentrated Sulphuric Acid • Sodium Hydroxide solution • Hydrogen Peroxide • Sulphuric Acid-Perchloric Acid Mixture • Perchloric Acid Solution • Concentrated Nitric Acid • Sulphurous Acid • Dilute Sulphuric Acid • Concentrated Hydrochloric Acid • Ammonium Acetate Solution • Dilute Hydrochloric Acid- • Hydrofluoric Acid • Analytical Balance • Ashless Paper Pulp • Filter papers
	Iron, Sl. No. iii), Table-1	• Concentrated Sulphuric Acid • Concentrated Hydrochloric Acid • Concentrated Nitric Acid • Dilute Sulphuric Acid • Hydrofluoric Acid • Potassium Bisulphate • Hydrogen Sulphide Gas • Hydrogen Sulphide Wash Solution • Potassium Permanganate Solution • Potassium Thiocyanate Solution • Standard Titanous Chloride Solution • Analytical Balance • Platinum Crucible • Heating Apparatus/Burner • Magnet • Ashless Paper Pulp

		• Filter papers
	Copper, Sl. No.4, Table-1	• 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-Dithiocarbamate Solution • Carbon Tetrachloride • Sodium Sulphate • Standard Copper Solution • Silica Basin • Analytical Balance • Ashless Paper Pulp • Filter Papers • Platinum Crucible • Heating Apparatus/Burner • Photometer
	Manganese, Sl. No. v), Table-1	• Concentrated Nitric Acid • Sodium Bismuthate • Sulphurous Acid • Dilute Nitric Acid • Phosphoric Acid • Standard Ferrous Ammonium Sulphate Solution • Standard Sodium Oxalate Solution • Standard Potassium Permanganate Solution • Analytical Balance • Asbestos Gooch Crucible • Heating Apparatus/Burner
	Magnesium, Sl. No. vi), Table-1	• Sodium hydroxide • Hydrogen peroxide • Sodium carbonate • Methyl red • Ammonium hydroxide • Sodium hydroxide • Ammonium chloride • Hydrochloric acid • Ammonium sulphide • Ammonium persulphate • Hydrogen sulphide • Bromine water • 8 Hydroxyquinoline • Glacial Acetic acid • Methyl Orange • Potassium hydroxide

		• Potassium bromide • Potassium bromate • Potassium Iodide • Soluble starch • Potassium Iodate • Sodium Thiosulphate
	Chromium, Sl. No. vii), Table-1	• Sulphuric Acid • Nitric Acid • Silver Nitrate Solution' • Hydrofluoric Acid • Ammonium Persulphate • Dilute Hydrochloric Acid • Ferrous Ammonium Sulphate • Recrystallized Potassium Dichromate Solution' • Potassium Permanganate • Dark Coloured Stoppered Glass Bottle • Pure Re-crystallized Sodium Oxalate or Oxalic Acid • Analytical Balance • Burner • General Glasswares • Titration Assembly
	Zinc, Sl. No. viii), Table-1	a) By Spetrophotometric method • Hydrochloric acid • Potassium chlorate • Dithizone • Carbon tetrachloride • Complex forming solution • Sodium sulphide • Pure Zinc (99.95% purity) • Ammonium hydroxide • Ammonium oxalate • Sodium acetate • Sodium Thiosulphate b) By Volumetric method • Hydrochloric acid • Nitric acid • Dilute Sulphuric acid • Hydrogen sulphide • Tartaric acid • Ammonium hydroxide • Methyl red indicator • Formic acid • Ammonium sulphate • Ammonium nitrate • Methylated spirit • Mercuric chloride • Potassium Thiocyanate • Chloroform • Potassium Iodate

	Titanium, Sl. No. ix), Table-1	• Sodium Hydroxide Solution • Nitric Acid-Sulphuric Acid Mixture • Dilute Sulphuric Acid • Hydrogen Peroxide • Standard Titanium Solution • Filter Papers • Weighing Balance • Heating Apparatus/Burner
	Boron, Sl. No. x), Table-1	• Any Method mutually agreed between the manufacturer and the purchaser
	Gallium, Sl. No. xi), Table-1	• Any Method mutually agreed between the manufacturer and the purchaser

	Zirconium, Sl. No. xii), Table-1	• **By Gravimetric Method**
		  • Concentrated Hydrochloric Acid
		  • Mandelic Acid
		  • Mandelic Acid, Wash Solution
		  • Absolute Alcohol
		  • Diethylether
		  • Analytical Balance
		  • Hot Plate/Water Bath
		  • Low Ash Filter Paper
		  • Platinum Crucible
		  • Burner
		• **By Spectrophotometric Method**
		  • Zirconium
		  • Hydrofluoric Acid
		  • Double Distilled Water
		  • Concentrated Nitric Acid
		  • Concentrated Sulphuric Acid
		  • Polyethylene Bottle
		  • Tri-n-octyl Phosphine Oxide
		  • Nitric Acid(7N)
		  • Pyridine
		  • Pyrocatechol Violet
		  • Dilute Hydrochloric Acid
		  • Conical Flasks
		  • B17 or B24 Glass Sockets
		  • Stopper
		  • Graduated Measuring Cylinder or SeparatingFunnel
		  • Mechanical Shaker
		  • Spectrometer with cells

	Vanadium, Sl. No. xiii), Table-1	• Potassium Permanganate • N-Cinnamyol 1-N Phenyl Hydroxalmine (CPHA) • Dilute Hydrochloric Acid • Hydrochloric Acid • Chloroform • Dilute Sulphuric Acid • Standard Vanadium Solution • Filter Papers • Hot Plate • Weighing Balance • Heating Apparatus/Burner • General Glasswares
The above list is indicative only and may not be treated as exhaustive		

ANNEXURE B
TO PRODUCT MANUAL FOR
ALUMINIUM INGOTS, BILLETS AND WIRE BARS
(EC GRADE) **according to IS 4026:2023**

SCHEME OF INSPECTION AND TESTING

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 and implement a calibration plan for the test equipment.

2. TEST RECORDS - The manufacturer shall maintain test records for the test carried out to establish conformity.

3. LABELLING, MARKING AND STANDARD MARK – Each Aluminum Ingot, Billet and Wire Bar shall be legibly painted or stamped with the cast number for identification; and the name or trademark of the manufacturer. Further, the Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L .....) shall be incorporated on the product and/or its packaging and the testcertificate for each consignment of the material, provided always that the product thus marked conforms to all the requirement of the specification.

4. CONTROL UNIT- All Aluminum Ingots or Billets or Wire Bars representing the same cast, grade and manufactured under the uniform conditions of production in the same place constitute Control unit.

5. LEVELS OF CONTROL: The tests as indicated in Table 1 and at the levels of control specified therein, shall be carried out on the whole production of the factory which is covered by this scheme and appropriate records maintained in accordance with paragraph 2 above.

6. 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.

7. TEST CERTIFICATE : For each consignment of BIS Certified material conforming to IS 4026:2023 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)

TABLE 1: LEVELS OF CONTROL

TEST DETAILS				Test Equipment Requirement	LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method			No. of Samples	Frequency	
		Clause	Reference				
8	Chemical Composition	8	IS 4026 & IS 504 (Part 1 to 16) or any other established chemical/ instrumental method	R	One	Each cast/control unit	-----
7.	Shapes and Sizes	7.1	IS 4026, IS 1820	R	Firm to have adequate in-process controls to check compliance of this parameter given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		

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. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

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.

BIS STANDARD MARK

ANNEXURE I

(Para 7 of the Scheme of Inspection and Testing)

XYZ Company

(Registered office Address and works address)

TEST CERTIFICATE FOR ALUMINIUM INGOTS, BILLETS AND WIRE BARS (EC GRADE)

According toIS 4026:2023

TEST CERTIFICATE No._____ DATE_____

To M/s_____

We certified that the material described below fully conforms to IS 4026:2023 as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks LicenceNo.CM/L_____are as indicated below against each order No.

(PLEASE REFER TO IS 4026:2023 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Nominal Size	Control Unit No.	Type	Quantity in tonnes	CHEMICAL COMPOSITION														PHYSICAL PROPERTIES	Remarks
					% Al	% Si	% Fe	% Cu	% Mn	% Mg	% Cr	% Zn	% Ti	% B	% Ga	% Zr	% Ti +V	Other elements	Shapes and Sizes	

REMARKS

WAGON NO.

TRUCK NO.

FOR XYZ COMPANY

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