



CORPORATE PURCHASING SPECIFICATION

AA19950

Rev No.03

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ALUMINIUM ALLOY SAND AND CHILL CASTINGS GR.4600M

1.0 GENERAL:

This specification governs the requirements of Aluminium alloy sand and chill castings of grade 4600M.

2.0 APPLICATION:

For complex, thin walled, pressure tight and vibration resistant castings with very good resistance to corrosion and good weld-ability.

3.0 CONDITION OF DELIVERY: As cast.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirements of the following national standard and also meet the requirements of this specification.

IS:617-1994 Gr.4600M: Aluminium and Aluminium alloys ingots and castings for general engineering purposes

5.0 DIMENSIONS AND TOLERANCES:

The dimensions of the castings shall be in accordance with the drawings supplied with the order. For un-machined surfaces, unless otherwise stated in the order/drawing, the tolerances on linear dimensions and wall thickness shall be as per Corporate Standard No. AA0230402.

6.0 MANUFACTURE:

The castings shall be sand or chill cast as specified in the order/drawing.

7.0 FINISH:

The castings shall be properly fettled and dressed and shall be thoroughly cleaned. The castings shall be supplied either in un-machined, rough-machined or finish-machined conditions as specified in the order/drawing.

8.0 FREEDOM FROM DEFECTS:

The castings shall be sound and free from harmful defects such as blow holes, inclusions, shrinkage, gas cavities, hot spots, cold shuts, cracks, gross porosity, dross etc., which may adversely affect the machining and utility of castings.

Revisions: Clause.17.11.46 of MOM of MRC(NFCW+HE)

APPROVED:
INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(NFM+HE)

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9.0 CHEMICAL COMPOSITION:

The chemical composition of the material, when analysed in accordance with IS:504 (Methods of Chemical analysis of Aluminium its alloys) or any other conventional / Instrumental methods shall be as follows

| Element | Percent | |
|------------|-----------|---------|
| | Minimum | Maximum |
| *Copper | - | 0.1 |
| Silicon | 10.0 | 13.0 |
| *Magnesium | - | 0.10 |
| Iron | - | 0.6 |
| *Manganese | - | 0.5 |
| *Nickel | - | 0.1 |
| *Zinc | - | 0.1 |
| *Lead | - | 0.1 |
| *Tin | - | 0.05 |
| *Titanium | - | 0.2 |
| Aluminium | Remainder | |

Note: These elements need not be determined when the material supplied conforms with the mechanical properties specified in this specification. However, the supplier shall ensure that the composition of the material is within the limits specified above.

10.0 TEST SAMPLES:

10.1 One test specimen shall be selected from each heat for chemical analysis. Care shall be taken to discard the first drillings till a clean oxide-free surface is reached.

10.2 One tensile test specimen shall be prepared from each as per clause 7 of IS:617

11.0 MECHANICAL PROPERTIES:

The test specimen when tested in accordance with IS:1608, the material shall show the following tensile properties:

| | Sand Castings | Chill Castings |
|---|---------------|----------------|
| Tensile Strength N/mm ² | 165 Min | 190 Min |
| % Elongation on $5.65 \sqrt{S_0}$ gauge or 50mm gauge length | 5 Min | 7 Min |



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12.0 ADDITIONAL TESTS:

If specified in the order/drawing the following additional tests shall be conducted on the castings.

- 1) Pressure test
- 2) Radiographic test

The requirements of these tests shall be as prescribed in the order/drawings or as tensile properties mutually agreed upon.

13.0 RETEST:

Should any of the test pieces first selected, fail to pass the prescribed tests mentioned under various clauses in this specification, two further samples from the same batch shall be selected for test. One of which shall be from the same component from which the original test sample was taken unless that component has been withdrawn by the supplier.

Should the test pieces from both these additional samples pass, the batch represented by the test sample shall be accepted. Should the test pieces from either of these additional samples fail, the batch represented by the test sample shall be rejected.

14.0 REPAIR OF CASTINGS:

The castings shall not be repaired, unless permission in writing has been obtained previously from BHEL.

15.0 TEST CERTIFICATES:

The supplier shall submit five copies of test certificates giving the following information.

BHEL Order No.

AA19950 (Rev. No. 03)

Supplier's reference and Name.

Method of manufacture

Heat No.

Results of chemical analysis, mechanical and all other tests as called for in this specification/order.

Drawing/Pattern No.

In addition, supplier shall ensure to enclose one copy of the test certificate along with the dispatch documents to facilitate quick clearance of the material.

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16.0 PACKING AND MARKING

Castings shall be suitably packed to prevent corrosion and damage during transit. Machined surfaces shall be properly protected with anti-corrosive compounds.

Each package or casting shall be legibly marked with the following information:

BHEL Order No.

AA19950

Heat No.

Identification mark/No.

Weight

Supplier's reference and Name

17.0 REFERRED STANDARDS (Latest Publications Including Amendments)

- 1) IS:617
- 2) AA0230402
- 3) IS:504
- 4) IS:1608