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|  | <h1 style="margin: 0;">CORPORATE PURCHASING SPECIFICATION</h1> | <div style="border-bottom: 1px solid black; padding: 2px;">AA53615</div> <div style="border-bottom: 1px solid black; padding: 2px;">Rev No. 02</div> <div style="padding: 2px;">PAGE 1 of 4</div> |
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ALKYD BASED NO-BAKE BINDER FOR FOUNDRIES

1.0 GENERAL:

This specification governs the quality requirements of Alkyd Based No-bake Binder of 3 part system for use in foundries.

The three parts of the binder in liquid form consists of

Part A – Binder (Alkyd Resin)

Part B – Accelerator

Part C – Hardener (A cross linking agent preferably Isocyanate)

Part A, Part B and Part C will be from same source.

2.0 APPLICATION:

Used in the preparation of no-bake sand system for moulds and cores in the production of both ferrous and non-ferrous castings.

3.0 COMPLIANCE WITH NATIONAL STANDARD:

The material shall comply, with the requirements of the following national standard and also meet the requirements of this specification.

IS 10032 : 2013: Organic No-bake Binders for Use in Foundries

4.0 CHEMICAL COMPOSITION:

The binder shall be based on alkyd resin. The composition of the binder of the bulk supply as determined by infra-red spectrography or thin layer chromatography or any other suitable method shall strictly adhere to the **Type Approved Sample**.

5.0 TEST SAMPLES:

As per IS: 4905.

Samples of part A, B and C shall be selected at random from each consignment for preparation of mould samples as described below:

5.1 Preparation of Moulded Sample:

5.1.1 Mixing Proportion:

Unless otherwise stated, the mixing proportion shall be as given below:

| | |
|------------------------------|---------------------------|
| Dry Silica Sand | : 4000 parts by weight |
| (Fineness Number A FS 37-55) | |
| Binder (Part A) | : 2.5% of sand by weight |
| Accelerator (Part B) | : 2.0% Part A by weight |
| Hardener (Part C) | : 20% of Part A by weight |

| | | | | | |
|---|---------|------------|--|----------|------------------------------|
| Revisions: Preface sheet, Clause 1.0 & 3.0 of this specification. | | | APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(FN) | | |
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Note: The mixture shall have a minimum bench life of 10 minutes.

5.1.2 Preparation of Moulding:

50 g of Part A and 1 g of Part B are mixed together and poured into the sand muller / mixer. The mixer is mulled / mixed for 2 minutes. Then 2 kg of dry sand is added and the sand mixture of Part A and Part B is mulled / mixed in the muller / mixer for two minutes. 10 g of Part C is further added and the machine is run for 3 minutes.

6.0 PROPERTIES:

6.1 Compression Strength (Cold):

The moulded test samples, prepared as per clause 4, when tested for cold compression strength shall show the following values:

| Time of mould setting Hours | Cold Compression Strength N/mm ² , minimum |
|-----------------------------|---|
| 4 | 1.8 |
| 8 | 3.0 |
| 24 | 4.8 |

7.0 TYPE APPROVAL:

7.1 Samples:

Samples for type approval testing shall be accepted only from those manufacturers whose manufacturing and testing facilities are considered satisfactory to ensure continuous supply of good product.

7.2 TYPE TESTS:

When tested in accordance with the relevant methods of BHEL Standard AA0851710 : Test Methods For Varnishes and Enamels the constituents, viz, the binder (Part A) accelerator (Part B) and hardener (Part C) shall show the following properties.

| Properties | Part A | Part B | Part C |
|--|--------------|--------------|--------------|
| Type of Material | Alkyd Resin | ----- | Isocyanate |
| General Condition | Clear liquid | Clear liquid | Clear liquid |
| Viscosity (at 25° C) mPs | 560 | 560 | 50-60 |
| Specific Gravity (At 25°C) | 0.94-0.98 | 0.94-0.96 | 1.2-1.24 |
| Solid Content % | 66-70 | 60-66 | 85-90 |
| Volatile Matter (% by weight) | 35-40 | 50-55 | 10-15 |
| Acid Value, maximum (mg of KOH/mg of sample) | 5 | 52 | 8 |
| Flash Point °C | 38-40 | ----- | 180-200 |



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8.0 INSPECTION AT SUPPLIER'S WORKS:

- 8.1 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.
- 8.2 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.
- 8.3 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.
- 8.4 BHEL may, at its discretion, test the material after receipt and acceptance of the material will be based on the BHEL's test results.
- 8.5 Supplier shall ensure that the material is free from extraneous material. The material shall be rejected if it is not free from extraneous material.
- 8.6 For result of analysis and properties of material the decision of BHEL shall be final and binding on the supplier.
- 8.7 If the material received is not found suitable according to the requirements, it shall be replaced free of cost by the supplier.
- 8.8 For any deviation, demanded by the supplier from the specification, prior approval of BHEL must be obtained.

9.0 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.

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 certificate shall bear the following information:

AA53615, Rev. No. 03: ALKYD BASED NO-BAKE BINDER FOR FOUNDRIES

BHEL Order No.

Manufacturer's / Supplier's name.

Trade mark, if any.

Batch No.

Quantity Supplied.

Date of manufacture and expiry

Test results of clauses 4.0, 6.0, and 7.0.

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10.0 KEEPING PROPERTY:

When stored under cover in a dry place in the original sealed container under normal temperature conditions, no sludge formation shall take place in the individual parts of the binder and they shall retain the properties prescribed in this specification for a period of not less than 12 months after the date of manufacture which shall be subsequent to the date of placing the order.

11.0 PACKING AND MARKING:

The material shall be packed in air tight, moisture and tamper proof steel drums of 50 kg/lot for Part-A, 50 kg/lot for Part-B, and 25 kg/lot for Part-C. Original Manufacturer packing is acceptable. Each container shall be legibly marked or labeled with the following information.

AA53615: ALKYD BASED NO-BAKE BINDER FOR FOUNDRIES

BHEL Order No.

Manufacturer's / Supplier's name.

Trade mark, if any

Batch / Lot No.

Net weight

Date of manufacture and expiry.

12.0 REJECTION AND REPLACEMENT:

If the material does not comply with the requirements of this specification during receipt inspection at BHEL or if any defect is found during further processing of the material, BHEL reserves the right to reject the whole consignment not withstanding any previous certification of satisfactory testing and / or inspection.

The supplier shall undertake to replace the rejected material at his own cost and the rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.

13.0 ENVIRONMENTAL REQUIREMENTS:

The supplier shall furnish Material Safety Data Sheet (MSDS) covering all information relating to human safety and environmental impacts of the hazardous materials particularly during their transportation, storage, handling and disposal along with each supply.

Each container shall be marked with corresponding symbol and minimum worded cautionary notice for flammable / corrosive / toxic / harmful / irritant and oxidising etc. as applicable.

14.0 REFERRED STANDARDS (Latest Publications including Amendments):

- 1) IS: 4905
- 2) AA0851710