



उत्पाद मानुयल
सिंचाई प्रयोजनों के लिए एल्यूमीनियम मिश्र धातु ट्यूब -
विशिष्टता भाग 1 वेल्डेड ट्यूब
IS 7092 (Part 1):1992 के अनुसार

PRODUCT MANUAL FOR
Aluminum Alloy Tubes for Irrigation Purposes –
Specification Part 1 Welded Tubes as per IS 7092 (Part 1):1992

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन (विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरणके प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में 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 7092 (Part 1):1992
	शीर्षक Title	:	Aluminum Alloy Tubes for Irrigation Purposes – Specification Part 1 Welded Tubes
	संशोधन संख्या No. of amendments	:	NIL
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	The tubes shall be manufactured from raw material strips/sheets conforming to the aluminum alloys 31000, 31500, 40800, 51300, 52000, 53000 and 55000 as per IS 737
b)	समूहिकरण दिशा निर्देश Grouping Guidelines	:	Please see Annex-A

c)	नमूने का परिमाण Sample Size	:	For chemical test: 5 pcs of 5 cm length For tensile properties, flattening test: 1 m length of Tube For Hydrostatic Pressure Test: No sample shall be drawn for Third Party Testing. All full length tubes shall be tested in the factory for the requirements of Hydrostatic Pressure Test as per cl.7.4 of IS 7092(Part 1). For Dimensions and Tolerances: The requirements of Dimensions and Tolerances as per cl.8. of IS 7092 (Part 1) shall also be tested in the factory on all tubes from which samples are drawn for Third Party Testing.
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 are possible to be carried out in a day
6.	लाइसेन्स का कार्यक्षेत्र /Scope of the Licence :		
	IS 7092 (Part 1) के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 7092 (Part 1) with the following scope:		
	Name of the product	Aluminum Alloy Tubes for Irrigation Purposes – Specification Part 1 Welded Tubes	
	Alloy Designation	31000, 31500, 40800, 51300, 52000, 53000,55000	
	Condition (Temper)	O, HX2, HX4, HX6, HX8	
	Size	Tubes of Nominal Diameter from 50.8 mm to up to and including 203.2 mm	

BUREAU OF INDIAN STANDARDS

Manak Bhawan, 9, Bahadur Shah
Zafar Marg, New Delhi – 110002

**ANNEXURE A
TO PRODUCT MANUAL
FOR
Aluminum Alloy Tubes for Irrigation Purposes –
Specification Part 1 Welded Tubes as per IS 7092 (Part 1):1992**

GROUPING GUIDELINES

- 1) IS 7092 (Part 1) covers the requirements of Electric resistance welded aluminum alloy tubes for irrigation (including sprinkler irrigation) purposes and suitable for a maximum working pressure of 1000 kN/mm² for diameters up to and including 203.2 mm.
- 2) These tubes shall be manufactured from strips and sheets of alloys 31000, 31500, 40800, 51300, 52000, 53000 and 55000 conforming to IS 737.
- 3) In view of above, for the purpose of GoL/CSoL, the following grouping guidelines may be considered:-

Group	Designations	Grouping
1	31000 31500	Within each group, samples of Tubes of the lowest and highest outside diameter shall be drawn to cover the range of sizes for tubes intended to be covered.
2	40800	
3	51300 52000 53000 55000	If sample drawn above is of alloy designation having higher major alloying element content, alloys having lower major alloying element content shall also be covered in the licence. Further, if sample drawn above is of Condition (temper) producing higher minimum tensile strength, Conditions (temper) producing lower minimum tensile strength shall also be covered in the licence.

4) Hydrostatic Pressure Test as per cl.7.4 of IS 7092 (Part 1) shall be carried out in the factory on full length of all tubes from which samples are drawn for Third Party Testing. Further, the requirements of Dimensions and Tolerances as per cl.8. shall also be tested in the factory on all tubes from which samples are drawn for Third Party Testing.

5) However, it shall be ensured that the firm is having all the necessary manufacturing and testing facilities for manufacturing/testing of all the alloy designations/conditions/sizes covered in the scope of the licence.

6) During the operation of the licence, BOs shall ensure that all alloy designations/conditions/sizes covered in the scope of the licence are drawn for independent testing in rotation over a period of time.

**ANNEXURE B
TO PRODUCT MANUAL
FOR
Aluminum Alloy Tubes for Irrigation Purposes –
Specification Part 1 Welded Tubes as per IS 7092 (Part 1):1992**

LIST OF TEST EQUIPMENTS

Major test equipment essentially 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.	Spectrometer, 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/polyethylene/SS Beaker, Pyrex beakers and other glassware	Chemical Composition, cl.7.1.
2.	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.	Copper (Below 0.1%)
3.	Reagents – Concentrated Sulphuric Acid, Concentrated Nitric Acid, Concentrated Hydrochloric Acid, Mixed Acids(Conc.HCL, Conc. Sulphuric Acid, Conc. Nitric Acid), Hydrofluoric Acid, Dilute Sulphuric Acid, Ammonium Fluoride, Concentrated Ammonium Hydroxide, Acetic Acid, Urea Solution, Potassium Iodide Solution, Standard Sodium	Copper (Above 0.1%)

	Thiosulphate Solution, Starch solution, ammonium thiocyanate, Sodium Hydroxide Solution, Sodium Sulphate Solution, Sodium Hydroxide-Sodium Sulphate Wash Solution, Dilute Nitric Acid, Sulphurous Acid, Hydrogen Copper (Above 0.1%) PM/ IS 733/1 Oct 2018 Sulphide(gas), Hydrogen Sulphide Wash Solution	
4.	Reagents – Sodium Hydroxide, Hydrogen Peroxide, Sodium Carbonate, Methyl Red Indicator Solution, Conc. Ammonium Hydroxide, Ammonium Chloride Wash Solution, Ammonium Chloride, Conc. Hydrochloric Acid, Ammonium Sulphide Solution, Ammonium Persulphate, Ammonium Sulphide Wash Solution, Bromine Water, 8-Hydroxyquinoline Solution, Dilute Ammonium Hydroxide, Methyl Orange Indicator Solution, Potassium Bromate-Potassium Bromide Solution, Potassium Iodide Solution, Starch Solution, Standard Potassium Iodate Solution, Standard Sodium Thiosulphate Solution	Magnesium (0.01 to 12 %)
5.	Reagents – Sodium Hydroxide Solution, Hydrogen Peroxide, Potassium Cyanide Solution, Dilute Hydrochloric Acid, Ammonium Chloride, Bromine Water, Conc. Ammonium Hydroxide, Sodium Acetate, Tartaric Acid, Chrome Blank T Indicator, Standard Magnesium Sulphate, Standard EDTA Solution.	Magnesium (0.5 to 11%)
6.	Reagents- Sodium Hydroxide Solution, Dilute Nitric Acid, Ammonium Molybdate Solution, Standard Silicon Solution.	Silicon (0.02 to 0.3%)
7.	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	Silicon (Above 0.3%)
8.	Reagents-Sodium Hydroxide Solution, Finely granulated lead containing under 0.001% iron,	Iron (0.03 to 0.10%)

	Acetate Buffer Solution, Hydroxylamine Hydrochloride Solution, O-phenanthroline solution, Standard Iron Solution. Equipment – Magnet, Nickel Beaker.	
9.	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.	Iron (0.01 to 2.0%)
10.	Reagents – Sodium Hydroxide Solution, Sodium Nitrite Solution, Acid Mixture(Conc. Nitric Acid and Phosphoric Acid), Hydrofluoric Acid, Potassium Periodate Solution, Standard Manganese Solution	Manganese (Mn content between 0.01 to 0.1%)
11.	Reagents - Sodium Hydroxide Solution, Acid Mixture(Conc. Sulphuric Acid, Phosphoric Acid and Nitric Acid), Silver Nitrate Solution, Ammonium Persulphate Solution, Ammonium Chloride Solution, Standard Arsenite-Nitrite Mixture, Sodium Arsenite, Standard Manganese Solution.	Manganese (Chromium Content up to 0.5%)
12.	Reagents – Conc. Nitric Acid, Sodium Bismuthate, Sulphurous Acid, Dilute Nitric Acid, Phosphoric Acid, Standard Ferrous Ammonium Sulphate Solution, Standard Sodium Oxalate Solution, Standard Potassium Permanganate Solution. Equipment- Asbestos Gooch Crucible	Manganese (Mn content between 0.1 to 1.5%)
13.	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,	Zinc (Photometric Method for Zn content below 0.1%)

	Sodium Sulphide Wash Solution, Standard Zinc Solution.	
14.	Reagents – Mixed Acid(Conc. Sulphuric Acid, Conc. HCl and Conc. Nitric Acid), Dilute Sulphuric Acid, Hydrogen Sulphide(gas), Hydrogen Sulphide Wash Solution, Tartaric Acid Solution, Conc. Ammonium Hydroxide, Methyl Red Indicator Solution, Formic Acid Mixture, Formic Acid Wash Solution, Dilute Hydrochloric Acid, Ammonium Nitrate, Methylated Spirit, Mercuric Potassium Thiocyanate Solution, Chloroform, Standard Zinc Solution, Standard Potassium Iodate Solution.	Zinc (By Mercuric Thiocyanate Method)
15.	Reagents – Sodium Hydroxide Solution, Nitric Acid-Sulphuric Acid Mixture, Dilute Sulphuric Acid, Hydrogen Peroxide, Standard Titanium Solution.	Titanium
16.	Reagents – Conc. Sulphuric Acid, Conc. Nitric Acid, Silver Nitrate, Hydrofluoric Acid, Ammonium persulphate, Dilute HCl, Standard Ferrous Ammonium Sulphate Solution, Standard Potassium Permanganate Solution.	Chromium
17.	Universal Tensile Testing Machine with extensometer	Tensile Properties, cl.7.2
18.	Flattening Test Machine, Vernier Caliper, Sample Preparation Facilities	Flattening Test, cl.7.3
19.	Pressure Gauge Range 0-30 kg/cm ² (LC 0.1 kg/cm ²) Hydrostatic Test set up Stop Watch (Range 0-999 hrs)(LC 1sec)	Hydrostatic Pressure Test, cl.7.4

Note 1: The above is an indicative list for the purpose of guidance only and may not be treated as exhaustive

ANNEXURE C
TO PRODUCT MANUAL FOR
Aluminum Alloy Tubes for Irrigation Purposes –
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SCHEME OF INSPECTION AND TESTING

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 equipments.

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

3. LABELLING, MARKING, PACKING - The Standard Mark as given in schedule of the licence and Licence Number (i.e. CM/L) shall be incorporated on the product and on the test certificate accompanied along with each consignment, and the marking and packing shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conform to all the requirements of the specification.

4. CONTROL UNIT – All tubes of the same composition, temper, dimensions and produced in the same way and of the same cast/heat shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

6. TEST CERTIFICATE - For each consignment of BIS Certified material conforming to **IS 7092 (Part 1):1992** 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)

7. 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. Any rejected material which is potentially re-salable be sheared or cut or deformed in such a manner that it cannot be used for any other purpose except re-melting. A separate record shall be maintained giving information on quantity and cast number/control unit number, as applicable, relating to all such rejections/defective/sub-standard material of the production not conforming to the requirements of the Specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the Specification. The Standard Mark (if already applied) on rejected material should be defaced.

TABLE 1: LEVELS OF CONTROL

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARK S
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S: Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
5	Workmanship and Finish	5.1, 5.2, 5.3, 5.4	IS 7092 (Part 1)	R	Manufacturer shall maintain adequate inspection/in-process controls to ensure freedom from defects		
7.1	Chemical Composition	7.1, 7.1.1.	IS 7092 (Part 1) IS 737 IS 504 (all parts)	S	One	Each Heat	In case of raw material sheets/strips procured from outside, the manufacturer shall ensure that the material is received with test certificate indicating the alloy designation and its chemical composition. No further testing is required if the raw material sheets/strips procured are ISI marked as per IS 737.

7.2	Tensile Properties	----	IS 7092 (Part 1) IS 737 IS 1608 (Part 1)	R	One	Each Control Unit	-----
7.3	Flattening Test	7.3, 7.3.1, 7.3.2	IS 7092 (Part 1) IS 2328	R	One	Each Control Unit	-----
7.4	Hydrostatic Pressure Test Requirement	---	IS 7092 (Part 1)	R	Each Tube	Each Tube	-----
8	Dimensions and Tolerances	Table 1	IS 7092 (Part 1)	R	Adequate inspection to ensure that the tubes conform to the requirements of the specification		

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 empanelled 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.

ANNEXURE I

(Para 6 of the Scheme of Inspection and
Testing) XYZ ALUMINUM
COMPANY

(Registered office Address and works address)

TEST CERTIFICATE

**Aluminum Alloy Tubes for Irrigation Purposes –
Specification Part 1 Welded Tubes as per IS 7092 (Part 1):1992**

DATE_____

TEST CERTIFICATE No. _____

BIS
STANDA
RD
MARK

To M/s_____

We certified that the material described below fully conforms to IS **7092 (Part 1):1992** Chemical composition and Mechanical properties of the product, as tested in accordance with the Scheme of Testing and Inspection contained in the BIS Certification Marks Licence No. CM/L_____ are as indicated below against each order No.

(PLEASE REFER TO IS **7092 (Part 1):1992** FOR DETAILS OF
SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Nominal Size	Control Unit No.	Alloy Designation	Quantity in tonnes	CHEMICAL COMPOSITION								Tensile Strength	Dimensions and Tolerances	Hydrostatic Pressure Test	Flattening Test	Remarks
					Al %	Si %	Mn %	Fe %	Mg %	Zn %	Cu %	Ti % etc.					

REMARKS

WAGON

NO.

TRUCK NO.

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

FOR XYZ ALUMINUM COMPANY