



BHEL GOINDWAL

TERMS AND CONDITIONS FOR
(Tender Enquiry No. 1415-143 Dated 15.12.2014 Due date 06.01.2015)
ITEM: O-Rings and Sealing Rings

PRE-QUALIFICATION TERMS

P1. Earnest Money Deposit (EMD)

- i. Bidders not registered with any unit of BHEL are required to deposit an amount of Rs. 5000/- as Earnest Money (EMD) by way of DD in favour of BHARAT HEAVY ELECTRICALS LIMITED, drawn on Punjab National Bank, State Bank of India, HDFC Bank, Union Bank, Allahabad Bank Payable at Goindwal Sahib or any other bank payable at Amritsar. Central/State PSUs/State owned Corporations are exempted from EMD, for which relevant documentary proof has to be submitted in the envelope of EMD. MSEs are also exempted from EMD. Necessary documents for MSE benefits as per tender should be submitted in part-I of tender.
- ii. EMD shall be forfeited if after opening the tender, the bidder revokes his tender within the validity period or increases his earlier quoted prices.
- iii. EMD shall be forfeited if the bidder does not commence the work within the period as per LOI/PO.
- iv. EMD submitted by all unsuccessful bidders shall be refunded normally within 15 days of finalisation of contract with successful bidders. For successful candidate the EMD will be refunded after the successful completion of contract.

**IF THE OFFER IS NOT ACCOMPANIED WITH ACCEPTANCE OF TERMS AND CONDITIONS,
IT SHALL BE CONCLUDED THAT ALL THE TERMS AND CONDITIONS ARE ACCEPTABLE
AND NO CLAIM WHATSOEVER SHALL BE ENTERTAINED LATER ON.**



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COMMERCIAL AND TECHNICAL TERMS

1. INVITING TENDERS

Sealed tenders in three parts; Part-I: EMD, Part II: Techno-commercial bid and Part-III: Price bid are hereby invited for supply of **O-Rings and Sealing Rings** as per applicable technical terms mentioned by BHEL. The relevant documents are attached with the Enquiry.

The three bids should be submitted in **separate sealed inner envelopes** duly mentioning the detail as follows:

Bid	Description	Superscription on envelope	Min documents to be submitted
Part-I	EMD envelop	PART-I: EMD for tender enquiry no. 1415-143 dated 15.12.2014	Draft payable at Goindwal Sahib/Proof of claiming exemption
Part-II	Pre-qualification & Techno-Commercial bid	PART-II: "Techno-Commercial Bid" Tender Enquiry no. 1415-143 dated 15.12.2014 Due date of opening: 06.01.2015 Sender:	1. Acceptance of all terms and conditions. 2. Un-priced (Prices not filled) format showing taxes and duties structure.
Part-III	Price bid	PART-III: "Price Bid" Tender Enquiry no. 1415-143 dated 15.12.2014 Sender:	Price bid duly filled prices in words also along with same taxes and duties as mentioned in un-priced bid.

PLEASE SEE AND FOLLOW THE CHECKLIST PROVIDED AT THE END

All the sealed envelopes should be put in an outer envelope clearly mentioning Tender Enquiry No., item description as "O-Rings and Sealing Rings" and due date of opening and time.

Part-I: EMD should contain:

DD of requisite amount payable at Goindwal Sahib only **OR** if exemption is sought, proper documents as required and explained in Pre-qualification Para P1.

Part-II: Techno-Commercial bid should contain

The details/data/ information/ supporting documents as per requirement of Pre-Qualification Bid.

- a) Acceptance of Techno-Commercial terms and conditions should be attached next. This can be attached either by signing each page of terms and conditions or a confirmation statement.
Any deviation proposed by bidder shall be considered by BHEL at its own discretion; and if finally considered, shall carry loading factor at the discretion of BHEL.
- b) Unprice bid, filling all other details except **prices**.

Sealed quotations shall reach by 1500 Hrs on due date. Part-I shall be opened on due date at 1530 Hrs. Based on evaluation of pre-qualification and/or techno-commercial offers, Price bids of bidders who qualify from pre-bid qualification and techno-commercial evaluation shall be opened. Date of opening of Price bid shall be informed to all successful bidders.

Part III: Price Bids:

Price quotation format shall be as attached.

Present rate of VAT/CST & Excise duty + any cess on ED shall be mentioned in the table as %. All duties shall be paid extra. However, the comparison among bidders shall be done on the basis of quoted rates converted to "Total landed cost to BHEL". Duties shall be payable extra against ED Gate Pass valid for CENVAT benefit.

Price quoted shall be firm and not subject to any escalation during the contract.

Price should be quoted on FOR Destination Goindwal Sahib basis. If not mentioned, it shall be concluded that the offer is on FOR Destination Goindwal Sahib basis. In case rates are Ex-Works basis, loading of expenses i.e., freight, transit insurance shall be done by BHEL at its discretion to arrive at Landed prices. Comparison shall be done at Landed cost to BHEL.



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Tenders should be free from CORRECTION AND ERASURES. Corrections if any must be attached. Sealed Tenders can be dropped in the tender box labeled as 'Tender box for MM contracts'. This tender box is located at the entrance of Admin block BHEL Goindwal. For any clarification you can contact on email id tendermm@bheliyp.in. FAX (01858 224061)/E-mail (tendermm@bheliyp.in) offers received in time shall be considered only when such offers are complete in all respects. Tender may be handed over to Sh Harpreet Rai/ Head MM or Sh Pranshu in case of bulky tenders.

Fax (01859-222061) / E-Mail (tendermm@bheliyp.in) offers received in time shall be considered only when such offers are complete in all respects.

2. VALIDITY OF OFFERS:

The offers shall be kept open for acceptance for **60 days** from the date of opening of the tender. In case of extension of tender opening date, the validity shall be suitably revised.

3. SCOPE OF SUPPLY

Material shall be supplied as per the applicable latest Technical Delivery Conditions (TDC)/ Material Standard requirements/BPS/Drawing and other requirement as given in the Purchase Order. National & International material Standards shall have to be arranged by vendors themselves.

4. REPLACEMENT OF REJECTION:

If the material is rejected due to defective workmanship during inspection or at the time of actual use, within the guarantee period, the rejected material shall be replaced by the supplier. Corresponding quantity shall be treated as unsupplied against respective purchase order till replacement is received at BHEL. If the material is found defective and rejected during use for which payment has already been released the rejected quantity shall be supplied free of cost by the vendor within a month of intimation of the rejection by BHEL.

5. DELIVERY SCHEDULE:

Supplies shall be affected and completed as per schedule mentioned in the POs. We require material ***within two months from PO***. Further, BHEL may release delivery schedule from time to time based upon our requirement. Vendor shall be required to complete the order as per the BHEL schedule requested.

6. ACCESS TO MANUFACTURING PREMISES:

While Purchase Orders placed on the vendor are under execution, authorized representatives of BHEL shall be allowed free access to the manufacturing facilities for the purpose of inspection or monitoring the progress of purchase orders. This access will also be extended to representatives of BHEL's customers accompanying the authorized representative/s of BHEL (which shall be intimated in advance), if our contractual requirements with our customers call for the same.

7. TERMS OF PAYMENT:

- a. Due payment against supplies received shall be due after 30 days of receipt and acceptance of material and shall be paid within next 15 days period. In case of deviation, loading shall be done at SBI base rate + 6% at time of opening of Part 1.
- b. Documents to be submitted
 - i. Commercial invoice (in duplicate)
 - ii. Excise invoice (in duplicate) valid for claiming CENVAT credit
 - iii. Original VAT invoice valid for claiming input tax credit, if applicable
 - iv. Material Test Certificates (MTC) and
 - v. Compliance Certificate.
- c. Above documents should include your Registration numbers such as ECC no, PAN no, CST no, TIN/ VAT nos. etc.



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- d. It is mandatory to mention proper material codes in the invoices and separate invoices to be raised for different POs.
- e. *BHEL releases payment through EFT mode ONLY. Necessary details may please be submitted by filling required format before release of payment.*

8. INSPECTION:

1. All required tests shall be carried out by vendor at no extra cost. Relevant TCs shall accompany the consignment. **BHEL may decide to inspect itself/arrange third party at vendors' works itself as and when necessary with prior intimation to the vendor.** No additional charges shall be claimed for such inspections.
2. Latest applicable revisions of standards/procedures to be referred.
3. Material Test Certificates (MTC), Inspection reports and Compliance/Guarantee Certificate are to be provided along with the supplies.
4. Any inspection carried out before supply by vendor/incoming stage at BHEL notwithstanding, if any defect/non-conformity is noted during processing, the same shall be attended/replaced by vendor at no extra cost.

9. COUNTER OFFERS AND LOADING CRITERIA

BHEL reserves the right to negotiate with L1 or re-float the tender in case the quoted prices are not acceptable.

BHEL will give counter-offer to MSE vendors falling in the L1+15% range only. This counter offer will be given only in the case where the L1 bidder is not MSE. If L1 bidder is MSE, no counter offer will be given. This counter offer will be given as per below criteria:

1. Tender quantity shall be divided in the proportion 80:20 (80% for L1 and 20% for MSE's) in case the L1 vendor is not a MSE subject to following conditions:
 - I. In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be offered 20% quantity of tender quantity at L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise. In case of more than one such Micro and Small Enterprise, the supply shall be shared equally. If there are more than one MSE in the price band of L1+15% to whom the offer has been sent and some of them reject the offer then the remaining quantity shall be distributed equally to the MSEs accepting L1 prices.
 - II. 20% from the 20% quantity (i.e. 4% of the tender quantity) offered to the MSE's shall be reserved for MSE's owned by SC/STs. In event of failure of such Micro and Small Enterprises to participate in tender process or meet tender requirements and L1 price, 4 per cent quantity for Micro and Small Enterprises owned by SC/ST entrepreneurs shall be met from other Micro and Small Enterprises.
 - III. In case any MSE vendor does not accept the counter offer, the above mentioned 20% quantity shall be offered to L1.
 - IV. If there is no MSE in the Price band of L1+15% then the 20% quantity shall be offered to L1 vendor.
 - V. If other suppliers (other than L1) are not under MSE then 100% qty will be offered to L1 supplier.
2. In case if the L1 vendor is MSE then quantity shall be provided as 96 % for L1, and 4% tender quantity shall be offered to the MSEs owned by SC/ST's in the price band of L1+15%. In event of failure of such Micro and Small Enterprises to participate in tender process or meet tender requirements and L1 price, 4 per cent sub-target for procurement earmarked for Micro and Small Enterprises owned by SC/ST entrepreneurs shall be met from L1 vendor.

All above offered qty are subject to acceptance of L1 rates.



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In case of non- acceptance of counter offer by any vendor after above applicable provisions the whole quantity would be offered to L1 vendor.

This ratio can be altered in case of any failure on part of L1 regarding delivery commitment/quantity/quality of material.

All above mentioned preferences shall be given to MSEs and SC/STs only on the submission of documentary evidence.

3. In case the L1 vendor is a MSE owned by a SC/ST then the 100% qty will be offered to L1 supplier.

If there are more than one MSE vendor falling in the range of L1 + 15% than the lowest bidder will be given the counter offer first; on his non acceptance other MSE bidder falling in L1+15% range will be approached.

If there is no MSE bidder in the L1+15% range or no MSE vendor accepts the counter offer than the whole quantity will be offered to L1 bidder.

Before giving the counter offer to MSE bidder, his MSE nature will be verified according to the documents mentioned in the clause 24. If documents will not be in line with clause 24 then no counter offer will be given.

10. GUARANTEE:

Vendor shall give a guarantee of 18 months from the date of dispatch or 12 months from use, against manufacturing defects, whichever is earlier. In case of non-acceptance of this term bid will be rejected.

11. PENALTY FOR LATE DELIVERY:

'Time is the essence of the contract'. As such, delivery of goods specified in the Purchase Orders released under the scope of this contract shall be made within the time limit prescribed therein. Penalty for late delivery will be applicable @ 0.5% per week or part thereof subject to a maximum of 10.0 %.

If any vendor does not accept LD ½% of the supply for each week of delay subject to a maximum of 5%, their offer is likely to be rejected by BHEL and the price bid shall not be opened. Bidders accepting for 10% LD shall not be loaded on account of LD. However bidders who offer any other % LD [between 5% to 10%] shall be loaded @ % deviation from 10% and their accepted %.e.g. If a bidder accepts for a max of 7% LD only, their offer would be loaded @ 3% (10 - 7 = 3).

BHEL reserves the right to receive or not receive the material after the due date of PO.

12. RISK PURCHASE:

BHEL shall be entitled to terminate the contract/pending POs at any stage and to purchase elsewhere at the risk and cost of the vendor, either the whole of the goods or any part thereof which the supplier has failed to deliver or dispatch within the time stipulated as aforesaid. Vendor shall be liable for the losses, which BHEL may sustain by way of such risk purchase in addition to aforesaid penalty for delayed delivery.

13. SUB-CONTRACT:

The purchase order or any part thereof shall not be sub-contracted, assigned or otherwise transferred without previously obtaining the BHEL's consent in writing.

14. FORCE MAJEURE:

If at any time during the continuance of the contract, the performance in which or in any part by either party of any obligations under the contract are prevented or delayed by reason of any war, hostilities, acts of public enemy, civil commotion, sabotage, fires, explosions, epidemics, quarantine restrictions, or acts



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of God (hereinafter referred to "an events" then provided the notice of happening of any such event is given by either party to the other within 21 days of the occurrence thereof, neither party shall by reason of such event be entitled to terminate the contract nor shall either party have any claim for damages against the other in respect of such non-performance and delay in performance and delivery under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist. If the performance in whole or part of any obligation under the contract is prevented or delayed by reason of any such event, claims of extension of time shall be granted for periods considered reasonable by BHEL subject to prior notification by the vendor to BHEL of the particulars of the event and supply to BHEL, if required, of any supporting evidence. Any waiver of time in respect of partial installment shall not be deemed a waiver of time in respect of remaining deliveries.

15. **DISPUTES:**

In the event of any dispute and/or difference arising between the Vendor and BHEL as to interpretation and/or execution of the contract and/or the respective rights and liabilities of the parties, such disputes and/or differences shall be referred to the sole arbitrator nominated by BHEL. The provisions of the Indian Arbitration Act and the rules there under shall apply to such arbitration. The award passed by the arbitrator shall be final and conclusively binding on all the parties.

16. **JURISDICTION:**

The court of the place from where the purchase order is issued during the contractual period shall alone have jurisdiction to decide any dispute arising out of or in connection with the purchase order.

17. **MSME & MSE Certification:**

If the bidder is registered as any of Micro/Small/Medium enterprise as defined in Micro Small and Medium Enterprises Development Act, 2006; a copy of registration certificate to be attached. MSE's shall be given preferences as described in "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" subject to the submission of proper documentary evidence (i.e. District Industries Centers or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts and Handloom or any other body specified by Ministry of Micro, Small and Medium Enterprises) with quotation. "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" document can be downloaded from link <http://dcmsme.gov.in/FinalPressorder.pdf> and can also be collected from the office of Manager/MM IVP Goindwal. Below Clause 24 need to be followed for this required documents for MSE benefits.

18. **CLARIFICATIONS:**

The correspondence exchanged against the tender from both tenderer and BHEL through email are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business. Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

19. **LOI (Letter of Intent)**

BHEL may issue LOI prior to the PO for any reason whatsoever. The LOI in such cases is to be treated as PO for all practical purposes and all the Terms & Conditions of the tender shall be applicable from the date of issue of LOI.



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20. GENERAL:

- a) BHEL will not be bound by any power of attorney granted by the vendors or by changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the vendor concerned.
- b) BHEL reserves the right to extend the due date of opening, which shall be informed. Validity of offer shall be deemed to be revised accordingly.
- c) BHEL reserves the right to accept or reject any part or whole of the tender of a bidder by assigning a valid reason thereof. BHEL reserves the right to cancel the tender without assigning any reason thereof and without any obligation before any commitment.
- d) If possible, please submit soft copy of price quotation [copied on a blank CD of standard make] put in the sealed offer.
- e) Acceptance of all terms and conditions, in the form of signed copy of T&C or confirmation separately written, shall be submitted along with quotation. If nothing is mentioned, it shall be concluded that terms and conditions are acceptable.

21. BANNED FIRMS:

The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website www.bhel.com.

22. SUPPLIER REGISTRATION:

Bidders, who are not currently on registered list of BHEL IVP Goindwal Sahib, may submit duly filled format for "Vendor Registration form". The form can be downloaded from our website www.bhel.com or can be requested at hrai@bhelivp.in or amit@bhelivp.in. Registered vendors with BHEL IVP GWL have to mention their vendor code. Registered vendors with any other unit of BHEL are also required to mention the vendor code given by respective BHEL unit along with photocopy of latest POs from BHEL unit. Techno-commercially qualified bidders may be asked for submission of supplier registration form for getting registered with BHEL, IVP, Goindwal.

23. WORDS AND FIGURES

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

24. PREFERENCES FOR MSE's:



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Preferences as mentioned in "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" shall be given to Micro and Small enterprises.

Main points which are mentioned in the above order are as follows:

- 20% Procurement of the tender value shall be made from MSE (Micro, Small Enterprises) firms.
- 4% from the above mentioned 20% procurement quantity shall be procured from MSE's owned by SC /ST's. Failure to participate by any MSE owned by SC/ST's this 4% quantity shall be procured from other MSEs.
- EMD shall be exempted for MSE's. All these benefits are subject to production of all statutory documents
- In tender, participating Micro and Small Enterprises quoting price within price band of L1+15 per cent shall also be allowed to supply a portion of requirement by bringing down their price to L1 price in a situation where L1 price is from someone other than a Micro and Small Enterprise and such Micro and Small Enterprise shall be allowed to supply up to 20 per cent of total tendered value. In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).
- Below are the documents which need to be submitted for proving the MSE nature:

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



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Annexure - I

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-11) dtd:.....
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 MSMED
Act, 2006:
Rs.....Lacs

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / 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



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CHECKLIST AND SEQUENCE OF DOCUMENTS TO BE SUBMITTED IN THREE PARTS
BIDS

S. No.	Document	Status [pl. check the following for ready ref]
1.	EMD envelope	Sealed envelope marked as Part-I "EMD envelope" DD submitted/ proof of claiming exemption submitted
2A.	Second envelope should contain (1) Techno-Commercial bid (2) Un-price bid (item prices not to be mentioned) (3) MSE certificate or annex 1 if any	Sealed envelope marked as Part-II "Pre-Qualification & Techno-Commercial Bids" Yes 1. Acceptance of techno-commercial terms. 2. Un-price bid attached. 3. Prequalifying details Envelop sealed.
3.	Price Bid sealed in separate envelope super scribing tender enquiry detail, due date of opening, sender address	Sealed envelope marked as Part-III "Price Bid" Yes, sealed
4.	All three sealed envelopes put in an outer envelope mentioning all details like Enquiry no., description, due date	Yes

BHARAT HEAVY ELECTRICALS LTD
IVP, GOINDWAL SAHIB
UNPRICE BID ANNEXURE

Annexure to Enquiry No. 1415-143 Dated 15.12.2014 Due Date of submitting quotations 06.01.2015

S.No.	Matl Code	Matl Description	Drg No./ Rev no.	Qty Reqd	Unit	Quoted Yes/No
1	964524890000	O RING-3200	3V320009715/02	20	NO	
2	964561660000	O RING-3204	3V320409715/02	15	NO	
3	964563200000	O RING-3208	3V320809715/01	12	NO	
4	964652630000	O RING-3245	3V324509715/00	45	NO	
5	964653770000	SEALING RING-5107	4V510790153/02	15	NO	
6	964652150000	SEALING RING-GRA (550-C900-RHI	3V320824522/01	10	NO	
7	964652140000	SEALING RING-GRA (700-C500/C90	3V320424522/01	30	NO	
8	964652120000	SEALING RING-GRA(450&500-C500/	3V320024522/01	20	NO	
9	964652240000	SEALING RING-GRAFOIL-3245	4V324526688/00	70	NO	
10	964563230000	SEALING RING-RUB (550-C900-RHI	4V320806731/01	20	NO	
11	964561680000	SEALING RING-RUB (700-C500/C90	4V320506583/01	15	NO	
12	964653640000	SEALING RING-RUB (750-C500/C90	4V324526842/00	75	NO	
13	964561650000	SEALING RING-RUB(450&500-C500/	4V320006575/02	15	NO	

Excise Duty rate (mention in % if applicable, mention as **NIL** if not applicable) *Pl. clearly mention*

Cess on ED rate (mention in % if applicable) **Extra@** *Pl. clearly mention*

CST (%) **Extra@** *Pl. clearly mention*

VAT (%) **Extra@** *Pl. clearly mention*

Validity of offers (**As per BHEL terms 60 days validity is required**) *Pl. clearly mention*

Delivery terms (FOR Goindwal Sahib) *Pl. clearly mention*

MSE Firm (YES/NO) *Pl. clearly mention*

Please note that nothing will be considered other than prices in the price bid.

Authorised signatory with seal

BHARAT HEAVY ELECTRICALS LTD
IVP, GOINDWAL SAHIB
PRICE BID ANNEXURE

Annexure to Enquiry No. 1415-143 Dated 15.12.2014 Due Date of submitting quotations 06.01.2015

S.No.	Matl Code	Matl Description	Drg No./ Rev no.	Qty Reqd	Unit	Unit Price, Rs.	
						In Figures	In Words
1	964524890000	O RING-3200	3V320009715/02	20	NO		
2	964561660000	O RING-3204	3V320409715/02	15	NO		
3	964563200000	O RING-3208	3V320809715/01	12	NO		
4	964652630000	O RING-3245	3V324509715/00	45	NO		
5	964653770000	SEALING RING-5107	4V510790153/02	15	NO		
6	964652150000	SEALING RING-GRA (550-C900-RHI	3V320824522/01	10	NO		
7	964652140000	SEALING RING-GRA (700-C500/C90	3V320424522/01	30	NO		
8	964652120000	SEALING RING-GRA(450&500-C500/	3V320024522/01	20	NO		
9	964652240000	SEALING RING-GRAFOIL-3245	4V324526688/00	70	NO		
10	964563230000	SEALING RING-RUB (550-C900-RHI	4V320806731/01	20	NO		
11	964561680000	SEALING RING-RUB (700-C500/C90	4V320506583/01	15	NO		
12	964653640000	SEALING RING-RUB (750-C500/C90	4V324526842/00	75	NO		
13	964561650000	SEALING RING-RUB(450&500-C500/	4V320006575/02	15	NO		

Taxes and other conditions will be as mentioned in Unprice Bid

Authorised signatory with seal

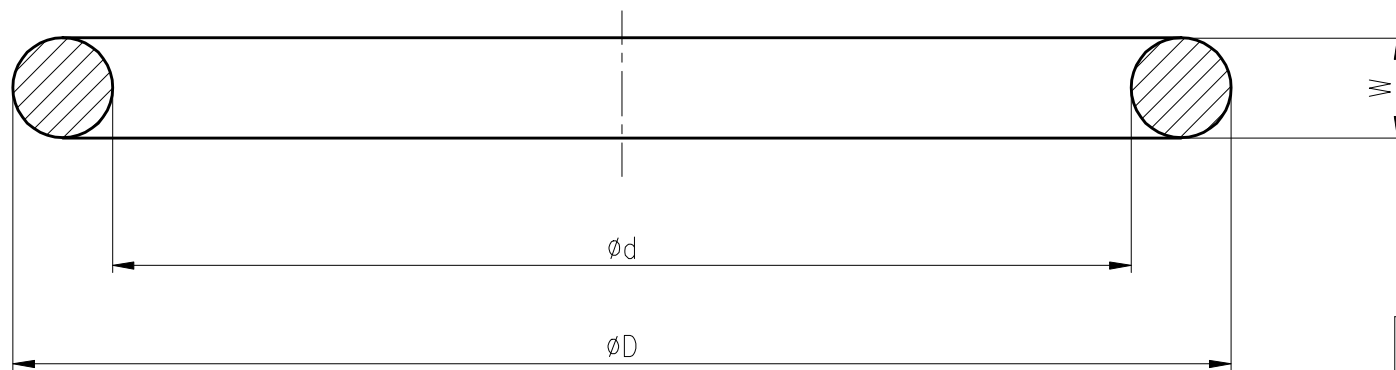
3-V-0000-Λ-ζ
DRAWING NO. 09715

12.5 / 3.2

SL.NO.	DRAWING NO.	MATL. SPEC.	COMPONENT CODE	DIMENSIONS			WEIGHT IN Kgs.
				∅D	∅d	W	
01	3-V-3200-09715/02	BUNA-N	96 452 489 0000	441.30	430.66 ^{±1.143}	5.330 ^{±0.127}	0.046
02	3-V-3202-09715/02	BUNA-N	96 452 430 0000	698.25	684.28 ^{±1.52}	6.985 ^{±0.152}	0.125
03	3-V-3204-09715/02	BUNA-N	96 456 166 0000	647.45	633.48 ^{±1.52}	6.985 ^{±0.152}	0.116
04	3-V-3207-09715/02	BUNA-N	96 456 188 0000	391.03	380.40 ^{±0.80}	5.330 ^{±0.127}	0.041
05	3-V-3208-09715/01	BUNA-N	96 456 320 0000	495.43	481.46 ^{±1.14}	6.985 ^{±0.152}	0.088
06	3-V-3245-09715	BUNA-N	96 465 263 0000	715.70	701.73 ^{±1.52}	6.985 ^{±0.152}	0.116
07	3-V-3319-09715	BUNA-N	96 465 402 0000	730.25	716.28 ^{±1.52}	6.985 ^{±0.152}	0.125

NOTES

01. THE 'O' RING SHALL WITHSTAND A SERVICE PRESSURE OF 200 Kg/SQ.CM.
02. HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
03. 'O' RING SHALL COMPLY WITH THE REQUIREMENTS OF LATEST APPLICABLE QUALITY PROCEDURE.
04. PACKING OF 'O' RING SHALL BE AS PER LATEST APPLICABLE QUALITY PROCEDURE.



REV 08	DATE 19.01.11	ALTERED CHD & APPD M.RAJAKUMAR	M.SRINIVASAN	REV 07	DATE 21.04.07	ALTERED CHD & APPD P.BOOMINATHAN	M.SRINIVASAN
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SL.NO. 07 INCLUDED.

SL.NO. 06 INCLUDED.

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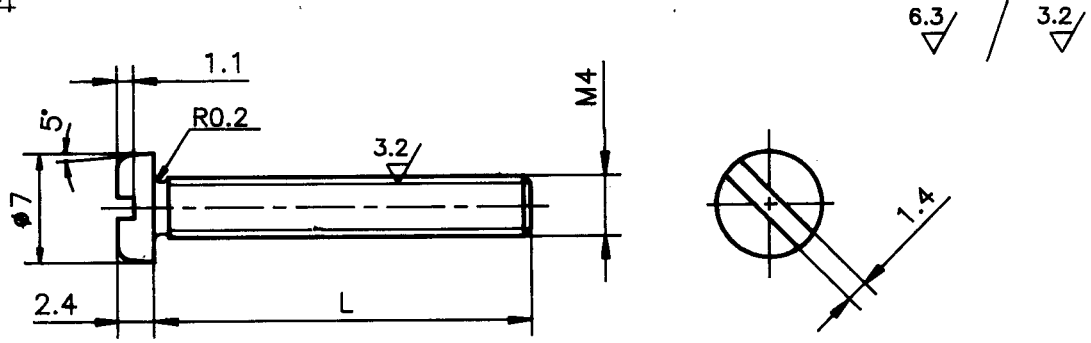
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No COMP. CODE	ITEM No
-	-	-	-	-	-	-	-	-	-
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT									
		BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.			DRN	M.SRINIVASAN	SIGN	DATE 28/4/2009	NO.OF VAR.
365-121					CHD	P.BOOMINATHAN		28/4/2009	
					APPD	M.RAJAKUMAR		28/4/2009	
DEPT VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATION			NO. OF ITEMS			
CODE 320	NTS	REF. TABLE	CAD : C309715						
TITLE		CARD CODE	DRAWING NO.		REV				
'O' RING		U 01	3-V-0000-09715		08				

REV 01	DATE 9.7.94	ALTERED R. Mohan
		CHECKED
JCN: F80235 DT: 21.7.94 COMPONENT CHANGED TO SUB-DELIVERY ITEM.		

TOLERANCE FOR UNTOLERANCED DIMENSIONS	
UPTO 6 MM	= ± 0.1 MM
> 6 UPTO 120 MM	= ± 0.2 MM
MORE THAN 120 MM	= ± 0.5 MM
ANGULAR TOLERANCE	= ± 0.5 Deg.
CHAMFER	= ± 5 Deg.

REV 02	DATE 15.3.97	ALTD: M.V.K.	CHD & APPD: [Signature]
		QUALITY REFERENCES REMOVED.	
DCL: 54 5850			

SL. No.	DRG. No.	COMP. CODE	DIMENSIONS		NET WT (Kgs.)
			L		
01.	4.V.K502.90513/02	964564420000	25		0.002
02.	4.V.K508.90513/02	964564430000	35		0.003



Note :-

01. THE SCREW SHALL COMPLY WITH THE REQUIREMENTS OF LATEST APPLICABLE QUALITY PROCEDURE.
02. MATERIAL :- STEEL TO CLASS 4.8 OF IS-1367 (PART-3)

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	COMP CODE	ITEM No
BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. CHENNAI 600014.					DEN R. MOHAN CHD N.P.ESWARAN APPD N.NAGARAJAN	SIGN R. Mohan [Signature] [Signature]	DATE 3.5.93 4.5.93 6.5.93	NO. OF VAR	
DEPT VL	GRADE OF UNTOL DIM	SCALE	WEIGHT (KG).	REFERENCE INFORMATION				NO. OF ITEMS	
CODE 320	6 / M / F	NTS	-	CAD: F490513					
TITLE					CARD CODE	DRAWING NO.		REV	
INDICATOR SCREW					U 01	4-V-0000-90513		02	

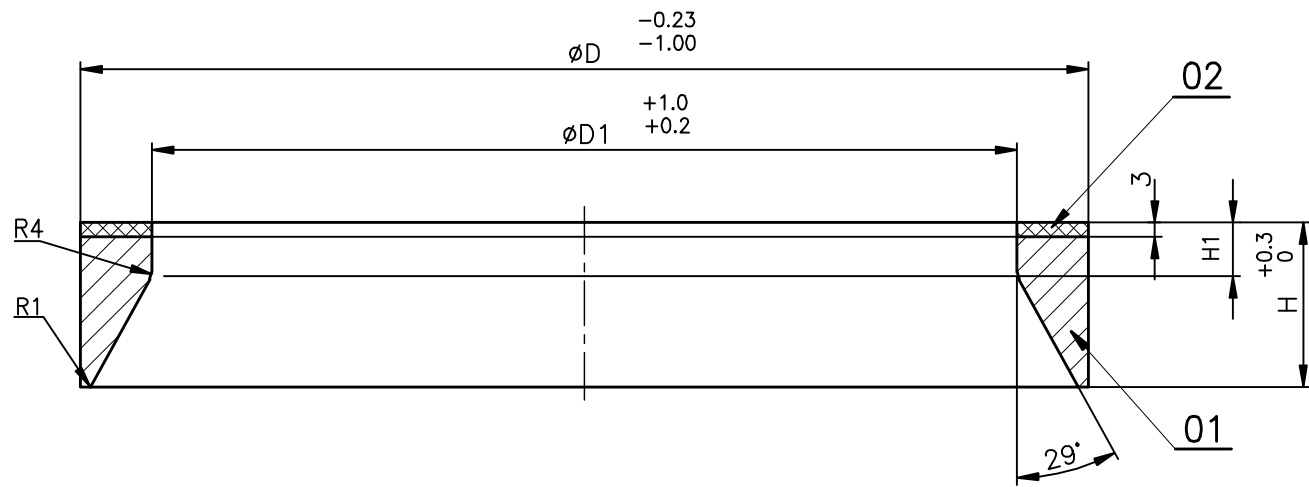
DRAWING NO. 3-V-0000-24522/01

SL. No.	DRAWING NO.	COMP.CODE	DIMENSIONS				NET Wt.(kg)
			∅D	∅D1	H	H1	
01	3-V-3200-24522/1	96 465 212 0000	490	440	48.0	10.0	2.30
02	3-V-3202-24522/1	96 465 213 0000	770	730	40.0	10.0	2.60
03	3-V-3204-24522/1	96 465 214 0000	720	680	40.0	15.0	2.70
04	3-V-3208-24522/1	96 465 215 0000	564	524	46.0	15.0	2.20

TECHNICAL REQUIREMENTS:

- GASKET DENSITY (WITH WIRE MESH): $2.2 \pm 0.09 \text{ gm/cm}^3$
GASKET DENSITY (WITHOUT WIRE MESH): $1.65 \pm 0.09 \text{ gm/cm}^3$
- LEACHABLE CHLORIDE CONTENT NOT TO EXCEED 20PPM
- GRAPHOIL GASKET TO BE PROVIDED WITH INCONEL MULTILAYERED WIRE MESH WITH WIRE DIA. OF 0.15mm & WITH A MESH SIZE OF 355x100 MICRONS AS PER IS:1568
- ASH CONTENT CONSISTING OF TRACE ELEMENTS IN OXIDE FORM SHALL NOT EXCEED 2% MAX.
- PERCENTAGE LOSS AT 600°C: 10 MAX.
- PERCENTAGE OF WATER SOLUABLE: 0.1 MAX.
- TEST CERTIFICATES TO BE PRODUCED FOR DIMENSIONS AND POINTS 1,2,3,4,5 & 6 AS MENTIONED ABOVE.
- GASKETS ARE TO BE DESPATCTED IN HARDBOARD BASKETS. TOP AND BOTTOM SIDES OF GASKETS ARE TO BE PROTECTED BY PLYWOOD.

ITEM No.	MATERIAL
01	GRAPHOIL
02	INCONEL



NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
01	SEALING RING	-	GRAFOIL (PREFORMED)	-	-	-	-	-	014

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED	GANESH
01	08.07.11	CHD & APPD	M.RAJAKUMAR

TOLERANCE ON ∅D AND ∅D1 CORRECTED.
DCP: 801193

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI-620014.

DRN	NAME	SIGN	DATE	NO.OF VAR.
CHD	P.BOOMINATHAN		02.01.07	
APPD	M.RAJAKUMAR		02.01.07	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATION	NO. OF ITEMS
VL	NTS	REFER TABLE	CAD : F324522	

TITLE: **SEALING RING (PRE FORMED GRAFOIL)**

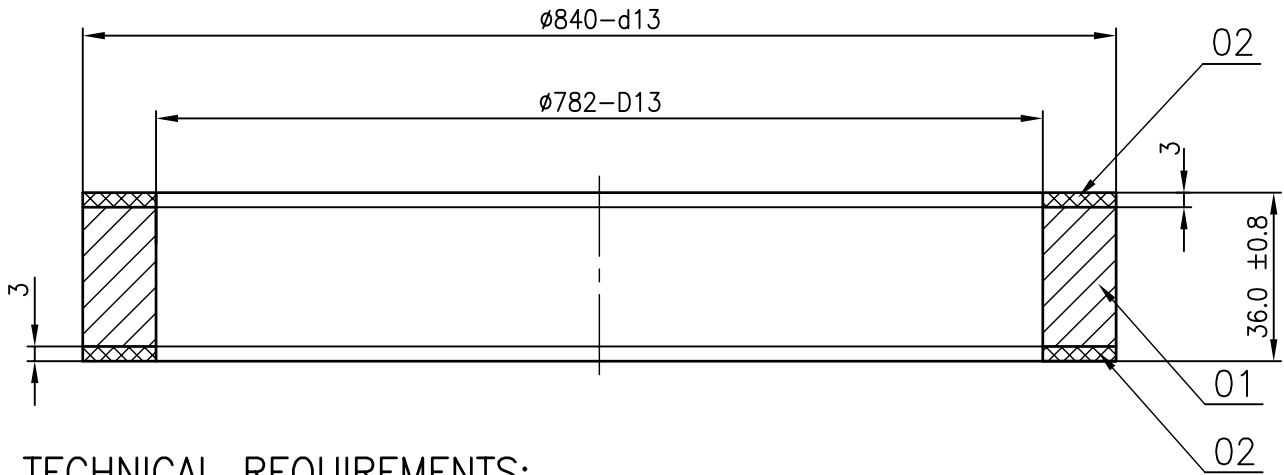
CARD CODE	DRAWING NO.	REV
U 01	3-V-0000-24522	01

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS

ALL DIMENSIONS ARE IN MILLIMETRES.
DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD


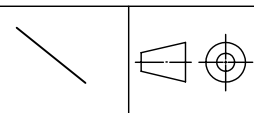
ø840-d13	-1.720
	-0.320
ø782-D13	+1.540
	+0.290



TECHNICAL REQUIREMENTS:

- GASKET DENSITY (WITH WIRE MESH): $2.2 \pm 0.09 \text{ gm/cm}^3$
GASKET DENSITY (WITHOUT WIRE MESH): $1.65 \pm 0.09 \text{ gm/cm}^3$
- LEACHABLE CHLORIDE CONTENT NOT TO EXCEED 20PPM
- GRAPHOIL GASKET TO BE PROVIDED WITH INCONEL MULTILAYERED WIRE MESH WITH WIRE DIA. OF 0.15mm & WITH A MESH SIZE OF 355x100 MICRONS AS PER IS:1568
- ASH CONTENT CONSISTING OF TRACE ELEMENTS IN OXIDE FORM SHALL NOT EXCEED 2% MAX.
- PERCENTAGE LOSS AT 600°C: 10 MAX.
- PERCENTAGE OF WATER SOLUABLE: 0.1 MAX.
- TEST CERTIFICATES TO BE PRODUCED FOR DIMENSIONS AND POINTS 1,2,3,4,5 & 6 AS MENTIONED ABOVE.
- GASKETS ARE TO BE DESPATCTED IN HARDBOARD BASKETS. TOP AND BOTTOM SIDES OF GASKETS ARE TO BE PROTECTED BY PLYWOOD.

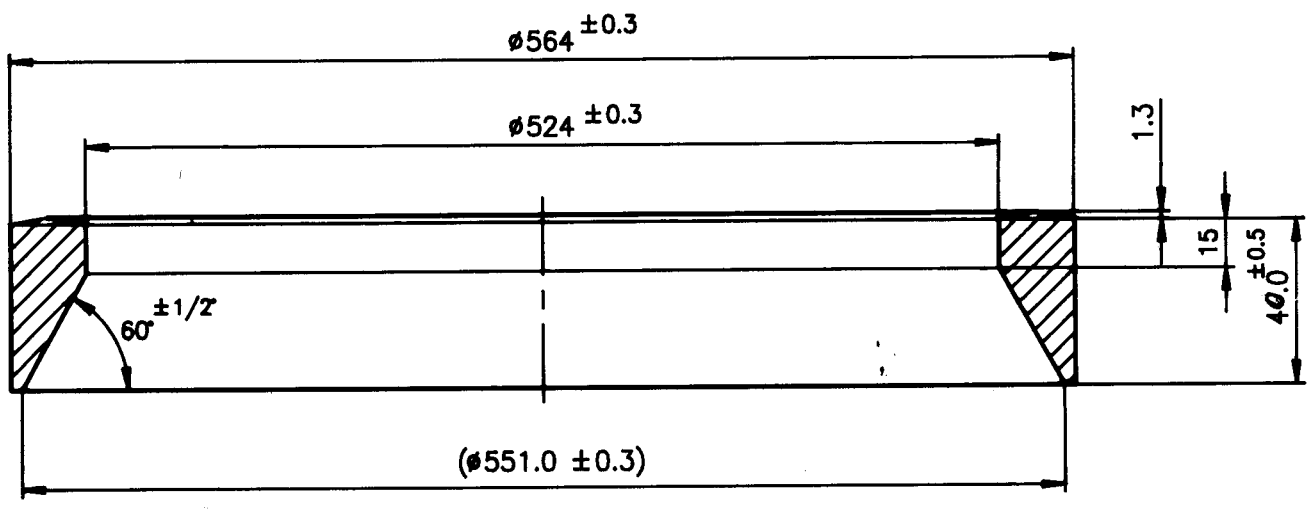
ITEM No.	MATERIAL
01	GRAPHOIL
02	INCONEL

-	-	-	-	-	-	-	-	-	-
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
 365-122	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.	DRN	NAME		SIGN	DATE	NO.OF VAR		
		CHD	M.SRINIVASAN			07.03.07			
		APPD	P.BOOMINATHAN			07.03.07			
DEPT VL		SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS			NO. OF ITEMS		
CODE 320		NTS	4.7	COMPONENT CODE: 96 465 224 0000 CAD : F426688					
TITLE				CARD CODE	DRAWING NO.			REV	
SEALING RING (PRE FORMED GRAFOIL)				U 01	4-V-3245-26688				

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CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

REV	DATE	ALTERED	R. Mohan
01	28.2.96	CHEK APPD.	Kaly
D.C.N. FS: 0446 IN NOTES, 04 & 05, QUALITY REFERENCES REMOVED.			



NOTE

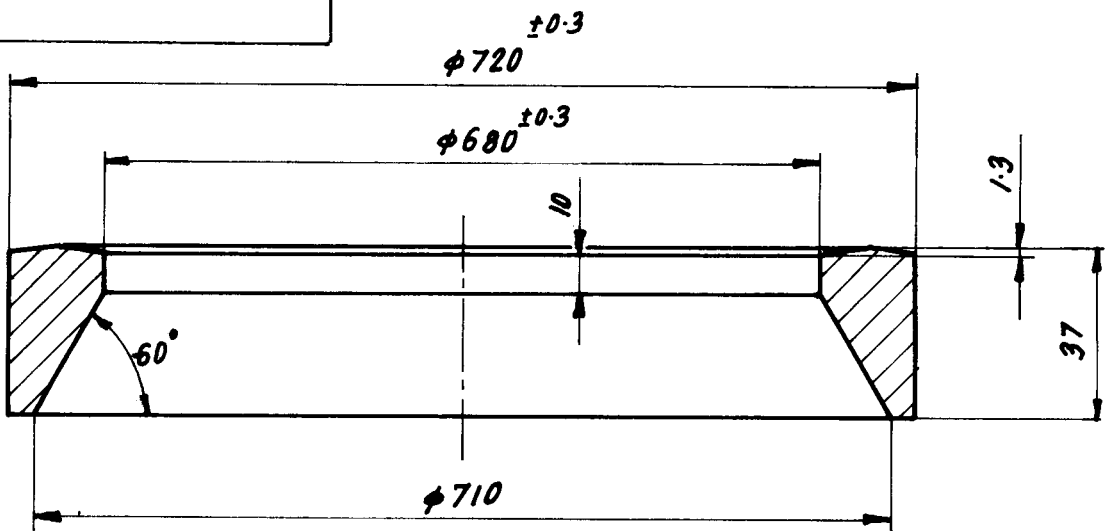
- 01. MATERIAL : NITRILE (NBR)
- 02. HARDNESS : 90 ± 5 DURO.
- 03. SURFACE FINISH : $\sqrt{\text{RMAF 3}}$
- 04. SEALING RING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE TDC.
- 05. PACKING SHALL BE DONE AS PER APPLICABLE TDC.

TOLERANCE FOR UNTOLERANCED DIMENSIONS	
UPTO 6 MM	= ± 0.1 MM
> 6 UPTO 120 MM	= ± 0.2 MM
MORE THAN 120 MM	= ± 0.5 MM
ANGULAR TOLERANCE	= ± 0.5 Deg.
CHAMFER	= ± 5 Deg.



01	SEALING RING	—	NITRILE (NBR)	—	—	2.01	—	—	026
NO OFF	DESCRIPTION	MATL CODE	MATL SPECH	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.					DRN	M.SRINIVASAN	SIGN	DATE	NO. OF VAR
					CHD	N.P.ESWARAN		13.10.93	
					APPD	N.NAGARAJAN		22.11.93	
DEPT VL	GRADE OF UNTOL.DIM	SCALE		WEIGHT (KG).	REFERENCE INFORMATION				NO. OF ITEMS
CODE 320	G/M/F	NTS		2.01	COMP CODE : 964563230000 CAD : F406731				
TITLE					CARD CODE	DRAWING NO.			REV
SEALING RING (RUBBER)					U 01	4-V-3208-06731			01

TP-DG-4-V-3205-06583
 CORPORATE DRG ID R. Mohan
 01 28.2.94 CAD. & APPD. :- *[Signature]*
 DCN. FS:0446
 IN NOTES 5 & 6,
 QUALITY REFERENCES
 REMOVED.



NOTES:-

1. MATERIAL : NITRILE (NBR)
2. HARDNESS : 90 ± 5 DURO.
3. TOLERANCE : UNLESS OTHERWISE SPECIFIED ± 0.3 MM.
4. SURFACE FINISH : $\sqrt{\text{RMAES}}$
5. SEALING RING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE TDC.
6. PACKING SHALL BE DONE AS PER APPLICABLE TDC.



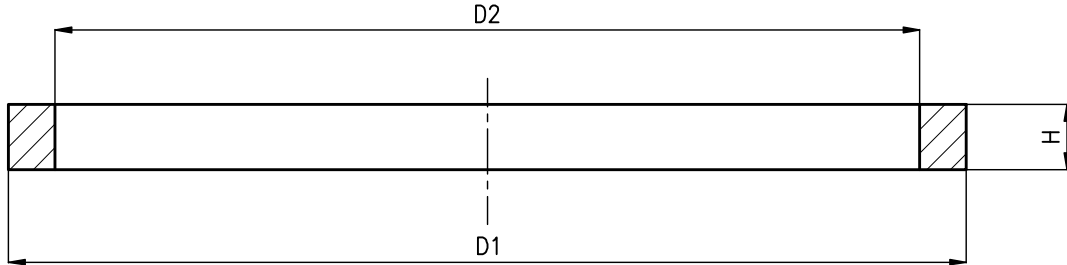
—		SEALING RING	96456168	NITRILE (NBR)	—	—	2.04	—	—
NO. OF PIECES	NAME - DIMENSIONS	SEMI - PRODUCT	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	DRAWING NO.	ITEM NO.
REMARKS				TOTAL NET Wt (kg)					
SCALE	DRAWN	N.P.ESWAR <i>[Signature]</i>			ALTERATIONS	DATE	SIGNATURE	ALTERATION INDEX	
	CHECKED								
	APPROVED	N.NAGARAJAN <i>[Signature]</i>							
	STDS. OFFICER				TRANS. COPY NO.				
	DATE	31.10.98							
TYPE		GROUP		OLD DRG.		NEW DRG.			
TITLE		SEALING RING (RUBBER)		DRAWING NO.		4.V.3205.06583 01			



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FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP ALL DIMENSIONS ARE IN MILLIMETRES.

REV	DATE	ALTERED
		CHD & APPD

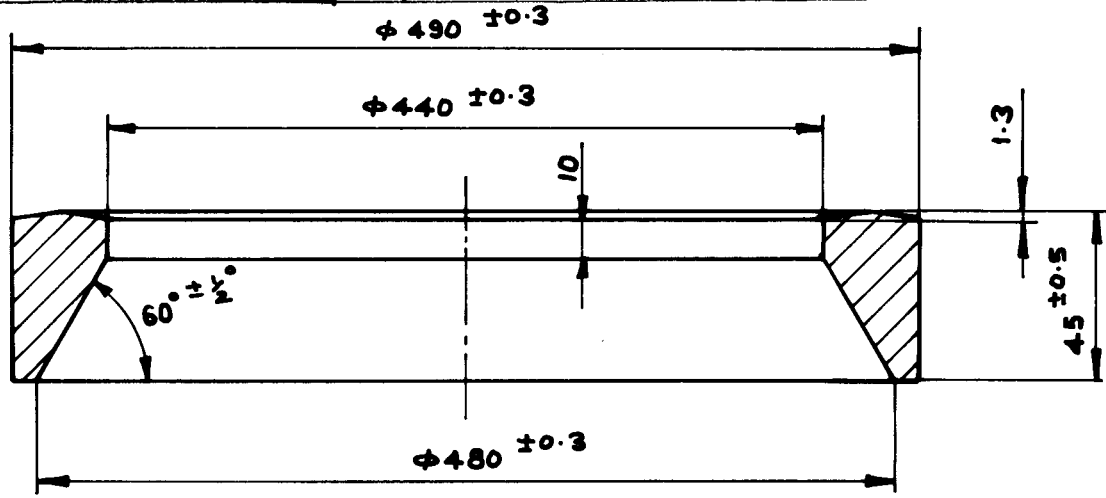


NOTES:

1. MATERIAL: NITRILE (NBR)
2. HARDNESS: 90 ±5 DURO
3. TOLERANCE: UNLESS OTHERWISE SPECIFIED ±0.3 MM
5. SURFACE FINISH: $\sqrt{\text{RMAF3}}$
6. SEALING RING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE QUALITY PROCEDURE.
6. PACKING SHALL BE DONE AS PER APPLICABLE QUALITY PROCEDURE.

02	SEALING RING	-	840	782	31	4.0	-	4.V.3245.26842	-	
								96 465 364 0000		
01	SEALING RING	-	720	650	44	6.4	-	4.V.3318.26842	-	
								96 465 369 0000		
SL. NO.	DESCRIPTION	MATL CODE	D1	D2	H	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No	
								COMPONENT CODE		
					DRN	NAME		SIGN	DATE	NO. OF VAR
					CHD	GANESH			19.03.10	
					APPD	M RAJAKUMAR			19.03.10	
DEPT VL		SCALE	WEIGHT (KG).	REFERENCE INFORMATION					NO. OF ITEMS	
CODE										
TITLE					CARD CODE	DRAWING NO.			REV	
SEALING RING (RUBBER)					U 01	4-V-0000-26842			00	

REV	DATE	ALTERED: R. Mohan	REV	DATE	ALTD.: R. Mohan
01	15.5.93	CHECKED: <i>kgb</i>	02	28.2.96	CHD. & APPD: <i>kgb</i>
1. TDC No. 15 INCLUDED FOR HARDNESS REFERENCE. 2. TDC No. 5:131 REV.01 WAS TDC No. 5:134.			IN NOTES, 5 & 6, QUALITY REFERENCES REMOVED.		



NOTES:

1. MATERIAL : NITRILE (NBR)
2. HARDNESS : 90 ± 5 DURO.
3. TOLERANCE : UNLESS OTHERWISE SPECIFIED ± 0.3 mm.
4. SURFACE FINISH : $\sqrt{\text{RMAF 3}}$
5. SEALING RING SHALL COMPLY WITH THE REQUIREMENTS OF APPLICABLE TDC.
6. PACKING SHALL BE DONE AS PER APPLICABLE TDC.



- SEALING RING		96456165	NITRILE (NBR)	-	-	1.95	-	-	-	
NO. OF PIECES	DESCRIPTION	MATL. CODE	FINAL MATERIAL	INITIAL MATERIAL	SCRAP SORT	NET Wt (kg)	GROSS Wt (kg)	DRAWING NO.	ITEM NO.	
REMARKS				TOTAL NET Wt (kg)						
SCALE	DRAWN	<i>U. S. S.</i> <i>kgb</i>	TRANS. COPY NO.	ALTERATIONS		DATE	SIGNATURE	ALTERATION INDEX		
NTS	CHECKED									
	APPROVED									
	STDS. OFFICER									
	DATE	7.8.90								
		TYPE	GROUP	OLD DRG.	NEW DRG.					
TITLE SEALING RING (RUBBER)			DRAWING NO. 4-V-3200-06575							

**ELASTOMERIC COMPOUNDS
for OIL FIELD EQUIPMENT**

Revision record:

Rev:00/16.04.90 : First issue

Rev:01/04.12.93 : Editorial corrections

Rev:02/15.11.96 : Elastomer TDCs 5:131,135,154,155,156,157,161,162,163,179,183 & 184 merged & rewritten

1.0 MATERIAL SPECIFICATION - Elastomer materials of grade specified in P.O.or drg. The property requirements are as given in Table-1.

2.0 GENERAL

These Elastomeric compounds are for use as O-rings/packings in water and oil based drilling fluids, sea water, petroleum based lubricants and ethleneglycol anti-freeze mixtures.

Shall be manufactured to the relevant size in the drawing.

The grade nos. specified correspond to the Standards of M/s National;USA.

3.0 ENGINEERING REQUIREMENTS

MATERIAL PROPERTIES: The property requirements for the elastomers are given in table-1.

The hardness tests shall be carried out as per D2240/ D1415 and tensile tests as per D412/D1414(as per D1457 for PTFE materials).Additional property requirements for grades MS-447 & MS 452 (tested as per D621) are as follows.

	MS 447	MS 452
Coefficient of thermal expansion (in/in/ $F \times 10^{-5}$) at 75 to 300°F	6.0+ 0.5	7.6+0.5
% deformation under load(max.)(24 Hours at 2000 psi at 70°F Min).	5.0	3.5
% permanent deformation (max.)after load release	2.0	2.2

4.0 INSPECTION & TESTING

The dimensions on the finished product shall conform to the relevant drawing.

Sampling inspection shall be carried out for visual,dimensions & hardness as per Cl.8.0.

The following type tests shall be carried out for conformance to this specification:

TYPE TESTS

AIR AGING TEST : This test shall be carried out in an Air oven (ASTM D573) or by heating in air in a test tube enclosure (ASTM D865).The purpose of this test is to determine the influence of elevated temperatures on the physical properties of vulcanized rubber.

The test shall be carried out at Minimum test temperature shown in table-2 for each grade for 70 hrs. in accordance with ASTM D412 and properties after air aging test shall conform to table-2.

COMPRESSION SET TEST : This test shall be carried out in accordance with ASTM D395 B i.e.

Compression set under constant deflection in air with exceptions listed out in ASTM D1414 Cl.10.0

The test shall be performed at a minimum test temperature indicated in table-2 for 70 hours, except for Grade MS 225. For grade MS:225, the test duration shall be 22 hours.

The maximum permanent compression set shall comply to table-2.

LOW TEMPERATURE BRITTLINESS TEST : This test ensures that rubber will not exhibit fracture when subjected to specified impact conditions.The Test shall be carried out in accordance with ASTM D2137/D746 and shall PASS at the test temperature indicated in table-2.

IMMERSION TEST : This test ensures the ability to withstand the effect of liquids and shall be carried out in accordance with ASTM D471/D1414.

The liquids used for the test shall be ASTM Oil 1&3 at a minimum temperature indicated in Table-3 for various grades and Distilled water at a minimum temperature of 212°F for a period of 70 hrs.

Permissible variation in properties after immersion in liquids are given in Table- 3.

Immersion test is not applicable for grades MS 447 & MS 452.

VALIDITY : The validity of these Type test results is for two years from the date of test,in the case of PSL 1,2 & 3. However, in case of PSL 4,this test shall be carried out for each batch of purchase order. The type test shall be conducted at approved laboratory or witnessed by BHEL.

5.0 SPECIAL REQUIREMENTS

Insert ring shall be positioned as shown in BHEL drawing or the drawing approved by BHEL.

After Moulding, all parts must be inspected by the vendor/manufacturer to ensure proper positioning of the insert ring. The NDE to be followed can be RT/MT and meet the requirement indicated in the drawing.

The ring must be generally located in the web of the seal, but in no case, in flexible lip of the seal. No part of the ring shall be visible to the naked eye unless it is specified in the drawings.

6.0 DOCUMENTATION

For PSL 1,2 & 3: Certificate of compliance which indicates P.O.No, Drg No, Material grade & type tested compound no, Batchwise Cure/mould date & Shelf life (expiry date) shall be submitted.

For PSL 4 : Test certificates for the physical properties, in addition to certificates mentioned above shall be submitted for each P.O.

7.0 MARKING AND PACKING

Each item shall be packed in polythene cover individually with suitable preservatives like French chalk powder with label having following details.

- (a) Drg. Number & size (b) Purchase Order No. (c) Batch Number
 (d) Compound No. (e) Date of Cure/Mould (f) Shelf life (expiry date)
 (g) Any other relevant details specified in the Purchase Order/drawing.

Each item shall be supplied in sturdy carton boxes to protect against permanent distortion during shipment and storage and from sunlight, dust etc. during shipment and storage. Each box shall contain only one size and lot of the product as given below.

- (1) Size more than 6" -- each separate box (2) Size 2" to 6" -- 5 nos. in one box
 (3) Size below 2" -- 10 nos. in one box.

Each box shall also be labeled with details specified above viz (a) to (g) above.

8.0 SAMPLING PLAN: for elastomeric compounds based on MIL-STD-105 (latest) single sampling normal inspection.

Lot size	Sample size	Acceptance/Rejection criteria
26 to 50	8	No defect permitted
51 to 90	13	-do-
91 to 150	20	Accept when no. of defect \leq 1; Otherwise reject
151 to 280	32	-do-
281 to 500	50	Accept when no. of defect \leq 2; Otherwise reject

For lot size 25 Nos. & below, 100% inspection shall be done.

TABLE-1 PROPERTY REQUIREMENT OF ELASTOMERS

Elastomer Grade	MS-219	MS-220	MS-221	MS-225	MS-231	MS-233	MS-426	MS-427	MS-428	MS-430	MS-431	MS-447	MS-452	
Material	NBR	NBR	NBR	NBR	FKM	FKM	TFEP	TFEP	FVMQ	HSN	XNBR	PTFE	PTFE	
Hardness	Value	60 \pm 5	70 \pm 5	90 \pm 5	70 \pm 5	90 \pm 5	70 \pm 5	90+10	80 \pm 5	85 \pm 10	80 \pm 5	70 \pm 5	65 \pm 5	63 \pm 5
	Type	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(D)	(D)	
Applicable	Min.	0	-20	-20	32	0	-20	-20	-20	-50	-20	-20	-50	-50
Temp. Range (°F)	Max.	180	180	180	200	250	250	250	250	250	250	180	250	250
Tensile strength in														
Psi (min)		2000	2000	2500	2000	1600	1500	2200	2000	1000	2500	2000	1500	1000
Ultimate elongation														
% (min)		500	300	200	350	100	100	100	100	150	150	300	75	75
Tensile modulus (psi) at														
100% elongation (min)		400	800	600	500	500	-	1000	500	500	400	-	-	
Tensile modulus (psi) at														
50% elongation (min)		-	-	-	-	-	-	1500	-	-	-	-	-	
Shelf life in years		2	2	2	2	4	4	4	4	4	2	2	10	10

NBR - Nitrile FVMQ - Fluoro Silicone (Silastic LS) FKM - Fluoro carbon (VITON, FLUOREL)
 HSN - Hydrogenated Nitrile TFEP - Tetra fluoro ethylene & Propylene (AFLAS) XNBR - Carboxylated Nitrile
 PTFE - Teflon (W/25% carbon/graphite filler)-MS447 ; PTFE - Teflon (W/Ryton/MoS2/Carbon filler)-MS452

TABLE-2 : AIR AGING, COMPRESSION AND LOW TEMPERATURE BRITTLENESS TEST REQUIREMENTS

Grade	Min. Test Temp °F	AIR AGING TEST				COMPRESSION TEST RESULT (Compression set) in (%) max	TEST TEMP. FOR LOW TEMPERATURE BRITTLENESS TEST.
		Acceptable variation in					
		Hardness points	Tensile Strength(%)	Ultimate Elongation(%)	Volume (%)		
MS 219	180	± 05	± 10	± 20	± 10	40	0°F
MS 220	180	± 10	± 15	± 20	± 05	30	0°F&-20°F
MS 221	180	± 05	± 10	± 30	± 10	25	0°F&-20°F
MS 225	212	± 10	± 10	± 20	± 10	40	32°F
MS 231	250	± 10	- 40max	- 20max	± 10	40	0°F
MS 233	250	± 10	- 40max	- 20max	± 10	40	0°F&-20°F
MS 426	250	± 10	± 10	± 15	± 10	30	0°F&-20°F
MS 427	250	± 10	- 25	- 25	-	40	0°F&-20°F
MS 428	250	± 05	± 10	± 10	± 10	30	0°F, -20°F, -50°F&-75°F
MS 430	250	± 10	± 10	± 20	± 10	30	0°F&-20°F
MS 431	180	± 05	± 15	± 20	± 10	35	0°F&-20°F
MS 447	-	-	-	-	-	-	0°F, -20°F & -50°F
MS 452	-	-	-	-	-	-	0°F, -20°F & -50°F

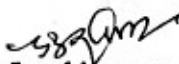
(*) Min. test temperature is same for both air aging test & compression test

TABLE-3 : IMMERSION TEST REQUIREMENT

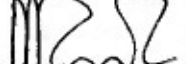
Grade	Min Test temp. °F (*)	Permissible variation in properties (±) with											
		ASTM Oil # 1				ASTM Oil # 3				Distilled water			
		Hardness	Tensile strength	Ultimate Elongation	Volume	Hardness	Tensile strength	Ultimate Elongation	Volume	Hardness	Tensile strength	Ultimate Elongation	Volume
MS 219	180	05	10	20	10	10	20	15	20	05	15	20	10
MS 220	180	10	20	20	10	10	20	20	10	10	20	20	10
MS 221	180	05	15	30	10	05	15	30	10	05	15	10	05
MS 225	212	05	05	10	05	05	05	10	10	-	-	-	-
MS 231	250	05	15	10	05	05	10	10	05	05	20	10	10
MS 233	250	05	15	10	05	05	10	10	05	05	20	10	10
MS 426	250	10	15	20	10	10	15	20	20	10	15	20	10
MS 427	250	05	15	25	10	10	20	25	10	05	15	20	10
MS 428	250	05	15	10	10	10	20	10	30	05	10	10	10
MS 430	250	10	10	20	10	10	10	20	10	06	10	10	10
MS 431	180	10	20	20	10	10	20	20	10	-	-	-	-

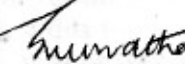
*Min. test temp. specified is only for immersion test with ASTM Oil #1 & 3. For distilled water, the test temp. is 212°F.
NOTE: Values indicated in Table are % values, except for Hardness. For hardness, it is variation in absolute value.

Prepared by

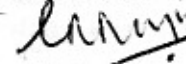

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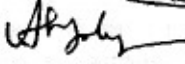
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