

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                  |                                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------|
| Domain :                          | bhel.abcprocure.com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                  |                                     |
| Parent department:                | BHEL Trichy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                  |                                     |
| Unit name                         | : BHEL Trichy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Enquiry date                                     | : 05/06/2018 05:30:00               |
| Purchase group                    | : FB Consumable-PRDN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RFQ/NIT/Enquiry Officer                          | : RAJAPRAKASH K                     |
| Event ID                          | : 2640                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RFQ/NIT/Enquiry no.                              | : 1901800092                        |
| Tender Description                | : SUPPLY OF NON ASBESTOS MATERIALS AS PER SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                  |                                     |
| Terms & Conditions                | : S P E C I A L T E R M ( S )<br>1. The Enquiry is a two part Enquiry through EPS. Offer from any other mode will not be accepted.<br>2. Suppliers should give acceptance for supply of non-asbestos material as per plant standard issued by BHEL.<br>3. Delivery terms will be full quantity within 6 weeks from the date of PO.<br>4. Quantity tolerance of +-3% is included in this Enquiry.<br>5. OFFERS from Manufacturers will be accepted, offers from traders will summarily be rejected.<br>6. SUPPLIERS SHOULD ATTACH THE DULY FILLED & SIGNED SCANNED COPY OF ANNEXURE B_NON ASBESTOS.<br>7. NEW SUPPLIERS (NOT REGISTERED IN BHEL) SHOULD ATTACHED THE SCANNED COPY OF ANNEXURE-N.<br>8. Suppliers who belong to MSE category should submit attested copies of either Udyog AADHAAR MEMORANDUM (UAM) along with attested copy of a CA certificate applicable for the relevant financial year (latest audited)<br>ATTACHMENT:<br>1. ANNEXURE A EPS<br>2. ANNEXURE B<br>3. ANNEXURE N<br>4. ANNEXURE I<br>5. TP SPECIFICATION |                                                  |                                     |
| Product / service / work keywords | : Non Asbestos Ceramic,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                  |                                     |
| No. of Bid Parts                  | : Multiple                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Envelope                                         | : Techno-commercial bid , Price bid |
| Type of contract                  | : Goods                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Project duration / delivery or completion period | : 50 days                           |
| Download document                 | : Before login                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | RFQ floated under the policy                     | : PP-PURCHASE POLICY                |
| Estimated Category                | : H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No. of items already attached                    | : 10                                |
| Delivery/Location At              | : BHEL TRICHY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Inspection by Agency                             | : TPI/ENGINEER IN CHARGE, BHEL      |
| Inspection Location               | : THIRD PARTY INSPECTION APPOINTED BY BHEL AT VENDOR WORKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Min. bid required                                | : 2                                 |

## Bid submission configuration

|                |   |           |                |   |                |
|----------------|---|-----------|----------------|---|----------------|
| Bid evaluation | : | Item wise | Bidding access | : | Open Tender    |
| Base currency  | : | INR       | Bidding type   | : | NCB/Indigenous |

## Key configuration

|                 |   |             |
|-----------------|---|-------------|
| Pre-bid meeting | : | Don't allow |
|-----------------|---|-------------|

## Dates configuration

|                                 |   |                     |                               |   |                     |
|---------------------------------|---|---------------------|-------------------------------|---|---------------------|
| Document downloading start date | : | 13/06/2018 14:00:00 | Document downloading end date | : | 05/07/2018 14:00:00 |
| Bid submission start date       | : | 13/06/2018 14:00:00 | Bid submission end date       | : | 05/07/2018 14:00:00 |
| Bid opening date                | : | 05/07/2018 14:30:00 |                               |   |                     |

## Document / EMD / Security fee detail

|               |   |              |     |   |              |
|---------------|---|--------------|-----|---|--------------|
| Document fees | : | Not required | EMD | : | Not required |
|---------------|---|--------------|-----|---|--------------|

## Bidding forms

PRICE BID

PRICEBID TEMPLATE

### Note:

Unit rate quoted should be exclusive of GST

| ITEM NAME                                                | QUANTITY | UNIT OF MEASUREMENT |
|----------------------------------------------------------|----------|---------------------|
| MILL BOARD 25 MM - TP 23296                              | 30000.00 | KG                  |
| PACKING ROPE SQ.15MM - TP23299                           | 600.00   | KG                  |
| Gasket-3mm TP 23292/REV 02                               | 200.00   | KG                  |
| CARBON FIBRE/CERMC FIBRE GLND PKNG 6MM TP-23299/REV 02   | 200.00   | KG                  |
| CARBON/CERAMIC FIBRE GLAND PACKING-8SQMM TP 23299/REV 02 | 200.00   | KG                  |
| COMPRESSED FIBRE JOINTING SHEETS-3MM TP-23295 REV 01     | 300.00   | KG                  |
| PACKING ROPE DIA - 10MM TP 23299/REV 02                  | 1500.00  | KG                  |
| COMPRESSED FIBRE JOINTING SHEET-3.00MM TP: 23293/REV 02  | 300.00   | KG                  |
| CARBON FIBRE/CERAMIC FIBRE CLOTH-3MM TP-23297/Rev 02     | 200.00   | KG                  |
| NONASBESTOS COMPRESSED FIBREJOINTING 3MM TP 23294/REV 02 | 700.00   | NO                  |

## Information for Online Participation

Bidder who wish to participate in this tender needs to procure Digital Certificate as per Information Technology Act-2000 using that they can digitally sign their electronic bids. Bidders can procure the same from any or the CCA approved certifying agencies, or they may contact e-Procurement Technologies Ltd. at below mentioned address and they will assist them in procuring the same. Bidders who already have a valid digital Certificate need not to procure the same. In case bidders need any clarification regarding online participation, they can contact,

e-Procurement Technologies Ltd.

Corporate Office:

Address : A-201/208, Wall Street - 2, Opp. Orient Club,  
Nr. Gujarat College, Ellis Bridge,  
Ahmedabad - 380006, Gujarat(INDIA)

## Digital Certificate Contacts

Contact Person : Mr. Himalay Vaishnav

Cell : +91-9099090830

Phone Nos. : +91-9099090830

Fax No :

e-Mail : [info@abcProcure.com](mailto:info@abcProcure.com)

## Support Team Contacts

Contact Person : BHEL Support Team Ahmedabad

Cell : +91-79-40270590

Phone Nos. : +91-79-40270599/508/560/590/513

Fax No :

e-Mail : [Bhel.Support@abcProcure.com](mailto:Bhel.Support@abcProcure.com)

Bidder who wish to participate in e-Tender need to fill data in predefined forms of Price bid available in respective tender only. After filling data in predefined forms bidders need to click on final submission link to submit their encrypted bid. Bidder need to submit Document Fees, EMD & Reference Documents in hard copy if such instruction are given by tendering authority. As Per the new Inter-operability guidelines released by Controller of Certifying Authorities(CCA), the Secured Socket Layer(SSL) certificate for a e-procurement application is generated on a new algorithm, SHA2.

Also, the Digital Certificates that will be applicable for these platforms have to be SHA2 algorithm complaint. For the same, the users have to ensure that they have Windows XP(SP3)/Windows Vista/Windows7 installed in their respective PC/Laptop. In case of Windows XP Service pack - 3, if you get any issue you can install the SSL patch, which is available at our download section of our e-Tender/e-Auction Portal and also at our corporate website [www.abcprocure.com](http://www.abcprocure.com) just below the label of "Knowledge section".



## Annexure A

### QUOTATIONS:

1.

a. Interested bidders / Suppliers shall submit their offer through e-Procurement mode at <https://bhel.abcpocure.com>. Offers in any other mode will not be accepted. For Enterprise Procurement System (EPS) Bidders/Suppliers are requested to follow these steps.

### REQUIREMENTS

1. Computer with good Internet Connection (Minimum 256 kbps).
2. Operating System should be Windows Vista / Windows 7 and above.
3. Web Browsers: IE 9.0 (32-bit Browser only) & above, Mozilla Firefox up to version 51 (32 bit / 64 bit), Google Chrome 20.0 to 41.0
4. System Access with Administrator Rights
5. Digital Certificate: To participate in an e-Tender, you need to have a Class-II/III Digital Signature Certificate (DSC) for Signing & Encryption (Required both digital signature certificate: Signing & Encryption) of bids issued by any of the valid Certifying Authorities (approved by Controller of Certifying Authorities) in India. Valid Digital Signature Certificate (DSC) must be installed in a computer system from where you want to access the website.

### Steps for registration & bidding:

For registration & submitting bids, vendors shall follow the link "Bidder manual for BHEL Bidders" in <https://bhel.abcpocure.com>.

In case of any assistance, please call the following Nos for support:

Contact: +91-79-40270549/560/590

### General Conditions:

- a. Bidders are requested to quote their offer price on F.O.R Destination (BHEL/Stores) basis only (The basic price of the material quoted in the bid should be inclusive of Packing, Forwarding, freight and transit insurance, etc.,). Ex-works offers will be summarily rejected without further clarification.
  - b. No charges shall be indicated as "Lumpsum" or "Approximate" in absolute value. All charges like taxes and duties should be clearly specified as "percentage" of the quoted rates.
  - c. Manufacturer's name, trademark or patent no. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation wherever necessary.
  - d. Products with I.S.I. certification marks will be preferred.
  - e. The Purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept in Part or full without assigning any reason whatsoever.
  - f. The bidder has to keep track of any changes by viewing the addendum / Corrigendum's issued by the Purchaser on time-to- time basis in the E-Procurement platform. The Company calling for tenders shall not be responsible for any claims/problems arising out of this.
  - g. The user should complete all the processes and steps required for bid submission. The successful bid submission can be ascertained once acknowledgement is given by the system through bid submission number after completing all the processes and steps. BHEL and M/s. e-Procurement Technologies limited. will not be responsible for incomplete bid submission by users. Users may also note that the incomplete bids will not be saved by the system and are not available for the Purchaser for processing.
  - h. Before uploading scanned documents if any, the bidders shall sign on all the statements, documents, certificates uploaded by him, owning responsibility for their correctness / authenticity.
2. Offers should have a validity of minimum 90 days from the date of Tender opening. The quoted/Finalized rates shall be Firm till completion of the supplies including amendment / deviation / extension if any in quantity / date.
3. On the due date of tender opening, only technical bids will be opened. The opened technical bids will be evaluated by us and clarifications required, if any, will be called for from the bidders on technical and commercial points. If no reply is received from the vendor for the clarification raised by BHEL with in the final cut-off date those vendors offer will be processed with the documents available / submitted against



this tender. Offers not meeting the required specification and technical condition will be summarily rejected. The price bids of technically suitable bidders will be opened on a later date with prior intimation to techno-commercially suitable bidders.

4. Ranking L-1, L-2 etc. shall be done for individual items for the techno-commercially acceptable offers on landed cost to BHEL, Trichy basis and BHEL reserves the right to place order for individual items with different vendors. In the event of more than one vendor becoming L1 for the item, the enquiry quantity will be shared equally among all the L1 vendors.

5. BHEL reserves the right to negotiate with L1 vendor or re-float the tender for items where, L1 price is not the lowest acceptable price; BHEL reserves the right to increase or decrease the tender quantity.

**6. TERMS OF PAYMENT: (Indigenous)**

Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials.

**Any deviation in the above payment term will attract loading as mentioned below.**

**"Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.**

**NOTE: 100% payment against dispatch document through bank / 90% payment against through document through bank + 10% payment after acceptance of materials / Cheque payment / payment against proforma invoice / advance payment / current cheque or post-dated cheque along with purchase order will not be accepted and those offers will not be considered.**

7. LD clause & Risk purchase clause are applicable.

(Any deviations in the LD shall attract loading to the extent of relaxation sought to which it is not agreed by the bidder at offered value).

**Single delivery schedule:**

If the Supplier fails to deliver the P.O quantity within the period specified in the contract, then the Purchaser shall deduct liquidated damages, 0.5% of the total order value per week of delay or part thereof subject to a maximum of 10% of the total order value.

**Staggered delivery schedule**

In case of staggered delivery schedule, if the Supplier fails to deliver the quantity of any line item of the P.O within the period specified in that line item, Purchaser shall deduct Liquidated Damages, 0.5% of the undelivered portion per week delay or part thereof subject to maximum of 10% of the total order value.

**Liquidated Damages (LD): (Any deviations shall attract loading to the extent of relaxation sought to which it is not agreed by the bidder at offered value).**

**RISK PURCHASE:** Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitutes therefor. The supplier shall be liable for any loss, which the purchaser may sustain by reason of such risk purchases in addition to penalty at the rate mentioned in LD clause above.

8. **GST:** For supplies after implementation of GST i.e. after 30.06.2017, the following conditions will apply and supplier shall fully comply to the below points.

**Indigenous suppliers:**

a. Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GST registration no which should clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer..

b. Supplier shall mention their GSTN registration number in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.



c. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).

d. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.

e. All documents like Mill Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.

f. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL.

g. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.

h. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers / contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.

**9. PACKING AND MARKING:** The supplier shall arrange for securely protecting and packing the stores to avoid loss or damages during transit.

**10. SPECIAL PROVISIONS FOR MICRO AND SMALL ENTERPRISES (MSE) BIDDERS REGISTERED AS PER MSME ACT:**

i) 20% of the tendered quantity is earmarked for MSE Vendors (**Manufacturers only and not for the Traders/Dealers of Service Category - Vide Office Memorandum circular of Micro, Small & Medium Enterprises, Clause – i, dt: 09.02.17**) in this tender. If L1 offer is from a Micro / Small enterprise, this provision is not applicable. (Applicable only for those items whose quantity is more than 5000 Kg).

ii) Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs. In event of failure of such Micro and Small enterprises to participate in the tender process or meet the tender requirements and the L1 price, the 4% sub-target for procurement ear-marked MSE owned by SC / ST entrepreneurs shall be met with other MSE enterprise/s.

iii) In case MSE vendor participating in the tender quotes within the price band of L1 + 15%, they will be allowed to supply the portion of the requirement subject to acceptance of L1 price by MSE vendor. In case of more than one such MSE, the supply shall be shared proportionately.

iv) MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity (Five years from the date of issue of acknowledgement in EM II)

v) Valid NSIC certificate or Udyog Aadhaar Memorandum or EM II certificate along with CA certificate (Format enclosed as per **Annexure-I**) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM II is over.

vi) Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier

submits these documents. This provision for MSE will apply subject to the condition that the participating MSE meets the tender requirements.

vii) In case of any change in the MSE status of the bidder, it shall be the responsibility of the bidder to notify the change as a part of the bid document. If at a later date it comes to the knowledge of BHEL, that the change in the status has not been intimated by the bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the bidder as per the procurement policy of BHEL.

viii) In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items / quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like tendered items being a system etc., then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1.

#### **11. Sharing of Quantity:**

- a. 20% of the tendered quantity is earmarked for MSE suppliers in this tender. The earmarked 20% quantity will be counter offered to the MSE vendors whose rate is within L1+15% band & up to H1 of MSE. In case of non-acceptance of the counter offering of 20% reservation to MSE vendors, the total tender quantity will be ordered as mentioned in 10.1 (c). For the balance 80% of the tendered quantity, BHEL reserves the right to order the tender quantity 100% on L1 vendor. Counter offering of L1 rate will not be made with any H1 vendor of Non-MSE
- b. If L1 is from a Micro / Small enterprise, the 20% earmarking provision is not applicable and order will be split in the ratio of 70:30 (between L1 , L2 / L3 at matched L1 F.O.R rate in the order of commercial ranking). Counter offering of L1 rate will not be made with any H1 vendor of Non-MSE.
- c. If there is no response from MSE vendors the above split up of 10.1 (a) & 10.1 (b) will not be applicable and the total tender quantity will be split and ordered in the ratio of 70:30 (between L1 , L2 / L3 at matched L1 F.O.R rate in the order of commercial ranking .
- d. In case of counter offering rate does not accepted by the L2 as well as L3 vendor, such counter offer quantity also will be ordered on L1 vendor.

#### **12. Conditional offers are likely to be rejected.**

**13.** The correspondences between the bidder and BHEL through email are considered as valid document legally though not signed. It is treated as valid confirmations made on behalf of the respective company and comes under the legal ambit of the business transaction and hence binding on both the parties.

**14. Disclaimer Clause:** Neither the Organization (Bharat Heavy Electricals Ltd.) nor the service provider (M/s. e-Procurement Technologies limited.) is responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

**15.** Bidders participating in the tender should declare in their technical bid whether they have been black-listed / kept on hold / given Business holiday for a specified period by any Public Sector Undertaking or Government Departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to BHEL. If no such details are mentioned in the offer, it will be construed that the bidder is not under any such hold. However, at a later date if it comes to the notice of BHEL about any such hold under enforcement, BHEL reserves the right to reject the offer at any point of time and also under any stage of the finalization of the tender. Such bidders will not be permitted to participate in the further tender proceedings and will be communicated suitably.

**16.** BHEL reserves the right to negotiate or re-float the enquiry opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.

**17.** In case of any quality rejection of materials, the supplier has to collect the materials at his own cost within the 10 days of rejection of advice. Otherwise the materials will be scrapped



18. Unloading at BHEL has to be done by the suppliers and BHEL will not be in a position to provide any handling / unloading facilities.
19. Bidders not confirming to the enquiry specifications will be disqualified.
20. If Guarantee / Warranty period is applicable as per tender specification, No deviation permitted and deviated offers are liable for rejection.
21. IMPORTANT NOTE: BHEL WILL CONSIDER THE RANKING AFTER THE LOADING IS APPLIED AS REFERRED ABOVE WHEREVER DEVIATIONS ARE OBSERVED.
22. No revision of prices will be entertained at any circumstances after tenders are opened.
23. The Tender Due date falling on public holiday due to any circumstances, the tender will be opened on next working day.
25. Delivery goods/ items should be securely and suitably packed to avoid transit damages.
26. The vendor should attach scanned copies of the following annexures duly filled in, sealed and signed by the vendor (Part-I).
- Annexure I (CA certificate).
  - Annexure A (Terms and conditions).
  - Annexure B (Commercial confirmation format).
27. The commercial confirmation format (as per annexure B ) should be submitted along with the technical bid, without fail. Terms and conditions to be confirmed /accepted/mentioned in your technical bid and the format (which we have mentioned in our enquiry as per annexure B) should be the same, without any variation/deviation. In case of variation/deviation between the technical bid and format, the details furnished in the format (as per annexure B) only are considered for evaluation.
28. Any communication / clarification regarding the tender shall be sent to the following
- E-mail: pgavictor@bhel.in***  
***Phone no. 0431-2577645***



**TECHNO COMMERCIAL BID**  
**TO BE SUBMITTED ALONG WITH PART – I (TECHNO COMMERCIAL BID)**

**ANNEXURE –B**

| S. NO | DESCRIPTION                                                                                                                                                                                   | BHEL REQUIREMENTS                                                                                                                                               | SUPPLIER CONFIRMATION / DEVIATION<br>(STRIKEOUT WHICHEVER IS NOT APPLICABLE) |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1     | VALIDITY                                                                                                                                                                                      | 90 DAYS FROM DATE OF TECHNICAL BID OPENING                                                                                                                      | NON DEVIATABLE                                                               |
| 2     | PRICE QUOTED                                                                                                                                                                                  | FOR-DESTINATION BHEL STORES / TRICHY                                                                                                                            | NON DEVIATABLE                                                               |
| 3     | LD CLAUSE                                                                                                                                                                                     | (For details please read S.No:07 of "Annexure – A")                                                                                                             | NON DEVIATABLE                                                               |
| 4     | RISK PURCHASE CLAUSE                                                                                                                                                                          | (For details please read S.No:07 of "Annexure – A")                                                                                                             | NON DEVIATABLE                                                               |
| 5     | ACCEPTANCE FOR SUPPLYING MATERIALS AS PER PLANT STANDARD INDICATED FOR EACH ITEM                                                                                                              |                                                                                                                                                                 | CONFIRM / NOT CONFIRM                                                        |
| 6     | DEIVERY SCHEDULE *                                                                                                                                                                            | Delivery terms will be full quantity within 6 weeks from the date of PO.                                                                                        | CONFIRM / NOT CONFIRM                                                        |
| 7     | PREVIOUS EXERIENCE                                                                                                                                                                            | Suppliers should enclose any one of the purchase order copy against their experience in supplying Non-Asbestos materials during past three years from Jan 2014. | ATTACHED / NOT ATTACHED                                                      |
| 8     | Whether the suppliers have been black listed by any PSU / Other units of BHEL.                                                                                                                |                                                                                                                                                                 | BLACK LISTED / NOT BLACK LISTED                                              |
| 9     | Offers from Manufacturers will be accepted, Offers from traders will summarily be rejected.                                                                                                   |                                                                                                                                                                 | MANUFACTURER / TRADER                                                        |
| 10    | Suppliers should submit the test certificate from any approved lab and samples shall be identified by BHEL/TPI but final acceptance will be given on the basis of test conducted at BHEL Lab. |                                                                                                                                                                 | ACCEPTED / NOT ACCEPTED                                                      |
| 11    | CONTACT DETAILS                                                                                                                                                                               | PERSON<br>NAME:<br>MOBILE NO:<br>EMAIL :                                                                                                                        |                                                                              |

\* Bidders are requested to adhere to BHEL Delivery schedule strictly.

SIGN AND SEAL OF AUTHORIZED PERSON

**ANNEXURE - N (For NEW VENDORS only)**

| Sl No | Details                                                                                                                                                                                                                                                                                                                                             | Document submission |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1     | Nature of ownership & relevant documents.<br>(Proprietorship-Professional Tax Regn & Municipal Regn; Partnership firm – Partnership Deed; Co-operative society – Society rules & bye laws ; Private/Limited Company – memorandum & Articles of Association)                                                                                         |                     |
| 2     | Manufacturing range & facilities:<br>• List down the product range & specification details.<br>• List of Manufacturing facilities/equipment's (including material handling facility)                                                                                                                                                                |                     |
| 3     | Licence details of the factory                                                                                                                                                                                                                                                                                                                      |                     |
| 4     | <ul style="list-style-type: none"> <li>• Permanent Account No</li> <li>• GST registration number</li> <li>• State sales Tax / TIN number</li> <li>• Excise duty registration number</li> <li>• Excise control code number</li> <li>• Service tax registration number</li> <li>• Regn number of category as per MSMED Act (If applicable)</li> </ul> |                     |
| 5     | If registered with any other BHEL unit<br>• Letter of registration with BHEL unit (If applicable)<br>• Proof of successfully executed or executing purchase orders                                                                                                                                                                                  |                     |
| 6     | Accreditation certificate for ISO:9001 / TOC of Quality System manual / ISO:14000 / OHSAS ISO 18000 (If applicable)                                                                                                                                                                                                                                 |                     |
| 7     | Balance Sheet for the last three years along with the audit report                                                                                                                                                                                                                                                                                  |                     |
| 8     | EXPERIENCE IN SUPPLYING Profile sealer or similar material TO VARIES INDUSTRIES<br>(All the new vendors should enclose a Purchase Order copy against their experience in the supply of Profile sealer or similar material to various industry)                                                                                                      |                     |

## ANNEXURE –I

### Certificate by Chartered accountant on Chartered Accountant's letter head

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

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

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

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

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

Or

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

Date:

(Signature)

Name:

Membership number:

Seal of Chartered Accountant:



# ANNEXURE - PQC

ENQ.NO:

|              |                                                                                                                                                                                                                                                                    |                                  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|              | <b>Material: NON ASBESTOS MATERIALS</b>                                                                                                                                                                                                                            |                                  |
|              |                                                                                                                                                                                                                                                                    |                                  |
| <b>Sl.No</b> | <b>PRE QUALIFICATION CRITERIA ---Points</b>                                                                                                                                                                                                                        | <b>Vendor to confirm</b>         |
| <b>01</b>    | <i>Acceptance for supplying NON ASBESTOS MATERIALS as per standard indicated for Each item</i>                                                                                                                                                                     | ACCEPTED / NOT<br>ACCEPTED       |
| <b>02</b>    | <i>Bidders have to confirm whether they have been black-listed / kept on hold / given Business holiday for a specified period by any Public Sector Undertaking or Government Departments/any other units of BHEL. (With reference to S.No.15 of Annexure – A).</i> | YES / NO                         |
| <b>03</b>    | <i>Offers from <b>Manufacturers</b> will only be accepted.<br/>Offers from traders will summarily be rejected.</i>                                                                                                                                                 | <b>Manufacturer /<br/>Trader</b> |
| <b>04</b>    | <i>Suppliers should enclose any one of the purchase order copy against their experience in supplying Non-Asbestos materials during past three years from Jan 2015.</i>                                                                                             | ENCLOSED / NOT<br>ENCLOSED       |

## NOTE:

**Offers meeting the above prequalification criteria points only will be evaluated further. Otherwise it will summarily be rejected.**

SIGN AND SEAL OF AUTHORIZED PERSON



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23292**  
Rev. No. **02**  
PAGE **1** OF **4**

**NON ASBESTOS COMPRESSED FIBRE JOINTING SHEETS**  
(HIGH PRESSURE STEAM & WATER)

**1. SCOPE**

This specification governs the quality of non-asbestos compressed fibre jointing sheets for high pressure steam and water.

**2. APPLICATION:**

The supplied material shall be suitable for use in steam turbines, boilers, thermal insulation, packing & sealing purposes at maximum operating pressures of 14.0 N/mm<sup>2</sup> and temperature of 450 C.

**3. DIMENSIONS AND TOLERANCES:**

3.1. Dimensions: the material should be supplied to the dimensions specified on the order.

3.2. Thickness: the thickness of the sheets shall preferably be selected from the following,  
0.40, 0.50, 0.75, 1.00, 1.50, 2.00, 3.00, 5.00 mm

3.3. Tolerance: Maximum permissible deviation on the nominal thickness of the sheets shall be as

| Nominal thickness<br>( mm) |                      | Permissible deviation from<br>nominal thickness $\pm$ mm | Max. Deviation between points not<br>more than 250 mm apart, $\pm$ mm |
|----------------------------|----------------------|----------------------------------------------------------|-----------------------------------------------------------------------|
| Above                      | Up to &<br>including |                                                          |                                                                       |
| -                          | 0.50                 | 0.05                                                     | 0.05                                                                  |
| 0.50                       | 1.00                 | 0.10                                                     | 0.10                                                                  |
| 1.00                       | 2.00                 | 0.15                                                     | 0.10                                                                  |
| 2.00                       | 3.00                 | 0.20                                                     | 0.15                                                                  |
| 3.00                       | 5.00                 | 0.20                                                     | 0.15                                                                  |

**4. MATERIAL**

The material used for manufacturing this Non Asbestos Compressed Fibre Jointing Sheets is glass, ceramic or aramid fibre with suitable high temperature binder material.

|                                                                                                                                                   |          |            |                                                                         |                  |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------------------------------------------------------------------------|------------------|------------------------------|
| <b>Revisions</b><br>1. Requirement of withstanding Flue gas with 6% sulphur deleted.<br>2. Parameters and test revised as per discussion with MM. |          |            | <b>Approved:</b><br>STANDARDS SECTION<br>ITS&S<br>HPBP. TIRUCHIRAPPALLI |                  |                              |
| Rev. No. <b>02</b>                                                                                                                                | Amd. No. | Reaffirmed | Prepared:                                                               | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>15-09-16</b>                                                                                                                               | Dt.      | Dt.        | <b>STANDARDS</b>                                                        | <b>STANDARDS</b> | <b>21.02.2014</b>            |



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23292**  
Rev. No. **02**  
PAGE **2** OF **4**

**5. FREEDOM FROM DEFECTS**

- The sheets shall have uniform texture, smooth on both sides and free from irregularities such as blisters tears and lumps.
- The sheets shall have square and evenly cut edges and they shall be smooth flat, free from cracks, as well as foreign mechanical inclusions.
- The Non-Asbestos Compressed Fibre jointing sheets shall be of uniform thickness and suitable for easy shearing. The variations in thickness in one sheet should not exceed 10%.

**6. TEST SAMPLE**

Supplier shall supply a test sample to BHEL for acceptance before regular supplies.

**7. PROPERTIES:**

For Properties and Conditions refer TABLE-1 attached herewith.

| Thickness(mm) | Material Code | **Weight/unit area(kg/m <sup>2</sup> ) |
|---------------|---------------|----------------------------------------|
| 0.4           | 220300280000  | -                                      |
| 0.5           | 220300290000  | -                                      |
| 0.75          | 220300440000  | -                                      |
| 1             | 220300310000  | -                                      |
| 1.5           | 220300700000  | 2.85                                   |
| 2             | 220300300000  | 3.8                                    |
| 3             | 220300150000  | 5.7                                    |
| 5             | 220300020000  | 5.75                                   |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per square meter.*

**8. TYPE APPROVAL**

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





**PLANT PURCHASING  
SPECIFICATION  
HPBP-TIRUCHIRAPPALLI**

**TP 23292**  
Rev. No. **02**  
PAGE **3** OF **4**

**9. TEST CERTIFICATES.**

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

**TP 23292**-Rev No 01: Non-Asbestos Compressed Fibre Jointing Sheets for high pressure steam and water applications

BHEL Order No.  
Manufacturer's /Supplier's Name  
Trade mark , if any  
Batch/ Lot No.  
Date of manufacture  
Quantity supplied  
Test results of clause 3 and TABLE -1

**10. PACKING AND MARKING**

Unless otherwise stated, the material shall be supplied either flat or in rolls suitably packed to prevent damages during transit.

Manufacturer's name and grade shall be clearly marked on a piece of 300 x 300 mm cut from any position of the sheet.

Each package shall be legibly marked with following information,

**TP 23292**-Rev No 01: Non Asbestos Compressed Fibre Jointing Sheets for high pressure steam and water applications

BHEL Order No.  
Manufacturer's /Supplier's Name  
Trade mark , if any  
Batch/ Lot No.  
Date of manufacture  
Quantity supplied



**PLANT PURCHASING  
SPECIFICATION  
HPBP-TIRUCHIRAPPALLI**

TP 23292

Rev. No. 02

PAGE 4 OF 4

**TABLE – 1**

| SI No | Characteristic                                                                                              | Requirement                                                           | Method of Test                                                                                                                                      |
|-------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Material (preferable. Better material meeting physical properties may be used. But must be certified in TC) | Glass, ceramic or aramid fibre with suitable high temperature binder. | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2     | Density gm/CC                                                                                               | 1.57 to 2.20                                                          | ASTM C1185 <sup>#</sup>                                                                                                                             |
| 3     | Tensile Strength<br>a) 0.4 to 1.0 mm thick<br>b) Above 1 mm thick                                           | 14 N/mm <sup>2</sup> minimum                                          | ASTM F 152 <sup>#</sup>                                                                                                                             |
| 4     | Compressibility %                                                                                           | 6-14                                                                  | ASTM F36 <sup>#</sup>                                                                                                                               |
| 5     | % Recovery                                                                                                  | 40 minimum                                                            | ASTM F36 <sup>#</sup>                                                                                                                               |
| 6     | Water Absorption - % increase in mass. Duration – 24 hrs                                                    | 10 max.                                                               | ASTM C1185 <sup>#</sup>                                                                                                                             |
| 7     | Loss of ignition at 500 °C ± 5 °C. Duration – 1 hr                                                          | 30 % max                                                              | ASTM F495 <sup>#</sup>                                                                                                                              |
| 8     | Flexibility Test (after accelerated ageing)                                                                 | No sign of cracking                                                   | ASTM C1185/ASTM F147 <sup>#</sup>                                                                                                                   |
| 9     | Stress relaxation – residual Stress                                                                         | 23 N/mm <sup>2</sup> minimum                                          | ASTM 6147/BS 7531 <sup>#</sup>                                                                                                                      |
| 10    | Moisture content 105 °C ± 5°C                                                                               | 2 max                                                                 | ASTM C1185 <sup>#</sup>                                                                                                                             |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23293**  
Rev. No. **02**  
PAGE **1** OF **4**

**NON ASBESTOS COMPRESSED FIBRE JOINTING SHEETS**  
( MEDIUM PRESSURE STEAM,WATER& OIL)

**1. SCOPE**

This specification governs the quality of non-asbestos compressed fibre jointing sheets for medium pressure steam, water and oil.

**2. APPLICATION:**

The supplied material shall be suitable for use with steam, water and oil in steam turbines and boiler applications at maximum operating pressures of 7.0 N/mm<sup>2</sup> and temperature of 425°C.

**3. DIMENSIONS AND TOLERANCES:**

3.1. Dimensions: The material should be supplied to the dimensions specified on the order.

3.2. Thickness: The thickness of the sheets shall preferably be selected from the following,  
0.40,0.50,0.75,1.00,1.50,2.00,3.00 mm

3.3. Tolerance: Maximum permissible deviation on the nominal thickness of the sheets shall be as

| Nominal thickness<br>( mm) |                     | Permissible deviation from<br>nominal thickness ± mm | Max. Deviation between points not<br>more than 250 mm apart, ± mm |
|----------------------------|---------------------|------------------------------------------------------|-------------------------------------------------------------------|
| Above                      | Up to&<br>including |                                                      |                                                                   |
| -                          | 0.50                | 0.05                                                 | 0.05                                                              |
| 0.50                       | 1.00                | 0.10                                                 | 0.10                                                              |
| 1.00                       | 2.00                | 0.15                                                 | 0.10                                                              |
| 2.00                       | 3.00                | 0.20                                                 | 0.15                                                              |

**4. MATERIAL**

The material used for manufacturing this Non Asbestos Compressed Fibre Jointing Sheets is glass, ceramic or aramid fibre with suitable high temperature binder material.

**Revisions**

- Requirement of withstanding Flue gas with 6% sulphur deleted.
- Parameters and test revised as per discussion with MM.

**Approved:**

STANDARDS SECTION  
ITS&S  
HPBP, TIRUCHIRAPPALLI

|                     |          |            |                  |                  |                              |
|---------------------|----------|------------|------------------|------------------|------------------------------|
| Rev. No. <b>02</b>  | Amd. No. | Reaffirmed | Prepared:        | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>15-09-16</b> | Dt.      | Dt.        | <b>STANDARDS</b> | <b>STANDARDS</b> | <b>21.02.2014</b>            |



**PLANT PURCHASING  
SPECIFICATION**  
HPBP TIRUCHIRAPPALLI

**TP 23293**  
Rev. No. **02**  
PAGE **2** OF **4**

**5. FREEDOM FROM DEFECTS**

- The sheets shall have uniform texture, smooth on both sides and free from irregularities such as blisters tears and lumps.
- The sheets shall have square and evenly cut edges and they shall be smooth flat, free from cracks, as well as foreign mechanical inclusions.
- The Non-Asbestos Compressed Fibre Jointing Sheets shall be of uniform thickness and suitable for easy shearing. The variations in thickness in one sheet should not exceed 10%.

**5. TEST SAMPLE**

Supplier shall supply a test sample to BHEL for acceptance before regular supplies.

**6. PROPERTIES:**

Properties and conditions refer TABLE-1 attached herewith.

| Thickness(mm) | Material Code | **Weight/unit area(kg/m <sup>2</sup> ) |
|---------------|---------------|----------------------------------------|
| 0.4           | 220300320000  | -                                      |
| 0.5           | 220300330000  | -                                      |
| 0.75          | 220300340000  | -                                      |
| 1             | 220300350000  | -                                      |
| 1.5           | 220300360000  | -                                      |
| 2             | 220300370000  | -                                      |
| 3             | 220300450000  | -                                      |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per square meter.*

**8. TYPE APPROVAL:**

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





**PLANT PURCHASING**  
**SPECIFICATION**  
HPBP TIRUCHIRAPPALLI

**TP 23293**  
Rev. No. **02**  
PAGE **3** OF **4**

**9. TEST CERTIFICATES.**

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

**TP 23293**-Rev No 01: Non-asbestos Compressed Fibre Jointing Sheets for medium pressure steam, water and oil applications

BHEL Order No.  
Manufacturer's /Supplier's Name  
Trade mark , if any  
Batch/ Lot No.  
Date of manufacture  
Quantity supplied  
Test results of clause 3 and TABLE-1

**10. PACKING AND MARKING**

Unless otherwise stated, the material shall be supplied either flat or in rolls suitably packed to prevent damages during transit.  
Manufacturer's name and grade shall be clearly marked on a piece of 300 x 300 mm cut from any position of the sheet.  
Each package shall be legibly marked with following information,

**TP 23293**-Rev No 01: Non-Asbestos Compressed Fibre Jointing Sheets for medium pressure steam, water and oil applications

BHEL Order No.  
Manufacturer's /Supplier's Name  
Trade mark , if any  
Batch/ Lot No.  
Date of manufacture  
Quantity supplied



**PLANT PURCHASING  
SPECIFICATION  
HPBP-TIRUCHIRAPPALLI**

TP 23293  
Rev. No. 02  
PAGE 4 OF 4

**TABLE 1**

| Sl No | Characteristic                                                                                                              | Requirement                                                           | Method of Test                                                                                                                                      |
|-------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Material (preferable. Better material meeting physical properties may be used. But must be certified in TC)                 | Glass, ceramic or aramid fibre with suitable high temperature binder. | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2     | Density gm/CC                                                                                                               | 1.57 to 2.20                                                          | ASTM C1185 #                                                                                                                                        |
| 3     | Tensile Strength<br>a) 0.4 to 1.0 mm thick<br>b) Above 1 mm thick                                                           | 9 N/mm <sup>2</sup> minimum<br>12.8 N/mm <sup>2</sup> minimum         | ASTM F 152 #                                                                                                                                        |
| 4     | Compressibility %                                                                                                           | 6-14                                                                  | ASTM F36 #                                                                                                                                          |
| 5     | Recovery %                                                                                                                  | 40 minimum                                                            | ASTM F36 #                                                                                                                                          |
| 6     | Water Absorption - % increase in mass - Duration – 24 hrs                                                                   | 10 max.                                                               | ASTM C 1185 #                                                                                                                                       |
| 7     | Loss of ignition at 475 °C ± 5 °C. Duration –1 hr                                                                           | 30 % max                                                              | ASTMF495 #                                                                                                                                          |
| 8     | Flexibility Test (after accelerated ageing)                                                                                 | No sign of crack                                                      | ASTM C1185/ASTM F147 #                                                                                                                              |
| 9     | Stress relaxation – residual Stress                                                                                         | 17.5 N/mm <sup>2</sup> minimum                                        | ASTM 6147/BS 7531 #                                                                                                                                 |
| 10    | Moisture content 105 °C ± 5°C                                                                                               | 2 max                                                                 | ASTM C1185 #                                                                                                                                        |
| 11    | Oil Ingress in thickness /mass for 5 hours at 150 ±2 °C                                                                     | 50% maximum                                                           | Standard Methods #                                                                                                                                  |
| 12    | Petrol Soaking<br>a) Increase in thickness for 5 hours at 20 °C to 30°C<br>b) Increase in mass for 5 hours at 20 °C to 30°C | 50 % maximum<br>30 % maximum                                          | Standard Methods #                                                                                                                                  |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23294**  
Rev. No.02  
PAGE 1 OF 4

**NON ASBESTOS COMPRESSED FIBRE JOINTING SHEETS**  
(LOW PRESSURE STEAM AND WATER)

**1. SCOPE:**

This specification covers the quality of Non asbestos compressed fibre jointing sheets for low pressure steam and water applications.

**2. APPLICATION:**

Suitable for use in boiler applications for thermal insulation, packing and sealing purposes up to a maximum operating pressure of 2.0 N/mm<sup>2</sup> and temperature of 350°C.

**3. DIMENSIONS AND TOLERANCES:**

3.1 Dimensions: The material shall be supplied to the dimensions specified on the order.

3.2 Thickness: The thickness of sheets shall preferably be selected from the following:  
0.40, 0.50, 0.75, 1.00, 1.50, 2.00, 3.00 mm.

3.3 Tolerances: Maximum permissible deviation on nominal thickness of sheets shall be as follows:

| Sl.No | Nominal Thickness (mm) |                  | Permissible deviation from nominal thickness (±)mm | Max. deviation on thickness between points not more than 300mm apart (±) mm |
|-------|------------------------|------------------|----------------------------------------------------|-----------------------------------------------------------------------------|
|       | Above                  | Upto & Including |                                                    |                                                                             |
| 1.    | -                      | 0.5              | 0.05                                               | 0.05                                                                        |
| 2.    | 0.5                    | 1.0              | 0.10                                               | 0.10                                                                        |
| 3.    | 1.0                    | 2.0              | 0.15                                               | 0.10                                                                        |
| 4.    | 2.0                    | 3.0              | 0.20                                               | 0.15                                                                        |

**4. MATERIAL:**

The material used for manufacturing this Non Asbestos Compressed Fibre Jointing Sheets shall be glass, ceramic or aramid fibre with suitable binder material meeting the temperature requirement as specified under application.

**Revisions**

- Requirement of withstanding Flue gas with 6% sulphur deleted.
- Parameters and test revised as per discussion with MM.

**Approved:**

STANDARDS SECTION  
ITS&S  
HPBP, TIRUCHIRAPPALLI

|                     |          |            |                  |                  |                              |
|---------------------|----------|------------|------------------|------------------|------------------------------|
| Rev. No. <b>02</b>  | Amd. No. | Reaffirmed | Prepared:        | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>15-09-16</b> | Dt.      | Dt.        | <b>STANDARDS</b> | <b>STANDARDS</b> | <b>21.02.2014</b>            |



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

TP 23294

Rev. No. 02

PAGE 2 OF 4

**5. FREEDOM FROM DEFECTS:**

The supplied sheets shall be of uniform texture, smooth on both sides without any crack and free from irregularities.

The sheets shall have square and evenly cut edges and they shall be smooth flat, free from cracks, as well as foreign mechanical inclusions.

The Non-Asbestos Compressed Fibre Jointing Sheets shall be of uniform thickness and suitable for easy shearing. The variations in thickness in one sheet should not exceed 10%.

**6. TEST SAMPLE:**

Supplier shall supply a test sample to BHEL for acceptance before regular supplies.

**7. PROPERTIES:**

For Properties and conditions refer TABLE-1 attached

| Thickness(mm) | Material Code | **Weight/unit area(kg/m <sup>2</sup> ) |
|---------------|---------------|----------------------------------------|
| 0.4           | 220300380000  | -                                      |
| 0.5           | 220300390000  | -                                      |
| 0.75          | 220300410000  | -                                      |
| 1             | 220300420000  | -                                      |
| 1.5           | 220300010000  | 2.9                                    |
| 2             | 220300200000  | 4.2                                    |
| 3             | 220300900000  | 6.3                                    |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per square meter.*

**8. TYPE APPROVAL:**

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





**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23294**  
Rev. No. **02**  
PAGE **3** OF **4**

**9. TEST CERTIFICATES:**

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

**TP 23294**-Rev.No.:01 Non asbestos compressed fibre jointing sheets for low pressure steam and water applications.

BHEL Order No.

Manufacturer's/Supplier's Name.

Trade Mark, if any.

Batch/Lot No.

Quantity supplied.

Test results of Clauses 3 and TABLE-1.

**10. PACKING AND MARKING:**

Unless otherwise stated, the material shall be supplied either flat or in rolls suitably packed to prevent damages during transit.

Manufacturer's name and grade shall be clearly marked on one corner of each sheet.

Each package shall be legibly marked with the following information:

**TP 23294**-Rev. No.01: Non asbestos compressed fibre jointing sheets for Low pressure steam and water applications.

BHEL Order No.

Manufacturer's/Supplier's Name.

Trade Mark, if any.

Batch/Lot No.

Date of manufacture.

Quantity supplied



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

TP 23294

Rev. No. 02

PAGE 4 OF 4

**TABLE -1**

| SI No | Characteristic                                          | Requirement                                                           | Method of Test                                                                                                                                      |
|-------|---------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Material of the fibre jointing                          | Glass, ceramic or aramid fibre with suitable high temperature binder. | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2     | Density gm/CC                                           | 1.57 to 2.20                                                          | ASTM C1185 #                                                                                                                                        |
| 3     | Tensile strength N/mm <sup>2</sup>                      | 6.7 min                                                               | ASTM F152 #                                                                                                                                         |
| 4     | Compressibility %                                       | 6 to 14                                                               | ASTM F 36 #                                                                                                                                         |
| 5     | Recovery %                                              | 40 min                                                                | ASTM F 36 #                                                                                                                                         |
| 6     | Water Absorption- % increase in mass. Duration – 24 hrs | 10 max                                                                | ASTM C1185 #                                                                                                                                        |
| 7     | Loss on ignition at 400 °C ± 5 °C<br>Duration – 1 hr    | 30% max                                                               | ASTM F495 #                                                                                                                                         |
| 8     | Flexibility Test (after accelerated ageing)             | No sign of crack                                                      | ASTM C1185/ASTM F147 #                                                                                                                              |
| 9     | Stress relaxation – residual Stress                     | 15 N/mm <sup>2</sup> minimum                                          | ASTM 6147/BS 7531 #                                                                                                                                 |
| 10    | Moisture content 105 °C ± 5°C                           | 2 max                                                                 | ASTM C1185 #                                                                                                                                        |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



**PLANT PURCHASING  
SPECIFICATION  
HPBP-TIRUCHIRAPPALLI**

**TP 23295**

Rev. No. **01**

PAGE **1** OF **4**

**COMPRESSED NON ASBESTOS FIBRE JOINTING SHEETS (GASKETS)**

**1. Scope :**

The specification governs the quality of oil resistant compressed non-asbestos fibre sheet manufactured from glass, ceramic or aramid fibre of the highest grade, suitably bonded with heat resisting compound. The material is suitable for use with oil.

**2. Application:**

Used in the manufacturing of pole washers, slot liners, other parts of electrical machines, control gear and flange joints etc.

**3. Preferred thicknesses (mm) : 0.25, 0.4, 0.5, 0.8, 1, 1.5, 2, 2.5 and 3.**

**4. Tolerance on thickness :**

Thickness x Width x Length of the sheet shall be stated on the order.

The maximum permissible variation from nominal thickness and the maximum deviation on thickness between points not more than 300 mm apart shall be as given below:

| Sl. No.   | Thickness (mm) |                   | Max. permissible variation from nominal thickness ( $\pm$ )mm | Max. deviation on thickness between points not more than 300mm apart ( $\pm$ ) mm |
|-----------|----------------|-------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------|
|           | Over           | Up to & Including |                                                               |                                                                                   |
| <b>1.</b> | -              | 0.5               | 0.05                                                          | 0.025                                                                             |
| <b>2.</b> | 0.5            | 1.0               | 0.08                                                          | 0.05                                                                              |
| <b>3.</b> | 1.0            | 1.5               | 0.13                                                          | 0.08                                                                              |
| <b>4.</b> | 1.5            | -                 | 0.18                                                          | 0.10                                                                              |

**5. Test Methods :**

Unless otherwise specified, the test shall be conducted in accordance with the relevant methods as adopted for asbestos.

**6. Test samples :**

Three sheets of ordered thickness and size 300 X 300 mm shall be supplied for testing and approval purposes.

|                                                                        |          |            |                                                                  |                  |                              |
|------------------------------------------------------------------------|----------|------------|------------------------------------------------------------------|------------------|------------------------------|
| Revisions<br>1. Parameters and test revised as per discussion with MM. |          |            | Approved:<br>STANDARDS SECTION<br>ITS&S<br>HPBP, TIRUCHIRAPPALLI |                  |                              |
| Rev. No. <b>01</b>                                                     | Amd. No. | Reaffirmed | Prepared:                                                        | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>15-09-16</b>                                                    | Dt.      | Dt.        | <b>STANDARDS</b>                                                 | <b>STANDARDS</b> | <b>21.02.2014</b>            |



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

TP 23295

Rev. No. 01

PAGE 2 OF 4

**7. Finish :**

The surface of the sheet shall be of uniform texture smooth on both sides, free from visible defects like blisters, loose fibres, wrinkles and dents. The sheets shall be free from foreign inclusions, which is detriment during use.

**8. Physical properties:**

For Properties refer TABLE – 1 attached

| Thickness(mm) | Material Code | **Weight/unit area(kg/m <sup>2</sup> ) |
|---------------|---------------|----------------------------------------|
| 0.25          | 220300430000  | -                                      |
| 0.4           | 220300220000  | -                                      |
| 0.5           | 220300230000  | -                                      |
| 0.8           | 220300240000  | -                                      |
| 1             | 220300270000  | -                                      |
| 1.5           | 220300180000  | 2.85                                   |
| 2             | 220300250000  | -                                      |
| 2.5           | 220300260000  | -                                      |
| 3             | 220300190000  | 5.7                                    |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per square meter.*

**9. Chemical properties :**

Sulphur content (Extractable): The total amount of sulphur content shall not exceed 50 ppm.

**10. Mechanical properties :**

- Tensile strength:

The average value of eight test results of fibre joining shall be not less than the maximum values as given below:

| Sl. No. | Nominal Thickness(mm) |                   | Tensile Strength Min           |                              |
|---------|-----------------------|-------------------|--------------------------------|------------------------------|
|         | Over                  | Up to & including | Longitudinal N/mm <sup>2</sup> | Transverse N/mm <sup>2</sup> |
| 1.      | -                     | 0.5               | 35                             | 14                           |
| 2.      | 0.5                   | 1.2               | 45                             | 16                           |
| 3.      | 1.2                   | -                 | 60                             | 18                           |

- Cutting and punching :

Shall be capable of being cut or punched without cracking or flaking.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

**TP 23295**

Rev. No. **01**

PAGE **3** OF **4**

**11. Test certificate:**

Three numbers of original test certificates shall be supplied with each consignment, giving the following information:

**TP 23295** Rev-00: Compressed Non Asbestos Fibre jointing Sheet.

BHEL Order No :

Batch/Lot No :

Test values obtained/ certificates for compliance for clause 8 and 10.

**12. Packing and Marking :**

The sheets shall be packed in wooden boxes suitably wrapped in water proof paper / canvas so as to protect them from moisture and mechanical damage.

Each package shall be marked with the following information.

**TP 23295** Rev-00: Compressed Non Asbestos Fibre jointing Sheet.

BHEL Order No :

Manufacturers or supplier's name & grade Batch/Lot No:

Thickness, width and Length.

Net volume.





**PLANT PURCHASING  
SPECIFICATION**  
HPBP-TIRUCHIRAPPALLI

TP 23295  
Rev. No. 01  
PAGE 4 OF 4

**TABLE -1**

| Sl No | Characteristic                                           | Requirement                    | Method of Test                                                                                                                                      |
|-------|----------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Material of the fibre jointing                           | Glass, ceramic or aramid fibre | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2     | Density gm/cc                                            | 1.5 to 2.0                     | ASTM C1185 #                                                                                                                                        |
| 3     | Tensile strength N/mm <sup>2</sup>                       | 10 min                         | ASTM F152 #                                                                                                                                         |
| 4     | Compressibility %                                        | 6 to 15                        | ASTM F 36 #                                                                                                                                         |
| 5     | % Recovery                                               | 50 min                         | ASTM F 36 #                                                                                                                                         |
| 6     | Water Absorption - % increase in mass. Duration – 24 hrs | 10 max.                        | ASTM C1185 #                                                                                                                                        |
| 7     | Loss on ignition at 200 °C ± 5 °C<br>Duration – 1 hr     | 30% max                        | ASTM F495 #                                                                                                                                         |
| 8     | Flexibility Test(after accelerated ageing)               | No sign of crack               | ASTM C1185/ASTM F147 #                                                                                                                              |
| 9     | Stress relaxation – residual Stress                      | 17.5 N/mm <sup>2</sup> minimum | ASTM 6147/BS 7531 #                                                                                                                                 |
| 10    | Moisture content 105 °C ± 5°C                            | 2 max                          | ASTM C1185 #                                                                                                                                        |
| 11    | Swelling Test in ASTM Oil No 3                           |                                |                                                                                                                                                     |
|       | 1) % Thickness increase                                  | 25 max                         | ASTM F 146 #                                                                                                                                        |
|       | 2) % Weight increase                                     | 20 max                         | ASTM F 146 #                                                                                                                                        |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



# PLANT PURCHASING SPECIFICATION HPBP - TIRUCHIRAPPALLI

TP 23296

Rev. No. 02

PAGE 1 OF 3

## CERAMIC FIBRE MILL BOARD

### 1. SCOPE

This standard covers asbestos free ceramic fibre mill board used as fire proof thermal insulating material.

### 2. MATERIAL

The material used for manufacturing this mill board is ceramic fibre base with suitable high temperature binder.

The mill board shall have uniform texture, smooth on both sides and free from irregularities such as blisters tears and lumps.

The mill board shall have square and evenly cut edges and they shall be smooth flat, free from cracks, as well as foreign mechanical inclusions.

The mill board should withstand the required temperature of steam or the flue gases of coal fired boilers containing 6% sulphur.

### 3. APPLICATION

Ceramic fibre mill board used as fire proof thermal insulating material.

### 4. TECHNICAL REQUIREMENTS

Properties and conditions refer table 1.

The ceramic fibre mill board shall be of uniform thickness and suitable for easy shearing. The variations in thickness in one sheet should not exceed 10%.

Tolerance on the size and thickness shall be as

**On size** :  $\pm 10$  mm

**On thickness**

Upto and including 2 mm :  $\pm 0.2$  mm

Above 2 mm :  $\pm 0.3$  mm

#### Revisions

- Description changed from silicon fibre to ceramic fibre.
- Parameters and test revised as per discussion with MM.

#### Approved:

STANDARDS SECTION  
ITS&S  
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|                     |          |            |                  |                  |                              |
|---------------------|----------|------------|------------------|------------------|------------------------------|
| Rev.No. <b>02</b>   | Amd. No. | Reaffirmed | Prepared:        | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>15-09-16</b> | Dt.      | Dt.        | <b>STANDARDS</b> | <b>STANDARDS</b> | <b>12.02.2014</b>            |



**PLANT PURCHASING  
SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

TP 23296

Rev. No. 02

PAGE 2 OF 3

| Thickness of mill board | Material code | **Weight kg/sq.m |
|-------------------------|---------------|------------------|
| 5                       | 220300600000  | 4.875            |
| 10                      | 220300060000  | 9.750            |
| 25                      | 220300070000  | 24.375           |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per meter length.*

**5. DESIGNATION**

Ceramic fibre mill board thickness 10 mm, according to this specification shall be designated on drawings as:

- i. Material specification column : 220300060000
- ii. Description column : Ceramic fibre mill-board 10 mm.
- iii. drawing number column : **TP 23296**

**6. ORDERING DESCRIPTION**

For placing indents, issuing enquiries and on purchase order, for 1 meter length and width, the ordering description given below shall be followed:

ASBESTOS FREE MILL BOARD 10 mm THICK, 1 m X 1 m,  
As per BHEL STANDARD **TP 23296**

**7. ADDITIONAL INFORMATION**

- i. Copies of this standard shall be enclosed along with purchase order.

**8. FINISH**

The millboards shall have uniform texture, smooth on both sides and free from irregularities such as blisters, tears and lumps.

\* The FT-IR report shall contain the following.

- A) Spectral Range
- B) Resolution
- C) Finger print

\*\* Standard methods along with applicable tests and acceptance standard applied at test canters shall be declared in TC.



**PLANT PURCHASING  
SPECIFICATION  
HPBP TIRUCHIRAPPALLI**

TP 23296

Rev. No. 02

PAGE 3 OF 3

**TABLE -1**

|    |                                                                                                             |                                                           |                                                                                                                                                     |
|----|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Material (preferable. Better material meeting physical properties may be used. But must be certified in TC) | Ceramic fibre base with suitable high temperature binder. | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2  | Density (gm/cc)                                                                                             | 0.5 to 1                                                  | ASTM C1185 #                                                                                                                                        |
| 3  | Moisture at 105°C ± 5 °C                                                                                    | 2 max                                                     | ASTM C1185 #                                                                                                                                        |
| 4  | Loss on ignition at 550°C ±5°C after exposure for 30 minutes                                                | 20% max                                                   | ASTM F495 #                                                                                                                                         |
| 5  | Continuous service temperature                                                                              | 450 °C                                                    | -----                                                                                                                                               |
| 6  | Maximum resistance temperature                                                                              | 500 °C                                                    | -----                                                                                                                                               |
| 7  | pH of water extract                                                                                         | 7 to 8.5                                                  | Standard Method #                                                                                                                                   |
| 8  | Chloride content of water extract ppm                                                                       | 200max                                                    | Standard Method #                                                                                                                                   |
| 9  | Sulphur content of water extract ppm                                                                        | 50max                                                     | Standard Method #                                                                                                                                   |
| 10 | Longitudinal tensile strength N/mm <sup>2</sup>                                                             | 10 (max)                                                  | ASTM F152 #                                                                                                                                         |
|    | Transverse tensile strength N/mm <sup>2</sup>                                                               | 9 (max)                                                   | ASTM F152 #                                                                                                                                         |
| 11 | Shore hardness(A)                                                                                           | 55 to 65                                                  | Standard Method #                                                                                                                                   |
| 12 | Thermal conductivity at 800 °C (W/m °C)                                                                     | 0.17                                                      | ASTM F433 #                                                                                                                                         |
| 13 | Linear shrinkage % (max)                                                                                    | 3                                                         | Standard Method #                                                                                                                                   |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

TP 23297

Rev. No. 02

PAGE 1 OF 3

**CERAMIC FIBRE CLOTH**

**1. SCOPE**

This standard covers asbestos free ceramic fibre cloth.

**2. MATERIAL**

The material used for cloth is a ceramic fibre free from asbestos. The cloth shall have uniform texture, smooth on both sides and free from irregularities such as blisters tears and lumps.

**3. TECHNICAL REQUIREMENTS**

Refer Table-2 for technical requirements.

The cloth shall be fire resistant, vermin-proof and capable of withstanding required temperature.

Recommended thickness of cloth for BHEL's use shall be 2, 3 or 5 mm.

The cloth shall be supplied in rolls of nominal width 1 m and length 25 to 40 m.

**4. DESIGNATION**

Asbestos free ceramic fibre cloth, thickness 3 mm, according to this standard shall be designated on drawings as:

- i. Material specification column : 220300500000
- ii. Description column : Ceramic fibre cloth 3 mm.
- iii. Drawing number column : TP 23297

|                                                                                                                                                     |          |            |                                                                      |           |                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|----------------------------------------------------------------------|-----------|------------------------------|
| Revisions:<br>1. Plain Woven added in ordering description in addition to twill woven.<br>2. Parameters and test revised as per discussion with MM. |          |            | Approved:<br><br>STANDARDS SECTION<br>ITS&S<br>HPBP, TIRUCHIRAPPALLI |           |                              |
| Rev. No: 02                                                                                                                                         | Amd. No. | Reaffirmed | Prepared:                                                            | Issued:   | Dt. of 1 <sup>st</sup> issue |
| Dt. 15-09-16                                                                                                                                        | Dt.      | Dt.        | STANDARDS                                                            | STANDARDS | 12.02.2014                   |





**PLANT PURCHASING**  
**SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

TP 23297

Rev. No. 02

PAGE 2 OF 3

**5. ORDERING DESCRIPTION**

For placing indents, issuing enquiries and on purchase order, the ordering description given below shall be followed:

CERAMIC FIBRE CLOTH TWILL/**PLAIN** WOVEN 2 MM THICK, 1m X 25m, AS PER BHEL STANDARD **TP 23297**

**6. Thickness and weight**

| Recommended thickness | Density dry condition (gm/cm <sup>3</sup> ) | Material code | **Weight (kg/m <sup>2</sup> ) |
|-----------------------|---------------------------------------------|---------------|-------------------------------|
| 3 mm                  | 0.7-1.2                                     | 220300500000  | 2.85                          |

*\*\*weight indicated is approximate only. Vendor to provide actual weight per meter length.*

**7. ADDITIONAL INFORMATION**

- i. For procurement purpose, this standard shall be enclosed along with purchase order.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

TP 23297

Rev. No. 02

PAGE 3 OF 3

**TABLE-2**

|   |                                                                  |            |               |                                                                                                                                                     |
|---|------------------------------------------------------------------|------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Material of cloth                                                |            | Ceramic fibre | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2 | Density gm/cc (dry condition)                                    | 2mm thick  | 0.5 to 1.2    | ASTM C1185 #                                                                                                                                        |
|   |                                                                  | 3 mm thick | 0.5 to 1.2    | ASTM C1185 #                                                                                                                                        |
|   |                                                                  | 5 mm thick | 0.5 to 1.2    | ASTM C1185 #                                                                                                                                        |
| 3 | Chloride content max                                             |            | 50 ppm        | Standard method #                                                                                                                                   |
| 4 | Sulphur content max                                              |            | 50 ppm        | Standard method #                                                                                                                                   |
| 5 | Service Temperature                                              |            | 500 °C        | -----                                                                                                                                               |
| 6 | Resistance Temperature                                           |            | 550 °C        | Standard method #                                                                                                                                   |
| 7 | Loss on ignition at 600 °C ± 5 °C after exposure for 30 minutes. |            | 25% max       | ASTM F495 #                                                                                                                                         |
| 8 | Moisture content at 105 °C ± 5 °C                                |            | 2.5% max      | ASTM C1185 #                                                                                                                                        |
| 9 | Thermal conductivity at 800°C (W/m°C)                            |            | 0.17          | ASTM F433 #                                                                                                                                         |

The supplier shall ensure that the tensile strength of the fibre and cloth shall not be sacrificed due to use of non-asbestos material. Vendor to guarantee the above and the strength properties shall be certified on Test Certificate.

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.



**PLANT PURCHASING  
SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

**TP 23299**  
Rev. No. **02**  
PAGE **1** OF **3**

**CERAMIC FIBRE GLAND PACKINGS**  
**(Excluding those for Corrosive Acid Services)**

**1. SCOPE**

1.1 This specification covers free ceramic fibre gland packing.

**2. APPLICATION**

2.1 Suitable for flanged joints of ducts and fans for leakage prevention, valves, expansions provisions for refractory, thermal insulation, furnace joints, air heaters and doors in boiler

**3. DIMENSIONS & SIZES :**

Dimensions and sizes shall be as per table-1 of this standard. For technical parameters, refer to Table-2.

**4. DESIGNATION :**

Carbon Fibre / Ceramic Fibre gland packing of sizes 10 mm, square shape shall be designated as :

**ON DRAWING :**

- |                          |                         |
|--------------------------|-------------------------|
| 1. Description column    | : Packing Rope SQ 10 mm |
| 2. Drawing number column | : <b>TP 23299</b>       |
| 3. Material code column  | : 220300400000          |

**4.1 Ordering description**

For placing indents, issuing enquiries and on purchase order, the ordering description given below shall be followed.

Gland Packing carbon fibre/ceramic fibre, 6 mm round.

**5. SAMPLING AND ACCEPTANCE**

5.1 The density of packing rope shall be provided by vendor/supplier and shall be determined in dry condition.

**6. ADDITIONAL INFORMATION.**

6.1 For procurement purpose, this standard shall be enclosed along with purchase order.

|                                                                                                                                                                                                       |          |            |                                                                             |                  |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-----------------------------------------------------------------------------|------------------|------------------------------|
| <b>Revisions</b><br>1. Lubrication requirements specified in table-2 (Sl. No.9 & 10) deleted & Sl. No. re-numbered.<br>2. Parameters and test revised as per discussion with MM. 40 mm SQ rope added. |          |            | <b>Approved:</b><br><br>STANDARDS SECTION<br>ITS&S<br>HPBP, TIRUCHIRAPPALLI |                  |                              |
| Rev. No. <b>02</b>                                                                                                                                                                                    | Amd. No. | Reaffirmed | Prepared:                                                                   | Issued:          | Dt. of 1 <sup>st</sup> issue |
| Dt. <b>10-09-16</b>                                                                                                                                                                                   | Dt.      | Dt.        | <b>STANDARDS</b>                                                            | <b>STANDARDS</b> | <b>12.02.2014</b>            |



**PLANT PURCHASING**  
**SPECIFICATION**  
HPBP - TIRUCHIRAPPALLI

**TP 23299**  
Rev. No. **02**  
PAGE **2** OF **3**

**TABLE-1**

| SHAPE  | SIZE | MATERIAL CODE | **WEIGHT (KG)<br>PER METRE LENGTH |
|--------|------|---------------|-----------------------------------|
| Round  | 10   | 220300400000  | 0.08                              |
|        |      |               |                                   |
| Square | 6    | 220300160000  | 0.03                              |
|        | 8    | 220300170000  | 0.06                              |
|        | 10   | 220300030000  | 0.09                              |
|        | 12   | 220300050000  | 0.14                              |
|        | 15   | 220300080000  | 0.22                              |
|        | 20   | 220300040000  | 0.38                              |
|        | 40   | 220300460000  | 1.54                              |

**\*\*** - Weight indicated is approximate only. Vendor to provide actual weight per meter length.



**PLANT PURCHASING  
SPECIFICATION  
HPBP - TIRUCHIRAPPALLI**

**TP 23299**  
**Rev. No. 02**  
**PAGE 3 OF 3**

**Table-2 (Technical parameters)**

|    |                                                                |                                                     |                                                                                                                                                     |
|----|----------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Material of the Gland Packings                                 | Glass ply or Ceramic fibre                          | The supplier shall certify the product as asbestos free by doing the test methods like FT-IR, XRD, Microscopic or any other standard test methods.* |
| 2  | Density gm/cc (in Dry condition)                               | The density shall be indicated by vendor / supplier | ASTM C1185 #                                                                                                                                        |
| 3  | Chloride content max                                           | 50 ppm                                              | Standard Method #                                                                                                                                   |
| 4  | Sulphur content max                                            | 50 ppm                                              | Standard Method #                                                                                                                                   |
| 5  | Temperature resistance                                         | 450 °C Min                                          | ----                                                                                                                                                |
| 6  | Continuous service temperature                                 | 400 °C                                              | ----                                                                                                                                                |
| 7  | Loss on ignition at 500 °C $\pm$ 5 °C for 30 minutes by mass % | To be specified by the supplier                     | ASTM F495 #                                                                                                                                         |
| 8  | Moisture content at 105 °C $\pm$ 5 °C % by mass                | 2 max                                               | ASTM C1185 #                                                                                                                                        |
| 9  | The wire Dia of the reinforcement                              | 0.15 to 0.2 mm                                      | ----                                                                                                                                                |
| 10 | Reinforcement wire                                             | Inconel/SS 304 Grade                                | ----                                                                                                                                                |

- \* - Test Report shall be submitted by the vendor along with materials as a compliance certificate to confirm the material supplied is asbestos free.
- # - Standard Methods along with applicable test and acceptance standard applied at test centres shall be declared in TC. Other international standard testing methods are also valid.
- The compressibility, tensile strength of the fibre shall not be sacrificed due to use of non-asbestos material. Vendor may guarantee the above and these properties shall be certified by Vendor on Test Certificate.

A. Finish: The Gland packing shall be smooth and it shall not have torn-out threads.

B .The compressibility, tensile strength of fiber shall not be sacrificed due to use of non-asbestos material. Vendor to guarantee the above and these properties shall be certified by Vendor on Test Certificate