



उत्पाद मैनुअल
सामान्य इंजीनियरिंग प्रयोजनों के लिए रिमेल्टिंग और कास्टिंग के लिए एल्युमिनियम
और एल्युमिनियम मिश्रधातु सिल्लियाँ – विशिष्ट

IS 617: 2024 के अनुसार

Product Manual for
Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General
Engineering Purposes — Specification
According to IS 617: 2024

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	भारतीय मानक संख्या IS No.	:	IS 617:2024
	शीर्षक Title	:	Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General Engineering Purposes
	संशोधनों की संख्या No. of amendments	:	01
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific raw material requirement. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	समूहीकरण दिशानिर्देश	:	Please refer Annex-A

	Grouping Guidelines	
c)	नमूने का परिमाण Sample Quantity	For Chemical test: 5 pcs of 50 mm X 50 mm For Mechanical Test (applicable for castings) : 02 Separately Cast Test Pieces/Test Pieces machined from castings for Tensile Properties(cl.7.1.) and Hardness (cl.7.4.). For Hardness (as per cl.7.4), if possible, 1 pc of Casting can also be drawn for testing on Porosity free area of the casting. The requirements of Freedom from Defects (cl.8.) shall be tested in the factory on the full sizes of Ingots/Castings, samples from which have been drawn for I/T. Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	Form, Alloy (Chemical Symbol), Condition (Temper)- in case of casting. Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	परीक्षण उपकरणों की सूची List of Test Equipment	Please refer to Annex- B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	Please refer to Annex- C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	
	All Tests can be carried out in a day Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.	
6.	लाइसेंस का दायरा /Scope of the Licence:	

	IS 617:2024 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है □Licence is granted to use Standard Mark as per IS 617:2024 with the following scope:	
7.	उत्पाद का नाम Name of the product	Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General Engineering Purposes
	Form	Casting and/or Ingot
	Casting Process	Sand Casting (S), K (Chill or permanent mould casting), D (pressure die casting), L (Investment Casting) or any other casting process as per mutual agreement between the manufacturer and purchaser
	Alloy (Chemical Symbol)	Al 99.0, Al 99.5, AlSi9....
	Condition (Temper)(Applicable only in case of Castings)	M, O,T1, T4,T5,T6,T64,T7 or any other temper as per mutual agreement between the manufacturer and purchaser

BUREAU OF INDIAN STANDARDS
Manak Bhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002

ANNEX-A
TO PRODUCT MANUAL FOR
Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General
Engineering Purposes
According to IS 617:2024

GROUPING GUIDELINES

- 1) IS 617:2024 covers the requirements of aluminium and its alloys in form of ingots for remelting and castings for general engineering purposes. Chemical Composition of different Alloy Groups covering various Alloys of Aluminum have been specified under Table 1.
- 2) 4 Casting Processes i.e. Sand Casting (S), Chill or Permanent Mould Casting (K), Pressure Die Casting (D) and Investment Casting (L) have been specified . Mechanical Properties of these Alloys supplied in different tempers (M,O,T11,T4,T5,T6,T64,T7) for each Casting Process have been specified under Tables 2,3, 4 & 5, respectively. The Mechanical Properties specified in case of Pressure Die Castings, given at Table 5, are for information only.
- 3) For any other processes and tempers, mechanical properties shall be agreed between manufacturer and purchaser. In the case of Ingots only Chemical Composition requirement is applicable. Mechanical Properties are applicable in case of Castings only.
- 4) For the purpose of GoL/CSoL, manufacturer shall be required to submit declaration at the time of application with regards to the manufacturing process (such as Primary Aluminum Manufacturers, Secondary Aluminum Manufacturers, Manufacturers manufacturing only Castings), Form of Supply (Ingot/Casting), Alloy Designations, Casting Processes and Temper Designations, intended to be covered in the Scope of the Licence.
- 5) The following Grouping Guidelines shall be applicable in case of manufacturers intending to cover Ingots in the scope of the licence:

a)

Group	Alloy Group	Alloy Designation	Sampling
1	Al	Al 99.0 Al 99.5 Al 99.7	Sample of ingot of Alloy Designation having highest purity of Aluminum shall be drawn and tested for the requirements of Chemical Composition (cl.6.) to cover Alloy Designations having lower purity of Aluminum. For example: If sample of Alloy Al 99.7 is drawn and tested, Al 99.5 and Al 99.0 can automatically be covered in the scope.
2	AlCu	AlCu4Ti(a) AlCu4MgTi Al Cu5MgAg Al Cu5 NiCoZr AlCu4Ti(b) AlCu4NiMg AlCu10MnMg	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).

3	AlSi	Al Si3 Al Si9 Al Si11 Al Si12(a) Al Si12(b) Al Si12(Fe) AlSi5 AlSi5(a)	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
4	AlSiMgTi	AlSi2MgTi	One sample of ingot of the Alloy Designation shall be drawn and tested.
5	AlSi7Mg	AlSi7Mg AlSi7Mg0.3 AlSi7Mg0.3(a) AlSi7Mg0.3(b) AlSi7Mg0.6 AlSi7Mg0.3Ti	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
6	AlSi10Mg	AlSi9Mg AlSi10Mg AlSi10Mg(a) AlSi10Mg(b) Al Si10Mg(Fe) AlSi10Mg(Cu) AlSi11MgMn AlSi11MgNi AlSi12MgCu	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
7	AlSi5Cu	AlSi5Cu1Mg AlSi5Cu3 AlSi5Cu3Mg AlSi5Cu3Mn(a) AlSi5Cu3Mn(b) AlSi5Cu3Mn(c) AlSi5CuMg AlSi5Cu4 AlSi6Cu4(b) AlSi8Cu(a) AlSi8Cu(b) AlSi7Cu AlSi6Cu4	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
8	AlSi9Cu	AlSi7Cu2 AlSi7Cu2(a) AlSi7Cu3Mg AlSi8Cu1.5Mg AlSi8Cu3 AlSi9Cu1Mg Al Si9Cu1Mg(a) Al Si9Cu3(Fe) Al Si9Cu3(Fe)(Zn) Al Si11Cu2(Fe) Al Si11Cu3(Fe) AlSi9Cu3(a)	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).

		AlSi10Cu AlSi10Cu(a) AlSi9Cu3(b) AlSi9Cu2 AlSi11Cu2(Fe)	
9	AlSi12Cu	AlSi12(Cu) AlSi12Cu(a) AlSi12Cu(b) Al Si12Cu1(Fe) Al Si12CuMgNi AlSi12Cu2Mg	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
10	AlSi14Cu	AlSi14Cu AlSi14Cu(a)	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
11	AlSi17Cu	Al Si17Cu4Mg	One sample of ingot of the Alloy Designation shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
12	AlSiMn	AlSi10MnMg	One sample of ingot of the Alloy Designation shall be drawn and tested for the requirements of Chemical Composition (cl.6.).
13	AlMg	Al Mg3 Al Mg5 Al Mg5(Si) Al Mg9 Al Mg5Si2Mn(Fe) AlMg0.6 AlMg0.4 AlMg3Si AlMg2 AlMg AlMg0.45	One sample of ingot of any Alloy Designation, among the Alloys intended to be covered in the Licence from the Group, shall be drawn and tested requirements of Chemical Composition (cl.6.). In case of non -availability of MTCs (of earlier consignments), samples of all those Alloys shall also be drawn and tested.
14	AlZnMg	Al Zn5Mg	One sample of ingot of the Alloy Designation shall be drawn and tested requirements of Chemical Composition (cl.6.).
15	AlZnSiMg	Al Zn10Si8Mg	One sample of ingot of the Alloy Designation shall be drawn and tested requirements of Chemical Composition (cl.6.).

b) Evidence of manufacturing capability, such as Mill Test Certificates (MTCs) (of earlier consignments) , of all Alloy Designations intended to be covered in the Licence within each Group, shall be submitted by the manufacturer and their conformity to the requirements of IS 617:2024 shall be established before endorsing all alloy designations in the Scope. In case of

non-availability of MTCs (of earlier consignments), samples of all those Alloys shall also be drawn and tested from each Group.

c) For covering Castings along with Ingots, separate samples of Castings of each Alloy Designation, drawn as per a) & b) above, for each Casting Process(Sand Casting (S), Chill or Permanent Mould Casting (K), Pressure Die Casting (D) and Investment Casting (L) or any other casting process (mechanical properties based upon mutual agreement and to be declared by the manufacturer at the time of offering samples), shall also be drawn and tested for the requirements of Mechanical Properties as per Table 2,3 & 4 or as agreed between manufacturer and purchaser, as applicable, and other requirements of the standard applicable for castings (excluding Chemical Composition which has already been tested on Ingots).

d) The samples of Castings drawn for the Alloy Designations as per a) & b) above, shall be drawn in such a way that samples of all Tempers (M,O,T11,T4,T5,T6,T64,T7 or any other temper as per mutual agreement between the manufacturer and purchaser) ,intended to be covered in the scope of the licence, are tested for each Casting Process.

6) The following Grouping Guidelines shall be applicable in case of Manufacturers intending to cover only Castings in the scope of their licence:

Group	Alloy Group	Alloy Designation	Sampling
1	Al	Al 99.0 Al 99.5 Al 99.7	Sample of Casting of Alloy Designation having highest purity of Aluminum shall be drawn and tested to cover Alloy Designations having lower purity of Aluminum. For example: If sample of Alloy Al 99.7 is drawn and tested, Al 99.5 and Al 99.0 can automatically be covered in the scope
2	AlCu	AlCu4Ti(a) AlCu4MgTi Al Cu5MgAg Al Cu5 NiCoZr AlCu4Ti(b) AlCu4NiMg AlCu10MnMg	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence,from the Group shall be drawn and tested.
3	AlSi	Al Si3 Al Si9 Al Si11 Al Si12(a) Al Si12(b) Al Si12(Fe) AlSi5 AlSi5(a)	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.
4	AlSiMgTi	AlSi2MgTi	One sample of Casting of the Alloy Designation shall be drawn and tested.
5	AlSi7Mg	AlSi7Mg AlSi7Mg0.3 AlSi7Mg0.3(a) AlSi7Mg0.3(b)	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.

		AlSi7Mg0.6 AlSi7Mg0.3Ti	
6	AlSi10Mg	AlSi9Mg AlSi10Mg AlSi10Mg(a) AlSi10Mg(b) Al Si10Mg(Fe) AlSi10Mg(Cu) AlSi11MgMn AlSi11MgNi AlSi12MgCu	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.
7	AlSi5Cu	AlSi5Cu1Mg AlSi5Cu3 AlSi5Cu3Mg AlSi5Cu3Mn(a) AlSi5Cu3Mn(b) AlSi5Cu3Mn(c) AlSi5CuMg AlSi5Cu4 AlSi6Cu4(b) AlSi8Cu(a) AlSi8Cu(b) AlSi7Cu AlSi6Cu4	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.
8	AlSi9Cu	AlSi7Cu2 AlSi7Cu2(a) AlSi7Cu3Mg AlSi8Cu1.5Mg AlSi8Cu3 AlSi9Cu1Mg Al Si9Cu1Mg(a) Al Si9Cu3(Fe) Al Si9Cu3(Fe)(Zn) Al Si11Cu2(Fe) Al Si11Cu3(Fe) AlSi9Cu3(a) AlSi10Cu AlSi10Cu(a) AlSi9Cu3(b) AlSi9Cu2 AlSi11Cu2(Fe)	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.
9	AlSi12Cu	AlSi12(Cu) AlSi12Cu(a) AlSi12Cu(b) Al Si12Cu1(Fe) Al Si12CuMgNi AlSi12Cu2Mg	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group shall be drawn and tested.
10	AlSi14Cu	AlSi14Cu AlSi14Cu(a)	One sample of Casting of any Alloy Designation, among the Alloys intended

			to be covered in the Licence, from the Group shall be drawn and tested.
11	AlSi17Cu	Al Si17Cu4Mg	One sample of Casting of the Alloy Designation shall be drawn and tested.
12	AlSiMn	AlSi10MnMg	One sample of Casting of the Alloy Designation shall be drawn and tested.
13	AlMg	Al Mg3 Al Mg5 Al Mg5(Si) Al Mg9 Al Mg5Si2Mn(Fe) AlMg0.6 AlMg0.4 AlMg3Si AlMg2 AlMg AlMg0.45	One sample of Casting of any Alloy Designation, among the Alloys intended to be covered in the Licence, from the Group, shall be drawn and tested.
14	AlZnMg	Al Zn5Mg	One sample of Casting of the Alloy Designation shall be drawn and tested.
15	AlZnSiMg	Al Zn10Si8Mg	One sample of Casting of the Alloy Designation shall be drawn and tested.

b) Evidence of manufacturing capability, such as Mill Test Certificates (MTCs) (of earlier consignments) , of all Alloy Designations intended to be covered in the Licence within each Group, shall be submitted by the manufacturer and their conformity to the requirements of IS 617:2024 shall be established before endorsing all alloy designations in the Scope. In case of non-availability of MTCs (of earlier consignments), samples of all those Alloy Designations shall also be drawn and tested from each Group.

c) The samples of Castings of the Alloy Designations, drawn as per a) & b) above, shall be drawn for each Casting Process(Sand Casting (S), Chill or Permanent Mould Casting (K), Pressure Die Casting (D) and Investment Casting (L) or any other casting process (mechanical properties based upon mutual agreement and to be declared by the manufacturer at the time of offering samples) and tested for all requirements of the standard including Chemical Composition as per cl.6 (Table 1) and Mechanical Properties as per Table 2,3 & 4 or as agreed between manufacturer and purchaser, as applicable.

d) The samples of Castings drawn for the Alloy Designations as per a) & b) above, shall be drawn in such a way that samples of all Tempers (M,O,TI1,T4,T5,T6,T64,T7 or any other temper as per mutual agreement between the manufacturer and purchaser) ,intended to be covered in the scope of the licence, are tested for each Casting Process.

e) Scope of licence shall be restricted based on the manufacturing and testing facilities available.

f) During operation of licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEX – B
LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

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

Sl. No.	Test Equipment/Chemicals and Identification Numbers (Where applicable)	Tests Used in with Clause Reference
1.	Tensile Test, Cl 7.2	Universal Testing Machine with Extensometer
2.	Hardness, Cl 7.4	Brinell Hardness Tester with Indenter, Indenter Measuring System (Manual/Automatic), Standard Calibration Blocks
3.	Freedom from Defects (8.1, 8.2)	Dye Penetrant Testing Setup (ref IS 3658), Radiographic Tester/Ultrasonic Tester
4.	Pressure Test, Clause 10	Pressure Test Arrangement
5.	Chemical Composition, Cl 6.1, Table 1	Optical Emission Spectrometer with all requisite channels along with available Certified Reference Materials for calibration of the range of each element covered under Table 1
(i)	Copper	• 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

(ii)	Silicon	• Sodium Hydroxide Solution • Hydrogen Peroxide • Concentrated Sulphuric Acid • 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 • 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
(iii)	Iron	• 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
(iv)	Manganese	• 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
(v)	Titanium	• Sodium Hydroxide Solution • Nitric Acid-Sulphuric Acid Mixture • Dilute Sulphuric Acid • Hydrogen Peroxide • Standard Titanium Solution • Filter Papers • Weighing Balance • Heating Apparatus/Burner
(vi)	Magnesium	• Sodium Hydroxide Solid • Hydrogen Peroxide • Sodium Carbonate- Solid • Methyl Red • Ammonium Hydroxide • Ammonium Chloride • Hydrochloric Acid • Hydrogen Sulphide- Gas • Ammonium Persulphate • Ammonium Sulphide • Bromine Water • Hydroxyquinoline • Glacial Acetic Acid • Dilute Ammonium Hydroxide • Methyl Orange • Alcohol • Potassium Hydroxide • Potassium Bromide • Potassium Bromate • Potassium Iodide Solution • Soluble Starch

		• Potassium Iodate • Sodium Thiosulphate • Erlynmeyer Flask • Titration Assembly • Analytical Balance • General Glasswares • Hot Plate • Filter Papers • Sintered Glass Funnel • Burner • Ammoniacal Water
(vii)	Chromium	• 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
(viii)	Zinc	• Dilute Hydrochloric Acid • Potassium Chlorate • Carbon Tetrachloride • Ammonium Hydroxide • Ammonium Oxalate • Sodium Acetate • Sodium Thiosulphate • Sodium Sulphide • Dithizone • Pure Zinc(99.95%) • Analytical Balance • Burner • Filter Paper • Titration Assembly • Spectrophotometer
(ix)	Lead	• Sodium Hydroxide • Dilute Hydrochloric Acid • Nitric Acid

		• Dilute Sulphuric Acid • Hydrogen Sulphide-Gas • Sulphuric Acid • Tartaric Acid • Ammonium Chloride-Solid • Ammonium Hydroxide • Dimethylglyoxime • Burner • Filter Paper • Dessicator • General Glasswares
(x)	Nickel	• Sodium Hydroxide • Dilute Hydrochloric Acid • Nitric Acid • Dilute Sulphuric Acid • Hydrogen Sulphide-Gas • Sulphuric Acid • Tartaric Acid • Ammonium Chloride-Solid • Ammonium Hydroxide • Dimethylglyoxime • Burner • Filter Paper • Dessicator • General Glasswares
(xi)	Tin	• Conical Flask with a three-holed rubber stopper containing an inlet tube for carbon dioxide, an air condenser and a hole for a burette that is kept closed by means of a glass rod • Antimony-metallic powder • Aluminum Sheet or Rolled Foil • Dilute Hydrochloric Acid • Carbon Dioxide-Gas • Starch • Potassium Iodide • Potassium Iodate • Sodium Hydroxide • Tin • Analytical Balance • Burner • Arrangement for passing current of Carbon Dioxide gas • General Glasswares

Note: The above is an indicative list for the purpose of guidance only

ANNEX- C SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is:

a) For Primary and Secondary Aluminium Manufacturers: All Aluminum Ingots/Castings of the same cast, of the same Temper (applicable in case of Castings), Alloy (designation) and manufactured from the same casting process (in case of castings) under uniform conditions of production in one go shall constitute a control unit.

b) For Manufacturers manufacturing only Castings: All Aluminium Castings manufactured from the same cast of raw material, of the same Alloy Designation, Temper and manufactured from the same casting process under uniform conditions of production in one go shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L) shall be incorporated suitably/legibly on the Ingots/Castings and the marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conforms to all the requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 Additional Marking requirements: The material or packaging shall also be marked with the following additional requirement:

- a) “For BIS certification details please visit www.bis.gov.in”
- b) Any other requirement not specified in the Indian Standard

4. TEST CERTIFICATE – For each consignment of BIS Certified material conforming to IS 617:2024 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).

5. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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.

TABLE 1
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S:Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
6	Chemical Composition	6.1 to 6.4 9.1.1, 9.1.2, 9.1.3 Table 1	IS 617 IS 504(all parts) Any other established instrumental/chemical method	R	One	Each Heat/Cast	—
7, 7.1	Mechanical Properties (Applicable for castings only) The mechanical properties for separately cast test pieces for sand cast, chill cast and investment cast conditions shall be in accordance with Table 2, Table 3 and Table 4 respectively. For each alloy, mechanical properties are only specified for the commonly used methods of casting and for commonly used tempers. For other processes and tempers mechanical properties shall be agreed between manufacturer and purchaser. In case of non-availability of separately cast test samples, test piece machined from the castings may be tested. The form, size and location of test pieces, and the minimum mechanical test values to be obtained from them, shall be as agreed to between the supplier and the purchaser. However, agreed value tensile properties should not be less than 75 percent of the specified value.						
7.2	Tensile Test	7.1, 7.2, 7.3	IS 617 IS 1608(Part 1)	R	One	Each control unit	—

7.4	Hardness	7.4	IS 617 IS 1500(Part 1)	R	One	Each control unit	—
8	Freedom from Defects						
8.1	Ingots	8.1	IS 617	R	Manufacturer shall exercise adequate in-process controls to ensure that each Ingot remains free from harmful defects		
8.2	Castings	8.2.1, 8.2.2	IS 617 IS 3658	R	Manufacturer shall exercise adequate in-process controls to ensure that each Casting remains free from harmful defects and cracks.		
				S	The dye penetrant test (see IS 3658) process may be used to detect cracks if required by the purchaser and standard of acceptance shall be mutually agreed to between the supplier and the purchaser.		
				S	Radiography/ultrasonic tests may be tested in special cases subject to agreement between the purchaser and the supplier. The details of the test methods to be used, the frequency of inspection and standards of acceptance should be based on mutual agreement of purchaser and manufacturer.		
11	Pressure Test	11	IS 617	S	One	Each Castings	if required by the purchaser each casting shall be pressure tested. Details such as test medium test pressure and time under test shall be as per agreement between purchaser and manufacturer. All castings shall be leak proof

Annexure-I
(Para 4 of the Scheme of Inspection and Testing)
XYZ Aluminium Company
(Registered office Address and works address)

ISI Mark
With IS No.
and CM/L
no.

Test Certificate for Aluminium and Aluminium Alloys Ingots for Remelting and Castings for General Engineering Purposes
TEST CERTIFICATE NO. _____

To M/s _____ Dated _____

We certified that the material described below fully conforms to IS 617:2024 Chemical composition and Physical properties 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.

(PLEASE REFER TO IS 617:2024 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Alloy Chemical Symbol	Form(Ingot/ Casting) along with Cast No.	Temper (applicable in case of Castings)	Chemical Composition (in %)													Mechanical Properties (Applicable in case of Castings)				Pressure Test (Optional)	Remarks
				Al	Cu	Si	Mg	Fe	Ni	Zn	Pb	Sn	Ti	Mn	Cr	Others	Tensile Strength MPa	0.2% Proof Stress	Elongation %	Hardness Test		

Remarks
Wagon No.
Truck No.

FOR XYZ ALUMINIUM COMPANY

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