



Bharat Heavy Electricals Limited

Fabrication Stamping & Insulator Plant
Jagdishpur, Amethi – 227817(U.P.)

Office: 91(05361) 224119
Fax: 91(05361) 224243

MATERIAL MANAGEMENT

Notice Inviting Tender

Tender Enquiry No: 2026/TE-02

Dtd: 26.08.2026

E-Tender is invited in Two Part Bid System for (Techno Commercial Bid and Price bid) for the Supply of Paint & Thinners as per tender requirement.

General:

1. This tender is asked in Two part bid system i.e Techno Commercial Bid and Price Bid.
2. Mode of Submission of offer: Being e-tender, offer will be submitted online through e-tender portal: <https://eprocurebhel.co.in/nicgep/app>

Important dates are given below:

EVENT	SCHEDULE
Last Date & Time for receipt of tender	Date : 05.09.2026 Time : 14:00 hrs (IST)
Tender opening date & Time (Part I)	Date : 05.09.2026 Time : 15.30 hrs (IST)

3. In case of any difficulty faced while registering on BHEL's e-Procurement portal developed by NIC, queries may be addressed to 0120-4001002, 0120-4001005 and 0120-6277787; email: support-eproc@nic.in. These details are also available on 'Contact Us' page of the portal
4. Offer to be submitted only on e-procurement portal. Hard copy/email offer is not required to be submitted to BHEL-FSIP. **Any offer received in Hard copy/Email shall not be accepted and straightway rejected by BHEL-FSIP**
5. The offer shall be submitted as per the instructions of tender documents and as detailed in this NIT. Non acceptance of any term may lead to rejection of quotation.
6. Prices shall be firm and there is no price variation.

(I) Item Description and Scope of Supply:

Sl.	BHEL Material Code	Material Description	Qty in Ltr
As mentioned in sheet			

(II) Attachment to Tender Enquiry:

Sl. No.	Description	Annexure/Enclosure
1	Techno-Commercial Bid Form	Attached
2	General Terms and conditions	Attached



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- (III) **Contact person details: Rakesh Kumar** Manager –MM Phone: 05361 224187/ 8429937575, E-mail: rakesh.kumar@bhel.in

Details of Paint Primer & Thinner for 2nd RC 2026

Annexure-1

S.L. No.	ITEM Group	MAT. CODE	Paint Description	Specs	Shade/ Color	Total Tentative Required Qty. (in Ltr)
1	A	AA5610031206	CHEMICAL RESISTANT EPOXIDE FINISHING PAINT LIGHT GREY (IS:14209) (SPEC: AA56131)	AA56131	LIGHT GREY SHADE NO 631 OF IS 5	2500
2		AA5610012015	POLY AMIDE CURED EPOXY BASED MIO/TIO2 PIGMENTED INTERMEDIATE COAT PAINT (SPEC: AA56112)	AA56112	Dark Brown	6000
3		AA5610014018	EPOXY BASED ZINC RICH PRIMER PAINT	AA56114	GREY	3000
4		JP5670008995	THINNER FOR EPOXY PAINT (SPEC: AA56708)	AA56708	NA	3000
5	B	AA5610026237	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Smoke Grey Shade No: 692 of IS5	AA56126	Smoke grey to shade no. 692 of IS5	3500
6		AA5610026326	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Canary Yellow Shade No: 309 of IS5	AA56126	Canary Yellow to Shade No: 309 of IS5	450
7		AA5610026512	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Deep Orange Red Shade No: 591 of IS5 after giving primary coat (HPEP -Hyd-40/10 MT crane)	AA56126	Deep Orange Red to Shade No: 591 of IS5	300
8		HY5610026997	Synthetic Enamel (Long Oil Alkyd) to IS 2932 (Grey White) RAL-9002	AA56126	(Grey White) RAL-9002	1000
9		AA5610001013	RED OXIDE ZINC PHOSPHATE (ALKYD BASE)PRIMER TO IS:12744 (latest), AS PER SPECIFICATION: AA56101 (*)	AA56101	Red Oxide	45800
10		JP5670001990	THINNER FOR ALKYL BASED PAINT, AS PER SPEC: AA56701 (*)	AA56701	NA	10600
11	C	AA5610049016	HEAT RESISTANT ALUMINUM PAINT TO IS 13183 GR. I (TEMPERATURE UPTO 600 C)	AA56149	Metallic Aluminium	1600
12		JP5610098017	HEAT RESISTANT ALUMINIUM PAINT GR.III AS PER IS 13183	JP56198	Metallic Aluminium	16500
13		JP5670098994	THINNER FOR HEAT RESISTANT ALUMINIUM PAINT (*)	In compliance of above Specification IS 13183	NA	5000
14	D	AA5610013011	INORGANIC ETHYL ZINC SILICATE PRIMER TO IS 14946 MAIN COAT (SPEC: AA56113)	AA56113	GREY	8000
15		JP5670097980	THINNER FOR INORGANIC ETHYL SILICATE PRIMER TO IS-14946	In compliance of above Specification IS 14946	NA	3000
16	E	AA5610042216	POLYURETHANE FINISH PAINT-DARK ADMR GREY	AA56142	DARK ADMR GREY	4500
17		AA5610042518	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 GREY White SHADE RAL9002, (SPEC: AA56142)	AA56142	GREY White SHADE RAL9002	4000
18		AA5610042674	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 Golden Yellow to RAL 1004, (SPEC: AA56142)	AA56142	Golden Yellow to RAL 1004	200
19		JP5670098986	THINNER FOR ACRYLIC PAINT	In compliance of above Specification IS 13213	NA	2500
						121450

Bid Specific Special Terms and Conditions (STC)

1. Material are required as per **Specification & SQAP** (Specification, IS & **SQAP** are enclosed in this Tender).
2. Bidder kindly read carefully and understand **BHEL Specification & SQAP** for **all 19 items** and then quote in this tender, bidder has to supply material as per BHEL Specification, IS and SQAP applicable.
3. **Quality Plan:** Supplier has to prepare material and offer for inspection as per attached Standard Quality Assurance Plan for respective items.
4. Inspection by BHEL / TPIA may be carried out at the vendor's works or at an NABL-approved laboratory prior to dispatch. The cost of NABL testing shall be borne solely by the vendor. The vendor shall inform BHEL at least 7 days in advance prior to dispatch of the material for Pre-Dispatch Inspection (PDI). (SQAP is attached along with tender.)
5. **PRE-QUALIFYING REQUIREMENT (PQR) is applicable:**

- A. Past Experience:** Bidder should have supplied **Paint & Primer** in past 03 (Three) Years (from the last day of the previous month of tender submission). Copies of Purchase Order with invoice/ Delivery challan is required to be submitted as a documentary proof.

Paint Manufacturer should have experience of successfully manufacturing and supply at least following quantity of each item in last 3 years.

Paint : 40550 Ltr
Primer : 56800 Ltr
Thinner: 24100 Ltr

- B. For Manufacturers:** Certification/ Declaration of being manufacturer along with valid ISO 9001 certificate or manufacturing process chart of tendered item.

Only manufacturers can participate in this Rate Contract Enquiry (Tender).

Note: Trader/Dealer/Distributor/Agent/Stockist etc. are not allowed to participate in the RC enquiry.

- C. Financial Capability:** Average annual financial turnover during the **last 03 (Three) financial years ending March'2025, at least Rs. 28.90 Lakhs.**

Turnover Certificate issued by CA having UDIN no. **OR** Audited Balance Sheet is required to be submitted as a documentary proof.

Paint Manufacturer to submit PQR document along with offer. Paint Manufacturer who qualifies in above qualifying requirement shall be eligible for techno-Commercial evaluation of the offer.

6. Offer of bidders for the Item shall be evaluated **as per Groups wise evaluation** given as below. Paint & Thinner are required to procure from same supplier due to compatibility of both with each other.

Details of Paint Primer & Thinner for 2nd RC 2026						
Annexure-1						
S.L. No.	ITEM Group	MAT. CODE	Paint Description	Specs	Shade/ Color	Total Tentative Required Qty. (in Ltr)
1	A	AA5610031206	CHEMICAL RESISTANT EPOXIDE FINISHING PAINT LIGHT GREY (IS:14209) (SPEC: AA56131)	AA56131	LIGHT GREY SHADE NO 631 OF IS 5	2500
2		AA5610012015	POLY AMIDE CURED EPOXY BASED MIO/TIO2 PIGMENTED INTERMEDIATE COAT PAINT (SPEC: AA56112)	AA56112	Dark Brown	6000
3		AA5610014018	EPOXY BASED ZINC RICH PRIMER PAINT	AA56114	GREY	3000
4		JP5670008995	THINNER FOR EPOXY PAINT (SPEC: AA56708)	AA56708	NA	3000
5	B	AA5610026237	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Smoke Grey Shade No: 692 of IS5	AA56126	Smoke grey to shade no. 692 of IS5	3500
6		AA5610026326	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Canary Yellow Shade No: 309 of IS5	AA56126	Canary Yellow to Shade No: 309 of IS5	450
7		AA5610026512	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Deep Orange Red Shade No: 591 of IS5 after giving primary coat (HPEP -Hyd-40/10 MT crane)	AA56126	Deep Orange Red to Shade No: 591 of IS5	300
8		HY5610026997	Synthetic Enamel (Long Oil Alkyd) to IS 2932 (Grey White) RAL-9002	AA56126	(Grey White) RAL-9002	1000
9		AA5610001013	RED OXIDE ZINC PHOSPHATE (ALKYD BASE)PRIMER TO IS:12744 (latest), AS PER SPECIFICATION: AA56101 (*)	AA56101	Red Oxide	45800
10		JP5670001990	THINNER FOR ALKYL BASED PAINT, AS PER SPEC: AA56701 (*)	AA56701	NA	10600

11	C	AA5610049016	HEAT RESISTANT ALUMINUM PAINT TO IS 13183 GR. I (TEMPERATURE UPTO 600 C)	AA56149	Metallic Aluminium	1600
12		JP5610098017	HEAT RESISTANT ALUMINIUM PAINT GR.III AS PER IS 13183	JP56198	Metallic Aluminium	16500
13		JP5670098994	THINNER FOR HEAT RESISTANT ALUMINIUM PAINT (*)	In compliance of above Specification IS 13183	NA	5000
14	D	AA5610013011	INORGANIC ETHYL ZINC SILICATE PRIMER TO IS 14946 MAIN COAT (SPEC: AA56113)	AA56113	GREY	8000
15		JP5670097980	THINNER FOR INORGANIC ETHYL SILICATE PRIMER TO IS-14946	In compliance of above Specification IS 14946	NA	3000
16	E	AA5610042216	POLYURETHANE FINISH PAINT- DARK ADMR GREY	AA56142	DARK ADMR GREY	4500
17		AA5610042518	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 GREY White SHADE RAL9002, (SPEC: AA56142)	AA56142	GREY White SHADE RAL9002	4000
18		AA5610042674	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 Golden Yellow to RAL 1004, (SPEC: AA56142)	AA56142	Golden Yellow to RAL 1004	200
19		JP5670098986	THINNER FOR ACRYLIC PAINT	In compliance of above Specification IS 13213	NA	2500
						121450

7. The tender requirement is tentative and intended for finalizing the Rate Contract only. BHEL will issue Purchase Orders (PO) under the Rate Contract based on order volume and needs during the contract's duration. BHEL is not obligated to issue a PO for all items listed in the Rate Contract.
8. Separate **Confirmed Purchase Orders (PO)** shall be placed as per material requirement by BHEL. Supplier has to supply the items against PO only.
9. Prices shall be FIRM and valid for ordering up to **12 months** from date of Framework agreement / MOU / RC. Delivery terms shall be **FOR** BHEL Jagdishpur.
10. Material delivery of each item of the Confirmed PO to be made by supplier within **6 weeks** from date of PO. For staggered lots, delivery schedule shall be provided in PO.

11. **Delivery Term:** F.O.R-BHEL FP Store Jagdishpur

12. **Packing & Forwarding, Freight and Insurance:** Packing & Forwarding, Freight and Insurance shall be in vendor's scope.

13. **Offer Validity:** Offer shall be valid for a period of 90 days from the date of Techno-commercial (Part-I) bid opening date.

14. **GST Certificate:** Please submit (attach) your GST certificate along with your offer.

15. **Payment term:** Lot wise Payments shall be made to the Seller within number of days (as below) from receipt of material, subject to acceptance of material at BHEL FSIP store Jagdishpur, on direct presentation of the documents.

Type of Bidder	Payment Terms (Numbers of days)
Micro & Small Enterprises (MSEs)	45 DAYS
Medium Enterprises	60 DAYS
Non MSME	90 DAYS

16. **Liquidated Damage (LD)/ Penalty:** In case of delay in delivery as per PO/Contract delivery schedule, LD/ Panalty shall be applicable @0.5 % per week of delay or part thereof on undelivered portion subject to a maximum of 10% of the order value.

17. Framework agreement is to be finalized with **two** successful bidders subject to acceptance of the L-1 rates only. The quantity distribution percentage shall be as follows depending upon number of bidders accepted L-1 rate:

No. of bidders (N) accepting L1 rate	N=1	N=2***
Qty Distribution (%)	L1: 100%	L1: 60% L2: 40%

***Purchase Preference shall be applicable for MSE supplier's as per MSME ACT and in this case distribution may increase among more than two bidders.

Counter offer will be given to L2 or higher bidder one by one. If counter offer is accepted by bidder, PO shall be placed for 40% qty. If No bidder accepts counter offer 100% quantity will be given to L1 bidder.

*Subject to BHEL discretion in case of only two qualified suppliers.

**In case of counter offer is accepted by bidder, item rate quoted by L1 bidder shall be applicable to counter offer accepted supplier for PO placement for each item.

Price Evaluation: on Price Bid opening based, There is no Reverse Auction in this Tender.

18. **Unloading of material:** Unloading of material at BHEL Premises will be done by BHEL, please keep in mind while quoting price in this tender. However, demurrages on account of delay in unloading due to improper packing, non-availability of proper dunnage, not adhering to the tender conditions and other reasons attributable to supplier shall be on supplier's accounts only.
19. **RC Quantity Tolerance:** Deviation in quantity is permissible **up to 25%** individually for each item.
20. **PO Quantity Tolerance:** Deviation in quantity is permissible **up to 10%** individually for each item.
21. Supplier shall supply materials manufactured in their manufacturing facility/unit only.
22. **Test Certificate at the time of supply:** At the time of supply, Test Certificate of respective batches / lot as per applicable standards or specifications of BHEL is required along with supply of material.
23. **Guarantee Certificate at the time of supply:** At the time of supply, Supplier to provide guarantee for minimum 1 year against any manufacturing defect from date of receipt of material at BHEL FSIP Jagdishpur for each lot.
24. **Shelf Life Certificate at the time of supply:** At the time of supply, Supplier has to provide Shelf Life Certificate for at least minimum 1 year for each lot from date of its manufacturing receipt of material.
25. Material should be supplied of latest manufactured batch (Not more than 2 to 3 months old) due to shelf life items.
26. Final inspection shall be done at BHEL FSIP Jagdishpur after receipt of material.
27. Packing and marking of material shall be made strictly as per specifications/IS.
28. Material packaging shall be marked with BHEL PO No., Material code, Name and Specification, along with manufacturer brand name, batch no. and manufacturing date. This should also have mentioned in respective Test Certificates.
29. If any non-conformity is noticed during receipt or use of material at BHEL, the supplier has to take corrective and preventive actions accordingly within a specified time frame and shall also arrange for replacement of that lot at his risk and cost whenever required.
30. Whenever required by BHEL, supplier has to re-validate of the usability of their supplied material after expiry in BHEL stores and shall issue revised shelf life certificates for respective batches of usable material within a specified time frame.

Bidder's Sign

Participated for Which Group

Supplier Name:

Tender no. 2026/TE-02

Paint Primer & Thinner for 2nd RC 2026								
S.L. No.	ITEM Group	MAT. CODE	Paint Description	Specs	Shade/ Color	Total Tentative Required Qty. (in Ltr)	UOM	Mentioned Group Name here in below box
1	A	AA5610031206	CHEMICAL RESISTANT EPOXIDE FINISHING PAINT LIGHT GREY (IS:14209) (SPEC: AA56131)	AA56131	LIGHT GREY SHADE NO 631 OF IS 5	2500	Liter	
2		AA5610012015	POLY AMIDE CURED EPOXY BASED MIO/TIO2 PIGMENTED INTERMEDIATE COAT PAINT (SPEC: AA56112)	AA56112	Dark Brown	6000	Liter	
3		AA5610014018	EPOXY BASED ZINC RICH PRIMER PAINT	AA56114	GREY	3000	Liter	
4		JP5670008995	THINNER FOR EPOXY PAINT (SPEC: AA56708)	AA56708	NA	3000	Liter	
5	B	AA5610026237	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Smoke Grey Shade No: 692 of IS5	AA56126	Smoke grey to shade no. 692 of IS5	3500	Liter	
6		AA5610026326	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Canary Yellow Shade No: 309 of IS5	AA56126	Canary Yellow to Shade No: 309 of IS5	450	Liter	
7		AA5610026512	Synthetic Enamel Paint (Long Oil Alkyd) to IS 2932 Deep Orange Red Shade No: 591 of IS5 after giving primary coat (HPEP -Hyd-40/10 MT crane)	AA56126	Deep Orange Red to Shade No: 591 of IS5	300	Liter	
8		HY5610026997	Synthetic Enamel (Long Oil Alkyd) to IS 2932 (Grey White) RAL-9002	AA56126	(Grey White) RAL-9002	1000	Liter	
9		AA5610001013	RED OXIDE ZINC PHOSPHATE (ALKYD BASE)PRIMER TO IS:12744 (latest), AS PER SPECIFICATION: AA56101 (*)	AA56101	Red Oxide	45800	Liter	
10		JP5670001990	THINNER FOR ALKYL BASED PAINT, AS PER SPEC: AA56701 (*)	AA56701	NA	10600	Liter	
11	C	AA5610049016	HEAT RESISTANT ALUMINUM PAINT TO IS 13183 GR. I (TEMPERATURE UPTO 600 C)	AA56149	Metallic Aluminium	1600	Liter	
12		JP5610098017	HEAT RESISTANT ALUMINIUM PAINT GR.III AS PER IS 13183	JP56198	Metallic Aluminium	16500	Liter	
13		JP5670098994	THINNER FOR HEAT RESISTANT ALUMINIUM PAINT (*)	As per above Specification	NA	5000	Liter	
14	D	AA5610013011	INORGANIC ETHYL ZINC SILICATE PRIMER TO IS 14946 MAIN COAT (SPEC: AA56113)	AA56113	GREY	8000	Liter	
15		JP5670097980	THINNER FOR INORGANIC ETHYL SILICATE PRIMER TO IS-14946	In compliance of above Specification IS 14946	NA	3000	Liter	
16	E	AA5610042216	POLYURETHANE FINISH PAINT-DARK ADMR GREY	AA56142	DARK ADMR GREY	4500	Liter	
17		AA5610042518	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 GREY White SHADE RAL9002, (SPEC: AA56142)	AA56142	GREY White SHADE RAL9002	4000	Liter	
18		AA5610042674	ALIPHATIC ACRYLIC POLYURETHANE FINISHING PAINT TO IS 13213 Golden Yellow to RAL 1004, (SPEC: AA56142)	AA56142	Golden Yellow to RAL 1004	200	Liter	
19		JP5670098986	THINNER FOR ACRYLIC PAINT	In compliance of above Specification IS 13213	NA	2500	Liter	

Please mentioned you have participated for Which Group:



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: QA/BE/QAP/PROZP/001

REV NO: 02

DATE: 22.04.2025

PAGE: 01 of 09

SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD			REMARKS	
							AGENCY			
							P	R	W	
1.	item slmo-9 A.) RED OXIDE ZINC PHOSPHATE (ALKYD BASE) TO IS:12744 (SPEC AA56101) PRIMER B.) INORGANIC ETHYL ZINC SILICATE PRIMER TO IS: 14948 (SPEC AA56113) item slmo-14	a) Details on Container and TCs	Visual	100%	A. AA56101/ IS:12744 B. AA56113/ IS:14948	TC	2	1	-	Refer Note S. N 4
		b) Drying Time	Test	Sample		TC	2	1		
		c) Consistency	Test	Sample		TC	2	1	1*	Testing is to be done at NABL Approved Lab. *BHEL FSIP /BHEL-TPJA may witness the Sample testing.
		d) Mass Per 10 litres	Test	Sample		TC	2	1	1*	
		e) Flash Point	Test	Sample		TC	2	1	-	
		f) Scratch Hardness for ROZPP	Test	Sample		TC	2	1	-	
		g) Flexibility and Adhesion for ROZPP	Test	Sample		TC	2	1	-	
		h) Resistance to Salt Spray:	Test	Sample		TC	2	1	-	
		i) Protection against Corrosion under Conditions of Condensations	Test	Sample		TC	2	1	-	
		j) Composition for ROZPP: I. Pigment Content: II. Zinc Phosphate III. Red Oxide as Fe2O3 K) Composition for Inorganic Ethyl zinc silicate I. Solid content II. Total Metallic zinc content j) Volume solids, Compatibility test with coats, Wet opacity (for information only) for ROZPP m) Volume solid, Pot Life, Dry film thickness, MUD cracking test, Sedimentation test, Cure test for Inorganic Ethyl zinc silicate primer	Test	Sample		TC	2	1	-	

ABBREVIATIONS:

P-PERFORMED BY

R-REVIEWED BY

W-WITNESSED BY

TC-TEST CERTIFICATE

INSPECTION AGENCY:

1-BHEL/BHEL NOMINATED INSPECTION AGENCY, 2-PERFORMERMANUFACTURER

PREPARED BY

MAHENDRA KUL YADAV

ENGINEER/0 & BE

REVIEWED BY

SIVANANDAN KUMAR

DY. MGR/0 & BE

APPROVED BY

ATUL VERMA

DGM/0 & BE



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: QA/BE/QAP/ROZP/1001

REV NO: 02

DATE: 22.04.2025

PAGE: 02 of 09

SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY			REMARKS
		a) Details on Container and TCs	Visual	100%	AA56142/IS 13213	TC	2	1	-	Refer Note S.N 4
		b) Drying Time (at ambient temperature)	Test	Sample		TC	2	1	-	
		c) Weight (Mass Per Ten Litre)	Test	Sample		TC	2	1	-	Testing is to be done at NABL Approved Lab. BHIL FSIP /BHIL-TPVA may witness the Sample testing.
		d) Consistency	Test	Sample		TC	2	1	1*	
		e) Flash Point	Test	Sample		TC	2	1	-	
		f) Fineness of grind	Test	Sample		TC	2	1	-	
		g) Gloss at 60°	Test	Sample		TC	2	1	-	
		h) Scratch Hardness	Test	Sample		TC	2	1	-	
		i) Flexibility and adhesion test	Test	Sample		TC	2	1	-	
		j) Dry film thickness per coat	Test	Sample		TC	2	1	-	
		k) Volume solids	Test	Sample	TC	2	1	-		
		l) Pot life	Test	Sample	TC	2	1	-		

ABBREVIATIONS:

P-PERFORMED BY

R-REVIEWED BY

W-WITNESSED BY

TC-TEST CERTIFICATE

INSPECTION AGENCY:

1-BHEL/BHEL, NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

PREPARED BY

MAHENDRA KUL YADAV

ENGINEER/QA & BE

REVIEWED BY

SIKANDAR KUMAR

DY. MGR/QA & BE

APPROVED BY

ATUL VERMA

DGM/QA & BE



INDIAN JACKETING

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: Q2BEQAP/ROZPI001
REV NO: 02
DATE: 27.04.2025
PAGE: 03 of 09

SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY		REMARKS
							P	R. V.	
2	Item Sino. 12 A) HEAT RESISTANCE ALUMINUM PAINT TO IS 13183 GRADUALLY PER SPECIFICATION/013100 B) HEAT RESISTANT ALUMINUM PAINT-G: 1 TEMPERATURE UP TO 600°C AS PER SPEC REQUIREMENTS ↓ Item Sino. 11	a) Details on Container and TCs	Visual	100%	A) JPS 6493 IS 13183 B) AA50149N5 10160	TC	2	1	Refer Note S.N.4
		b) Drying Time	Test	Sample		TC	2	1	
		c) Consistency	Test			TC	2	1	Testing is to be done at NABL
		d) Mass in kg Per 10 litre	Test	Sample		TC	2	1	Approved LAD
		e) Non volatile matter content	Test	Sample		TC	2	1	BHEL FSIP
		f) Volume solids	Test	Sample		TC	2	1	BHEL TPA may
		g) Scratch hardness	Test	Sample		TC	2	1	Witnessed the
		h) Flexibility and adhesion	Test	Sample		TC	2	1	Sample testing
		i) Water resistance	Test	Sample		TC	2	1	
		j) Salt spray resistance	Test	Sample		TC	2	1	
		k) Resistance to heat	Test	Sample		TC	2	1	
		l) Chemical composition	Test	Sample		TC	2	1	
		m) Flash Point	Test	Sample		TC	2	1	
		n) Protection against corrosion under conditions of condensation	Test	Sample		TC	2	1	

APPROVALS: PREPARED BY REVIEWED BY TO TEST CERTIFICATE INSPECTION AGENCY: BHEL NOMINATED INSPECTION ENGINEER 248-RECRUT/RAH/FACTURER	PREPARED BY MAHENDRA KUMAR YADAV ENGINEER & DE	REVIEWED BY SANDEEP KUMAR DR. MOROA DC	APPROVED BY MOHAN KUMAR DANDIA & B
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FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: QA/BE/QA/PROZP/001
REV NO: 02
DATE: 22.04.2025
PAGE : 04 of 09

SI. NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY			REMARKS
							P	R	W	
		a) Details on Container and TCs	Visual	100%		TC	2	1	-	Refer Note S.N.4
		b) Drying Time	Test	Sample		TC	2	1		
		c) Consistency	Test	Sample		TC	2	1	1*	Testing to be done at NABL Approved Lab. FSIP /BHEL, TPJA may witness the Sample testing.
		d) Mass in kg Per 10 litres	Test	Sample	AA56105	TC	2	1	1*	
		e) Volatile matter, percent by mass	Test	Sample		TC	2	1	-	
		f) Pigment content, percent by mass	Test	Sample		TC	2	1	-	
		g) Volume solids, percent	Test	Sample		TC	2	1	-	
		h) Dry film thickness per coat	Test	Sample		TC	2	1	-	
		i) Flash point	Test	Sample		TC	2	1	-	
		j) Pot life at ambient temperature	Test	Sample		TC	2	1	-	
		k) zinc phosphate, percent by mass on pigment	Test	Sample		TC	2	1	-	
		l) Scratch Hardness	Test	Sample		TC	2	1	-	
		m) Flexibility and Adhesion and Type Test	Test	Sample		TC	2	1	-	

CHEMICAL RESISTANT
EPOXIDE RED OXIDE ZINC
PHOSPHATE PRIMING PAINT
SPEC AA56105

NA

ABBREVIATIONS:

P-PERFORMED BY
R-REVIEWED BY
W-WITNESSED BY
TC-TEST CERTIFICATE
INSPECTION AGENCY:
I-BHEL/BHEL NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

PREPARED BY

MAHENDRA KUL YADAV
ENGINEER/Q & BE

REVIEWED BY

SRIKANTH KUMAR
DY. MGR/Q& BE

APPROVED BY

KUL VERMA
GM/Q & BE



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: QA/BE/QAP/ROZ/P/001

REV NO: 02

DATE: 22.04.2025

PAGE: 05 of 09

SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY			REMARKS
							P	R	W	
5.	POLYAMIDE CURED EPOXY BASED MIOCTO2 PIGMENTED INTERMEDIATE COAT PAINT (SPEC AA56112)	a) Details on Container and TCs	Visual	100%	AA56112	TC	2	1	-	Refer Note S.N.4
		b) Drying Time	Test	Sample		TC	2	1		
		c) Consistency	Test	Sample		TC	2	1	1*	Testing is to be done at NABL Approved Lab. *BHEL FSIP/BHEL-TP/IA may witness the Sample testing.
		d) Mass in kg Per 10 litres	Test	Sample		TC	2	1	1*	
		e) Non-volatile matter	Test	Sample		TC	2	1	-	
		f) Volume Solids	Test	Sample		TC	2	1	-	
		g) Resistance to salt spray	Test	Sample		TC	2	1	-	
		h) Flexibility & Adhesion	Test	Sample		TC	2	1	-	
		i) Scratch Hardness	Test	Sample		TC	2	1	-	
		j) Flash Point	Test	Sample		TC	2	1	-	
		k) Dry film thickness	Test	Sample		TC	2	1	-	
		l) Pot life	Test	Sample		TC	2	1	-	
		m) Chemical composition	Test	Sample		TC	2	1	-	

Item S.no.2
↓

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INSPECTION AGENCY:

1-BHEL/BHEL NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

5

PREPARED BY

MAHENDRA KU. YADAV
ENGINEER/IO & BE

REVIEWED BY

SIVAKUMAR KUMAR
DY. MGR/QA BE

APPROVED BY

ATUL VERMA
DGM/Q & BE



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

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SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY			REMARKS
							P	R	W	
6.	EPOXY BASED FINISH PAINT/CHEMICAL RESISTANCE EPOXIDE FINISHING PAINT TO IS 14209, SPEC: AA56131, SHADE AS PER SPECIFICATION	a) Details on Container and TCs	Visual	100%	AA56131/ IS 14209	TC	2	1	-	Refer Note S.N 4
		b) Drying Time	Test	Sample		TC	2	1	-	
		c) Consistency	Test	Sample		TC	2	1	1*	Testing is to be done at NABL. Approved LMO. SHEL FSIP /BHEL-TPA may witnessed the Sample testing.
		d) Mass in kg Per 10 litres	Test	Sample		TC	2	1	1*	
		e) Fineness of grind, Gloss at 60°	Test	Sample		TC	2	1	-	
		f) Non-volatile Matter Content	Test	Sample		TC	2	1	-	
		g) Scratch hardness and spreading capacity	Test	Sample		TC	2	1	-	
		h) Flexibility and adhesion	Test	Sample		TC	2	1	-	
		i) Pigment (Type Test) and chemical composition	Test	Sample		TC	2	1	-	
		j) Epoxy Resin Content (Type Test)	Test	Sample		TC	2	1	-	
7.	HIGH BUILD BLACK COAL TAR EPOXIDE PAINT SPEC AA56135	k) Resistance to Salt Spray, Chemical Resistance Test	Test	Sample	AA56135	TC	2	1	-	
		l) Impact Test, Pot Life, Heat Resistance test	Test	Sample		TC	2	1	-	
		Refer Spec AA56135: Test results of clauses 7 and 9 as per specification	Test	Sample		TC	2	1	-	
8.	THINNER FOR EPOXY PAINT SPEC AA56708	As per specification of AA56708	Test	Sample	AA56708	TC	2	1	-	

item 8 no. 1

Item 8 no. 4

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INSPECTION AGENCY:

1-BHEL/BHEL NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

PREPARED BY

MAHENDRA KUL YADAV
ENGINEER/0 & BE

REVIEWED BY

SANKAR KUMAR
DY. MGR/0 & BE

APPROVED BY

ATUL VERMA
DGMD & BE



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QAP NO: QA/BE/QAP/PROZP/001

REV NO: 02

DATE: 22.04.2025

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SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY			REMARKS
							P	R	W	
9. ← item S/no- 10	THINNER FOR ALKYL BASED PAINT AS PER SPECIFICATION: AA56701	Refer Spec AA56701: Test results of clauses 7.0 as per specification	Test	Sample	AA56701	TC	2	1	-	
10. ← item S/no. 15	THINNER FOR INORGANIC ETHYL SILICATE PRIMER TO IS 14946	As per specification of IS 14946	Test	Sample	IS 14946	TC	2	1	-	
11. ← item S/no- 19	THINNER FOR ACRYLIC PAINT IS 13213	As per specification of IS 13213	Test	Sample	IS 13213	TC	2	1	-	
12. ← NA	OIL RESISTANCE SYNTHETIC ENAMEL PAINT SPEC AA56132	Refer Spec AA56132: Test results of clauses 7 and 9 as per specification	Test	Sample	AA56132/IS14947-2001 RA2007	TC	2	1	-	
13. ← item S/no. 13	THINNER FOR HEAT RESISTANT ALUMINIUM PAINT	Refer Spec IS13183	Test	Sample	IS13183	TC	2	1	-	

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INSPECTION AGENCY:
1-BHEL/BHEL NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

7

PREPARED BY

MAHENDRA K. YADAV
ENGINEER/D & BE

REVIEWED BY

SANKAR KUMAR
DY. MGR/D & BE

APPROVED BY

ATUL VERMA
DGM/D & BE

INDUSTRIAL PAINTS & PRIMERS

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SL NO	COMPONENT	CHARACTERISTICS		METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY		REMARKS	
		a) Details on Container and TCs	Visual	100%			TC	2	1	-	Refer Note S. N 4
		b) Drying time	Test	Sample			TC	2	1		
		c) Consistency	Test	Sample			TC	2	1	1*	Testing is to be done at NABL Approved Lab. *BHEL FSIIP /BHEL-TPIA may witness the Sample testing.
		d) Mass Per 10 litres	Test	Sample			TC	2	1	1*	
		e) Gloss 60 deg (Type Test)	Test	Sample			TC	2	1	-	
		f) Accelerated Storage Stability Test, 60°C, 96 hours (IS 2932 Annexure F)	Test	Sample			TC	2	1	-	
		g) Scratch Hardness after 48 hours of air drying	Test	Sample			TC	2	1	-	
		h) Flash Point	Test	Sample			TC	2	1	-	
		i) Accelerated Weathering Test	Test	Sample		IS 2932/AA56126	TC	2	1	-	
		j) Resistance To Acid (IS-2932 Annexure D)	Test	Sample			TC	2	1	-	
		k) Resistance To Alkali (IS-2932 Annexure E)	Test	Sample			TC	2	1	-	
		l) Flexibility and Adhesion	Test	Sample			TC	2	1	-	
		m) Fineness of Grind	Test	Sample			TC	2	1	-	
		n) Compatibility with Primer to AA 56101 (IS 2074/IS-12744)	Test	Sample			TC	2	1	-	
		o) Outdoor Durability Test (IS-2932)	Test	Sample			TC	2	1	-	

Item Sino.
S, G, F & B
↓

14.
SYNTHETIC ENAMEL PAINT
(LONG OIL ALKYD) TO IS2932,
SHADE AS PER SPEC AA56126.

1-SHELBI BEL NOMINATED INSPECTION AGENCY, 2-PERFORMER/MANUFACTURER

MAHENDRA KU. YADAV



~~ATUL VERMA~~



FSIP, JAGDISHPUR

STANDARD QUALITY ASSURANCE PLAN (SQAP)

INDUSTRIAL PAINTS & PRIMERS

QP NO: QA/BE/QAP/ROZP/001

REV NO: 02

DATE: 22.04.2025

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SL NO	COMPONENT	CHARACTERISTICS	METHOD OF CHECK	EXTEND OF CHECK	ACCEPTANCE NORMS/ STANDARD	FORMAT OF RECORD	AGENCY		REMARKS
		a) Details on Container and TCs	Visual	100%		TC	2	1	Refer Note S. N 4
		b) Drying time at room temp. (Hard dry)	Test	Sample		TC	2	1	
		c) Consistency	Test	Sample		TC	2	1	Testing is to be done at NABL Approved Lab.
		d) Mass Per 10 litres	Test	Sample		TC	2	1	*BHEL FSIP/BHEL-TP/A may witness the Sample testing.
		e) Flash Point	Test	Sample	MSB 114	TC	2	1	-
		f) Volatile matter, percent by mass	Test	Sample		TC	2	1	-
		g) Pigment content, percent by mass	Test	Sample		TC	2	1	-
		h) Resistance to Salt Spray:	Test	Sample		TC	2	1	-
		i) Protection against Corrosion under Conditions of Condensations	Test	Sample		TC	2	1	-
		j) Metallic zinc content on the non-volatile of the paint, Refer Annexure-B	Test	Sample		TC	2	1	-
		k) Volume solid, Pot Life, Dry film thickness	Test	Sample		TC	2	1	-

item slno. 3
↓
EPOXY BASED ZINC RICH PRIMER
PAINT (SPEC: MSB114)
SHADE AS PER
SPECIFICATION/PO

Note:

- Supplier shall submit NABL approved lab test certificate of Paint/Primer along with supply and also submit data sheet of Paint/Primer.
- Supplier shall ensure all applicable critical parameters as per specification to be mentioned in test certificates.
- BHEL may send sample of paint/primer for testing at Lab.
- Supplier shall ensure the following details on container and TCs.
 - Name of Material
 - BHEL PO No
 - Manufacturer's/Supplier Name and Address
 - Batch/Lot No.
 - Date of Manufacturing and Expiry.
 - Mixing Ratio

ABBREVIATIONS:

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INSPECTION AGENCY:

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9

PREPARED BY

MAHENDRA K. YADAV
ENGINEER/2 & BE

REVIEWED BY

SKANDHAR KUMAR
DY. MGR/2 & BE

APPROVED BY

K. VERMA
DGM/2 & BE



CORPORATE PURCHASING SPECIFICATIONS

AA56101

Rev. No.09

PAGE 1 of 5

ANTI-CORROSIVE PRIMING PAINT

1.0 GENERAL:

This specification governs the quality requirements of air drying Anti Corrosive ready mixed Red oxide Zinc phosphate priming paint which shall be capable of being brushed, sprayed by conventional methods. The priming paint shall be suitable to be thinned with MTO/white spirit conforming to BHEL specification AA56701.

The paint shall be compatible with high quality full glossy outdoor finishing paint to BHEL specification AA56126 (IS: 2932 Part 1), when surfaces primed with this paint are coated with 2 coats of finishing paint.

2.0 APPLICATION:

The material shall be intended for use as a primer coat in the painting system for protection of steel surfaces against corrosion for outdoor and indoor application on Electrical equipment. Normally, for best performance the surface to be coated shall be ensured free from oil, loose rust/dust etc., followed by blast cleaning to Sa 2 1/2.

This shall be followed by application of two coats of the priming so as to achieve dft of 30 microns, min.

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

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

IS:12744 (Part: 1): 2013: Ready Mixed Paint, Air Drying, Red Oxide-Zinc Phosphate Priming-Specification.

4.0 COLOUR: The colour of the material shall be that of red oxide.

5.0 FINISH: Smooth and Matt to Egg shell flat

6.0 FREEDOM FROM DEFECTS:

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

The dried surface of the coating shall be smooth, uniform, homogenous appearance and shall be free from physical defects like, pinholes, wrinkles, hard particles, blisters, air bubbles etc.

7.0 CHEMICAL COMPOSITION:

The paint shall be formulated with anti-corrosive pigments like Red oxide of iron, Zinc phosphate, extenders etc., dispersed in unsaponifiable modified alkyd medium in solvent,

Revisions:

Clause 1, 9.7, 11 and Annexure 1

APPROVED:

INTER PLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(CPO+NM)

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3HEEP, Haridwar

Corp. R&D

Jan 1980

AA56101

Rev. No.09

PAGE 2 of 5

CORPORATE PURCHASING SPECIFICATIONS



thinner and drier in suitable proportions so as to satisfy the requirements prescribed in this specification. The raw materials used in the formulation of the priming paint shall be of good quality and conform to following Indian standards.

- | | |
|----------------------------------|-------------|
| a) Zinc Phosphate | : IS: 10897 |
| b) Red Oxide of Iron | : IS: 44 |
| c) Oil or turpentine | |
| d) Petroleum hydrocarbon solvent | : IS: 1745 |
| e) Liquid drier | : IS: 8766 |

The supplier of the material has to certify that the paint supplied shall be free from lead or its compounds and also meets the legislative requirements of ISO 14001.

8.0 TEST SAMPLES AND TEST METHODS

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

500ml of thoroughly mixed sample representing lot be drawn from randomly selected drum and shall be sent to laboratory for testing. The testing shall be done in accordance with relevant part and section of IS: 101 or as specified in this specification.

9.0 PROPERTIES:

9.1. Drying Time

- | | |
|-------------|---------------------|
| Surface dry | : 2 hours, maximum |
| Hard dry | : 18 hours, maximum |

9.2. Consistency

Smooth and uniform and suitable for brushing without appreciable drag on the brush or spraying as required.

Efflux time by Ford cup No. 4, at $27 \pm 20^\circ\text{C}$: 80 - 120 secs.

9.3. Mass per Ten Litres:

13.5 kgs. $\pm 3\%$

9.4. Flash Point:

30°C , min

9.5. Scratch Hardness:

When tested on coated panels air dried for 48 hrs and tested at a load of 1500g on steel panels and 1000g on tinned mild steel panels, no such scratch as to show the bare metal shall be produced.

9.6. Flexibility and Adhesion:

When tested on coated panels air dried for 48 hrs, no visible damage or detachment of coating shall take place and passes the test when tested by cylindrical bend test method.



CORPORATE PURCHASING SPECIFICATIONS

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9.7. Resistance to Salt Spray:

When tested as per test method of IS 2074 Part 1, the test panel prepared from the followed by air drying for 48 hrs, material shall show no sign of corrosion after continuous exposure for 96 hrs, in salt spray cabinet.

9.8. Protection against Corrosion under Conditions of Condensations:

The coated panels air dried for 48 hrs, are subjected to continuous exposure, shall show no sign of deterioration of the coating & metal surface show no sign of corrosion.

9.9. COMPOSITION:

9.9.1. Pigment Content: 50 ± 5% by mass

9.9.2. Zinc Phosphate (IS 10897): 16.0%, min. by mass on pigment

9.9.3. Red Oxide AS Fe₂O₃ (IS 44): 50.0%, min. by mass on pigment

10.0 VOLUME SOLIDS: 40.0% min. (Pigment + Binder) by weight.

11.0 COMPATIBILITY TEST WITH COATS:

The primer paint shall be fully compatible with top coats like, High quality full glossy finishing paint conforming to AA56126 /IS 2932 Part 1, when tested as per method prescribed in Annexure-1.

12.0 WET OPACITY (FOR INFORMATION ONLY):

Theoretical coverage: 10 sq.m / litre @ dft: 35 microns.

13.0 TEST CERTIFICATES:

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

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

The test certificates shall bear the following information:

AA56101 Rev. No. 08 - ANTI-CORROSIVE PRIMING PAINT

BHEL order:

Supplier's Name and address

Identification/Trade Mark, if any.

Batch No/Lot No.:

Date of Manufacture and Expiry.

Lot Quantity:

Test results of clause 7.0 to 12.0.

Special Instructions, if any.

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CORPORATE PURCHASING SPECIFICATIONS



14.0 KEEPING PROPERTY:

When the material stored in a covered dry place in the original sealed container at under ambient conditions, the same shall retain the properties prescribed in this specification for a period of at least 12 months after the date of manufacture, which shall not be subsequent to the date of placing the order and not earlier than one month of the scheduled delivery date mentioned in BHEL order.

15.0 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 oxidizing etc. as applicable.

16.0 PACKING & MARKING:

Unless otherwise stated, the paint shall be supplied in packing size as specified in BHEL order and shall be packed in air tight leak -proof metal container conforming to IS: 1407 and IS: 2552. Each container shall bear following information neatly written or pasted on the container.

AA56101 - ANTI-CORROSIVE PRIMING PAINT

BHEL order:

Name of supplier and address:

Identification/Trade Mark, if any.

Quantity of material:

Batch No/Lot No.:

Date of Manufacture and Expiry.

Special Instructions, if any:

17.0 REFERRED STANDARDS (Latest Publications Including Amendments)

- | | |
|----------------------|----------------|
| 1) IS: 44 | 2) IS : 101 |
| 3) IS : 1407 | 4) IS : 1745 |
| 5) IS : 2074 | 6) IS : 2552 |
| 7) IS: 2932 : Part 1 | 8) IS: 10897 |
| 9) IS : 12744 | 10) IS : 13262 |
| 11) ASTM D 3359 | 12) AA56126 |
| 13) AA56701 | 14) IS: 8766 |



CORPORATE PURCHASING SPECIFICATIONS

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ANNEXURE-I

TEST FOR COMPATIBILITY OF ANTI-CORROSION PRIMING PAINT (AA 56101) WITH TOP COATS OF FINISHING PAINT (AA56126/IS 2932 : Part 1)

The compatibility of anti- corrosive priming paint conforming to AA 56101 with top coat finishing paint to AA56126/IS 2932 : Part 1, shall be checked by Cross-cut tape adhesion method prescribed in ASTM D 3359. The adhesion tape used shall conform to IS 13262 or any other tape bearing ISI mark having sufficient adhesion strength.

A Steel plate of size 150x100mm is taken for testing compatibility. Thoroughly clean the plate with emery to make it free from rust, oil, dust etc. Apply two coats of homogenized anticorrosive priming paint after allowing coating to dry over night before, application of next coat.

Apply two coats of top coat finishing paint evenly covering plate completely. Allow the coatings, to dry for 48 hours at ambient conditions before performing the cross cut adhesion test.

Test method B shall be followed and the acceptance criteria shall be 4 B, i.e., small flakes of the coating material are detached at intersections and less than 5% of the area is affected

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CORPORATE PURCHASING SPECIFICATION

AA56112

Rev No. 02

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HIGH BUILD INTERMEDIATE EPOXY PAINT

1 GENERAL

This specification governs the quality requirements of cold cured two-pack high build intermediate epoxy paint suitable for application by brushing or spraying.

2 APPLICATION

This material shall be used as an intermediate coat on epoxy primed surfaces to provide high build up coating thickness so as to protect the steel and other equipment's against corrosion due to humidity, saline environment and corrosive atmosphere.

3 COMPLIANCE WITH NATIONAL STANDARDS

There is no national standard covering this material.

4 COLOUR

Dark brown

5 FINISH

Smooth and matt.

6 FREEDOM FROM DEFECTS

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

The dried surface shall be free from defects like bittyness, floating of pigments, wrinkles, orange peel, blisters , hard particles, pin holes etc.,

7 CHEMICAL COMPOSITION

The material shall be based on two components epoxy system and supplied as catalysed epoxy resin pigmented with MIO & TiO₂ and polyamide as an accelerator or hardener for cold curing. The mixing ratio of base and accelerator shall be as per supplier's recommendations. The type and content of the binding material i.e., epoxy resin, as determined by infrared spectrography or thin layer chromatography shall be strictly same as that of "Type Approved Sample".

The supplier should provide IR-Spectrograph in support of above composition.

The supplier of the material has to certify that the paint supplied is free from natural resins and free from lead or its compound to meet requirements of ISO 14001.

8 TEST SAMPLE

Tender sample 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 sample of the material shall be drawn and tested as per IS 101.

Revisions:

As per clause 44.4 a) of MOM of MRC-CPO+NM

APPROVED:

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(CPO+NM)

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Dt:

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HEEP, Haridwar

Corp.R&D

01-06-2001

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AA56112	CORPORATE PURCHASING SPECIFICATION 
Rev No. 02	
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9 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
Smooth and homogenous.

9.2 Drying Time
Touch dry : 6 hours, max.
Hard dry : 12 hours, max.

9.3 Mass per ten litres
12.5-13.5 kgs.

9.4 Non-volatile matter
48 - 52% by weight.

9.5 Volume Solids
55%, min.

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

9.7 Flexibility & Adhesion
The film shall show no sign of damage, detachment or cracking when tested after 7 days curing at RT or 2 hours drying at 70 - 80°C after 24 hours air drying.

9.8 Scratch Hardness
The film shall show no sign of scratch so as to show the bare metal at a load of 1000 grams when tested after 7 days curing at RT or 2 hours drying at 70 - 80°C after 24 hours air drying.

9.9 Flash Point
Not below 25°C.

9.10 Dry film thickness
75-100 microns per coat as per BHEL standard AA0674105.

9.11 Pot life
4-6 hours, when mixed.

4



CORPORATE PURCHASING SPECIFICATION

AA56112

Rev No. 02

PAGE 3 of 3

10 TEST CERTIFICATES

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.

AA56112, Rev.02: HIGH BUILD INTERMEDIATE EPOXY PAINT

BHEL Order No.

Manufacturer's/Supplier's Name and Trade mark, if any.

Batch/Lot No.

Date of manufacture and expiry

Test results of clause 7 to 9

T.C. No and date

Mixing ratio

11 KEEPING PROPERTY

When stored in covered dry place in the original sealed containers under normal temperature conditions, the material shall retain the properties prescribed in this specification for a period of six months after the date of manufacture which shall be subsequent to the date of placement of BHEL order.

12 PACKING AND MARKING

Unless otherwise stated, base & hardener shall be packed separately in steel containers of 4 litres capacity.

Each container shall bear the following information:

AA56112: HIGH BUILD INTERMEDIATE EPOXY PAINT

BHEL Order No.

Batch / Lot No.

Supplier's/ Manufacturer's Name and Trade mark, if any

Name of components

Mixing ratio

Quantity supplied

Date of manufacture and expiry

13 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 oxidizing etc. as applicable.

14 REFERRED STANDARDS (Latest Publications Including Amendments)

1) IS 101

2) AA0674105



CORPORATE PURCHASING SPECIFICATION

AA56113

Rev No. 02

PAGE 1 of 4

INORGANIC ETHYL ZINC SILICATE PRIMER

1 GENERAL

This specification prescribes the quality requirements and application procedure for two components, air-drying, Inorganic Zinc Ethyl Silicate priming paint. This priming paint when applied on steel structures provides excellent resistance to temperature, soil chemicals, salts, water, and chemical resistance under marine conditions and outside weather ability.

2 APPLICATION

The material shall be intended for use as a primer coat in the painting system on new steel structures internally and externally. Normally, for best performance, the surface to be coated shall be ensured free from oil, loose rust/dust etc., followed by blast cleaning to Sa 2 ½ min. with a surface profile of 35 to 50 microns. This shall be followed by application of single coat of the priming paint by spray method so as to achieve dry film thickness t of 65-75 microns. The surface profile after blasting shall be 20-35 microns.

3 COMPLIANCE WITH NATIONAL STANDARDS

The material shall comply with the requirements of following Indian standard and also, meet other requirements of this specification:

IS: 14946-2001, Main coat: Zinc Ethyl Silicate Primer, Two Components

4 COLOUR

The colour of the material shall be Grey.

5 FINISH

Smooth and Matt.

6 COMPOSITION

The material shall be two components moisture and self-cured Inorganic Ethyl Silicate Binder pigmented with zinc metal powder conforming to IS: 14355 and having a purity of 99% and particle size of 4-5 microns, in the recommended proportion. The coating of this material attains water resistance within 30 minutes of application and remains unaffected by rains, condensation or dew etc. The manufacturer shall specify the principal type of binder used.

The supplier of the material shall declare that components of paint supplied shall meet the legislative requirements ISO 14001.

7 MIXING RATIO

The components of paints are to be mixed in the proportion as recommended by supplier of the material.

8 TEST METHODS

Unless specified otherwise, tests shall be conducted as prescribed in relevant parts and section of Indian standard IS: 101 and IS: 14946. The test panels shall preferably be prepared on blast cleaned surface.

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3 HPEP, Hyderabad

Corp.R&D

01-06-2001

AA56113	CORPORATE PURCHASING SPECIFICATION	
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9 PROPERTIES

The material shall meet the following technical requirements:

9.1 DRYING TIME

- Surface dry : 15 minutes, max.
- Hard dry : 2 hrs. min.
- Time to topcoat : 24 hrs. min.

9.2 CONSISTENCY

The liquid component mixed with powder shall be suitable for application by spray as such or when thinned in the proportions at specified by the manufacturer.

9.3 FLASH POINT

Not below 15°C

9.4 MASS PER TEN LITRES

20 kgs., min.

9.5 VOLUME SOLIDS

60% , min.

9.6 POT LIFE OF MIX (ANNEXURE D OF IS: 14946)

4 hrs. min. at 30°C

9.7 DRY FILM THICKNESS

65-75 microns per coat when measured after 72 hrs. of curing.

9.8 RESISTANCE TO SALT SPRAY TEST (TYPE TEST)

The material shall pass resistance to salt spray test, when test panels cured for 72 hrs. are subjected to continuous exposure for 2000 hrs.

9.9 PROTECTION AGAINST CORROSION UNDER CONDITIONS OF CONDENSATION (TYPE TEST)

The material shall pass the test, when test panels cured for 72 hrs. are subjected to exposure at specified conditions for 2000 hrs.

9.10 HEAT RESISTANCE TEST

The film shall not show signs of cracking, blistering or flaking when coated test panels air-dried for 48 hrs., are kept at 400±10°C for 6 hrs followed by plunging in cold water-three cycles, min.

9.11 COMPOSITION

9.11.1 SOLID CONTENT

68%, min. by weight of mixed paint.

9.11.2 TOTAL METALLIC ZINC CONTENT (ANNEXURE B OF IS: 14946)

75%, min. by weight in non-volatile portion of the paint.

9.12 MUD-CRACKING TEST

The coating applied to dry film thickness of 120 microns minimum, shall not show any mud cracking when viewed under 10 X magnification.

9.13 SEDIMENTATION TEST

There shall not be any segregation of zinc powder from the base material within 2 hrs in the



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mixed paint.

9.14 CURE TEST

The coated test panels air dried for 48 hrs shall pass the cure test when tested according to test procedure given in ASTM D 4752.

10 KEEPING PROPERTY

When stored in covered dry place in the original sealed containers under normal ambient conditions, the liquid portion shall not show thickening, curdling, gelling or hard caking and also retain the properties of mixed paint prescribed in this specification for a period of six months from date of delivery.

11 TEST CERTIFICATES

Unless otherwise stated, three copies of test certificates and product data sheet shall be supplied along with each consignment giving following information:

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

- AA56113, Rev. 02: INORGANIC ETHYL ZINC SILICATE PRIMER
- BHEL Order No. & Date
- Batch / Lot No.
- Supplier's/ Manufacturer's Name and Trade mark, if any
- Quality supplied
- Date of manufacture and expiry
- Test values as per clause 9
- Mixing ratio
- Technical information, if any:

12 PACKING AND MARKING

Unless otherwise stated, the components of paint shall be supplied separately in moisture and leak proof containers in packing size as specified in the BHEL order.

Each container of the consignment shall bear the following information printed or pasted at suitable place so as to protect it from damage during transportation and handling:

- AA56113: INORGANIC ETHYL ZINC SILICATE PRIMER
- BHEL Order No. & Date
- Batch / Lot No.
- Supplier's/ Manufacturer's Name and Trade mark, if any
- Name of contents:
- Mixing ratio:
- Quantity in container
- Date of manufacture and expiry
- Technical information, If any:

13 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.

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Rev No. 02		
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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 PRECAUTIONS

- Use off the mixed paints within stipulated pot life i.e., 4 hrs after mixing and should be continuously agitated during application.
- Inorganic Zinc silicate primer should not be applied at relative humidity below 50% and the surface should remain free from condensation at the time of application.
- After completion of the work, the application equipment must be cleaned thoroughly immediately with thinner and kept safely for next use.
- The surface to be painted must be blast cleaned to Sa 2 ½, min. and the painting shall be done by spray method uniformly. However, brush may be used for touch up of local areas only.

15 REFERRED STANDARDS (Latest Publications Including Amendments)

- IS: 101
- IS: 14355
- AA0674101
- ASTM D4752

6



CORPORATE PURCHASING SPECIFICATIONS

AA56114

Rev. No.03

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EPOXY BASED ZINC RICH PRIMER PAINT (TWO PACK)

1.0 GENERAL:

This specification deals with the quality requirements and test for Epoxy Based Zinc Rich Primer Paint suitable for corrosion protection.

2.0 APPLICATION:

The paint shall be used as a primer coat on abrasive blast cleaned steel structures internally and externally, in conjunction with epoxy base paints on fabricated structures and components.

3.0 COMPLIANCE WITH NATIONAL STANDARD:

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

IS: 14589 – 1999 Grade 2 : Zinc priming paint, epoxy based, two-pack specification.

4.0 COMPOSITION:

The paint consists of two components a base and a hardener. The base contains epoxy binder pigmented with zinc dust and suitable extenders. The hardener contains polyamide and solvents to cure the base of paint system.

5.0 MIXING RATION:

The components of paint are to be mixed as recommended in the product data sheet supplied by the manufacturer of the paint.

6.0 COLOUR: Grey.

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

10.1. Mass PER 10 litres: 21.5 kg per 10 litres, minimum

10.2. Consistency: Paint shall be mixed so that it produces a smooth and uniform paint suitable for application.

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3 HPBP, Trichy

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10.3. Drying time at room temp. (Hard dry): 4 hours, maximum.

10.4. Volatile matter, percent by mass : 30.0 maximum.

10.5. Pigment content, percent by mass : 65.0 minimum.

10.6. Volume solids, percent : 35.0, minimum.

10.7. Dry film thickness : 45.0 microns, minimum.

10.8. Flash point : 15° C, minimum.

10.9. Pot life at ambient temperature (Annexure-A): 6.0 hours, minimum.

10.10. Metallic zinc content on the non-volatile of the paint (Annexure-B):
85.0 percent by mass, minimum.

11.0 TYPE APPROVAL:

11.1. 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.

11.2. Type tests:

11.2.1. Protection against corrosion under condensation using abrasive blasted steel panel for 28 days (IS 101, Part 6/Section 1):
The test panel, after testing period, shall not show any film deterioration and corrosion of the steel. Crippage shall not more than 3mm on either side of the scribe lines for passing the test.

11.2.2. Resistance to salt spray for 30 days (Annexure-C):
The test panel, after testing period, shall not show any film deterioration and corrosion of the steel. Crippage shall not more than 3mm on either side of the scribe lines for passing the test.

12.0 TEST CERTIFICATES
Unless otherwise stated, three copies of test certificates shall be supplied along with each consignment giving following information:

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

BHEL order

AA56114 , Rev 03 : EPOXY BASED ZINC RICH PRIMER PAINT (TWO PACK)

Manufacturer's/supplier's Name:

Trade name/mark, if any:

Batch/Lot No.:

Quantity supplied:

Date manufacture & expiry:

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Test results of clause 9.0

Mixing ratio

13.0 KEEPING PROPERTY

When stored in covered dry place in the original sealed containers under normal temperature conditions, the material shall retain the properties prescribed in this specification for a period of 12 months after the date of manufacture which shall be subsequent to the date of placement of BHEL order.

14.0 PACKING AND MARKING

Unless otherwise stated, base and hardener shall be packed separately in steel containers of approximate capacities. Each container shall bear the following information:

AA56114 EPOXY BASED ZINC RICH PRIMER PAINT (TWO PACK)

BHEL Order No.

Manufacturer's/ Supplier's name:

Trade name / mark, if any:

Batch/Lot No.:

Name of components:

Mixing ratio:

Quantity supplied:

Date of manufacture & expiry:

15.0 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 oxidizing etc. as applicable

16.0 REFERRED STANDARDS (Latest Publications Including Amendments):

- 1) IS: 101

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ANNEXURE - A (CI 10.9)

If the mixed paint, as recommended by the supplier, could be still thinned, the end of the working life (pot life) has not been reached. The end of the working life is reached when the test material (paint) gels, becomes stringy or cannot be thinned for application. The time interval between the mixing time and time of gelling shall be reported as pot life of the mixed paint.

ANNEXURE - B (CI 10.10)

DETERMINATION OF METALLIC ZINC

I. Reagents required:

- 0.1 N Potassium Permanganate
- Ferric chloride solution: 20 g of ferric chloride ($\text{FeCl}_3 \cdot 6 \text{H}_2\text{O}$) and 20ml of 20% sodium solution.
- Anhydrous sodium acetate 20% solution.
- Zimmerman - Reinhardt solution: One litre of solution contains 67g of manganese sulphate ($\text{Mn SO}_4 \cdot 4 \text{H}_2\text{O}$), 130ml of concentrated sulphuric acid and 138ml of phosphoric acid.

II. Procedure:

0.2g of the sample of the pigment is weighed and transferred to 600ml Erinmeyer flask and 50ml of ferric chloride solution is added. The flask is agitated constantly still all zinc is completely dissolved. 50ml of Zimmerman -Reinhardt solution and 250ml of water are added. This is titrated with 0.1 N Potassium permanganate solution till a pink colour is obtained. A blank determination is also carried out using the same amounts of reagents.

III. Calculation:

$$\text{Metallic zinc percent, by mass} = \frac{(V-B) \times N \times 0.0327}{\text{Wt. of sample in gm}} \times 100$$

Where

V = ml of potassium permanganate solution required for titration

B = ml of potassium permanganate solution required for titration of blank

N = Normality of potassium permanganate solution and

W = wt. of the sample in gram

ANNEXURE - C (CI 11.2.2)

RESISTANCE TO SALT SPRAY TEST

The test panels of size 50 mm X 1.5 mm of abrasive blasted steel shall be given one coat of paint to produce desired dry film thickness and the paint film is allowed to cure for seven days. In the middle of the panel a scribe mark extending up to metal is made. (Each mark 50 mm long using a cutting edge at least 0.75 mm wide). The painted panels shall be exposed to salt spray test continuously as described in 3 of IS 101 for 30 days.



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After specified period of exposure, the test panels shall be examined for deterioration and corrosion of the steel. Crippage shall not be more than 3mm on either side of the scribe lines for passing the test.

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CORPORATE PURCHASING SPECIFICATION

AA 561 26

Rev. No. 06

PAGE 1 OF 6

HIGH QUALITY FULL GLOSSY OUT DOOR FINISHING PAINT

1.0 GENERAL

This specification governs the quality requirements of synthetic resin, full glossy high quality air drying finishing paint.

The paint shall be capable of being brushed sprayed or flow-coated by thinning suitable with white spirit conforming to BHEL specification AA 56101.

The paint shall be compatible on surface primed with any alkyl based primer conforming to IS : 2074, IS:12744 and BHEL specification AA 56101: Anti corrosive priming paint.

The compatibility shall be checked by cross-cut Adhesion test detailed in Annexure-1.

2.0 APPLICATION

Suitable for application on the surface of outdoor equipment.

3.0 COLOUR

As specified on BHEL order.

4.0 COMPLIANCE WITH NATIONAL STANDARDS

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

IS:2932 - 2003 SPECIFICATION FOR ENAMEL SYNTHETIC, EXTERIOR;
(a) UNDER COATING (a) FINISHING

with additional requirements of compatibility with priming paint to IS:2074/IS:12744.

5.0 FINISH: Smooth and full glossy.

Revisions :As per 40th MOM of MRC CPO

APPROVED:
INTERPLANT MATERIAL
RATIONALISATION COMMITTEE-MRC (CPO)

Rev. No. 06	Amd.No.	Reaffirmed	Prepared	Issued	Dt. of 1st Issue
Dt:26.05.2012	Dt :	Year:	2 BHOPAL	Corp. R&D	January, 1980

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6.0 FREEDOM FROM DEFECTS:

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

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

7.0 CHEMICAL COMPOSITION

7.1 Pigments and Total Solids

Only non-chalking rutile titanium dioxide shall be used as a white pigment and any other pigment used shall be light-fast. Extenders shall not be used in general. If absolutely necessary, good quality extenders upto a maximum of 5 percent may be used.

The total volume of solids in the paint shall not be less than 35%. Pthalic Anhydride content shall be 20% min. and shall be certified by the supplier.

7.2 Binder

The binder shall be long oil synthetic alkyd resin free from natural rosins and their derivatives or their modification in any form when tested in accordance with IS:101, part 9, sec 2. The composition of the binder as determined by infra-red sepectrography shall be strictly adhered to the type approved sample in bulk supply.

8.0 TEST SAMPLES

Tender samples will not be required when once the type approval 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.

9.0 PROPERTIES

Unless otherwise specified, when tested in accordance with IS:101 and IS:2932, the test samples shall show the following properties:

9.1 Drying Time

Surface dry	: 4 hours, max.
Hard dry	: 12 hours, max.
Tack free	: 24 hours, max.

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9.2

Consistency

Shall be smooth, uniform and suitable for brushing.
80 to 120 seconds at 27 ±2°C when measured with Ford cup No. 4.

9.3

Gloss 60 deg (Type Test)

Above 71.

9.4

Accelerated Storage Stability Test, 60°C, 96 hours (IS:2932 Annexure F)

Shall pass the test.

9.5

Scratch Hardness after 48 hours of air drying

The test shall be carried out with 1000 g.
No scratch as to show base metal.

9.6

Flash Point

Not below 30°C

9.7

Weight

9.0 kg per 10 litres, min
However it shall be within ±3% of the approved sample of each colour.

9.8

Accelerated Weathering Test

After 21 days exposure under accelerated weathering conditions, the film shall not show any sign of general breakdown, and retain a gloss of 40% of original value.

9.9

Resistance To Acid (IS:2932 Annexure D)

The film shall not show signs of disintegration or change of colour. The loss of gloss shall not be more than 50% of the original gloss.

9.10

Resistance To Alkali (IS:2932 Annexure E)

The film shall not show signs of disintegration or change of colour. The loss of gloss shall not be more than 50% of the original gloss.

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9.11 Flexibility and Adhesion

No visible damage or detachment of the film after 96 hours air-drying at room temperature followed by cooling for 5 hours at 0°C.

The test shall be carried out on the cold film, care being taken to ensure that the temperature of the panel and the rods does not exceed 0°C during the bending operation.

9.12 Fineness of Grind

Not more than 15 microns.

9.13 Compatibility with Primer to AA 56101 (IS:2074/IS:12744)

Shall pass the test, when tested as per Annexure I.

10.0 TYPE APPROVAL

10.1 Sample

Sample 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.

10.2 Type Test

Outdoor Durability Test (IS:2932)

Painted panels prepared and tested as per Appendix C as per C-3 IS:2932 shall satisfy the requirements laid down in the standard for at least 12 months after painting.

11.0 TEST CERTIFICATES

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

In addition, the supplier shall ensure to enclose one copy of test certificate along with their dispatch documents / packing list to facilitate quick clearance of the material. The test certificates shall bear the following details:

5



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AA 561 26

Rev. No. 06

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- | | |
|---------------------------------|--|
| 1. AA 56126 (Rev.No.06) : | High Quality Full Glossy outdoor 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. Flash Point | 11. Lead Content |
| 12. Scratch Hardness | 13. Flexibility and adhesion |
| 14. Compatibility | 15. Date of manufacture & Expiry |
| 16. Accelerated weathering test | 17. Fineness of grind |
| 18. Resistance to acid | 19. Resistance to alkali |
| 20. Accelerated storage test | |

12.0 KEEPING PROPERTY:

When stored under cover in a dry place in the original sealed container at "normal temperature conditions", the material shall retain the properties prescribed in this specification for a period of not less than 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, the paint shall be packed in 20 litre/ 4 litre steel drums, confirming to IS:2552 & IS:1407. Each container shall bear the following information:

1. AA 56126 : High Quality Full Glossy Outdoor Finishing Paint
2. BHEL Order No.
3. Suppliers Name
4. Type no./ Brand name / Shade
5. Date of manufacture / Batch no.
6. Expiry date
7. Special Instructions (if any)
8. 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:1407 | 3. IS:2074 | 4. IS:2552 | 5. IS:2932 |
| 6. IS:12744 | 7. IS 13262 | 8..AA 56101 | 9. AA 56126 | 10. AA 56701 |
| 11. ASTM D 3359 | | | | |

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ANNEXURE - 1 (Cl. 1 & 9.13)

TEST FOR COMPATIBILITY OF FINISHING PAINT (AA 561 26) WITH PRIMER (AA 561 01)

The compatibility of finishing paint to AA 561 26 with primer AA 561 01 shall be checked by tape adhesion test generally in line with ASTM D-3359 except for the following changes as per performance requirement of the paint system.

The adhesion tape used shall be transparent cellulose tape conforming to IS:13262. Tape bearing BIS Certification mark is also acceptable.

2 coats of finishing paint to AA 561 26 are to be applied over 2 coats of primer to AA 561 01 on cleaned and emeryed steel plate of size 150x100 mm. Each primer finish coat to be applied after 24 hrs. drying of previous coat without any roughening by emery.

Adhesion test shall be performed after 48 hours of air drying of final coat. Test panels are to be dried at ambient temperature.

Method - B shall be followed and acceptance criteria will be 4B Viz. Small flakes of the coating are detached at intersections and less than 5% of area is effected.



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 settling 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.,

Revisions:

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JANUARY, 1980

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AA 561 31	CORPORATE PURCHASING SPECIFICATION	
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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 4. Freedom from defects 6. Consistency 8. Mass per 10 liters 10. Heat resistance test 12. Gloss 14. Scratch Hardness 16. Resistance to salt spray 18. Compatibility 20. Pot life	3. Finish 5. Chemical composition 7. Spreading capacity 9. Drying/Curing Time 11. Fineness of grind 13. Non-volatile matter content 15. Flexibility and adhesion 17. Chemical Resistance test 19. Impact test 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 SPECIFICATIONS

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FULL GLOSS POLYURETHANE FINISHING PAINT

1.0 SCOPE:

This specification governs the quality requirements of Polyurethane Finishing Paint (Two pack system). This is recommended for exterior applications where it is desirable for gloss retention for long periods, chemical and corrosion resistance. This paint is suitable for both brush and spray application.

The paint shall be compatible on surface primed with epoxy priming as per AA56109 and intermediate paint as per AA56112.

2.0 APPLICATION:

Suitable for use in as those exterior surfaces where it is designed to retain colour and gloss for long period in addition to provide excellent chemical and corrosion resistance.

3.0 COLOUR

As specified in BHEL order.

4.0 COMPLIANCE WITH NATIONAL STANDARD:

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

IS: 13213 - 1991(RA-2007): "POLYURETHANE FULL GLOSS ENAMEL (TWO PACK)"

5.0 FINISH: Smooth and full glossy

6.0 FREEDOM FROM DEFECTS:

The components of the paint shall remain free from defects like hard settling of pigments, skinning, livering (excessive viscosity build up) when kept in closed container till its shelf life.

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

The paint shall conform to the requirements of ISO 14001 and shall be free from lead/ lead components.

7.0 CHEMICAL COMPOSITION:

The paint consists of two components enamel and a hardener solution to be mixed by volume. The mixing ratio of base and hardener shall be as per supplier's recommendation. Enamel shall consist of an appropriate polyol, pigments, solvents and additives. The hardener solution shall consist of an aliphatic polyisocyanate, solvents, and additives.

Revisions: As per 40 th MOM of MRC-CPO			APPROVED: INTER PLANT MATERIAL RATIONALISATION COMMITTEE – MRC(CPO)		
Rev. No.06	Amd. No.	Reaffirmed	Prepared	Issued	Dt. of 1 st Issue
Dt:26-05-2012	Dt:	Year:	3 HEP, Bhopal	Corp. R&D	Jan 1991

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Note:

- 1) The base contains acrylic resin and acid /alkalic / light fast pigments.
- 2) The mixed paint shall be stirred well for 20 minutes to mature and must be consumed within 4.0 hours after mixing.
- 3) The content and nature of the components shall be strictly same as type approved sample. This shall be confirmed by IR spectrography / thin layer chromatography which should be provided by supplier.

8.0 TEST SAMPLES:

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

Sampling of paint shall be done as per IS: 101.

- 8.1. To draw a representative sample, the contents of the container selected for sampling shall be mixed as thoroughly as possible by shaking or stirring or both or by rolling, so as to bring all portions into uniform distribution.
- 8.2. The samples shall be taken in a suitable, clean, dry air-tight glass bottle of one litre capacity. It should be almost but not completely filled by the sample.
- 8.3. In case of failure of first sample, two samples shall be drawn from other two drums of the same consignment at random and failure of the second sample in complying with the specification will lead to the rejection of the whole consignment.

9.0 TEST METHODS

Unless otherwise specified, the samples shall be tested in accordance with relevant part and section of IS 101

9.1. PROPERTIES:

9.1.1. Drying Time (at ambient temperature)

- a) Surface dry : 3.0 hours, maximum
- b) Hard dry : 8.0 hours, maximum
- c) Full cure : 7days, maximum
- d) Hard dry at 70°C : 30 minutes, maximum with 15 minutes flash off time.

9.1.2. Consistency

Suitable for brushing and spraying. 40 - 60 secs by F.C No.4 at $27 \pm 20^\circ \text{C}$.

9.1.3. Fineness of grind

10 microns, minimum

9.1.4. Gloss at 60°

85, minimum.

9.1.5. Scratch Hardness after full cure for 7 days under load of 1000 gms, min.



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No such scratch as to show the bare metal

9.1.6. Flexibility and adhesion test

No visible damage or detachment of paint film when tested by Erichsen cupping test up to 8mm.

9.1.7. Weight

9.0 kg, minimum per 10 litres of mixed paint. However it shall be within $\pm 3.0\%$ of type approved sample.

9.1.8. Dry film thickness per coat of application

25 - 30 microns

9.1.9. Volume solids

40.0%, minimum

9.1.10. Flash Point

20°C, minimum of each component

9.1.11. Pot life at 27 $\pm$ 2°C

4.0 hours, minimum

10.0 TYPE APPROVAL

10.1. Samples

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

10.2. Type Test

10.2.1. Accelerated Tests (IS:13213):

Tests shall be conducted as per procedure given in below for chemical resistance to Sulphuric acid, Caustic potash, Oil & Solvents and the result shall not show any signs of blistering, wrinkling and lifting. Difference in gloss and colour between immersed and un-immersed area of paint film shall be minimum.

PROCEDURE:

Preparation of painted panels generally as per IS: 101.

Apply one coat of epoxy zinc phosphate primer (two pack) at minimum 35microns dry film thickness by spraying and allow to dry for at least 6 hours and not more than 24 hours. Dry rub with emery paper No.400 and wipe clean with a dry soft cloth.

Apply one coat of epoxy surfacer (two pack) at minimum 35 microns dry film thickness by spraying and allow to dry for at least 6 hours and not more than 24hours. Wet rub with water proof emery paper No.400 and allow to dry.

Apply one coat of full gloss polyurethane enamel (two pack) at minimum 35microns dry film thickness by spraying and allow to air dry for 7 days.

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Note: For immersion tests prepare and paint both sides of the panels and protect the edges of the panels by sealing with a chlorinated rubber paint.

Resistance to Sulphuric acid:

Immerse 3/4th of the panel in 30% sulphuric acid for 24 hours. Remove the panel, wash in running fresh water and allow it to dry for an hour.

Resistance to Caustic potash:

Immerse 3/4th of the panel in 20% solution of potassium hydroxide for 24 hours. Remove the panel, wash in running fresh water and allow it to dry for an hour.

Resistance to Oil:

Immerse 3/4th of the panel in a mineral lubricating oil for 24 hours. Remove the panel and wipe the excess oil with cotton, wash it with mineral turpentine and allow to dry for 30 minutes.

Resistance to Solvents:

Test one panel for resistance to xylene, ethanol and acetone respectively. Take a clean white sterilized cotton and soak it in the solvent and place it on the painted panel without squeezing the cotton. Immediately cover the soaked cotton with a suitable watch glass and leave it for 6 hours. Remove the watch glass and the soaked cotton, wipe the area with a clean dry cotton.

10.2.2. Durability Test (IS:8662)

10.2.2.1. Normal Outdoor Exposure Test:

Preparation of panels for the test and tests shall be as per procedure given in Annexure. Test panels shall be exposed at an angle of 45° facing south. The test shall satisfy the requirements laid down for at least 12 months after painting.

10.2.2.2. Accelerated Weathering Test (IS:8662)

The test shall satisfy the requirement laid down, after 1000 hrs. test in Xenon Arc Type Weatherometer (with rotating day / night device) with a cycle of 3 minutes rainfall and 17 minutes dry period.

PROCEDURE:

Preparation of panels for the test shall be as per the procedure given in the Annexure. Samples of panels shall be tested in duplicate in a accelerated weathering apparatus and samples drawn from the exposed films shall be evaluated for gloss and various film properties.

The requirement of the test shall be taken to have been satisfied if the performance in respect of the film characteristics is within the limits specified below:

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a)	Gloss	The film shall have a minimum gloss retention of 50% of the original value
b)	Colour	The film shall have a minimum rating of 8
c)	Freedom from Checking, Cracking, Flaking, Chalking, Spotting, Blistering and corrosion	-do-

NOTE:

- Test certificate of Cl.10.2.1 & 10.2.2 shall be forwarded by the supplier in line with IS: 13213 and IS: 8662 at the time of type approval. While supplying the material supplier shall furnish these test certificates after every two years.
- Supplier should submit the results of Cl.10.0 at the time of type approval and once in a year there after.

11.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied giving the following information.

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.

AA56142 (Rev.No.06) – FULL GLOSS POLYURETHANE FINISHING PAINT

BHEL Order No.

Supplier's Name & Trade Mark, if any.

Batch No.

Date of Manufacture

Test Results of clause 7.0:

12.0 KEEPING PROPERTIES

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

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:

AA56142: FULL GLOSS POLYURETHANE FINISHING PAINT

BHEL Order No.

Manufacturer's / supplier's name.

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Trade mark, if any.

Batch/lot no.

Date of manufacture and expiry.

Quantity supplied.

Mixing ratio.

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 along with 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:8662
- 3) IS:335
- 4) IS:13213
- 5) AA56109
- 6) AA56112

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ANNEXURE (Cl: 10.2.2.1)

PROCEDURE OF DURABILITY TEST:

PREPARATION OF TEST PANELS:

The panel shall be mild steel plate of 1.25mm thick and free from surface defects. Size of the panel for outdoor exposure test shall be 300mm x 300mm and for the Accelerated weathering test 150mm x 150mm. Panels shall be cleaned and the back and edges of the panels shall be protected with two coats of a suitable paint.

The surface of the test panels to be exposed shall be prepared as follows, taking care that total dry film thickness of the complete system shall be between 75 and 100 microns. Air drying of films shall be done at temperature $27 \pm 2^\circ \text{C}$ and at a relative humidity of 65 ± 5 percent.

- Apply one coat of ready mixed paint red oxide zinc chrome primer by brushing and allow to air dry for 24 hours.
- Rub down lightly with waterproof emery paper No.280/330, wipe off the surface with a clean and dry soft cloth and then apply by brushing one coat of the under coating enamel and allow it to dry for 24 hours.
- Rub down, wet, with water proof emery paper No.280/320 wipe off the surface with a clean and dry soft cloth and then apply by brushing one coat of the finishing enamel and allow it to dry for 24 hours.
- Rub down, wet, with water proof emery paper No.220, wash and wipe off water, and when the surface is dry, apply by brushing a second coat of the finishing enamel and allow it to dry for 7 days before subjecting to exposure test.

OUT DOOR EXPOSURE TEST:

Expose in open the test panels prepared as above in duplicate at an angle of 45° facing south. Examine the condition of the exposed films at monthly intervals for the first quarter and thereafter quarterly for the rest of the period for the properties gloss, colour, checking, cracking, flaking, chalking and spotting.

For the above examinations, wash the right hand half of the surface of the two test panels by pouring water and then wiping with a soft cloth or chamois leather. Examine the same half of the test panel at each examination. At the end of the stipulated period for durability test examine the two halves of the test panels. The sample shall be considered satisfactory if the material surface underneath as well as condition of the film in both the halves, the one washed periodically as well as the one washed only for the final examination is satisfactory by the method of evaluation given below. Stray film failure due to extraneous causes other than climatic shall be ignored.

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ANNEXURE - CONTINUED

Evaluation and Rating of Film Characteristics:

- Gloss: Specular 45° and 60° head glossometer reading.
- Colour: The initial rating for a good colour match shall be 10. The colour Retention on exposure shall be expressed and recorded as the abbreviation of the type of colour change followed by numerical rating as follows:

<u>RATING</u>	<u>TYPE OF COLOUR CHANGE</u>
10 - Good match	D - Darkening
9 - Satisfactory	F - Fading
8-7 - Slight colour change	B - Blueing
6-5 - Definite colour change	R - Reddening
4-3 - Bad Colour change	Y - Yellowing
2-1 - Very bad colour change	L - Loss of colour
0 - Complete colour change	

- Checking: Freedom for checking shall be rated as 10 for no checking and 0 for most severe and complete checking.
- Cracking: Freedom for cracking shall be rated as 10 for no cracking and 0 for most severe and complete cracking.
- Flaking: Freedom for flaking shall be rated as 10 for no flaking and 0 for most severe and complete flaking.
- Chalking: Freedom for chalking shall be rated as 10 for no chalking and 0 for most severe and complete chalking.
- Spotting: Freedom from spotting shall be rated as follows:

Numerical value	Rating
10	No spotting
9	Satisfactory
8-7	Slight spotting
6-5	Definite spotting
4-3	Bad spotting
2-1	Very bad spotting
0	Complete spotting

- Blistering and Corrosion: The film shall remain generally free from blisters and the metal underneath shall show no signs of corrosion on exposure for 12 months. A few isolated blisters without any signs of corrosion underneath as well as one or two localized corrosion and/or rust spots shall not constitute a cause of failure.



CORPORATE PURCHASING SPECIFICATION

AA56149

Rev No. 01

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HEAT RESISTANT ALUMINIUM PAINT-Gr. 1 (TEMPERATURE UPTO 600°C)

1 GENERAL

This specification governs the quality requirements of Heat Resistant Aluminium Paint, which shall be capable to withstand temperature upto 600°C.

2 APPLICATION

The paint shall be used as primer and finishing paint on steam turbine components like HP casing, IP casing, ESV & CV casing etc., and on other components where temperature is likely to go upto 600°C. The paint shall be capable of being brushed or air sprayed on the components.

3 COMPLIANCE WITH NATIONAL STANDARDS

The material shall conform to the requirements of following national standard and also shall meet other requirements of this specification.

IS 13183 : 1991, Gr. 1: Aluminium Paint, Heat Resistant specification

4 COLOR

That of metallic Aluminium

5 FINISH

The dried coating shall be bright, smooth and lustrous.

6 FREEDOM FROM DEFECTS

The paint shall remain free from defects like hard settling of pigments, skinning when kept in a closed container and livering (excessive 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 peel, colour fading, wrinkles etc.

7 CHEMICAL COMPOSITION

The paint shall be based on special grade of silicone binder of required thermal stability of 600°C, pigmented with aluminium paste and extenders in suitable proportions so as to meet the requirements of the specification. The supplier should provide IR-Spectrograph in support of above composition.

8 PROPERTIES

The material when tested in accordance with relevant parts and clauses of IS 101 shall show the following properties.

Revisions:
As per clause 44.4 a) of MOM of MRC-CPO+NM

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(CPO+NM)

Rev No.01	Amd No.	Reaffirmed	Prepared	Issued	Dt. of 1 st Issue
Dt:01-02-2005	Dt:	Year:2021	HEEP, Haridwar	Corp.R&D	01-06-2001

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8.1 DRYING TIME

Surface Dry : 1 hour, max.
Tack free : 3 hours, max.
Hard Dry : 18 hours, max.

8.2 NON VOLATILE MATTER

30% by mass, min.

8.3 CONSISTENCY

20 secs. min. at 27±2°C

8.4 SCRATCH HARDNESS

To pass the test at 6H pencil hardness, when tested on the paint film dried for 48 hours at room temperature.

8.5 VOLUME SOLIDS

20%, min.

8.6 FLASH POINTS

Not below 27° C

8.7 MASS PER TEN LITRES

10.3±0.5 kg

8.8 *SALT SPRAY RESISTANCE

The film of the paint shall pass the salt spray test when the panel is exposed for 96 hours in salt spray cabinet. The test panel shall be of cold rolled steel and the paint film is dried in air for 30 minutes followed by heating at 250°C for one hour and cooled to room temperature before loading for the test.

8.9 *WATER RESISTANCE

The film of the paint shall show no more than slight whitening or dulling in comparison to the fresh sample, when immersed the test panel in water for 24 hours at 27±2°C.

8.10 RESISTANCE TO HEAT

To pass the test when tested as per Annexure.

8.11 *FLEXIBILITY AND ADHESION

To pass the test when the paint panel is dried for 48 hours at room temperature and then subjected to bend test.

8.12 PROTECTION AGAINST CORROSION UNDER CONDITIONS OF CONDENSATION

To pass the test when the test panel is dried for 48 hours at RT and then subjected to an exposure in temperature humidity chamber for a period of 7 days.

Note: * Test shall be conducted after the paint is fully cured.

9 TYPE APPROVAL

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

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10 TEST CERTIFICATES

Unless otherwise stated, three copies of test certificates shall be supplied giving the following information. In addition, the supplier shall ensure to send one copy of the Test certificate along with despatch documents for quick clearance of material.

AA56149, Rev.01: HEAT RESISTANT ALUMINIUM PAINT-Gr. 1 (TEMPERATURE UPTO 600°C)

BHEL Order No and Date.

Manufacture's/Supplier's Name and Trade mark, if any.

Batch/Lot No.

Date of manufacture and Expiry

Test Results of clauses 7 and 8

Quantity of the lot.

T.C. No and Date.

11 KEEPING PROPERTY

When stored in a covered dry place in the original sealed container under normal temperature conditions, the material shall retain the properties prescribed in this specification for a period of 12 months after the date of manufacture, which shall be subsequent to the date of placing the order.

12 PACKING AND MARKING

The paint shall be supplied in sealed and leak proof metal containers preferably in 4 litres size and each container shall bear the following information:

AA56149: HEAT RESISTANT ALUMINIUM PAINT-Gr. 1 (TEMPERATURE UPTO 600°C)

BHEL Order No.

Batch / Lot No.

Supplier's/ Manufacturer's Name and Trade mark, if any

Date of manufacture and expiry

Quantity supplied

13 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 oxidizing etc. as applicable.

14 REFERRED STANDARDS (Latest Publications Including Amendments)

- 1) IS 101

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Annexure (CI 8.10)

TESTING OF HEAT RESISTANCE**A.1 COLD ROLLED STEEL**

Prepare and clean the test panels made from cold rolled steel. Apply the paint uniformly on the test panels. Air dry the panels for 30 minutes and bake subsequently at 250°C for 1 hour. Cool the test panels for room temperature. Place the panels in the furnace at $600 \pm 5^\circ\text{C}$ for a period of 24 hours. Remove the panels from the furnace cool and examine the surface for any cracking, blistering, flaking or peeling. In absence of above surface defects, the material is deemed to have passed the heat resistance test.

A.2 HOT ROOLED STEEL

Take test panels of low carbon steel, clean them thoroughly using hydrocarbon solvent. Coat these test panels with paint under test so as to get a coating thickness of 25-30 microns. Dry them in air for 24 hours. Keep these test panels in the furnace and are subjected to following heating schedule.

Expose the test panels for 8 hours at 400°C followed by further heating for 8 hours at 500°C and finally for 8 hours at 600°C. The panels shall be removed from the furnace for short interval for physical examination.

In absence of above surface defects, the material is deemed to have passed the heat resistance test.

	CORPORATE PURCHASING SPECIFICATION			AA 567 01	
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PETROLEUM HYDROCARBON SOLVENT (GR.: 145/205)					
1.0 GENERAL: This specification governs the quality requirements of Petroleum hydrocarbon solvent, Gr.: 145/205, low aromatic.					
2.0 APPLICATION: Suitable for use in paint industry in general. This solvent is used as a thinner for all Alkyd Based paints					
3.0 COMPLIANCE WITH NATIONAL STANDARDS: The material shall comply with the requirements of the following material standard and shall also meet the requirements of this specification. IS: 1745 – 1978(RA-2005) : Petroleum hydrocarbon solvents Gr.: Solvent 145 / 205, low aromatic					
4.0 FREEDOM FROM DEFECTS: The material shall be clear and free from sediments suspended matters and undissolved water..					
5.0 COMPOSITION: The material shall be a petroleum distillate.					
6.0 TEST SAMPLES: Test samples shall be supplied for testing and approval as per IS: 1447.					
6.1 To draw a representative sample, the contents of the container selected for sampling shall be mixed as thoroughly as possible by shaking or stirring or both or by rolling, so as to bring all portions into uniform distribution.					
6.2 The samples shall be taken in a suitable, clean, dry air-tight glass bottle of one liter capacity. It should be almost but not completely filled by the sample.					
6.3 In case of failure of first sample, two samples shall be drawn from other two drums of the same consignment at random and failure of the second sample in complying with the specification will lead to the rejection of the whole consignment.					
7.0 PROPERTIES: When tested in accordance with the test methods shown against each clause, the test samples shall show the following properties:					
7.1* Colour (Say bolt) (IS: 1448-Part 14): + 20, minimum					
7.2 Copper Strip Corrosion Test (IS: 1448-Part 15): Not worse than No. 1, at 50°C for 3 hours.					
7.3 Density (IS: 1448-Part 16): g per ml, at 15°C: Not limited but to be reported.					
Revisions: As per 40 th MOM of MRC -CPO			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (CPO)		
Rev. No. 05	Amd.No.	Reaffirmed	Prepared	Issued	Dt. of 1st Issue
Dt.26.05.2012	Dt:	Year:	2 BHOPAL	Corp. R&D	JANUARY, 1981

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7.4 Flash Point (Abel) (IS: 1448-Part 20):
35⁰ C, minimum.

7.5 Residue on Evaporation (IS: 1448-Part 29):
5 mg per 100 ml, maximum.

7.6 Aromatic Content (IS: 1448-Part 48):
40% by volume, maximum.

7.7 Distillation Range:

7.7.1 Initial boiling point (IS: 1448-Part 18):
145⁰ C, minimum.

7.7.2 Final boiling point:
205⁰C. maximum

7.7.3 50% by volume at, in °C:
Not limited but to be reported.

7.7.4 95% by volume at a temperature:
Not limited but to be reported.

8.0 TEST CERTIFICATES:

Unless otherwise specified, 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 567 01, Rev.No.05 : Petroleum Hydrocarbon Solvent, Gr.: 145/205, Low aromatic
BHEL Order No.
Manufacturer’s/Supplier’s Name.
Trade Mark, if any.
Batch No.
Date of Manufacture and expiry
Test results of clauses 7.0

9.0 Acceptance Criteria: Material shall be accepted on the basis of test results furnished by supplier and testing at BHEL in respect of Cl 7.3, 7.5, 7.7.1, 7.7.2.

3

	CORPORATE PURCHASE SPECIFICATION	AA 567 01
		Rev. No. 05
		PAGE 3 OF 3

10.0 PACKING AND MARKING:

The material shall be packed in mild steel made, road tankers which shall be thoroughly cleaned before filling.

Each container shall marked with the following information:

AA 567 01 : Petroleum Hydrocarbon Solvent, Gr.: 145/205, Low aromatic

BHEL Order No.

Manufacturer's/Supplier's Name.

Trade Mark, if any.

Batch/Lot No.

Date of Manufacture

Quantity supplied.

A caution label **"FLAMMABLE"** together with the corresponding symbol for labelling dangerous goods.

11.0 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

12.0 REFERRED STANDARDS (Latest Publications Including Amendments):

1. IS : 1447 2. IS: 1448 3.IS:1745



CORPORATE PURCHASING SPECIFICATION

AA56708

Rev No. 04

PAGE 1 of 2

THINNER FOR EPOXY PAINTS

1 GENERAL

This specification governs the quality requirements of Thinner for all types of Epoxy Paints.

2 COMPLIANCE WITH NATIONAL STANDARDS

There is no Indian standard covering the requirements of this material.

3 FREEDOM FROM DEFECTS

The material shall be clear and free from sediments, suspended and undissolved matters.

4 TEST SAMPLE

½-litre sample shall be drawn from each consignment for testing and approval.

5 COMPOSITION

The material shall be a blend of either esters, ketones and/or Aromatic hydrocarbons.

6 PROPERTIES

The material shall be compatible with all types of epoxy and stoving (priming and finishing) paints.

7 TEST CERTIFICATES

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

The test certificates shall bear the followings information:

- AA56708, Rev. 04: THINNER FOR EPOXY PAINTS
- BHEL Order No.
- Supplier's/ Manufacturer's Name and Trade mark, if any
- Batch / Lot No.
- Date of manufacture & Expiry, if any.
- Test results of clause 6

8 PACKING & MARKING

The material shall be suitably packed in 20 litre drums to avoid damage during transit. Each container shall be marked with the following information:

Each container shall bear the following information:

- AA56708:THINNER FOR EPOXY PAINTS
- BHEL Order No.

Revisions:

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(CPO+NM)

Rev No.04	Amd No.	Reaffirmed	Prepared HEP, Bhopal	Issued Corp.R&D	Dt. of 1 st Issue 01-08-1988
Dt:26-05-2012	Dt:	Year:2019	3		

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AA56708	CORPORATE PURCHASING SPECIFICATION	
Rev No. 04		
PAGE 2 of 2		

- Supplier's / Manufacturer's Name and Trade mark, if any.
- Batch/Lot No.
- Date of manufacture & Expiry, if any.
- Quantity supplied

9 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 oxidizing etc. as applicable.

10 REFERRED STANDARDS (Latest Publications Including Amendments)

1) Nil

4

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

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Mazdoor Kisan Shakti Sangathan

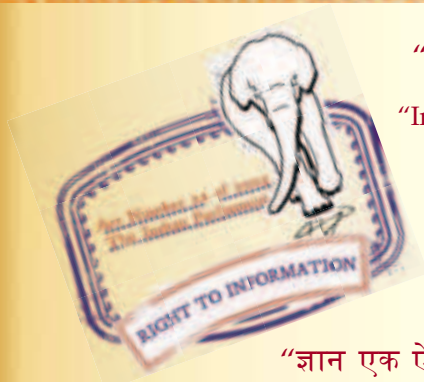
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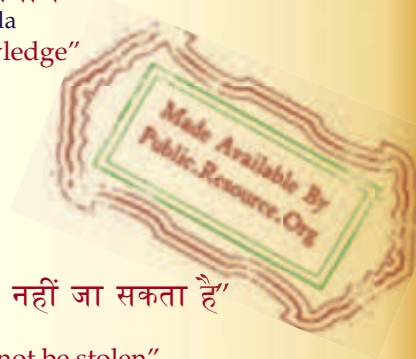
IS 13183 (1991): Aluminium paint, heat resistant [CHD 20: Paints, Varnishes and Related Products]



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Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 13183 : 1991

भारतीय मानक
एल्युमिनियम रोगन, उष्मा प्रतिरोधी — विशिष्ट

Indian Standard
**ALUMINIUM PAINT, HEAT RESISTANT —
SPECIFICATION**

UDC 667.633.42 : 669.71

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1991

Price Group 2

Paints and Allied Products Sectional Committee, CHD 020

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

Considering the need of an aluminium paint for the painting of steel structures and equipments to prevent corrosion at high temperature, it was decided to formulate a standard on heat resistant paint.

Paint complying with this standard is intended for interior and exterior use on metal surfaces that may be subjected to temperature up to 600°C.

The paint is intended for use on gasoline, diesel and steam engines, steam turbines, pumps etc and interior structural members of boilers and boiler houses.

For the purpose of deriding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

**AMENDMENT NO. 2 MAY 2002
TO
IS 13183:1991 ALUMINIUM PAINT, HEAT RESISTANT —
SPECIFICATION**

(*Page 2, Table 1, Sl No 2, col 2*) — Substitute 'Non volatile matter and pigment content' for 'Non-volatile matter'.

(*Page 2, Table 1, Sl No. 2, col 4*) — Substitute '101 (Part 8/Sec 2) 1990' for '27 of IS 101 1964'.

(CHD 20)

Reprography Unit, BIS, New Delhi, India

**AMENDMENT NO. 1 JANUARY 1993
TO
IS 13183 : 1991 ALUMINIUM PAINT, HEAT
RESISTANT — SPECIFICATION**

- (*Page 3, clause B-1, informal table, line 4*) — Delete
- (*Page 3, clause B-1, para 2, line 6*) — Substitute 'grade 1' for 'grade 3'
- (*Page 3, clause C-2*) — Substitute 'STEEL' for 'STFEL'
- (*Page 4, Annex E*) — Delete

(CHD 020)

Reprography Unit, BIS, New Delhi, India

Indian Standard

ALUMINIUM PAINT, HEAT RESISTANT — SPECIFICATION

1 SCOPE

This standard prescribes the requirements, methods of sampling and test for the heat resistant Aluminium Paint. This material shall withstand solvents, normal weather exposure and temperature up to 600°C.

1.1 The material will be used as a finishing heat resistant paint for chimneys, stacks, boiler, pipes and furnace structures where protection to moderate corrosive marine and industrial environment and heat resistance are required.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 COMPOSITION AND GRADES

The material shall be based on suitable binders such as silicone resin, organic titanates, hydrocarbon resin or synthetic rubber resins along with aluminium paste (see IS 289 : 1963) and extender pigments in suitable proportions

Grade 1 — up to 600°C

Grade 2 — up to 400°C

Grade 3 — up to 200°C

NOTES

1 Composition mentioned in the specification should be treated as guidelines and not mandatory upon the manufacturer.

2 Maximum operating temperature resistance for a paint is limited by melting point of the pigment. Since melting point for aluminium is 600°C, paints above 600°C temperature resistance are not recommended.

4 REQUIREMENTS

4.1 The paint shall be suitable for brushing or spraying without reduction.

4.2 Keeping Properties

The paint shall not skin, gel, thicken excessively or cake in the original unopened container for a period of not less than one year from the date of manufacture.

4.3 Heat Resistance

Films of paint prepared and tested as in Annex B shall show no cracking, blistering, flaking or peeling. When cut as in Annex B the paint shall adhere tightly to the metal.

4.4 Salt Spray Resistance

Films of paint prepared and tested as in Annex C and examined immediately after removal from the test shall show not more than a trace of rusting and not more than 5 blisters, non of which is larger than 1 mm in diameter. Dulling or staining unaccompanied by red rusting shall be permitted. On removal of the paint from the panels tested as in C-2, the surface of the steel shall show no more than a trace of rusting, pitting or corrosion.

4.5 Water Resistance

A film of paint when tested as in Annex D shall show no wrinkling or blistering immediately upon removal of the panel from the water. The paint shall be no more than slightly affected when examined 2 hours after removal, and after 24 hours air drying, the portion of the paint which was immersed shall show no more than a slight whitening or dulling in comparison to the portion that was not immersed.

4.6 Mass in kg/10 Litres

The minimum mass in kg/10 litres of the material, when tested as per IS 101 (Part 1/Sec 7) : 1987 shall be within ± 3 percent of the approved sample.

4.7 The material shall also conform to the requirements given in Table 1.

5 PACKING AND MARKING

5.1 Packing

The paint shall be packed as agreed to between the purchaser and the supplier.

5.2 Marking

The container shall be marked with the following information:

- a) Name and grade of the material;
- b) Indication of the source of manufacture;
- c) Volume of the material;
- d) Batch No. or Lot No. in code or otherwise;
- e) Month and year of manufacture; and
- f) Caution notes as follows;
 - i) The material is to be kept away from flames, and
 - ii) Use only with adequate ventilation. Avoid prolonged breathing of vapour or contact with skin.

IS 13183 : 1991

Table 1 Requirements for Aluminium Paint, Heat Resistant
(Clause 4.7)

SI No.	Characteristic	Requirement	Method of Test Ref. to IS No.
(1)	(2)	(3)	(4)
1)	Drying time		
	a) Surface dry h, <i>Max</i>	1	101 (Part 3/Sec 1) : 1986
	b) Tack free h, <i>Max</i>	3	
	c) Hard dry h, <i>Max</i>	18	
2)	Non-volatile matter, percent by mass, <i>Min</i>	30	27 of IS 101 : 1964
3)	Flash point, °C	Above 27°C	101 (Part 1/Sec 6) : 1967
4)	Colour	That of metallic aluminium	11 of IS 101 : 1964
5)	Finish	Bright, smooth & lustrous	101 (Part 3/Sec 4) : 1987
6 *	Scratch hardness, (750 g load)	To pass the test	101 (Part 5/Sec 1) : 1988
7)*	Flexibility and adhesion, after 48 hours drying	- d o -	101 (Part 5/Sec 2) : 1988
8)*	Protection against corrosion under conditions of condensation (7 days)	- d o -	101 (Part 6/Sec 1) : 1988
	Consistency, Sec, <i>Min</i>	20	101 (Part 1/Sec 5)

*Applicable only to grade 2 and 3 and to be carried out after full cure

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed in IS 101 (Part 1/Sec 1) 1986

6.2 Criteria of Conformity

A lot shall be described as conforming to the requirements of this standard, if the test results of the composite sample satisfy all the requirements prescribed under 4.

7 TESTS

7.1 Tests shall be conducted as referred in col 4 of Table 1.

7.2 Quality of Reagents

Unless otherwise specified, pure chemicals and distilled water (see IS 1070 : 1977) shall be employed.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
101 1964	Methods of test for ready mixed paints and enamels (<i>second revision</i>)	Sec 5) : 1987	Sec 5 Consistency (<i>under print</i>)
		Sec 6) : 1987	Sec 6 Flash point (<i>third revision</i>)
101 (Part 1/Sec 1)	Methods of sampling and test for paints, varnishes and related products . Part 1 Test on liquid paints (general and physical) Sec 1 Sampling (<i>third revision</i>)	Sec 7) 1987 (Part 3/Sec 1) : 1986	Sec 7 Mass per 10 litres (<i>third revision</i>) Part 3 Tests on paint film formation Sec 1 Drying time (<i>third revision</i>)

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
Sec 4) : 1987	Sec 4 Finish (<i>third revision</i>)	(Part 6/Sec 1) . 1887	Part 6 Durability tests on paint films Sec 1 Durability under conditions of condensation (<i>third revision</i>)
(Part 5/Sec 1) : 1987	Part 5 Mechanical tests on paint films Sec 1 Hardness test (<i>third revision</i>)	289 : 1963	Aluminium paste for paints (<i>revised</i>)
Sec 2) : 1987	Sec 2 Flexibility and adhesion (<i>third revision</i>)	1070 : 1977	Water for general laboratory use (<i>second revision</i>)

ANNEX B
(Clause 4.3)

TESTING OF HEAT RESISTANCE

B-1 HOT ROLLED STEEL

Select eight 10 cm × 15 cm panels which are completely free of loose mill scale from 14 gauge as rolled commercial quality low carbon steel Clean it with the solvent, aliphatic naphtha-ethylene glycol monethyl ether solvent mixture. Spray the paint, one or two coats, on all the eight panels so as to obtain a total dry film thickness between 20 to 30 microns. Dry it in air for 24 hours. Place the panels in furnace in such a way that no part of these is in direct contact with the bottom or sides of the furnace and subject to the following heating schedules.

<i>Grade</i>	<i>Time</i>	<i>°C</i>
3	8 h	200
2	4 h	300
	1 h	400
	1 h	600
1	8 h	400
	8 h	500
	8 h	600

Remove the panels from the furnace for as short a period of time as possible and inspect (except for knife test) for compliance with 4.3 at the end of each heating period. Remove two panels at the end of the 400°C, for grade 2, and 500°C, for grade 3, heating periods for use in the salt spray test (see Annex C) At the conclusion of the heating schedule remove the remaining two panels, allow to cool in air for 24 hours, cut with a knife blade and observe for conformity with 4.3.

B-2 COLD ROLLED STEEL

Prepare and clean the panels as in B-1 Apply the paint to the side of the panel that has been flat polished Air dry for 30 minutes and bake at 250°C for 1 hour. Cool to room temperature Place the panels in a furnace and heat for 24 hours, in a furnace that has been previously raised to a temperature of 600° ± 2°C. Remove from the oven, cool and inspect for conformity with 4.3 performing the knife test as in B-1.

ANNEX C
(Clause 4.4)

TESTING OF SALT SPRAY RESISTANCE

C-1 HOT ROLLED STEEL

Expose the unscared panels removed from the 400°C or 500°C heating periods of B-1 to the salt spray for 24 hours as per 3 of IS 101 (Part 6/ Sec 1). Upon removal wash the panels gently in warm running water until free from any visible salt deposits and examine immediately for conformity with 4.4.

C-2 COLD ROLLED STEEL

Prepare three 10 cm × 30 cm steel panels as in B-2, except that these are not to be heated up to 600°C. Expose the unscored panels to the salt spray as in C-1 for 96 hours, Upon removal, wash the panels gently in warm running water until free from any visible salt deposits and examine immediately for conformity with 4.4.

IS 13183 : 1991

ANNEX D
(Clause 4.5)

TESTING OF WATER RESISTANCE

D-1 Prepare a film of paint as in **B-2**, except do not heat to 600°C. Coat all exposed uncoated metallic surfaces with wax or suitable coating and immerse the panel for 24 hours at $27 \pm 2^\circ\text{C}$. Upon removal, observe the panel for conformity with **4.5**.

ANNEX E
(Table 1, Sl No. 5)

DETERMINATION OF SILICON CONTENT

E-1 Place the extracted vehicle in a flask and distill off most of the solvent. Transfer the concentrated resin solution to a tared platinum crucible, using benzene to wash the flask thoroughly, and evaporate the remaining solvent on a steam bath. Add 4 to 5 drops of chlorobenzene which reduces frothing on some samples, and agitate or warm the contents to dissolve the samples, Add 2 ml of 15 percent fuming H_2SO_4 to the solution at room temperature, followed by 0.5 ml of fuming HNO_3 . Hold over a low flame or heat several hours to accomplish digestion. When the mass has solidified and danger of frothing is past, heat the crucible to complete expulsion of SO_2 fumes. Place residue, usually black, in a muffle furnace for 1 hour at 800°C and weigh the remaining residue as silicon dioxide (SiO_2).

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Doc : No. CHD 20 (0014)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Headquarter:

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Telephones : 331 01 31, 331 13 75

Telegrams: Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	87 86 62
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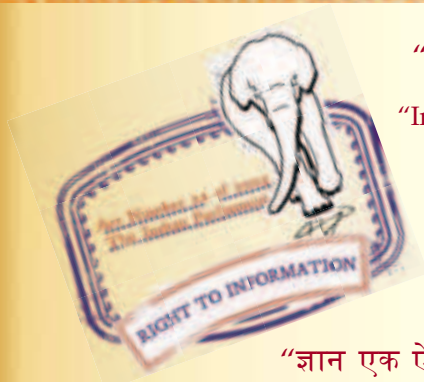
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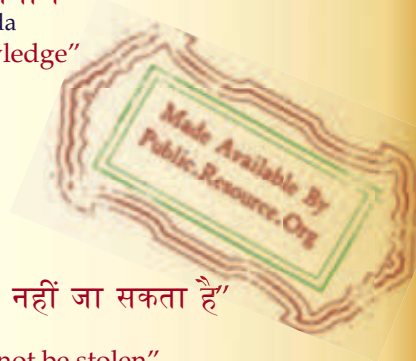
IS 13213 (1991): Polyurethane full gloss enamel (two pack)
[CHD 20: Paints, Varnishes and Related Products]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS 13213 : 1991
(Reaffirmed - 2012)

भारतीय मानक

पॉलियूरिथेन, पूर्ण चमक वाला इनेमल (दो पैक) – विशिष्ट

Indian Standard

**POLYURETHANE FULL GLOSS ENAMEL
(TWO PACK) - SPECIFICATION**

UDC 666.293

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

October 1991

Price Group 4

Paints (Other than Industrial Paints) and Allied Products Sectional Committee, CHD 020

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints (Other than Industrial Paints) and Allied Products Sectional Committee had been approved by the Chemical Division Council.

High performance coatings based on synthetic polymers are a recent development. Polyurethane surface coatings being the most recent addition, are probably one of the best available system for corrosion protection of steel. It is also the economical among other anti-corrosion coatings. It not only wards off corrosion but also fortifies the steel against chemical attack and physical damage.

The use of polyurethane paints, presents a two-fold potential hazards such as toxic and fire hazards. The safety precautions should be taken in handling and painting of these materials (*see* Annex J).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AMENDMENT NO. 1 DECEMBER 1994
TO
IS 13213 : 1991 POLYURETHANE FULL GLOSS ENAMEL
(TWO PACK) — SPECIFICATION

(Page 1, clause 1.1.1, line 2) — Delete the words '(conventional air/air-less)'.

(Page 1, clause 4.1.1, line 2) — Delete the word 'extenders'.

(Page 1, clause 5.4) — Add the following after the word 'apparatus':

'However during mixing of two components in large quantities, the mixing may be done using a high speed stirrer and the rise in temperature shall not be more than 5°C.'

(Page 2, Table 1) — Add the following after Sl No. (i)(b):

Sl No.	Characteristic	Requirement	Method of Test	
			Annex (4)	Ref to IS No. (5)
(1)	(2)	(3)		
c)	Hard dry, 70°C, Max	30 min, with 15 min flash off time	—	101 (Part 3/Sec 1) : 1986 (see Note)

[Page 2, Table 1, Sl No. (i), col 5] — Substitute '101 (Part 3/Sec 1) : 1986' for '101 (Part 3/Sec 5) : 1987'.

[Page 2, Table 1, Sl No. (xiv)] — Substitute 'Gloss retention shall be minimum 50 percent of the original gloss value. There will be no appreciable change in colour' for 'Difference in gloss and colour between immersed and unimmersed area of paint film shall be minimum'.

(Page 2, Table 1) — Add at the end of the table:

'NOTE — Test Panels shall be kept at 70°C for hard drying.'

(Page 3, clause 6.1.1) — Substitute 'Any sediment formed in the container shall be mixed thoroughly, preferably with power driven stirrer to form homogeneous paint' for 'Any sediment that does form must be easy to stir up again in order to give a homogeneous paint'.

(Page 3, Annex A, line 11) — Substitute 'Sec 1 : 1986' for 'Sec 1 : 1987'.

(CHD 031)

Reprography Unit, BIS, New Delhi, India

Indian Standard

POLYURETHANE FULL GLOSS ENAMEL (TWO PACK) – SPECIFICATION

1 SCOPE

1.1 This standard prescribes requirements and methods of sampling and test of a two-pack full gloss polyurethane enamel, intended to be used for the protection of exterior of railway coaches, diesel and electric locomotive against atmospheric corrosion.

1.1.1 It is primarily suitable for application by spraying (conventional air/airless). It may also be applied by brush for touching up small areas.

1.1.2 The material is intended to be used as a top coat in painting system for the protection of exterior of railway coaches, etc, involving wet and damp areas, high humidity, coastal, marine and industrial fall out. Polyurethane paints shall be suitable for use in those exterior applications where it is desirable to retain colour and gloss for long periods of time in addition to providing excellent chemical and corrosion resistance.

2 REFERENCES

The Indian Standards listed in Annex A are the necessary adjuncts to this standard.

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 1303 : 1983 and the following shall apply.

3.1.1 Component

Each of the two parts of the paint which when mixed together, form a pigmented polyurethane paint.

3.1.2 Paint

The mixture of the two components in the proportion recommended by the manufacturer.

4 REQUIREMENTS

4.1 Composition

The paint shall consist essentially of two components, enamel and hardener or catalyst solution to be mixed in such simple proportion preferably by volume to satisfy all the requirements of this standard.

4.1.1 An enamel shall consist of (i) an appropriate

polyol, and (ii) pigments, extenders, solvents and additives.

4.1.2 Hardener or catalyst solution shall consist of (i) an aliphatic polyisocyanate, and (ii) solvents and additives.

NOTE — To determine whether the polyisocyanate is aliphatic or aromatic in nature, the test shall be carried out as prescribed in Annex B.

4.1.3 The mixture of base and hardener shall be allowed to mature for 20 min at $27 \pm 2^\circ\text{C}$. The mixture must be consumed within 4 hours after mixing.

4.2 The material shall also comply with the requirements given in Table 1.

5 TESTS

5.1 Unless specified otherwise, tests shall be conducted as prescribed in IS 101. References to the relevant parts of that standard are given in col 5 of Table 1.

5.2 The preparation of metal panels shall be as per IS 101 (Part 1/Sec 3) : 1986.

5.3 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* 1070 : 1977) shall be employed.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

5.4 The two component polyurethane finish enamel shall be mixed in the ratio recommended by the manufacturer of the paint before conducting the test or tests. Where the enamel is required to be applied on panels, it shall be done so by using suitable spraying apparatus.

5.5 The spray gun shall be thoroughly cleaned before use. Correct size of nozzle and air-cap shall be fitted to it. The air pressure shall be adjusted in accordance with the viscosity of the material to be sprayed. An even and uniform coat having a dry film thickness of minimum 35 microns has to be obtained. The film thickness shall be determined by the method prescribed in Annex C.

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Table 1 Requirements for Full Gloss Polyurethane Enamel (Two-Pack)
(Clause 4.2)

Sl No.	Characteristic	Requirement	Methods of Test	
			Annex (4)	Ref to IS No. (5)
(1)	(2)	(3)		
i)	Drying time			101 (Part 3/Sec 5) : 1987
	a) Surface dry, <i>Max</i>	3 Hours		
	b) Hard dry, <i>Max</i>	8 Hours		
ii)	Consistency	Smooth and uniform and suitable for spray application	—	101 (Part 1/Sec 5)*
iii)	Finish	Smooth and full glossy	—	101 (Part 3/Sec 4) : 1987
iv)	Colour	Close match to be specified IS colour or to an agreed colour	—	101 (Part 4/Sec 2) : 1989
v)	Dry film thickness, <i>Min</i>	35 microns	C	—
vi)	Volume solids, <i>Min</i>	40 percent	D	—
vii)	Scratch hardness	No such scratch as to show bare metal	—	101 (Part 5/Sec 1) : 1988
viii)	Flexibility and adhesion	No visible damage or detachment of film	—	101 (Part 5/Sec 2) : 1988
ix)	Flash point (for each component)	Not below 20°C	—	101 (Part 1/Sec 6) : 1987
x)	Fineness of grind, <i>Max</i>	10 microns	—	101 (Part 3/Sec5) : 1987
xi)	Pot life, 27±2°C, <i>Min</i>	4 Hours	E	—
xii)	Gloss at 45° angle of incidence, <i>Min</i>	52	—	101 (Part 4/Sec 4) : 1988
xiii)	Weight in kg/10 l, <i>Min</i>	9	—	101 (Part 1/Sec 7) : 1987
xiv)	Accelerated tests:			
	a) Resistance to sulphuric acid	Shall not show any signs of blistering, wrinkling and lifting. Difference in gloss and colour between immersed and un-immersed area of paint film shall be minimum	F	—
	b) Resistance to caustic potash	do		
	c) Resistance to oil	do		
	d) Resistance to solvents	do		
xv)	Durability test:	<i>Rating</i>		
	a) Out-door exposure	Chalking 10	G	—
	b) Accelerated weathering test	Checking 10		
		Cracking 10		
		Flaking 10		
		Spotting 10		
		Blistering 10		
		Colour change 7-8		
		Gloss The film shall have a minimum gloss retention of 90 percent of its original value		
		Corrosion No corrosion (see 3.4 of IS 8662 :1978)		
xvi)	Keeping properties	Not less than one year	—	101 (Part6/Sec 1) : 1988

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ANNEX B**(Clause 4.1.2)****METHOD OF IDENTIFYING AROMATIC AND ALIPHATIC ISOCYANATES****B-0 GENERAL**

B-0.1 Aliphatic polyisocyanates show no colouration while aromatic polyisocyanates show a light brown to a dark reddish brown colouration with hydrogen peroxide.

B-1 REAGENTS**B-1.1 Acetone**

B-1.2 3 percent hydrogen peroxide solution in acetone.

B-2 PROCEDURE

B-2.1 Prepare an approximately 40-50 percent solution of the polyisocyanate in acetone. To 50 ml of this solution, stir 1 ml of 3 percent hydrogen peroxide solution. Allow it to stand for 5-10 min.

B-2.2 The development of any light brown to a dark reddish brown colour indicates aromatic polyisocyanates. No colour indicates aliphatic polyisocyanates.

ANNEX C**[Clause 5.5, and Table 1, Sl No. (v)]****DETERMINATION OF PAINT FILM THICKNESS****C-0 GENERAL**

C-0.1 This specifies non-destructive methods for determining the thickness of dry paint films on metallic substrates. It is, therefore, primarily intended for use in checking the thickness of paint films on painted articles.

C-1 APPARATUS**C-1.1 Electromagnet**

This type of instrument, requires a supply of

electrical power and incorporates means of stabilizing the supply to an electromagnetic head.

C-2 PROCEDURE

C-2.1 The head is placed on an unpainted metal surface similar in nature to that bearing the paint film under test. A reading is taken and the operation repeated on the painted surface. The scale on the instrument is calibrated to indicate the thickness of the paint film shown by the difference between two readings.

ANNEX D**[Table 1, Sl No. (vi)]****DETERMINATION OF VOLUME SOLIDS****D-0 GENERAL**

D-0.1 This method is intended to provide a measure of the volume of dry coating obtainable from a given volume of liquid coating. This volume is considered to be the most equitable means of comparing the coverage and the wet film thickness of the given paint.

D-1 APPARATUS

D-1.1 Analytical Balance — Sensitive to 0.1 mg.

D-1.2 Stainless Steel Disc

60 mm diameter and 0.70 mm thickness with a small hole 2 to 3 mm from the edge. A fine wire such as chromel is attached through the hole for suspending the disc in a liquid.

D-1.3 Weight Box

D-1.4 Beaker — 1 litre.

D-1.5 Mass per Litre Cup

D-1.6 Hot Air Oven — Capable to maintain $90 \pm 2^\circ\text{C}$.

D-2 PROCEDURE

D-2.1 Dry the disc in an oven at 90°C for 10 minutes and cool. Weigh the disc in air. Let it be W_1 grams.

D-2.2 Suspend the disc in water and weigh again. Let it be W_2 grams.

D-2.3 Calculate the volume of the disc V as follows:

$$V = \frac{W_1 - W_2}{d}$$

where

d is the density of the water at room temperature.

D-2.4 Determine the weight of non-volatile content of the liquid coating material by drying a known amount of paint at 90°C for 3 hours. Let it be W grams.

D-2.5 Determine the specific gravity of the paint to the nearest 0.001 g/ml by using mass per litre cup. Let it be P .

D-2.6 Dip the disc in the paint sample for 10 minutes and take out the disc. Allow the excess coating material to drain off. Blot the coating material off the bottom edge of the disc so that beads or drops do not dry on the bottom edge of the disc. Dry the disc at 90°C for 3 hours and cool. Weigh the coated disc in air. Let it be W_3 grams.

D-2.7 Suspend the coated disc in water and weigh again. Let it be W_4 grams.

D-2.8 Calculate the volume of the coated disc V_1

as follows:

$$V_1 = \frac{W_3 - W_4}{d}$$

where

d is the density of water at room temperature.

D-2.9 Calculate the volume of the dried coating as follows:

$$\text{Volume of dried coating} = V_1 - V \quad (V_d)$$

D-2.10 Calculate the volume of wet coating as follows:

$$V_w = \frac{W_3 - W_1}{W \times P}$$

where

W = grams of non-volatile matter in 1 g of wet coating.

D-2.11 Calculate the percent volume solids of the paints as follows:

$$\frac{V_1 - V}{V_w} \times 100 \text{ OR } \frac{V_d}{V_w} \times 100$$

D-2.12 The percent volume solids of a paint is related to the covering capacity and film thickness in the following manner:

a) **Theoretical coverage (m^2/l) =**

$$\frac{\text{Percent volume solids}}{\text{Dry film thickness (microns)}} \times 10$$

b) **Wet film thickness (microns) =**

$$\frac{\text{Dry film thickness (microns)}}{\text{Percent volume solids}} \times 100$$

ANNEX E

[Table 1, Sl No. (xi)]

DETERMINATION OF POT LIFE

E-1 GENERAL

E-1.1 The time taken to reach to end of working life from the original viscosity shall be considered as the pot life of the material.

E-2 PROCEDURE

E-2.1 Condition the components of the coating for one hour at 27°C and mix immediately in the proper ratio to fill the can to be approximately 1 cm of the top. The lid should be loosely placed on the can.

E-2.2 Measure the viscosity initially and every hour thereafter, as prescribed in IS 101 (Part 1/Sec 5).

NOTE — The interval may be shortened, if desired.

E-2.3 Near the end of the coating's working life, the viscosity builds up rapidly. When it appears that the coating may be too viscous to spray, remove a small portion and add the appropriate thinner. If the paint can still be thinned, the end of the working life has not been reached.

E-2.4 The end of the working life is reached when the paint gels, becomes stringy or cannot be thinned for application.

E-3 Report the working life as pot life of the period.

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ANNEX F

[Table 1, Sl No. (xiv)]

ACCELERATED TESTS

F-1 GENERAL

F-1.1 These tests of chemical resistance, are included to assure the customer that the coating contains a sufficiency of cured resin to exhibit the long term requirements.

F-2 PROCEDURE

F-2.0 Prepare the panels as per Annex H. For the immersion tests as in **F-2.1** to **F-2.3**, prepare and paint both sides of the panels and protect the edges of the panels by sealing with a chlorinated rubber paint.

F-2.1 Resistance to Sulphuric Acid

Immerse 3/4th of the panel in 30 percent sulphuric acid for 24 hours. Remove the panel, wash in running fresh water and allow it to dry for an hour. Record the observation.

F-2.2 Resistance to Caustic Potash

Immerse 3/4th of the panel in 20 percent solution

of potassium hydroxide for 24 hours. Remove the panel, wash in running fresh water, allow it to dry for an hour. Record the observation.

F-2.3 Resistance to Oil

Immerse 3/4th of the panel in a mineral lubricating oil (see **19.1** of IS 101 : 1964) for 24 hours.

Remove the panel and wipe the excess oil with cotton, wash it with mineral turpentine and allow to dry for 30 minutes. Record the observation.

F-2.4 Resistance to Solvents

Test one panel each for resistance to xylene, ethanol and acetone respectively. Take a clean white sterilized cotton and soak it in the solvent and place it on the painted panel without squeezing the cotton. Immediately cover the soaked cotton with a suitable watch glass and leave it for 6 hours. Remove the watch glass and the soaked cotton, wipe the area with a clean dry cotton. Record the observation immediately.

ANNEX G

[Table 1, Sl No. (xv)]

DURABILITY TEST

G-1 GENERAL

G-1.1 Both sides of the panels must be prepared and painted as per Annex J for normal outdoor exposure test as well as accelerated weathering test.

G-2 NORMAL OUT-DOOR EXPOSURE TEST

G-2.1 Expose the test panels in the open in duplicate at an angle of 45° facing south. The duration of test shall be for a period of 12 months. The test shall be started from any month in a calendar year. Examine the condition of the exposed films at monthly intervals for the first quarter and thereafter quarterly for the rest of the period for the following characteristics:

- Gloss
- Colour
- Checking; cracking and flaking

- Chalking
- Spotting
- Blistering

G-2.2 Wash the right hand half of the surface of the two test panels with 5 percent caustic soda solution followed by 5 percent hydrochloric acid solution and subsequent thorough rinsing with water. Wipe the panel with a clean soft cloth. Examine the same half of the test panels at each examination. As an aid in the examination, a magnifying glass may be used, but the valuation shall be based on an assessment with the unaided eye. At the end of the stipulated period for durability test, examine the two halves of the test panels. The sample shall be considered satisfactory if the material surface underneath as well as condition of the film in both the halves, the one washed periodically as well as the one washed only

for the final examination is satisfactory. The requirements of this test shall be taken to have been satisfied if performance in respect of the characteristics as noted in A-3.2 and A-3.4 of IS 8662 : 1978 is within the limits specified in Table 1.

G-3 ACCELERATED WEATHERING TEST

G-3.1 Carry out the test for 1 000 hours in a xenon

arc type weatherometer (with rotating day/night device) with a cycle of 3 minutes rainfall and 17 minutes dry period.

The requirements of this test shall be taken to have been satisfied if performance in respect of the characteristics as noted in A-3.2 and A-3.4 of IS 8662 : 1978 is within the limits specified in Table 1.

ANNEX H

(*Clause F-2.0*)

PREPARATION OF PAINTED PANELS FOR ACCELERATED TESTS

H-1 The preparation of panels shall generally be in accordance with IS 101 (Part 1/Sec 3) : 1986.

H-2 Apply one coat of epoxy zinc phosphate primer (two-pack) at minimum 35 microns dry film thickness by spraying and allow to dry for at least 6 hours and not more than 24 hours. Dry rub with emery paper No. 400 and wipe clean with a dry soft cloth.

H-3 Apply one coat of epoxy surfacer (two-pack) at minimum 35 microns dry film thickness by spraying and allow to dry for at least 6 hours and not more than 24 hours. Wet rub with water-proof emery paper No. 400 and allow to dry.

H-4 Apply one coat of full gloss polyurethane enamel (two-pack) at minimum 35 microns dry film thickness by spraying and allow to air dry for 7 days.

ANNEX J

(*Foreword*)

HEALTH HAZARDS AND SAFETY MEASURES

Use of polyurethane paints generally presents a two-fold potential hazard, toxic hazards and fire hazards.

Toxic effects through the lungs and the skin occur frequently in the industrial usage of paints. The best guide of comparative values of ingestion toxicity is the LD 50 value. It refers to the lethal doses of toxic substance which can kill 50 percent of one class of animal in test. The LD 50 value for polyisocyanates is much lower when compared to the LD 50 value of cyanides. Another guide of comparative values of inhalation is the threshold limit value (TLV). The TLV for monomeric di-isocyanates has been fixed up at 0.02 ppm. Therefore, spraying of polyurethane paints calls for safety precautions in the form of proper

ventilation, proper exhaust facilities and hand-gloves for the spray painters. However, it would be an ideal painting practice to go in for proper spray booth.

As far as fire hazards are concerned, all solvents based paints are known for their fire-risks. This can be eliminated by providing good ventilation so as to avoid vapour air mixture which are flammable and also by not exposing the paint vapours to sources of static electricity, sparks or flames.

The polyurethane coatings are as safe to handle as any other solvent based paints, provided general industrial hygiene principles are followed.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola
CALCUTTA 700054

Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036

Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
BOMBAY 400093

Branches : AHMADABAD, BANGALORE, BHOPAL, BHUBANESHWAR, COIMBATORE,
FARIDABAD, GHAZIABAD, GUWAHATI, HYDERABAD, JAIPUR, KANPUR,
PATNA, THIRUVANANTHAPURAM.

Telephone

{ 311 01 31
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53 38 43

235 02 16

6 32 92 95

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दो घटक जस्ता ईथाइल सिलिकेट
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Indian Standard
ZINC ETHYL SILICATE PRIMER,
TWO COMPONENTS — SPECIFICATION

ICS 25.220.40; 87.020

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 6

Industrial Paints Sectional Committee, CHD 031

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Industrial Paints Sectional Committee had been approved by the Chemical Division Council.

Zinc rich primers find a wide range of applications for corrosion protection of iron and steel. These can be used alone but are usually employed as a primer coat as a part of the protective system for long term corrosion protection. Zinc pigmented primers are also used for fabrication primers (shop primers) for the protection of abrasive blast cleaned steel plates and fabricated components of ships and other structures. Repair of damaged galvanized and metallic zinc sprayed coatings is carried out by using metallic zinc rich primers.

The standard has been prepared with the aim to cater for the requirements of zinc rich paints for use as primers and prefabrication paints having different degree of corrosion protection.

The satisfactory performance of zinc rich primers depends largely on their capacity to attain close electrical contact between zinc particles and iron or steel surface to be protected. The close electrical contact permits in achieving adequate galvanic protection of the steel substrate especially under marine conditions. To ensure such electrical contact it becomes essential to remove all mill scale, rust and any other contamination from the steel surface to be painted. The zinc rich primers, therefore, shall be applied only to very carefully prepared steel preferably abrasive blast cleaned surface conforming to Sa 2.5/Sa 3 quality to Swedish standard. It is important to control the surface roughness. This is mainly achieved by the selection of correct size of grit or shot and appropriate air pressure. The profile height obtained should lie between 50-75 microns.

While formulating this standard, considerable assistances have been obtained from SSPC - Paint 20, November 1982, Systems and Specification, Steel Structure Painting Manual, Part 2 of Steel Structure Painting Council, Pittsburgh, PA (USA).

This standard also provides informative guidance for deciding a testing programme to help vendors (see Annex G).

The committee responsible for the formulation of this standard is given in Annex II.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of specified value in this standard.

Indian Standard

ZINC ETHYL SILICATE PRIMER, TWO COMPONENTS — SPECIFICATION

1 SCOPE

This standard prescribes requirements, sampling and method of test for zinc ethyl silicate primer. This material shall be used for the painting of steel paint equipments, by spraying, where corrosion protection, chemical resistance under marine atmospheric condition, abrasion and heat resistance are required.

2 REFERENCES

The Indian Standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 TERMINOLOGY

For the purpose of this standard the terms and definitions used in IS 1303 shall apply.

4 REQUIREMENTS

4.1 Composition

The material complying with this standard shall be ethyl silicate pigmented with zinc metal *see* IS 14355. The manufacturer shall specify the principal type of binder used in the pigmented curing agent. The total metallic zinc content in non-volatile portion of the shop coat primer shall be 65 percent *Min* and for the main coat primer 75 percent *Min* when tested as per Annex B.

4.2 Weight per 10 litre of the mixed paint shall be 13 kg, *Min* for shop coat and 20 kg, *Min* for main coat and shall be determined in accordance with IS 101 (Part 1/Sec 7). Variation shall be within +3 percent.

4.3 Solids percent by weight of the mixed paint shall be 50 *Min* for shop coat and 68 *Min* for main coat and shall be determined in accordance with IS 101 (Part 2/Sec 2). Variation shall be within +2 units.

4.4 Keeping Properties

The liquid portion of the multi-component paint shall not show thickening, curdling, gelling or hard caking after being stored unmixed for six months from the date of delivery in a tightly covered unopened

container at a temperature of $27 \pm 2^\circ\text{C}$ [*see* IS 101 (Part 6/sec 2)].

4.5 The material shall conform to the requirements given in Table 1.

5 TESTS

5.1 Unless specified otherwise, tests shall be conducted as prescribed in IS 101, preferably on the blasted panels. Reference to the relevant sections of the standard are given in col 6 of Table 1.

5.2 The preparation of metal panels shall be according to IS 101 (Part 1/Sec 3).

5.3 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

6 PACKING AND MARKING

6.1 Packing

It shall ensure that the quality does not deteriorate during storage and shall be as agreed to between purchaser and supplier.

6.2 Marking

6.2.1 Each container shall be marked with the following information:

- a) Indication of the source of manufacture,
- b) Batch No. or Lot No. and month and year of manufacture,
- c) Date of expiry,
- d) Mass of the material,
- e) Name of the material (both the component to be mentioned including type and pack), and
- f) The caution label 'FLAMMABLE' together with the corresponding symbol for labelling dangerous goods as given in Fig. 5 of IS 1260 (Part 1).

6.2.2 BIS Certification Marking

The product may also be marked with the Standard Mark.

Table 1 Requirements of Zinc Ethyl Silicate Primer

(Clause 4.5)

Sl No.	Characteristics	Requirements		Method of Test, Ref to	
		for Shop Coat Primer (3)	for Main Coat Primer (4)	Annex	IS 101
(1)	(2)	(3)	(4)	(5)	(6)
A Wet Paint					
i) Mixing Ratio		Simple ratio as specified by the manufacturer both by weight as well as by volume		—	
ii) Consistency		The liquid component mixed with powder/component using power stirrer shall be suitable for application by the appropriate method(s) either as such or when thinned in the proportions as specified by the manufacturer		—	Part 1/Sec 5
iii) Flash Point		Not below 13°C	Not Below 15°C		Part 1/Sec 6
iv) Drying Time:					Part 3/Sec 1
a) Surface dry		15 min <i>Max</i>	15 min <i>Max</i>		
b) Hard dry		2 h <i>Min</i>	2 h <i>Min</i>		
c) Time to top coat		24 h <i>Min</i>	24 h <i>Min</i>	C	
v) Mud-cracking (when viewed under 10 X magnification)		The coating applied to a dry film thickness of 60 micron, <i>Min</i> shall not show any mud cracking	The coating applied to a dry film thickness of 120 micron, <i>Min</i> shall not show any mud cracking	—	
vi) Volume solids, percent <i>Min</i> (To be determined by air drying the coated disc at room temperature for 24 h and also non-volatiles are to be estimated by air drying for 24 h)		30	60		Part 8/Sec 6
vii) Pot life, <i>Min</i> at 30°C		6 h	4 h	D	
NOTE — Tests from Sl No. (ii) to (vii) are for mixed paint.					
B Dry Coat (To be conducted after 72 h of curing)					
i) Dry film thickness		15-25 microns	65-75 microns		Part 3/Sec 2
ii) Colour	—	Grey (self standard)		—	Part 4/Sec 2
iii) Finish		Smooth matt	Smooth matt		Part 5/Sec 1

Table 1 (Concluded)

Sl No.	Characteristics	Requirements		Method of Test, Ref to	
		for Shop Coat Primer (3)	for Main Coat Primer (4)	Annex (5)	IS 101 (6)
(1)	(2)				
	iv) Protection against corrosion under conditions of condensation	1 000 h Min	2 000 h Min		Part 6/Sec 1
	v) Salt spray test	750 h Min	2 000 h Min		Part 6/Sec 1
	vi) ¹⁾ Heat resistance test. Panel kept at 400 ± 10°C for 6 h followed by plunging in cold water — Three cycles, Min	N.A.	The film shall not show signs of cracking, blistering or flaking		Part 7/Sec 3
	vii) Effect of welding	To pass the test	N.A.	E and F	

NOTES

1 Inorganic zinc rich primers should not be applied at relative humidities below 50 percent, without specific instructions from paint manufacturer.

2 Multiple component zinc rich paints should be applied within 4 h after mixing and should be continuously agitated during application.

¹⁾ To be carried out at the option of users.

6.2.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of the conditions under which the licence for use of the Standard Mark may be granted to the manufacturers or the producers may be obtained

from the Bureau of Indian Standards.

7 SAMPLING

Representative samples of the material shall be drawn according to 6 of IS 101 (Part 1/Sec 1).

ANNEX A

(Clause 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	Title	IS No.	Title
101	Methods of sampling and test for paints, varnishes and related products :	(Part 3/Sec 4) : 1987	Tests on paint film formation, Section 4 Finish (<i>third revision</i>)
(Part 1/Sec 1) : 1986	Test on liquid paints (general and physical), Section 1 Sampling (<i>third revision</i>)	(Part 4/Sec 2) : 1988	Optical tests on paint films, Section 2 Colour (<i>third revision</i>)
(Part 1/Sec 3) : 1986	Test on liquid paints (general and physical), Section 3 Preparation of panels (<i>third revision</i>)	(Part 6/Sec 1) : 1988	Durability tests, Section 1 Resistance to humidity under conditions of condensation (<i>third revision</i>)
(Part 1/Sec 5) : 1989	Test on liquid paints (general and physical), Section 5 Consistency (<i>third revision</i>)	(Part 6/Sec 2) : 1989	Durability tests, Section 2 Keeping properties (<i>third revision</i>)
(Part 1/Sec 6) : 1987	Test on liquid paints (general and physical), Section 6 Flash Point (<i>third revision</i>)	(Part 7/Sec 3) : 1990	Environmental tests on paint films, Section 3 Resistance to heat (<i>third revision</i>)
(Part 1/Sec 7) : 1987	Test on liquid paints (general and physical), Section 7 Mass per 10 litres (<i>third revision</i>)	(Part 8/Sec 6) : 1993	Tests for pigments and other solids, Section 6 Volume solids
(Part 2/Sec 2) : 1986	Test on liquid paints (Chemical examination), Section 2 Volatile matter (<i>third revision</i>)	266 : 1993	* Sulphuric acid (<i>third revision</i>)
(Part 3/Sec 1) : 1986	Tests on paint film formation, Section 1 Drying time (<i>third revision</i>)	1070 : 1992	Reagent grade water (<i>third revision</i>)
(Part 3/Sec 2) : 1989	Tests on paint film formation, Section 2 Film thickness (<i>third revision</i>)	1260 (Part 1) : 1973	Pictorial marking for handling and labelling of goods : Part 1 Dangerous goods (<i>first revision</i>)
		1303 : 1983	Glossary of terms relating to paints (<i>second revision</i>)
		1499 : 1977	Method for charpy impact test for metals (<i>first revision</i>)
		1608 : 1995	Mechanical testing of metals — Tensile testing (<i>second revision</i>)
		14355 : 1996	Zinc dust pigment for paints

ANNEX B

(Clause 4.1)

DETERMINATION OF TOTAL ZINC

B-1 GENERAL

Two methods are prescribed. In Method 1 total zinc content in the sample is determined volumetrically using potassium ferrocyanide solution. Method 2 is the alternate method and uses EDTA method.

B-2 METHOD 1

B-2.1 Outline of the Method

Total zinc content in the sample is determined volumetrically using potassium ferrocyanide solution.

B-2.2 Reagents

B-2.2.1 Concentrated Sulphuric Acid — See IS 266.

B-2.2.2 Ammonium Hydroxide — 20 percent (m/v).

B-2.2.3 Dilute Hydrochloric Acid — Approximately 6 N.

B-2.2.4 Diphenylamine Indicator

Dissolve 1 g of diphenylamine in 100 ml of concentrated sulphuric acid. It shall be freshly prepared.

B-2.2.5 Standard Potassium Ferrocyanide Solution

B-2.2.5.1 Dissolve 21.12 g of potassium ferrocyanide and 0.3 g of potassium ferricyanide in one litre of water and standardize as described in B-2.2.5.2.

B-2.2.5.2 Standardization of potassium ferrocyanide solution

Weigh accurately 4 to 5 g of pure zinc in a beaker, add 60 ml of dilute hydrochloric acid and heat carefully till it dissolves completely. To facilitate dissolution about 0.02 g of iron filling free from zinc may also be added. After all the zinc has dissolved, cool, dilute and make up to one litre. Pipette out 20 ml of made up zinc solution into a 500 ml conical flask, dilute to 100 ml with water and neutralize with ammonium hydroxide, added carefully till a white precipitate appears. Add dilute hydrochloric acid drop by drop till the precipitate just dissolves and add 5 ml dilute acid in excess. Warm to 60°C, add 3 drops of diphenylamine indicator and titrate against potassium ferrocyanide solution, a precipitate is formed with deepening in colour as the end point approaches, the end point being the sudden colour change with the addition of one drop from blue violet to a pale green colour persisting even after thorough shaking. Repeat the titration to obtain constant values. Calculate the mass of zinc equivalent to 1 ml of potassium ferrocyanide solution.

B-2.3 Procedure

Weigh about 2.5 g of the material accurately into a beaker, moisten with alcohol and dissolve in 40 ml of dilute hydrochloric acid by heating. Cool, filter, if necessary, and make up to 500 ml.

B-2.3.1 Pipette 20 ml of the made up solution into a 250-ml beaker, dilute to 50 ml and pass hydrogen sulphide for about 5 min. Keep for 10 min. Heat to 80°C. Filter and collect the filtrate in a 500-ml conical flask. Boil the filtrate till free from hydrogen sulphide. Just neutralize with ammonium hydroxide, make acidic with dilute hydrochloric acid, warm to 60°C and titrate against the standard potassium ferrocyanide solution exactly as was done for the standardization of the ferrocyanide solution.

B-2.4 Calculation

$$\text{Total zinc (as Zn),} = \frac{2.500 VF}{M}$$

percent by mass

where

V = volume in ml of standard potassium ferrocyanide solution used in the titration,

F = mass in g of the zinc equivalent to one ml of standard potassium ferrocyanide solution, and

M = mass in g of the material taken for the test.

B-3 METHOD 2

B-3.1 Reagents

B-3.1.1 Concentrated Hydrochloric Acid — Density 1.18 g/ml.

B-3.1.2 Dilute Hydrochloric Acid — Dilute 200 ml of the hydrochloric acid (see B-3.1.1) to 1 litre, with water.

B-3.1.3 Sulphuric Acid — Density 1.84 g/ml.

B-3.1.4 Nitric Acid — Density 1.42 g/ml.

B-3.1.5 Ammonia Solution — Density 0.880 g/ml.

B-3.1.6 Buffer Solution — Dissolve 200 g of hydroxylammonium chloride ($\text{NH}_2\text{OH}\cdot\text{HCl}$) in approximately 300 ml of water. Dissolve 28 g of sodium hydroxide in approximately 300 ml of water. Combine the two solutions, cool and dilute 1 litre with water.

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B-3.1.7 Ethylene diamine tetra acetic acid (EDTA), disodium salt, dihydrate, solution, zinc factor T, in g Zn/ml (that is 1 ml of disodium EDTA solution will form a complex with T g of zinc).

Dissolve about 20 g of disodium EDTA, dihydrate, in water and make up to 1 litre with water. Store in a polyethylene bottle.

Standardize against a 0.05 M zinc sulphate solution.

B-3.1.8 *Xylenol Orange* — 0.1 g indicator (sodium salt) in 100 ml of water.

B-3.1.9 *Bromothymol Blue* — 0.1 g in 100 ml of 96 percent ethanol (w/v).

B-3.2 Procedure

B-3.2.1 Weigh to the nearest 0.001 g about 1.5 g of the sample into a 250-ml beaker. Dissolve the sample in 20 ml of the hydrochloric acid (see B-3.1.1) and add 1 or 2 ml of the nitric acid (see B-3.1.4) to ensure that any lead present is dissolved. Add 5 ml of the sulphuric acid (see B-3.1.3) and evaporate strongly, until fuming. Cool then add 100 ml of water, boil for a short time and allow to stand until the following day.

B-3.2.2 Filter the solution through a sintered glass or silica crucible; wash the crucible, collecting the

filtration in a 500 ml one mark volumetric flask. Make the solution up to the mark and mix thoroughly.

B-3.2.3 By means of a pipette, transfer 50 ml of the solution to a 500-ml conical flask; add 200 ml of water and 3 drops of the bromothymol blue indicator (see B-3.1.9), then add ammonia solution (see B-3.1.5) drop by drop, until the colour turns blue. Then add the hydrochloric acid (see B-3.1.2) until the red colour changes to pale yellow. After that add 20 ml of the buffer solution (see B-3.1.6) and 3 drops xylenol orange indicator (see B-3.1.8) and titrate with the disodium EDTA solution (see B-3.1.7) until the red colour changes to pale yellow.

B-3.3 Calculation

Total zinc content (as Zn), = $\frac{1000 VT}{m}$
percent by mass

where

m = mass, in grams of the test portion;

T = zinc factor in grams per millilitre, of the disodium EDTA solution ; and

V = volume, in millilitres, of the disodium EDTA solution used.

ANNEX C

[Table 1, Sl No. 1 (A), iv (b) and C]

DETERMINATION OF HARD DRY AND TIME TO TOP COAT

C-1 PURPOSE

To determine hard dry and time to top coat of zinc silicate coatings, with desired dry film thickness (DFT) and under standard atmospheric conditions of $27 \pm 2^\circ\text{C}$ and 65 ± 5 percent relative humidity.

C-2 SCOPE

This test method is applicable for checking hard dry time and time to top coat.

C-3 PREPARATION OF TEST SPECIMENS AND TEST CONDITIONS

C-3.1 Conduct test in a well ventilated room or chamber, free from dust, products of combustion, laboratory fumes and under diffused light.

C-3.2 Apply the paint on M.S. panel, blast cleaned to Sa 2 1/2 with a surface profile 25-40 microns by spray application at a recommended DFT.

C-3.3 Allow the coated panel to dry in a horizontal or slanting position shielded from direct air current and in absence of direct sunlight.

C-3.4 Testing should be done within an area, any point of which is not less than $\frac{1}{2}$ inch (15 mm) from the film edge.

C-3.5 Testing should be done at temperature $27 \pm 2^\circ\text{C}$ and at relative humidity of 65 ± 5 percent.

C-4 PROCEDURE

C-4.1 Hard Dry Time

Place the test panel in a horizontal position at a height such that when the thumb is placed on the film, the arm of the operator is in a vertical line from the wrist to the shoulder. Bear down on the film with the thumb, exerting the maximum pressure of the arm, at the same time turning the thumb through an angle of 90° in plane of the film. The film is considered 'hard dry' when there is no loosening, detachment, wrinkling or other evidence of distortion of the film.

C-4.2 A quick and easy method to assess adequacy of cure for topcoating is to rub the primer with the edge of a coin. If the film burnishes, it is acceptable.

ANNEX D

[Table 1, Sl No. 1 (A), vii]

DETERMINATION OF POT LIFE OF INORGANIC ZINC SILICATE

D-1 PURPOSE

To determine the pot life of inorganic zinc silicate product.

D-2 SCOPE

This test method covers the determination of pot life by determining homogeneity property after a specified period of time for all moisture cured inorganic zinc silicate type of coatings.

D-3 DEFINITION

D-3.1 Pot Life

Maximum time during which a product (two pack) should be used after they have been mixed together.

D-4 APPARATUS

D-4.1 Thermometer — graduated in 1.0°C .

D-5 SAMPLING

Take a representative samples (two components) of 9

the product to be tested. Take sufficient quantities and mix so as to make approximately 200 ml of mixed paint.

D-6 PROCEDURE

D-6.1 Testing to be carried out at $30 \pm 2^\circ\text{C}$ (unless specified otherwise).

D-6.2 Mix the base and hardner in the recommended ratio so as to make approximately 200 ml of mixed paint.

D-6.3 Homogenize the mixture intermittently (at least at an interval of 1 h).

D-6.4 After regular interval (for example 1 h) observe the homogeneity that is, presence of any surface skin.

D-6.5 The end of pot life is indicated by skin/crust formation.

D-7 REPORT

- Pot life in time units, and
- Temperature.

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ANNEX E

[Table 1, Sl No. 1 (B) vii]

PROCEDURE FOR PREPARATION OF TEST PANELS

E-1 PROCEDURE

Use test panels of appropriate size. Degrease using a suitable solvent, say mineral spirit. Abrasive blast using sand or chilled iron grit. Abrade the panel with zero number emery paper to flatten the excessively higher peaks, clean with brush, degrease, dry and immediately

coat with the material using suitable application technique. Care should be taken that at no time during degreasing and painting should the prepared surface be touched by hand or otherwise contaminated.

NOTE — Surface profile of the panel blast cleaned as per procedure described above lies between 25-40 microns.

ANNEX F

[Table 1, Sl No. 1 (B) vii]

DETERMINATION OF INFLUENCE ON WELDING

F-1 GENERAL

The mild steel plates coated with the prefabrication primer are welded and the weld is examined for porosity and mechanical properties along with a control weld assembly.

F-2 PROCEDURE

F-2.1 Test Plate

Use mild steel plates of size 500 mm × 150 mm × 20 mm for making the weld test assemblies. A single V-notch preparation is made on longitudinal edge of each panel.

F-2.2 Preparation of Weld Assembly

Abrasive blast two plates including the edges in accordance with E-1 and coat them with prefabrication primer as per manufacturers instructions except that the dry film thickness shall be 40-50 microns. Allow the primer coat to dry for seven days. Prepare the test assembly by welding the plates together using appropriate consumable electrodes. Abrasive blast the control assembly plates and weld in a similar fashion.

F-2.3 Examination of Test Assemblies

The test assemblies shall be examined for the tests given below:

- a) *Radiographs* : These are to have a sensitivity

of better than 2 percent of the plate thickness under examination, as shown by an image quality indicator.

- b) *Photo-macrographs* : These may be of actual size and are to be taken from near each end and from the centre of the weld.
- c) *Face and reverse bend test* : The test specimens are to be bent by pressure round a former of diameter equal to three times the plate thickness.
- d) *Impact tests* : These are to be carried out at ambient temperature on three charpy V-notch test specimens prepared in accordance with IS 1499. The specimens are to be notched at the centre line of the weld, perpendicular to the plate surface.
- e) *Tensile test* : Ultimate tensile strength shall be determined in accordance with IS 1608 keeping the weld joint in the middle of the test piece.

F-2.4 The primer shall be deemed to have passed the test if porosity in primer coated weld assemblies does not exceed 10 percent than that encountered in control weld. The results of other tests on welds with primer shall not be below the minimum specified values of control welds.

ANNEX G**(Foreword)****GENERAL PROVISIONS****G-1 SUPPLY**

Unless otherwise agreed by the purchaser, the zinc-ethyl silicate primer supplied shall not differ significantly from the requirements of the specification in either composition or performance.

G-2 VENDORS CERTIFICATE

The purchaser may require a test certificate that primer complies with this specification.

G-3 The following information shall be given on the certificate:

- a) Description of primer,
- b) The vendor's product reference,
- c) Batch identification,
- d) Quantity in batch, and
- e) Date of manufacture.

A certificate may relate to more than one batch.

G-4 TESTS

G-4.1 The arrangement to establish compliance of the primer with this specification and the frequency of the tests to be carried out for testing the bulk supply shall be as agreed between the purchaser and the supplier.

G-4.2 When a purchaser orders supply of primer to this standard in lots to be delivered over a period, it is not contemplated that all of the tests specified must necessarily be made on samples representative of every batch or consignment. The extent and frequency of the testing will depend on many factors and a definite schedule cannot be laid down.

G-4.3 The following classification of tests is, however, submitted for the guidance of purchasers in establishing, in consultation with manufacturers, an appropriate

testing programme in relation to vendor's certification.

G-4.4 It may also provide a useful basis on which to establish a testing programme when a testing authority, acting on behalf of a purchaser, is required to examine a series of batches for compliance with this standard.

G-4.4.1 GROUP 1

Tests to be made on first batch and on every subsequent batch:

- Mass in kg per 10 litre
- Solids in percent by weight
- Consistency
- Drying time
- Pot life
- Colour
- Finish
- Total metallic zinc content
- Flash point

G-4.4.2 GROUP 2

Tests to be made on first batch and subsequently as and when agreed:

- Percent volume solids
- Protection against corrosion under condition of condensation
- Salt spray test
- Heat resistance test in case of main coat primer
- Effect of welding on shop coat primer
- Keeping qualities

ANNEX H**(Foreword)****COMMITTEE COMPOSITION****Industrial Paints Sectional Committee, CHD 31****Chairman**

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SHRI JUNG BAHADUR

DR P. G. RUNAVIKAR (Alternate)

SHRI DHIRENDRA KUMAR

SHRI B. C. CHAKRABORTY (Alternate)

Representing

In personal capacity (14 Orion Oomer Park, Bhulabhai desai road, Mumbai 40026)

Addisons Paints & Chemicals Ltd, Chennai

Asian Paints (I) Ltd, Mumbai

Bajaj Auto Ltd, Pune

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(Continued on page 11)

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Members

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Oil and Natural Gas Corporation Ltd, New Mumbai
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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices :

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110 002

Telephone
{ 323 76 17
{ 323 38 41

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi
CALCUTTA 700 054

{ 337 84 99, 337 85 61
{ 337 86 26, 337 91 20

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160 022

{ 60 38 43
{ 60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600 113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400 093

{ 832 92 95, 832 78 58
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PLANT PURCHASING SPECIFICATION JAGDISHPUR

JP56198

Rev No. 00

PAGE 1 of 3

Heat Resistant Aluminium Paint Gr. III as per IS 13183

1 SCOPE

This specification governs the quality requirements of Heat Resistant Aluminium Paint, which shall be capable to withstand temperature up to 200°C.

2 APPLICATION

The paint shall be suitable for heat resistant application on the surfaces of Ceramic Lined components and other machine parts which are exposed to an operating temperature of 200°C as well as to protect against moderate corrosion.

3 COMPLIANCE WITH NATIONAL STANDARDS

The material shall conform to the requirements of following national standard and also shall meet other requirements of this specification.

IS 13183 : 1991, Gr. III: Aluminium Paint, Heat Resistant-Specification.

4 COLOR

That of metallic Aluminium

5 FINISH

Bright, smooth and lustrous.

6 FREEDOM FROM DEFECTS

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

The dried coating of paint shall be free from defects like bittyness, floating of pigments, leafing/flaking of film from substrate etc.

7 CHEMICAL COMPOSITION

The paint shall be based on special heat resistant silicone binder pigmented with fine grade of aluminium paste and extender pigments in suitable proportion so as to meet the requirements of this specification.

The supplier of the material has to certify that the paint supplied is free from natural resins and free from lead or its compound to meet requirements of ISO 14001. The supplier should provide IR -Spectrograph in support of above composition.

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PLANT PURCHASING SPECIFICATION JAGDISHPUR

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8 PROPERTIES

The material when tested in accordance with relevant parts and clauses of IS 101 shall show the following properties.

8.1 DRYING TIME

Surface Dry: 1 hour, max.

Tack free: 3 hours, max.

Hard Dry: 18 hours, max.

8.2 NON VOLATILE MATTER

30% by mass, min.

8.3 CONSISTENCY

20 secs. min.

8.4 FLASH POINTS

Not below 27° C

8.5 MASS PER TEN LITRES

The minimum mass in kg/10 litres of the material, when tested as per IS 101 (Part 1/Sec 7) : 1987 shall be within ± 3 percent of the approved sample.

8.6 *SALT SPRAY RESISTANCE

As per IS 13183: 1991 Clause 4.4

8.7 *WATER RESISTANCE

As per IS 13183: 1991 Clause 4.5

8.8 *RESISTANCE TO HEAT

As per IS 13183: 1991 Clause 4.3

8.9 *FLEXIBILITY AND ADHESION

To pass the test when tested after 48 hrs of air drying.

8.10 *PROTECTION AGAINST CORROSION UNDER CONDITIONS OF CONDENSATION

To pass the test when the test panel is dried for 48 hours at Room Temperature and then subjected to an exposure in

temperature humidity chamber for a period of 7 days.

8.11 *SCRATCH HARDNESS

To pass the test at 6H pencil hardness.

Note: * Test shall be conducted after the paint is fully cured.



PLANT PURCHASING SPECIFICATION JAGDISHPUR

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9 TEST CERTIFICATES

Unless otherwise stated, three copies of test certificates shall be supplied giving the following information. In addition, the supplier shall ensure to send one copy of the Test certificate along with despatch documents for quick clearance of material.

JP56198, Rev.00: Heat Resistant Aluminium Paint Gr. III as per IS 13183

BHEL Order No and Date.

Manufacture's/Supplier's Name and Trade mark, if any.

Batch/Lot No.

Date of manufacture and Expiry

Test Results of clauses 7 and 8

Quantity of the lot.

T.C. No and Date.

10 KEEPING PROPERTY

When stored in a covered dry place in the original sealed container under normal temperature conditions, the material shall retain the properties prescribed in this specification for a period of 12 months after the date of manufacture, which shall be subsequent to the date of placing the order.

11 PACKING AND MARKING

The paint shall be supplied in sealed and leak proof metal containers in size as per BHEL order. Each container shall bear the following information neatly written or pasted at suitable location on it.

JP56198, Rev.00: Heat Resistant Aluminium Paint Gr. III as per IS 13183

BHEL Order No.

Manufacture's/Supplier's Name and Trade mark, if any.

Batch/Lot No.

Date of manufacture and Expiry

Quantity supplied

12 REJECTION AND REPLACEMENT

Material not conforming to the requirement shall be Rejected. Supplier shall undertake to replace the material free of cost without any delay and arrange to take back the material at his own cost.

13 REFERRED STANDARDS (Latest Publications Including Amendments)

- 1) IS 101

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

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GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

SL. NO.	DESCRIPTION
1	General:
A	These General Terms & Conditions (GTC) shall apply to all tender enquiries, notice inviting tenders (NIT), request for quotations concerning the supply of goods and / or rendering of services to Bharat Heavy Electricals Ltd., FSIP, Jagdishpur (hereinafter referred to as BHEL or the Purchaser) or its Projects / Customers. Special / supplementary/Notice Inviting Tender (NIT) terms and conditions of enquiry, if any, will override the terms and conditions mentioned in this GTC.
2	General Instructions - Common for Indigenous & Foreign enquiries
	Supplier may also be referred as Bidder/Vendor. The terms are being used interchangeably. A Purchase Order is a document issued by a buyer to a seller indicating the items or services wish to purchase. Purchase Order shall be treated as a contract and both are interchangeable. Order of precedence will be as follows: a. Any Corrigendum b. NIT Terms & Conditions c. Special/Supplementary terms and Conditions d. General Terms and Conditions
A	Through E- procurement-
	i. Offer shall be submitted by the bidders in single / two parts as called in Tender enquiry. ii. Bid Part - I Technical cum Commercial bid Bid Part - II Price bid iii. Suppliers shall quote price on BHEL/authorised third party service provider e-procurement site. Any deviation from the price format shall be clearly brought out in the offer Bid part-I. The offer shall be uploaded on BHEL e-procurement site using Class III digital signature. Bidders to put sign and seal on all the uploaded documents. The quotation should be uploaded on the site before due date and time. Part-I of the bid shall contain complete item-wise scope of supply as offered vis-à-vis the scope of supply as per enquiry, all commercial terms and conditions etc. It is expected that bidders shall meet all our technical and commercial requirements and shall not deviate from them.
B	Commercial Conditions quoted by the vendor in any place including as stated in bidder's 'General Terms and Conditions' if any, shall not be binding on the BHEL and the conditions contained in this GTC, including special conditions, if any, for this enquiry shall only prevail, unless agreed by BHEL.
C	<u>Wherever Reverse Auction is called for</u> REVERSE AUCTION (RA): "BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on https://www.bhel.com/supplier-registration) for this tender. RA shall be conducted among the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do (es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking." <u>Wherever Reverse Auction is not called for</u> PRICE BID OPENING: Tender shall be finalized via price bid opening of all the techno-commercially qualified bidders in place of RA. Price bid should contain only price of item. Anything other than price of item shall be invalid. <i>Tender finalization mode (RA or Price bid opening) shall be specified in NIT / Special / supplementary terms and conditions of enquiry.</i>
D	The goods offered shall confirm to BHEL specifications and / or National/International standards as mentioned in the Enquiry and the bidder is required to confirm his unconditional acceptance to the same. Vendors, seeking deviations from the specifications and any other conditions, may indicate the same clearly on a separate sheet, with reasons for such deviations. BHEL reserves the right to reject the offer with deviations or load the deviations suitably for evaluation.

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E	Wherever, any make/ brand specific requirement is there in tender, the offers shall be submitted directly by Manufacturer/ OEM or his authorized agent/dealer/distributor only. Unsolicited offers shall be summarily rejected. In case both OEM and its Authorized agent/dealer/distributor quote against tender, offer of only OEM shall be considered.
F	Bid in single part or techno-commercial bid in two-part system (as the case may be) will be opened on the due date. In case of two-part bid, price bids of techno-commercially acceptable bidder(s) only shall be opened on the assigned date.
G	In case of changes in scope and / or technical specification and / or commercial terms & conditions, having price implication, techno-commercially acceptable bidders shall be asked by BHEL to submit the impact of such changes on their price bids. In case a bidder opts to submit revised price bid instead of impact called for, then latest price bid shall prevail.
H	The bidders will submit Integrity Pact, duly signed by its authorized signatory, where called for in the enquiry.
I	Bidders who are not registered with BHEL FSIP, Jagdishpur may visit www.bhel.com and may fill up online "Supplier Registration Form" on BHEL link (http://supplier.bhel.in) along-with all the supporting documents.
J	BHEL expects that the bidder must respond to the enquiry. Regret letter, with valid reasons for not participating in the tender will be submitted where the bidder is unable to submit offer. Repeated lack of response (Not Quoted in last four consecutive tenders or all enquiries in last two years whichever is earlier) on the part of vendor may lead to his deletion from BHEL's approved vendor list.
K	Goods shall be properly packed to avoid transit damage. Suitable markings shall be provided to identify the goods with that of the PO No. and the consignee details.
L	Goods shall be consigned to Store Officer, BHEL, FSIP, IA Jagdishpur Dist- Amethi (U.P.) India, unless otherwise specified in the PO.
M	All corrigenda, addenda, amendments, time extensions, clarifications etc. to the tender will be hosted on BHEL website (www.bhel.com)/ https://eprocurebhel.co.in/nicgep/app eProcurement website only.
N	In the course of evaluation, if more than one bidder happens to occupy L1 status, effective L1 will be decided by soliciting discounts from the respective L1 bidders. In case more than one bidder happens to occupy the L1 status even after soliciting discounts, the L1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L1 bidder (s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.
O	The Purchaser can consider awarding tendered quantities among more than one bidder (after acceptance of L1 price by the other bidders) in the manner and proportion disclosed in the tender conditions. Wherever the numbers of qualified responses (N) are three or more, the distribution shall be limited to (N-1) qualified responses. Distribution in case of two qualified bidders shall be as per BHEL's discretion only. Purchaser can also consider awarding of part of the tendered quantity to other than L1 bidder at L1 counter offered rates, if the quantity offered by the L1 bidder is less than the quantity tendered for. BHEL can also award order to L1 bidder/counter offer accepted bidders in case any bidder is not supplying/delaying the supplies and in this case the distributed quantity shall not be considered in loading share. The loading of Order shares on suppliers will also be subject to their performance (Quality, Delivery and Service) for the supplies made against Purchase Orders. The suppliers with consistence good performance will be preferred over poor performance supplier and encouraged with more order share. Depending upon performance in supplies BHEL shall go to redistribute the pending orders/shares of poor performer to other suppliers whose performance in supplies is better.
P	The bidder shall submit price bid strictly in the price format, wherever provided for, in the enquiry. Any attempt on the part of the bidder to alter the contents of the price bid format in any manner, which in the opinion of BHEL can vitiate the tendering process, will lead to rejection of the bid, <u>besides BHEL taking appropriate punitive action as deemed fit as per policy.</u>
Q	In case the bidder decides to sub-contract part of his activity / work to some of his vendors, details of such intended subcontracting shall be mentioned in the bid. This will however not absolve the bidder from his contractual obligations and responsibilities.
R	Wherever the minimum reserved capacity is called for in the tender, the offers of such bidders, who do not quote for the minimum reserved capacity, are liable to be rejected.

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3	Delivery Terms
A	Indigenous Purchase
	Goods shall be delivered on 'FOR Destination' basis (with freight and insurance in bidder scope) to the named destination unless otherwise called for in the enquiry.
B	Foreign Purchase — Imports
B1	1. Goods shall be despatched by Sea, unless stated otherwise in the enquiry or purchase order. 2. Terms of Delivery for Sea shipment shall be on CFR / CIF basis with 14 days' detention free period for FCL (Full Container Load) Cargo of GP & HC Containers. 3. For other cases - Other than GP & HC Containers, LCL Cargo shall be delivered at Nhava Sheva (JNPT) & Break-bulk Cargo at Mumbai (MPT). 4. For Air consignments, the terms of delivery shall be FCA at BHEL nominated Airport. 5. Freight amount shall be indicated separately in the offer in case of CIP/CFR/CIF. 6. The number of detention free days and destination charges payable to shipping line must be mentioned in your offer and also on the Bill of Lading. 7. Offer received on FOB basis may be considered on an exceptional basis. BHEL will load freight, marine insurance & shipping line port handling charges etc. to work out landed cost at Sea Port. 8. Please visit BHEL website for details of named Air ports and Sea ports. Name of the gateway port so chosen by the Seller shall be indicated by the Bidder in his offer.
B2	1. For delivery of FCL (Full Container Load) cargo, the Bidder shall provide minimum 14 days' detention free period from the date of delivery at Port of Discharge / Place of Delivery (in case of ICD). Wherever the detention free period offered is less than 14 days, the bids shall be loaded for the period short of 14 days' period. 2. <u>Port Congestion charges or any additional charges claimed by the shipping line at Port of Discharge / Place of Delivery shall be to the Seller's account.</u>
C	If bidder insists for Ex Works Delivery in FOR tenders, BHEL shall load for transportation charges as per BHEL transport rate contract. In case of rate contract is not available, BHEL may seek budgetary offer for transportation charges.
4	Delivery Schedule & Completion date
A	• Instead of writing specific date against delivery offered, bidder shall commit delivery period in number of days / weeks / months to suit the delivery period indicated in the enquiry. • Commencement of delivery period shall be reckoned from the date of PO / LOI or any other agreed milestone. • Seller shall deliver the goods in the manner and schedule agreed under the Purchase order. • Goods shall be delivered within contractual period or any extension thereof, if any, granted by the Purchaser. • If delivery is linked to approval of documents, time for submission of such documents to be indicated and delivery period to be indicated from approval of documents. This delivery schedule will be considered for processing delivery extension, wherever applicable. • BHEL reserves the right to cancel the order if material is not delivered within PO scheduled delivery. • In case of unsatisfactory performance on quality / delivery BHEL will have right to discontinue the contract in part or full.
B	In case of foreign supplies, the date of Bill of Lading (B/L) or AWB shall be taken as actual date of delivery.
C	In case of Indigenous bidders, the date of delivery at named destination in India shall be taken as contractual delivery completion date where delivery terms are FOR destination.
D	In case of 'Ex-works' delivery terms, the date of Intimation by supplier to lift the material or date of invoice, whichever is earlier, shall be the contractual delivery completion date.
5	Transit Insurance
	Except where delivery terms are agreed on CIF basis for Imports & FOR destination basis for indigenous purchases, transit insurance will be covered by BHEL under its Open Marine Transit Insurance Policy. Seller shall inform dispatch particulars with value of consignment to the Purchaser within 07 days of dispatch for BHEL to arrange insurance coverage in its policy. Failure on the part of seller to inform dispatch particulars will make him liable to pay for any transit damages / losses suffered by the Purchaser.
6	Force Majeure
	Notwithstanding anything contained in the contract, neither the Seller nor the Purchaser shall be held responsible for total or partial non-execution of any of the contractual obligations, should the obligation become unreasonably onerous or

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	impossible due to occurrence of a 'Force Majeure' which directly affects the obligations to be performed by the Purchaser or the Seller; Such events include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotions, insurgency, sabotage, acts of public enemy, fires, explosion, epidemics, quarantine restrictions, floods, earthquake, or acts of God, restrictions by Govt. authorities; over which the Seller or the Purchaser has no control.
	The party claiming to be affected by force majeure shall notify the other party in writing without delay, within two weeks on the intervention and on the cessation of such circumstance. Extension of time sought by the Seller along with supporting evidence and so granted by the Purchaser for the supply/ work affected, if any, shall not be construed as waiver in respect of remaining deliveries. Rescheduling of deliveries on account of force majeure conditions, if so agreed by the Purchaser, will not entail the Seller to claim any increase in the price on whatsoever account. Notwithstanding above provisions, Purchaser shall reserve the right to cancel the order/ Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements. If deemed necessary, Purchaser may takeover partly processed material at a mutually agreed price.
7	LD/Penalty for delayed delivery/ performance.
A	Subject to force majeure conditions, I. LD shall be 0.5 % of the total order value per week of delay or part thereof subject to a maximum of 10% of the total order value. II. In case of staggered delivery schedule, LD shall be 0.5 % of the undelivered portion per week of delay or part thereof subject to a maximum of 10% of the total order value of that lot. However, even if a staggered delivery schedule for Capital Machine / BOPs is agreed, the LD cap will be levied on total order value and not undelivered portion of the order value. III. In case of any amendment/ revision, the LD shall be linked to the amended / revised PO value. Any loading on LD/penalty clause shall be to the extent to which it is not agreed to by the bidder (at offered value). The same shall be intimated separately prior to price bid opening. Note: "Recovery of LD will not include GST". Date of Gate entry at BHEL shall be considered as date of material receipt for LD purpose except Ex Works PO. In case the contractually agreed delivery date falls on a holiday in BHEL FSIP Jagdishpur, the next working day shall be taken as contractual delivery date for compliance and applicability of LD / penalty. In case any supply is rejected by BHEL, Receipt date of replacement material shall be considered as date of material receipt for LD purpose.
B	Risk Purchase
	If the material is not supplied within the agreed delivery period, BHEL reserves the right to cancel the order and purchase the material from alternate source (s) at the Risk and Cost of the Seller along with appropriate action as per BHEL extant rules. In such an event, it shall be obligatory on the part of seller to make good any loss suffered by the purchaser. Amount to be recovered in case of risk purchase shall be calculated as below: Risk and Cost against Balance Work : Risk & Cost Amount= [(A-B) + (A x H/100)] Where, A = Value of Balance scope of Work/ Supply (*) as per rates of new contract B = Value of Balance scope of Work/ Supply (*) as per rates of old contract being paid to the contractor/ supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any. H = Overhead Factor to be taken as 5 In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero). *(Balance scope of work/ supply) Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work/ Supply for calculating risk & cost amount. Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

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	Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities. Substitute/ extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute/ extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions. However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose. NOTE: In case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work/supply' for calculating Risk & Cost amount.
8	Indian Agents and Agency commission
A	BHEL prefers to deal directly with Foreign vendor, wherever required, for procurement of Goods. However, if the Foreign Principal desires to avail services of an Indian Agent, then the Principal should ensure compliance to "regulatory guidelines" which will require submission of an agency agreement.
B	The CFR / CIF price quoted will be deemed to be inclusive of Indian Agency commission. Agency commission as disclosed by the bidder in his quoted CFR / CIF price will be paid in Indian Rupees on receipt & acceptance of Materials or it's installation at destination, as the case may be. The lower of the TT buying rate prevailing on the date of technical bid opening or price bid opening shall be considered for computation of Agency commission.
C	In a tender either the Indian Agent on behalf of Principal / OEM or the Principal / OEM itself can bid, but both cannot bid simultaneously for same item / product in the same Tender. In case bids are received from both the Principal / OEM and the agent, bid received from the agent will be ignored.
D	If an agent submits Bid on behalf of the Principal / OEM, the same agent shall not submit bid on behalf of another Principal / OEM in the Tender, for the same Item / Product.
9	Documentation:
A	Indigenous Purchase
	For supply orders placed on Indian Suppliers: Irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at https://suvidha.bhel.in/suvidha, prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs. five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and up to Rs. five lakhs, in case they were not digitally signed and uploaded on the portal. Note- "The material will not be accepted inside BHEL in absence of the above."
B	Foreign Purchase — Imports
	A. Vendor to share immediately Bill of lading with Import Invoice and packing list of material at mssea@bhel.in and incorporate following detail in the bill of lading: a. Import & export Code (IEC) of importer; b. GST Identification No (GSTIN) of importer; c. Official email id of importer (to be used for correspondence by shipping lines and Customs) – mssea@bhel.in to be included. B. Seller shall send 1 set of following documents, in English, within 7 days of B/L date / 1 day of AWB date by courier to the Purchaser. 1. Express / Original 'Clean on board' Bill of Lading / AWB. 2. One set of Commercial Invoice, Packing list indicating container-wise Gross weight, Net weight, CBM volume, No. of packages with Dimensions of each package. 3. Original Certificate of Country of Origin issued by Chamber of Commerce. 4. One set of Original Test Certificates and O&M Manual where called for. 5. Fumigation / Phyto Sanitary Certificate wherever cargo is packed in wooden packing or packing of plant origin material is used. 6. Supplier should additionally forward 2 sets of original documents mentioned at point 1 to 5 along with original bill to Lading through any international courier service / registered airmail or AWB by captain's mail within three days of obtaining the same directly to the following:

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	(i) Head- M.S Regional Operations Division BHEL 14th Floor Centre-1 World Trade Centre, Cuffe Parade Colaba, Mumbai 400 005 INDIA E-mail: mssea@bhel.in (ii) Head- Finance Administrative Bldg. BHEL, FSIP, IA Jagdishpur Amethi, 227817, UP, India And confirm forwarding details to Purchase Officer, BHEL, FSIP, IA Jagdishpur 227817, Amethi , UP, India <u>through email</u>. 7. In case the Seller decides to negotiate all 3 originals of B/L / AWB along with all original documents through negotiating Bank, non-negotiable documents (NNDs) consisting of copy of B/L / AWB & documents mentioned at Sl. No 9- B2 to B5 will be sent by e-mail to the Purchaser at his e-mail address given in the PO. Other documents, as required, will be separately indicated in the Purchase Order. Additional expenditure, if any, incurred by the Purchaser by way of detention / demurrage, resulting out of delay attributable to the Seller in providing Negotiable documents, will be recovered from the Seller. In case any discrepancy is raised by bankers / BHEL with respect to documents submitted, vendor to facilitate clearance of goods through Delivery Order.
C	General
	1. For Hazardous chemicals, the materials safety data sheet (MSDS) is to be submitted. 2. All certificates as called must be sent. BHEL may test any goods supplied and their decision is final irrespective of supplier's certificates. If test certificate and guarantee certificate are not received along with the document stipulated in these specifications, BHEL reserves the right to get the material tested and recover the expenses from the supplier without awaiting supplier's confirmation.
10	Pricing Terms:
	Prices once quoted shall remain firm within the validity or any extension thereof for placement of order, till complete execution of the order, without any escalation / increase for any reason, whatsoever, unless specifically provided for in the Enquiry & PO. In case of foreign vendors, the quoted price shall be taken as inclusive of Third Party Inspection and testing charges as called for in the NIT.
11	Price Validity :
	Unless stated otherwise in the enquiry, offer shall be valid for a period of 90 days from the date of Techno- commercial (Part-I) bid opening date.
12	Taxes & Duties - Indigenous Purchase:
A	Vendor to ensure timely remittance of SGST, CGST, IGST as applicable in time as per law.
B	Vendor to ensure compliance to filing of monthly GST sales return including BHELs supplies by 10 th of next calendar month in the online GST portal wherever applicable.
C	Vendors to declare filing of timely returns and GST remittance / likely remittance / ITC adjustment along with invoice.
D	Vendor to submit invoices compliant with GST invoice Rules
E	Vendors to comply with all statutory provisions as may be applicable at the time of despatch / sale. Any additional financial liability to BHEL on account of non-compliance by vendors shall be borne by them and shall be adjusted / recovered from the vendors. BHEL reserves the right to review the existing offers / contracts for any revision in terms, which may arise due to change in any statutory provisions to ensure that the benefit accrues to BHEL.
F	Vendor to ensure TAX INVOICE submission along with consignment.
G	In respect of cases where the liability to discharge GST is on BHEL under reverse charge mechanism, vendors have to ensure timely submission of invoices and delivery of material / services to BHEL, so that there is no mismatch on both activities. In case there is any additional financial liability on BHEL on account of default on the part of the vendor on submission or delivery of material / services the same shall be passed on to them. In respect of free issue material by BHEL, vendors have to return the processed material within the time line as per the provisions of GST. In case of any additional tax liability on BHEL on account of non-compliance by the vendor, the additional financial implications on BHEL shall be passed on to the vendor.
H	Vendors to provide the applicable HSN / SAC codes as called for in the enquiry.

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I	e-Invoicing: In line with notifications of the Government of India in the Ministry of Finance (Department of Revenue), GST invoices are to be uploaded by vendors on the Invoice Registration Portal (IRP) as per applicability of relevant notifications and shall submit the unique 'Invoice Reference Number (IRN)' after digitally signing the e-invoice generated by IRP. It is important to note that where a vendor is required to issue an e-invoice but fails to do so, then such invoice would not be treated as a valid invoice under GST law for availing input tax credit (ITC).
13	Taxes & Duties - Foreign Purchase — Imports
	The offered prices shall be <u>inclusive of all the Taxes and duties</u> as applicable in the country of bidder / country of dispatch for the quoted CFR / CIF price.
14	Payment Terms-
A	Indigenous: 100% payment in 90 days of receipt (45 days for MSE having UDYAM certificate, registered suppliers as per relevant Act in force), subject to acceptance of material at BHEL, on direct presentation of the documents. In case of despatch of material to site directly, site certification for receipt of materials is required unless otherwise provided for in the PO. GST amount shall be released only after the same is credited in BHEL account in GSTR 2.
B	Foreign: 100% direct Payment payable on 90th day of B/L / AWB.
	Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded as per below point: (i) Repo Rate (as applicable on the date of bid opening; Techno-commercial bid opening in case of two part bids) + 4% shall be considered for loading for the period of relaxation sought by bidders. (ii) Wherever LC payment terms are not offered in NIT and the same is insisted by bidder(s), all LC related bank charges to be incurred by BHEL shall also be loaded. (iii) In case of deviation w.r.t. LC payment terms offered in NIT, the loading shall be done for all LC related bank charges to be incurred by BHEL.
C	Foreign vendors to submit declaration of Permanent Establishment and Business Connection (PEBC) for remittances purpose. Declaration to be submitted in required formats whichever is applicable as per their transaction entered into with BHEL. In the absence of certificates from the vendor, withholding tax at applicable rates along with surcharge and cess will be recovered at the time of remittance to the vendor.
D	Foreign vendors to submit Tax Residency Certificate (TRC) & Form 10 F (for obtaining DTAA benefits) in respect of services. The TRC (tax residency certificate) is to be issued by the authorities of the government of vendor's country. If the informative part of the format (other than residency) is not furnished by the authorities, the same may be furnished by the vendor as a declaration.
15	Inspection of Goods
A	The Seller shall give adequate notice, of 1 week (unless otherwise stated) or as mutually agreed period, in writing to the Purchaser (in case Customer inspection is involved) or BHEL appointed TPIA about the date and place at which the goods will be ready for inspection/ testing, as provided for in the contract.
B	Purchaser or his authorized representative shall be entitled to carry out inspection of material and Workmanship / Surveillance Audit at Seller's premises or at his sub-contractor's premises at all reasonable times during execution of contract; Such inspection, examination and testing, if made, shall not absolve the Seller from his obligations under the contract. Wherever required, BHEL may carry out testing at BHEL's testing Lab and in case of any rejection during such testing, replacement / rectification, as required, will have to be done by Supplier. If BHEL carries out any rectification of such rejected material, such cost will be recovered from Supplier's Bills. In case of Customer inspection as Supplier's Works, inspection clearance to be obtained from Customer and submitted to BHEL.
C	BHEL's representative from unit or Corporate Quality (CQ) is authorised to carry out audits along with TPIA at vendor's works before clearing the items for despatch.

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D	All costs related to inspections and re-inspections shall be borne by the Seller. In case of inspection by BHEL and / or BHEL's customer, the cost of to & fro passage and Boarding & Lodging shall be borne by the Purchaser / Customer, unless otherwise specifically agreed. In case of foreign vendors, the cost of third party inspection, where called for, shall be deemed to be included in the quoted price. Seller shall be responsible to provide assistance such as labour, materials, electricity, fuels, stores, apparatus, instruments at his cost, as may be required and as may be reasonably demanded to carry out such tests effectively.
E	REJECTION: If any goods are rejected, BHEL shall be at liberty to take action as per following: a) Allow the supplier, wherever mutually agreed, to rectify the rejected goods at BHEL's works within reasonable time as fixed by BHEL. - or b) Allow the supplier to make free replacement within a specified period. Rejected goods can be lifted by the supplier there after. - or c) In case payment has been done, allow supplier to refund equivalent value of rejected material by NEFT / RTGS or furnish Bank Guarantee for same amount before lifting the rejected goods. Fresh replacement shall be regulated as per terms and condition of the original Purchase Order. In case payment has not been done, allow the supplier, wherever mutually agreed, to rectify the rejected goods at supplier's works within reasonable time as fixed by BHEL. - or d) Terminate the contract either in part or in whole at the discretion of BHEL and recover the loss, if any, from the supplier. - or e) Any goods rejected by BHEL must be removed by the supplier after making payment through NEFT / RTGS within 45 days from the date of intimation of rejection or 30 days after receipt of the intimation of rejection whichever is earlier. If vendor fails to lift or allow despatch of rejected material at his cost within 90 days from the intimation of rejection, his claim on rejected material shall cease.
16	Guarantee / Warranty and corresponding Repairs / Replacement of Goods Manufacturer's works test / infection certificates shall be furnished along with the guarantee that material conforms strictly to the specification for general & special conditions as laid down in the purchase order. Goods shall comply with the specifications for material, workmanship and performance. The Guarantee/ Warranty shall be for a period of 12 months from the date of receipt. If the delivery is found non-compliant during the Guarantee/ Warranty period, leading to rejection, the Seller shall arrange free replacement / repair of goods, within one month from the date of intimation or any mutually agreed period. The rejected goods shall be taken away by the Seller at his cost and replaced on Delivered Duty Paid (DDP) (FOR - BHEL Stores / designated destination basis) within such period. In the event of the Seller's failure to comply, Purchaser may take action as appropriate, including Repair / Replenish rejected goods & disposal of rejections, at the risk & cost of the Seller. In case the defects attributable to Seller are detected during processing of the goods at purchasers/ his subcontractor's works, the Seller shall be responsible for free replacement / repair of the goods as required by the purchaser.
17	Evaluation and Loading Criteria: Evaluation of the tender shall be on the basis of delivered cost, i.e. 'total cost to BHEL' w.r.t the technical scope and commercial conditions finalized after techno-commercial clarifications (after considering, inter alia, Customs Duty and GST / Other taxes as applicable/Other applicable loading). Exchange rate (TT selling rate of State Bank of India) applicable on the date of Part-I bid opening shall be considered for evaluation of foreign bids. If the relevant day happens to be a bank holiday in India, then the FOREX rate as on the previous bank working day shall be taken for evaluation. Foreign suppliers shall ensure that the benefits as applicable under Comprehensive Economic Partnership Agreement (CEPA) with Government of India are disclosed in the bid & relevant documents such as Certificate of Country of Origin, issued by the appropriate authority in the country of Export is provided by the vendor along with dispatch documents. Bids shall be evaluated with such applicable benefits. In the event of Seller failing to provide appropriate documents for Purchaser to avail disclosed concessional duty benefits in India, financial loss, so incurred, will be to the Seller's account. The evaluation currency for this tender shall be INR (Indian Rupees).

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18	Variation of orders
	No variation to the Purchase order is permitted unless authorised in writing and signed by or on behalf of purchase executive, BHEL Jagdishpur.
19	Sub-contract
	BHEL's order or part there off, if further to be subcontracted in exceptional circumstances the details of subcontracting and to whom to be subcontracted shall be furnished to BHEL and written permission shall be obtained from BHEL. However, it shall not absolve the supplier of the responsibility of fulfilling BHEL order requirements.
20	Recovery / deductions of amount from supplier
	A) Any amount on account of recovery from consignor / supplier under any condition shall be liable to be adjusted against any amount payable to the consignor / supplier against bills. B) For any deficiency in supplies where deduction is involved, an amount as decided by BHEL, shall be deducted from supplier's bills.
21	Safety During Inspection by BHEL/TPIA
	The vendors shall maintain and ensure sufficient safety measures as required for inspections and test like HV test. Pneumatic test, Hydraulic test Spring test, Bend test, Material handling and safe working environment etc. to enable Inspection Agency for performing inspection. The vendor shall ensure that all the safety precautions specified in factories Act 1948 chapter-IV Section-21 to 41 are complied with respect to equipment's to be inspected. If any test equipment is found not complying with proper safety requirement, then the inspection agency may withhold inspection, till such time the desired safety requirements are met.
22	Non-Disclosure Agreement
	All Drawings and technical documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. <u>BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder, for any infringement of the provisions contained herein.</u>
	DRAWINGS, PATTERNS & TOOLS: All drawings, patterns & tools supplied by BHEL or made at BHEL's expense are BHEL's property. These cannot be used or referred to any other party and must only be used in the execution of BHEL's orders. These should be preserved at the supplier's cost for a period of not less than 5 years. Patterns & tools should be returned to BHEL within 90 days of issue of the same.
23	Settlement of Disputes & Arbitration
	If any dispute or difference of any kind whatsoever shall arise between BHEL and the Supplier/Vendor, arising out of the contract for the performance of the work whether during the progress of contract termination, abandonment or breach of the contract, it shall in the first place referred to Designated Engineer for amicable resolution by the parties. Designated Engineer (to be nominated by BHEL for settlement of disputes arising out of the contract) who within 60 days after being requested shall give written notice of his decision to the contractor. Save as hereinafter provided, such decision in respect of every matter so referred shall forthwith be given effect to by the Supplier/Vendor who shall proceed with the work with all due diligence, whether he or BHEL desires to resolve the dispute as hereinafter provided or not. If after the Designated Engineer has given written notice of this decision to the party and no intention to pursue the dispute has been communicated to him by the affected party within 30 days from the receipt of such notice, the said decision shall become final and binding on the parties. In the event the Supplier/Vendor being dissatisfied with any such decision or if amicable settlement cannot be reached then all such disputed issues shall be resolved through conciliation in terms of the BHEL Conciliation Scheme 2018.

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

A	<u>CONCILIATION:</u> Any dispute, difference or controversy of whatever nature howsoever arising under or out of or in relation to this Agreement (including its interpretation) between the Parties, and so notified in writing by either Party to the other Party (the "Dispute") shall, in the first instance, be attempted to be resolved amicably in accordance with the conciliation procedure as per BHEL Conciliation Scheme 2018. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in - "Procedure for conduct of conciliation proceedings" (as available in www.bhel.com).
B	<u>ARBITRATION:</u> Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided in Clause 21.1 herein above or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract (hereinafter referred to as the 'Dispute'), then, either Party may, refer the disputes to Arbitration as per the provisions of The Arbitration and Conciliation Act. The dispute may be referred to an appropriate Arbitral Institution for adjudication of dispute by a Sole Arbitrator appointed in accordance with the Rules of said Arbitral Institution.
D	A party willing to commence arbitration proceeding shall invoke Arbitration Clause by giving notice to the other party in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice') before referring the matter to arbitral institution. The Notice shall be addressed to the Head of the Region, Power Sector/ Unit, BHEL, executing the Contract and shall contain the particulars of all claims to be referred to arbitration with sufficient detail and shall also indicate the monetary amount of such claim including interest, if any. After expiry of 30 days from the date of receipt of aforesaid notice, the party invoking the Arbitration shall submit that dispute to the Arbitral Institution and that dispute shall be adjudicated in accordance with their respective Arbitration Rules. The matter shall be adjudicated by a Sole Arbitrator who shall necessarily be a Retd Judge having considerable experience in commercial matters to be appointed/nominated by the respective institution. The cost/expenses pertaining to the said Arbitration shall also be governed in accordance with the Rules of the respective Arbitral Institution. The decision of the party invoking the Arbitration for reference of dispute to a specific Arbitral institution for adjudication of that dispute shall be final and binding on both the parties and shall not be subject to any change thereafter. The institution once selected at the time of invocation of dispute shall remain unchanged. The fee and expenses shall be borne by the parties as per the Arbitral Institutional rules. The Arbitration proceedings shall be in English language and the seat and venue of Arbitration shall be New Delhi. Subject to the above, the provisions of Arbitration & Conciliation Act 1996 and any amendment thereof shall be applicable. All matters relating to this Contract and arising out of invocation of Arbitration clause are subject to the exclusive jurisdiction of the Court(s) situated at New Delhi. Notwithstanding any reference to the Designated Engineer or Conciliation or Arbitration herein, a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree. Settlement of Dispute clause cannot be invoked by the Contractor, if the Contract has been mutually closed or 'No Demand Certificate' has been furnished by the Contractor or any Settlement Agreement has been signed between the Employer and the Contractor. It is agreed that Mechanism of resolution of disputes through arbitration shall be available only in the cases where the value of the dispute is less than Rs. 10 Crores. In case the disputed amount (Claim, Counter claim including interest is Rs. 10 crores and above), the parties shall be within their rights to take recourse to remedies other than Arbitration, as may be available to them under the applicable laws after prior intimation to the other party. Subject to the aforesaid conditions, provisions of the Arbitration and Conciliation Act, 1996 and any statutory modifications or re-enactment thereof as amended from time to time, shall apply to the arbitration proceedings under this clause. In case, multiple arbitrations are invoked (whether sub-judice or arbitral award passed) by any party to under this contract, then the cumulative value of claims (including interest claimed or awarded) in all such arbitrations shall be taken in account while arriving at the total claim in dispute for the subject contract for the purpose of disputed amount as above. Disputes having cumulative value of less than 10 crores shall be resolved through arbitration and any additional dispute shall be adjudicated by the court of competent jurisdiction.

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

	In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable: In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSEs Disputes) as mentioned in DPE OM No. 05/0003/2019-FTS-10937 dated 14-12- 2022 as amended from time to time.
24	Applicable Laws and Jurisdiction of Courts Indian laws both substantive and procedural, for the time being in force, including modifications thereto, shall govern the Contract including Arbitration proceedings. The competent Courts at Sultanpur/Amethi/New Delhi (for foreign Bidders only) in the State of Uttar Pradesh, India shall have sole jurisdiction.
25	Benefits earmarked for Purchase from Micro & Small Enterprises (MSEs) — Indigenous Purchase
A	MSE bidders must submit the valid UDYAM certificate along with their bid w.r.t. their respective MSE status as per extant norms. Date to be reckoned for determining the deemed validity will be the last date of Technical bid submission. Non-submission of such document will lead to consideration of their bid, at par with other bidders and MSE status of such bidders shall be shifted to Non- MSE supplier till the supplier submit these documents.
B	In tender, participating MSEs quoting price within price band of L1+15% shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE and such MSE shall be allowed to supply up to 25% of total tendered value. In case of more than one such MSE, the supply shall be shared proportionately. A quantum of 6.25% out of 25% quantity, so earmarked, will be reserved for MSE's owned by SC / ST entrepreneurs who submit their bid with relevant documents provided that in event of failure of such MSE(s) to participate in tender process or meet tender requirements and L1 price, 6.25% sub-target for procurement earmarked for MSE(s) owned by SC or ST entrepreneurs shall be met from other MSE(s). Special provision for Micro and Small Enterprises owned by Women: 3% reservation for women owned MSEs under following conditions: - - In case of Proprietary MSE, proprietor is woman. - In case of Partnership MSE, the woman partner is holding at least 51% share in the unit. - In case Private limited companies, at least 51% share is held by woman promoters. In case of indivisible tender, the full quantity shall be awarded to L1.
26	Integrity Pact (IP) — Independent external monitors (IEM) For tenders in which integrity pact is applicable, following points stand valid :
A	IP is a tool to ensure that activities and transactions between the company and its bidders / contractors are handled in a fair, transparent and corruption free manner. A panel of Independent External Monitors (IEMs) have been appointed to oversee implementation of IP in BHEL. The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory who signs in the offer) along with techno commercial bid. Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this pact would be a preliminary qualification. Name : _____ Address: _____ mail : _____ } As indicated in NIT / enquiry : _____
B	Please refer Section 8 of the IP for roles and responsibilities of IEMs. In case of any complaint arising out of tendering process, the matter may be referred to the IEM mentioned in the tender. NOTE: No routine correspondence shall be addressed to the IEM (phone / post / e-mail) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarifications / issues shall be addressed directly to the tender issuing (procurement) department.
27	Fraud Prevention Policy : The Bidder along with its associate / collaborators / sub-contractors / sub-vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.
28	GSTN nos. of vendors as well as GSTN No of BHEL must be mentioned on the invoices/bills of the materials. Please note that correct HSN code as well as rate of GST be mentioned in the invoice/bills. BHEL FSIP GSTIN Reg. No: 09AAACB4146P2ZC

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

	State Code: 09 (Uttar Pradesh)
29	(a) Right of Acceptance: BHEL reserves the right to accept the offers in part or in full. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced/increased quantity without any extra charges. (b) Right of Rejection /Non- Placement of PO: BHEL reserves the right to reject the offers in part or in full or cancel the Tender enquiry-without assigning any reason. BHEL is not bound to place PO of tendered items. (c) Wherever BHEL business interest will contradict with any supplier, offer of that supplier may be rejected.
30	Deviation: Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the tender. Otherwise, it will be treated as that all those terms and conditions as mentioned in the tender are acceptable in Toto.
31	Benefits earmarked to suppliers for Purchase under 'MAKE IN INDIA'
	Compliance to MAKE IN INDIA (MII) circular issued by GOI: "For this procurement, the local content to categorize a supplier as a Class I local supplier / Class II local supplier / Non-Local Supplier and purchase preference to Class I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part II bids against this NIT".
	As part of minimizing import content, Government of India, vide order no P-45021/2/2017-B.E.-II dated 15.06.2017, under the subject – Public Procurement (Preference to Make in India) -- has set the initiatives to encourage and promote indigenously manufactured goods within India and services provided by sources within India. In line with this, bidders who manufacture the goods and provide services within India (otherwise referred as local suppliers) are given purchase preference and are entitled to benefits in the tender
A	Definitions
(i)	Local content means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent. Presently, the minimum local content required is 50%. The nodal ministry may prescribe a higher or lower percentage in respect of any particular item and may also prescribe the manner of calculation of local content.
(ii)	Local supplier means a supplier or service provider whose product or service offered for procurement meets the minimum local content as prescribed
(iii)	Margin of Purchase Preference means the maximum extent to which the price quoted by a local supplier may be above the L1 for the purpose of purchase preference. Presently the margin of Purchase preference is 20%.
B	Conditions under which preference is given
(i)	In procurement of goods in respect of which the Nodal ministry has communicated that there is sufficient local capacity and local competition, and where the estimated value of procurement is Rs 50 lakhs or less, only local suppliers shall be eligible. If the estimated value of procurement of such goods is more than Rs 50 lakhs, provisions of 31(A) (ii) and 32(A)(iii) shall apply.
(ii)	If the procurement of goods are not covered by 31(A)(i) and are divisible in nature, the following procedure shall be followed :
<i>a</i>	If L1 is a local supplier, the order for full quantity shall be awarded to local supplier
<i>b</i>	If L1 bid is not from a local supplier, 50% of the order quantity shall be awarded to L1. Thereafter, the lowest bidder among the local suppliers, shall be invited to match the L1 price for the remaining 50% quantity, subject to the local supplier's quoted price falling within the margin of purchase preference, and the order for that quantity shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price or accepts less than offered quantity, the next higher local supplier within the margin of purchase preference shall be invited to match the L1 price for remaining quantity and so on, and the order shall be awarded accordingly. In case some quantity is still left uncovered on local suppliers, then such balance quantity may also be ordered on the L1 bidder.
<i>iii</i>	If the procurement of goods are not covered by 31(A)(ii) and are not divisible in nature, and in procurement of services where the bid is evaluated on the price alone, the following procedure shall be followed :

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

a	If L1 is a local supplier, the order shall be awarded to local supplier
b	If L1 bid is not from a local supplier, then the lowest bidder among the local suppliers, will be invited to match the L1 price, subject to the local supplier's quoted price falling within the margin of purchase preference, and the order shall be awarded to such local supplier subject to matching the L1 price. In case such lowest eligible local supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on, and the order shall be awarded accordingly. In case none of the local suppliers within the margin of preference match the L1 price, then the order may be awarded to the L1 bidder.
C	Exemption of small purchases
	Notwithstanding anything contained at clause 31 above, procurements where the estimated value of procurement is less than Rs 5 lakhs are exempt and purchase preference shall not be accorded in such cases. However the exemption shall be applicable as per latest Govt. of India guidelines.
D	Verification of local content
(i)	The local supplier, at the time of tender, bidding or solicitation, shall be required to provide self-certification that the item offered meets the minimum local content and shall give details of the location(s) at which the local value addition is made.
(ii)	In cases of procurement for a value in excess of Rs 10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
(iii)	False declarations shall be in breach of code of integrity and shall invite action as per guidelines for Suspension of Business dealings with Suppliers
E	In case of any disputes / clarifications, the extant guidelines of Government of India shall prevail.
32	RESTRICTION UNDER RULE 144 (xi) OF THE GENERAL FINANCIAL RULES (GFR) 2017: As per latest government guidelines
I	Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority.
II	"Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
III	"Bidder from a country which shares a land border with India" for the purpose of this Order means: -
a	An entity incorporated, established or registered in such a country; or
b	A subsidiary of an entity incorporated, established or registered in such a country; or
c	An entity substantially controlled through entities incorporated, established or registered in such a country; or
d	An entity whose beneficial owner is situated in such a country; or
e	An Indian (or other) agent of such an entity; or
f	A natural person who is a citizen of such a country; or
g	A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
IV	The beneficial owner for the purpose of (iii) above will be as under:
1	In case of a company or limited liability Partnership, the beneficial owner is the natural person (s) who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. Explanations –

GENERAL TERMS AND CONDITIONS (GTC) OF TENDER ENQUIRY

A	“Controlling ownership interest” means ownership of or entitlement to more than twenty-five per cent. Of shares or capital or profits of the company
B	“Control” shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder’s agreements of voting agreements;
2	In case of a partnership firm, the beneficial owner is the natural person (s) who, whether acting alone or together, or through one or more juridical of capital or profits of the partnership;
3	In case of an unincorporated association or body of individuals, the beneficial owner is the natural person (s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property of capital of profits of such association or body of individuals;
4	Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
5	In case of trust, the identification of beneficial owner (s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
V	An agent is a person employed to do any act for another, or to represent another in dealings with third person.
33	Conciliation
	BHEL and bidder agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the terms & conditions of order, which the parties are unable to settle mutually), arise inter-se the parties, the same may, be refereed by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL panel of Conciliators Notes: 1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators. 2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof. The details of Conciliations shall be governed by the BHEL Conciliation scheme 2018.
34	Clause for Suspected Cartel Formation
	The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines. <i>Important Note: The bidder will, when presenting his bid, declare whether other family firms or sister concern affiliates/subsidiary firms are participating in same tender, so as to eliminate the possibility of cartel formation.</i>
35	CONFLICT OF INTEREST
	A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. Bidder has to submit sealed and signed declaration (Annexure-11) along with their offer.
36	SUSPENSION OF THE BUSINESS DEALINGS
	Defaulter suppliers/contractors shall be treated as per BHEL’s Guidelines for Suspension of the Business Dealing with suppliers/contractors.

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL web site <https://www.bhel.com/supplier-registration>.

1.0 Integrity commitment, performance of the contract and punitive action thereof:

1.1. Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

1.2 Commitment by Bidder/ Supplier/ Contractor:

1.2.1. The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

1.2.2. The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

1.2.3. The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in malpractices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on [www. bhel.com](http://www.bhel.com) and/or under applicable legal provisions.

37 BID SECURITY / EARNEST MONEY DEPOSIT (EMD)

Bidders to submit Bid Security / Earnest Money Deposit (EMD) along with their bids (except Micro and Small Enterprises (MSEs) or Startups as recognized by Department for Promotion of Industry and Internal Trade (DPIIT)).

Applicability: The applicability of Bid Security / Earnest Money Deposit (EMD) the subject tender shall be mentioned the special terms and conditions of the tender enquiry/NIT.

Amount of EMD: The amount of Bid Security / Earnest Money Deposit (EMD) the subject tender shall be mentioned the special terms and conditions of the tender enquiry.

Modes of deposit

a) The EMD may be accepted only in the following forms:

- (i) Electronic Fund Transfer credited in BHEL account (before tender opening).
- (ii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer).
- (iii) Fixed Deposit Receipt (FDR).
- (iv) Bank Guarantee from any of the Scheduled Banks.
- (v) Insurance Surety Bonds.

b) In case the EMD is more than Rupees Two lakh and in case of foreign bidders, it may be in the form of a bank guarantee (in equivalent Foreign Exchange amount, in case of foreign bidders) issued / confirmed from any of the scheduled commercial bank in India in an acceptable form. The EMD shall remain valid for a period of 45 (forty-five) days beyond the final bid validity period.

	Forfeiture of EMD (i) A bidder's EMD will be forfeited if the bidder withdraws or amends its/his tender or impairs or derogates from the tender in any respect within the period of validity of the tender or if the successful bidder fails to furnish the required performance security within the specified period mentioned in the Tender. (ii) EMD by the tenderer to be withheld in case any action on the bidder is envisaged under the provisions of extant "Guidelines on Suspension of business dealings with suppliers/ contractors" and forfeited/ released based on the action as determined under these guidelines. Return of EMD (i) Bid securities of the unsuccessful bidders shall be returned to them at the earliest after expiry of the final bid validity period and latest by the 30th day after the award of the contract. However, in case of two packet or two stage bidding, Bid securities of unsuccessful bidders during first stage i.e. technical evaluation etc. shall be returned within 30 days of declaration of result of first stage i.e. technical evaluation etc. (ii) Bid security shall be refunded to the successful bidder on conclusion of the order/ receipt of a performance security (if called in the tender). (iii) EMD shall not carry any interest.
38	PERFORMANCE SECURITY/ Security Deposit To ensure due performance of the contract, Performance Bank Guarantee (PBG) or Security Deposit (SD), hereafter referred as performance security shall be submitted by successful bidder after award of the contract. Performance security is to be submitted by the date specified in the contract. Applicability: The applicability of Performance security the subject tender shall be mentioned the special terms and conditions of the tender enquiry/NIT. Amount of Performance security: The total amount of Performance Security shall be mentioned in contract (which is usually 5% of the contract value, however this value may vary as per BHEL discretion). Modes of deposit: a) Performance security may be furnished in the following forms: (i) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL. (ii) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL. (iii) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). (iv) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL). (v) Insurance Surety Bond. (Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith) b) In case of GTE tenders, the performance security should be in the same currency as the contract and must conform to Uniform Rules for Demand Guarantees (URDG 758) – an international convention regulating international securities. Performance Security is to be furnished by a specified date (generally 14(fourteen) days after notification of the award) and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations. Forfeiture of Performance Security: The performance security will be forfeited and credited to BHEL's account in the event of a breach of contract by the supplier. Return of Performance Security:

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	Performance Security shall be refunded to the contractor without interest, after he duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract. The Performance Security shall not carry any interest.
39	BREACH OF CONTRACT, REMEDIES AND TERMINATION
	In case of breach of contract, 10% of the contract value will be recovered from SD/ bank guarantee, running bills etc. or legal action may be pursued. Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract. Wherever breach of contract is applicable Risk Purchase will not be applicable.
40	Grievance Redressal Mechanism
	To promote transparency and ensure fair treatment of all bidders, a structured Grievance Redressal Mechanism is in place to address any concerns or issues arising during the tendering process or in subsequent business dealings with the company. Suppliers/Contractors are requested to follow the below escalation process for grievance resolution: 1.First Level: Any grievance should initially be addressed to the designated Dealing Officer, whose contact details are provided in the Notice Inviting Tender (NIT)/Contract. 2.Second Level: If the issue remains unresolved, it may be escalated by lodging a formal grievance through the SUVIDHA Portal: https://suvidha.bhel.in/suvidha/. Responses will be provided in accordance with the defined escalation matrix.”
41	Annexures

CERTIFICATE OF NO DEVIATION

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sir,

Subject: No-Deviation Certificate

Ref: 1) Tender Enquiry No.....
2) All other pertinent issues till date

We hereby confirm that we have not changed/ modified/materially altered any of the tender documents as downloaded from the website/ issued by BHEL and in case of such observance at any stage, it shall be treated as null and void.

We also hereby confirm that we have neither set any Terms and Conditions and nor have we taken any deviation from the Tender conditions together with other references applicable for the above referred Tender.

We further confirm our unqualified acceptance to all Terms and Conditions, unqualified compliance to Tender Conditions.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Date:

Place:

UNDERTAKING

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sir,

Subject: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS

Ref: 1) Tender Enquiry No.....

I/We,declare that, I/We am/are not admitted under insolvency resolution process or liquidation under Insolvency and Bankruptcy Code, 2016, as amended from time to time or under any other law as on date, by NCLT or any adjudicating authority/authorities.

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Date:

Place:

NON-DISCLOSURE CERTIFICATE

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

I/We understand that BHEL FSIP, is committed to Information Security Management System as per their Information Security Policy.

Hence, I/We who are submitting offer for providing services to BHEL FSIP against Tender Enquiry No..... hereby undertake to comply with following in line with Information Security Policy of BHEL FSIP.

- To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
- The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of BHEL FSIP.

Thanking you,

(Signature, date & seal of Authorised
Signatory of bidder)

Date:

Place:

Declaration

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To
 Fabrication, Stamping and Insulator Plant
 Bharat Heavy Electrical Limited
 Jagdishpur
 Amethi-227817

Dear Sir,

Subject: Details of related firms and their area of activities

Ref: 1) Tender Enquiry No.....

Please find below details of firms owned by our family members that are doing business/ registered for same item with BHEL,(NA, if not applicable)

1	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
2	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
...		

Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Date:

Place:

Declaration

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sir,

Subject: Details of relation/relatives of Proprietor /Partner(s)/ Director(s) employed in BHEL

Ref: 1) Tender Enquiry No.....

I/We hereby submit the following information pertaining to relation/relatives of Proprietor /Partner(s)/ Director(s) employed in BHEL.

Tick any one as applicable:

1. The Proprietor, Partner(s), Director(s) of our Company/Firm DO NOT have any relation or relatives employed in BHEL

OR

2. The Proprietor, Partner(s), or Director(s) of our Company/Firm HAVE relation/relatives employed in BHEL and their particulars are as below:

- i.
- ii.

(Signature, Date & Seal of Authorized
Signatory of the Bidder)

Note:

1. Attach separate sheet, if necessary.
2. If BHEL Management comes to know at a later date that the information furnished by the Bidder is false, BHEL reserves the right to take suitable against the Bidder.

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH
REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH
JUNE, 2020 AND SUBSEQUENT ORDER(S)

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur, Amethi-227817

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).

Ref: 1) Tender Enquiry No-.....

We hereby certify that the items/works/services offered by M/s.....
..... (Name of of bidder) has a local content of % and this meets the local content requirement for **Class-1 Local supplier/ class-2 Local supplier/Non-Local **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

- | | |
|---------|---------|
| 1. | 2. |
| 3. | 4. |
| ... | |

Thanking you,
Yours faithfully,

(Signature, Date & seal of Authorized Signatory of the Bidder)

** - Strike out whichever is not applicable.

Note:

1. Bidders to note that above format, duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidders quoted value is in excess of Rs 10 Crores, the authorised signatory of this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder

DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To

Fabrication, Stamping and Insulator Plant

Bharat Heavy Electrical Limited

Jagdishpur, Amethi-227817

Sub: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017).

Ref: 1) Tender Enquiry No

2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India. I certify that
..... (NAME OF THE Bidder organisation), is not from such a country/ has been registered with the Competent Authority (attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT)).

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,

Yours faithfully,

(Signature, Date & seal of Authorized Signatory of the Bidder)

Note: Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.

PROFORMA OF BANK GUARANTEE FOR EARNEST MONEY
(On non-Judicial paper of appropriate value)

Bank Guarantee No-.....

Date-.....

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sirs,

In accordance with the terms and conditions of Invitation for Bids/Notice Inviting Tender Enquiry No-..... M/s..... having its registered office at (hereinafter referred to as the 'Tenderer'), is submitting its bid for the work/supply of Invited by Bharat Heavy Electrical Limited (Employer) through its unit at Fabrication, Stamping and Insulator, Jagdishpur.

The tender conditions provide that the tenderer shall pay a sum of Rs..... as Earnest Money deposit in the form therein mentioned. The form of payment of Earnest Money Deposit includes Bank Guarantee executed by a Scheduled Bank.

In lieu of the stipulations contained in the aforesaid Tender Conditions that an irrevocable and unconditional Bank Guarantee against Earnest Money Deposit for an amount of Rs is required to be submitted by the Tenderer as a condition precedent for participation in the said Tender and the Tenderer having approached us for giving the said Guarantee, we, the (Name & address of the Bank) having our Registered Office at..... (hereinafter referred to as the Bank) being the guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer without any demur, merely on your first demand any sum or sums of Rs..... (in words Rupees.....) without any reservation, protest, and recourse and without the beneficiary needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor/Contractor/Vendors in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment hereunder and the Tenderer shall have no claim against us for making such payment

We.....Bank further agree that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Tender or to extend the time of submission of from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Tenderer and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Tenderer or for any or forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Tenderer or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Tenderer and not withstanding any security or other guarantee that the Employer may have in relation to the Tenderer's liabilities.

The Guarantees shall be irrevocable and shall remain in force upto and including..... and shall be extended from time to time for such period as may be desired by the Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Tenderer but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms hereof. However, unless a demand or claim under this guarantee is made on us in writing on or before..... We shall be discharged from all liabilities under this Guarantee.

This Bank Guarantee shall be governed, construed and interpreted in accordance with the laws of India.

Courts at Sultanpur (Uttar Pradesh) shall have exclusive jurisdiction over any matter arising out of or in connection with Bank Guarantee.

We Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of bank under this guarantee shall not exceed
- b) This Guarantee shall be valid upto
- c) Unless the Bank is served a written claim or demand on or before _____ all rights under this guarantee shall be forfeited and the Bank shall be relieved and

discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

- d) This bank Guarantee shall be effective only when the BG message is Transmitted by the issuing bank through SFMS to the bank of beneficiary IFSC: SBIN0009072, Bank: STATE BANK OF INDIA, BRANCH: IGFC Branch, A/c no. 10405292240, A/c Name: Bharat Heavy Electricals Limited.

We,Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Date:

Place of issue:

Notes:

1. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp

Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Contractor/sub-contractor /vendor/ Bank issuing the guarantee.

BANK GUARANTEE FOR PERFORMANCE SECURITY
(On non-Judicial paper of appropriate value)

Bank Guarantee No.....

Date.....

To
Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sirs,

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office BHEL House, Siri Fort New Delhi through its Unit at Fabrication Stamping and Insulator Plant, Jagdishpur having awarded to..... (Name of the Vendor / Contractor / Supplier) with its registered office at..... hereinafter referred to as the ' Vendor / Contractor / Supplier ', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Refs No.....and the Vendor / Contractor / Supplier having agreed to provide the a contract performance bank guarantee, equivalent to % (... percent) value of the contract to the employer for the faithful performance of the Contract.

We, AXIS BANK LIMITED, (here in after referred to as the Bank), having registered/Head office atand inter alia a branch atbeing the Guarantor under this Guarantee, hereby irrevocably and unconditionally undertake to forthwith and Immediate pay to the Employer a any sum or sums upto a maximum amount of Rs(Rupees in words) without any demur, immediately on first demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand.

Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.....

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Vendor / Contractor / Supplier in any suit or proceeding pending before any Court or Tribunal, Arbitrator or any other authority, our liability under this present being absolute and unequivocal. The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the Vendor / Contractor / Supplier shall have no claim against us for making such payment.

We the..... Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract/ satisfactory completion of the performance guarantee period as per the terms of the Contract and that it shall continue to be enforceable till all the dues of the employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We..... Bank further agree that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Vendor /Contractor / Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Vendor / Contractor / Supplier and to forbear or enforce any of the terms and conditions relating to the said Contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Vendor / Contractor / Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Vendor / Contractor / Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us. The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Vendor / Contractor/ Supplier and notwithstanding any security or other guarantee that the Employer may have in relation to the Vendor /Contractor / Supplier 's liabilities.

This Performance Bank Guarantee shall remain in force upto..... and including and shall be extended from time to time for such period as may be desired by Employer.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Vendor / Contractor / Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the..... we shall be discharged from all liabilities under this guarantee thereafter.

This Bank Guarantee shall be governed, construed and interpreted in accordance with the laws of India.

Courts at Sultanpur (Uttar Pradesh) shall alone have exclusive jurisdiction over any matter arising out of or in connection with this bank guarantee.

We Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.

Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this guarantee shall not exceed-----
- b) This Guarantee shall be valid up to
- c) Unless the Bank is served a written claim or demand on or before..... all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.
- d) This bank Guarantee shall be effective only when the BG message is Transmitted by the issuing bank through SFMS to the bank of beneficiary IFSC: SBIN0009072, Bank: STATE BANK OF INDIA, BRANCH: IGFC Branch, A/c no. 10405292240, A/c Name: Bharat Heavy Electricals Limited.

We, Bank have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

For and on behalf of
(Name of the Bank)

Notes:

1. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp

Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Contractor/sub-contractor /vendor/ Bank issuing the guarantee.

LIST OF CONSORTIUM BANKS

Sl. No.	NAME OF THE BANK
1	State Bank of India
2	Canara Bank
3	IDBI Bank Limited
4	ICICI Bank Limited
5	HDFC Bank Limited
6	Axis Bank
7	IndusInd Bank Limited
8	Bank of Baroda
9	Exim Bank
10	Indian Bank
11	Punjab National Bank
12	Union Bank of India
13	Yes Bank Limited
14	RBL Bank Ltd.
15	Standard Chartered Bank
16	Indian Overseas Bank
17	Kotak Mahindra Bank Limited
18	Federal Bank Limited
19	Hongkong and Shanghai Banking Corporation Ltd

DECLARATION FOR CONFLICT OF INTEREST

(To be Typed & submitted in the Letter Head of the Company/Firm of Bidder)

To

Fabrication, Stamping and Insulator Plant
Bharat Heavy Electrical Limited
Jagdishpur
Amethi-227817

Dear Sir,

Subject: Declaration for Conflict of Interest

Ref: 1) Tender Enquiry No.....

The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations:

- i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly;
- ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating;
- iii) Procurement of goods directly from the manufacturers/ suppliers shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent 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. However, this shall not debar more than one Authorised distributor (with/ or without the OEM). from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.
- iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.

The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or

informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

Note: In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/ guidelines.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Date:

Place:

DECLARATION FOR OWNERSHIP STATUS OF MSE

(To be filled and Submitted in the Letter Head of the Company/Firm of Bidder)

To
 Fabrication, Stamping and Insulator Plant
 Bharat Heavy Electrical Limited
 Jagdishpur
 Amethi-227817

Dear Sir,

Subject: Declaration for ownership status

Ref: 1) Tender Enquiry No.....

Bidder falling under MSE category shall furnish the following details & submit documentary evidence/ Govt. Certificate (UDYAM) etc. in support of the same along with their techno-commercial offer.

Type under MSE	SC/ST Owned	Women Owned	Others (excluding SC/ST & Women Owned)
Micro			
Small			

Note: If the bidder does not furnish the above in the tender, offer shall be processed construing that the bidder is not falling under MSE category.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Date:

Place: