



CORPORATE PURCHASING SPECIFICATION

AA19953

Rev No.04

PREFACE SHEET

ALUMINIUM ALLOY SAND AND CHILL CASTINGS Gr.4635M

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

- | | | |
|-----------|---|--|
| 1. INDIAN | : | IS:617-1994, Grade-4635M |
| 2. GERMAN | : | DIN 1725-1983,
Gr:G-A/Si 10 Mg (Sand castings)
Gr:Gk-A/Si 10 Mg (Chill castings) |

Suggested/Probable Suppliers and Grades:

Refer plant vendors list

User Plants References:

- | | | |
|--------------|---|--|
| 1. HYDERABAD | : | |
| 2. TRICHY | : | |

Revisions:
Clause.25.1 of MOM of MRC-NFM+HE

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

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ALUMINIUM ALLOY SAND AND CHILL CASTINGS Gr.4635M

1.0 GENERAL:

This specification governs the requirements of Aluminium alloy sand and chill castings of grade 4635M.

2.0 APPLICATION:

For complex, thin walled, pressure tight and vibration resistant castings with high strength, moderate corrosion resistance and dimensional stability on temperature variations.

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.4635M: Aluminium and Aluminium alloy 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 specified in the order/drawing, the tolerances on linear dimensions and wall thickness shall be as per BHEL standard 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, dressed and 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 porosities, dross etc., which may adversely affect the machining and utility of castings.

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9.0 CHEMICAL COMPOSITION:

The chemical composition of the material when analysed in accordance with IS:504 (Methods for 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	0.2	0.6
Iron	-	0.6
Manganese	0.3	0.7
*Nickel	-	0.1
*Zinc	-	0.1
*Lead	-	0.1
*Tin	-	0.05
*Titanium	-	0.2
Aluminium		Remainder

*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 test specimen for mechanical test shall be prepared as per clause 6 of IS:617.
- 10.3. Each casting shall be tested for hardness.

11.0 MECHANICAL PROPERTIES:

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

Method of Casting	Tensile Strength, N/mm ² (Min)	%Elongation on 5.65√S ₀ Gauge Length (Min)	Hardness BHN (Min)
Sand	-	-	55
Chill Cast	190	3	65



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12.0 ADDITIONAL TEST:

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/drawing or as mutually agreed upon.

13.0 RETESTS:

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 testing, 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.

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

- 1) BHEL Order No.
- 2) AA19953, Rev.No.04: ALUMINIUM ALLOY SAND AND CHILL CASTINGS Gr.4635M
- 3) Supplier's reference and Name
- 4) Method of manufacture
- 5) Heat No.
- 6) Results of chemical analysis, mechanical and all other tests as called for in this specification / order/ drawing.
- 7) Drawing/Pattern No.

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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:

- 1) BHEL Order No.
- 2) AA19953
- 3) Heat No.
- 4) Identification Mark/No.
- 5) Weight
- 6) Supplier's Reference and Name

17.0 REFERRED STANDARDS (Latest Publications including Amendments)

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