



उत्पाद मानुयल

प्रशीतन प्रयोजनों के लिए एल्युमिनियम ट्यूब

विशिष्टता

IS 9612:1980 के अनुसार

**PRODUCT MANUAL FOR ALUMINIUM
TUBES FOR REFRIGERATION PURPOSES
ACCORDING TO IS 9612:1980**

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनिमय **2018** की स्कीम -I के तहत यह उत्पाद मैनुअल प्रमाणीकरण की संचालन रीति में सुसंगत और पारदर्शिता सुनिश्चित करने के लिए सभी क्षेत्रीय /शाखा कार्यालयों एवं लाइसेंस धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेंस/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज 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 9612:1980
	शीर्षक Title	:	Specification for aluminium tubes for refrigeration purposes
	संशोधनों की संख्या No. of Amendments	:	1
2.	नमूनकरण दिशा निर्देश 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)	समूहिकरण दिशा निर्देश Grouping guidelines	: Please refer Annex-A
c)	नमूने का परिमाण Sample Size	: For chemical test: 5 pcs of 5 cm length For Mechanical tests: 3 m 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).
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 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 कार्यक्षेत्र /Scope of the License : IS 9612:1980 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 9612:1980 with the following scope:	
	Name of the product	Aluminium tubes for Refrigeration Purposes
	Material Grade	19000 or 19500
	Size	Outside Diameter from ...xx...mm to up to and includingxx... mm, Wall Thickness fromxx...mm to up to and includingxx... mm

ANNEX A

Grouping Guidelines

1) IS 9612:1980 covers the requirements of Aluminum tubes in straight length or coil form for refrigeration purposes. This standard covers 2 Material grades of Aluminium Tubes namely 19000 & 19500, Outside Diameter from 6 to 50 mm and thickness from 1 to 3 mm

2) In view of above, it is proposed to have the following grouping guidelines for the purpose of GoL/CSoL:-

a) Samples, covering combination of lowest and highest Outside Diameter (OD) and wall thickness of Tubes, from the sizes intended to be covered in the licence, shall be drawn and tested to cover all sizes of Tubes.

b) Separate Samples for each Material (19000 and 19500) are also required to be drawn and tested

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

4) 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 Equipment*****(INDICATIVE LIST, FOR GUIDANCE ONLY)***

Tests used in with Clause Reference	Test Equipment
Chemical Composition (Clause 6.1)	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 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/polyethene/SS Beaker Pyrex beakers and other glassware
Copper	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, silica basin.
Silicon (0.02 to 0.3%)	Reagents- Sodium Hydroxide Solution, Dilute Nitric Acid, Ammonium Molybdate Solution, Standard Silicon Solution
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,,Hydrofluoric Acid
Iron	Reagents -Concentrated Sulphuric Acid, Concentrated Nitric Acid, 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.
Manganese	Reagents - Sodium Hydroxide Solution, Acid Mixture (Phosphoric Acid and Conc. Nitric Acid), Sodium Nitrite Solution, hydrofluoric acid, Conc Sulphuric acid, Potassium periodate, Standard Manganese Solution.
Zinc	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.
Tensile properties	Universal Tensile Testing Machine Extensometer
Flattening Test	Flattening Test Machine, Vernier Caliper, Filing or Chamfering Equipment
Pressure Test	Hydrostatic Test Equipment, Pressure Gauge
Dimensions	Vernier Caliper Micrometer

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/btch 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: **All Aluminum tubes of the same size and Material grade manufactured from same cast of raw material on the same line in one go in a same way up to 500 kg 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/empaneled 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/empaneled 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 licence shall be incorporated legibly and indelibly on the product and on the test, certificate accompanied along with each consignment provided always that the material so marked conforms to each requirement of the specification.

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

4. TEST CERTIFICATE: For each consignment of BIS Certified material conforming to IS 9612:1980 there shall be a test certificate which shall contain the Standard Mark, the batch/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)		
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				
3	Supply of Material	3	IS 9612	R	Manufacturer shall maintain adequate controls to ensure Each Coil/Length of Tubes shall be supplied in accordance with the provisions of the specification		
4	Workmanship and Finish	4	IS 9612	R	Manufacturer shall exercise adequate in- process controls to ensure that the tubes remain free from harmful defects		
6.1	Chemical Composition	6.1	IS 9612 IS 504 or any other established Instrumental / Chemical method	R	One	Each Heat /Cast	In case of the Material procured from Outside for manufacture of Tubes is ISI marked and is received with test certificate, no further testing is required
6.2	Tensile Test	6.2	IS 9612 IS 1608 (Part 1)	R	One	Each Control Unit	-----
6.3	Flattening Test	6.3	IS 9612 IS 2328	R	One	Each Control Unit	-----
6.4	Pressure Test requirement	6.4	IS 9612	R	One	Each Control unit	-----
7	Dimensions and Tolerances	7.1 Table 1 Table 2	IS 9612	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.		

TEST CERTIFICATE No. _____

DATE_____

To M/s_____

(PLEASE REFER TO IS 9612:1980 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TESTRESULTS

Order No.& Date								
Material grade and condition								
Control Unit No.								
Quantity in tonnes								
	CHEMICAL COMPOSITION							
Al %								
Cu %								
Mg %								
Si %								
Fe %								
Mn %								
Zn %								
T.I.%								
Tensile Strength								
Elongation								
Flattening Test								
Pressure Test requirements								
Dimensions								

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

FOR XYZ COMPANY