



भारत हेवी इलेक्ट्रिकल्स लिमिटेड, भोपाल
BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
BUSHING ENGINEERING DEPARTMENT
Phone: +91-755-2502772, 2022, 3470 E-mail: sek@bhel.in, singhsukhvir@bhel.in

TENDER NOTICE NO. BCE/RTV/2020-21/01

DATED: 10/02/2021

Sub.: Application & Testing of RTV silicone rubber high voltage insulator coating on Air End Porcelain insulator of 800kV, 420kV, 36kV bushings and 36kV post insulator at Bhuj, Gujarat Powergrid site.

Dear Sir(s),

Sealed tenders are invited for carrying out the subject work. The tender submission and opening details are as follows:

- **DATE & TIME OF RECEIPT OF THE TENDER:** 05/03/2021 Till 11.00 Hrs.
- **DATE & TIME OF TENDER OPENING:** 05/03/2021 after 14.00 Hrs.
- **PLACE OF TENDER SUBMISSION:** "GREEN COLOURED WORKS CONTRACT TENDER BOX" placed in Tender Room, Administrative Building, Ground Floor, BHEL, Bhopal – 462 022.

The details of the work shall be as per the **Scope of Work (Clause No. 5.0)**. Prices are to be submitted as **Price-bid format (Annexure-II of this NIT)**. The other conditions and details of tender are as follows:

1.0) PROJECT:

- 765KV TRANSFORMER PACKAGE TR01 FOR 7X500 MVA, 765/400KV TRANSFORMER AT BHUJ-II GIS S/S.
- REACTOR PACKAGE TR02 FOR 110MVAr 765KV BUS REACTOR AT BHUJ-II PS(GIS).

2.0) DETAILS OF EQUIPMENTS TO BE COATED:

Air End Porcelain Insulator for following bushings:

- 800kV, 2500A OIP bushing - 11 nos.
- 420kV, 2500A OIP bushing - 07 nos.
- 36kV porcelain bushing - 12 nos.
- Post insulator - 12 nos.

Quantity Variation:

- +30% for all the above items as per requirement.
- No negative qty variation for items b,c & d. Item a. may be reduced to a minimum of 4 nos. as per actual site requirement.
- Work on qty variation items shall be executed on the works contract rate with payment on actual basis.

3.0) DIMENSIONS OF EQUIPMENTS TO BE COATED:

Sl. No.	Description	As per drg. No.
1.	800KV, 2500A OIP bushing	TEMP/RTV/01 (Anx-A of Technical Specification)
2.	420KV, 2500A OIP bushing	TEMP/RTV/02 (Anx-B of Technical Specification)
3.	36KV Porcelain bushing	TEMP/RTV/03 (Anx-C of Technical Specification)
4.	36KV Post insulator	TEMP/RTV/04 (Anx-D of Technical Specification)

For the above kindly refer technical specification no. BCE/PS/RTV-02 at Annexure-I of this tender.

4.0) DOCUMENTS TO BE SUBMITTED ALONGWITH TENDER:

- 4.1 Valid Type Test Reports as per Technical Specification no. BCE/PS/RTV-02 at Annexure-I.
- 4.2 Field Quality Plan (FQP) for executing RTV coating work at site. It may be noted that work has to be conducted at Powergrid Site, therefore FQP in line with earlier executed job with Powergrid will be preferable.
- 4.3 Documents for Pre-Qualification requirement given under Cl. No. 10.0 of this tender.
- 4.4 A "No Deviation Certificate" in the prescribed format as per Annexure-IV will have to be compulsorily attached with the offer.
- 4.5 Permanent Income tax account number (PAN) and Goods & Services Tax Identification Number (GSTIN).
Copy of documents to be submitted.

5.0) SCOPE OF WORK:

Application and Testing of RTV silicone rubber high voltage insulator coating including arrangement of all RTV coating material/misc. items/ consumables/ cleaning/ post coating waste removal from equipment materials, tools & tackles, testing appliance/equipments, man lift etc required for completion of the job in supplier's scope. All these works to be carried out at Bhuj, Gujrat Powergrid site.

- 5.1 Detailed scope of work/material details/test details etc. shall be as per technical specification no. BCE/PS/RTV-02 attached at Annexure-I of this NIT.
- 5.2 Type Test report submitted during the tender shall be submitted for Powergrid approval.
- 5.3 Field Quality Plan for executing the RTV coating work shall be approved by Powergrid before starting the work.
- 5.4 Contractor shall be responsible for deputing required number of well-qualified, knowledgeable and experienced Applicator/Supervisor/workmen for executing the entire work as per schedule. Contractor shall indemnify BHEL against all claims and losses under various statutes or any civil or criminal law in connection with the employees deployed by him.
- 5.5 RTV applicator should have valid Applicator License.
- 5.6 Contractor will have to ensure that the Health, Safety and Environment (HSE) requirements are clearly understood and faithfully implemented at all levels at site. They will have to ensure adequate safety precautions at site as per the various statutes and shall be entirely responsible for the complete safety of their workmen/employees at the site. Necessary Personal Protection Equipment's (PPE's) (such as Helmets, Goggles, safety Belts, Gloves, First aid box etc.) shall be provided by the contractor to the worker/staff as per requirement during the work.
- 5.7 Contractor shall comply with all statutory requirement, rules, regulations & notification etc. in relation to employees issued from time to time by the concerned authorities
- 5.8 Cleaning the waste generated in the work area/customers equipment after completion of the RTV coating work, shall be ensured by the contractor before leaving the site. All the material/instruments/tools and tackles etc. required for cleaning the waste shall be arranged by the contractor.
- 5.9 After completion of the RTV coating, contractor shall perform Acceptance and Routine tests specified under clause no. 7.2 of the technical specification. All the tests shall be witnessed by BHEL/Powergrid.



After completion of coating and testing of RTV coating at site, contractor shall obtain work completion certificate from BHEL/ POWEGRID indicating Powergrid undertaking for acceptance of RTV coating.

- 5.10 All the workmen/equipment deployed at site shall be covered under workmen compensation insurance. The insurance policy will have to be taken after award of work its copy shall be submitted on award of contract. An undertaking in this regards will have to be given along with the offer. Contractor shall be completely responsible for compensation/insurance of his workmen in the event of any unintended and unforeseen accident at site during work execution.
- 5.11 Contractor to obtain insurance cover for his employees / equipment, tools & tackles etc and take third party risk insurance coverage at his own cost. BHEL shall not be responsible for any loss, damage, pilferage of his property under employees

6.0 TERMS OF PAYMENT:

- 6.1 The payment for RTV coating shall be done by BHEL against work completion certificate mentioned at Sr. No. 5.8 above.
- 6.2 Payment shall be released normally, within 60days (45days for MSME) after submission of the bills, with meeting all formalities in advance. All payment shall be released through electronic pay mode only.
- 6.3 All the payment shall be made as per BHEL norms and is subject to deduction of Security Deposit and Income Tax at source as per the applicable rules. Security Deposit recovered shall only be refunded after completion of warranty period (as mentioned in clause 9.0 below).
- 6.4 HSN code /SAC, rate of tax under GST and Applicable GST (IGST, CGST/SGST/UT/GST) and GSTIN shall be clearly mentioned by the bidder on invoice.
- 6.5 Bidder has to give his undertaking that GST portion of the invoice shall be released only upon:
- a) All invoices raised by contractors /vendors must be GST complaint Tax invoices as per GST invoices rules.
 - b) Contractor declaring such invoices in his GSTR-1 or any modified return as notified by government.
 - c) Receipt of good /services and tax invoices by BHEL and
 - d) Confirmation of payment of GST thereon by contractor on GSTN portal.
 - e) Alternatively, Contractor has to submit BG of appropriate value which shall be valid at least one month after the confirmation of date of payment of GST by contractor on GSTN portal and receipt of Tax invoice and receipt of services, whichever is later. Contractor has to give an undertaking in this regard.
 - f) Contractor has to give an undertaking to BHEL that they have declared invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
- Payment to Contractor for GST portion will be released only after completion of above activity and on availment of ITC by BHEL.

- 6.6 In case GST credit is delayed/denied to BHEL due to **non/delayed receipt of services /goods and /or tax invoices** or expiry of the timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from contractor along with interest levied /leviable on BHEL.

6.7 Reverse Charge under GST

- 6.7.1 In respect of services, reverse charge liability shall arise at the earliest of date of payment to service provider or 60 days from the date of issue of invoice by service provider. Contractor has to submit bill for payment within 30 days from the date of invoice. Any interest or penalty implications attributable to the contractor shall be recovered from them.
- 6.7.2 Any GST liability arising on BHEL under reverse charge before actual receipt of goods and /or invoice thereof would be subject to recovery of interest leviable for the period between the date of such liability



and actual date of eligibility of ITC based on receipt of goods, receipt of invoices and other condition specified in GST Law.

6.8 Penalty

- 6.8.1 Penalty if chargeable from suppliers/ contractors as per NIT, applicable GST will be charged in addition to the same.

6.9 Tax Deduction at sources

- 6.9.1 TDS as per extent provisions of the IT and GST Law shall be deducted from supplier/contractor bill.

7 SCHEDULE OF WORK (COMPLETION PERIOD):

- 7.1 Complete coating work may be executed in multiple visits within a span of one year from Work Order issue date. Prices shall remain firm during this contract execution period.
- 7.2 The contractor will be given an advance notice of 15 days before the work starting date prior to each visit and within this period, he will be required to mobilise his manpower, equipment, RTV coating material, man lifter, T&P along with all accessories etc. required to complete the work at site. The bidder will have to ensure before submission of his bids, that adequate manpower and resources are available at his disposable to be deployed at site in the above given time frame.
- 7.3 The Contractor shall complete the RTV coating and testing as per Cl.No. 5.0 of technical specification within 7 days from work starting date. After completion of RTV coating and testing at site, contractor shall obtain work completion certificate from BHEL/ POWEGRID indicating Powergrid undertaking for acceptance of RTV coating.

- 8 **PENALTY:** Penalty @ 0.5% per week subject to maximum of 10% of the contract price shall be levied for the delay in completion of RTV coating work described above within contract period as stipulated under clause 7.0. **GST on penalty shall be charged in extra.**

- 9 **Warranty Period of RTV coating:** Warranty period for RTV coating shall be 5 years from the date of work completion certificate mentioned under Cl.No.5.9 of this NIT. During this period, the contractor shall at his own cost and initiative, correct, repair and/or rectify any and all defects of the work that may arise due to poor performance/ non-conformance of the RTV coating. Mobilization of manpower, equipment, RTV coating material, man lifter, T&P along with all accessories etc. required to complete the work., for attending coating deficiencies, will be at contractor's responsibility & cost. No charges whatsoever shall be paid by BHEL.

10 MANDATORY REQUIREMENT FOR CONSIDERING THE OFFER:

The tender shall be governed by following mandatory requirements for considering the offer:

- 10.1 **QUALIFYING CRITERIA:** Only those parties who fulfill the following eligibility criteria shall be considered for participating in the tender:
- 10.1.1 Average Annual financial turnover during the last 3 years, ending 31-03-2020, should be at least Rs. 6.0 Lakhs. The bidders will have to furnish documents of audited annual accounts (balance sheets, profit loss accounts) in support of their firm meeting the above criteria.
- 10.1.2 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:
- a. One similar completed work costing not less than the amount equal to Rs 16 Lakhs.
OR
- b. Two similar completed each works costing not less than the amount Rs 10 Lakhs.



OR

- c. Three similar completed each works costing not less than the amount equal Rs 8 Lakhs.

Similar works means Application and Testing of RTV silicone rubber high voltage insulator coating including arrangement of all RTV coating material/misc. items/ consumables/ cleaning/ post coating waste removal from equipment materials, tools & tackles, testing appliance/equipments, man lift etc required for completion of the job in supplier's scope. The parties will have to furnish documents (LOA & Work Completion Certificate/ MOM) in support of their firm meeting anyone of the above criteria.

10.2 Tender cost of Rs. 500/- in favor of BHEL Bhopal as per Clause 2.9 of Annexure-III. GST shall be extra.

10.3 Earnest Money Deposit as per Clause 3.0 of Annexure-III.

The price schedule format, rates of optional activities, Terms and Conditions stipulating tendering procedure, EMD, Security Deposit, General Conditions of Contract, Special Conditions of Contract, Instructions to Contractor Code for Safety Management at Sites, Statutory Liabilities of the Contractor, No deviation format, technical specification are enclosed in Annexure-I to IV. The tenderer is advised to study these annexures and put up signature with seal as acceptance of various clauses.

For and on behalf of BHEL Bhopal,



Singiren.E. Kandulna
(Manager/CIE)
BHEL BHOPAL

Enclosures: Annexure-I to Annexure-IV, as above

PRICE SCHEDULE

TENDER NOTICE NO. BCE/RTV/2020-21/01

DATED: 10/02/2021

Scope: Application & Testing of RTV silicone rubber high voltage insulator coating on Air End Porcelain insulator of 800kV, 420kV, 36kV bushings and 36kV post insulator at Bhuj, Gujrat Powergrid site. (Details as per Sr. No. 05 of this NIT)

1. Price to be quoted by bidder's (in Rs)

Sl. No.	DETAILS OF WORK	Qty. (In Nos.)	UNIT RATE FOR RTV COATING (including material, application and testing at site) (In Rs.)	TOTAL PRICE FOR RTV COATING (including material, application and testing at site) (In Rs.)	TOTAL PRICE (In Rs.)
1.0	RTV COATING CHARGES				
1.1	Price for 800KV, 2500A OIP bushing coating as per drg no.- TEMP/RTV/01 at M/s Powergrid Bhuj, Gujrat site (as per entire scope of work clause 5.0 of tender)	11			
1.2	Price for 420KV, 2500A OIP bushing coating as per drg no.- TEMP/RTV/02 at M/s Powergrid Bhuj, Gujrat site (as per entire scope of work clause 5.0 of tender)	7			
1.3	Price for 36KV Porcelain bushing coating as per drg no.- TEMP/RTV/03 at M/s Powergrid Bhuj, Gujrat site (as per entire scope of work clause 5.0 of tender)	12			
1.4	Price for Post insulator coating as per drg no.- TEMP/RTV/04 at M/s Powergrid Bhuj, Gujrat site (as per entire scope of work clause 5.0 of tender)	12			
	Total price (1.0)				
2.0	Mobilization charges (with Manpower/ Equipment/accessories Material etc for completing the work.	Qty. (In Nos.)	Charges per visit (In Rs.)	Total visit charges (In Rs.)	TOTAL PRICE (In Rs.)
2.1	Mobilization charges per visit	15			
	Total price (2.0)				
	GRAND TOTAL (1.0 + 2.0)				
	GRAND TOTAL PRICE IN WORDS :				

Notes:

- I) Offers will be evaluated on the basis of total price quoted above.
- II) Given drawings are tentative and are subject to slight variation.
- III) **Applicable GST shall be paid extra.** Any loss of tax credit due to the reason attributable to contractor shall be recovered from them along with interest.
- IV) The quoted rate shall remain firm throughout the contract period and no variation/escalation what so ever during the contract period shall be allowed.
- V) The unpriced Price Bid mentioning "Quoted" against above rates (duly signed and sealed) shall be submitted in the offer along with the signed copy of the NIT with all the Annexures.
- VI) 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 of person signing the bid else the bid shall be liable for rejection. The firm should take care to fill up the rate, it should be legible and should be in the price bid provided with tender documents or else the bid shall be liable for rejection. No claim of confusion, unawareness etc shall be entertained after opening of bids.
- VII) In case of 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 representatives(s), Ranking will be done accordingly. BHEL's decision in such situation shall be final and binding.
- VIII) Discrepancy in words and figures:
 - (a) If, in 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 (a) and (b) above.
 - (d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto 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.

(Signature & seal of Bidder)



TERMS AND CONDITIONS

TENDER NOTICE NO. BCE/RTV/2020-21/01

DATED: 10/02/2021

1.0 DEFINITIONS:

The following terms and expressions shall have the meaning hereby assigned to them, except where the context otherwise requires:

- 1.1 'BHEL' shall mean Bharat Heavy Electricals Limited, a Company registered under the Indian Companies Act, 1956 with its Registered Office at BHEL House, Siri Fort, New Delhi, Pin-110049 through its office at Piplani, Bhopal – 462022 or its authorized Officers or its Engineers or other employees authorized to deal with any matters with which these persons are concerned on its behalf.
- 1.2 'CONTRACTOR' or 'FIRM' shall mean the individual, firm or Company providing the services and shall include their executors, administrators, successors and permitted assigns.
- 1.3 'CONTRACT' or 'CONTRACT DOCUMENT' shall mean and include guidelines and declarations of the registration, the General Terms & Conditions and Statutory Compliances, schedules of quantities, accepted appendices of rates, if any, technical specifications, special specifications, if any, Letter of Intent, agreement & the work order, issued by BHEL.

Any conditions or terms stipulated by the bidder in the tender documents or subsequent letters shall not form part of the Contract unless specifically accepted in writing by BHEL and incorporated in the work order.
- 1.4 'TENDER DOCUMENTS' shall mean Instruction to Tenderers, General Terms & Conditions, Special Conditions, Tender Specifications including drawings and any other documents issued to the bidder against invitation of bid.
- 1.5 'LETTER OF INTENT' shall mean the intimation by a letter / email / fax to the bidder that the tender has been accepted in accordance with provision contained in that letter. The responsibility of the Contractor commences from the date of issue of this letter and all the terms and conditions of Contract are applicable from this date.
- 1.6 'APPROVED, DIRECTED or INSTRUCTED' shall mean approved, directed or instructed by BHEL concerned authorities.
- 1.7 'WORK' or 'CONTRACT WORK' shall mean and include the work to be done in relevant work category by the firm or as specified in the Tender documents.

2.0 TENDERING PROCEDURE:

The tender shall be accepted and processed as follows:

The Tender shall be submitted in **TWO PARTS**, as described below:

2.1 PART-I: (TECHNO-COMMERCIAL BID) : This part shall consist of the following

- i) EMD of amount, equivalent to value as per Clause No. 3.0 below, drawn in favor of "**Bharat Heavy Electricals Limited**" payable at **Bhopal** shall be enclosed. In the absence of submission of EMD, the offer will be summarily rejected.
- ii) Tender Fees of **Rs. 500/-** in favor of "**Bharat Heavy Electricals Limited**" shall be accepted through electronic-Mode only in favor of BHEL as detailed in clause 2.9 below. In the absence of submission of same, the offer will be rejected. GST shall be extra.
- iii) Techno-commercial offer comprising of:



- a) Confirmation of Scope of Work, Supporting documents for qualification criteria and other clauses as applicable etc.
- b) Un-priced copy of PRICE FORMAT. *The un-priced copy of the Price bid format shall be the same as the Price bid but without the Prices. All the quoted Prices/Rates etc. shall be replaced with the word 'QUOTED' or 'Q', in the un-priced copy.*

2.2 PART-II: (PRICE BID)

- i) Format containing **PRICES** only (**to be furnished in the enclosed Price Schedule format only**). Prices shall be quoted in Indian Rupees only. Price Bid should not contain any technical details and/or Commercial Terms & Conditions as the same are supposed to be contained in PART-I only so that the same can be evaluated before opening of Price Bid(s).
- ii) Price bids of only techno-commercially short listed vendors will be opened.
- iii) The above two bids (**Part-I and Part-II**) shall be enclosed in a sealed envelope and shall have tenderer's distinctive seal and shall be super-scribed with the **TENDER REF. NO and DUE DATE**.

2.3 The Tender shall be addressed to the following:

To,

**THE TENDER ROOM ('GREEN COLOURED WORKS CONTRACT TENDER BOX')
ADMINISTRATIVE BUILDING, GROUND FLOOR,
BHARAT HEAVY ELECTRICALS LTD,
P.O. PIPLANI, BHOPAL (M.P.) Pin-462022.**

- 2.4 The tender shall be dropped in the above stipulated tender box positively **before 11.00 hrs on the due date (as mentioned above)**. It will be bidder's responsibility to ensure submission of tender in the designated "Green Coloured Works Contract Tender Box" before expiry of due date and time. Any tender which is received after **11.00 Hrs on the due date and subsequently** shall not be considered and will be returned to the sender. No explanation/ reasoning for late submission/receipt of tender will be entertained.
- 2.5 In case, Bidders wants to deputing their representative at BHEL Bhopal for dropping their offer in the tender box then bidder has to obtain security gate pass for reaching at tender box. In such case, bidders shall have to send personal details to BHEL at least one day in advance for obtaining security gate pass.
- 2.6 Bidders may note that the PART-I: (TECHNO-COMMERCIAL BID) of the tender shall be opened in tender room of BHEL Bhopal on tender due date after 14.00 hrs in presence of those tenderer's who choose to be present. PART-II (PRICE BID) of only those bidders whose offers will be techno-commercially short listed after scrutiny will be opened later.
- 2.7 The tenderer is advised to satisfy themselves for work environments & be acquainted with the actual working and other prevalent conditions regarding organizing resources to various sites across the country prior to submission of tender. No claim will be entertained later on grounds of lack of knowledge.
- 2.8 In case of any query/doubt on the tender specifications, bidder can contact the concerned authority for clarification before tender submission. No modification/ deviation w.r.t. any clause, terms & conditions etc shall be acceptable after opening of tender.
- 2.9 **Cost of the Tender documents is Rs. 500/- (Rupees Five Hundred only) & GST rate as applicable shall be extra**, shall be accepted through electronic-Mode only in favor of BHEL (NEFT/RTGS/Net Banking/POS/SB Collect etc.). The procedure of tender fee deposit is given in Clause 5.0 below. Tender received without remittance of tender cost will not be considered & will be rejected.
- 2.10 Discrepancy in words and figures: (a) If, in 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 (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto 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.

3.0 EARNEST MONEY DEPOSIT (EMD):

Earnest Money Deposit will be as per the tender documents. EMD is to be paid by each tenderer for securing fulfillment of any obligation in terms of NIT.

3.1 Rates of EMD shall be as under:

3.1.1 For works / services: **Rs 39,930/-**

3.2 MODES OF DEPOSIT:

EMD shall be accepted through Electronic-Mode only in favor of BHEL (NEFT/RTGS/Net Banking/POS/SB Collect etc.). The procedure of EMD deposit is given in **Clause 5.0 below**.

EMD can also be accepted in the form of FDR issued by Schedule Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL).

In case total EMD amount is more than to Rs. 2 Lakhs, the amount in excess of Rs. 2.0 Lakhs 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.

3.3 FORFEITURE OF EMD:

EMD of the Tenderer shall be forfeited as per NIT conditions, if:

- i) After opening of 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.

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.

3.4 EMD given by all unsuccessful tenderer shall be refunded.

3.5 EMD shall not carry any interest.

3.6 EMD of the successful Bidder shall be converted and adjusted against the security deposit and shall be refunded after the expiry of the warranty period / defects liability period as applicable.

4.0 SECURITY DEPOSIT (SD):

The Security Deposit means the security provided by the Contractor towards fulfillment of any obligations in terms of the provisions of the contract.

4.1 The total amount of Security Deposit will be 5% of the contract value. EMD of the successful Bidder shall be converted and adjusted towards the required Security Deposit.

4.2 MODES OF DEPOSIT:



The balance amount to make up the required Security Deposit (SD) of 5% of the contract value may be accepted in the following forms:

- i) SD shall be accepted through electronic-Mode only in favor of BHEL (NEFT/RTGS/Net Banking/POS/SB Collect etc.). The procedure of SD deposit is given in Clause 5.0 below.
- ii) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee Format should have the approval of BHEL
- iii) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the contractor, A/c BHEL).
- iv) Securities available from Indian Post Offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of the Contractor furnishing the security and duly endorsed / hypothecated / pledged, as applicable in favour of BHEL).

Note: Acceptance of Security Deposit against Sl. no. (iii) and (iv) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, 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.

4.3 COLLECTION OF SECURITY:

- i) At least 50% of the required Security Deposit, including the EMD, should be collected before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor till the total amount of the required Security Deposit is collected.
- ii) If the value of work order at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the contractor or recovered from payment/s due to the contractor.
- iii) The recoveries made from running bills (cash deductions towards SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work.
- iv) EMD of the successful tenderer shall be converted and adjusted against the security Deposit
- v) Security Deposit shall be released to the contractor upon fulfillment of contractual obligations as per the terms of contract.
- vi) The Security deposit shall not carry any interest.

5.0 PROCEDURE OF DEPOSITING EMD/SD/TENDER FEE

EMD/SD/ Tender Fee will be accepted only in electronic Mode, which can be deposited on line through following link as mentioned below: <https://www.bhelbpl.co.in/qcins/iccs.htm>.

The procedure of depositing EMD/SD/Tender Fee is below:

- a. For depositing amount online, depositor has to open SB- collect through Online E-Payment option available on Internet (www.bhelbpl.co.in under caption new link).
- b. After reading the instruction for depositing the amount; EMD & Tender Fee amount shall be deposited. EMD and Tender Fee may please be deposit together under EMD module where the EMD & Tender Fee both are applicable.
- c. After the successful payment DU No. shall be generated from the banking system.
- d. After depositing the amount, Depositor has to fill Deposit slip available on Internet (www.bhelbpl.co.in under caption new link) by selecting required Enquiry number. Tender Fee and EMD may please be enter separately.
- e. As and when credit received in BHEL account, automatic mail sent to the depositor.



Note: - After submitting the Deposit Slip a control number will be generated through system which can be used for getting print out from the system, Bidder's has to submit this printout of deposit slip along with their offer.

6.0 GENERAL CONDITIONS OF CONTRACT

- 6.1 The agencies which are currently under hold/ban/suspension of business dealing with BHEL/POWERGRID and communicated thereof shall not be considered in this tender.
- 6.2 The tenderer has to confirm all clauses of as mentioned above, Deviations, if any, have to be recorded clearly, against the respective serial number. All the documents of the tender shall be signed by tenderer on every page and sent with the offer.
- 6.3 Offers will be evaluated on the basis of total price quoted.
- 6.4 All the quoted prices shall be **exclusive of taxes & duties** as may be applicable.
- 6.5 The offer should be valid for minimum of 90 days from the date of opening the bid.
- 6.6 The bidders shall be required to submit furnish their organizational information in the format attached herewith as Annexure-V.
- 6.7 Over run/idling charges shall not be applicable.
- 6.8 If the tenderer attaches any other conditions in the offer, then due to its implications prices may be loaded to the quoted price during evaluation.
- 6.9 All tender papers dully filled in and signed by the tenderer must be returned with the offer as proof of the acceptance of the conditions of the Contract.
- 6.10 Mode of Communications: Generally, all communications, references etc. shall be delivered through email, fax or given to the authorized supervisor. It will be undertaken that the firm has read and understood the message, within 3 days of the delivery, even if they have not received / not opened/ having any problems on their side. Firm shall communicate their change of authorized supervisor, email address in advance.
- 6.11 All communications shall be made by/addressed to on behalf of BHEL by following officer or his authorized representatives. Any change will be informed time to time.
Sr. Dy. General Manager, CIE & BCE, Bharat Heavy Electricals Ltd, P.O. Piplani, Bhopal (M.P.) Pin-462022, Tel./Fax: 0755-250-2772/2022/2255 Email: kmnaik@bhel.in, sek@bhel.in, singhsukhvir@bhel.in.

7.0 SPECIAL CONDITIONS OF CONTRACT:

The tender shall be governed by general conditions which are as follows:

- 7.1 BHEL does not bind themselves to award the work to lowest tenderer or any other bidder. It will be it sole discretion to process or cancel the tender and no reason/explanation shall be given for their decision.
- 7.2 The prices shall be firm and final and shall be quoted strictly in the price-bid format provided in the Annexure-I. Applicable Service Tax shall be paid extra against proof of their deposition in the accounts of government.
- 7.3 The Contractor shall follow all the statutory compliances and all the prevailing Industrial / Labour laws/ Govt. laws, statutory safety clauses as amended from time to time.
- 7.4 If any urgent work (in respect whereof the decision of the BHEL shall be final and binding) becomes necessary, the Contractor shall execute the same as may be directed.
- 7.5 The firm shall ensure that no damage is caused to any person/any existing work/property of BHEL/other parties working inside the customer premises. If any such damage is caused, it shall be the responsibility of the firm to make good the losses and compensate the affected parties at his own cost.
- 7.6 The Contractor shall not sublet, transfer or assign the whole or any part of the work under the Contract.



- 7.7 The decision of BHEL regarding interpretation of any terms and conditions set forth in the Agreement shall be final and binding on the Contractor. In case the Contractor does not carry out the Contractual/statutory obligations or the services rendered by him are found to be unsatisfactory, it will be brought to HIS notice first to rectify the deficiency/ anomaly within (15) days failing which BHEL reserves the right to impose the penalty maximum 10% of the Contract price in the and/or terminate the Contract without assigning any reason whatsoever. In such an event, no damages will be payable for short closure of the Contract.
- 7.8 Without prejudice to the aforesaid clause, BHEL reserves its right to terminate the Contract without assigning any reason thereof by giving 30 days' notice in writing to the Contractor.
- 7.9 The cancellation of Contract may be either for whole or part of the Contract at BHEL's option. In the event of termination of Contract in whole or part BHEL may procure upon such terms and in such manner as deemed appropriate, supplies or services similar to those so terminated and the Contractor shall be liable to BHEL for any excess costs for such similar supplies or services provided that the Contractor shall continue the performance of this Contract to the extent not terminated under the provisions of this clause.
- 7.10 All disputes arising in connection with the Contract shall be settled by mutual consultation. If no agreement is reached the dispute shall be settled in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and the rules made there under. The dispute shall be referred for arbitration to any arbitrator to be appointed by the Head of the Unit. The award of the arbitrator shall be final and binding on both the Parties. The venue of the Arbitration shall be Bhopal in India. The Award to be given by the Arbitration shall be a speaking award. All questions, disputes, differences arising under, out of or in connection with this Contract shall be to the exclusive jurisdiction of Hon'ble Court of Madhya Pradesh.
- 7.11 The firm will be required to sign a Contract with BHEL on a proper Non-judicial stamp paper, in a prescribed format before start of work. The cost towards agreement shall be borne by the firm.
- 7.12 The bidder will have to ensure before submission of his bids, that adequate manpower and resources are available at his disposal to be deployed at site in the above given time frame. The final work schedule may vary depending on the prevalent site conditions and customer requirements and may be revised for early completion of respective activities/readiness of charging during the course of execution. These revised targets shall be informed to Contractor by BHEL time to time. Accordingly, Contractor has to meet such targets set out by the customer/BHEL by augmenting their resources. The Contractor shall have to work in parallel at more than one Transformer/Reactor as may be required during execution of work to meet the targets for readiness of charging set out by the customer and informed by BHEL to Contractor time to time.
- 7.13 In the event of schedule is delayed for the reason beyond Contractor's control, the Contractor shall keep the provision for continuing the work upto one year beyond above completion period if so considered by BHEL for time extension of Contract Agreement. In such case, the rates as quoted in Price Schedule will be applicable for the extended period.
- 7.14 BHEL may also increase/decrease the quantity of equipment's/items/no. of visits included in the work content. Pro-rata rates shall be paid to the Contractor for the same.
- 7.15 RIGHTS OF BHEL:
- BHEL reserves to itself, the following rights without entitling the Contractor to any compensation: -
Resorting to any, some, all of the actions like Contract termination, recovering the dues/ losses from the Security Deposit and the Contract amount, forfeiting the Security Deposit, cancelling the order and getting the work done through other agencies at the cost of the Contractor, cancellation of registration, banning the business with BHEL etc., in any event of the followings:
- Work is not executed or partly executed within the agreed execution period.
In such event, it shall be obligatory on the part of contractor to make good any loss suffered by BHEL.
 - Contractor's repeated poor performance, withdrawal from or abandonment of the work, except in force majeure conditions.
 - Serious lapse in performance, Persistence disregard of the BHEL instructions.
 - Insolvency of the Contractor.
 - Assignment, transfer, subletting of the Contract work without BHEL's written permission.
 - Non-fulfillment of any Contractual obligations or obligations under the law.



7.16 FORCE MAJEURE:

Notwithstanding anything contained in the contract, neither BHEL nor the Contractor shall be held responsible for total or partial non-execution of any of the contractual obligations, should the obligation become unreasonably onerous or impossible due to occurrence of a 'Force Majeure' which directly affects the obligations to be performed by the BHEL or the contractor; such events include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotions, insurgency, sabotage, acts of public enemy, fires, explosion, epidemics, quarantine restrictions, floods, earthquake, or acts of God, restrictions by Govt. authorities; over which the BHEL or the contractor has no control.

The party claiming to be affected by force majeure shall notify the other party in writing without delay, within two weeks from the occurrence of such situation and on the cessation thereof. Extension of time sought by the contractor along with supporting evidence and so granted by BHEL for the work affected, if any, shall not be construed as waiver in respect of remaining execution. Rescheduling of execution on account of force majeure conditions, if so agreed by BHEL, will not entail the contractor to claim any increase in the price on whatsoever account.

Notwithstanding above provisions, BHEL shall reserve the right to cancel the Contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements. If deemed necessary, BHEL may takeover partly processed work at a mutually agreed price.

7.17 CONCILIATION PROCEEDINGS UNDER THE BHEL CONCILIATION SCHEME, 2018

The Parties agree that if at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation, effect, interpretation or breach of the agreement, contract or the Memorandum of Understanding (delete whichever is inapplicable), which the Parties are unable to settle mutually), arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators.

Notes:

1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators.

2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators.

The proceedings of Conciliation shall broadly be governed by 7.11 of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Annexure to this SCC.

(The Conciliation Proceedings hereunder, supersede the relevant terms & conditions given in "Special Terms & Conditions and Statutory Compliances" or any other Tender document, where ever applicable).



**FORMAT FOR
"NO DEVIATION CERTIFICATE"**

TENDER NOTICE NO. BCE/RTV/2020-21/01

DATED: 10/02/2021

NO DEVIATION CERTIFICATE

This is to certify that our offer is exactly in line with your Tender Enquiry No. _____ . This is to expressly certify that we have read all the clauses of tender and our offer contains **no deviation** either Technical or Commercial in either direct or indirect form.

Signed By:

Name : _____

Designation : _____

Organization : _____

Date & Place : _____

Phone/Fax/Email : _____

Stamp & Seal : _____

(Signature & seal of Bidder)



ANNEXURE - I



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV, 420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR

NAME & ADDRESS OF THE SUPPLIER :		NAME & ADDRESS OF THE INDIAN AGENT :	
TELEPHONE NOS.:		TELEPHONE NOS.:	
FAX NOS.:		FAX NOS.:	
E-MAIL ADDRESS :		E-MAIL ADDRESS :	
			Spec. No : BCE/PS/RTV-02
			Rev00
			Date : 08/10/2020
SCOPE:			
1.1	RTV Silicone coating (alongwith testing at site) is required to be done on porcelain insulators (air end only) of the following Electrical Bushings meant to be installed on different reactor and transformers. The overall climate is moderate hot, humid, tropical, highly polluted and conducive to rust and fungus growth. The climatic conditions are prone to wide range of outdoor service conditions.	Vendor to confirm	
1.1.1	800 KV, 2500A, OIP Bushing - to drg. No. TEMP/RTV/01 No. of porcelain insulators to be coated : 04 nos. at Bhuj-Gujrat. (Refer Annexure - I to this Technical Specification.)	Vendor to confirm	
1.1.2	420 KV, 2500A, OIP Bushing - to Drg. No. TEMP/RTV/02 No. of porcelain insulators to be coated : 7 nos. at Bhuj-Gujrat. (Refer Annexure - II to this Technical Specification.)	Vendor to confirm	
1.1.3	36 KV Porcelain Bushing - to Drg. No. TEMP/RTV/03 No. of porcelain insulators to be coated : 11 nos. at Bhuj-Gujrat. (Refer Annexure - III to this Technical Specification.)	Vendor to confirm	
1.1.4	Post insulator Bushing - to Drg. No. TEMP/RTV/04 No. of porcelain insulators to be coated : 4 nos. at Bhuj-Gujrat. (Refer Annexure - IV to this Technical Specification.)	Vendor to confirm	
1.2	BHEL reserves the right to for quatity variation of $\pm 20\%$ on the quantity indicated above. The unit prices quoted shall be firm and no price variation will be accepted for quantity variation.	Vendor to confirm	

[Signature]



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

1.3	Supply, transportation and application of RTV silicone rubber high voltage insulator coating and all items/consumables/cleaning/removal of waste from equipment materials, tools & tackles, testing equipments including man lift etc required for completion of the job shall be in suppliers scope.	Vendor to confirm	
1.4	The RTV Coating shall be done at Customer's Project Site.	Vendor to confirm	
1.5	The Work shall be completed after work order placement within 30 days from intimation to start the work. Supplier to plan material and manpower accordingly.	Vendor to confirm	
1.6	List of Acceptance and routine test shall be conducted per clause no. 7.2 of this technical specification. Price for the same shall be included in your offer. The same shall be taken into evaluation.	Vendor to confirm	
1.7	The Warranty Period for RTV coating shall be 05 years from the date of completion of coating (duly accepted by BHEL/POWERGRID). In case of any damage to the coating within the Warranty period, the same shall be attended at site within 15 days of intimation, free of cost without any financial implication to BHEL..	Vendor to confirm	
1.8	Vendor shall submit applicator Training certification and Experience details alongwith the offer.	Vendor to confirm	
1.9	Vendor shall submit the detailed field quality plan for approval. It is not the intention of this specification to specify completely herein all details and design requirements. However, the materials offered & work execution shall confirm in all respects to high standards of engineering and workmanship and be capable of performing in continuous commercial operation up to guarantee in a manner acceptable to purchaser.		
1.10	Vendor shall submit a copy of latest Type Test & Routine tests alongwith the offer.	Vendor to confirm	
2.0	<u>Technical Parameters :</u>		
2.1	<u>Liquid form:</u>		
	<u>Item</u>	<u>Requirement</u>	
2.1.1	Material type	One part RTV.	Vendor to confirm
2.1.2	Appearance	Paint	Vendor to confirm

Singh



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

2.1.3	Substrate application temperature range deg C	-4°C to 121°C	Vendor to confirm	
2.1.4	Percentage of solids by weight	> 70%	Vendor to confirm	
2.1.5	Filler/Additive type:	ATH, Quartz or both.	Vendor to confirm	
2.1.6	Colour:	Grey	Vendor to confirm	
2.1.7	Track free at 25 deg C & 50% RH:	30 MINUTES	Vendor to confirm	
2.2	As Cured (Solid form):			
	Item	Requirement		
2.2.1	Application Area	Glass, Porcelain, station insulator, as well as bushing, instrument transformer and related devices	Vendor to confirm	
2.2.2	Method of application:	Airless Spray	Vendor to confirm	
2.2.3	Use of Primer for adhesion	FORBIDDEN (No primer material shall be allowed).	Vendor to confirm	
2.2.4	Full cure time	> 24 hours	Vendor to confirm	
2.2.5	Die electric Strength	> 20 KV/mm	Vendor to confirm	
2.2.6	Tracking and Erosion (IEC 60587, Method 1: Application of constant tracking voltage).	Class 1A 4.5 or better.	Vendor to confirm	
2.2.7	Dry Arc Resistance	Tract - Min 140 seconds Burnout- Min 420seconds	Vendor to confirm	
2.2.8	Volume resistivity	Min 1.0×10^{12} Ohm-cm	Vendor to confirm	
2.2.9	Coating thickness	500 microns + 10% tolerance, dry film thickness	Vendor to confirm	
2.2.10	Tracking and Erosion test	1000 hours	Vendor to confirm	

(Signature)



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

2.2.11	Min. Salinity Level withstood during "Artificial pollution test using salt fog method	>160 kg/m ³		
2.2.12	Hydrophobic recovery test	HC1 or HC2	Vendor to confirm	
2.2.13	Resistant to	Marine salt fog, Water, Industrial (cement dust, fly ash, acid emission etc.), Rough Weather Conditions	Vendor to confirm	
2.2.14	Other Properties	Non Hazardous to environment, surface after full cure shall be smooth	Vendor to confirm	
3.1	<u>Material:</u>			
3.1.1	The RTV Silicone high voltage insulation coating shall be ultraviolet (UV) radiation exposure resistant. The finished product shall withstand the adverse atmospheric conditions due to weather, proximity to the coast, fumes, ozone, acids (particularly nitric acid in the coastal areas and sulphuric acid in the oil field areas), bases/alkalis, and hydrocarbon components, dust or rapid changes to air temperature (temperature extremes). There shall not be significant material degradation such as development of surface cracks and unacceptable increase in surface hardness etc.		Vendor to confirm	
3.1.2	The RTV Silicone high voltage insulation coating shall be resistant to atmospheric and chemical degradation. Salt air, airborne pollutants, industrial pollutants such as cement dust, sulphur, rain and humidity shall not result in flashover on the coating.		Vendor to confirm	
3.1.3	The RTV Silicone high voltage insulation coating shall be resistant to arcing and corona. The Coating shall exhibit high tracking resistance to reduce damage during salt-storms (storms arising from the sea) or other severe contamination events. The track resistance of the RTV Silicone Rubber Insulator Coating material shall meet the requirements of IEC 60587, Method 1, Class 1A 4.5kV.		Vendor to confirm	

Signature



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

3.1.4	The RTV Silicone high voltage insulation coating shall be a single component, ready-to-use after simple mixing. It shall not require excessive mixing/shaking and thinning/dilution before use. The Coating shall be moisture curable at room temperature.	Vendor to confirm	
3.1.5	The RTV Silicone high voltage insulation coating shall exhibit long-term water repellency and hydrophobicity.	Vendor to confirm	
3.1.6	The RTV Silicone high voltage insulation coating shall not require use of any primer on the ceramic insulators for adhesion purposes.	Vendor to confirm	
3.1.7	The RTV Silicone high voltage insulation coating shall be easy to be reapplied. The Coating shall have excellent arc resistance, excellent unprimed adhesion, easy to apply and spray-able as well as paint-able.	Vendor to confirm	
3.1.8	The RTV Silicone high voltage insulation coating shall have a minimum 12 months shelf life, which shall effect from the date of manufacturing. The manufacturer shall submit the warranty to this effect. The expiry date shall be marked on the containers. The remaining shelf life of the material shall be at least six (6) months when delivered to site. The coating shall be supplied in cans weighing not more than 25kg.	Vendor to confirm	
4.0	Codes and standards for application/ testing shall be: IEC 60243-1, IEC TR 62039, IEC 60250, IEC 60587, IEC TS 62073, IEC 61621, IEC 62217, IEC 62631-3-2, IEEE Std 957, IEEE Std 1523, ASTM D149-09, ASTM D150-11, ASTM D257-14, ASTM D495-14, CEA LWIWG-02 (1996).	Vendor to confirm	
5.1	<u>Surface and other preparation:</u>		
5.1.1	All equipment surfaces to be coated should be made free from dust, grease, oil etc. & other foreign matter. Also the surface meant for application must be dry.	Vendor to confirm	
5.1.2	The RTV coating supplied for application should be properly mixed before application as per the recommendations of manufacturer. The coating should cover complete surface and should be applied in manner that prevents runs, sags, drips, spills etc. The application shall be done by certified applicant of Manufacturer.	Vendor to confirm	
5.1.3	All necessary personal protective equipment (PPE) shall be used by the applicator and staff engaged for cleaning	Vendor to confirm	



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

5.1.4	Necessary access equipment such as Man-Lift, Ladder or Hydra shall be used for access to insulators at height	Vendor to confirm	
5.1.5	Under no circumstance, the staff / applicator or other person shall climb on the coated insulators.	Vendor to confirm	
6.1	<u>Composition and properties</u>		
6.1.1	The RTV Silicone high voltage insulation coating shall be capable of withstanding high-pressure water power washing. To prove this property, a power wash test shall be performed per requirements stated hereafter in this standard.	Vendor to confirm	
6.1.2	The RTV Silicone high voltage insulation coating shall protect the ceramic insulators (porcelain and glass) against flashovers caused by pollution.	Vendor to confirm	
6.1.3	The manufacturer shall advise/recommend suitable method of application and submit written application instructions and shall suggest suitable equipment set-up (size of pump and compressors, etc.) and the compatibility of his product to be reapplied on the RTV coating from other manufacturers.	Vendor to confirm	
7.1	Type test: prescribed in relevant standards shall be performed on RTV coated sample tiles or RTV coated insulators as applicable to verify the suitability of the design, materials and method of manufacture. Testing shall include, but not limited to following. These tests shall be performed only on the new design of RTV silicone high voltage insulation coating. The test reports shall be submitted from tests done in a NABL/International accredited lab..	Vendor to confirm	
7.1.1	Tracking and Erosion Resistance test (IEC 60587, method 1, class 1A 4.5kV): shall consists of smooth porcelain plates of 6mm(±0.5mm) thickness coated with the thickness of the material as proposed by the manufacturer for the offered coating. Breaking of porcelain substrate shall not be allowed.	Vendor to confirm	
7.1.2	Salt fog test: tracking and erosion test outlined in IEC- 60061 shall be carried out.	Vendor to confirm	
7.1.3	Dry arc resistance test: resistance test shall be carried out as per ASTM D495	Vendor to confirm	



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

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7.1.4	Contact Angle Measurement test: contact angle measurement test shall be performed in accordance with IEC TS 62073.	Receding	Vendor to confirm	
7.1.5	BDV testing of fully cured coating: be carried out as per IEC:60243-1 or ASTM D149.	The test shall	Vendor to confirm	
7.1.6	Volume Resistivity Test: be carried out as per IEC:60093. Sample thickness shall be 2mm which can be obtained by using an open mould casting technique. The minimum volume resistivity as specified shall be achieved.	The test shall	Vendor to confirm	
7.1.7	Artificial Pollution Test in general with IEC 60507 without the pre-condition test.		Vendor to confirm	
7.1.8	Adhesion Test as type test: Adhesion test shall be performed in accordance with Canadian Electric Association (CEA) specification LWIWG-02 (96) or any other equivalent standard to verify the bonding characteristics of the RTV Silicone Rubber Coating when applied to ceramic insulators. Three (3) coated insulators shall be put in water having 0.1% by weight of NaCl and boiled for 100 hours (each sample separately). At the end of boiling, allow each insulator to remain in the water until the water cools to about 50oC. The coating shall not exhibit any water blisters at the interface between the insulator surface and the coating.		Vendor to confirm	
7.2	Acceptance Tests (at Site): appliances and equipments for testing are in the scope of bidder/ contractor	All	Vendor to confirm	
7.2.1	Thickness measurement: Dry film thickness (DFT) of the coating shall be measured at site on all Equipments randomly at least at one point of the Equipment.		Vendor to confirm	
7.2.2	Adhesion Test as acceptance test: Adhesion test shall be performed at site in accordance with CEA specification LWIWG-02 (96) or any other equivalent standard to verify the bonding characteristics of the RTV Silicone Rubber Coating when applied to ceramic insulators. Three (3) coated insulators shall be put in water having 0.1% by weight of NaCl and boiled for 2 hours (each sample separately). At the end of boiling, allow each insulator to remain in the water until the water cools to about 50oC. The coating shall not exhibit any water blisters at the interface between the insulator surface and the coating.		Vendor to confirm	

Singh



BHARAT HEAVY ELECTRICAL LIMITED, BHOPAL

**SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR RTV SILICONE COATING ON PORCELAIN INSULATOR OF 800KV,
420KV, 145KV OIP BUSHINGS AND 36KV INSULATOR & POST INSULATOR**

7.2.3	High Pressure Water Withstand Test: A power water wash test shall be performed at site on 5% sample in accordance with IEEE Std 957 to demonstrate that the RTV coated insulators can be power washed without any damage to RTV coating. The test shall be a water spray of a solid stream through a 6mm diameter nozzle at 3800 kPa for a period of 10 (ten) minutes. The nozzle of the spray equipment shall be at a distance of 3m from the insulator surface. There should not be any damage to the coating.	Vendor to confirm	
7.2.4	Hydrophobicity test : Hydrophobicity test shall be carried out on virgin material at site on 5% sample on 1-2 coated equipment as per STRI guidelines and the results shall be HC2 class or better. Hydrophobicity test shall be carried out after completion of high pressure water withstand test.	Vendor to confirm	
8.1	Markings		
8.1.1	The packing and expiry dates of coating shall be labeled on the coating cans. The expiry date shall be considered from the packaging date and not from the date of shipment of the coating. The cans shall be marked for "flammable" or "non-flammable" depending upon the type of solvent used for the dispersion of the coating.	Vendor to confirm	
9.0	Offers of bidder/ contractors banned by BHEL./ POWERGRID shall not be considered for this tender.		

Signature

ANNEXURE - A
TEMP/RTV/OI

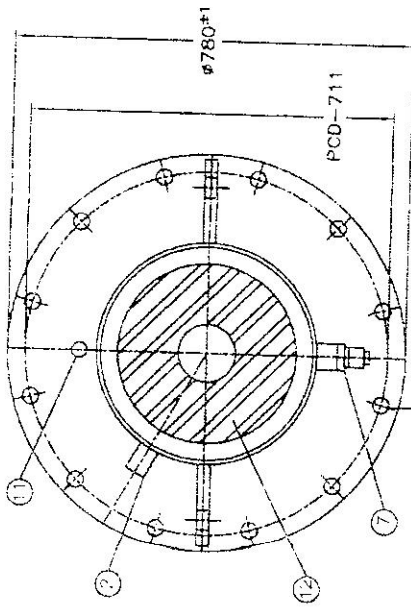
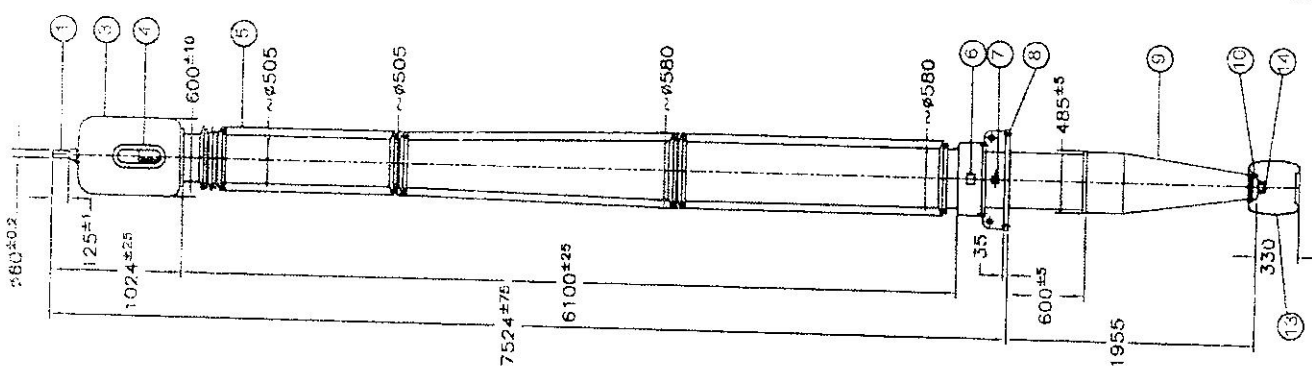
Note: This is tentative drawing.

DRG NO: 3-SBD 623

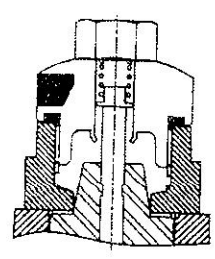
IF IN DOUBT, ASK

CG Power and Industrial Solutions Limited
A subsidiary of CG Power and Industrial Solutions Limited
CG Power and Industrial Solutions Limited
S-1, DIVISION, ARBAID, NASHIK

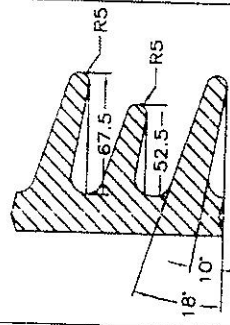
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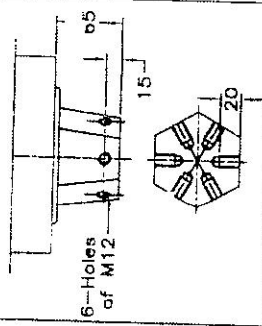
TEST TAP DETAIL



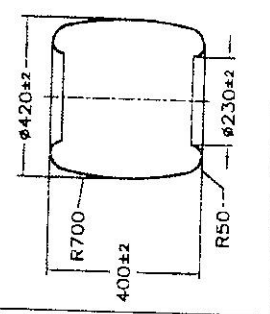
TYPICAL SHIELD PROFILE



BOTTOM TERMINAL DETAIL



BOTTOM SHIELD DETAIL



ITEM	DESCRIPTION	MATERIAL	FINISH	QTY.
1	HV TERMINAL	COPPER	NICKEL PLATED	1 NO.
2	OIL FILLING/SAMPLING VALVE	STEEL	NICKEL CHROME PLATED	1 NO.
3	CONSERVATOR	AL ALLOY	---	1 NO.
4	OIL INDICATOR PRISMATIC	ALUMINIUM	---	1 NO.
5	AIR END PORC. INSULATOR	PORCELAIN	BROWN GLAZED	1 NO.
6	RATING PLATE	ALUMINIUM	---	1 NO.
7	TEST TAP ASSY.	---	---	1 NO.
8	MOUNTING FLANGE	AL ALLOY	---	1 NO.
9	OIL END PORC. INSULATOR	PORCELAIN	BROWN GLAZED	1 NO.
10	BOTTOM END CAP	BRASS	NICKEL PLATED	1 NO.
11	AIR VENT PLUG	BRASS	NICKEL PLATED	1 NO.
12	CONDENSER CORE	OIL IMPREG. PAPER	---	1 NO.
13	BOTTOM SHIELD	ALUMINIUM	---	1 NO.
14	BOTTOM TERMINAL	BRASS	NICKEL PLATED	1 NO.

TECHNICAL DETAILS

TYPE: STEM TYPE CONDENSER BUSHING WITH OIL IMPREGATED PAPER INSULATION.
RATED VOLTAGE(L-L) = 800 kV
RATED VOLTAGE(L-E) = 462 kV
RATED CURRENT = 2500 A
P.F. WITHSTAND VOLTAGE(DRY) = 970 kV
L.I. / S. I. WITHSTAND VOLTAGE = 2100 / 1550 kVp
TOTAL CREEPAGE DISTANCE (Min.) = 20000 mm
CANTILEVER WITHSTAND LOAD = 5000 N
REFERENCE STANDARD = IEC 60137 : 2017
TAN DELTA AT AMBIENT TEMPERATURE : < 0.004
PARTIAL DISCHARGE LEVEL AT 1µm : < 10 pC
TOTAL MASS = 3500 kg± 0%
TOTAL OIL QUANTITY= 600 Ltr. ±10%

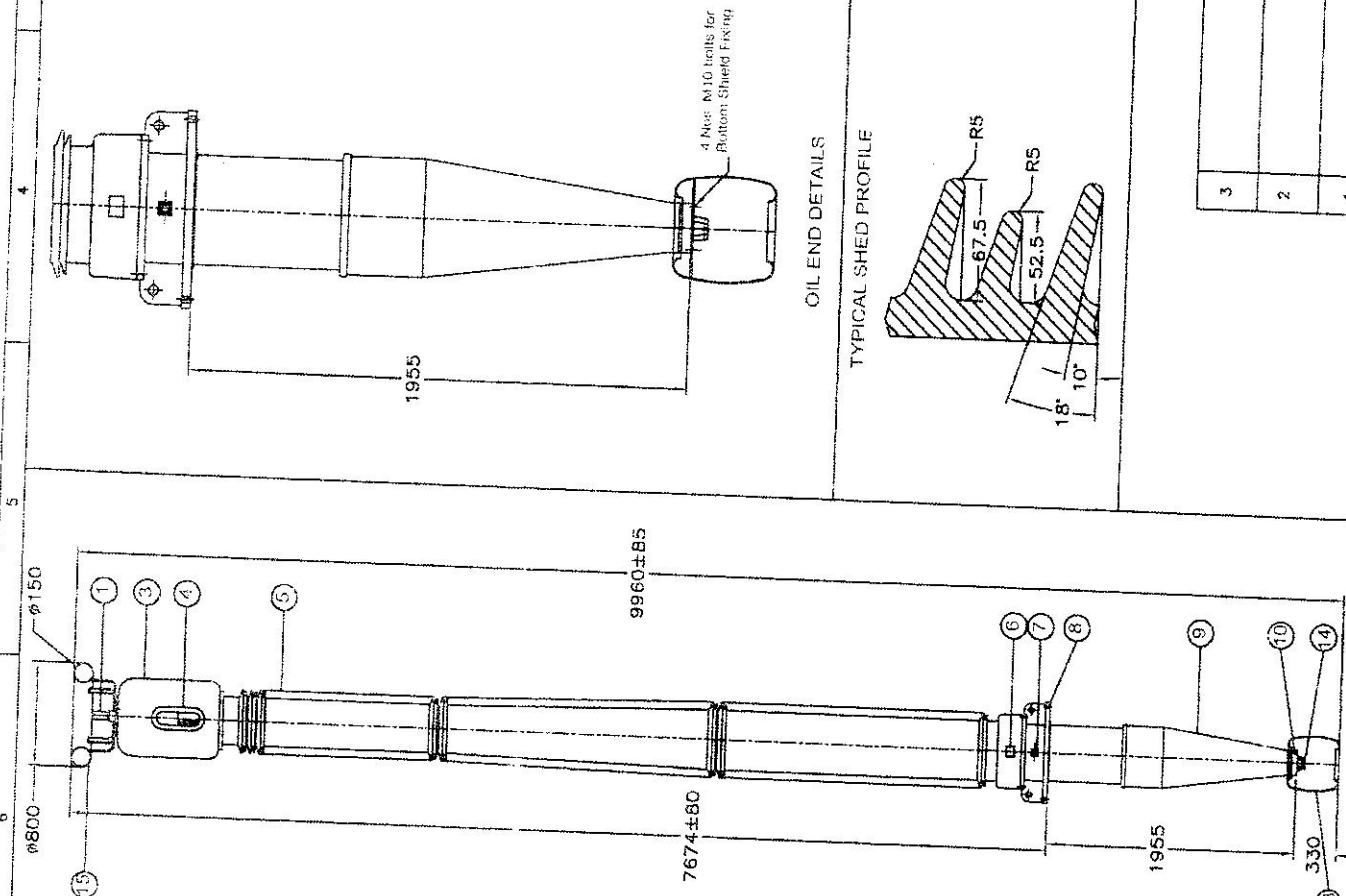
REFER INSTRUCTION MANUAL FOR ERECTION & MAINTENANCE

GEN. TOL.	MATL.	SPEC.	TITLE : 800 kV CONDENSER BUSHING	
THIRD ANGLE PROJECTION	SCALE: NTS	INITIALS	NAME	CG Power and Industrial Solutions Limited S-1, DIVISION, ARBAID, NASHIK
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	SHB	DRG NO: 3-SBD 623
APPD	USS	DATE : 17.09.2019	CGL W.O.:	REV 0
NO	REVISION	SIGN	DATE	
3				
2				
1				

DRG.NO: 3-SBD 623

IF IN DOUBT, ASK

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ITEM	DESCRIPTION	MATERIAL	FINISH	QTY.
1	HV TERMINAL	COPPER	NICKEL PLATED	1 NO.
3	CONSERVATOR	AL-ALLOY	---	1 NO.
4	OIL INDICATOR PRISMATIC	ALUMINIUM	---	1 NO.
5	AIR END PORC. INSULATOR	PORCELAIN	BROWN GLAZED	1 NO.
6	RATING PLATE	ALUMINIUM	---	1 NO.
7	TEST TAP ASSLY.	---	---	1 NO.
8	MOUNTING FLANGE	AL-ALLOY	---	1 NO.
9	OIL END PORC. INSULATOR	PORCELAIN	BROWN GLAZED	1 NO.
10	BOITEM END CAP	BRASS	NICKEL PLATED	1 NO.
13	BOTTOM SHIELD	ALUMINIUM	---	1 NO.
14	BOTTOM TERMINAL	BRASS	NICKEL PLATED	1 NO.
15	AIR END SHIELD	ALUMINIUM	---	1 NO.

PORCELAIN DETAILS (APPROX.)			
PORCELAIN ZONE	I.D. (mm)	SHED DIAMETER	
		BIG (mm)	SMALL (mm)
TOP	300	505	475
MIDDLE (AVG.)	345	550	520
BOTTOM	390	595	565

GEN. TOL.		MATERIAL SPEC.		TITLE :	
THIRD ANGLE PROJECTION		SCALE: NTS		800 kV CONDENSER BUSHING (WITH AIR END SHIELD)	
ALL DIMS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	CHD	APPD	NAME	CG Power and Industrial Solutions Limited
NSB	SHB	USS	DATE : 17.09.2019	DRG.NO: 3-SBD 623	REV 0
					CGI W.O.:

ANNEXURE - B

TEMP/RTV/03

Note: This is tentative des.

CG Power and Industrial Solutions Limited
(Formerly Crompton Greaves Limited)
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IF IN DOUBT, ASK

DRG.NO: 3SBD 536

1

ITEM

DESCRIPTION

MATERIAL

FINISH

QTY.

1

HV TERMINAL

COPPER

NICKEL PLATED

1

2

OIL FILLING/SAMPLING VALVE

STEEL

1

3

CONSERVATOR

ALLOY

1

4

OIL INDICATOR (FLOAT)

BODY-ALUMINIUM

1

5

AIR END PORC. INSULATOR

PORCELAIN

BROWN GLAZED

1

6

RATING PLATE

ALUMINIUM

1

7

TEST TAP ASSLY.

1

8

MOUNTING FLANGE

ALLOY

1

9

OIL END PORC. INSULATOR

PORCELAIN

BROWN GLAZED

1

10

BOTTOM TERMINAL

BRASS

NICKEL PLATED

1

11

AIR VENT PLUG

BRASS

NICKEL PLATED

1

12

CONDENSER CORE

OIP

1

13

END SHIELD

ALUMINIUM

1

TECHNICAL DETAILS:

TYPE: STEM TYPE CONDENSER BUSHING WITH OIL IMPREGNATED PAPER INSULATION.

RATED VOLTAGE(L-L) = 420 kV

RATED VOLTAGE(L-E) = 242 kV

RATED CURRENT = 2500 A

P.F. WITHSTAND VOLTAGE(DRY) = 685 kV

L.I. / S. I. WITHSTAND VOLTAGE = 1425 / 1050 kVp

TOTAL CREEPAGE DISTANCE = 10500 mm

MAXIMUM ANGLE OF MOUNTING = 30° (MAX.) FROM VERTICAL

CANTILEVER WITHSTAND LOAD = 4000 N

RATED SHORT TIME CURRENT RATING = IEC 60137 : 2008

TAN DELTA AT AMBIENT TEMP. = < 0.4 %

PD LEVEL AT Um = < 10 pC

REFERENCE STANDARD = IEC 60137 : 2008

TOTAL MASS = 975 kg±10% TOTAL OIL QUANTITY = 200 Ltr. ±10%

REFER INSTRUCTION MANUAL FOR ERECTION & MAINTENANCE

TITLE: -420 kV / 2500A CONDENSER BUSHING

CG Power & Industrial Solutions Limited
(Formerly Crompton Greaves Limited)
S-1 DIVISION, AMBAD, NASHIK

DRG.NO: 3SBD 536

REV 1

GEN. TOL. MATL. SPEC.

THIRD ANGLE PROJECTION

SCALE: NTS INITIALS NAME

ALL DIMS. IN MM. DRG RRA

UNLESS OTHERWISE SPECIFIED C-HD S-HB

APD US

DATE: 24.08.2017

COL W.O.:

DATE: 24.08.2017

SH T OF 1

TEST TAP DETAIL

FLANGE DETAIL

END SHIELD DETAIL

1

2

3

4

5

6

7

8

9

10

11

12

13

8-Holes of $\phi 20$ for Mounting

PCD-430

$\phi 480$

Earthing Hole M12

265

190

$\phi 180$

$\phi 290$

125

$\phi 60$

$\phi 470$

3315

4190

$\phi 480$

260

800

1335

45°

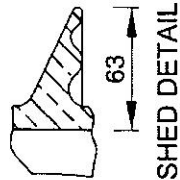
R70 MINIMUM

65

M12 Holes 6 Nos.

R475 MINIMUM

A3 297 - 420



NO.	DESCRIPTION	MAT.
001	PORCELAIN INSULATOR	PORCELAIN
002	STEM	COPPER
003	CAP	BRASS
004	CONNECTING LUG	BRASS
006	SEALING WASHER	NITRILE RUBBUR
007	VENT PLUG	BRASS
008	GASKET RING	TEFLON
009	CLAMPING RING	AL
010	CLAMPING MEMBER	ZINC ALLOY
011	SEALING WASHER	SRBC
012	SEALING WASHER	SRBC
013	FARTHING SHIF D	COPPER

NOTE :- 1. REMOVE VENT PLUG IT.007 & 008 DURING FILLING OF OIL IN TANK AND TO BE REFITTED AFTER BUSHING IS FILLED WITH OIL.

2. APPROX.OIL QTY. = 2.5 LITRES

3. MAKE : BHEL.

4. TOTAL WEIGHT = 40 KG.

5. COMPLIANCE TO STD. : IEC 60137

[illegible]

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

49830610900/02
REF. DRG. NO.

SIGN. & DATE

INVENTORY NO.

ORG. NO.

LOGO AND MONTH AND YEAR OF MFG.

4 X M16 X 22 DEEP
(0.5 MM OVER SIZE)
EQUI: SPACED ON 127±0.5 PCID.

VIEW LOOKING IN THE
DIRECTION OF ARROW-R

VIEW LOOKING IN THE
DIRECTION OF ARROW-P


NOTES:-

- | | | | |
|--|----|------------|---------|
| 1 - MCI TO CONFORM TO GRADE BM 320 OF IS:14329-1995. | | | |
| OR S.G.IRON TO CONFORM TO Gr 450/10 OF IS:1865-1991. | | | |
| 2 - INSULATOR WILL CONFORM TO IS.2544 / IS:5350 PII / IEC:168 / IEC:273.IN GENERAL. | | | |
| 3 - HOLES IN THE CAP SHOULD BE TAPPED / DRILLED OVERSIZE BY 0.5MM AS PER IS:1367 PART13-(1983) | | | |
| 4 - TOTAL CREEPAGE DISTANCE | mm | | 850 |
| 5 - <u>MECHANICAL VALUES</u> - | | | |
| a - CANTILEVER STRENGTH | - | kN-m/kgf-m | 6/600 |
| b - TENSILE STRENGTH | - | kN/kgf | 43/4300 |
| c - TORSIONAL STRENGTH | - | kN-m/kgf-m | 3/300 |
| d - COMPRESSION STRENGTH | - | kN/kgf | 86/8600 |
| 6 - <u>ELECTRICAL VALUES</u> - | | | |
| a - PF WITHSTAND VOLTAGE(WET) | - | kV(rms) | 75 |
| b - IMPULSE WITHSTAND VOLTAGE | - | kvp | 170 |
| c - VISIBLE DISCHARGE VOLTAGE | - | kV(rms) | 27 |
| 7 - GALVANIZING | | 610g/sq-m | |

FERROUS PARTS ARE HOT-DIP GALVANIZED(EXCEPT FLAME THREADS) AND TEST CONFORM TO IS:2633/IEC-383/BS 729 PORCELAIN BROWN GLAZED.

BP9066055871	001 TO 004	36KV POST INSULATOR
STYLE	ITEMS	DESCRIPTION OR REMARK

004	BONDING MATERIAL	PORTLAND CEMENT	—	—
003	BOTTOM FLANGE	M.C IRON / S.G IRON	4	1
002	TOP FLANGE	M.C IRON / S.G IRON	2.5	1
001	SHELL	PORCELAIN	12	1
ITEM	DESCRIPIONS	MATERIAL	UNIT WT.	QT

ADDITIONAL INFORMATION STANDARD				TRANSFORMER / REACTOR			
STATUS OF DRAWING				36 KV SOLID CORE POST INSULATOR BHARAT HEAVY ELECTRICALS LTD. BHOPAL			
DISTRIBUTION OF PRINTS TRE-1, TRM-3							
REV	DATE	REASON	BY	DATE	REASON	BY	DATE
01	11-09-19	RECEIVED	GA				
		APPROVED	GA				
ORG REDRAWN				36 KV SOLID CORE POST INSULATOR 3 4996100004			