



## उत्पाद मानुयल

### SPECIFICATION FOR ALUMINIUM ALLOY

### TUBES FOR IRRIGATION PURPOSES

### PART 2 EXTRUDED TUBE IS 7092(Part2 ):1987

### के अनुसार

**PRODUCT MANUAL FOR  
SPECIFICATION FOR ALUMINIUM ALLOY TUBES  
FOR IRRIGATION PURPOSES  
PART 2 EXTRUDED TUBE  
ACCORDING TO IS 7092(Part2 ):1987**

भारतीय मानक ब्यूरो -स्कीम की विनियम (मूल्यांकन अनुरूपता)I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन मे रीति और पारदर्शिता के सुसंगता सुनिश्चित करने के लिए सभी क्षेत्रीय शाखा द्वारा धारियों लाइसेन्स एवं कार्यालयोंसंदर्भ सामग्री के रूप मे उपयोग किया जाएगा। बीआईएस लाइसेन्स जा किया उपयोग का दस्तावेज़ इस भी द्वारा आवेदकों भावी इच्छुक के करने प्राप्त पत्र प्रमाण है। सकता

*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<br>Product                  | : | IS 7092(Part2 ):1987                                                                        |
|    | शीर्षक<br>Title                    | : | SPECIFICATION FOR ALUMINIUM ALLOY TUBES<br>FOR IRRIGATION PURPOSES<br>PART 2 EXTRUDED TUBES |
|    | संशोधन संख्या<br>No. of Amendments | : | 02                                                                                          |

|    |                                                                                                                                                                                                                          |                                                                                                               |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 2. | <b>नमूनाकरण दिशा निर्देश</b><br><b>Sampling Guidelines:</b>                                                                                                                                                              |                                                                                                               |
| a) | <b>कच्चा माल</b><br><b>Raw material</b>                                                                                                                                                                                  | : No specific raw material requirement                                                                        |
| b) | <b>समूहिकरण दिशा निर्देश</b><br><b>Grouping guidelines</b>                                                                                                                                                               | : Please refer ANNEX –A                                                                                       |
| c) | <b>नमूने का परिमाण</b><br><b>Sample Size</b>                                                                                                                                                                             | : 2mtr* 1 No for all Mechanical tests<br>100gms drillings or 5 pieces of 5cm* 5 pieces for all chemical tests |
| 3. | <b>परीक्षण उपकरणों की सूची</b><br><b>List of Test Equipment</b>                                                                                                                                                          | : Please refer ANNEX –B                                                                                       |
| 4. | <b>निरीक्षण व परीक्षण स्कीम</b><br><b>Scheme of Inspection and Testing</b>                                                                                                                                               | : Please refer ANNEX –C                                                                                       |
| 5. | <b>एक दिन में संभावित परीक्षण</b><br><b>Possible tests in a day :</b>                                                                                                                                                    |                                                                                                               |
|    | All tests can be carried out in a day.                                                                                                                                                                                   |                                                                                                               |
| 6. | <b>लाइसेन्स का कार्यक्षेत्र</b><br><b>Scope of the Licence :</b>                                                                                                                                                         |                                                                                                               |
|    | IS 7092(Part2):1987 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है<br>“Licence is granted to use Standard Mark as per IS 7092(Part2):1987 with the following scope: |                                                                                                               |
|    | <b>Name of the product</b>                                                                                                                                                                                               | Specification for aluminium alloy tubes for irrigation purposes<br>Part 2 extruded tubes                      |
|    | <b>Nominal Size</b>                                                                                                                                                                                                      | 50mm,<br>63mm,75mm,90mm,100mm,125mm,150mm,175mm,200mm                                                         |

**ANNEX A TO THE  
PRODUCT MANUAL FOR  
SPECIFICATION FOR ALUMINIUM ALLOY TUBES  
FOR IRRIGATION PURPOSES  
PART 2 EXTRUDED TUBE  
AS PER IS 7092(Part2 ):1987**

**Grouping Guidelines**

IS 7092 (Part 2) specifies Aluminium Alloy tubes to be manufactured from Aluminium Alloy 63400 in WP temper in the following nominal sizes :

**50 mm, 63mm,75mm,90mm,100mm,125mm,150mm,175mm,200mm**

For the purpose of GoL/CSoL, the following grouping guidelines shall be considered:-

- 1) One sample of any nominal size of tubes, intended to be covered under the licence , shall be tested for all the requirements of the specification to cover the remaining sizes being manufactured as well.
- 2) Since Hydrostatic Pressure Test as per cl.5.3. is to be carried out on full length of the tube, the same may be carried out by the IO in the factory during Preliminary Inspection on all samples drawn for Independent testing.
- 3) It shall, however, be ensured that the applicant/licensee has got complete manufacturing as well as testing facilities for the sizes of tubes required to be covered in the licence.
- 4) During the operation of license, BO shall ensure that all the sizes of tubes covered in the licence are drawn for independent testing on rotation over a period of time.

**ANNEX B TO THE  
PRODUCT MANUAL FOR  
SPECIFICATION FOR ALUMINIUM ALLOY TUBES  
FOR IRRIGATION PURPOSES  
PART 2 EXTRUDED TUBE  
AS PER IS 7092(Part2 ):1987**

**List of Test Equipment**

| S. No. | Tests used in with Clause reference                                                                   | Test Equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | <p style="text-align: center;"><b>Chemical Composition</b></p> <p style="text-align: center;">6.1</p> | <p><b>Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels and Certified/Standard Reference Materials</b></p> <p style="text-align: center;">OR</p> <p><b>Chemicals and Reagents for Chemical method as per IS 504 for each element given below**</b></p>                                                                                                                                                                                                                                                                                                                                                                        |
|        | <p style="text-align: center;">Copper</p>                                                             | <ul style="list-style-type: none"> <li>• Dilute Sulphuric Acid</li> <li>• Hydrofluoric Acid</li> <li>• Hydrogen Sulphide Gas</li> <li>• Hydrogen Sulphide Wash Solution</li> <li>• Dilute Nitric Acid</li> <li>• Concentrated Ammonium Hydroxide</li> <li>• Dilute Ammonium Hydroxide Wash Solution</li> <li>• Citric Acid Solution</li> <li>• Sodium Diethyl-Dithiocarbamate Solution</li> <li>• Carbon Tetrachloride</li> <li>• Sodium Sulphate</li> <li>• Standard Copper Solution</li> <li>• Silica Basin</li> <li>• Analytical Balance</li> <li>• Ashless Paper Pulp</li> <li>• Filter Papers</li> <li>• Platinum Crucible</li> <li>• Heating Apparatus/Burner</li> </ul> |

|  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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|  |           | <ul style="list-style-type: none"> <li>• Photometer</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  | Magnesium | <ul style="list-style-type: none"> <li>• Sodium Hydroxide</li> <li>• Hydrogen Peroxide</li> <li>• Sodium Carbonate</li> <li>• Sodium Carbonate Solution</li> <li>• Methyl Red Indicator Solution</li> <li>• Concentrated Ammonium Hydroxide</li> <li>• Ammonium Chloride Wash Solution</li> <li>• Ammonium Chloride</li> <li>• Concentrated Hydrochloric Acid</li> <li>• Ammonium Sulphide Solution</li> <li>• Ammonium Persulphate</li> <li>• Ammonium Sulphide Wash Solution</li> <li>• Bromine Water</li> <li>• 8-Hydroxyquinoline Solution</li> <li>• Dilute Ammonium Hydroxide</li> <li>• Methyl Orange Indicator Solution</li> <li>• Potassium Bromate</li> <li>• Potassium Bromide</li> <li>• Potassium Iodide Solution</li> <li>• Starch Solution</li> <li>• Standard Potassium Iodate Solution</li> <li>• Standard Sodium Thiosulphate Solution</li> <li>• Analytical Balance</li> <li>• Ashless Paper Pulp</li> <li>• Filter Papers</li> <li>• Heating Apparatus/Burner</li> </ul> |
|  | Silicon   | <ul style="list-style-type: none"> <li>• Sodium Hydroxide Solution</li> <li>• Hydrogen Peroxide</li> <li>• Concentrated Sulphuric Acid</li> <li>• Sulphuric Acid-Perchloric Acid Mixture</li> <li>• Perchloric Acid Solution</li> <li>• Concentrated Nitric Acid</li> <li>• Sulphurous Acid</li> <li>• Dilute Sulphuric Acid</li> <li>• Concentrated Hydrochloric Acid</li> <li>• Ammonium Acetate Solution</li> <li>• Dilute Hydrochloric Acid-</li> <li>• Hydrofluoric Acid</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|  |           | <ul style="list-style-type: none"> <li>Analytical Balance</li> <li>Ashless Paper Pulp</li> <li>Filter Papers</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|  | Iron      | <ul style="list-style-type: none"> <li>Concentrated Sulphuric Acid</li> <li>Concentrated Hydrochloric Acid</li> <li>Concentrated Nitric Acid</li> <li>Dilute Sulphuric Acid</li> <li>Hydrofluoric Acid</li> <li>Potassium Bisulphate</li> <li>Hydrogen Sulphide Gas</li> <li>Hydrogen Sulphide Wash Solution</li> <li>Potassium Permanganate Solution</li> <li>Potassium Thiocyanate Solution</li> <li>Standard Titanous Chloride Solution</li> <li>Analytical Balance</li> <li>Platinum Crucible</li> <li>Heating Apparatus/Burner</li> <li>Magnet</li> <li>Ashless Paper Pulp</li> <li>Filter Papers</li> </ul> |
|  | Manganese | <ul style="list-style-type: none"> <li>Concentrated Nitric Acid</li> <li>Sodium Bismuthate</li> <li>Sulphurous Acid</li> <li>Dilute Nitric Acid</li> <li>Phosphoric Acid</li> <li>Standard Ferrous Ammonium Sulphate Solution</li> <li>Standard Sodium Oxalate Solution</li> <li>Standard Potassium Permanganate Solution</li> <li>Analytical Balance</li> <li>Asbestos Gooch Crucible</li> <li>Heating Apparatus/Burner</li> </ul>                                                                                                                                                                               |
|  | Zinc      | <ul style="list-style-type: none"> <li>Concentrated Sulphuric Acid</li> <li>Concentrated Hydrochloric Acid</li> <li>Dilute sulphuric acid</li> <li>Hydrogen Sulphide gas</li> <li>Hydrogen Sulphide Wash Solution</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |

|  |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|  |          | <ul style="list-style-type: none"> <li>• Tartaric Acid Solution</li> <li>• Concentrated ammonium hydroxide</li> <li>• methyl red indicator solution</li> <li>• Formic Acid</li> <li>• Ammonium Sulphate</li> <li>• dilute hydrochloric acid</li> <li>• concentrated nitric acid</li> <li>• methylated spirit</li> <li>• mercuric potassium thiocyanate solution</li> <li>• Chloroform</li> <li>• Standard Zinc Solution</li> <li>• Standard Potassium Iodate Solution</li> <li>• Sintered-Glass Crucible</li> <li>• Drying Oven</li> <li>• Weighing Balance</li> <li>• Ashless Paper Pulp</li> <li>• Filter Papers</li> </ul> |
|  | Chromium | <ul style="list-style-type: none"> <li>• Conc. Sulphuric Acid</li> <li>• Conc. Nitric Acid</li> <li>• Silver Nitrate Solution</li> <li>• Hydrofluoric Acid</li> <li>• Ammonium Persulphate</li> <li>• Dil. Hydrochloric Acid</li> <li>• Standard Ferrous Ammonium Sulphate Solution</li> <li>• Standard Potassium Permanganate Solution</li> <li>• Weighing Balance</li> <li>• Heating Apparatus/Burner</li> </ul>                                                                                                                                                                                                            |
|  | Titanium | <ul style="list-style-type: none"> <li>• Sodium Hydroxide Solution</li> <li>• Nitric Acid-Sulphuric Acid Mixture</li> <li>• Dilute Sulphuric Acid</li> <li>• Hydrogen Peroxide</li> <li>• Standard Titanium Solution</li> <li>• Filter Papers</li> <li>• Weighing Balance</li> <li>• Heating Apparatus/Burner</li> </ul>                                                                                                                                                                                                                                                                                                      |

|   |                                            |                                                                                                                                                  |
|---|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | <b>Dimensions</b><br>cl.7., Table 1        | Vernier caliper<br><br>Micrometer<br>Range 0-200mm<br>LC 0.02mm<br><br>Range 0-25 mm<br>LC 0.01mm<br>Measuring Tape<br>0-10 mtr                  |
| 3 | <b>Hydrostatic Pressure Test</b><br>cl.6.4 | Pressure Gauge<br>Range 0-30 kg/cm <sup>2</sup> (LC 0.1 kg/cm <sup>2</sup> )<br>Hydrostatic Test set up<br>Stop Watch (Range 0-999 hrs)(LC 1sec) |
| 4 | <b>Mechanical Tests</b><br>cl.6.2          | Universal Testing Machine with Extensometer                                                                                                      |
| 5 | <b>Drift Expansion Test</b><br>6.3         | Universal Testing Machine<br>Conical Mandrels of included angle of 30°                                                                           |

***\*The above list is indicative only and may not be treated as exhaustive.***

**\*\* All the necessary glassware is required for testing along with chemicals mentioned above if the chemical composition is determined as per IS 504.**

**ANNEX C TO THE  
PRODUCT MANUAL FOR  
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PART 2 EXTRUDED TUBE  
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**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 a calibration plan for the test equipment's.

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

**3. LABELLING AND MARKING** – The Standard Mark as given in the Schedule of the license shall be marked at a suitable place on the outside of each tube, provided always that the tube thus marked conforms to all the requirement of the specification. Each tube shall carry legibly the manufacturer's name or trade mark. In addition, the following information shall be included in the label attached to each bundle or stencilled on the tube

- Name of the manufacturer/Logo/ Trade Mark or if any,
- Identification Mark in code or otherwise to enable the date and lot of manufacture to be traced back to factory records,
- Designation and Temper of the Alloy

**4. CONTROL UNIT** – All the tubes of the same size manufactured from the same consignment of the raw material in one shift (8 hrs or less) shall constitute a single 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.

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

**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. Any rejected material which is potentially resalable 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/coil number/control unit number, as applicable, relating to all such rejections/defective/substandard 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 (para 5 of the Scheme of Inspection & Testing)**

| (1)          |                        |             |                | (2)                                                                            | (3)               |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|------------------------|-------------|----------------|--------------------------------------------------------------------------------|-------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Details |                        |             |                | Test equipment requirement<br>R: required (or)<br>S: Sub-contracting permitted | Levels of Control |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Cl.          | Requirement            | Test Method |                |                                                                                | No. of Samples    | Frequency | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|              |                        | Clause      | Ref.           |                                                                                |                   |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4.1 to 4.3   | Workmanship and Finish | 4.1 to 4.3  | IS 7092(Part2) | R                                                                              | Each Tube         | Each Tube | The tubes failing in this requirement shall not be marked                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 5.3,6.3      | Hydrostatic Test       | 5.3, 6.4    | IS 7092(Part2) | R                                                                              | Each Tube         | Each Tube | a) The tubes for this test shall be so selected that the samples are scattered covering entire period of production of that batch<br>i) If any of the tubes in the sample first selected fails in this test, 10% of the tubes from the remaining tubes in the batch shall be selected according to IS 5.3.1 and tested<br>ii) If any of these additional tubes fail, the entire batch shall be rejected.<br>b) Each tube of the batch shall be tested for hydrostatic pressure test. The tubes |

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|           |                           |              |                                          |   |             |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------|---------------------------|--------------|------------------------------------------|---|-------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                           |              |                                          |   |             |                   | passing the test and the tubes failing in the test shall be separated. The tubes failing shall be rejected. The tubes passing shall be treated as passing this requirement of the specification.                                                                                                                                                                                                                               |
| 6.1,6.1.1 | Chemical Composition      | 6.1,6.1.1    | IS 504<br>IS<br>7092(Part2)              | R | One         | Each heat         | No further testing is required if the raw material is ISI marked and is received with test certificate                                                                                                                                                                                                                                                                                                                         |
| 6.2       | Mechanical Properties     | 6.2          | IS 1608<br>(Part 1)<br>IS<br>7092(Part2) | R | Two samples | Each control unit | If any one of the test piece first selected fail to pass the tensile test and drift expansion test, two further samples from the same batch shall be selected for testing, one of which shall be from the tube from which the original test sample was taken. If the test pieces from either of these additional samples fail, the batch represented by the test sample shall be deemed not to comply with this specification. |
| 6.3       | Drift Expansion Test      | 6.3, Table 1 | IS 2335<br>IS<br>7092(Part2)             | R | Two samples | Each control unit |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7.1       | Dimensions and Tolerances | Table 2      | IS<br>7092(Part2)                        | R | One         | Every Hour        | In case the sample fails, that hour's production shall not be marked. All the units in that hour's production shall be deemed to comply with the                                                                                                                                                                                                                                                                               |

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|     |        |        |               |   |     |                       |                                       |
|-----|--------|--------|---------------|---|-----|-----------------------|---------------------------------------|
|     |        |        |               |   |     |                       | requirements of dimensions and length |
| 7.2 | Length | cl.7.2 | IS 7092(Part2 | R | One | Every Hour Production | -do-                                  |

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.