08/11/25

**ENQUIRY** 

TWO PART BID

E-TENDER

### भारत हैवी इलेक्ट्रिकल्स लिमिटेड, पिपलानी, भोपाल- ४६२०२२ (भारत) सामग्री प्रबंधन विभाग

BHARAT HEAVY ELECTRICALS LIMITED, PIPLANI, BHOPAL-462022 (INDIA) **MATERIALS MANAGEMENT DIVISION** 

TIN NO- 23573000001 ECC NO- AAACB4146PXM009 MPCT NO- HEL/05/01/0001/S15/11/79 PHONE NO: 91-755-2500100 FAX: 91-755-2500023

www.bhel.com

**ENQUIRY NO** E5953041 **ENQUIRY DATE** 29/10/25

ENQUIRY DUE DATE

 $\mathbf{E}$ 

SUPP NAME AND ADDRESS	SUPP CODE	REV CD	REV NO	REV DATE	NO OF CATY2	NO OF CATY3	ENQ NO OF ITEMS	INDENT NO
	0	1	0	NA	3	6	3	121354571
	GUARANTEE CERTIFICATE		Y	SUPPLY CONDITI	ON SUPPLI	ER'S IDENTIFICAT	TION MARK SHOULD BE	
	TEST CERTIFICATE		Y	1	ON EA	.СН ЈОВ.		
	INSTRUCTION BOOKLET		N	TECHNICAL CON	DITION AS PER	DRG.		
	SAMPLE		N	1				
	GATE PASS		Y	INSPECTION CON	NDITION AT BHI	EL BHOPAL		

NOTE: QUOTE PRICE BOTH IN FIGURES & WORDS. IN CASE OF MISMATCH PRICE IN WORDS WILL BE VALID, QUOTATIONS NOT BEARING ENQUIRY NO AND DUE DATE LIABLE TO BE REJECTED.

SL	MATERIAL	DESC	UNIT	ITEM	QTY	LOT	LOT	DEST	DELIVERY
NO	CODE			QTY	VR%	NO	QTY		DATE
1	BP9094822741	TA7009BZ,TA7003 BX/CW INSU. WASHER (TOP) TO DRG. NO. 44303281005	NO	180.000	30	1	90.000	213	24/12/25
		REV04. TO BE SUPPLIED IN PROPER PACKING. PO NO, DRG.NO.& TYPE OF MACHINE SHOULD BE MARK OF EACH JOB.				2	90.000	213	24/01/26
2	BP9094822784	TA 7009 BZ,TA7003BX/CW INSU. WASHER (BOTTOM ) TO DRG.NO.		180.000	30	1	90.000	213	24/12/25
		44303281003 ITEM 01, REV. 06. PO NO,DRG NO. AND TYPE OF MACHINE TO BE MARKED ON EACH JOB . TO BE SUPPLIED IN PROPER PACKING.				2	90.000	213	24/01/26
3	BP9094822750	TA 7009BZ,TA7003 BX/CW INSU. SLEEVE TO DRG.NO. 34303281001 REV.03.	NO	180.000	30	1	90.000	213	24/12/25
		PO NO.,DRG.NO. AND TYPE OF MACHINE TO BE MARKED ON EACH JOB. TO BE SUPPLIED IN PROPER PACKING.				2	90.000	213	24/01/26

REMARK

DRAWING	Y	PURCH SPEC	Y	CATALOUGE	N	Quality Surveillance Pla N	TWO PART BID Y

NOTE:BHEL,BHOPAL'S Standard Terms & Conditions BP200102 (Latest Revision) form a part of this Enquiry. Bidders may obtain from us copies of these terms and conditions if not already available.

1.Drawing.

Note: During Bid Evaluation, No loading of price with regard to preferential payment of within 45 days will be made on vendore falling under MSMED ACT - OCT 06

Please submit your lowest quotation in sealed envelop essentially superscribed with ENQUIRY NO, DUE DATE AND PARTY'S NAME so as to reach at TENDER ROOM, GROUND FLOOR, ADM BUILDING. BHEL, PIPLANI BHOPAL-462022 by 11.00 am of due date.

3.In case you are not making an offer against this Enquiry, we request you to post a regret letter.

SPECIAL REMARK: Bid to be submitted through e-procurement. Refer eproc link on BHEL Bhopal B2B site.

NAME: SHRI MANENDRA SINGH Documents Enclosed

3. Purchase specification.

2.Catalogue. 4.Quality Surveillance Plan.

**DESG:** DY.MANAGER

0755-2505880

manendra1@bhel.in

SIGN & SEAL

1. This is only a request for Quotation & not an order.

4.Indian vendors to please indicate GSTIN on their quotation.

2.Small Scale industries should indicate SSI Regn. No. in Quotation/invoice.



# HEAVY ELECTRICAL PLANT, BHOPAL BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5953041

DUE ON 08-11-2025

## **NIT TERMS & CONDITIONS:**

SL. NO.	DESCRIPTION	DETAILS
1.	RATE CONTRACT TERMS	We intend to enter into a Rate Contracts (RC) for ordering up to 12 months from RC freeze date, i.e. RC are to be kept valid for ordering up to 12 months from RC freeze date. Purchase Ordering shall be done as per BHEL requirement against the finalised rate contract & within its validity. Dispatches to be made against our purchase order (computerized) only, which will be issued against this Rate Contract.  BHEL reserves the right to cancel/ short close the Rate Contract for unordered qty at any point of time even before the expiry of RC validity without assigning any reason whatsoever it may be.
	ITEM	Item#01: - TA7009BZ, TA7003 BX/CW INSU. WASHER (TOP) TO DRG. NO. 44303281005 REV04. TO BE SUPPLIED IN PROPER PACKING. PO NO, DRG. NO. & TYPE OF MACHINE SHOULD BE MARK OF EACH JOB.  Item#02: - TA 7009 BZ, TA7003BX/CW INSU. WASHER (BOTTOM) TO DRG.NO.
2.	DESCRIPTION	44303281003 ITEM 01, REV. 06. PO NO, DRG NO. AND TYPE OF MACHINE TO BE MARKED ON EACH JOB. TO BE SUPPLIED IN PROPER PACKING.  Item#03: - TA 7009BZ, TA7003 BX/CW INSU. SLEEVE TO DRG.NO. 34303281001 REV.03. PO NO., DRG.NO. AND TYPE OF MACHINE TO BE MARKED ON EACH JOB. TO BE SUPPLIED IN PROPER PACKING.
3.	TECHNICAL CONDITION	As per attached list of attached Drawings & Spec.
4.	QUANTITY	180 Nos of each item
5.	QUANTITY VARIATION	± 30%.
6.	SPLITTING OF ORDER	Not Applicable
7.	DELIVERY	For the 1st lot of 90 Nos of item01, 02 & 03 scheduled delivery date shall be within 60 days from the PO date and thereafter for each subsequent lot of 90 Nos of item01, 02 & 03.
	SCHEDULE REQUIREMENT	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.
8.		scheduled delivery date shall be within 30 days from the scheduled delivery date of the
8.	REQUIREMENT DELIVERY	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.
	DELIVERY TERMS DELIVERY	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.  FOR Destination (BHEL Bhopal)
9.	REQUIREMENT  DELIVERY TERMS DELIVERY INSTRUCTION	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.  FOR Destination (BHEL Bhopal)  Supplier identification (viz. Vendor code, PO number, SN etc) is must on the job  Not Applicable.  Inspection at BHEL
9.	REQUIREMENT  DELIVERY TERMS DELIVERY INSTRUCTION QAP INSPECTION	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.  FOR Destination (BHEL Bhopal)  Supplier identification (viz. Vendor code, PO number, SN etc) is must on the job  Not Applicable.
9. 10. 11.	REQUIREMENT  DELIVERY TERMS  DELIVERY INSTRUCTION  QAP INSPECTION CONDITION	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.  FOR Destination (BHEL Bhopal)  Supplier identification (viz. Vendor code, PO number, SN etc) is must on the job  Not Applicable.  Inspection at BHEL
9. 10. 11.	REQUIREMENT  DELIVERY TERMS  DELIVERY INSTRUCTION  QAP INSPECTION CONDITION  SAMPLE TEST	scheduled delivery date shall be within 30 days from the scheduled delivery date of the previous lot. Early delivery acceptable.  FOR Destination (BHEL Bhopal)  Supplier identification (viz. Vendor code, PO number, SN etc) is must on the job  Not Applicable.  Inspection at BHEL  As per attached Drg, Spec (As applicable)  All Material TC to be supplied along with material as per Drg Spec. and TC should



# HEAVY ELECTRICAL PLANT, BHOPAL BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5953041

DUE ON 08-11-2025

	GUARANTEE/	
15.	WARRANTEE/	GUARANTEE/ WARRANTEE Certificate to be supplied along with each lot of the material.
15.	CERTIFICATE	GOAKANTEE/ WAKKANTEE CEITHCATE TO be supplied along with each lot of the material.
16.	INVOICE & DOCUMENTS SUBMISSION FOR PAYMENT.	For supply orders placed on Indian Suppliers: Irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at https://suvidha.bhel.in/suvidha/, prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and upto Rs five lakhs, in case they were not digitally signed and uploaded on the portal.  The material will not be accepted inside BHEL in absence of the above.
17.	PAYMENT TERMS	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 16)  i.e. 100% payment in 90 days of receipt (45 days for Micro & Small and 60 days for Medium enterprises as registered in Udyam Certificate as per relevant MSME act in force) and subject to acceptance of material and relevant documents at BHEL.  Any deviation from the above payment terms, if accepted (by BHEL), shall be loaded @ SBI base rate + 6% for the purpose of bid evaluation.
18.	TECHNICAL PQR (T-PQR)	Technical Pre-Qualification Requirements (T-PQR) for procurement of the items is attached with the NIT.  Compliance of all the points in T-PQR is mandatory. In absence of compliance of above and non-submission of documents required against the T-PQR, the Vendor's offer is liable to be rejected.  Duly filled T-PQR with desired documents shall be submitted by the Vendor along with the offer.  Information/ compliance/ documents submitted by vendor shall be authentic in all aspects. In case any deviation/ false information/ forged documents are observed / revealed later on, BHEL is free to initiate appropriate punitive proceeding against the Vendor as per Prevalent Processes and Guidelines of Company.
19.	FINANCIAL PQR (F-PQR)	Not Applicable.
20.	BID PARTS	Offer shall be submitted by the bidders in Two Parts, i.e. Part-I Technical cum Commercial bid & Part-II Price bid.
21.	PENALTY / LD	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 9) i.e. <b>0.5%</b> of the undelivered portion per week of delay or part thereof, subject to a maximum of <b>10%</b> of the undelivered order value owing to delayed delivery.
22.	PRICE BASIS	Firm Price basis
23.	PRICING TERMS	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 12)
24.	PRICE VALIDITY	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 13) i.e. Offer shall be valid for a period of 90 days from the date of Techno- commercial (Part-I) bid opening date.
25.	TAXES & DUTIES	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 14)



# HEAVY ELECTRICAL PLANT, BHOPAL BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5953041

		DUE ON 08-11-2025
FVALUATION		

26.	EVALUATION CRITERIA	Individual item L1 basis				
27.	EVALUATION IN CASE OF MORE THAN ONE L-1 BIDDER	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. Decision of BHEL in such situations shall be final and binding.				
28.	BID SECURITY/ Earnest Money Deposit (EMD)	Not Applicable				
29.	PERFORMANCE SECURITY (PBG)	Not Applicable.				
30.	REVERSE AUCTION	Not Applicable.				
31.	MSE PREFERENCE	Applicable as per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 29)				
32.	PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA)	Not Applicable.				
33.	INTEGRITY PACT (IP)	Not Applicable.				
34.	RESTRICTION UNDER RULE 144 (xi) GFR	As per attached BHEL GTC of ENQUIRY (BP200102B, Cl. No. 34)				
35.	CONFLICT OF INTEREST AMONG BIDDERS/ AGENTS AND THEIR DECLARATION	A bidder shall not have conflict of interest with other bidders. Such conflict of interest of lead to anti-competitive practices to the detriment of Procuring Entity's interests.  Bidders having a conflict of interest shall not be eligible to participate in the tend process.  Treatment of cases regarding conflict of interest: -  The bidder notes that a conflict of interest would said to have occurred in the tend process and execution of the resultant contract, in case of any of the following situation:  i) If its personnel have a close personal, financial, or business relationship with a personnel of BHEL who are directly or indirectly related to the procurement execution process of the contract, which can affect the decision of BHEL directly or indirectly;  ii) The bidder (or his allied firm) provided services for the need assessment procurement planning of the Tender process in which it is participating;  iii) Procurement of goods directly from the manufacturers /suppliers shall preferred. However, if the OEM/ Principal insists on engaging the services of				



# HEAVY ELECTRICAL PLANT, BHOPAL BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5953041 DUE ON 08-11-2025

		agent, such agent shall not be allowed to represent more than one manufacturer/ supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ supplier or the manufacturer/ supplier could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor (with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.  iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.
		The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s), in this regard. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/guidelines.
36.	ANNEXURE-IX	The Bidder/Supplier/Contractor will, when presenting his bid, declare whether other Family Firms or Sister Concern Affiliates/Subsidiary firms are participating in the same tender, so as to eliminate the possibility of cartel formation. Format for declaration is available in the NIT documents for this enquiry (Annexure-IX). Same is to be submitted with the offer.
37.	SPECIAL CONDITIONS	Bidders who fall under MSE (Micro & Small Enterprises only) and fail to upload 'UDYAM Registration Certificate (URC)' shall automatically be considered as Non-MSE supplier for this tender.  Further, it is to be noted that MSE benefits are not being extended to Agent/ Dealer/ Trader/ Distributor (i.e. Other than manufacturer). Supplier has to also provide supporting document(s) such as Agreement Between OEM & Bidder(s) etc. Identification must. Soon after rejection of material, it is to be ensured by supplier that material should be taken back maximum within two weeks after communication for rectification/ replacement & supply back the rectified/ fresh material to BHEL Bhopal within 30 days from rejection. In the event of non-lifting of rejected material by supplier, BHEL will not be responsible for loss of such items to the supplier in any case.  Offers of suppliers who are in 'HOLD/BANNED' status in BHEL Bhopal PMD shall not be considered.  Unregistered vendors to submit documents required for registration to BHEL Portal Online (https://bhel.com/supplier-registration).



# HEAVY ELECTRICAL PLANT, BHOPAL BHARAT HEAVY ELECTRICALS LIMITED

BHEL ENQUIRY NO. E5953041

DUE ON 08-11-2025

38.	OTHER TERMS & CONDITIONS	Other Terms & Conditions as per attached BHEL GTC of ENQUIRY (BP200102B).  Any deviation of NIT, BHEL GTC of ENQUIRY (BP200102B) and BHEL PO Terms, where vendor response is not affirmative to be clearly indicated, else BHEL will consider that all above Terms & Conditions are acceptable to vendors.
39.	GEM REGISTRATION	As you are kindly aware that Government e-Marketplace (GeM) is a one stop portal to facilitate Online Procurement of Goods & Services required by various Government Departments/ Organizations/ PSUs.  BHEL being a PSU, would like that its suppliers/ contractors also have visibility on this portal so that GeM can be used for procurement by BHEL.  Hence, you are requested to get yourselves registered on GeM.
40.	TENDER FEE	Not applicable
41.	BID SUBMISSION WITHIN DUE DATE & TIME	No request for extension of tender due date will be entertained at the time of tender opening and after due date under any circumstances. Hence, all bidders are requested to submit their bid well within due date and time only.  BHEL reserves the right for extension of tender based on the situation without assigning any reason whatsoever it may be.
42.	DOCUMENTS TO BE FURNISHED ALONG WITH YOUR QUOTATION	Signed and Sealed copy of:  - NIT - BHEL GTC of ENQUIRY (BP200102B) - BHEL PO Terms  Duly Filled, Signed and Sealed copy of:  - Techno-Commercial Annexure - T-PQR along with all supporting documents - Annexure-IX in Company Letterhead - Annexure A for OEM & MSE Declaration Others:  - UDYAM Registration Certificate (as applicable for MSME bidders only)
43.	INVOICING THROUGH SUVIDHA PORTAL	For supply orders placed on Indian Suppliers, irrespective of the value of the invoice amount, the bidder / vendor should necessarily upload the despatch & invoice details on BHEL SUVIDHA portal at <a href="https://suvidha.bhel.in/suvidha/">https://suvidha.bhel.in/suvidha/</a> , prior to despatch. All documents as per PO checklist, along with additional documents (if any), must be uploaded on the portal. It is mandatory that tax invoices with a net amount (including taxes) exceeding Rs five lakhs uploaded on the portal are digitally signed using a Class 3 Digital Signature Certificate (DSC) issued by a licensed Certifying Authority. Submission of invoice document in hard copy is allowed for invoices with a net amount (including taxes) equal to and upto Rs five lakhs, in case they were not digitally signed and uploaded on the portal. The material will not be accepted inside BHEL in absence of the above.

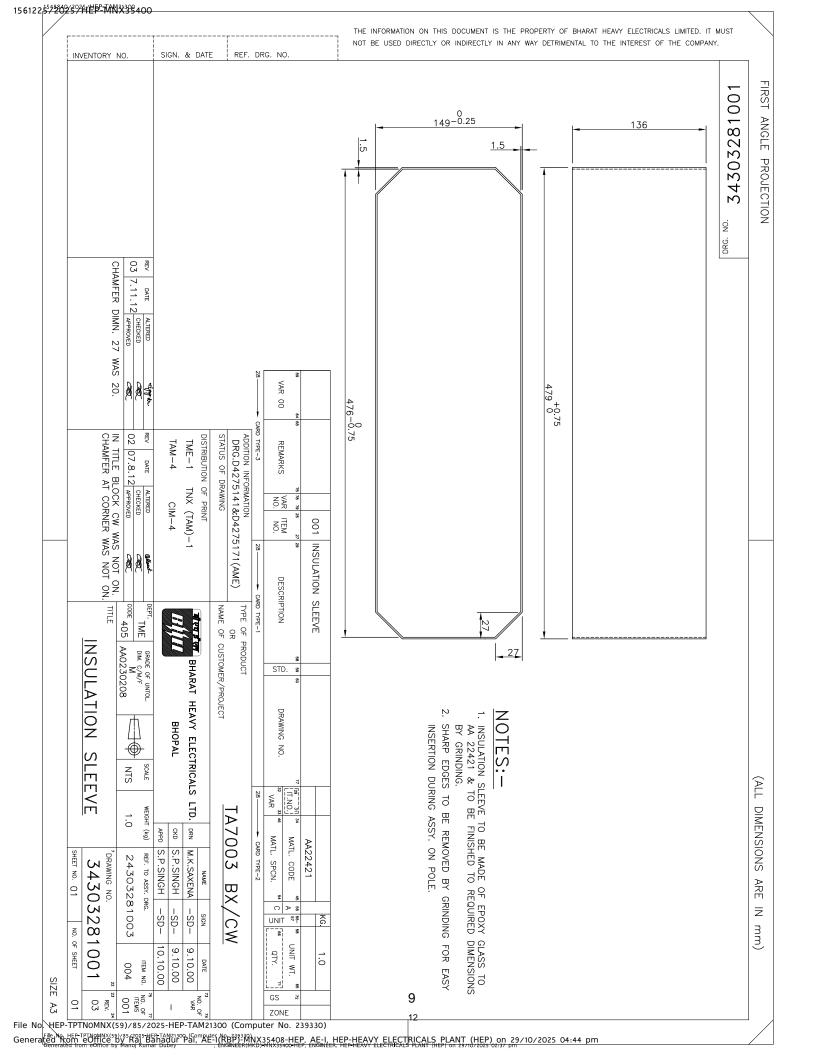
IT IS HEREBY MENTIONED THAT THIS IS E-TENDER SO OFFER SUBMITTED THROUGH E-PROCUREMENT PORTAL (www.eprocurebhel.co.in) SHALL ONLY BE CONSIDERED.

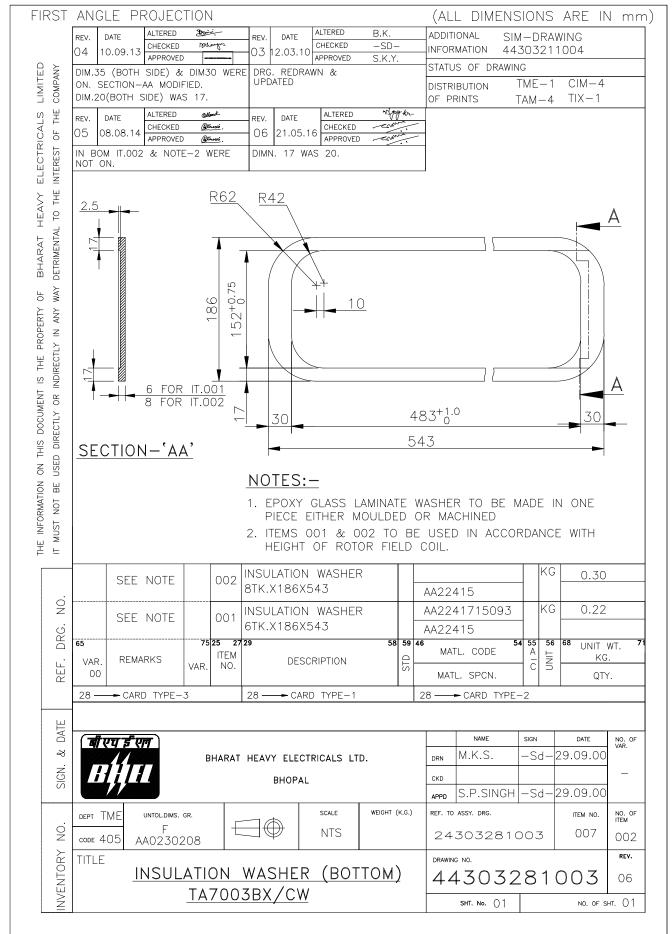
 $\frac{Techno\text{-}Commercial\ Annexure}{\text{(To be filled by supplier inline with NIT requirement and submit with offer)}}$ 

Tende	er No.	E5953041 due on 08/11/2025					
	iption :	Iltem01: - INSU. WASHER (TOP) 44303281005 REV04.  Item02: - INSU. WASHER (BOTTOM) 44303281003 ITEM01, REV06.  Item03: - INSU.SLEEVE TO DRG. NO. 34303281001 REV03  TENDER QTY.:- 180 Nos +/-30% for each item  Delivery required as per NIT.					
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any			
1	Quotation reference no. & date	As per supplier					
2	HSN / SAC code	As per supplier					
3	Quotation currency	In INR					
4	Contact person	As per supplier					
5	Phone / Mobile	As per supplier					
6	E-Mail	As per supplier					
7	Order to be placed on (Also provide supplier code at BHEL Bhopal, If registered)	As per supplier					
8	Address	As per supplier					
9	Please specify delivery in weeks/ days (Specify item wise, lot wise as per RFQ)	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)					
10	Rate quoted on "Firm" price basis	Yes					
11	Quoted for all the items and full quantity of tender enquiry	Yes / No. (If "No" please mention item number with Qty of regreted items)					
12	Technical specifications	Accepted as per NIT / Accepted with deviation (If select Accepted with deviation, please mention the deviation)					
13	Inspection	As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)					
14	Test certificate & Gurantee certificate as per NIT and specification will be submitted along with each consignment	Yes (In case of "No" your offer may be rejected).					
15	Brand name, if any.	As per supplier					
16	Supply from	As per supplier					
17	Terms of delivery ("FOR DESTINATION" means freight & insurance upto destination in supplier's scope (Destination: CRX Divn, BHEL Bhopal)	Accepted / Accepted with deviation (If select Accepted with deviation, please mention the deviation)					
18		As per NIT/ Accepted with deviation (If select Accepted with deviation, please mention the deviation)					
	, ,	As per supplier As per supplier					
		As per supplier					
22	UGST RATE (IN %)	As per supplier					
23	Are you manufacturer of quoted item (s).	Yes / No					
24	Are you registered under MSMED ACT 2006 as small or micro.  NOTE: - Firms registered under medium scale shall not be considered eligible for MSE benefits.	Yes / No (If select Yes, please enclosed valid UDYAM certificate)					

 $\frac{Techno\text{-}Commercial\ Annexure}{\text{(To be filled by supplier inline with NIT requirement and submit with offer)}}$ 

Tende	er No.	E5953041 due on 08/11/2025						
Description :		Iltem01: - INSU. WASHER (TOP) 44303281005 REV04. Item02: - INSU. WASHER (BOTTOM) 44303281003 ITEM01, REV06. Item03: - INSU.SLEEVE TO DRG. NO. 34303281001 REV03 TENDER QTY.:- 180 Nos +/-30% for each item Delivery required as per NIT.						
Sr. No.	ELEMENTS	Standards	To be offered/confirmed by supplier	Remarks, if any				
25	Terms of Payment (100% payment in 90 days of receipt (45 days for Micro & Small and 60 days for Medium enterprises as registered in Udyam certificate as per relevant MSME act in force) and subject to acceptance of material and relevant documents at BHEL. Pl refer GTC BP200102B)	, , ,						
26	SELF CERTIFICATION OF MINIMUM LOCAL CONTENT, IF MORE THAN 50% VALUE ADDITION IS IN INDIA. (Note- In case of tenders worth more than Rs. 10 crores, Suppliers shall necessarily submit certificate from statutory auditor or cost auditor or cost accountant or CA) Please also specify the amount of local content in India. EXAMPLE :if 100% INDIGENOUS (MADE IN INDIA) MARK "Y"/100%	<del>As per supplier</del> /not applicable						
27	Details of location of value addition / manufacturing	As per supplier/not applicable						
28	I()ther (harges (It any)	Applicable / Not Applicable. (If applicable please mention percentage (%) / Value (along with type of charges).						
29	Penalty for delayed performance as per BP200102B & NIT	Yes / No (In case of "No", your offer will be loaded suitably)						
30	Confirmation that documents pertaining to	Yes / No						
31	Acceptance to "REVERSE ALICTION" if	Not applicable						
32	Submission of Declaration format with duly sealed & signed (Annexure IX, refer attached) regarding whether other family firms or sister concern affiliates / subsidiary firms are participating in the same tender.	(Yes / No) If No please specify the reason.						
33	General terms and conditions of enquiry (Form No. BP-200102B) and BHEL PO Terms & Conditions is Acceptable.	Yes (In case of "No" your offer may be rejected).						
34	Quotation Validity will be 90 days from the date of techno-commercial bid opening.	Yes						
35	Tender fees submitted	Yes / Not Applicable	Not Applicable					





14

TA-7003 BX

44303281005

SHT. No. ()1

04

NO. OF SHT. 01



AA 224 15 Rev. No. 02

PAGE 1 OF 5

# EPOXY LAMINATED GLASS FABRIC BASE SHEET (TEMPERATURE INDEX 155)

### 1.0 GENERAL:

This specification governs the quality requirements of laminated sheet made from layers of fine and plain woven glass fabric (non-alkaline glass type E) having suitable silane/volan finish with good electrical properties using thermosetting epoxy resin as the bonding medium. The material has a temperature index of at least 155.

### 2.0 APPLICATION:

This material may be used with discretion for insulating spacers, wedges, packers and pressed parts of electrical machines.

### 3.0 COMPLIANCE WITH NATIONAL STANDARDS:

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

NEMA-LI-1: 1989, Gr. G-11.

### 4.0 DIMENSIONS AND TOLERANCES:

### 4.1 Sizes:

Thickness, width and length shall be as stated on BHEL order.

### 4.2 Preferred thickness (mm):

0.5, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 25, 30, 40, 50 and 70. Other thickness can also be ordered.

### 4.3 Tolerances:

### 4.3.1 Thickness:

Thickness of the sheet shall not depart at any point from the nominal thickness by more than the appropriate value as shown in the following table:

Revisions: Cl: 32.4.43 of MOM of MRC-E			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (E)			
Rev. No. 02	Amd.No.	Reaffirmed	Prepared	Issued	Dt. of 1st Issue	
Dt:15.01.2003	Dt:	Year:	HYDERABAD	Corp. R&D	May, 1980	

AA 224 1	5
Rev. No.	02



PAGE 2 OF 5

Th	ickness, mm	Permissible variation from
Above	upto & including	nominal thickness, mm
-	0.5	0.10
0.5	2	0.20
2	3	0.25
3	5	0.50
5	7	0.75
7	10	0.90
10	15	1.10
15	20	1.25
20	25	1.40
25	30	1.50
30	40	1.75
40	50	2.00
50	60	2.50
60	70	3.00

### 4.3.2 Width and Length:

Size, mm	Tolerance, ± mm
Below 1000	35
Above 1000	50

### 4.4 Flatness (for sheets 3.0mm and above):

The flatness of sheets shall be such that when a sheet is placed without restraint on a flat surface, concave side, if present, up, departure at any point of the surface from a light straight edge laid in any direction upon it shall not exceed the following:

- a) 0.50 mm under a 300 mm straight edge.
- b) 3.00 mm under a 600 mm straight edge.
- c) 6.00 mm under a 1000 mm straight edge.

### **5.0 FINISH:**

The surface of the sheets shall be even, smooth, free from visible defects like blisters, loose fibres, resin concentration, delamination, wrinkles, local deformation and dents. The materials shall be supplied with trimmed edges.

### **6.0 TEST METHODS:**

Unless otherwise specified the tests shall be conducted in accordance with the relevant methods of BHEL standard AA 085 17 01.



AA 224 15

**Rev. No. 02** 

PAGE 3 OF 5

### 7.0 SAMPLING AND ACCEPTANCE:

### 7.1 Routine and Acceptance Tests:

Unless otherwise stated, one sheet chosen at random out of every 20 sheets of a supply shall be subjected to routine tests. One sheet of 300 X 300 mm of 10 mm thickness shall be supplied with each consignment.

The arithmetic mean of the test results for an individual test shall meet the requirement of this specification.

The lowest value obtained for any test shall not be less than 90% at the specified value.

### 7.2 Type Tests:

Type tests shall be carried out at the time of first approval and subsequently once in two years and whenever doubt arises, on the quality of the material.

### **8.0 PHYSICAL PROPERTIES:**

**8.1** Specific Gravity :  $1.8 \pm 0.1$ 

8.2 Marten's Heat distortion Temperature (Type test)(For thickness 10mm and above) : 240°C, min

8.3 Water Absorption at 20<sup>0</sup> C for 24 hours (Type test):

Thick	kness (mm)	Water absorption	
Above	upto & including	%, max.	
-	1	0.40	
1	1.5	0.30	
1.5	3	0.20	
3	10	0.15	
10	25	0.10	
More than	25*	0.10	

<sup>\*</sup> Thickness above 25 mm shall be machined to 25 mm keeping one side intact.

### 8.4 Texture of Glass Fabric:

For laminates upto 20 mm thickness a fine woven glass cloth of 0.18mm thick shall be used. For laminates above 20mm thickness a glass cloth of not more than 0.255 mm thick shall be used. This shall be checked by burning the bonding at 600°C for sufficient time.

AA 224 15		<b>बी</b> एच इंस्ल
Rev. No. 02	CORPORATE PURCHASING SPECIFICATION	HHE
PAGE 4 OF 5		

### 8.5 Heat Shock Test:

A specimen of size 100x100 of ordered thickness is kept in an oven maintained at 250±5° C for 15 minutes. The specimen is removed directly to ambient conditions (ie. Room temperature) after this period and observed. The material is considered satisfactory in this test, if no delamination, cracks, splitting, blistering or resin oozing is observed at the end of the test.

### 9.0 MECHANICAL PROPERTIES:

Tensile Strength (For sheets 1.5 mm thick and above) (Type test):

250 N/mm<sup>2</sup> (25.5 kg/mm<sup>2</sup>), min.

- 9.2 Cross Breaking Strength (For sheet 1.5 mm thick and above):
- **9.2.1** As received condition: 350 N/mm<sup>2</sup> (35.6 kg/mm<sup>2</sup>), min.
- 9.2.2 After heating at 150°C for 1 hour and tested at 150°C. The reduction shall not be more than 50% of the value obtained in received condition.
- 9.3 Shear strength (for sheets 1.5 mm thick and above) (Type test):

100 N/mm<sup>2</sup> (10.2 kgf/mm<sup>2</sup>), min.

- 9.4 Compression strength proof (For sheets 5 mm thick & above) (Type test): 400 N/mm<sup>2</sup> (40.8 kgf/mm<sup>2</sup>).
- 9.5 Impact strength Charpy Flatwise (For sheets 2.5 mm & above) (Type test):

 $75 \text{ kJ/m}^2$ , min. Below 10 mm thick  $150 \text{ kJ/m}^2$ , min. 10 mm thick & above

- 9.6 Splitting load, Edgewise (For sheets 10 mm thick and above): 2.94 kN (300 kg), min.
- 9.7 Punching (For sheets below 2.5 mm) (Type test):

When the sheet under test is pierced in a single operation with a pattern shown in IS: 1998. There shall not be excessive lifting or cracking around the holes.

9.8 Machinability (For sheets 3.0mm and above) (Type test):

The sheet shall be capable of being sawn, milled, drilled and tapped with a M3.5 tap and shall be capable of being shaped in a shaping machine without showing any sign of cracking or chipping.

- 10.0 ELECTRICAL PROPERTIES:
- 10.1 Insulation Resistance after 24 hours immersion in water at 27°C (Type test): 10<sup>4</sup> Megohms, min.



AA 224 15

Rev. No. 02

: 40 kV

PAGE 5 OF 5

10.2 Electric Strength - Proof in oil at 90°C:

**10.2.1 Flatwise:** Thickness upto & including 5mm : 14 kV/mm above 5mm\* : 12 kV/mm

10.2.2 Edgewise (For 5 mm and above)

\* Thickness above 5mm shall be machined down to 5 mm keeping one surface intact.

10.3 Dissipation Factor (Tan delta) at 50 Hz (Type test) : 0.02, max.
10.4 Comparative Tracking Index (Type test) : 250, min.

### 11.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied alongwith each Consignment.

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

The test certificate shall bear the following information:

AA 22415 (Rev.No 02): Epoxy Laminated Glass Fabric Base Sheet.

BHEL Order No.

Supplier's Reference:

Batch/Lot No.

Test values obtained/Certificate for compliance for clauses 8.0 to 10.0 for all routine tests.

### 12.0 PACKING AND MARKING:

Identification slips shall be pasted suitably on all four corners of each board giving the size of the board and manufacturer's code number/grade. The boards shall be suitably packed in wooden case lined with water proof paper from inside. Each sheet should be separate from other sheet by a thick paper or card-board.

Each package shall be marked with the following information:

AA 22415: Epoxy Laminated Glass Fabric Base Sheet.

BHEL order No.

Manufacturer's / Supplier's Name

Batch/Lot No.

Thickness, Width and Length.

No. of sheets:

Net weight and Gross weight:

Test Certificate No.

### 13.0 REFERRED STANDARDS (Latest Publications Including Amendments):

1) AA 085 17 01

2) IS:1998

3) NEMA - L1-1



AA 224 21

Rev. No. 03

PAGE 1 OF 4

### FIBRE GLASS EPOXY MOULDINGS

### 1.0 GENERAL:

This specification governs the quality requirements of Glass Fibre Reinforced High Pressure and High Temperature Epoxy Mouldings.

The epoxy mouldings shall have a very good resistance to oil, petrol and acids and the water extract of the material shall be neutral. The material shall have a temperature index of at least 155.

### 2.0 APPLICATION:

Used as lead insulation of a bar type windings (caps) etc., for Hydro - generators.

### 3.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no Indian sandard covering this material.

### 4.0 DIMENSIONS AND TOLERANCES:

Shall be as stated on the order or the drawing accompanying BHEL order.

### 5.0 COMPOSITION:

### **5.1** Glass Chopped Strand Mat:

The epoxy mouldings shall be based on chopped strand glass fibre type E-silane finished and treated with epoxy resin using hardener, additives like curing agents, lubricants, plasticlizers etc., added in suitable proportions keeping in view the required properties and moulding conditions. However these additives should not have any detrimental effect on the properties and performance of mouldings.

Glass fibre shall be thoroughly dried before use to remove moisture.

### **5.2 Resin**:

Bisphenol A based liquid epoxy resin having epoxy equivalent of 180 to 200, with appropriate hardener for temperature index 155.

or

Novalak epoxy resin of low molecular weight having epoxy equivalent of 175 to 200, with appropriate hardener for temperature index 155.

Revisions : Cl: 32.4.45 of MOM of MRC-E			LANT MATERIAI TION COMMITTI	=	
Rev. No. 03	Amd.No.	Reaffirmed	Prepared Issued Dt. of 1st Issue		Dt. of 1st Issue
Dt:15.01.2003	Dt:	Year:	BHOPAL	Corp. R&D	Feb, 1980

AA 224 21		ी वी एवं इ
Rev. No. 03	CORPORATE PURCHASING SPECIFICATION	H
PAGE 2 OF 4		



### 5.3 **Diluents and Viscosity Reducers:**

Not to be used.

### 6.0 **MOULDING CONDITIONS:**

 $: 155 \pm 5^{\circ}C$ Moulding temperature

 $3.0 \pm 0.5 \text{ N/mm}^2$ Specified mould pressure

Moulding time : 15 minutes, approx.

Post curing of components/sheets : 6 to 8 hours at  $140^{\circ}$  to  $150^{\circ}$ C

**Note:** However, supplier may furnish recommended moulding schedule.

### 7.0 FINISH:

Shall be pure, smooth, compact, bright surface and shall be free from cracks, blisters, gas pockets, foreign inclusions etc., and with bond uniformly distributed.

### **TEST SAMPLES:** 8.0

### 8.1 **Tests On Moulded Sheets:**

Three moulded sheets of size 3±0.25 x 300 x 300 mm and one sheet of 10±0.5 mm thick and size 300 x 300 prepared from the same batch shall be supplied for testing and approval purposes.

### 8.2 **Tests On Components:**

Number of test samples and tests to be conducted shall be as mutually agreed upon between BHEL and supplier.

### 9.0 **PROPERTIES:**

Unless otherwise specified, the tests shall be conducted in accordance with the relevant methods of BHEL standard AA 085 17 01.

### 9.1 Physical:

9.1.1 Specific Gravity  $1.8 \pm 0.1$ 

9.1.2 Water absorption : 0.2%, max.

9.1.3 Bond Content :  $40 \pm 4\%$ 

Shall be determined by burning the bond at 600°C for sufficient time.

### 9.1.4 Marten's Heat Distortion Temperature:

155°C minimum.



AA 224 21

Rev. No. 03

PAGE 3 OF 4

9.2 **MECHANICAL**:

**9.2.1 Tensile Strength** : 80 N/mm<sup>2</sup> minimum

**9.2.2 Cross Breaking Strength** : 120 N/mm<sup>2</sup> min.

**9.2.3 Compression Strength** : 130 N/mm<sup>2</sup> minimum

9.2.4 Impact Strength - Charpy - Flatwise : 30 kJ/m<sup>2</sup> minimum

9.3 ELECTRICAL:

9.3.1 Electric Strength (Proof) In Oil At 90°C - Flatwise:

This test shall be carried out on 3 mm thick sheet.

As received : 10kV/mm

At  $90^{\circ}$  after ageing at  $155^{\circ} \pm 2C$  in air for 100 hrs : 10 kV/mm

9.3.2 Volume Resistivity 'As Received':

10<sup>12</sup> ohm - cm minimum

9.3.3 Surface Resistivity:

10<sup>12</sup> ohm - minimum

10.0 Shrinkage (For information only):

0.15% maximum.

Components shall be placed in an oven after measuring dimensions and temperature increased to 155°C as rapidly as possible. The temperature shall be maintained for a period of 16 hours. Then the components shall be cooled rapidly to room temperature and then subjected to relative humidity of 95 to 100% at room temperature. Components shall be maintained under this condition for 6 hours.

Components shall be subjected to six cycles as stated above. The dimensions shall be measured after this and percentage shrinkage shall be computed.

### 11.0 TEST CERTIFICATES:

Unless otherwise specified, three copies of test certificates shall be supplied alongwith each consignment.

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

The test certificate shall bear the following information:

AA 224 21		बीएव ई एन
Rev. No. 03	CORPORATE PURCHASING SPECIFICATION	HHE
PAGE 4 OF 4		
AA 22421 (Rev.N. BHEL Order No. Manufacturer's na Batch/Lot Quantity supplied Test results of clause 11.0 PACKING AND Manufacturer's / Subsection of the Man	Il be suitably packed to avoid contamination and damage Packings shall be labeled with the following information: class epoxy mouldings.  Applier's Name  Nos.	



# BHARAT HEAVY ELECTRICALS LIMITED, BHOPAI

# TRACTION MACHINES ENGINEERING DIVISION

Date: 17.12.24

# Technical requirement of fiber Glass molding/ sheet-based items is as under:

-		Ver	Vendor to comment
ာ် <mark>ဗ</mark> ိ	Description	Complied / Not complied	Supporting relevant document to be submitted
_	Fiber Glass based Insulating items shall as per BHEL drawing No. & Specification mentioned in BHEL tender Enquiry	Yes/No	Deviation not accepted
2.	Manufacturing / supply experience in preceding 5 years (from tender opening date) for same or similar item* is required.	Yes/No	Unpriced PO copies, corresponding Challan/Invoice required.
ო	Vendor should be Manufacturer for tendered item not a trader.	Yes/No	

# Note:

- \* Same similar item to be Fiber Glass based molding if tendered item is molding based item and Fiber Glass sheet if tendered item is sheet based item as mentioned in respective drawing and specification with the tender Enquiry.
  Compliance of all the points in above PQR is mandatory. In absence of compliance of above, vendor's offer is liable to be rejected. က
  - 4

