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## CARBON BONDED SILICON CARBIDE CRUCIBLES

### 1.0 GENERAL:

This specification governs the requirements of Carbon Bonded Silicon Carbide Crucibles which can be used upto a temperature of 1500°C. The provisions of this standard does not apply to crucibles for melting steel.

### 2.0 APPLICATION:

Used for melting mainly non-ferrous metals and alloys such as copper, aluminium, zinc, tin etc. and their alloys. The crucibles shall possess high refractories to withstand the working temperature, high resistance to thermal shock, high density to cause no loss of content by absorption, high resistance to corrosive attack by fluxes, slags and metallic oxides and high cold crushing strength to hold the contents being carried (hot or cold).

### 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: 12847-1997 : Carbon Bonded Silicon Carbide Crucibles.

### 4.0 SHAPE, DIMENSION AND TOLERANCES:

Shape, dimensions and tolerances on dimensions of the crucibles shall be as per IS: 1748 or as per the catalogues of acceptable manufacturers as desired and ordered by individual units of BHEL.

### 5.0 FREEDOM FROM DEFECTS:

The crucible shall be free from defects or cracks detrimental to its use. Apart from visual check, soundness test may be carried out for detection of invisible cracks and any other internal flaws and crucible is expected to give a good ringing sound.

### 6.0 PRINCIPLE INGREDIENTS:

The principle ingredients of carbon bonded silicon carbide crucibles shall generally be as follows:

Silicon carbide	35%, minimum
Graphite	28 to 35%
Tar, pitch or any other carbon bonding materials such as resins etc	Balance

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## 7.0 ACCEPTANCE TEST:

All the crucibles shall be checked for dimensions, physical presence of cracks etc. for acceptance. Optional assessment of quality can be done with a crucible selected at random, after taking 5 melts. It shall not develop any defects like cracks, pitting on external surface or any erosions on the inside wall.

## 8.0 PROPERTIES:

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

**8.1 Pyrometric Cone Equivalent Standard Cone ASTM No. Part 1:** 28, minimum

**8.2 Modulus of Rupture-Part 5:** 8.0, minimum

**8.3 Apparent Porosity-Part 8:** 30%, maximum

**8.4 Bulk Density-Part 12:** 1.8 g/m<sup>3</sup>, minimum

## 9.0 INSPECTION AT SUPPLIER'S WORKS:

**9.1** BHEL reserves the right to witness the testing of the material at supplier works and therefore the supplier shall notify the readiness of the material in advance.

**9.2** BHEL may also opt for third party inspection. If so, BHEL may either specify a third party or else give a list of third party inspection agencies, out of which supplier may select one of his choice.

**9.3** The supplier shall offer BHEL's representative all reasonable facilities, without charge to satisfy the latter that the material is being furnished 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.

**9.4** BHEL may, at its discretion, test the material after receipt and acceptance of the material will be based on the BHEL's test results.

**9.5** Supplier shall ensure that the material is free from extraneous material. The material shall be rejected if it is not free from extraneous material.

**9.6** For result of analysis and properties of material the decision of BHEL shall be final and binding on the supplier.

**9.7** If the material received is not found suitable according to the requirements, it shall be replaced free of cost by the supplier.

**9.8** For any deviation, demanded by the supplier from the specification, prior approval of BHEL must be obtained.

## 10.0 TEST CERTIFICATES:

Unless and otherwise stated, one original and three copies of certificates from the original manufacturer shall be supplied along with each consignment.

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



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Manufacturer supplying material directly to BHEL should include BHEL PO No. in the Test Certificate. Any other supplier should provide a covering letter along with original manufacturer Test Certificate as above mentioning BHEL PO No.

The test certificates shall bear the followings information

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BHEL Order No.

Manufacturer's/ Supplier's Name.

Trade mark, if any.

Batch No.

Quantity supplied

Test results of clauses 4, 6 and 8.

## 11.0 PACKING AND MARKING:

The crucibles shall be packed individually in hay/bamboo baskets or any other suitable material to avoid damage during transit.

Each crucible shall be legibly marked or labeled with the following information:

AA53306

BHEL Order No.

Manufacturer's/ Supplier's Name.

Trade mark, if any.

Batch/ Lot No.

Size and Type

Quantity supplied

## 12.0 Referred Standards (Latest Publications including Amendments)

- 1) IS: 1748
- 2) IS: 1528