



**PURCHASE – CENTRAL  
MATERIALS MANAGEMENT  
BHARAT HEAVY ELECTRICALS LIMITED  
HEAVY ELECTRICAL EQUIPMENT PLANT  
HARDIWAR-249 403, Uttarakhand  
Fax: 01334-226462; Ph. No. 9899003053  
E-mail: apoorv.agrawal@bhel.in**

**REF NO. 794/C/A234/2021/1957C**

**SUB: OPEN E-TENDER ENQUIRY NO.: 794/C/A234/2021/1957C**

Dear Sir/Madam,

We are pleased to invite your offer in **TWO PARTS** strictly as per enclosed terms and conditions and general instructions and standard terms & conditions (GISTC) (latest revision) **through E-procurement system** for the under mentioned items.

**Important Note:**

1. The offers are invited through E-procurement System. Please visit our website <https://eprocurebhel.co.in/nicgep/app> for participation in tender. Tenders can be submitted using DSC (digital signature certificate).
2. To secure the bids/quotations submitted by you, BHEL uses PKI (Public Key Infrastructure) Technology for authentication which uses Digital Signature Certificates (DSC-Class 3b, SHA2, 2048bit).
3. We therefore need you to be ready with your Digital Signature Certificates (DSC-Class 3b, SHA2, 2048bit), as it is a mandatory requirement to participate in our e-tendering process. If you do not have DSC and you are not our registered vendor, you are requested to arrange the same immediately and register yourself in E-procurement System in order to participate in the tender.

For further information, / queries related to e-tendering system, you can contact helpline number of e-procure portal or send an E-mail at [support-eproc@nic.in](mailto:support-eproc@nic.in).

4. Other terms and conditions will be as per tender documents.

Sl. No.	Description of Item	Qty. (LT)	Delivery Required	EMD (Earnest Money Deposit)
1	AA5610005019 CHEMICAL RESISTANCE EPOXIDE PRIMER (RED BROWN COLOUR) PAINT SPEC: AA56105 REV: 07 SIZE: BASE GRADE: PRIMER-CHEMICAL REST RED BRN.	1000	25.08.2022	NIL
2	AA5610035554 HIGH BUILD, BLACK COAL TAR EPOXIDE PAINT SPEC: AA56135 REV: 05 SIZE: BASE GRADE: PAINT-HIGH BLD,BLCK TAR EPXD.	1000	25.08.2022	
3	AA5610031206 CHEMICAL RESISTANT EPOXIDE FINISHING PAINT - BASE / ACCELERATOR-LIQUID SPEC: AA56131 REV: 07 SIZE: LIGHT GREY 631 GRADE: CHEMICAL REST PNT EPOXIDELQD	450	25.08.2022	

\*\* Pre-Qualification Requirement (PQR) attached.



\*\* Technical Specifications attached.

\*\* Techno-Commercial sheet attached.

\*\* ITC applicable.

**\*\* Reverse auction is not applicable.**

Please submit your lowest quotation / offer for the above requirement subject to our terms and conditions. Your offer should be submitted on or before the due date **by 09:00 AM and bid will be opened at 02:00 PM**. BHEL will not be responsible for any type of delay / incomplete information from vendors etc.

- The Offers are invited through E-procurement System: <https://eprocurebhel.co.in/nicgep/app>
- Tender can be submitted digitally only (through E-Procurement system only), using Digital signature.

**NOTE: The vendor should submit their best price at this stage itself and they will not be allowed to revise the price unless there is change in specification or terms and conditions or specifically asked by BHEL. In case of any uncalled revision / discount submitted by vendor subsequently will be ignored & the bid is likely to be rejected.**

1. Intending vendors must remit the requisite EMD in the form of Demand draft / e-payment (in case of foreign bidders) only (**Cheque / Bank Guarantee are not acceptable**).
2. Documents submitted with the offer/bid by the bidder (Original Registered Supplier) shall be signed and stamped in each page by authorized representative of the bidder.

**Tender has to be opened in TWO PARTS as described below, on or before the due date and time of tender opening:**

- a) Part-I : 1. EMD  
2. Pre-Qualifying Requirement (PQR)  
3. Techno-Commercial Bid.
- b) Part-II : Price Bid.

**After tender opening (Part -I), if it is found that:**

- The bidder has not submitted the requisite EMD (if applicable)
- The bidder has claimed to be an MSE vendor but no supporting documents have been submitted in this regard.

**In both the above cases the offer of the bidder shall be straightaway rejected and no correspondence from the bidder in this regard shall be entertained.**

Micro and Small Enterprises (Udyog Aadhar Memorandum / Udyam Registration Certificate"/ documents as per GISTC will be exempted from the submission of EMD as per Govt. Guidelines. (For Indian Bidder)

**Central / State - PSUs / Government departments are exempted from submission of EMD subject to approval by BHEL management.**

BHEL-HEEP registered vendors (i.e. PMD vendors) are exempted from submission of EMD in case of open tender of related PMD items.

EMD shall not carry any interest.

In case of EMD, the envelope containing drafts for EMD and tender fee (if applicable) shall be sealed and super scribed as indicated, "DEMAND DRAFT FOR EMD/ TENDER FEE (IF APPLICABLE) FOR (ITEM NAME) AGAINST TENDER NO. \_\_\_\_\_ DUE ON \_\_\_\_\_."

Vendor's full name and address should be clearly mentioned on the envelope and shall be addressed to:

Head of Materials Management,



Heavy Electrical Equipment Plant,  
BHEL, Hardwar- 249403

Please note that EMD must reach tender room before due date and time of tender (i.e. 01:45 PM) otherwise your offer will be straightaway rejected and no correspondence from the bidder in this regard shall be entertained.

EMD by the Tenderer will be forfeited if, the successful bidder/vendor refuses to honor the Order after award of the same on him and/or withdraws his bid and /or unilaterally changes the offer and/or any of its terms & conditions within the validity period.

EMD given by all unsuccessful Tenderers shall be refunded on acceptance of award / LOI/PO by successful Tenderer. The EMD of successful bidder shall be returned after submission of Security Deposit.

BHEL will deal directly with the manufacturers / principal vendors and no correspondence with the agents will be entertained. The agents will not be permitted to visit / interact with BHEL on behalf of their principals. Subsequently also, no correspondence of any type will be made with any agent. ( All individuals / companies - representing / Advisor /retainer ship basis or claimed to be part time employees for many OEMs / claiming to be channel or business partner for BHEL work / stockist not registered specifically etc are Agents ). Communications with only those agents who have submitted agency agreement with their respective principal may be done.

Agents shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from both, the manufacturer / supplier and the agent, bid received from the agent shall be ignored.

## **PART -II: PRICE SCHEDULE**

For indigenous supply (Please attach un-priced copy of price schedule in techno-commercial bid)

Bidder to note that item wise evaluation will be done and hence should be complete in all respects for the full scope defined and considering all terms and conditions. Optional as indicated in specification will not be taken for evaluation. Any item not included in this price quoted above and shown separately will not be taken cognizance of and shall be ignored while evaluation.

Following details shall be provided in separate Annexure.

Unit prices for all items.

Prices for any other OPTIONAL items.

Transit insurance shall be arranged by BHEL.

Note:

The GST registration number of Bharat Heavy Electrical Ltd, Heavy Electricals Equipment Plant, Ranipur, Haridwar is "05AAACB4146P1ZL" with state Code as "05" and State Name as "Uttarakhand".

Transit insurance shall be arranged by BHEL.

The evaluation of tender shall be on the basis of "Total Landed cost at Destination" including Supply and Commissioning. For evaluation of foreign bids, exchange rate (TT selling rate of SBI) as on scheduled date of tender opening (Part-I bid opening) shall be considered. If the relevant day happens to be a bank holiday, then the Forex rate as on the previous bank (SBI) working day shall be taken.

Loading of TDS as applicable (TDS certificate shall be issued by BHEL) to calculate landed Cost at Destination for foreign bidders on price schedule submitted by bidder.

Also loading of custom duty (as applicable) in India will be done to calculate landed Cost at Destination for foreign bidders on price schedule submitted by bidder.

Indigenous suppliers: Vendors to quote rates on FOR destination (BHEL Haridwar) basis. However, the insurance will be arranged by BHEL.

The comparison between foreign and indigenous bids shall be done based on the Total Landed cost at Destination basis.

BHEL reserves the right to evaluate vendor's process capability / quality systems etc. by visiting vendor's works (if required).



BHEL reserves the rights to place order for tendered quantity on more than one vendor.

Currency for evaluation of the tender will be Indian rupees.

As per directives of CENTRAL VIGILANCE COMMISSION, GOVERNMENT OF INDIA, one agent can not represent two or more suppliers or quote on their behalf in a particular tender. If so found at any stage, BHEL Hardwar is likely to cancel Enquiries / POs to such suppliers. Further, such Indian Agent is likely to be de-listed (Black listed for business from BHEL)

The offers of the bidders who are on the banned list and also the offer of the bidders, who engage the services of the banned firm, shall be rejected. The list of banned firms is available on BHEL website [www.bhel.com](http://www.bhel.com).

NOTE:

**Make in India preference:**

For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 and 04.06.2020 subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract / PO / WP against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable.

Default purchase preference under Make in India order shall be 20% to suppliers with default minimum local content of 50% for all items / works / services. For further details, please refer latest version of GISTC.

Procurements where the Estimated value to be procured is less than Rs. 5 lakhs shall be exempted from Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 and 04.06.2020 & subsequent Orders issued by the respective Nodal Ministry.

The evaluation currency for this tender shall be INR.

Documents submitted with the offer / bid shall be signed and stamped in each page by authorized representative of the bidder.

Vendors operating from BHEL quarters, unauthorized colonies on BHEL land and Dharamshalas/ hotels shall not be considered, hence such vendors need not apply. Any vendor who is under hold (for the item)/delisted / banned with BHEL on date of opening of Part – 1 will not be allowed to quote for this tender. In case their offer is received, it may be out rightly rejected.

In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss/draw of lots, in the presence of the respective L-1 bidder (s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.

QUOTATIONS NOT IN ACCORDANCE WITH THE ABOVE INSTRUCTIONS ARE LIABLE TO BE DISQUALIFIED AND IGNORED.

**Please read general instructions and standard terms & conditions (GISTC) (latest revision) for tender enquiries. All the bidders / vendors must ensure compliance of the GISTC.**

**GISTC is available at <https://hwr.bhel.com/bhelweb/Home.jsp>**

Thanking You,  
Purchase Executive  
For & on behalf of BHEL, Hardwar



## Techno - Commercial Terms:

Sl. No.	Techno - Commercial Terms	Vendor's Compliance/ Remarks
1	<p><b>Payment Terms:</b> For NON-MSE vendors: -100% payment after receipt &amp; acceptance of material at BHEL HEEP, Haridwar.</p> <p>For MSE vendors : - 100% payment within 45 days after receipt &amp; acceptance of material at BHEL HEEP, Haridwar</p>	Accepted
2	<p><b>Delivery basis:</b> FOR:- BHEL , HEEP, Store, Haridwar</p>	Accepted
3	<p><b>Delivery Period:</b> Delivery period in no. of days from the date of purchase order.</p>	_____ days from the date of purchase order
4	<p><b>Liquidated Damages (LD) For Late Delivery:</b> Liquidated Damages (LD) for Late Deliveries shall be applicable @0.5% per week or part thereof on the value of respective delayed supplies subject to a maximum of 10% of the value of respective delayed supplies.</p>	Accepted
5	<p><b>Validity of offer:</b> 90 days from the tender opening date.</p>	Accepted
6	<p><b>Rate of GST applicable</b></p>	@ ..... % Extra
7	<p><b>Settlement of Disputes:</b> The venue of arbitration shall be Haridwar Courts, which will have exclusive jurisdiction.</p>	Accepted
8	<p><b>Risk Purchase Clause:</b> as per General Instructions and Standard Terms and Conditions (GISTC ) mentioned in the tender documents.</p>	Accepted
9	<p><b>Force Majeure Clause:</b> as per General Instructions and Standard Terms and Conditions (GISTC ) mentioned in the tender documents.</p>	Accepted
10	<p><b>MSE status:</b> along with documentary proof (i.e. UDYAM etc. must be attached)</p>	_____
11	<p><b>Details of contact person, Email, contact no. etc.</b></p>	_____
12	<p><b>Test Certificate:</b> <u>For item no 1 i.e. material code AA5610005019</u> – Test Certificate Required. <u>For item no 2 i.e. material code AA5610035554</u> – Test Certificate Required. <u>For item no 3 i.e. material code AA5610031206</u> – Test Certificate Required.</p>	Accepted

<p><b>13</b></p>	<p><b>Guarantee certificate:</b></p> <p><u>For item no 1 i.e. material code AA5610005019</u> – Guarantee Certificate required for 12 months from the date of manufacture.</p> <p><u>For item no 2 i.e. material code AA5610035554</u> – Guarantee Certificate is required for 12 months from the date of manufacture, which shall not be earlier than one month from the scheduled delivery date mentioned in purchase order, with each supply.</p> <p><u>For item no 3 i.e. material code AA5610031206</u> – Guarantee Certificate is required for 12 months from the date of manufacture, which shall not be earlier than one month from the scheduled delivery date mentioned in purchase order, with each supply.</p>	<p><b>Accepted</b></p>
<p><b>14</b></p>	<p><b>Packing:</b></p> <p><u>For item no 1 i.e. material code AA5610005019</u> – Material required in 20 litre steel container, base and hardener should be packed separately.</p> <p><u>For item no 2 i.e. material code AA5610035554</u> – Packing is required in 20 ltr steel container.</p> <p><u>For item no 3 i.e. material code AA5610031206</u> – Material required in 20 litre packing.</p>	<p><b>Accepted</b></p>
<p><b>15</b></p>	<p><b>MSDS:</b></p> <p><u>For item no 2 i.e. material code AA5610035554</u> – MSDS, as per clause no.14.0 of enclosed specification, is required alongwith each supply.</p> <p><u>For item no 3 i.e. material code AA5610031206</u> – MSDS required alongwith each supply.</p>	<p><b>Accepted</b></p>



**BIDDER MUST ENSURE TO SUBMIT THE FOLLOWING ALONG WITH THE OFFER: -**

1. PLEASE PROVIDE SIGNED & STAMPED COPY OF ALL THE PAGES OF BID DOCUMENT AS AN ACCEPTANCE TO ALL THE TERMS AND CONDITIONS OF BID.
2. PLEASE PROVIDE SUPPORTIVE DOCUMENTS AS PER PRE - QUALIFYING REQUIREMENTS (PQR).
3. PLEASE PROVIDE TECHNO - COMMERCIAL SHEET DULY FILLED AND SIGNED - STAMPED.
4. FOR ITEM NO 1 i.e. MATERIAL CODE AA5610005019 - PLEASE ADDRESS & CONFIRM TO EACH CLAUSE OF ENCLOSED SPEC. NO. AA56105 REV. 07 SEPERATELY IN YOUR OFFER.
5. FOR ITEM NO 2 i.e. MATERIAL CODE AA5610035554 - PLEASE ADDRESS ALL THE CLAUSES OF ENCLOSED SPEC. NO. AA56135 REV. 05 SEPERATELY IN YOUR OFFER.
6. FOR ITEM NO 3 i.e. MATERIAL CODE AA5610031206 - PLEASE ADDRESS & CONFIRM TO EACH CLAUSE OF ENCLOSED SPEC. NO. AA56131 REV. 07 SEPERATELY IN YOUR OFFER.



## **CERTIFICATE BY CHARTERED ACCOUNTANT ON LETTER HEAD**

This is to Certify that M/s ....., (hereinafter referred to as 'company') having its registered office at.....is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part-II) .....dtd:....., Category : ..... (Micro/Small). (copy enclosed).

Further verified form the Books of Accounts that the investment of the company as on date .....as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.O.1722(E) dated October 5, 2006: Rs.....Lacs.
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED act, 2006: Rs.....Lacs

**(Strike off whichever is not applicable)**

The above investment of Rs .....Lacs is within permissible limit of Rs..... Lacs for .....micro / small (Strike off which is not applicable) Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro / Small) **(Strike off whichever is not applicable)** and the date of graduation of such enterprises from its original category is ..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprises from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name-

Membership Number-

Seal of Chartered Accountant



## Format for self-Certification under preference to make in India order (for Indian bidder) Certificate

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017 & P-45021/2/2017-PP (BE-II) dated 28.05.2018, 29.05.2019, 04.06.2020 & subsequent Orders issued by the respective Nodal Ministry, we hereby certify that we M/s \_\_\_\_\_(supplier name) are local supplier meeting the requirement of minimum local content (50%) as defined in above orders for the material against Enquiry No. \_\_\_\_\_

Details of location at which local value addition will be made is as follows:

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We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and Signature of Supplier

**Pre-Qualifying Requirement (PQR) (Indent no. 20211957,  
20211958 & 20211959)**

The party should be manufacturer of PAINT or their authorized distributor/dealer/ franchise/ supplier.

In case of Manufacturer, they must submit the manufacturing certificate.

In case of authorized distributor/dealer/franchise/supplier, they must submit authorization latter.

बिनोद  
14/06/22

बिनोद कुमार यादव/ अपर अभियन्ता (आई. सी. एक्स)

कुंदन कुमार/ उप. प्रबंधक (आई. सी. एक्स) 3/3/1  
14.06.22



## CORPORATE PURCHASE SPECIFICATION

AA 561 05

Rev. No. 07

PAGE 1 OF 4

## CHEMICAL RESISTANT EPOXIDE RED OXIDE ZINC PHOSPHATE PRIMING PAINT

### 1.0 GENERAL:

This specification deals with the quality requirements of two pack Chemical resistant Epoxy Based Priming Paint pigmented with Red Oxide Zinc Phosphate.

### 2.0 APPLICATION:

The paint shall be used as a primer in the painting system for protection of steel work, both under marine and inland outdoor conditions.

### 3.0 COMPLIANCE WITH NATIONAL STANDARDS:

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

- i) IS: 14506 - 1998 : Epoxy red oxide zinc phosphate weldable primer, two component.

### 4.0 COMPOSITION:

The paint consists of two components i.e. base and accelerator. The base contains epoxy binder suitably pigmented with red oxide and zinc phosphate and extenders. The accelerator is polyamide and solvent to cure the base of the paint system.

### 5.0 MIXING RATIO:

The components of paint are to be mixed as recommended in the product data sheet supplied by the manufacturer of the paint. The type and content of the binding material as determined by infra-red spectroscopy or thin layer chromatography shall be strictly adhered to the "Type approved sample".

6.0 COLOUR: Red oxide.

7.0 FINISH: Smooth and matt.

### 8.0 FREEDOM FROM DEFECTS:

The base of the paint system shall remain free from defects like hard setting of pigments, skinning and livering when kept in closed container till its shelf life.

9.0 SAMPLING: As per IS:101.

### 10.0 TECHNICAL REQUIREMENTS.

Unless otherwise specified, the sample (mixed paint) shall be tested in accordance with IS 101.

#### Revisions :

Cl 33.7 a) of MOM of MRC-CPO

#### APPROVED :

INTERPLANT MATERIAL  
RATIONALISATION COMMITTEE-MRC (CPO)

Rev. No. 07

Amd.No.

Reaffirmed

Prepared

Issued

Dt. of 1st Issue

Dt:01.02.2005


Dt :

Year :

TIRUCHY


Corp. R&D

JUNE, 1980

AA 561 05	<b>CORPORATE PURCHASE SPECIFICATION</b>		
Rev. No. 07			
PAGE 2 OF 4			
10.1	<b>Mass per 10 litres</b>	: 12.0 kg, minimum	
10.2	<b>Consistency:</b>		
	Paint shall be mixed so that it produces a smooth and uniform paint suitable for application. 40 - 60 secs by FC No.4 at 27± 2 <sup>o</sup> C.		
10.3	<b>Drying time</b>	:	
	a) <b>Soft dry</b> : 4 hours, maximum. b) <b>Hard dry</b> : 16 hours, maximum		
10.4	<b>Volatile matter, percent by mass</b>	: 30.0 maximum.	
10.5	<b>Pigment content, percent by mass:</b>	40.0 minimum.	
10.6	<b>Volume solids, percent</b>	: 35.0, minimum.	
10.7	<b>Dry film thickness per coat</b>	: 25.0 microns, minimum.	
10.8	<b>Flash point</b>	: 20 <sup>o</sup> C, minimum..	
10.9	<b>Pot life at ambient temperature (Annexure-A):</b> 4.0 hours, minimum.		
10.10	<b>Zinc phosphate, percent by mass on pigment (Annexure-B):</b>		
	16 percent by mass, minimum.		
10.11	<b>Scratch Hardness ( IS: 101, Part 5/Sec. 1):</b>		
	After the film is cured for 7 days and tested under of 2000gm, no such scratch as to show the bare metal shall be produced.		
10.12	<b>Flexibility and Adhesion ( IS:101, Part 5 /Sec. 2):</b>		
	The film shall not show sign of damage detachment or cracking when tested after 4 days of curing.		
10.13	<b>Type Test:</b>		
	<b>Salt spray test for 300 hours ( IS:101, Part 6 /Sec. 1):</b>		
	The test panel prepared from this material shall show no signs of corrosion after continuous exposure for 300 hours in salt spray cabinet.		
11.0	<b>TYPE APPROVAL:</b>		
	<b>Samples:</b>		
	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.		

CS-1031



AA 561 05	<b>CORPORATE PURCHASE SPECIFICATION</b>	
Rev. No. 07		
PAGE 4 OF 4		

### ANNEXURE - B (CI 10.10)

#### PROCEDURE FOR TESTING OF ZINC PHOSPHATE CONTENT:

#### I. General:

The pigment is extracted from the paint and pigment is taken for the determination of Zinc phosphate content.

#### II. Reagents required:

##### a) Quinoline solution:

50ml of quinoline is dissolved in 60ml of hydrochloric acid and 30ml of water with constant stirring. The solution is cooled and filtered. This is diluted to 1000ml and stored in a polythene bottle.

##### b) Citric molybdic acid reagent:

54gm of pure molybdic acid and 12gm of sodium hydroxide are dissolved in 400ml of hot water. 60gm of citric acid and 140ml of hydrochloric acid are added to 200ml of water. Now molybdic acid solution is added with citric acid solution and is made up to 1000ml. (The solution may be green or blue colour on its exposure to light). If necessary 0.5 percent potassium bromate solution is added until the green colour becomes pale. This solution is kept in a polyethylene bottle and stored in a dark place.

#### III. Procedure:

1.0gm of the sample is weighed into a 250ml beaker and 30ml of 1: 1 nitric acid and 5ml of 1 : 1 hydrochloric acid is added. The content is boiled well and filtered and made up to 200ml.

50ml of aliquot is pipetted out into a 500ml conical flask and this is diluted to 100ml. 30ml of citric molybdic acid solution is added and boiled gently. 10ml of quinoline solution is added from burette with continuous swirling. (Add 3 to 4 ml drop wise and balance in steady stream).

The precipitate is filtered into a weighed Gooch crucible provided with glass fibre or filter paper previously dried at 250°C. The precipitate is washed with water and dried at 250°C. The dried precipitate (quinoline phosphomolybdate) is weighed and calculated for its weight by difference.

A blank determination is carried out in the same way as the determination but omitting the test solution.

#### Calculation:

$$\% \text{ Zinc phosphate, by mass} = \frac{(M_1 - M_0) \times 0.3816}{\text{Mass of sample in gm.}} \times 100$$

Where

M<sub>1</sub> = mass of precipitate in gm obtained in sample.

M<sub>0</sub> = mass of precipitate in gm obtained in blank.

CS-1031



**CORPORATE PURCHASING SPECIFICATION**

AA 561 31

Rev. No. 07

PAGE 1 OF 5

**CHEMICAL RESISTANT EPOXIDE FINISHING PAINT**

**1.0 GENERAL:**

This specification governs the quality requirements of Chemical resistant epoxide finishing paint (two pack system) suitable for application by brushing or spraying.

The paint shall be compatible on surfaces painted with epoxide priming paint conforming to BHEL specification AA 561 05.

**2.0 APPLICATION:**

To protect the outside surfaces of equipment from the effects of salty atmosphere, atmospheric gases forming acids with water and other mineral acids.

**3.0 COMPLIANCE WITH NATIONAL STANDARDS:**

There is no national standard covering this material. However, assistance has been derived from the following national standard:

IS: 14209-1994: Epoxy Enamel, Two Component, Glossy.

**4.0 COLOUR:**

As specified on BHEL order.

**5.0 FINISH:**

Smooth and full glossy.

**6.0 FREEDOM FROM DEFECTS:**

The paint shall remain free from defects like hard setting of pigments, skinning when kept in closed container and livering (excess viscosity build up) during its rated shelf life.

The dried paint film shall be free from defects like bittyness, floating of pigments, wrinkles, orange peeling, surface haze, colour fading, hard particles, etc.,

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It must not be used directly or indirectly in any way detrimental to the interest of the company.

CS-1036 7/5/17

<b>Revisions:</b> As per 40 <sup>th</sup> MOM of MRC-CPO			<b>APPROVED:</b> INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (CPO)		
Rev. No. 07	Amd.No.	Reaffirmed	Prepared	Issued	Dt. of 1st Issue
Dt: 26.05.2012	Dt:	Year:	BHOPAL	Corp. R&D	JANUARY, 1980

AA 561 31

Rev. No. 07

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## CORPORATE PURCHASING SPECIFICATION

**7.0 CHEMICAL COMPOSITION:**

The material shall be based on two components epoxy system with suitable pigments and supplied as base and accelerator. The mixing ratio of base and accelerator shall be as per supplier's recommendations. The type and content of the binding material shall be based on epoxy resin with an epoxy content of 350 to 500.

The material when determined by IR spectography or thin layer chromatography shall be strictly adhered to the **TYPE APPROVED SAMPLE**.

**8.0 TEST SAMPLES:**

Tender samples will not be required when once the type approval is given and the supplier concerned has to declare that the material for which the tender is given is of the same quality as the type approved sample.

Representative samples of the material shall be drawn and treated as per IS 101.

**9.0 PROPERTIES:**

Unless otherwise specified, when tested in accordance with relevant parts of IS : 101, the test samples shall show the following properties:

**9.1 Consistency:**

40 - 60 seconds in Ford cup No. 4 at  $27 \pm 2^{\circ}\text{C}$ .

**9.2 Drying Time:**

Surface dry : 1 hour, max.

Hard dry : 12 hours, max.

**9.3 Fineness of grind:**

6, minimum on Hegman's gauge.

**9.4 Gloss at 60°:**

61, minimum.

**9.5 Scratch Hardness:**

After the film is cured for 7 days at room temperature or 2 hours drying at 70 to 80°C and after 24 hours air drying and tested under a load of 2000g, no such scratch as to show the bare metal shall be produced.

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**9.6 Flexibility And Adhesion:**

The film shall show no sign of damage, detachment or cracking when tested after 7 days curing at room temperature or 2 hours drying at 70 - 80°C after 24 hours air drying by Erichen tester 5-8, mm.

**9.7 Weight:**

Between 11 and 12 kg per 10 litres of mixed paint.

**9.8 Non-volatile Matter Content:**

50%, minimum by weight of the base paint.

**9.9 Pigment (Type Test):**

20% minimum by weight of the base paint.

**9.10 Epoxy Resin Content (Type Test):**

30% minimum by weight of the base paint after finding the pigment and non-volatile matter content.

**9.11 Resistance to Salt Spray:**

The panels prepared from the material shall show no sign of corrosion after continuous exposure for a period of 7 days in the salt spray cabinet.

**9.12 Impact Test (DEF-1053):**

The film shall not show any sign of damage with a minimum impact of 250 kg-cm.

**9.13 Chemical Resistance Test (Appendix-1):**

Panels prepared and tested in accordance with Appendix-1 of this specification, when immersed in the liquids at the time, temperature and concentration specified below shall not show any sign of deterioration. Minor changes in colour is acceptable. The film shall not soften, get detached or become brittle.

10% Nitric acid by volume at 60±2°C for 12 hours.

20% Sulphuric acid by volume at 60±2°C for 8 hours.

10% Hydrochloric acid by volume at 60±2°C for 24 hours.

25% Sodium hydroxide by volume at 60±2°C for 12 hours.


Petrol at room temperature for 24 hours.

Methyl ethyl ketone at room temperature for 24 hours.

**9.14 Pot Life (Appendix-2):**

6 hours, minimum.

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**10.0 TYPE APPROVAL:**  
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.

**11.0 TEST CERTIFICATE:**  
Unless otherwise stated, three copies of test certificates shall be supplied along with each consignments, giving the following information.  
In addition, the supplier shall ensure to send one copy of the test certificates along with the despatch documents to facilitate quick clearance of the material.

1. AA 561 31, Rev 07: Chemical resistant epoxide finishing paint
2. Colour
3. Finish
4. Freedom from defects
5. Chemical composition
6. Consistency
7. Spreading capacity
8. Mass per 10 liters
9. Drying/Curing Time
10. Heat resistance test
11. Fineness of grind
12. Gloss
13. Non-volatile matter content
14. Scratch Hardness
15. Flexibility and adhesion
16. Resistance to salt spray
17. Chemical Resistance test
18. Compatibility
19. Impact test
20. Pot life
21. Date of manufacture & Expiry

**12.0 KEEPING PROPERTY:**  
When stored in covered dry place in the original sealed containers under normal temperature conditions, the base and accelerator shall retain the properties individually for a period of 12 months after the date of manufacture which shall not be earlier than one month from the scheduled delivery date mentioned in BHEL order, such that the mixed paint shall conform to the properties specified in this specification.

**13.0 PACKING AND MARKING:**  
Unless otherwise stated, base and accelerator shall be packed separately in steel containers of appropriate capacities. Each container shall bear the following information:

AA 561 31: Chemical resistant epoxide finishing paint  
BHEL Order No.  
Manufacturers/ Supplier's name  
Type No./Brand name / Shade  
Date of manufacture / Batch/Lot No.  
Expiry date  
Mixing ratio (if any)  
Quantity supplied:  
Special instructions (if any)

**14.0 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 alongwith each supply.  
Each container shall be marked with corresponding symbol and minimum worded cautionary notice for flammable / corrosive / toxic / harmful / irritant and oxidizing etc. as applicable.

**14.0 REFERRED STANDARDS (Latest Publications Including Amendments):**

1. IS: 101	2. IS: 2932	3. IS: 14209	4. AA 56105
5. DEF: 1053			

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**APPENDIX 1 - CHEMICAL RESISTANCE TEST ( CI: 9.13)**

150±2 X 100±2 mm mild steel panels shall be first cleaned from just by rubbing with abrasive paper and suitable solvent.

One coat of the Chromate primer is applied over the cleaned panel on both the sides. After 24 hours of air drying one coat of the finish paint is applied. After 24 hours another coat of the finish paint is applied and dried at 60° to 65° C for 2 hours or alternatively cured for 7 days at room temperature. The sides of the panel shall be protected with wax coating.

The dried painted panel shall be tested by immersing in respective reagent solution in a closed desecrator and any damaging effect to the film is observed. The film shall not become brittle. Softening and detachment of the film is not acceptable. Slight change in colour is permissible.

**APPENDIX 2 - DETERMINATION OF POT LIFE ( CI: 9.14)**

About 100ml of the mixed paint prepared by mixing the base and accelerator in the recommended proportions is taken in a beaker. The paint shall be such that it should be usable by brush under a specified pot life of 6-16 hours at room temperature.

In order to check whether the paint has gelled or not, a small quantity of the mixed paint is dissolved in the recommended thinner. It should not dissolve if the paint has gelled and vice-versa.

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## CORPORATE PURCHASING SPECIFICATION

AA 561 35

Rev. No. 05

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**HIGH BUILD BLACK COAL TAR EPOXIDE PAINT****1.0 GENERAL:**

This specification governs the quality requirements of two pack anticorrosive High Build Black Coal Tar Epoxide Paint which shall be capable of being brushed or sprayed by suitable thinning with the recommended thinner, if any, so as to obtain a dry film thickness of 4 to 5 mils (100-125 $\mu$ m) per coat.

**2.0 APPLICATION:**

Suitable for application where high humidity, total immersion in water, severe saline atmospheric condition and chemically corrosive environments prevail.

**3.0 COLOUR:** Black.**4.0 COMPLIANCE WITH NATIONAL STANDARDS:**

Assistance has been derived from IS: 14948 in preparation of this specification.

**5.0 FINISH:** Smooth and uniform (See note at clause 9.0).**6.0 FREEDOM FROM DEFECTS:**

The paint shall remain free from defects like hard setting of pigments, skinning when kept in closed container and livering (excess viscosity build up) during its rated shelf life.

The dried paint film shall be free from defects like bittyness, floating of pigments, surface haze, orange peeling, colour fading, wrinkles, etc.

**7.0 CHEMICAL COMPOSITION:**

The paint shall be composed of suitable grade of coal tar pitch, epoxy resins and accelerator in appropriate proportions to comply with the requirements of this specification. The infra-red spectrograph of epoxy resin used in binder shall be strictly adhered to that of type approved sample. Pigments and extenders used in the composition shall be resistant to chemicals and water.

**8.0 TEST SAMPLES:**

Tender samples will not be required when once the type approval (Clause 10.0) is given and the Supplier concerned declares that the material for which the tender is given is of the same quality as the type approved sample.

Representative samples of the material shall be drawn and treated as prescribed in IS: 101.

**Revisions:**As per 40<sup>th</sup> MOM of MRC -CPO**APPROVED:**

INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (CPO)

Rev. No.05

Amd.No.

Reaffirmed

Prepared

Issued

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Corp. R&amp;D

January, 1980

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**9.0 PROPERTIES:**

The paint shall be so thinned as to obtain a dry film thickness of 4 to 5 mils per coat. When tested in accordance with relevant parts and clauses of IS: 101 and Appendix-1 to this specification, the test samples shall show the following properties.

**9.1 Drying Time at room temperature:**

Surface dry : 4 hours maximum.  
Hard dry : 16 hours maximum.

**9.2 Scratch Hardness (type Test)\*:**

After the film is cured for 7 days under ambient conditions and tested under a load of 1200 g, no such scratch as to show the base metal shall be produced.

**9.3 Flexibility And Adhesion (Type Test)\*:**

The film shall not show sign of damage, detachment or cracking when tested after 7 days curing under ambient conditions.

**9.4 Flash Point :** Not below 25°C.

**9.5 Pot Life (Appendix-1):** 4 to 8 hours, min.

**9.6 Epoxy Resin Content:** 25% minimum by mass.

**9.7 Volume solid:** 64%, minimum

**9.8 Recoating Property:**

The painted film shall be capable of receiving one more coat of the same paint between 24 and 96 hours of applying the first coat.

**9.9 Effect of Boiling Water for 48 Hours On Cured Film (Type Test):**

No softening or peeling off, of the film shall take place.

**9.10 Effect of Heating at 150°C + 2°C in Air For 48 Hours:**

No softening or peeling off, of the film shall take place.

\***Note:** Scratch hardness, flexibility and adhesion and finish tests shall be conducted on painted grit blast steel panel while the other conditions of IS: 101 remaining unchanged.

**10.0 TYPE APPROVAL:****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.

**11.0 TEST CERTIFICATES:**

Unless otherwise stated, three copies of test certificates shall be supplied along with each consignment.

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

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The test certificates shall bear the following information:

AA 561 35 (Rev. 05): High Build Black Coal Tar Epoxide Paint.

Supplier's Name and Trade Mark, if any.

Batch No.

Date of Manufacture and Expiry.

Test results of clauses 7.0 and 9.0.

**12.0 KEEPING PROPERTY:**

When stored in a covered dry place in the original sealed container under normal temperature conditions, the base and accelerator when mixed in appropriate proportions shall retain the properties prescribed in this specification for a period of 12 months after the date of manufacture, which shall not be earlier than one month from the scheduled delivery date mentioned in BHEL order.

**13.0 PACKING & MARKING:**

Unless otherwise stated, base and accelerator shall be packed separately in steel containers of appropriate capacities.

If stated in BHEL order, the recommended thinner shall also be supplied in sufficient quantity.

Each container shall bear the following information:

AA 56135: High Build Black Coal Tar Epoxide Paint. (Base / Accelerator)

BHEL Order No.

Manufacturer's/Supplier's Name.

Trade Mark, if any.

Batch No.

Date of Manufacture & Expiry.

Quantity.

**14.0 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 alongwith each supply.

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

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

1. IS: 101

2. IS: 14948

**APPENDIX - 1**

**DETERMINATION OF POT LIFE (CLAUSE 9.6)**

About 100 ml of the mixed paint prepared by mixing the base and accelerator in the recommend proportions is taken in a beaker. The paint shall be such that it should be usable by brush under a specified pot life of 6 - 12 hours at room temperature.

In order to see if the paint has jelled or not, a small quantity of the mixed paint is dissolved in the recommended thinner. It should not dissolve if the paint has jelled and vice-versa.

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