Bharat Heavy Electricals Limited
Heavy Electrical Equipment Plant, Haridwar-249403
Works Engineering & Services
Works Contract Section
NOTICE INVITING TENDER

(Open Tender)

Tender Document

Name of Work: "Work contract for Surface Preparation & Painting of Transformer Tank & its Accessories in Fabrication".
Tender Enquiry No.: BHEL/HEEP/WEX-WCS/21-22/6620/20210030 DT 18.06.2021
Due date of Tender Opening: 09.07.2021
Type of Bid: Two Part

Place of Submission of Tender / Bid:

Through email at tendercell.heep@bhel.in
OR
Through Post at "Tender Room, Purchase Deptt., 4th floor,
Main Administrative Building, HEEP
BHEL Haridwar-249403 (Uttarakhand)"

1. *Himanshu Arora, Dy. Manager(WEX-WCS)*
Contact Address: WCS, ADM-4, BHEL (HEEP), Haridwar-249403
Email: harora@bhel.in ;
Phone: +91-1334-281932; Fax: +91-1334-226460

2. *Shiv Charan Meena, Manager (WEX-WCS)*
Contact Address: WCS, ADM-4, BHEL (HEEP), Haridwar-249403
Email: shiv.charan@bhel.in
Phone: +91-1334-284137; Fax: +91-1334-226460

3. *Tenzin Norsang, DGM (WEX-WCS)*
Contact Address: WCS, ADM-4, BHEL (HEEP), Haridwar-249403
Email: tenzin_n@bhel.in
Phone: +91-1334-281176; Fax: +91-1334-226460

Document can be downloaded from www.bhel.com/ www.bhelhwr.co.in
Note: *All corrigenda / addenda / amendments / time extensions / clarifications, etc. to the tender will be hosted on our website i.e. www.bhel.com / www.bhelhwr.co.in only and will not be published in any other media. Bidders should regularly visit above website to keep themselves updated.*

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

DETAILS OF TENDER DOCUMENT

The Tender document has been detailed as follows:

Part-I (TECHNO-COMMERCIAL BID)

1. Cover page
2. Index
3. Notice Inviting Tender (NIT)
4. Details of Bid & Bidder (To be filled by bidder)
5. General Instructions to Tenderer
6. General Terms & Conditions of Tender
7. Scope of Work
8. Pre-Qualification criteria (PQR) and LD Condition
9. Payment Terms & Condition
10. Special Terms & Condition
11. Un-price Price Bid
12. Annexure-X
13. No Deviation Certificate
14. Check List

Part-II (PRICE BID)

1. Price Bid (ANNEXURE-F)

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

NOTICE FOR TENDER (NIT)

BHARAT HEAVY ELECTRICAL LIMITED
HEEP, Haridwar-249403(UTTARAKHAND)

Name of Dept	Works Engineering & Services (Works Contract Section)		
Phone	*01334-281932*	Fax	01334-226460
Email Address	harora@bhel.in; shiv.charan@bhel.in *tenzin_n@bhel.in ;*		
Contact Person	Himanshu Arora		
NIT Key.	20210030	Dated	18.06.2021
NIT No.	BHEL/HEEP/WEX-WCS/21-22/6620/20210030 DT 18.06.2021		
NIT No. on www.bhel.com			
NIT No. on www.bhelhwr.co.in			

Type Of Tender	**Open**			
#Tender Cost (in INR)	500 (Inclusive of Taxes) & NIL for tender downloaded from website			
EMD (in INR)	Rs. 23,200/-			
Period of completion of work	15 Months			
Two Part Bid /single bid	Two Part Bid			
NIT Value (in Rs.)	Rs. 11,60,000/- + GST extra as applicable			
Last Date of Sale of Tender	08.07.2021		**Time :**	02:30PM
Last Date of submission of Tender	09.07.2021		**Time :**	01:45PM
* **Date and Time for opening of Technical Bid**	09.07.2021		**Time :**	02:00PM
Place Of submission of Tender	**Through email: tendercell.heep@bhel.in Or** **Tender Room, Purchase Deptt., 4th floor, Main Administrative Building, BHEL , HEEP, Haridwar-249403 (Uttarakhand)**			

* In case of two-part bid, date of opening of Tender means the date of opening of Techno-commercial bid. However, date of opening of price bid shall be intimated to technically qualified parties. If the due date of tender opening happens to be a holiday, the tenders will be opened on the next working Tuesday/Friday.

Tender cost & EMD shall be submitted either in form of cash receipt issued by cash section, BHEL, HEEP, Haridwar (subject to provision of Income tax act) or Demand draft issued by any nationalised bank in favour of Sr. Accounts Officer (Cash), BHEL, HEEP, Haridwar separately in two different envelopes superscribed as Tender cost and EMD respectively. However Tender cost is non-refundable. ***Tender fee & EMD shall be exempted subject to submission of valid MSME UDYAM/EM-II/NSIC Certificate (duly notarized or attested by a Gazetted officer) and Tender Fee shall be exempted for tender documents downloaded from website.***

Name of Work: "Work contract for Surface Preparation & Painting of Transformer Tank & its Accessories in Fabrication."

Contracting Executive Name: Himanshu Arora

Date:

1. BHEL reserves the right to accept or reject any/ all application(s) without assigning any reason thereof.
2. If any document submitted by tenderer found false at any stage, the tender/ work order will be cancelled immediately and the financial loss to BHEL if any in making alternative arrangement will be recovered from the contractor.
3. BHEL will not be responsible for the loss or delay of tenders in transit in any case.
4. All further corrigenda, addenda, amendments, time extensions, clarifications & etc. to the tender, if any shall only be notified on BHEL websites (www.bhel.com / www.bhelhwr.co.in) as applicable.
5. For detailed instructions/information refer the tender document on BHEL website.

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

Details of Bid & Bidder (To be filled by bidder)

(a) Bidder Offer No.: _____ Date: _____

(b) Legal Name of the bidder as in GST registration: _____

(c) GST registration No._____

(d)State_____

(e) Place of business_____

(f) Category of registration under GST (i.e. Registered dealer / Unregistered dealer/ dealer opted for Composition Scheme):

_____

(g) Address of the Bidder: _____

(h) Email Id and Contact No. of the Bidder: _____

(i) PAN No. Of Bidder (A copy of PAN Card to be submitted_____

Note: If GST registration is not applicable, Bidder shall submit justification of the same and will also provide supporting documents.

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

General Instructions to Tenderer

The Contractors who wish to participate should **go through the Tender documents thoroughly** and plan well before quoting, to ensure that the Tender process is not aborted / vitiated, due to their reasons.

1.0 Quoting & Signing the Tender

a. Before Quoting, the tenderers are advised to inspect the site of work and its environment and be well acquainted with the actual working and other relevant conditions, position of materials and labor. Tenderers are also requested to go through General -Terms & conditions, Special -Terms & conditions of tender, Scope of work, Technical Terms & Conditions, drawings and specifications and all other documents which are part of tender will form part of the agreement to be entered into.

b. While quoting the rate, the tenderer is advised to take into account the likely expenditure, taxes etc. during the operation of the Contract period from the date of commencement of work as directed by BHEL.

c. While quoting the rates the tenderer is advised to take into account all factors including any fluctuations in market rates. No claim will be entertained on this account after acceptance of the tender or during the execution of the contract.

d. All entries in Tender documents shall be clearly written in one ink or typed. All the corrections / cancellations / insertions, if any, shall be duly attested by the Bidders concerned.

e. Rates should be quoted as per the Price Bid. Rates quoted in any other form will not be accepted and is liable to be rejected.
   a) If, in the price structure quoted for the required goods / services / works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
   b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
   c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of e(a) and e(b) above.
   d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date up to which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

f. The Bidder shall fill in all the required particulars of the Tender documents and also sign & Stamp on each and every page of the Tender documents (Techno- Commercial Bid, Price Bids, Terms & Conditions etc.) including corrigendum & the drawing attached therein while submitting their tender.

g. Should a Bidder find discrepancies or omissions in the Tender documents or should there any doubt as to their meaning, he should at once address the authority inviting the Tender, for clarification well before the due date, so as to submit his Tender in time.

h. Every endeavor is made to avoid any error which can materially affect the basis of the tender but the successful tenderer shall take upon himself to provide for the risk or any error which may be subsequently discovered and shall make no subsequent claim on account thereof.

i. Tenders not in accordance with the Tender conditions herein contained and the Tenders not in original ARE LIABLE TO BE REJECTED.

j. If a Bidder deliberately gives wrong information in his Tender or creates conditions favorable for the acceptance of his Tender, BHEL WILL REJECT SUCH TENDER AT ANY STAGE.

k. Words imparting singular number shall be deemed to include plural number and vice-versa where the context so requires.

l. Canvassing in any form, in connection with the Tender is strictly prohibited and such Tenders are bound to be rejected. All information furnished is taken to be authentic by the bidder for evaluation of the Tender. Should any information be found incorrect subsequently, at any later stage, the Tender / Contract shall be rejected / terminated and action as per BHEL Policy, rules & prevailing Guidelines shall be taken.

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

m. Should a Bidder's or a Contractor's or in the case of a firm or company of Contractors / any of its shareholder's or shareholder's relative be employed in BHEL Haridwar, the authority inviting the Tenders shall be informed in writing of this fact at the time of submission of the Tender, failing which the Tender may be disqualified, or if such fact subsequently comes to light, the Contract may be cancelled.
n. The Tender schedule and the Tender shall be deemed to form an integral part of the Contract to be entered into for this work.
o. Tenders are to be submitted in **Tender Room, Purchase Deptt., 4th floor , Main Administrative Building, BHEL, HEEP, Haridwar-249403 (Uttarakhand)** upto 01:45 PM on the date of tender opening. BHEL will not be responsible for any consequences that may arise leading to delay in submission of tender/bid.
p. Late and Delayed Tenders shall be rejected.
q. In case of Limited Tender Enquiry if you are not interested to submit the offer, please send a letter specifying the same.
r. Price bid should not be enclosed along with the techno commercial bid and other documents in the same cover/envelope. The price bids have to be given category wise in a sealed cover and the entire lot of price bid sealed covers will have to be kept in a separate large cover, duly sealed.

ALL THE REQUIRED DOCUMENTS SHALL BE FILLED IN THE SAME SERIAL ORDER AS PER THE FORMAT / COLUMN OF THE "TECHNO-COMMERCIAL BID". ALL THE PAGES SHALL BE SERIALLY NUMBERED ON THE RIGHT HAND SIDE TOP CORNER. PAGE NUMBERS AND DETAILS OF THE CONCERNED DOCUMENTS ALSO SHALL BE FILLED IN "TECHNO- COMMERCIAL BID" IN THE BOXES PROVIDED. ALL THE PAGES OF TENDER DOCUMENTS ARE TO BE DULY SIGNED AND STAMPED BY THE BIDDER.

s. All the envelopes shall be super-scribed with Name of work, NIT No. & Date of Tender Opening with the Name & Complete address of the bidder.
t. The envelope Containing Price Bid shall additionally be super-scribed as "PRICE BID" and the envelope containing Techno-commercial bid shall be additionally super-scribed with "TECHNO-COMMERCIAL BID".
u. Tender Fees & EMD or Proof related to exemption as required as per Terms & Conditions of Tender shall be kept in Techno-commercial bid envelope.
v. ***The contractor must ink sign and stamp on each page of tender document including supporting documents submitted with tender.***
w. The annual maintenance and service contract shall be governed as per the BHEL Works policy, Rules & General conditions of the contract.
x. Bidders shall enclose the certificate of satisfactory performance, from previous customer in the Techno-Commercial Bid envelope, along-with the tender documents in support of their claim of having minimum experience of similar works and /or provide all documents as per PQR criteria.
y. Vendor shall ensure meeting all statutory obligations as applicable during the contract period.
z. Deviation from any of the specified requirements should be clearly brought out on a separate sheet titled as deviation. In case of no deviation a ***"NO DEVIATION STATEMENT"*** shall be submitted with the tender (Techno-commercial offer).

2.0 Signing the Tender

a. The Tender shall be signed by the Authorized Signatory Only.
b. Authorized signatory shall be the Proprietor.
c. In case the Bidder is a Partnership Firm under Partnership Act, the Tender shall be signed by all the Partners of the firm or by Partner having authority to sign on behalf of all other partners. Copy of the authority should be enclosed.
d. In case the Bidder is a company, authorized signatory of the company. Copy of the authority will have to be enclosed.
e. In case of Power of Attorney (POA). A copy of the Power of Attorney, duly attested by the issuer shall accompany the tender.

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

f. If the POA is revoked during the existence of the contract, it shall be the responsibility of the of the issuer to inform the same to BHEL. The issuer shall remain bound by the acts committed under the POA till the date of such information to BHEL.

3.0 Date / Time for opening of Tender

a. Sealed covers so received will be opened at **Tender Room, Purchase Deptt., 4th floor, Main Administrative Building, BHEL, HEEP, Haridwar-249403 (Uttarakhand)** at 02:00 PM on the same day of due date of tender submission as per NIT (Notice inviting Tender) in the presence of the Bidders or their Authorised Representatives who may choose to witness the same.
b. The Techno Commercial bids only will be opened in case of two-part bid.
c. In case of two-part bid, the Price Bids of bidders, who are technically qualified will be opened later. The date & time of price bid opening will be informed to the technically qualified Bidders.

4.0 Witnessing the Tender opening

a. The representative of the Bidder may choose to witness the Tender opening and have to produce the Authorization Letter in the tender room, before opening of the Tender. The representatives without Authorization Letter will not be allowed to participate in the Tender opening.
b. Only one representative from one bidder will be allowed to participate in the Tender opening.

5.0 Quoting

a. Quoting best rate and the sanctity of the L1 status.
b. Quoting the lowest best rate is a must against this Tender. However, bidders are required to understand that the lowest rate offered by them or accepted by them, as the case may be should be honoured throughout the period of the Contract.

6.0 Participation

The Parties who have been suspended or black listed or banned by BHEL HEEP, Haridwar or any other BHEL Unit will not be allowed to participate in the Tender and the bidder should declare the same in the Tender. Even during the course of evaluation / finalization of Tender if it is found that some of the parties are black listed / barred from business transactions / under business hold, BHEL will reject their offer.

7.0 Validity of Offers:

The rates quoted shall be valid for acceptance for a minimum period of 120 days from the date of tender opening. Withdrawal of Tender or increasing the rates during this validity period is not allowed. Date of tender opening shall be date of opening of first/Techno-commercial bid.

8.0 Address for sending the offer:

The offer should be sent to address as below well in advance so that it reaches before or on due date and time through registered post or in person.

In charge, Tender Room, Purchase Deptt., 4th floor, Main Administrative Building, BHEL, HEEP, Haridwar-249403 (Uttarakhand).

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

Submission of E-mail bids:

1. Bidders may also submit tenders/bids through email from their official email id on tendercell.heep@bhel.in . Tenders/bids submitted through email should be in pdf format with separate password protection for both techno-commercial bid and price bid. The attached file name shall carry NIT/ Enquiry number and super scribed with techno-commercial Bid and Price Bid so that both bids can be separately identified before opening. The date and time of Price Bid opening will be informed to the technically qualified bidders normally two days before date of price bid opening.

   Bidder is required to share the password for opening of techno-commercial bid/ price bid through email on tendercell.heep@bhel.in after 01:45 PM (IST) on the opening date of Techno-commercial bid/ price bid. Bidder to share the relevant bid opening password only. However, if no password is received up to 04:00 PM (IST) bids will not be opened and shall be ignored.

   BHEL will not be responsible for any consequences that may arise due to submission of wrong password by the bidder.

   Bidder submitting offer through email shall be super scribed as per subject below:

   a. Tender Enquiry Reference no. (NIT no.) _____

   b. Bid opening date (Part 1, Techno commercial) _____
2. Bid submission through email will be considered as consent to open the bid without physically witnessing the event.
3. Bidders may submit EMD and tender fee through Electronic Fund Transfer credited in BHEL account (before time/ date of tender opening i.e. 01:45 PM (IST) on the scheduled date and attach receipt of online transaction along with the techno-commercial bid. BHEL account details are as below:

   NAME: BHEL HEEP COLLECTION A/C
   ADDRESS: RANIPUR, HARIDWAR
   ACCOUNT NO. : 10667995458
   IFSC CODE: SBIN0000586

Note: -

1. In case of any ambiguity/discrepancy between any clause of "General Terms & Conditions" and "Special Terms & Conditions, Scope of Work, Technical Terms & Conditions and Bill of Quantity" the clause of "Special Terms & Conditions, Scope of Work, Technical Terms & Conditions and Bill of Quantity" shall prevail.

I/We agree with the above

Signature of Issuing officer

Signature of Bidder with Stamp

General Terms & Conditions of Tender

1. GENERAL

These general terms & conditions shall apply to all the Tender Enquiries, notice inviting tenders, request for quotations concerning the works/services contracts pertaining to Bharat Heavy Electricals Ltd., HEEP, Haridwar (hereinafter referred to as BHEL or the Purchaser). In case of placement of order these conditions will become part of Work Order (W.O.) until unless the deviations are specifically agreed by BHEL.

2. DEFINITIONS

In these general conditions of contract the following terms shall have the meaning hereby assigned to them except where the context otherwise requires: -

(a) "***THE CONTRACT***" shall mean the notice inviting the tender and acceptance thereof and the formal agreement if any, executed between the Bharat Heavy Electricals Ltd., Heavy Electrical Equipment Plant, Haridwar and the contractor together with the documents referred to there in including these conditions, and any special conditions, specifications, designs, drawings etc. All these documents taken shall be deemed to form one contract and shall be complementary to one another.

(b) The **"TENDER DOCUMENT"** means the form of tender as applicable with General and Special Conditions of contract, and the specifications and/or drawings as given to contractors for the purpose of preparing their tender including "Notice Inviting Tender".

(c) The **"WORK"** means the work described in the tender documents in individual work order and/ or accompanying drawings and specifications as may be issued from time to time to the contractor by the Engineer-In-Charge in writing the power conferred upon them, including all modifications or additional works and obligations to be carried out either at the site or in factory, workshop or any other place as may be essentially required for the performance of the work.

(d) The **"SITE"** means the land and/ or other place on into or through which the work is to be executed under the contract or any adjacent land, part or structure which may be allotted to or used for the purpose of carrying out the contract.

(e) The **"CONTRACTOR"** shall mean the individual of firm or company whether incorporated or not, undertaking the work and shall include legal representatives of such individual or persons composing such firm or incorporated company or successors of such person, firms or company as the case may be and permitted assignee of such individual or firm or company.

(f) The abbreviations" Engr/Sr. Engineer / Dy. Mgr/ Mgr./ Sr. Mgr/ DGM/ Sr.DGM" means Engineer/ Senior Engineer/ Deputy Manager/ Manager/ Senior Manager/ Deputy General Manager/ Sr.Dy. General Manager respectively who will direct the contract.

(g) The **"ENGINEER-IN-CHARGE"** means the Engineer/ Sr. Engineer or any other executive deputed by BHEL to supervise the work or part of the work on behalf of the First Party.

(h) Accepting authority: As per BHEL Delegation of Power.

(i) **"APPROVED"** means the approval of directions of the Engineer/ Sr. Engineer or any other executive or person deputed by them for the particular purpose.
BHEL means the Bharat Heavy Electricals Limited/ HEEP plant of the said Company at Ranipur, Hardwar.

(j) The **"CONTRACT SUM"** means the sum accepted or the sum calculated in accordance with the prices accepted in tender and/ or the Contract rate as applicable to the contractor for the entire execution and full completion of the work.

I/We agree with the above

(k) The **"FINAL SUM"** means the actual amount payable under the contract by BHEL to the contractor for the entire execution and full completion of the work.

(l) The **"TIME OF COMPLETION"** is the date or dates for completion of the work or any part of the work as set out in or ascertained in accordance with the individual work or the tender documents or any subsequent amendments thereto.

(m) A **"WEEK"** means seven days without regard to the number of hours worked in any day in that week.

(n) A **"DAY"** shall mean a day of 24 hours from midnight to midnight irrespective of the number of hours worked in that day.

(o) A **"WORK DAY"** means day other than that prescribed by the Negotiable Instruments Act, as being a holiday and consists of the number of hours of labour as commonly recognized by good employers in the trade, in the district where the work is carried out or as laid in the BHEL Rules and Regulations.

(p) **"DEVIATION ORDER"** means any order given by the Engineer-In-Charge to effect an alteration, addition or deduction, which does not radically affect the scope and nature of the contract.

(q) **"EMERGENCY WORK "** means any urgent measures which in the opinion of the Engineer-In-Charge become necessary during the progress of the work to obviate any risk of accident or failure or which become necessary for security.

(r) **"PROVISIONAL SUM"** or **"PROVISIONAL LUMPSUM"** means a lump sum included by the BHEL in the work for which details are not available at the time of inviting tender.

(s) **"PROVISIONAL ITEMS"** means items for which approximate quantities have been included in the tender documents.

3. EARNEST MONEY DEPOSIT

(a) Vendor is required to deposit the EMD as specified in NIT.

(b) EMD shall not carry any interest.

(c) Modes of deposit:
The EMD may be accepted only in the following forms:

(i) Cash deposit as permissible under the extant Income Tax Act (before tender opening)

(ii) Electronic Fund Transfer credited in BHEL account (before tender opening)

(iii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer)

(iv) Fixed Deposit Receipt (FDR) 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)**
In addition to above, the EMD amount in excess of Rs. Two Lakh may also be accepted in the form of Bank Guarantee from scheduled bank. The Bank Guarantee in such cases shall be valid for at least six months.

(d) Forfeiture of EMD
EMD by the Tenderer will be forfeited as per NIT conditions, if:

(i) After opening the tender and within the offer validity period, the tenderer revokes his tender or makes any modification in his tender which is not acceptable to BHEL.

(ii) The Contractor fails to deposit the required Security deposit or commence the work within the period as per LOI/ Contract.

(e) EMD by the tenderer shall be withheld in case any action on the tenderer 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.

I/We agree with the above

(f) EMD given by all unsuccessful tenderers shall be refunded normally within fifteen days of award of work.

(g) EMD of successful tenderer will be retained as part of Security Deposit.

(h) EMD deposited in any modes other than specified at (c) above shall lead to cancellation of the offer.

4. SECURITY DEPOSIT

(a) Successful vendor shall require to deposit security. The total amount of Security Deposit will be 5% of the contract value. EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security Deposit.

(b) Modes of deposit:
The balance amount to make up the required Security Deposit of 5% of the contract value may be accepted in the following forms:
i) Cash (as permissible under the extant Income Tax Act)
ii) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL
iii) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL
iv) 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)
v) 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)

(c) 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)

(d) The Security Deposit shall not carry any interest.

(e) The additional condition of Security Deposit (If any) shall be specified in Special Terms & Conditions of tender.

(f) Refund of Security Deposit
After completion of work awarded, provided always that the contractor shall first have been paid final bill and have rendered a "No Demand" certificate, the security deposit mentioned in condition above shall be refunded to the contractor as follows: 100% shall be released within 3 months of satisfactory completion of the work duly verified by Site/Engineer-In-charge.

5. COMMERCIAL TERMS

- Prices shall be quoted on "Firm Price" basis only.
- Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening.

6. **SPECIAL CONDITIONS FOR MSME**

"MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their, bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-

procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."

UAM need not required to be notarized or attested.

7. **SETTLEMENT OF DISPUTES/ARBITRATION**

In all cases of dispute, the matter shall be referred for ARBITRATION by sole arbitrator to be appointed by the Unit Head of Bharat Heavy Electricals Ltd., at HARIDWAR. The award of the Arbitrator shall be final and binding on both the parties. The place of Arbitration shall be Haridwar.

JURIDICTION: The courts of Haridwar, India, shall have exclusive jurisdiction.

8. RISK PURCHASE CLAUSE

In case of delays in supplies / defective supplies or non-fulfilment of any other terms & conditions given in the work order the purchaser/contracting executive may cancel the work order in full or part thereof and may also make the purchase of the material / service from elsewhere / alternative source at the risk and cost of supplier. Vendor/Contractor does not agree to above clause, their offer is liable to be rejected. In case any vendor/contractor accepts risk purchase clause initially and subsequently declines to honour the term in the eventuality of RISK PURCHASE, they may be banned for business with BHEL."

9. FORCE MAJEURE CLAUSE

Notwithstanding any other thing contained anywhere else in the contract or WO (Work Order), In case the discharge of obligation under the contract by either party is impeded or made unreasonably onerous, neither party shall be considered in breach of the contract to the extent that performance of their respective obligation is prevented by an event of Force Majeure that arises after the effective date (WO date). In the above clause, Force Majeure means an event beyond the control of the parties to the contract which prevents a party from complying with any obligation of the contract including but not limited to:

a) Act of God (Such as but not limited to earthquake, drought, tidal waves, floods etc.).

b) War (whether war be declared or not), Hostilities Invasion, Act of foreign enemy etc.

c) Rebellion, revolution, insurrection, civil war etc.

d) Contamination of Radio Activity from any nuclear fuel or from any other nuclear waste or any other hazardous materials.

e) Riots, commotions, strike unless restricted to the employees of supplier.

f) Acts of terrorism.

g) Other unforeseeable circumstances beyond the control of the parties and which the affected party cannot avoid even by using its best efforts.

h) Cancellation of contract by customer.

i) Change in law / government. Regulation making the performance impossible.

The party claiming to be affected by force majeure shall notify the other party in writing immediately without delay on the intervention and on the cessation of such circumstances.

Irrespective of any extension of time, if an event of force majeure occurs and its effect continues for more than 180 days the affected party shall have right to cancel the contract.

As soon as reasonably practicable following the date of commencement of a Force Majeure Event, and within a reasonable time following the date of termination of a Force Majeure Event, either Party invoking it shall submit to the other Party reasonable proof of the nature of the Force Majeure Event and of its effect upon the performance of the Party's obligations under this Agreement.

I/We agree with the above

The party shall, and shall ensure that its Subcontractors shall, at all times take all reasonable steps within their respective powers and consistent with Good Operating Practices (but without incurring unreasonable additional costs) to:

a) Prevent Force Majeure Events affecting the performance of the party's obligations under this Agreement.

b) Mitigate the effect of any Force Majeure Event.

c) Comply with its obligations under this Agreement.

If the war like situation has developed in a country where a seller's works is located in this W.O. or there is political instability and Indian Embassy located in that country forbids or advises for not having any business dealing with the sellers located in such zone / region/ country, then BHEL reserves the right to cancel the order.

10. FRAUD PREVENTION POLICY

The Bidder along with its associate / collaborators / sub – vendors / consultants / service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about fraud or suspected fraud as soon as it comes to their notice". Fraud Prevention policy and List of Nodal Officers shall be hosted on BHEL website, vendor portals of Units / Regions intranet.

11. SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS/CONTRACTORS

In order to protect the commercial interests of BHEL, it becomes necessary to take action against suppliers / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business / money / reputation, indulged in malpractices, cheating, bribery, fraud or any other misconducts or formation of cartel so as to influence the bidding process or influence the price etc. Penal action can be initiated on the suppliers / Contractors in line with extant "Guidelines for Suspension of Business Dealings with Suppliers / Contractors". The abridged version of extant 'Guidelines for suspension of business dealings with suppliers / contractors' has been uploaded on http://www.bhel.com on "supplier registration page".

12. IMPLEMENTATION OF INTEGRITY PACT (IP)

Bidders shall submit Integrity Pact (IP), duly signed by its authorized signatory who signs in the offer, along with their techno-commercial bids wherever estimated tender value is Rs. 2 Crore or above. This pact shall be considered as a preliminary qualification for further participation.

12A. INTEGRITY PACT (IP)

i). 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. Following Independent External Monitor (IEM) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl No	IEM	Email
1	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

ii). The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part 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.

I/We agree with the above

iii). Please refer Section-8 of the IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to the above IEM. All correspondence with the IEM shall be done through email only.

Note: No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are mentioned on the first page of tender documents.

13. DAMAGE & LOSS TO PRIVATE PROPERTY & INJURY TO CONTRACT EMPLOYEE

The Contractor shall at his own expense reinstate and make good to the satisfaction of BHEL and pay compensation for any injury, loss or damage occurred to any property or rights whatever including property and rights of BHEL (or agents) servants or employee of BHEL, the injury loss or damage arising out of or in any way in connection with the execution or purported execution of the Contract and further the Contractor shall indemnify, the BHEL against all claims enforceable against BHEL (or any agent, servant or employee of BHEL) or which would be so enforceable against BHEL where BHEL is a private person, in respect of any such injury (including injury resulting in death) loss or damage to any person whomsoever or property including all claims which may arise under the Workmen's Compensation Act or otherwise.

14. RIGHT OF ACCEPTANCE

a) BHARAT HEAVY ELECTRICALS LIMITED HARIDWAR reserves the right to reject any or all the bids / quotations without assigning any reason thereof. BHEL also reserves the right to increase or decrease the tendered quantities. Bidders should be prepared to accept order for reduced quantity without any extra charges.

b) Any discount /revised offer / bids submitted by a bidder on its own shall be considered, provided it is received on or before the due date and time of offer / bid submission (Part-1). Conditional discounts shall not be considered for evaluation of tenders.

c) Unsolicited discounts / revised offers / bids given after Part-1 bid opening shall not be accepted. No change in price will be permitted within the validity period asked for in the tender enquiry.

d) 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 the latest price bid shall prevail. However, in both situations, original price bid will be necessarily opened.

e) The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be returned after finalization of contract. EMD shall be forfeited in the event of bidder opting out after tender opening.

f) BHEL reserves the right to short close the existing Purchase Order / Rate Contract / Work Order or any extension thereof at any stage.

15. PRICE SCHEDULE

a) Kindly quote your prices in figures and words both. In case of any discrepancy in value, the prices quoted in words shall be considered for evaluation and establishing L1 status.

b) Applicable IGST / CGST / SGST and any other statutory levy should be indicated separately and clearly in the bid / quotation
NB: Financial evaluation of L1, L2 ….Status will be on the basis of Landed Cost to BHEL.

16. **GST RELATED TERMS & CONDITIONS**
Bidder has to specify the following in their techno-commercial bid (part I bid in case of two part bid):

I/We agree with the above

I. a) Legal Name of the bidder as in GST registration, GST registration No., State, Place of business, category of registration under GST i.e. Registered dealer / Unregistered dealer/ dealer opted for Composition Scheme,

b) HSN (Harmonised System Nomenclature) / SAC (Service Accounting Code), description of Goods/Services and applicable IGST / CGST / SGST rate and any other statutory levy, if any, for each item of Goods or Services.

II. a) Unregistered Dealer

Since in case of unregistered dealer, GST will have to be paid by BHEL under reverse charge mechanism, the same shall be added to the quoted price for evaluation bid.

b) Dealer opting for Composition Scheme

In case of registered dealer, who opt for composition scheme at the time of submission of bid, no GST will be payable to the bidder and also same will not be considered for evaluation of bid. Dealer has to declare in technical bid that no GST is shown separately in price bid. However, in case at the time of actual supply, the bidder charges GST at normal rate, the same shall be reimbursed subject to the availability of GST credit to BHEL. In case GST credit is not available to BHEL, no GST will be payable to the bidder.

III. Reimbursement of GST shall be made by BHEL-Haridwar on matching of Contractor inputs as mentioned below at GST portal and after ensuring of availability of input credit to BHEL, Haridwar. Hence, Contractor has to ensure compliance as follows-

a) Timely raising & submission of GST compliant Invoices
b) Timely receipt of Goods & Services
c) Timely and correct payment of applicable GST by supplier/contractor
d) Timely filing of return
e) Compliance of other applicable provisions on supplier/contractor:

Contractor has to also give consent to accept payment of tax after such matching in all cases where bills are submitted directly to BHEL-Haridwar or through bank or under LC or through any other mode.

IV. In the event of any disallowance of input credit (including reversal of credit) or applicability of interest or arising of any other financial liability on BHEL-Haridwar due to any default of supplier/contractor under GST such as non/delayed receipt of Good/Services, delayed raising & submission of invoices, delayed payment of tax, non/wrong declaration of sale by Contractor in return etc. or any other reason not attributable to BHEL, such implication shall be to supplier's/contractor's account and will be deducted from bills.

V. In the event of any change in the status of the bidder after submission of the bid but before the supply/service, GST applicable at the time of supply/service or GST quoted in the bid, based on the registration status of the bidder, whichever is lower shall be payable.

VI. Statutory Variation in Taxes & duties as applicable at the time of supply shall be payable. However, in the event of no change in law but bidder quoting certain tax structure in bid document which is lower than the applicable one, such amount shall be the maximum amount of tax that can be claimed by bidder.

VII. In case of Liquidated damage (LD) recovery, the applicable GST shall also be recoverable from the suppliers.

VIII. As per the extant GST rules, as of now it is not mandatory to file returns immediately and ITC has been allowed on self-declaration. In view of the changed scenario, the payment of GST shall made to the contractors simultaneously with their work/services invoices. The Contractors / vendors shall need to submit the undertaking as per the following format before such GST payments. However in case the availability of ITC on self-declaration is discontinued at the time of submission of invoice then the clause II above shall be applicable.

Certificate of Goods and Service to be furnished by Contractor with each bill / invoice

We hereby undertake that:

I/We agree with the above

1. Goods and Service Tax charged in the following Invoices / Bill Numbers are in compliance with the provision of GST Act & Rules prevailing thereon:

Sl. No	PO No/ Work Order	Invoice No	Invoice date	GST Amount

2. Goods and Service Tax charged in the Bill / Invoice shall be paid by us within due time.

3. Any liability due to any delay / default in payment of GST, return filling or any other NON-compliance under GST Law / Rules, shall be to our account.

4. In the event of any non-compliance on our part, We indemnify BHEL for any financial burden / loss on account of GST / interest / penalty.

5. We give our consent to BHEL to recover any such financial burden if arises on BHEL due to any non-compliance from any outstanding bills. In the event of Nil outstanding, same shall be paid by us to BHEL.

6. In the event of any such default, we agree BHEL to pay all future GST reimbursement after verification of GST compliance under the law.

7. We understand that this arrangement shall be valid till the credit of Input Tax Credit (ITC) is available without online validation or further amendment if any affecting admissibility of ITC to BHEL.

Signature of Authorized Signatory (with seal)
GST No:

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

17. SPECIAL POWERS OF TERMINATION

If at any time after the acceptance of the tender, BHEL shall for any reason whatsoever not require the whole or any part of the work, to be carried out, the Engineer In charge shall give notice in writing of the fact to the contractor, who shall have no claim to any payment of compensation or otherwise, howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the foreclosing of the work.

The contractor shall be paid at contract rates for the full amount of the work executed including such additional work i.e., cleaning of site etc. as may be rendered necessary by the said foreclosing. He shall also be allowed a reasonable payment (as decided by the Accepting Officer) for any expenses sustained on account of labour and material collected but which could not be utilized on the work as verified by the Engineer In charge but the contractor shall not have any claim for compensation on account of any alterations having been made in the original specifications, drawings, designs and instructions involving and curtailment of the work as originally contemplated.

18. PUBLIC PROCUREMENT PREFERENCE TO MAKE IN INDIA, ORDER 2017

For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019 & 04.06.2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ PO/WO against this NIT. In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable.

19. OVERWRITING IN PRICE BIDS

I/We agree with the above

Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else shall be liable for rejection.

20. GENERAL NOTES

a. Rates shall be quoted in figures as well as in words and contractor must put his signature & Seal on each page of the tender documents / undertakings, while submitting his offer, failing of which tender may be liable for rejection.

~~b.~~ BHEL reserves the right to cancel the tender at any stage of tendering till signing of agreement without assigning any reason(s) thereof. The tender cost in that event shall not be refunded.

c. The contractor shall not employ any worker less than 18 years of age during execution of his work.

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

e. The work shall be governed by the specifications, general terms & conditions of BHEL contract, special conditions, tender terms, environment related conditions, safety clause and any other relevant conditions applicable time to time.

f. The contractors are advised to see the site before quoting the rates.

g. BHEL reserves the right to award only a fraction or part of the work given in the bill of quantity.

h. Contractor found or reported for non-compliance of the legal obligations during the execution of the contract, shall be debarred from the issue of NITs for at least 01 year or till the proof of compliance is produced.

i. L1 may also be decided based on Reverse Auctioning based on the discretion of BHEL.

j. BHEL does not bind themselves to accept the lowest tender or any tender or to give any reason for their decision.

k. Contractor shall ensure all the safety provisions for the execution of the work awarded. It shall provide all the necessary PPE's (until & unless specified clearly about the issue of any PPE by BHEL in Special or any other Conditions of tender) to his workmen or any individual deployed by him for execution of the work and ensure usage of the same.

l. The evaluation currency for this tender shall be **INR.**

m. 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/We agree with the above

Signature of Bidder (with seal)

Scope of Work:

1. Surface preparation and Painting of Transformer Tank and its Accessories to be carried out in-house at BHEL Haridwar premises.
2. Surface preparation to be done by Shot/Grit/Copper Slag Blasting both inside & outside job surfaces and achieve the surface of SA2.5 in accordance with ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101.
3. Painting to be done by Air Spray painting both inside and outside job surfaces. The required primer and paints shall be provided by BHEL Haridwar. Vendor to perform paint as per BHEL standard TR 10257P and TR1005P Sl No 22. Vendor to achieve the requirements of Dry Film Thickness & Adhesion tests as per BHEL standard TR 10257P and TR1005P Sl No 22.
4. BHEL Haridwar shall provide the following for the required work:
    a. Covered space for Shot Blasting & Painting. However, the vendor may review the space and recommend any minor modifications if required.
    b. Handling facilities (Hydra Crane - 2nos) along with operators.
    c. Compressed air supply/ electrical supply at the above space.
    d. The required primer and paints.
5. Apart from contracted work at Sl No 2 & 3, following shall be in the scope of vendor:
    a. Abrasives/shot/grit/ Copper slag and related equipment shall be in the scope of vendor.
    b. All the measuring apparatus /facilities shall be in the scope of vendor.
        i. For surface preparation: Comparator in accordance with ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101 to ensure surface finish of SA2.5.
        ii. For painting: Alco meter (for checking Dry Film Thickness), Ford Cup No 4 (for measuring Viscosity of paint) and Cutter & cello Tape (for Adhesion Test).
    c. Vendor to arrange the transportation of above abrasives, equipment, measuring facilities & its employees at his own.
    d. Vendor to arrange the stay accommodation for its employees at his own.
6. Vendor to comply with all the surface preparation & painting requirements for Transformer Tank and its Accessories as per BHEL standard TR 10257P and TR1005P Sl No 22. The surface preparation & painting both shall be witnessed by the Customer.
7. Vendor to quote the rate @per sq m. The job details are as follows. The surface area defined is for reference only. The payment shall be made as per actual work.

Note:

(i) The first coat of primer/paint should be applied not later than 3-4 hours after surface preparation to avoid oxidation.
(ii) The painting surface shall be allowed to air dry for 16 hrs after each coat.
(iii) The surface preparation and painting has Customer Hold Point. BHEL will make best efforts to keep waiting time of customer after call minimum.

I/We agree with the above

Signature of Bidder (with seal)

Job Details:

Qty of Transformer Tanks & Accessories - 10 Nos
Detail for each set of Transformer Tanks & Accessories is as below:

Sl No	Description	Weight (kg) Dimensions (LxWxH in mm)	Applicable Surface Prep Standard	Applicable painting Standard	Surface Area (m^2)	Paint details
1	Bottom Tank Assly	9386 kg 7047x3455x585 mm	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101	TR 10257P and TR1005P Sl No 22.	50 (approx)	**Inside** - White Epoxy Enamel Paint (Total DFT 50 micron min) **Outside (Total DFT 155 micron min)**- Epoxy Primer (DFT 50 micron min) + HB MIO Paint (Intermediate Coat) (DFT 75 micron min)+ PU Paint (Finish Coat) (DFT 50 micron min)
2	Top Tank Assly	16101 kg 6960x3905x4000 mm	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101	TR 10257P and TR1005P Sl No 22.	210 (approx)	**Inside** - White Epoxy Enamel Paint (Total DFT 50 micron min) **Outside (Total DFT 155 micron min)**- Epoxy Primer (DFT 50 micron min) + HB MIO Paint (Intermediate Coat) (DFT 75 micron min)+ PU Paint (Finish Coat) (DFT 50 micron min)
3	HV Turret Assly	439 kg OD=1126; H=732 mm	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101	TR 10257P and TR1005P Sl No 22.	9 (approx)	**Inside** - White Epoxy Enamel Paint (Total DFT 50 micron min) **Outside (Total DFT 155 micron min)**- Epoxy Primer (DFT 50 micron min) + HB MIO Paint (Intermediate Coat) (DFT 75 micron min)+ PU Paint (Finish Coat) (DFT 50 micron min)
4	Main Conservator	1305.04 kg OD 1300 mm; L=4000 mm	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101	TR 10257P and TR1005P Sl No 22.	50	**Inside** - White Epoxy Enamel Paint (Total DFT 50 micron min) **Outside (Total DFT 155 micron min)**- Epoxy Primer (DFT 50 micron min) + HB MIO Paint (Intermediate Coat) (DFT 75 micron min)+ PU Paint (Finish Coat) (DFT 50 micron min)
5	Blanking Plates	267.65 kg Small items of varying sizes	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS	TR 1005P Sl No 8 and TR1005P Sl No 22.	Small items of varying sizes. Surface area cannot be	Inside - Epoxy White paint (2 coats) Outside - Primer + Red finish paint (2 coats)

I/We agree with the above

Signature of Bidder/Contractor with Stamp

			055900/ AA0674101		precisely defined.	
6	Outside Mounting	157.65 kg Small items of varying sizes	SA 2.5 as per ISO 8501 Part 1 or Swedish standard SIS 055900/ AA0674101	TR 10257P and TR1005P Sl No 22.	Small items of varying sizes. Surface area cannot be precisely defined.	Inside - Epoxy White paint (2 coats) Outside - Primer + Red finish paint (2 coats)
					Total: 400 sq m (approx.)	

(Job Picture – For reference only)

Delivery:

Work for 10 Nos set of Transformer Tanks & Accessories is to be carried out in phased manner upon intimation. It is likely, that after the call for first set, subsequent sets are to be delivered each month.

I/We agree with the above

Signature of Bidder/Contractor with Stamp

Pre-Qualification criteria for acceptance of tender are as under:

1. (A) - Average financial turnover during last 3 years ending 31st March of the previous financial year should be at least 30% of the estimated cost. **(i.e. Rs 348000)**

AND

1. (B)-Experience of having successfully completed similar works during last 7 years ending last day of month previous to the one in which applications are invited should be either of the following:

Three similar completed works costing not less than the amount equal to 40% of the estimated cost. **(i.e. Rs 464000)**

OR

Two similar completed works costing not less than the amount equal to 50% of the estimated cost. **(i.e. Rs 580000)**

OR

One similar completed works costing not less than the amount equal to 80% of the estimated cost**. (i.e. Rs 928000)**

"Similar Work "means

Surface Preparation to be done by Shot/Grit/copper Slag Blasting both inside & Outside job surfaces & Painting of Job both inside & outside job surfaces.

2. Proofs in support of above point no. 1 (A) & 1 (B) should be submitted with the tender otherwise offer is liable to be rejected. The documents in support of 1 (B) shall be accompanied with performance certificate issued by the customer on their letter head clearly specifying the address and contact details of customer

For verification purpose. (All the documents submitted shall be self-attested and stamped by the party).

3. Tenderer must submit proofs of PF Code No., ESI Code No., GST Tax registration (in proper taxable service category) , Income Tax PAN No. and Labor License (else give undertaking to submit within 15 days after receipt of letter of intent for labor license only).

I/We agree with the above

Signature of Bidder/Contractor with Stamp

LD Conditions:

In cases of delay from schedule, attributable to the contractor due to any reason, LD @ 0.5% of the total order value per week of delay in deliveries subject to a maximum of 10% of the total order value. In case of any amendment /revision, the LD shall be linked to the amended /revised PO value.

Payment Terms & Conditions

1) No advance payment shall be made under any circumstances. Also no interest shall be paid due to delay in making the payment.
2) Contractor must be having E-payment (CBS) account in any Nationalized Bank for E-Payment.
3) Running bill against work contract shall be submitted by contractor for payment within 15 days from the date of measurement. BHEL will process such bills and release the payment within 30 Days (from the date of submission of clear admissible bill) subject to receipt of measurement book (MB) with bill in duplicate & verification by BHEL for satisfactory completion of work and its correctness.
4) Goods & service tax (GST) shall be paid by BHEL as per Govt. rules.
5) Bill prepared by the contractor should be pre-numbered and must contain inter-alia GST registration number, PAN number and GST category (as per Good & service tax act).
6) Tax deduction at source: - tax shall be deducted at source from running bill as applicable income tax rule & other statutory requirements.

I/We agree with the above

Signature of Bidder/Contractor with Stamp

Special Terms and Conditions of Tender

1. The staff engaged by the contract should be well qualified and experienced to under and carry out the repairs as per the guidelines laid down by the Indian oil corporation. Contractor should preferably attach the relevant certificate for ensuring the technical competence
2. The contractor has to make his own arrangement for loading and conveyance and no extra charges will be paid by company.
3. Tools required repair/ servicing etc. shall have to be arranged by the contractor.
4. The workmen engaged by the contractor and contractor himself will abide by the general terms and condition of contract laid down by the BHEL and government of India from time to time.
5. The workmen engaged will be paid minimum wages as per the existing norms and deduction such as PF & ESI have to be borne by the contractor. The proof of the same with list of individuals and their amount is to be dully attached with the bill by contractor.
6. If the work is not completed / attended by the contractor, after instruction and any incident/accident happens in the meanwhile, then the contractor will be responsible for the loss occurred & a penal amount shell be deducted from his dues security money. The decision of AGM (BL-2) shall be final & binding in this matter.
7. The work will be governed by the terms and conditions of BHEL contract.
8. The contractor has to ensure that minimum wages are paid to his workmen and proper record maintained as per labour laws.
9. Insurance coverage of workmen for the entire period of the agreement from general insurance company has to be submitted before start of work.
10. The main criteria of judging performance of contractor will be timely completion of the work, quality of the work and response of the contractor.
11. Contractor should be registered with PF/ESI and should have Labour license (If Applicable) before Start of the work.
12. The work will have to be done on Sunday/Holiday/late hours if required. With the permission of Dy. Manager, I/C.
13. The contractor is required to provide adequate safety measures for his workmen wherever required. He will be solely responsible for any mishap, causing injury to the personnel/materials till the completion of the work.

I/We agree with the above

Signature of Bidder/Contractor with Stamp

14. Contract may be cancelled at any stage without assigning any reason and contractor will not have any claim in this regard.
15. BHEL has the right to reject all or any of the tenders and accept any tender (s) irrespective of its/their being the lowest/highest.
16. Contractor has to maintain complete record of all the labours deployed against this work.
17. PF and ESI is to be deposited against each labour for the period he has been deployed and will submit proof of the same.
18. The period of contract can be extended or shortened as per works requirement.

I/We agree with the above

Signature of Bidder/Contractor with Stamp

UNPRICED PRICE BID

(Not to be filled. However, this is to be signed and submitted with Techno-commercial Bid)

Estimated Cost: Rs. 11,60,000/- GST extra as applicable) **Tender Cost:** Rs. 500/-
Date of Opening of Techno-commercial Bid (PART-1): 09.07.2021 **EMD value:** Rs. 23,200/-

Period of Completion: 15 Months

Sl .No.	Work Description	Qty	Unit	Quoted rate in per sq. meter (in INR)	Total Quoted Rate in Figures (in INR)	Total Quoted Rate in Words (in INR)
1	WW6620000007 SURFACE PREPARATION BY BLASTING OF TRANSFORMER TANKS & ITS ACCESSORIES IN FABRICATION.	4000	SM (Square Meter)	xxxxx	xxxxx	xxxxxx
2	WW6620000008 PAINTING OF TRANSFORMER TANKS & ITS ACCESSORIES IN FABRICATION.	4000	SM (Square Meter)	xxxxx	xxxxx	xxxxxx
TOTAL					xxxxx	xxxxx

Note:

1. Rate should be quoted in figures as well as in words. No cutting / Over Writing is allowed in rates. In case of contradiction between rate/percent quoted in figure and Words, the same mentioned in Words will prevail. For details refer General Instructions to Tenderer of Techno-Commercial Bid.

2. L1 will be decided after calculating Final price & evaluated considering the category of registration as per condition of GST related NIT terms & condition.

3. GST shall be paid extra on actual basis.

I/We have the read the Terms and Conditions and Contractual Obligation of contract as per the Techno-commercial Bid under this Tender Enquiry and undertake to fulfill its entire requirement under the quoted rates

I/We agree with the above

Signature of Bidder/Contractor with Stamp

ANNEXURE-'X'

Certificate by Charted Accountant on Letter Head

This is to certify that M/s …… (hereinafter referred to as 'company') having its registered office at ……is registered under MSMED Act 2006, Entrepreneur Memorandum No. Part –II ……Dtd: …… Category: …… (Micro/ small). (Copy enclosed).

Further verified from Books of account that the investment of the company as per the latest audited financial year…….. as per MSMED Act 2006 is as follows:

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

(Strike off whichever is not applicable)

The above investment of Rs…… Lacs is within permissible limit of Rs……Lacs for…… (Micro/ small) (Strike off whichever is not applicable) category under MSMED Act 2006.

Or

The company has graduated from its original capacity (Micro/ small) (Strike off whichever is not applicable) and date of graduation of such enterprise from its original capacity is……. (dd/mm/yy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S. O. No. 3322 (E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by ministry if MSME.

Date:
(Signature)
Name-
Membership No.-
Seal of Chartered accountant

I/We agree with the above

Signature of Bidder/Contractor with Stamp

Acceptance/ No Deviation Certificate

Notwithstanding anything mentioned in our bid, we hereby accept all terms and conditions of the above tender. Or we hereby accept all terms and conditions of the above tender except the following: (Give reference to Clause Nos. of Terms & Conditions which is not acceptable)

1.

2.

Note: Any deviation specified elsewhere in the tender shall not be considered. Deviations may or may not be accepted by BHEL.

I/We agree with the above

Signature of Bidder/Contractor with Stamp

Check List for Tenderer

Sr. No.	Details of Criteria	Yes/ No	Please fill the Detail/ Remarks/ Reference of documents attached in support of each point.
1	Ink Signed & stamped on each page of Techno-commercial bid		
2	Ink Signed & Stamped on each page of supporting Document		
3	Only Signed & stamped **Un-priced Price Bid**.		
4	Ink Signed & Stamped on both sides of Techno-commercial Bid and Supporting documents if print / photocopy has been taken on both sides of the paper		
5	Quoted **Price Bid** duly filled, signed and stamped, should be submitted separately in sealed envelope.		
6	MSME Documents (if applicable) self attested		
7	Copy of GST Certificate.		
8	Copy of PAN card		

I/We agree with the above

Signature of Bidder/Contractor with Stamp

PRICE BID

Estimated Cost: Rs. 11,60,000/- GST extra as applicable) **Tender Cost:** Rs. 500/-
Date of Opening of Techno-commercial Bid (PART-1): 09.07.2021 **EMD value:** Rs. 23,200/-

Period of Completion: 15 Months

Sl .No.	Work Description	Qty	Unit	Quoted rate in per sq. meter (in INR)	Total Quoted Rate in Figures (in INR)	Total Quoted Rate in Words (in INR)
1	WW6620000007 SURFACE PREPARATION BY BLASTING OF TRANSFORMER TANKS & ITS ACCESSORIES IN FABRICATION.	4000	SM (Square Meter)			
2	WW6620000008 PAINTING OF TRANSFORMER TANKS & ITS ACCESSORIES IN FABRICATION.	4000	SM (Square Meter)			
TOTAL						

Note:

1. Rate should be quoted in figures as well as in words. No cutting / Over Writing is allowed in rates. In case of contradiction between rate/percent quoted in figure and Words, the same mentioned in Words will prevail. For details refer General Instructions to Tenderer of Techno-Commercial Bid.

2. L1 will be decided after calculating Final price & evaluated considering the category of registration as per condition of GST related NIT terms & condition.

3. GST shall be paid extra on actual basis.

I/We have the read the Terms and Conditions and Contractual Obligation of contract as per the Techno-commercial Bid under this Tender Enquiry and undertake to fulfill its entire requirement under the quoted rates

I/We agree with the above

Signature of Bidder/Contractor with Stamp

RFF | COMP. drg

TITLE : - Painting System of Transformer Tank & Accessories, Radiators, Cooler Control Cabinets / RTCC Panels etc.

This instruction applies to the painting application procedure for Transformer Tanks, Conservators and other fittings, Radiators, Marshalling Box, and Cooler Control Cabinet etc. This instruction also includes surface preparation and pretreatment for painting of the fabricated parts.
This painting specification meets the requirement of ISO corrosion standard ISO: 12944-2 with corrosion category C5-I / C5-M and atmospheric condition (Industrial/Marine). This painting specification shall be used for all domestic and exports order.

1. MATERIALS:

1.1 For Painting on Transformer Tank & Accessories.

1.1.1.	Epoxy Base Zinc Primer.	TRE/166
1.1.2.	Epoxy HB MIO.	TRE/167
1.1.3.	Aliphatic Polyurethane Finishing Paint	TRE/165
1.1.4.	Thinners for above as recommended.	
1.1.5.	Emery paper no 220, Wire Brush, Clean Cloth etc.	
1.1.6.	Nitro-Cellulose / Synthetic resin (epoxy) putty.	
1.1.7.	White Epoxy Enamel Paint.	TRE/168

1.2. For Painting on Marshalling Box and Control cabinets

1.2.1.	Epoxy Base Zinc Primer.	TRE/166
1.2.2.	Epoxy HB MIO.	TRE/167
1.2.3.	Aliphatic Polyurethane Finishing Paint	TRE/165
1.2.4.	Thinners for above as recommended.	
1.2.5.	Emery paper, Wire Brush, Clean Cloth etc.	
1.2.6.	White Epoxy Enamel Paint.	TRE/168

1.3. For Painting on Radiators.

1.3.1.	Epoxy Base Zinc Primer.	TRE/166
1.3.2.	Aliphatic Polyurethane Paint	TRE/165
1.3.3.	Etch Primer.	AA56103
1.3.4.	White Spirit.	AA56701
1.3.5.	Emery paper, Wire Brush, Clean Cloth etc.	
1.3.6.	Oil resistant low viscosity varnish	TRE/382/03

1.4. Paint Shade

Finishing paint shade should be as per customer requirement. Refer WO/MGS for the same.

2. MEASURING APPARATUS:

2.1. Alco meter for checking the Dry Film Thickness.
2.2. Ford Cup No 4 for measuring the Viscosity of the paint.
2.3. Cutter and Cello-tape for adhesion test.

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3. PROCEDURE FOR PAINTING

GENERAL

3.1.1 Paint used for External surface i.e. primer, intermediate coat and top or finish coat should be preferably from the same paint manufacturer and compatible to each other. However, internal coat can be of different paint manufactures.

3.1.2 Store the paints and thinners in original sealed containers with clear Identification marks indicating manufacturer's name, shade, designation and instruction for mixing & application.

3.1.3 Do not use paints after the shelf life has expired.

3.1.4 Open the containers just before application.

3.1.5 Thoroughly examine steel surface to be coated prior to commencement of work. Correct any condition that will adversely affect cleaning and coating application.

3.1.6 Inspect and test at each step of the painting operation before proceeding with the next step.

3.1.7 Verify that all painted surfaces are free from defects. If any defective area is found, repair and re-inspect before next operation.

3.2 SURFACE PREPARATION FOR INTERNAL AND EXTERNAL SURFACES:

3.2.1 For Transformer Tank, Turrets, Conservator, Header, A-Frame, Pipe Work above 80 NB, External surface of pipe work up to 80 NB etc.

Remove all the lamination, weld spatters, slag by scraping. Chamfer all the edges and remove sharp corners that cannot be properly painted. Remove oil, grease, dirt, dust etc. by using suitable degreasing agent and fresh water cleaning. Allow it to dry. After cleaning, check for any traces on substrate visually and re-clean if any traces are found.

Sand, Shot or Grit blast the surface to Sa 2.5 in accordance with ISO 8501 Part 1 or Swedish standard SIS 055900. The flanges, angles, concealed areas shall be blast cleaned prior to fabrication & paint with one coat of primer prior to fabrication.

After adequate blast cleaning of each large surface where blasting time is more than 3 hours, an overall blast cleaning is to be done on the entire surface once more so that entire surface areas is exposed as fresh for 1st coat of primer paint.

Compressed air used for the purpose must be dry and free from oil. Remove dust abrasive carefully by clean brush, by hosing with dry air. The first coat of primer or paint should be applied not later than 3-4 hours after surface preparation to avoid oxidation. Machined areas, Threaded components studs etc should be suitably protected during blast cleaning.

3.2.1.1 Cleaning of Transformer tank, Turret, Conservator, Header, Pipe work above 80 NB, End Frame and clamping structure etc in which shots can be entrapped:

3.2.1.1.1 After the shot blasting, hang the tank, cover and pipes / End frame assembly etc. by crane and shake it rigorously to detach all shots / metal chips etc. from body.
3.2.1.1.2 Cleaning by high pressure air.
3.2.1.1.3 Visual inspection by using torch to check entrapment of shots/ foreign Particles.
3.2.1.1.4 Cleaning of pipes with cloths wrapped in rods and high pressure air.
3.2.1.1.5 Use of boroscope for the pipes below 80 NB
3.2.1.1.6 Overall final visual inspection before application of paint.

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Note: Internal surface of pipe work up to 80 NB shall be cleaned by pickling process.

3.2.2. For Radiators

3.2.2.1. Radiator Element

3.2.2.1.1 Dressing & Grinding :

After welding, welds and flame cut edges shall be dressed and any major surface imperfections removed by grinding if necessary.

3.2.2.1.2 Degreasing and cleaning:

Single radiator element after air pressure testing under water shall be wiped with clean dry cloth piece to remove water and shall be degreased and cleaned to make the surface free from visible oil, grease & dirt, mill scale, rust , paint and other foreign matter using suitable chemicals.

After the cleaning, hang the each radiator with crane and shake it rigorously to detach all shots /metal chips etc. from body and clean it with high pressure air before application of varnish on inside surface.

3.2.2.2 Other parts of Radiator Assembly

All support and bracing details including header and header cover etc. shall be sand, shot or grit blasted in accordance with ISO 8501 part 1 or Swedish standard SIS 055900 Sa 2.5 to make the surface free from visible oil, grease & dirt, mill scale, rust, paint and other foreign matter. Compressed air used for blasting should be dry and free from oil.

3.2.2.3 Application of Etch Primer

One coat of Etch Primer shall be applied within 3-4 hours after shot blasting/chemical cleaning. Before application of Etch Primer coat, compressed dry air should be passed through the opening of radiator element as well as outside surface to remove dust etc. if any.

3.2.3 For Marshalling Box, RTCC Panels and Control Cabinets etc.

All weld, flame cut edges, sharp corners etc. shall be dressed. Surface preparation and phosphating shall be carried out by 7-tank process.

3.2.4 For Copper surface welded on Tank (If applicable)

Process for cleaning and pretreatment of copper surface prior to painting shall be done as per method described in TR10212P.

3.3 PAINT APPLICATION

3.3.1 General

Perform mixing of paints as per manufacturers published instructions. Maintain the ratio of two components critically. Follow these instructions.

1. Painting to be carried out in closed and dust free area.
2. Paint used for External surface i.e. primer, intermediate coat and top or finish coat should be preferably from the same paint manufacturer and compatible to each other. However, internal coat can be of different paint manufactures.

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3. Stir each component separately and then mix the hardener into resin and stir till uniform consistency is obtained. After mixing, the paint shall be allowed to mature for 30 minutes before use.

4. Consistency of the primer and finishing paint shall be maintained as per manufacturer's recommendations. Suitable thinner shall be used to achieve required consistency.

5. Set air pressure and volume of painting gun to achieve proper atomisation.

6. Apply a wet coat in parallel passes; overlap 50% to avoid bare areas and pinholes.

7. The time gap between any two successive coats shall not be more than 7 days.

8. When oven drying facility for coatings is available painted surface after each coat shall be allowed to air dry for 20 min at room temp there after forced dried in an oven at 90 ± 10 deg C for one hour.

9. In case oven drying facility is not available, painted surface shall be allowed to air dry for 16 hrs after each coat.

10. The number of coats shall be such that the minimum dry film thickness (DFT) specified is achieved.

11. The painted surface shall be allowed to air dry at shop temperature for 4 days before shipping.

3.3.2 Painting of external surface of Transformer Tank, Turrets Conservator, Headers, A-Frames, Pipe Work, and Supporting Structures etc.

[A] Application of Epoxy base zinc Primer :- Primer paint as prepared shall be applied by spraying / brushing over the sand, shot or grit blasted surface. DFT of the coat shall be 30-40 microns.

[B] Application of Intermediate under coat :- Blow Dry compressed air on the entire primer painted surface and clean loose paint, dust etc. Intermediate Paint of Epoxy HB MIO paint shall be applied. DFT of the coat shall be 75 microns (min).

[C] Finishing Coat :- Air hose the entire surface to remove loose paint, dust etc. Polyurethane finishing paint shall be applied by spraying/brushing. DFT of finishing coat shall be 50 microns (min). Total DFT of all the three coats shall be 155 microns (min).

3.3.3 Painting on internal surface of Transformer Tank, Turrets, Conservator, Headers, Pipe Work above 80 NB, Core Clamping Parts & all internal parts

Internal surface of tanks and other items shall be painted not later than 3-4 hours after preparation of the surface. White Epoxy Enamel Paint to be applied by spraying / brushing. DFT of the coat shall be 50 microns (min).

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3.3.4 Painting on External Surface of Marshalling Box, RTCC Panels and Control Cabinet

[A] Application of Epoxy base zinc Primer :- Primer paint as prepared shall be applied by spraying / brushing.

DFT of the coat shall be 30-40 microns.

[B] Application of Intermediate under coat :- Blow Dry compressed air on the entire primer painted surface and clean loose paint, dust etc. Intermediate Paint of Epoxy HB MIO paint shall be applied. DFT of the coat shall be 75 microns (min)

[C] Finishing Coat: - Air hose the entire surface to remove loose paint, dust etc. Polyurethane finishing paint shall be applied by spraying/ brushing. DFT of finishing coat shall be 50 microns (min).

Total DFT for Marshalling Box & Control Cabinet shall be 155 micron (min).

3.3.5 Painting on internal surface or Marshalling Box, RTCC Panels and Control Cabinets

Internal surface shall be painted by Two Coats of Epoxy primer followed by White Epoxy Enamel Paint by spraying / bushing. DFT of total coats shall be 50 microns (min).

3.3.6 Painting on Internal Surface of Radiators and pipe work up to 80 NB

3.3.6.1 Internal surface of the radiators shall be flushed with oil proof low viscosity varnish.

3.3.6.2 Internal surface of pipes up to 80 NB shall be flushed with oil proof low viscosity varnish / Epoxy white enamel paint.

3.3.7 Painting on External Surface of Radiators.

3.3.7.1 Brush / Spray painting of support and bracing detail for radiator elements and radiator header and outside of header cover

Epoxy Primer shall be applied by brush at the surface between the flutes before welding elements with header. Drying time for the coat shall be 16 hours.

3.3.7.2 Assembly of Radiators

The radiator shall be assembled after application of Etch Primer and Epoxy Primer Paints between flutes on radiator elements. Degreasing and rust removal shall be done of all support & bracing details for radiator elements as well as radiator header & outside of header.

3.3.7.3 Painting of Assembled Radiators

[A] First coat of Epoxy base zinc primer

First coat of Epoxy base zinc primer shall be applied by brushing/ spraying. Thickness of the coat shall be 30-40 microns. The painted surface shall be allowed to air dry for 16 hours.

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[B] Second coat of Epoxy base zinc primer

The second coat of epoxy base zinc primer shall be applied by brushing / spraying. The painted surface shall be allowed to air dry for 16 hours before the first coat of finishing paint is applied. Thickness of the coat shall be 30-40 microns.

[C] Final Coat of Aliphatic Polyurethane Paints

Aliphatic Polyurethane Finishing Paint shall be applied at the appropriate viscosity by brushing / spraying. The painted surface shall be allowed to air dry for 16 hours. Thickness of the coat shall be 50 microns (min).

Total DFT of primer and finish coats shall be 110 microns (min).

4.0 INSPECTION PROCESS CONTROL & TESTING

1. Painted surfaces shall be visually checked for defects like rundown, bubbles, blisters wrinkles etc. and for any area not covered by the coat.

2. Dry film thickness (DFT) shall be checked after every coat as per ASTM D1186.

3. Adhesion test is carried out by applying & removing pressure sensitive adhesive tape over cuts made in the paint film to ensure that adhesion of paint film to metallic substrate is adequate.

   The test shall be carried out generally in line with ASTM D 3359 except that pressure sensitive adhesive tape of 25 mm width, shall conform to IS: 2880. Method A of ASTM D 3359 shall be followed in case thickness of film is greater than 125 microns & acceptance criterion shall be 4A and method B of ASTM D 3359 shall be followed when thickness of paint film is between 50 to 125 microns and acceptance criterion shall be 4B.

4.1 Maintenance & touch up paint (External Surface)

In case any area of paint is damaged during handling / transport or is rectified by welding / heating after painting, following procedure shall be carried out on damaged areas.

4.1.1 Clean the surface thoroughly by convenient tools. No trace of oil / carbon should be left on the surface. If rusting has taken place, it should be removed by emery paper.

4.1.2 Apply Surface Tolerant Epoxy Priming Paint to give a DFT of 50 microns.

4.1.3 Apply finish coat of Aliphatic Polyurethane paint to get total paint thickness of 155 microns minimum.

5.0 GENERAL INSTRUCTION

5.1 Painting after dye penetrant test:

When jacking and lifting tests are to be performed on the transformers, load bearing welds, these areas are not painted immediately after sand / shot / grit blasting of the tank.
Following procedure is to be adopted for painting in this area.

5.1.1 Whenever any area is to be left unpainted for DP test, apply adhesive tape on that area after blasting & before painting.

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5.1.2 After completing the dye penetration test, remove tape and apply cleaner over the entire area and remove the dye and developer from that area.

5.1.3 Clean the area with general purpose thinner.

5.1.4 Clean the entire surface with a wire brush and do the painting as per given system procedure.

5.2 It is very essential to remove all the abrasives and dust generated by abrasive blasting. It may otherwise lead to premature failure of paint.

5.3 If minimum specified thickness is not achieved with one coat additional coat to be given after drying to achieve desired thickness.

5.4 Mix only sufficient quantity of paint required for immediate use. Do not use the paint once the pot life indicated is over, even after thinning.

5.5 Acceptance criteria for Dry film thickness measurement (90-10 rule)

For each area

- less than 10% of the reading may be below the specified total dry film thickness.
- No reading must be below 90% of the DFT specified.

5.6 All the earthing pads & bosses with threaded holes and all the threaded holes in Top & Bottom Tank, End Frame should be protected with plastic cap of respective size before Painting.

All threaded holes should be cleaned (if not protected during painting) free of paint and fitted with Bolts/plastic cap of suitable sizes before dispatch.

6.0 PRECAUTIONS:-

6.1 Mix only a sufficient quantity of paint required for immediate use for 2 hours.

6.2 Do not use leftover paint, which progressively hardens, and become unusable by adding thinner.

6.3 For wiping or cleaning the dust or loose particles from painted surface, use cotton rags only. Do not use cotton waste as it will leave loose fibers on the surface.

6.4 Painted surface if damaged, should be retouched up with similar procedure depending upon the extent of film exposed.

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SURFACE PREPARATION AND PRETREATMENT OF FERROUS SURFACE PRIOR TO PAINTING

1 GENERAL

This standard, details the surface preparation and pre-treatment of ferrous surfaces prior to painting. This includes removal of oil, grease, dirt and swarf followed by removal of rust by means of mechanical or chemical treatment.

Assistance has been taken from IS 8629, Part 2–1977 and Swedish Standard SIS 05 5900–1967 in preparing this standard.

2 REMOVAL OF OIL, GREASE, DIRT AND SWARF

Before application of paint, it is very essential to have a very clean surface. All oil, grease, dirt and swarf to be removed by means of solvent, alkali, emulsion or steam cleaning. Refer to specific MSDS (Material Safety Data Sheet) for precautions to be taken during storage, handling and disposal of such chemicals used.

2.1 Solvent cleaning

This shall be done by using petroleum solvent (other than CTC) or trichloroethylene.

2.1.1 Petroleum solvent cleaning

The method involves use of petroleum solvents like white spirit to BHEL specification AA56701. The process of cleaning such as immersion or brushing is decided depending on the size/shape of the component. However, sufficient time should be allowed for removal of the contaminants and in no case for less than one minute. Cleaning with brushing or wiping is used for the "insitu" cleaning of articles too large for immersion tanks or spray cleaning surfaces. The surface of the fabricated panel shall be cleaned with brush or cloth soaked in white spirit to BHEL specification AA56701 to remove stains of oil, grease etc. before rust removal. The solvent should be allowed to evaporate before next operation. If required, clean cotton cloth can be used for wiping the surface. The cloth shall be changed every time or the contaminants on the cloth will adhere to the substrate.

a) Process

Two main methods are given below. Details depend upon the quantity and characteristics of the parts or assemblies to be cleaned.

i) Immersion

This method may be used for unit parts or assemblies when contamination is light and when the highest degree of cleanliness is not essential; it is particularly suitable for hand cleaning in small tanks. The articles should be immersed in the solvent long enough to allow removal of the contaminants, and in no case for less than one minute. Agitation is desirable, and brushing or scrubbing with wire brushes will aid quick cleaning.

ii) Brushing or wiping

This method is intended for the removal of oil, grease and light contamination from bare metal areas or assemblies containing painted surfaces or non-metallic inserts that might be damaged by general application of solvent. It may also be used for the 'in-situ' cleaning of articles too large for immersion tanks or spray cleaning systems.

b) Handling precautions

Articles should be placed on hooks or racks or in suitable containers that permit adequate draining. They should not be handled with bare hands after cleaning. Clean gloves or similar protection should be used and handling kept to a minimum.

c) Safety precautions

Petroleum solvents should be used at room temperature in a well ventilated area and suitable exhausts and fire extinguishers should be provided, as these solvents are flammable. Oil-resisting synthetic rubber gloves should be worn when handling articles during cleaning, to protect the articles from sweat residues and to avoid any possible effect of the solvent on the skin. Care should be taken to avoid breathing the petroleum solvent vapour. Aprons, respirators and safety glasses shall be used by the operators who are responsible for the above operations.

d) Limitations

Petroleum solvent cleaning suffers from the following drawbacks:

i) Fire risk

ii) Brush or wipe or immersion methods being manual in operation are slow and time consuming and therefore unsuitable on their own for continuous production lines, and

iii) The degree of cleanliness achieved by such methods is not high and they are generally used for preliminary cleaning to supplement a proper degreasing operation.

2.1.2 Trichloroethylene cleaning

The method relates to surface cleaning with trichloroethylene solvent. This can be done by placing the equipment in the vapours of trichloroethylene or by immersing it in boiling trichloroethylene or by jetting trichloroethylene at high pressure on surfaces to be cleaned.

a) Degreasing

The three main processes are described below

The precise details of the equipment and the method of operation for each process depends on the quantity and characteristics of the parts or assemblies to be cleaned; the plant manufacturers' recommendations should be followed.

i) Vapour process

The remove simple films of oil and grease, articles may be subjected to the vapour process, in which the parts are exposed in a bath of solvent vapour. The vapour condenses on the cold surface of the articles and the condensate dissolves the oil and grease, taking it away to the base of the tank. To ensure the maximum condensation, the temperature of the articles should be as near to the room temperature as possible at the time of immersion. They should be passed through or suspended in the solvent vapour until no further condensation occurs, after which no further degreasing will take place. Articles with a very heavy film of grease may need a second exposure after cooling.

ii) Liquid process

Loosely bound contamination (too much for vapour treatment) such as polishing compound, swarf and road dirt may be removed by immersing the parts in vigorously boiling trichloroethylene.

iii) Jetting process

Articles with obstinate dirt deposits that cannot be removed by boiling trichloroethylene may require jetting at high pressure with the hot solvent. The jetting should be carried out only in equipment, specially designed for the purpose.

b) Handling precautions

During processing, the articles should be placed on hooks or racks or in a suitable container. They should be so arranged that there is adequate opportunity for the solvent to drain from holes, crevices, pockets and other irregularities. Parts or assemblies that would trap solvent should be rotated or tilted during the degreasing process to prevent drag-out of trichloroethylene. Handling may be reduced by

using mechanical and conveyor type degreasing plants which automatically rotate or tilt the articles. After cleaning, articles should not be handled with bare hands. Clean gloves or similar protection should be used.

c) Safety precautions

Trichloroethylene is a toxic substance. All safety precautions like wearing aprons, rubber gloves, respirators and safety glasses shall be used by the operator responsible for the above operations. Care should be taken to avoid breathing the vapour near degreasing equipment.

2.2 ALKALINE CLEANING

Cleaning of surface can be done by using alkaline degreasing agents, which are very good for cleaning but by and large injurious to skin. This process can be followed either by immersion in hot alkaline mixture or by electro cleaning process or by using jet cleaning process. In the electro cleaning process tank to be used as one electrode while job to the cleaned to other electrode. In the jet cleaning process, job to be cleaned is subjected to jet of hot alkaline solution at high pressure. Details of safety and handling as per IS 8629 Part 2.

2.3 EMULSION CLEANING

These are diphase cleaners of oil/water emulsion type. These cleaners may be applied by spray or dip, though spray is more common. Details of safety and handling as per IS 8629 Part 2.

2.4 STEAM CLEANING

This method related to the use of a jet of high pressure steam for the “in-situ" cleaning of large unit parts, assemblies and machinery that cannot be accommodated in a cleaning apparatus. The cleaning may be carried out with pure steam or with alkaline solution/steam mixture. Details of safety and handling as per IS 8629, Part 2.

3 REMOVAL OF RUST AND SCALE BY MECHANICAL OPERATIONS

3.1 HEAVY LOCALISED RUST

If rusting has occurred locally, but to such an extent that some pitting with hard rust flakes, is exhibited, the rust shall be first removed by using hand scraping or scraping with mechanical power tools or flame cleaning. The affected surface shall be treated as that mentioned for "Light Rust” in Clause 4.1.

3.1.1 Hand scraping

Scraping with a hand scraper generally follows by steel wire brushing and finally sanding the surface with a coarse sand paper, steel wool or emery paper.

3.1.2 Scraping with mechanical power tools

This gives better and quicker results than above, but it may not be possible to remove firmly adhering mill scale even with this method.

3.1.3 Flame cleaning

This is done by heating the surface with oxy-acetylene torch. Because of the difference in expansion between the heated mill scale and the bulk of the steel, the scale becomes loose and either falls off or is easily removed with wire brush. This process is not suitable for plates less than 6 mm thick because of buckling problem that may result during this process.

3.2 GENERAL RUSTING

If the surface is widely rusted to such as extent that pitting with hard flakes is exhibited, generally the job shall be grit or shot blasted. The principle is to impinge under pressure of air, a jet of sharp granulated steel (steel or non-metallic grit) on to the metal surface removing in the process any rust and scale, including firmly adhering mill scale. A steel surface properly cleaned by blasting may be immediately recognised by its silver grey surface and the criterion for good shot blasting is the evenness of the colour of the surface so cleaned. Precautions shall be taken when shot blasting light gauge steel to see that buckling does not occur as a result of continuous impingement of grit or steel shot under high velocity.

Before the process of blast, cleaning is carried out, may be cleaned by emulsion/steam cleaning to remove dirt, dust, grease etc.

3.3 BLAST CLEANING

The process of surface preparation by Blast Cleaning is described below:

3.3.1 White metal blast cleaning

A white metal blast cleaned surface when viewed without magnification shall be free of all visible oil, grease, dirt, dust, mill scale rust, paint oxides, corrosion products and other foreign materials.

3.3.2 Commercial blast cleaning

A commercial blast cleaned surface when viewed without magnification shall be free of all visible oil, grease, dirt, dust, mill scale rust, paint oxides, corrosion products and other foreign materials.

Staining shall be limited to no more than the 33% of each square inch of surface area and may consist of light shadows, slight streaks or minor discolouration caused by stains of rust. Stains of mill scale or stains of previously applied paint, slight residues of rust and paint may also be left in the bottom of the pits if the original surface is pitted.

3.3.3 Brush-off blast cleaning

A brush-off blast cleaned surface when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scales, loose rust and loose paint.

The entire surface shall be subjected to the abrasive blast. The remaining mill scale, rust or paint shall be tight.

When painting is specified, the surface shall be roughened to a degree suitable for the specified paint system.

Immediately prior to paint application, the surface shall comply with the degree of cleaning as specified.

3.3.4 Near white blast cleaning

A near white blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products and other foreign matter, except for staining as noted below:

Staining shall be limited to no more than 5% of each square inch of surface area and may consist of light shadows, slight streaks or minor discolouration caused by stains of rust, stains of mill scale or stains of previously applied paint.

3.4 SURFACE PREPARATION BEFORE BLAST CLEANING

Before blast cleaning, visible deposits of oil or grease shall be removed by solvent cleaning.

Before blast cleaning the surface, imperfections shall be removed from the surface as specified below:

Weld spatter shall be removed by using chipping hammer, spud bar, scrapper or by grinding.

Areas of unacceptable porosity should be filled or closed over with a needle gun or peening hammer.

Sharp edges may be removed by grinding, mechanical sanding, filling etc.

Deep corrosion pits, gouges, clamp marks or other surface discontinuities may be repaired by grinding or filling.

Areas of poor design for corrosion protection such as tack or spot welded connections, back to back angles, crevices (narrow openings) may require corrections by structural or design modifications where this is not possible, particular consideration should be devoted to minimise the effect of such deficiencies.

Substrate Chemical contamination (for blasting): shall be conducted with any suitable method to identify salt contamination.

– Type of check : Measurement
– Quantam of check : One Test/abrasive lot used
– Acceptance Norm : Chloride < 15 µg/cm² (ppm), Sulphate < 20 ppm

3.5 BLAST CLEANING METHOD AND OPERATION

3.5.1 Clean, dry compressed air shall be used for nozzle blasting (moisture separators, oil separators, traps or other equipment may be necessary to achieve this requirement).

3.5.2 The various method of surface preparation to achieve a blast cleaned surface are as follows:

a) Dry abrasive blasting using compressed air, blast nozzles and abrasive.

b) Dry abrasive blasting using a closed cycle, recirculating abrasive system with compressed air, blast nozzles and abrasives with or without vacuum for dust and abrasive recovery.

c) Dry abrasive blasting using a closed cycle recirculating abrasive system with centrifugal wheels and abrasive.

3.6 PROFILE OF ROUGHNESS OBTAINED DURING BLASTING

This will depend upon the abrasive used, the air pressure and the technique of blasting. Too low a profile may not provide a sufficient key for a coating while too high a profile may result in uneven coverage of high sharp peaks leading to premature coating failure, particularly for thin coatings such as blast primers apart from higher paint consumption.

The following table gives a brief guide to typical roughness profiles obtained using various types of abrasives

Types of abrasive	Mesh size	Maximum height of profile
Very fine sand	80	37 microns
Coarse sand	12	70 microns
Iron shot S 390 Typical non metallic "Copper slag"	14	90 microns
1.5 to 2 mm grain size	--	75/100 microns
Iron grit no. G16	12	200 microns

Profile measurement shall be made using appropriate profile gauge supplied with calibration standards.

3.7 ABRASIVE SELECTION

The selection of the size and type of abrasives which will most effectively and economically produced the desired surface finish, shall be as per Section-5 of "Surface preparation commentary (SSPC-SP-COM)", encl.no.25.

In general, select the smallest size abrasive that will produce the desired cleaning results. Usually, this will give the fastest, most economical cleaning operation.

3.8 SURFACE PREPARATION AFTER BLAST CLEANING AND IMMEDIATELY PRIOR TO PAINTING

Visible deposits of oil, grease or other contaminants shall be removed by solvent cleaning.

Dust and loose residues shall be removed from prepared surfaces by brushing, blowing off with clean, dry air, or vacuum cleaning.

After blast cleaning, surface imperfection which remain shall be removed to the extent required as explained at 4.2.

Any visible rust that forms on the surface of the surface steel after blast cleaning shall be removed by re-blasting the rusted areas.

3.9 INSPECTION

All work and material supplied under this specification shall be subject to timely inspection by Q.C.

Conditions not complying with this specifications shall be corrected.

The engineering and process documents, sub-contract, scope-procurement documents should establish responsibility for inspection and for any required affidavit certifying full compliance with this specifications.

The appearance of the surface after cleaning should correspond to pictorial standard as mentioned below

	Blast cleaning method	Pictorial standard	For Pictorials
1	White metal blast cleaning (blast cleaning to visually clean steel)	A Sa 3, B Sa 3 C Sa 3 & D Sa 3	Annexure 1a
2	Commercial blast cleaning (light blast cleaning)	B Sa 1, C Sa 1 & D Sa1	Annexure 1b
3	Brush-off blast cleaning (through blast cleaning)	B Sa 2, C Sa 2 & D Sa2	Annexure 1c
4	Near white blast cleaning (very through blast cleaning)	A Sa 2 ½, B Sa 2 ½, C Sa 2 ½ & D Sa 2 ½	Annexure 1d

Alternatively, NACE Visual Comparators may also be used for inspection purposes.

The test for assessment of dust on steel surfaces prepared for painting can be carried out as per the Pressure-sensitive Tape method as per ISO 8502-3.

NOTE:

1) All jobs are generally to be shot/grit blasted.
2) For pictorial standard only coloured profile should be used. (xerox copy not to be referred)
3) Blast cleaning surface should be measured after cleaning.

4 REMOVAL OF RUST BY CHEMICAL CLEANING

4.1 Light Rust

If a thin film of very light rust exists on the work, it shall be removed by means of de-rusting solution /rust converter. After degreasing as above, the de-rusting solution shall be applied in a thin film, using brush or swab and left for 10 to 15 minutes. At the end of the period and before it has dried, it shall be wiped off with a clean dry cloth and the surface examined any red rust is still visible, further similar application shall be made until the surface exhibits a grey colour only.

The surface shall then be followed to dry and be brushed down with a clean dry brush before painting. The drying may be accelerated by swabbing or brushing the surface with Industrial Methylated Spirit (AA56705). This is recommended for faster drying and removal of un-reacted acid.

NOTE:

In case of Epoxy painting system like BHEL standard AA0674104 and AA0674111 shot blasting of surface shall conform to Sa 2 ½ minimum of Swedish Pictorial Standard SIS 055900.

4.2 SULPHURIC ACID, HYDROCHLORIC ACID OR PHOSPHORIC ACID PICKLING

To remove scale and rust, pickling can be done by using sulphuric acid 5 to 20% concentration by volume at 60 to 80°C or hydrochloric acid 20 to 50% concentration by volume at room temperature or phosphoric acid at 5 to 25% concentration by vol. At 60 to 85°C.Appropriate inhibitors shall be used in the pickling bath to reduce acid attach on the base metal. This shall be followed by washing in water followed by dipping in phosphoric acid solution, 1-2% concentration by volume.

NOTE:

The pickling acid selection should be made on the basis of the material pickled.

4.2.1 Process details

The components to be treated shall be immersed in the tanks made of steel with suitable lining with chemicals, temperature and dipping time as given below:

(Suitable chemicals as per applicable purchase specification from time to time shall be used according to the process)

Concentration process	Pointage (Chemical in water) see note below	Bath dipping see note below	Temp. (deg. C)	Time
Degreasing (if hot)	3-5% WT/VOL	27 - 45	80 - 90	10-15 minutes
Degreasing (if cold)	10-15% WT/VOL	80 - 90	Room temp.	10-15 minutes
Rinsing in cold running water tank with over flow arrangement				
De-rusting (cold)	20-40% VOL/VOL	20 - 40	Room temp.	10-20 minutes
Rinsing in cold running water tank with over flow arrangement				
Phosphating (cold)	5-6% VOL/VOL	25 - 30	Room temp.	20-30 minutes
Rinsing in cold running water tank with over flow arrangement				
Passivation (if hot)	0.1-0.2% VOL/VOL	Free acid: 0.1-0.2ml per 25ml; Total acid: 2.5ml max. per 25ml	50 - 60	30-45 seconds
Passivation (if cold)	Same as above	Same as above	Room temp.	2-3 minutes

NOTE

a) The values are indicative. The chemical concentration, temperature (hot or cold), dipping time are to be maintained as given by the manufacturer of the chemical and the nature of oil/soil/rust on the component.

b) Pointage: is the value of the titrate (chemical used for titration)

Of a given strength, when a sample (whose concentration is to be checked) of 10ml is taken for titration (for convenience of titration, add 100ml water, value will not be different if water is added or not). For example, when a 10ml of degreasing solution is titrated using 0.1 N hydrochloric acid, if the titrate value is 25ml, then the pointage of degreasing solution is 25.

4.2.2 Analysis of pre-treatment baths

a) Take 10ml of sample solution + 100ml water + 6 to 8 drops of indicator given. Pour into a 250ml conical flask and shake well.

b) Titrate against the chemical given and observe for the change in colour. Note the value of titrate used. That is the pointage, which shall be as per the process details given earlier.

Solution	Indicator	Titrate with	Turning point
Degreasing	Phenolpthalin	0.1 N Hydrochloric acid	Pink to clear
De-rusting	Methyl orange	1.0 N Sodium hydroxide	Orange to yellow
Phosphating	Phenolpthalin	0.1 N Sodium hydroxide	Colourless/slight yellowish to pink atleast for 10 seconds

Passivation - given in further pages

NOTE

Toner concentration checking: Dip starch iodide paper for one minute in solution, observe the change in colour.

Colour change	Inference
Remains white	Toner insufficient
Turns blue	Toner sufficient
Turns dark blue	Toner excess

Passivation solution Titration Analysis:

For free acid strength:

Take 25ml sample in a measuring flask and pour into 100ml conical flask. Add 6 to 8 drops of Bromocresol green solution. See the colour remains yellow, titrate using 0.1 N sodium hydroxide until colour changes to green or blue. Note the value of standard solution.

For total acid strength:

Continue titration adding phenolphalin indicator to 0.1 N sodium hydroxide until solution changes to purple. Note the volume of sodium hydroxide.

4.3 ELECTRO - CHEMICAL CLEANING

It is possible to remove rust and scale by cathodic treatment in acid solution, cathodic treatment in alkaline solution, anodic treatment or alkaline de-rusting process as per IS 6005.

NOTE

Within 8 hours of surface preparation, the job should be subjected to phosphating or application of priming paint.

Surface cleaning and painting should not be carried out when the humidity in the chamber is above 80% (RH).

5 INSPECTION FOR PROCESS CONTROL

Quality control inspector shall visually inspect the prepared surface for freedom from rust, stain, oil or grease before application of priming paint. The records of surface cleanliness (extent of cleaning and profile) shall also be inspected. It shall also be ensured that the shot blasted surface should be subjected to phosphating or application of priming paint within 4 hours except the jobs which need pressure testing due to code requirements.

A comparative table showing the various equivalent standards is presented in the ANNEXURE 2.

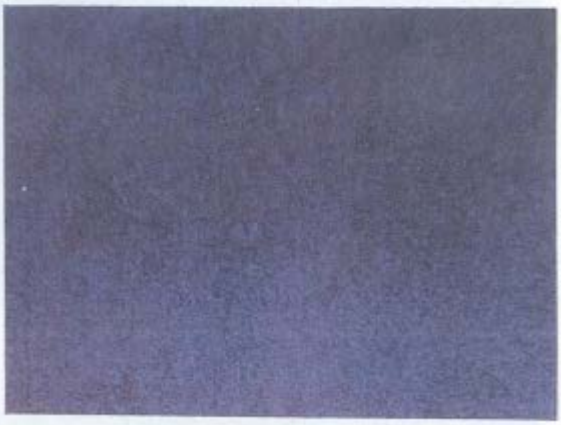
6 REFERRED STANDARDS (Latest Publications Including Amendments)

1) AA56701
2) AA56705
3) AA0674104
4) AA0674111
5) IS 6005
6) IS 8629 Part 2
7) ISO 8502
8) Swedish standard SIS: 05 5900-1967

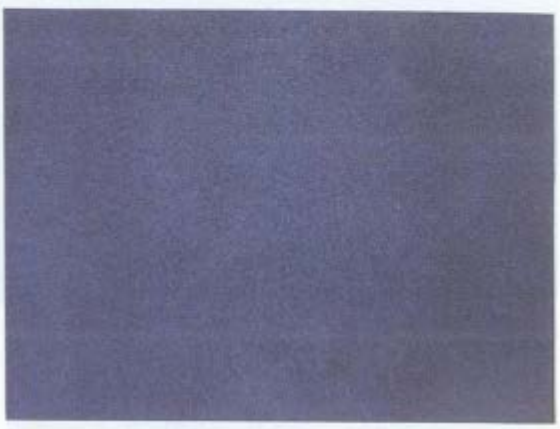
Annexure-1a
(Clause 3.9)

SURFACE FINISH RUST GRADE

A



A Sa 2 ½



A Sa 3

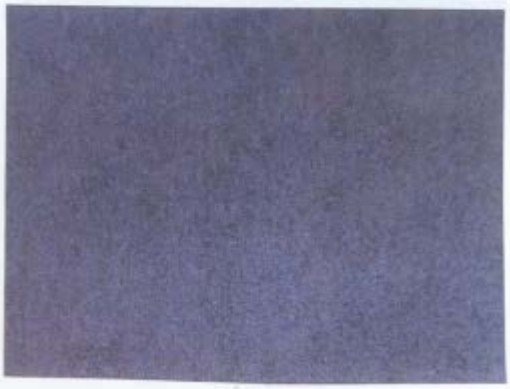
Annexure-1b
(Clause 3.9)

SURFACE FINISH RUST GRADE

B

B Sa 1

B Sa 2

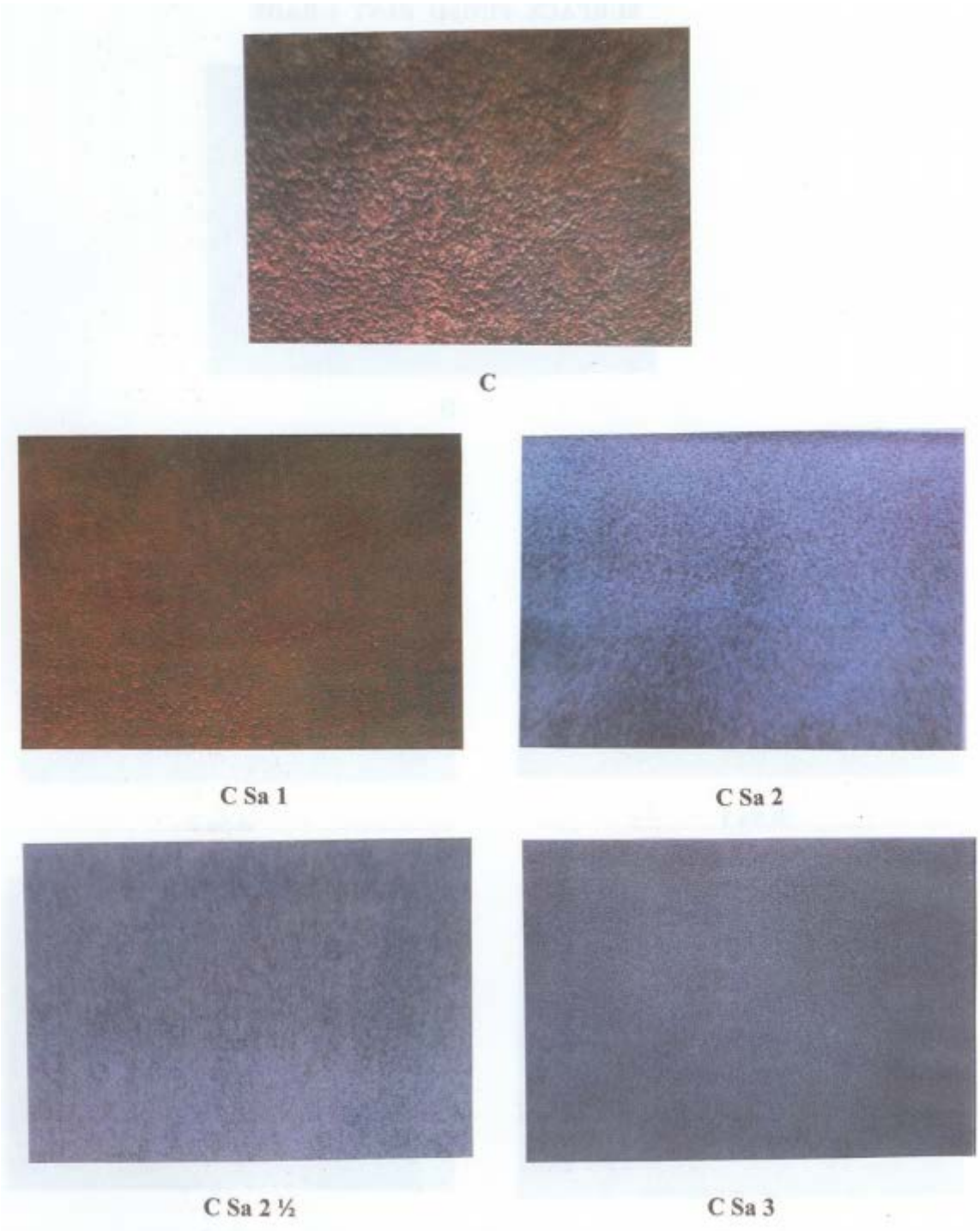


B Sa 2 ½

B Sa 3

Annexure-1c
(Clause 3.9)

SURFACE FINISH RUST GRADE

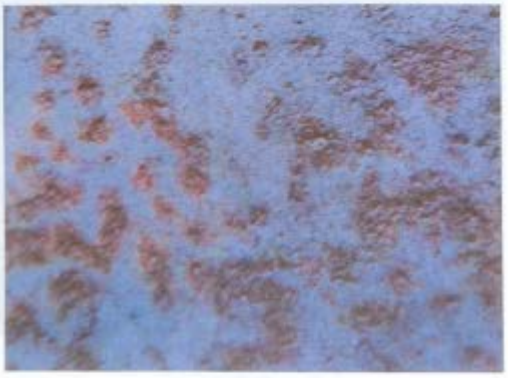


Annexure-1d
(Clause 3.9)

SURFACE FINISH RUST GRADE

D

D Sa 1



D Sa 2

D Sa 2 ½

D Sa 3

Annexure-2
(Clause 5)

INTERNATIONAL STANDARDS FOR SURFACE PREPARATION – A COMPILATION OF NEAREST EQUIVALENTS

Sl No.	Surface preparation	Swedish standard SIS: 055900	German standard DIN: 55928 Part-4	SSPC standard	BS 4232	A.S. 1627 Part-4	BSI standard IS:477	NACE standard
1	Blasting cleaning to white metal	Sa 3	Sa 3	SSPC-SP 5	1st Quality	Class 3	Class A1.1	1
2	Blast cleaning to near white metal	Sa 2½	Sa 2½	SSPC-SP10	2nd Quality	Class 2½	Class A1.2	2
3	Blast cleaning to commercial quality	Sa 2	Sa 2	SSPC-SP 6	3rd Quality	Class 2	Class A1.3	3
4	Brush-off blast cleaning	Sa 1	Sa 1	SSPC-SP 7	--	Class 1	Class A 1.4	4
5	Power tool cleaning	St 3	St 3	SSPC-SP 3	--	AS 1627 Part 2	Class 6.2.1.2	--
6	Hand tool cleaning	St 2	St 2	SSPC-SP 2	--	AS 1627 Part 7	Class 6.2.1.2	--

NOTES FOR ABOVE Sl. Nos. :

1) Removal of all visible rust, mill scale, paint and other contaminants.
2) 95% of any section of surface area is free from all rust, mill scales and other visible residues.
3) Two-thirds of any section of the surface area is free from all rust, mill scales, etc.
4) Removal of all loose mill scales, rust and foreign matter.
5) Through scraping and wire brushing to remove loose mill scales, rust and foreign matter using power operated tools.
6) Removal of loose rust and soil by wire brushing without using power tools.

REF. TR10005P

COMP.DRG.

Form no.2038

उत्पाद मानक परिणामित्र **PRODUCT STANDARD TRANSFORMER**

शाप / अभि. निर्देश SHOP / ENGG. INSTRUCTIONS

TR 10005 P

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शीर्षक :
TITLE :

PAINTING INSTRUCTIONS

1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPL-IED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
1	i. TRANSFORMER/ REACTOR TANK & COVER,TOP TANK BOTTOM TANK	IN SIDE	CHEMICAL & THERMAL RESISTANT EPOXY ENAMEL WHITE / CREAM SHADE	2	SPRAY OR BRUSH	BP 56179	TOTAL DFT 50 Min.	TR10206P	EPOXY PAINTING
	ii- TURRETS	OUT SIDE	i- CHEMICAL & THERM. RESIST EPOXY PRIMER.	2	SPRAY OR BRUSH	AA 56105	50 Min.		
	iii- INSPECTION COVERS, CONSERVATOR HEADERS		ii. CHEM.&THERM. RESISTANT EPOXY ENAMEL LIGHT GREY SHADE 631OF IS:5	2	SPRAY OR BRUSH	BP 56179	50 Min. TOTAL DFT. 100 Min.		
2	END FRAME,CLAMP PLATE,T.G &T.C BRACKETS &OTHER STEEL PARTS GOING INSIDE TRANSFORMER. TANK		CHEMICAL & THERMAL RESISTANT EPOXY ENAMEL WHITE / CREAM SHADE	2	SPRAY OR BRUSH	BP 56179	TOTAL DFT 50 Min.	TR10206P	
2 (A)	E/F, CLAMP PLATE, CROSS BEAM,T.G & T.C BRACKET,OTHER STEEL PARTS GOING INSIDE TANK UPTO 400 KV CLASS FOR TRANS.& REACTORS		OIL RESISTANT FULL GLOSSY WHITE PAINT	2	SPRAY OR BRUSH	BP 56183	TOTAL DFT 40 Min.	TR10211P	
3	BARE COPPER GOING INSIDE TRANS. TANK		ONE 50% OVERLAP WOUND LAYER OF CREPE KRAFT PAPER TO AA21117 TYPE B						
4	i. TRANSF. TANKS UPTO 400 KV CLASS ii. REACTOR TANKS UP TO 400 KV CLASS iii.SPARE COIL TANK iv. CONSERVATOR, RELIEF VENT, RAD. HEADER. v.CABLE BOX COMPOUND FILLED. vi.TURRETS	IN SIDE	OIL RESISTANT FULL GLOSSY WHITE PAINT	2	SPRAY OR BRUSH	BP 56183	TOTAL DFT 40 Min.	TR10211P	
		OUT SIDE	i.ANTI CORROSIVE PRIMER PAINT.	2	SPRAY OR BRUSH	AA 56101	40 Min.		
			ii. HIGH QUALITY FULL GLOSSY OUTDOOR FINISHING PAINT LIGHT GREY SHADE 631 OF IS :5	2	SPRAY OR BRUSH	AA 56126	40 Min TOTAL DFT 80 Min		

TR 10005 P

PAGE 1 OF 7

पुनः Rev. 20 दिनांकः Date 05.12.15	IN SHEET NO. 007, PENGAURD HB WHITE NOTE ADDED. 3/12 NiTiN A.DEOTA	वितरण DISTRIBUTION	सं.	स्वीकृत किया : APPROVED : sd/SRR, sd/SNA
पुनः Rev. 19 दिनांकः Date 21.04.14	APPROVED VENDORS FOR TRE SPECIFICATION PAINTS ADDED - SD - - SD - NKM A.DEOTA	TRE/TRM/FTM TRX/TTG QC-TCB/QA-TCB JHANSI		जारी किया : ISSUED : टीआरई मानक / TRE STD. तैयार किया : PREPD. : SD/-SJ दिनांक : DATE : 23-03-1986

REF. TR10005P

COMP.DRG.

1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPLIED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
5	PIPE WORK	IN SIDE	-----AS IN SL.NO.4------	-	FLOODING	BP 56183		TR10210P	
		OUT SIDE	-----AS IN SL.NO.4------	2 2	SPRAY OR BRUSH SPRAY OR BRUSH	AA 56101 AA 56126	40 Min. 40 Min. TOTAL DFT. 80 Min.		
6	ROLLER ASSY, A-FRAMES, BREATHERS,STEEL PARTS,OUTSIDE TRANSFORMER TANK	OUT SIDE	-----AS IN SL.NO.4------	2 2	SPRAY OR BRUSH SPRAY OR BRUSH	AA 56101 AA 56126	40 Min. 40 Min. TOTAL DFT. 80 Min.	TR10211P	
7	RADIATORS	OUT SIDE	i. SELF ETCH PRIMER ii. ANTI CORROSIVE PRIMER iii. HIGH QUALITY FULL GLOSSY FINISHING PAINT	 1 2	SPRAY OR BRUSH FLOODING FLOODING OR SPRAY OR BRUSH	AA56103 AA56101 AA56126	5 Min. 40 Min. 40 Min. TOTAL DFT. 85 Min.	TR10205P	
8	ALL BLANKING DURING SHIPPING	IN SIDE	-----AS IN SL.NO.4------	2	SPRAY OR BRUSH	BP56183	TOTAL DFT. 40 Min.	TR10211P	
		OUT SIDE	POST OFFICE RED FINISHING PAINT	2	SPRAY OR BRUSH	AA56126	TOTAL DFT. 40 Min.		
9	INSTRUMENT TRANSFORMER CT/CVT TANK	INSIDE EXCEPT SECONDARY TERMINAL BOX	-----AS IN SL.NO.4------	2	SPRAY OR BRUSH	BP 56183	TOTAL DFT. 40 Min.	TR10211P	
		INSIDE SECONDARY TERMINAL BOX	i.ANTI CORROSIVE PRIMER PAINT. ii.NON YELLOWING FULL GLOSSY WHITE PAINT	2 2	SPRAY OR BRUSH	AA56101 AA56127	40 Min. 40 Min. TOTAL DFT. 80 Min.		
		OUT SIDE	-----AS IN SL.NO.4------	2 2	SPRAY OR BRUSH	AA56101 AA56126	40 Min. 40 Min. TOTAL DFT. 80 Min.		

उत्पाद मानक PRODUCT STANDARD
परिणामित्र TRANSFORMER
शाप / अभि. निर्देश SHOP / ENGG. INSTRUCTIONS

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पुनः Rev. 20 दिनांकः Date 05-12-15

पुनः Rev. 19 दिनांकः Date 21.04.14

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जारी किया : ISSUED : टीआरई मानक / TRE STD.

तैयार किया : PREPD. : SD/-SJ

दिनांक ः DATE : 23-03-1986

1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPLIED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
10	MARSHALLING BOX/ KIOSK	IN SIDE	i.ANTICORROSIVE PRIMER PAINT. ii. NON YELLOWING FULL GLOSSY WHITE PAINT	2 2	SPRAY OR BRUSH	AA56101 AA56127	40 Min. 40 Min. TOTAL DFT. 80 Min.	TR10211P	
		OUT SIDE	----SAME AS IN SL. NO. 4 ------	2 2	SPRAY OR BRUSH	AA56101 AA56126	40 Min. 40 Min. TOTAL DFT. 80 Min.		
11	MARSHALLING BOX / KIOSK AIR FILLED CABLE BOX	IN SIDE	i.ANTICORROSIVE PRIMER PAINT. ii.WHITE ANTI CONDENSATION PAINT	2 2	SPRAY OR BRUSH	AA56101 HE1006 BP56194	40 Min. 40 Min. TOTAL DFT. 80 Min.	TR10211P	
		OUT SIDE	----SAME AS IN SL. NO. 4 ------	2 2	SPRAY OR BRUSH	AA56101 AA56126	40 Min. 40 Min. TOTAL DFT. 80 Min.		
									EPOXY PAINTING
12	PANELS MOUNTED INSIDE M.BOX/KIOSK		----SAME AS IN SL NO.10 (INSIDE) ------	2 2	SPRAY OR BRUSH	AA56101 AA56127	40 Min. 40 Min. TOTAL DFT. 80 Min.	TR10211P	
13	MARSHALING BOX/ KIOSK PARTS INCLUDING PANELS EXPOSED TO CHLORINE CONTAMINATED ATMOSPHERE	IN SIDE	i. CHEMICAL & THERMAL RESISTANT EPOXY PRIMER PAINT. ii. CHEMICAL& THERMAL RESISTANT EPOXY ENAMEL WHITE SHADE	2 2	SPRAY OR BRUSH SPRAY OR BRUSH	AA56105 BP56179	50 Min. 50 Min. TOTAL DFT. 100 Min.	TR10206P	
		OUT SIDE	I.CHEMICAL & THERMAL RESISTANT PRIMER PAINT. ii. CHEMICAL& THERMAL RESISTANT EPOXY ENAMEL PAINT LIGHT GREY SHADE 631OF IS:5	2 2	SPRAY OR BRUSH SPRAY OR BRUSH	AA56105 AA56179	50 Min. 50 Min. TOTAL DFT. 100 Min.		
14	NON FERROUS PARTS EXPOSED TO CHLORINE CONTAMINATED ATMOSPHERE	OUT SIDE	i.SELF ETCH PRIMER ii.CHEMICAL & THERMAL RESISTANT EPOXIDE PRIMING PAINT. iii. CHEMICAL& THERMAL RESISTANT EPOXY ENAMEL PAINT LIGHT GREY SHADE 631OF IS:5	1 1 2	SPRAY OR BRUSH	AA56103 AA56105 BP56179	5 Min. 25 Min. 50 Min. TOTAL DFT. 80 Min.		
15	RADIATORS (EPOXY PAINTING	OUT SIDE	----SAME AS IN SL. NO. 1 ------	2 2	SPRAY OR BRUSH	AA56105 BP56179	50 Min. 50 Min. TOTAL DFT. 100 Min.	TR10208P	

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पुनः Rev. 19 दिनांकः Date 21.04.14		TRE/TRM/FTM TRX/TTG QC-TCB/QA-TCB JHANSI		जारी किया : ISSUED : टीआरई मानक / TRE STD. तैयार किया : PREPD. : SD/-SJ	दिनांक ः DATE : 23-03-1986

1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPLIED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
					EPOXY PAINTING				
16	i.TRANSFORMER TANK&COVER,TOP TANK,BOT.TANK ii. TURRETS iii.INSPECTIONS COVERS, CONSERVATOR HEADERS	IN SIDE	CHEMICAL & THERMAL RESISTANT EPOXY ENAMEL WHITE SHADE	2	SPRAY OR BRUSH	BP56179	50 Min.		
		OUT SIDE	i.CHEMICAL & THERMAL RESISTANT EPOXY PRIMER	2	SPRAY OR BRUSH	AA56105	50 Min.	TR10206P	
			ii.CHEMICAL & THERMAL RESIST EPOXY ENAMEL LIGHT GREY SHADE 631 OF IS : 5	2		BP56179	TOTAL DFT. 100 Min.		
17	END FRAME, CLAMP PLATE ,CROSS BEAM, T.G & T.C. BRACKETS, OTHER STEEL PARTS GOING INSIDE TRANS.TANK		CHEMICAL & THERML RESISTANT EPOXY ENAMEL WHITE SHADE	2	SPRAY OR BRUSH	BP56179	TOTAL DFT. 50 Min.	TR10206P	
					ALUMINIUM PAINTING				
18	TRANS.TANK,COVER, TURRETS, INSP.COVER,CONS., RAD. HEADERS, RELIEF VENT, CABLE BOXES, P/W, A-FRAME MARSHALLING BOX ETC.	IN SIDE	OIL RESISTANT FULL GLOSSY WHITE PAINT	2	SPRAY OR BRUSH	BP56183	TOTAL DFT. 40 Min.	TR10211P	
		OUT SIDE	i. ANTI CORROSIVE PRIMING PAINT.	2	SPRAY OR BRUSH	AA56101	40 Min.	TR10209P	
			ii. ALUMINIUM PAINT	2		AA56128	40 Min. TOTAL DFT. 80 Min.		
19	RADIATORS (ALUMINIUM PRINTING)	OUT SIDE	I.ANTI CORROSIVE PRIMING PAINT.	-	FLOODING	AA56101	40 Min.	TR10209P	
			ii. ALUMINIUM PAINT	2	SPRAY OR BRUSH	AA56128	40 Min. TOTAL DFT. 80 Min.		

पुनः Rev. 20 दिनांकः Date 05-12-15	वितरण DISTRIBUTION	सं.	स्वीकृत किया : APPROVED : sd/SRR, sd/SNA
पुनः Rev. 19 दिनांकः Date 21.04.14	TRE/TRM/FTM TRX/TTG QC-TCB/QA-TCB JHANSI		जारी किया : ISSUED : टीआरई मानक / TRE STD. तैयार किया : PREPD. : SD/-SJ दिनांक ः DATE : 23-03-1986

1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPLIED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
20	i.TRANSFORMER TANK& COVER ,TOP & BOT. TANK	IN SIDE	CHEMICAL & THERMAL RESISTANT EPOXY WHITE PAINT	*	SPRAY OR BRUSH	TRE/168	TOTAL DFT 50 Min	TR10265P	POLYURETHANE PAINTING
	ii. TURRETS iii.INSPECTIONS COVERS, CONSERVATOR ,HEADERS, A-FRAMES, P/W ETC.	OUT SIDE	i.CHEMICAL& THERMAL RESISTANT EPOXY ZINC PHOSPHATE PRIMER	*	SPRAY OR BRUSH	TRE/166	50 Min.		
			ii. POLYURETHANE FINISHING PAINT.	*		TRE/165	50 Min. TOTAL DFT. 100 Min.		
	END FRAME, CLAMP PLATE, CROSS BEAM,T.G & T.C. BRACKETS, OTHER STEEL PARTS GOING INSIDE TRANS.TANK		CHEMICAL & THERMAL RESISTANT EPOXY WHITE PAINT	*	SPRAY OR BRUSH	TRE/168	TOTAL DFT. 50 Min.		
	RADIATOR	IN SIDE	FLUSHED WITH VARNISH			TRE/382/03			
		OUT SIDE	i.CHEMICAL& THERMAL RESISTANT EPOXY ZINC PHOSPHATE PRIMER	*	SPRAY OR BRUSH	TRE/166 OR AA56105	50 Min.		
			ii. POLYURETHANE FINISHING PAINT.	*		TRE/165 OR AA56142	50 Min. TOTAL DFT. 100 Min.		
21	i-TRANSFORMER TANK&COVER ,TOP TANK,BOT.TANK ii. TURRETS iii.INSPECTIONS COVERS, CONSERVATOR HEADERS ,A FRAMES , P/ W ETC	IN SIDE	OIL RESISTANT FULL GLOSSY WHITE PAINT	2	SPRAY OR BRUSH	BP56183	40 Min.	TR10211P	
		OUT SIDE	i.CHEMICAL RESISTANT HIGH BUILD EPOXIED PRIMING PAINT.	1	SPRAY OR BRUSH	AA56109	50 Min.	TR10229P	
			OR						
			CHEMICAL & THERMAL RESISTANT EPOXY PRIMER	2		AA56105	50 Min.		
			ii. POLYURETHANE FINISHING PAINT SHADE 631 OF IS:5	1 OR 2		AA56142	50 Min. TOTAL DFT. 100 Min.		

REF. TR10005P

COMP.DRG.

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Form no.2038

उत्पाद मानक PRODUCT STANDARD
परिणामित्र TRANSFORMER
शाप / अभि. निर्देश SHOP / ENGG. INSTRUCTIONS

TR 10005 P

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1	2	3	4	5	6	7	8	9	10
SR NO	PARTS	SUR-FACE	PAINT	NO.OF COATS	HOW APPLIED	PAINT SPEC.	DRY PAINT FILM TK. MICRON	PROCESS SPEC.	REMARKS
22	i.TRANSFORMER TANK& COVER ,TOP & BOT. TANK ii. TURRETS iii.INSPECTIONS COVERS, CONSERVATOR ,HEADERS, A-FRAMES, P/W ETC.	IN SIDE	CHEMICAL & THERMAL RESISTANT EPOXY WHITE PAINT	*	SPRAY OR BRUSH	TRE/168	TOTAL DFT 50 Min	TR10257P	POLYURETHANE PAINTING
		OUT SIDE	i.CHEMICAL& THERMAL RESISTANT EPOXY ZINC PHOSPHATE PRIMER	*	SPRAY OR BRUSH	TRE/166	50 Min.		
			ii. EPOXY HB MIO	*		TRE/167	75 Min.		
			iii. POLYURETHANE FINISHING PAINT.	*		TRE/165	50 Min. TOTAL DFT. 155 Min.		
	END FRAME, CLAMP PLATE, CROSS BEAM,T.G & T.C. BRACKETS, OTHER STEEL PARTS GOING INSIDE TRANS.TANK		CHEMICAL & THERMAL RESISTANT EPOXY WHITE PAINT		SPRAY OR BRUSH	TRE/168	TOTAL DFT. 50 Min.		
	RADIATOR	IN SIDE	FLUSHED WITH VARNISH			TRE/382/03			
		OUT SIDE	i.CHEMICAL& THERMAL RESISTANT EPOXY ZINC PHOSPHATE PRIMER	*	SPRAY OR BRUSH	TRE/166	50 Min.		
			ii. POLYURETHANE FINISHING PAINT.	*		TRE/165	50 Min. TOTAL DFT. 100 Min.		

NOTE TO DO:

1. EPOXY PAINTING TO BE CALLED WHEN SPECIFICALLY ASKED FOR BY THE CUSTOMERS.
2. EPOXY PAINTING HOWEVER TO BE CALLED WHEN EQUIPMENTS ARE TO BE INSTALLED IN CHEMICAL ATMOSPHERE OR NEAR SEA SHORES.
3. SHADE OF FINISHING PAINT IS TO BE COVERED ON MID/ DRAWINGS ALONG WITH RESPECTIVE S.NO. OF THIS STD.

(*) NUMBER OF COATS SHALL BE GIVEN TO ACHIEVE DFT AS PER COLUMN 08 .

NOTE TO SHOP:

1. PAINTING TO BE TOUCHED UP WHERE EVER REQUIRED BY TRANSFORMER SHOP BEFOR SHIPMENT.

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सं.

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तैयार किया : PREPD. : SD/-SJ

दिनांक ः DATE : 23-03-1986

APPROVED VENDORS FOR TRE SPECIFICATION PAINTS :

PAINT MAKE	INTERNAL SURFACE	EXTERNAL SURFACE		
	TRE/168	TRE/166	TRE/167	TRE/165
ASIAN	APCODUR CF699 WHITE	APCODUR RAPID RECOAT ZP PRIMER GREY	APCODUR RAPID RECOAT HB MIO	APCOTHANE CF678
AKZO NOBEL	INTERLINE 1012 WHITE	INTERGUARD 251	INTER GUARD 966	INTERTHANE 990
JOTUN	PENGAURD HB WHITE	PENGUARG HSP ZP	PENGUARG MID COAT MIO	HARD TOP XP
CHING	CHING EP EMC 182 WHITE	CHING EP PRIMER EMD 183	CHING EP MIO EMD 30	CHING EP TOP COAT ADD47

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