



CORPORATE PURCHASING SPECIFICATION

AA 53304

Rev. No. 03

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**FIRECLAY REFRACTORIES**

**1.0 GENERAL:**

This specification governs the requirements of high heat duty fireclay refractories and hollowwares for foundry applications (Sleeves, knees, reducers, tees, pouring cups).

**2.0 APPLICATION:**

Used as refractory lining bricks for furnaces and ladles and hollow refractory sleeves for gating system in moulds and cores. The refractory sleeves/hollowwares shall be for entry of molten metal at temperature in the range up to 1620 °C.

**3.0 COMPLIANCE WITH NATIONAL STANDARDS:**

The material shall comply, in general, with the requirements of the following National standards and also comply with the requirements of this specification.

IS: 8- 2004 : High Heat Duty Fireclay Refractories.

**4.0 DIMENSIONS AND TOLERANCES:**

4.1 **Shape and Size:** As per BHEL order/drawing.

4.2 **Tolerances:** ± 1% or 1mm, whichever is greater on both warpage and shrinkage.

**5.0 FREEDOM FROM DEFECTS:**

The refractories shall be free from cracks, voids, surface roughness (felt by rubbing with finger), low melting spots, inclusions and broken corners and edges. They shall be of homogenous texture and shall have good surface finish. Hollowware refractories should be manufactured by wet process using grain size 2 mm max.

**6.0 TEST SAMPLES:**

As per IS: 1528.

Revisions :  
As per 24<sup>th</sup> MOM of MRC-FN

APPROVED :  
INTERPLANT MATERIAL  
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**7.0 PROPERTIES:**

When tested in accordance with the relevant clauses of IS:1527 and IS:1528, mentioned against each, the test samples shall show the following values:

**7.1 Chemical Composition:**

Al<sub>2</sub>O<sub>3</sub> content 40%, minimum for fireclay bricks.  
Iron Oxide shall be limited to 2.2% max.

**7.2 PHYSICAL PROPERTIES:**

Property Requirements .	Type I	Type II
1. Apparent porosity, % volume, max	30	23
2. Cold Crushing strength, N/mm <sup>2</sup> , min.	17.5	25
3. Pyrometric cone equivalent standard		
Orton (ASTM) No., min	32	32
4. Refractoriness under load, ta °C, min	1400	1425
5 Permanent linear change, % max. :		
a) After heating at 1400°C for 5 hours	± 1.5	--
b) After heating at 1450°C for 2 hours	--	± 1.0

7.3 Hollow refractory sleeves for gating system should be of type II variety and should be amenable to cut by abrasive cut-off wheel.

**8.0 INSPECTION, DEVIATION AND REPLACEMENT:**

8.1 BHEL reserves the right to inspect material at site before despatch. The supplier shall intimate in advance about readiness of material enclosing a copy of test certificate of the material offered for inspection. However inspection at BHEL shall be final. The supplier shall offer BHEL representative all reasonable test facilities without charge to satisfy the latter that the material being furnished is in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make necessary arrangements for carrying out the prescribed tests elsewhere.

8.2 If the material received at BHEL is not found in accordance with the requirements, it shall be liable to be rejected and the supplier will have to replace it free of cost at the earliest.

8.3 For any deviation from the specification sought by the supplier, prior approval of BHEL must be obtained in writing.

**9.0 ACCEPTANCE**

For supplies from approved vendors, each consignment shall be accepted on the basis of supplier's TC and GC. Material shall be checked as per Clause 4 and 5 on random sample basis. Surveillance checking shall be done for properties mentioned in Clause 7.0

**9.0 TEST CERTIFICATES:**

9.1 Unless otherwise specified, one original and three copies of test certificates shall be supplied along with each consignment.

In addition the supplier shall ensure to send one copy of test certificates along with the despatch documents to facilitate quick clearance of the material.

The test certificates shall bear the followings information

AA 53304, Rev.No.03 : Fireclay Refractories / Refractory hollowware's

BHEL Order No.

Manufacturer's/Supplier's Name.

Trade mark, if any.; Batch No.; Date of manufacture

Size and Quantity supplied

Dimensional inspection as per clause 4.0.

Test results of clause 7.0

9.2 Suppliers other than the original manufacturer shall ensure providing original manufacturer's test certificates with linkage to supplier's invoice stating the batch No., lot No., etc of the supply.

**10.0 PACKING AND MARKING:**

The material should be transported suitably to avoid damage and moisture pickup during transit. Each piece of the refractory item should have supplier's identification mark and size as mentioned in the consignment document. Each consignment shall be legibly marked or labeled with the following information:

AA 53304: Fireclay Refractories/refractory hollowware's.

BHEL Order No.

Manufacturer's/ Supplier's Name.

Trade mark, if any.

Batch/Lot No.

Size and Quantity supplied

Date of manufacture

**11.0 REFERRED STANDARDS (Latest Publications Including Amendments)**

1) IS: 8 2) IS: 1527 3) IS: 1528