

	TD-219 Rev.00	PLANT PURCHASING SPECIFICATION HYDERABAD	HY 19998
			REV.NO. 01
			PREFACE

ALUMINIUM ALLOY SAND AND CHILL CASTINGS, HEAT TREATED

(GRADE: IS:617, 4635 T6)

For internal reference only

Remove this preface

Before issue to suppliers.

EQUIVALENT STANDARDS:

- 1) INDIAN : IS:617 – 1994
Alloy: 4635 T6
- 2) BRITISH : BS:1490
Gr: LM9 (Tf)
- 3) GERMAN : DIN:1725
Gr: G - Al Si 10 Mg Wa (Sand Casting)
GK – Al Si 10 Mg Wa (Chill Casting)

MAIN USERS: Turbines (IT)

Turbogenerators (TG)

Switchgear (SG)

Revisions : Brought in line with IS:617-1994			Issued : STANDARDS ENGINEERING DEPARTMENT		
Rev.No.01	Amd.No.	Reaffirmed	Prepared	Approved	Dt.of 1 st Issue
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(GRADE: IS:617, 4635 T6)

1.0 GENERAL:

This specification governs the quality requirements of Aluminium alloy sand and chill casting of grade 4635 T6.

2.0 APPLICATION:

The castings are required for SR-IV governor components, M.O.P. impellers, internal covers, Labyrinth rings, fan guide, current collector, bearing housing etc.

3.0 CONDITION OF DELIVERY:

The castings shall be supplied in rough machined, solution treated and aged condition.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

This specification, in general complies with IS:617, Alloy 4635 T6.

5.0 DIMENSIONS AND TOLERANCES:

The dimensions of the castings shall be in accordance with drawings supplied along with order. All surfaces marked for machining shall have sufficient machining allowance. For unmachined surfaces unless otherwise specified, in the order/drawing, the tolerances on linear dimensions and wall thickness shall be as per BHEL Corporate Standard AA0230402.

6.0 MANUFACTURE:

The castings shall be made by either sand casting or chill casting method as specified in drawing/order.

7.0 HEAT TREATMENT:

The castings shall be solution treated and then artificially aged to meet the specified mechanical properties. The recommended mechanical properties. The recommended heat treatment shall be as given below:

Solution treatment: Heating to $520 \pm 15^\circ\text{C}$, soaking for 8 hrs. followed by quenching in water.

Artificial Aging: Heating the solution treated castings to $180^\circ\text{C} \pm 15^\circ\text{C}$ soaking for 12 hrs. followed by quenching in water.

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8.0 FINISH:

The castings shall be properly fettled and dressed and shall be thoroughly cleaned. The castings shall be supplied either in unmachined or rough machined condition as stated in the order/drawing.

9.0 FREEDOM FROM DEFECTS:

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

10.0 The chemical composition of the material shall conform to the following:

Elements	Si	Mn	Mg	Fe	Cu	Pb	Ni	Zn	Sn	Ti	Al
%	Min.	10.00	0.30	0.20	--	--	--	--	--	--	Remainder
	Max.	13.00	0.70	0.60	0.10	0.10	0.10	0.10	0.05	0.20	

11.0 TEST SAMPLES:

11.1 One test specimen shall be selected from each heat for chemical analysis.

11.2 One tensile test specimen shall be prepared from each cast as per IS:617.

12.0 MECHANICAL PROPERTIES:

Test samples shall conform to the following mechanical properties:

Method of Casting	Tensile Strength N/mm ² (min.)	% Elongation on L=5.65 √So (min.)
Sand	240	1
Chill	295	1

13.0 RETEST:

If a sample selected fails to meet the requirements of mechanical properties mentioned in the clause 12, two further test pieces representing the same cast may be selected and tested in the same manner. If one of the additional test pieces meets the requirements of the test, the castings represented thereby shall be deemed to comply with this specification. If both of these test pieces fail to meet the requirements, the castings represents thereby shall be rejected.



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The castings defects shall not be rectified by brazing or any other methods unless otherwise approved by BHEL.

15.0 ADDITIONAL TESTS:

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

1. Pressure test.
2. Radiographic test.

The requirements of these tests shall be stated in the order/drawing or as mutually agreed upon.

16.0 INSPECTION AT SUPPLIER'S WORKS:

BHEL representative shall have free access to all the areas where the manufacture of the castings is done. All reasonable facilities shall be extended to him including labour where necessary.

17.0 TEST CERTIFICATES:

17.1 The supplier shall furnish the test certificates to BHEL continuing the following details:

- 1) HY 19998 Rev.01
- 2) BHEL Order No.
- 3) Item description
- 4) Drawing No.
- 5) Name of supplier
- 6) Melt No.
- 7) Serial No. of the casting
- 8) Heat treatment details
- 9) Results of all the tests stipulated in the specification/order.

17.2 These test certificates shall be signed by the chief of inspection/chief metallurgist of the supplier and attested by BHEL representative.

18.0 MARKING AND PACKING:

18.1 The following details shall be punched clearly on each casting and the same shall be encircled by paint.

- 1) HY 19998 Rev.01
- 2) BHEL Order No.
- 3) Melt No.
- 4) Drawing No.
- 5) BHEL Inspector's stamp
- 6) Supplier's name

18.2 The castings shall be suitably protected from damage during transit.

