

**GOVERNMENT OF INDIA
(Ministry of Railways)**

**SPECIFICATION FOR
HIGH ALUMINA 80% BRICKS FOR
LADLE BOTTOM LINING**

**MECHANICAL DRAWING OFFICE
RAIL WHEEL FACTORY
YELAHANKA, BANGALORE-560 064
INDIA**

**Issued by
SSE/D**

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SPECIFICATION FOR H.A. 80 % BRICKS FOR LADLE BOTTOM LINING**1.0 SCOPE**

- 1.1 The specification covers the manufacture and supply of the HA 80% bricks for ladle bottom lining to Rail Wheel Factory, Yelahanka, Bangalore 560 064, Karnataka state.
- 1.2 Suppliers shall have proven technical capability for having supplied the ladle bricks for similar applications. Evidence shall be furnished by the supplier along with the offer to corroborate the performance.

2.0 GENERAL DESCRIPTION

High Alumina Bricks are used for lining the bottom wall of the ladle in which molten metal is poured from the Electric Arc Furnace at temperature upto 1715°C.

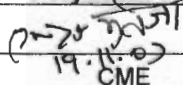
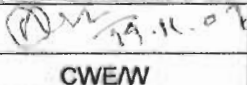
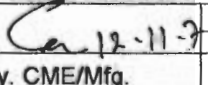
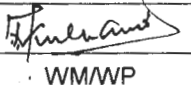
3.0 MATERIAL**a) CHEMICAL COMPOSITION**

- 1) Al₂O₃ : 80% Minimum.
 2) Fe₂O₃ : 1.5% Maximum.
 3) Alkalis : 1.0% Maximum.

b) PHYSICAL PROPERTIES

- i) Pyrometric Cone Equivalent (PCE) : +38 (As per ASTM Pyrometric cone/Orton.)
 ii) Cold Crushing Strength (CCS) : 600 kg/cm² (min.)
 iii) Apparent porosity (AP) : 18% (max.)
 iv) Permanent Linear Change (PLC) : +1 to +2.5% after heating for 5 hours at 1600°C.
 v) Size Tolerance : ±1.5% or ±2.0 mm, whichever is greater.
 vi) Refractoriness Under Load (RUL) : 1600 °C (min.)
 vii) Bulk Density (BD) : 2.8 gm/cc (min.)
 viii) Warpage on 230x115mm face: 0.50mm (max.)
 ix) Spalling Resistance : 30 cycles (min)[as per IS1528 Part III: 1974 Clause 4 (small prism test in air quenching at 1000°C)]

Physical Properties will be tested as per IS 1528 relevant parts.

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c) SIZE

The general size for bricks used is as follows:

High Alumina 80 brick of 230X 115 X 76mm Std.

4.0 REFRACTORY PARTICLE SIZE

Bricks should be compact having close grains. The raw material should not have more than 3 mm size refractory particles. When bricks are cut either for sampling or for lining purpose, they should not show any signs of lamination or refractory particle loosening due to large grains or inadequate bonding, or coring due to improper firing.

5.0 TESTING FACILITIES

The firm should have complete testing facilities to check the material as per the specification given above.

6.0 INSPECTION NORM

a) SAMPLING NORM

IS1528 Pt. VII: 1974

b) ACCEPTANCE CRITERIA

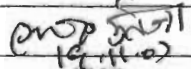
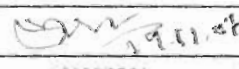
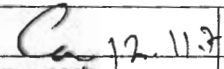
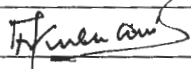
IS1528 Pt. VII: 1974.

7.0 HANDLING

Special care should be taken by the supplier to ensure that the edges do not get chipped off during manufacturing and subsequent handling. The bricks that are chipped off are liable to be rejected and would have to be replaced by the firm at their expense.

8.0 STORAGE

The supplier should have arrangement to store the subject item under covered accommodation to protect them from water.

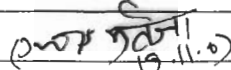
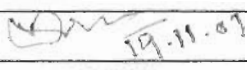
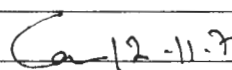
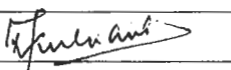
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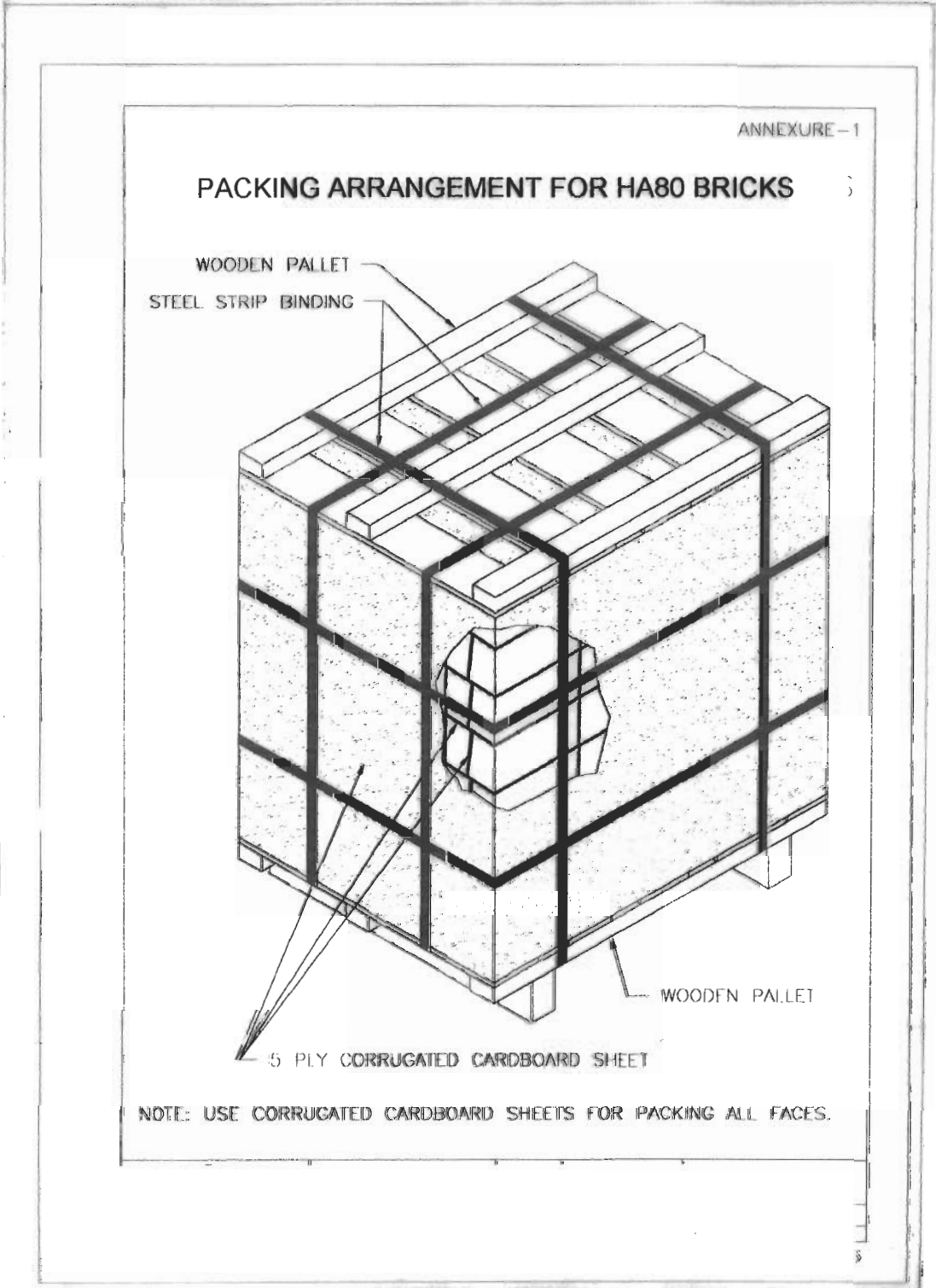
9.0 PACKING

The bricks shall be packed in disposable wooden base and top pallets of 1 to 1.5 M/T capacity, capable of being handled by 3 Ton Fork Lifts as shown in Annexure-1. The edges of the bricks should be protected with cardboard paper and strapped on to the base and top pallets. Additional corrugated cardboard of adequate thickness has to be used on all faces to avoid damage to brick edges due to strapping force.

10.0 TRANSPORT

The bricks should be transported to RWF stores by road directly from the firm's premises to avoid any damages to the bricks. Utmost care should be taken during the transportation of these bricks by adequately covering them with tarpaulin, etc to avoid bricks getting exposed to rain water during transit.

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