

Dt: 23.02.2017

HOSTING DETAILS

DESCRIPTION	REMARKS
Contact Person/Address	Vikas Verma, Engineer/ Valves/ Purchase
Approved By	Subhashini G, Sr. Manager/Valves/Purchase
Email	vinu@bheltry.co.in ; vikasverma@bheltry.co.in
Telephone	0431 2577210/7086
Fax	Not applicable
Notification (Reference) No.	EN-SHM2060 Due on 02.03.2017
Tender Title	Grafoil/SW Gaskets
Tender Type	BUY/ SERVICE CONTRACT / WORK CONTRACT
BRIEF DESCRIPTION	Procurement of Gaskets as per attached enquiry.
Published in Newspaper	NA
Published On	-
Tender Value in Rs.	Not to be published
EMD Value – Rs.	Not applicable
Document Cost – Rs.	Not applicable
Date of Issue of Notification – DD.MM.YYYY	23.02.2017
Date of Closure of Sale of Forms – DD.MM.YYYY	Not applicable
Completed Forms to be submitted by – DD.MM.YYYY	02.03.2017 (2.00PM)
Date of Opening of Bids – DD.MM.YYYY	02.03.2017 (2.30PM)

TYPE OF TENDER : OPEN TENDER

TENDER OPENING DATE : 02.03.2017

NUMBER OF BIDS : TWO PART BIDS **1. TECHNO-COMMERCIAL BID**
2. PRICE BID

DELIVERY PERIOD : WITHIN 4WEEKS FROM THE DATE OF PO

LD : Refer BHEL terms & conditions

Payment Terms : 100% payment after 45 days of acceptance of materials.

Delivery Terms : FOR BHEL Stores, TRICHY-14

TENDER FORWARDING ADDRESS:

TENDER OPENING CELL
ROOM No-26, BUILDING-24 (GROUND FLOOR)
BHEL, TRICHY-620 014
TAMIL NADU

 432-003	ENQUIRY VALVES	Bharat Heavy Electricals Limited (A Government of India undertaking) HIGH PRESSURE BOILER PLANT PURCHASE DEPARTMENT/VALVES TIRUCHIRAPPALLI-620 014.		Phone:0431-257 7086/7210 Email: tender_cell@bheltry.co.in vikasverma@bheltry.co.in vinu@bheltry.co.in
		ENQUIRY NO.	DATE	DUE DATE FOR QUOTATION
		EN-SHM2060	23.02.2017	02.03.2017
		Please quote Enquiry No. and due date in all correspondences. This is only a request for quotation and not an order.		
<u>Date , Time & Venue of tender opening :</u> 02.03.2017 at 14.30 Hrs. at The Tender Opening Cell / Valves Room No. 26, Building -24 Bharat Heavy Electricals Limited Tiruchirappalli - 620014,Tamilnadu, India		<u>Scope of supply</u> Supply of Gaskets (SW & Grafoil) as per the drawings/standards/TDC enclosed. List of Annexures Annexure 1A- Scope of Supply Annexure 1B- Drawings & Standards Annexure 2- Terms & Conditions Annexure 3- Schedule of Deviation Format Annexure 4 - RFQ Annexure 5- Supplier Confirmation Sheet Note: Only manufacturers are requested to quote for this enquiry.		
The rate of Excise Duty and Sales Tax, Prevalent on the date of quotation, should be clearly indicated in the quotation itself. Please, submit your lowest quotation subjected to our terms and conditions, so as to reach us on or before the due date. (Latest by 14.00 Hrs. (IST) on the due date). The offers will be opened at 14.30 Hrs. (IST) on the due date in the presence of tenderers who may like to be present. Late tenders will not be considered.		Yours faithfully, For Bharat Heavy Electricals Ltd Vikas Verma Engineer/Purchase/Valves		



434-003
Dt: 17.08.16

Page
1/2

PHONE : 91-44-28158821
GRAMS : BHARATELEC
FAX NO: 910431/520730
E-mail :
Web : FAX NO:

Enquiry No	Enquiry Date	Due Date for Quotation
EN-SHM2060 -	23.02.2017	02.03.2017
Please quote Enquiry No, Date and due date in all correspondences. This is only a request for quotation and not an order. Bid should be submitted in two parts. 1.Techno-commercial bid (Part-I) and 2.Price bid(Part-II) in a separate sealed cover and both covers must be placed in a third cover and sealed. Our Enquiry No., Enq. date & Enq. Due date must be written on all three covers.		

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	964562400000 GASKET-SW-GRP- OD77.8XID61.9X3.175T-5717	NO	1000.000	1,000.00	13.04.17
20	964562570000 SW GASKET 10 C300 GV-N065	NO	1.000	1.00	13.04.17
30	964651190000 GASKET-SW-GRP-OD146XID130X3.2T- 5158	NO	2.000	2.00	13.04.17
40	964651360000 GASKET-SW-GRP- OD92.0XID72.0X4.5T-3211	NO	100.000	100.00	13.04.17
50	964651460000 GASKET-SW-GRP-8"C150-GV-NC08	NO	4.000	4.00	13.04.17
60	964655030000 GASKET-SW	NO	10.000	10.00	13.04.17
70	964657630000 GASKET-CAM PROFILE-NJ66	NO	4.000	4.00	13.04.17
80	974603850000 GASKET(GRAFOIL)-V225	NO	1.000	1.00	13.04.17
90	974603890000 GASKET(GRAFOIL)-V329	NO	3.000	3.00	13.04.17
100	974604670000 GASKET-SW-GRP-OD620XID580X4.5T- L725	NO	16.000	16.00	13.04.17
110	974604680000 GASKET-SW-GRP-OD635XID595X4.5T- L705	NO	33.000	33.00	13.04.17
120	974604690000 GASKET-SW-GRP-OD128XID112X3.2T- L789	NO	21.000	21.00	13.04.17
130	974604740000 GASKET-SW-GRP-OD142XID122X3.2T- L751	NO	17.000	17.00	13.04.17

General Note:

PROPOSAL REFERENCE: EN-SHM2060 Dt:23.02.2017

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE
(Valves)



EN-SHM2060 / 23.02.2017

23505

SUPPLY OF THE FOLLOWING ITEM(S) AS PER THE DRAWING(S)/STANDARD(S)/TDC GIVEN

1)The offers are invited in two parts.

i)Part-I is bid covering the commercial terms and conditions.

ii)Part-II is price bid stating the price per unit in INR.

2)Commercial bid will be opened first.

3)Price bid will be opened only if the supplier is qualified Techno-commercially.

4)The price quoted should be kept valid for 120 DAYS from the date of tender opening.

5)LD @0.5% of the total PO value per week to a maximum of 10% of the total PO value will be levied in case of delay in the supply.For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.

6)Annexure of the terms and conditions are enclosed.

7)Drawings are enclosed.

8)Delivery term should be strictly FOR/BHEL/Trichy (For indigenous suppliers) or CFR Chennai Port(For import suppliers).

9)Payment term should be 100% payment after 45 days on acceptance of the material at our stores.

10)The terms and conditions shall be strictly as per our enquiry only.

11)If any deviation is noticed against our enquiry terms and conditions ,your offer will be summarily rejected.

The bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

The supplier shall submit EI/EI forms to BHEL time to time as indicated by the BHEL and in case of inordinate delay in issuing EI/EI forms, then BHEL reserves the right to deduct 5% of the value of the supplied items against which EI/EI forms pending to be issued

Enclosures:

"LD clause has to be confirmed without fail."

The offers should reach us 30 minutes before the time of opening of tenders. The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

MANAGER / PURCHASE
(Valves)

Sl.No:	Material Code	Material Description	Drawing Number	Specification	TDC	Enquiry Qty (in Nos)	UoM
10	964562400000	GASKET-SW-GRP-OD77.8XID61.9X3.175T-5717	3V571717200/02	VL/STDC/019/02		1,000	NO
20	964562570000	SW GASKET 10 C300 GV-N065	3VN06595046/04	VL:STDC:022/00		1	NO
30	964651190000	GASKET-SW-GRP-OD146XID130X3.2T-5158	3V515895989/00	VL:STDC:022/00		2	NO
40	964651360000	GASKET-SW-GRP-OD92.0XID72.0X4.5T-3211	3V321195989/00		TDC:5:158/00	100	NO
50	964651460000	GASKET-SW-GRP-8"C150-GV-NC08	3VNC0824014/00	VL:STDC:022/00	TDC:5:158/00	4	NO
60	964655030000	GASKET-SW	3VZ07795989/00			10	NO
70	964657630000	GASKET-CAM PROFILE-NJ66	4VNJ6627269/00			4	NO
80	974603850000	GASKET(GRAFOIL)-V225	3VV22521102/00			1	NO
90	974603890000	GASKET(GRAFOIL)-V329	3VV32921102/00			3	NO
100	974604670000	GASKET-SW-GRP-OD620XID580X4.5T-L725	3VL72522687/00	VL/STDC/022/00		16	NO
110	974604680000	GASKET-SW-GRP-OD635XID595X4.5T-L705	3VL70522687/00	VL/STDC/022/00		33	NO
120	974604690000	GASKET-SW-GRP-OD128XID112X3.2T-L789	3VL78922687/00	VL/STDC/022/00		21	NO
130	974604740000	GASKET-SW-GRP-OD142XID122X3.2T-L751	3VL75122687/00	VL/STDC/022/00		17	NO

BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPALLI 620 014 INDIA

TECHNICAL DELIVERY
CONDITION FOR

MILD STEEL GASKETS FOR
VALVES

TDC:5:158
PAGE 01 OF 03

EFFECTIVE DATE

08-01-89

ACCEPTED BY

SIGNATURE

DATE

ENGINEERING

[Signature]

27/01/89

PURCHASE

[Signature]

28/1/89

QUALITY ASSURANCE

[Signature]

04/02/89

QUALITY CONTROL

[Signature] 27/1

REV. NO.

DATE

AUTHORISED BY

SIGNATURE

00

08/01/89

QUALITY ASSURANCE

QUALITY ASSURANCE

[Signature]

ISSUED BY : QUALITY ASSURANCE

SCOPE

This Technical Delivery Condition specifies the requirements for the supply of Mild Steel Gaskets for valves.

The dimensions, dimensional tolerances and quantity shall be as per drg. and purchase orders.

MATERIALS

The material shall be of plain low Carbon Steel (Equivalent to AISI 1010 or even less).

The material shall be in fully soft annealed condition with max. hardness of 90 BHN.

The above annealing operation must be carried out before the gasket is machined to the final shape and size.

MECHANICAL PROPERTIES

Hardness must be measured on the finished Gaskets and the same should not exceed 90 BHN.

WORKMANSHIP

The finished machined gaskets to the drg. dimensions must be free from rust, heat treatment scales, burrs and other defects.

MARKING AND PACKING

The finished gasket must be applied with a layer of plastic peel rust preventive to avoid rusting during storing. Before applying the plastic peel, the gasket must be identified by paint stencilling in the location given as overleaf

The gaskets must be packed in suitable wooden boxes to avoid transit damage.

CERTIFICATION

Each batch of the gaskets must be supplied with back up certificate for the following:

- a) P.O. Number
- b) T.C. Number and date
- c) Material quantity in each size
- d) Material chemistry
- e) Heat treatment condition
- f) Hardness

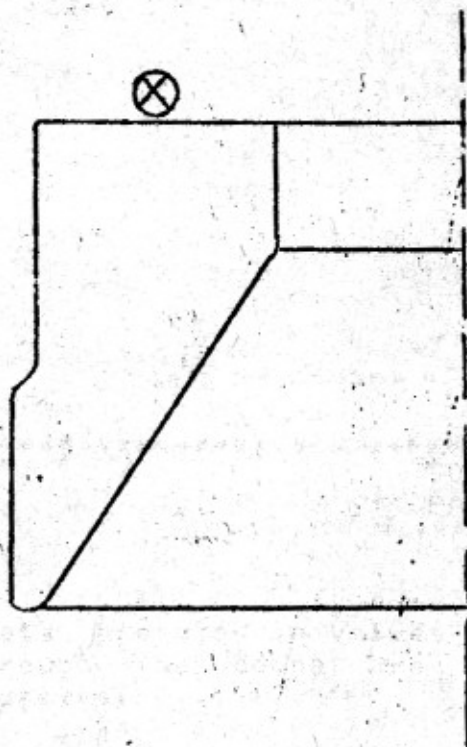
TDC:5:158

PAGE 03 OF 03

END USE

The gaskets are used in valves to arrest leakage of fluid through the bonnet area in the case of high pressure valves.

⊗ MARKING TO BE DONE ON THIS FACE

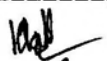
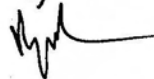


PRODUCT ENGINEERING / VALVES

VL:STDC:019
REVISION 02

T D C FOR S.W. GASKETS

- 1 Item : Spiral wound gasket of S.S with
filler for forged steel valves.
- 2 Application : Body - bonnet sealing
- 3 Material : Stainless steel with filler
- 4 Quantity : 30% extra to be procured as
contingency reserve.

	Signature	Date
Prepared by : K. SAKETHARAMAN		2/8/97
Checked by : N. NAGARAJAN		2/8/97
Approved by : R. THIRUVENGADAM		2/8/97

TDC FOR SPIRAL WOUND GASKET

1.0 SCOPE

This specification covers the dimensional, constructional, functional and qualitative requirements of spiral wound gaskets intended for use in valves to contain various media at different pressures and temperatures.

2.0 CONSTRUCTION

2.1 The spiral wound gaskets shall be made of alternate plies of pre-formed metal strip and filler tightly wound spirally.

2.2 The filler shall preferably protrude above the metal windings by about 0.125 mm (0.005") on either face of the gasket.

2.3 At the start and conclusion of the spiral form, min. 3 numbers of metal plies can be provided without any filler material, however the number of such plies shall not exceed 5 at each end.

2.4 The metal winding along the entire inner circumference of the gasket shall be suitably spot welded with equal spacing not exceeding 25 mm (1") with a minimum of 3 welds, out of which one shall be at the terminus of the metal ply.

2.5 The metal winding along the outer periphery of the gasket shall be welded with three welds at the terminus of the metal ply and can have additional welds spaced not more than 50 mm (2") apart.

3.0 GASKET DENSITY

3.1 The ratio of the number of metal windings to the number of filler windings, the winding tension etc., which govern the gasket density shall be suitably selected by the manufacturer such that when the gaskets are compressed as described in para 8.5 the thickness of the gaskets lie within the limits specified in Table I.

TDC FOR SPIRAL WOUND GASKET

4.0 DIMENSIONS

- 4.1 The dimensions of the gaskets shall be in accordance with the relevant drawing.
- 4.2 The thickness of the metal strip shall be between 0.18 mm and 0.23 mm.
- 4.3 The thickness of the filler used shall not exceed 0.4 mm.

5.0 MATERIAL

- 5.1 The material of the metal windings shall be AISI 304 or 316 stainless steel as indicated in the relevant drawing.
- 5.2 For CA filled spiral wound gasket, the filler material shall be canadian asbestos paper.
 - 5.2.1 The asbestos used as filler shall be composed of pure chrysolite asbestos and the total binder content shall not exceed 7% by weight. When the asbestos is heated at 1000 deg.F the total ignition loss shall not exceed 25% by weight.

6.0 PACKING

- 6.1 The gaskets shall be suitably packed in sets of 20 nos. each. The package shall be durably intact during transit and subsequent handling and storage.
- 6.2 The following details shall be clearly indicated in each package for identification.
 - a) Manufacturer's name
 - b) Gasket designation
 - c) Date of manufacture

7.0 WEIGHT

- 7.1 The manufacturer shall furnish the weight per 100 nos. of the gaskets in kilograms.

TDC FOR SPIRAL WOUND GASKET

8.0 INSPECTION & TESTING

8.1 The gaskets shall be subjected to the following inspection and testing at the manufacturer's works prior to shipment.

8.2 Visual Inspection:

8.2.1 The gaskets shall be undamaged and windings shall be intact.

8.2.2 Visually inspect for :

- a) Three welds on OD at terminus of the ply
- b) One weld at the terminus of the metal ply on the ID with additional welds spaced not more than 25 mm (1") apart.

8.3 DIMENSIONAL INSPECTION

8.3.1 At random few samples shall be selected and checked for conformance of dimensions with the drawing dimensions.

8.4 CHEMICAL ANALYSIS

8.4.1 The metal strip used shall be analysed for its chemical composition and it shall conform to the specification.

8.4.2 The filler material shall be analysed to estimate the binder content and percentage loss on ignition of the asbestos for canadian asbestos filled spiral wound gasket.

8.5 COMPRESSION TEST

8.5.1 For quantities upto 1000 pieces, 3 gaskets shall be compression tested. For quantities above 1000 pieces, the compression test shall be conducted on 3 gaskets plus 1 additional gasket for each 1000 pieces.

8.5.2 The compression test shall be conducted using four dial indicators placed 90 deg. apart to obtain average reading.

8.5.3 The gasket thickness shall be measured with micrometers before the gasket is placed into the test fixture.

TDC FOR SPIRAL WOUND GASKET

8.5.4 The test fixture shall be cleaned and closed with a load of 1500 kgs. (3000 lbs) and the dial indicators set to zero. The fixture shall be opened, the gasket placed inside and the fixture closed with a load of 50 kgs. (100 lbs.) The thickness of the gaskets indicated by the dials shall be read and the average thickness should match closely with the micrometer reading.

8.5.5 The required test load as shown in Table I shall then be applied on the gasket and the average compressed thickness shall be read. The load shall be maintained only for sufficient time to read the indicators, 5 to 10 seconds.

8.5.6 After the load is released the upper compression plate is left in contact with the gasket for about ten seconds and then the dial indicators are read to obtain the recovery of the gasket. The gasket shall be removed from the fixture and the thickness measured with micrometers. The micrometer reading should be approximately the same as the average recovered thickness measured with micrometers. The micrometer reading should be approximately the same as the average recovered thickness measured with the dial indicators. Occasionally between test runs the zero setting of the dial indicators should be checked.

8.5.7 For acceptance, average compressed thickness of each test gasket must be within the tolerance indicated in Table I and the average recovery must be 0.22 mm (0.0085") or more. Also there shall be no buckling of windings or failure of spot welds and the windings shall be intact.

9.0 TEST CERTIFICATE

9.1 Supplier shall furnish the following test certificates for each item for each lot.

- a) Material test certificate
- b) Compression test certificate
- c) Visual inspection and dimensional inspection.

10.0 DESIGNATION

10.1 The spiral wound gaskets shall be designated by the relevant drawing number and the technical specification number.

TDC FOR SPIRAL WOUND GASKET

10.2 Typical method of designation shall be as follows :

S.W. GASKET

3V-5903-04840 - VL:STDC:019

T A B L E - I

GASKET	FILLER	TEST LOAD kgs./Lbs.	COMPRESSED THICKNESS (Avg.mm)
3-V-5903-04840	CA		
3-V-5903-06275	PTFE	3700 / 8130	
3-V-5903-17200	GRAFOIL		
3-V-5904-04840	CA		
3-V-5904-06275	PTFE	6870 / 15100	
3-V-5904-17200	GRAFOIL		
3-V-5906-04840	CA		
3-V-5906-06275	PTFE	8840 / 19440	
3-V-5906-17200	GRAFOIL		
3-V-5907-04840	CA		
3-V-5907-06275	PTFE	8840 / 19440	
3-V-5907-17200	GRAFOIL		
3-V-5717-04840	CA		
3-V-5717-06275	PTFE	16450 / 36200	
3-V-5717-17200	GRAFOIL		
			- / -

2.66 +/- 0.12
(0.105" +/- 0.005")

Acceptable minimum recovery : 0.22 mm (0.0085") over the average compressed thickness of gasket.

11.0 QUALITY CHECKS AT BHEL

11.1 The following Inspections/tests shall be carried out on random samples in each size of gasket. If the samples fail to satisfy the specification requirements, additional samples will be selected and the tests will be repeated. If the additional samples also fail to satisfy the specification requirements, the bulk will be rejected.

TDC FOR SPIRAL WOUND GASKET

11.2 INSPECTION/TESTS TO BE DONE

- a) Visual Inspection as per para 8.2
- b) Dimensional Inspection
- c) Composition of metal strip
- d) Compression test as per para 8.5

In place of compression test, a hydrostatic test may be conducted on the gaskets in which case the test shall be conducted as described below.

11.3 PROCEDURE FOR HYDROSTATIC TESTING

11.3.1 The gaskets shall be tested between flanges designed in such a way that on compressing the 3.2 mm (0.125") gasket to 2.54 mm (0.100 +/- 0.005") metal to metal contact is established between the flanges and over-compression of the gaskets is prevented.

11.3.2 The flange faces shall have a finish of 3.2 microns and shall not have any radial tool marks.

11.3.3 The gasket shall be placed between flanges. The flange bolts shall be lubricated with Molykote-505 or equivalent and tightened with a torque wrench. The torque applied shall not exceed the value indicated in Table II.

11.3.4 Normal sequence for tightening of flange bolts shall be followed.

11.3.5 The test medium shall be water at a pressure of 211 kg/cm² (3000 psi).

11.3.6 When the gasketed joint is subjected to the internal hydrostatic pressure specified in 11.3.5, there shall be no leakage through the joint.

TDC FOR SPIRAL WOUND GASKET

11.3.7 After the hydrostatic test the flanges shall be disassembled and the gasket taken out for visual inspection. The spot welds on the gasket windings shall be intact and there shall be no buckling of metal windings on the inside periphery.

T A B L E - I I

GASKET DRAWING NO.	TORQUE (Kg.cm.)
3-V-5903-04840	400
3-V-5903-06275	
3-V-5903-17200	
3-V-5904-04840	800
3-V-5904-06275	
3-V-5904-17200	
3-V-5906-04840	1230
3-V-5906-06275	
3-V-5906-17200	
3-V-5907-04840	1360
3-V-5907-06275	
3-V-5907-17200	
3-V-5717-04840	3430
3-V-5717-06275	
3-V-5717-17200	

PRODUCT ENGG/VALVES
BHEL TRICHY-620014

VL:STDC:022
REV 00
PAGE 1 OF 5

TDC FOR SUB-DELIVERY COMPONENTS (SWG)

1. Item : Spiral wound gaskets with grafoil filler.
2. Application : Body-Bonnet Sealing
3. Material :)
4. Inspection :) Refer Annexure
5. Packing : Refer Annexure

(A. VISWANATHAN)
PREPARED
A. Viswanathan

mb
CHECKED
(S. Chandrasekar)

S. Kumar
APPROVED
S. KUMAR
30/12/93

ANNEXURE-----
TECHNICAL DELIVERY CONDITION FOR METALLIC SPIRAL WOUND
GASKETS - GRAFOIL FILLER
-----1.0 SCOPE:

This technical delivery condition specifies the constructional, functional and qualitative requirements of metallic spiral wound gaskets with grafoil filler for use in valves at different pressure and temperatures.

2.0 MANUFACTURE AND WORKMANSHIP :

- 2.1 These spiral wound gaskets shall be made of alternate plies of **performed** metal winding and filler tightly wound spirally.
- 2.2 The filler shall protrude above the metal strip by a maximum extent of 0.125mm on either face of the gasket.
- 2.3 At the start and conclusion of the spiral form a number of metal plies can be provided without any filler material; however, the number of such plies shall not exceed 5 at each end.
- 2.4 The metal winding around the entire inside circumference of the gasket shall be suitably spot welded in equal spacing not exceeding 25mm with a minimum of 3 welds.
- 2.5 The metal winding on the outside shall be welded with a minimum of three welds out of which one weld shall be at the terminal point.
- 2.6 Gaskets are to be compression tested in a compression testing machine with a suitable load to produce a unit pressure of 10000 to 15000 psi on the gasket. The compression shall not exceed the values specified in Table-1

N₃

VL:STDC:022
REV 00
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TABLE-1

Gasket thickness before compression	Gasket thickness after compression
3.2 mm (1.125")	2.29 to 2.54 mm (0.09" to 0.1")
4.4 mm (1.175")	3.18 to 3.43 mm (0.125" to 0.135")

2.7 GASKET DENSITY :

The ratio of the number of metal windings to the number of filler windings, winding tension etc. which govern the gasket density shall be suitably selected by the supplier such that when the gaskets are compressed as described in Para 2.6, the thickness of the gasket lie within the limits specified in Table-1.

3.0 DIMENSION :

3.1 All dimensions and style shall be in accordance with the relevant drawing. Where tolerances are not specified in the drawing, the following deviations can be allowed:

Gasket diameter ID $\pm$ 0.4 mm OD + 0.5 mm
- 0.0

Gasket thickness $\pm$ 0.13 mm

3.2 The thickness of the metal strip shall be between 0.18 mm and 0.23 mm.

3.3 The thickness of the grafoil used as filler shall not exceed 0.6 mm.

4.0 MATERIAL

4.1 Unless otherwise specified the material used for the metal winding shall be AISI 304 stainless steel.

4.2 The filler material shall be grafoil tapes.

- 4.3 If gaskets are required with centering rings the material shall conform to the drawing requirement.

5.0 PACKING :

Spiral wound gaskets shall be packed in Nos. of 10 in suitable card-board containers to avoid damage during transit. It should carry proper identification giving the size, type, drawing number and supplier's name.

6.0 RECEIPT INSPECTION & TESTING :

6.1 Visual Inspection :

The gasket shall be undamaged and the windings shall be intact.

- 6.2 At random few samples shall be selected and subjected to dimensional inspection. Dimensions shall conform to those given in the drawing.

- 6.3.1 The metal strip used shall be analysed for its chemical composition and it shall conform to the specification.

- 6.3.2 The filler material shall be analysed for material conformance.

6.4 Compression test :

- 6.4.1 The test shall consist of subjecting the gaskets to predetermined loads in a compression testing machine and measuring the thickness of the gaskets under the applied loads and after removal of loads.

- 6.4.2 The gasket shall be subjected to a uniform unit compressive load as described in Para 2.6

- 6.4.3 The thickness of the gasket shall be measured using dial indicators; with the applied load on the gasket, the thickness shall be within the limits specified in Table-1 under 2.6

- 6.4.4 After the load is removed the gasket shall recover atleast 0.25 mm over the compressed thickness obtained in the compression test.

N5

VL:STDC:022
REV 00
PAGE 5 OF 5

- 6.4.6 The gasket shall be visually examined after the compression test.

No buckling on the inner edge of the gasket shall be allowed. The spot welds should not foil and the windings should be intact.

6.5 Hydrostatic test and steam test :

- 6.5.1 The gasket shall be assembled in the actual valve or an equivalent flange.

- 6.5.2 The bolts shall be tightened with a torque wrench and the torques applied or compressed height shall not exceed those indicated in the drawing.

- 6.5.3 Normal sequencing of bolt tightening for flanges shall be followed.

- 6.5.4 Hydrostatic test and steam test shall be carried out at the parameters mentioned in the drawing. There shall be no leakage through the gasketed joint.

7.0 Test certificates :

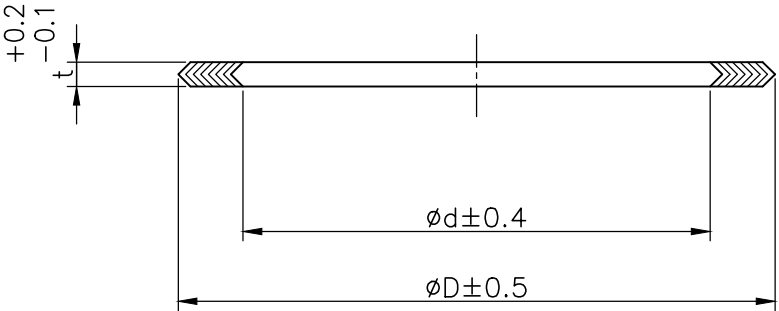
Supplier shall give the following Test Certificates for each item for each lot and should contain all details of the following tests.

- a. Compression Test Certificate
- b. Material Test Certificate
- c. Visual inspection and dimensional inspection.



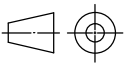
8922-0000-Λ-Σ
 DRAWING NO.

ITEM No.	DRAWING No.	COMPONENT CODE	DIMENSIONS			WEIGHT	REMARKS
			∅D	∅d	t		
01	3-V-L917-22687/00	974604550000	78	62	3.2	0.009	8"/300 CL; 6"/600CL.
02	3-V-L843-22687/00	974604560000	88	72	3.2	0.01	12/150,10/300,10/600
03	3-V-L958-22687/00	974604570000	113	97	3.2	0.05	24/150
04	3-V-L945-22687/00	974604580000	98	82	3.2	0.012	16"/150cl; 14"/600cl.
05	3-V-L946-22687/00	974604600000	507	467	4.5	0.74	16/150
06	3-V-L918-22687/00	974604610000	285	260	4.5	0.05	8/300
07	3-V-L927-22687/00	974604620000	404	372	4.5	0.1	12/150
08	3-V-L959-22687/00	974604630000	745	695	4.5	0.3	24/150
09	3-V-L827-22687/00	974604470000	230	205	4.5	0.046	6/300
10	3-V-L844-22687/00	974604640000	349	317	4.5	0.09	10/300
11	3-V-L859-22687/00	974604650000	422	382	4.5	0.14	12/300
12	3-V-L874-22687/00	974604750000	235	210	4.5	0.047	16"/300cl ; 6"/600cl
13	3-V-L890-22687/00	974604760000	462	422	4.5	0.15	14/300/600,16/300/600
14	3-V-L825-22687/00	974604460000	68	52	3.2	0.008	6/300
15	3-V-L805-22687/00	974604590000	108	92	3.2	0.013	20/150;16",20"/300cl;18"/600cl
16	3-V-L984-22687/00	974604660000	517	477	4.5	0.755	16/300
17	3-V-L725-22687/00	974604670000	620	580	4.5	0.911	20/300
18	3-V-L705-22687/00	974604680000	635	595	4.5	0.934	20/150
19	3-V-L751-22687/00	974604740000	142	122	3.2	0.070	24/600
20	3-V-L789-22687/00	974604690000	128	112	3.2	0.070	32/150
21	3-V-L790-22687/00	974604700000	948	888	4.5	1.2	32/150
22	3-V-L507-22687/00	974604710000	412	372	4.5	0.12	10/600
23	3-V-L513-22687/00	974604720000	50	34	3.2	0.006	3/900
24	3-V-L529-22687/00	974604730000	152	120	4.5	0.051	3/900
25	3-V-CV03-22687/00	974604770000	74	54	4.5	0.008	2"-2500-CONTROL VALVE
26	3-V-3211-22687/00	974604870000	92.0	72.0	4.5	0.05	50/65-3000ADV
27	3-V-L703-22687/00	974604860000	570	530	4.5	0.85	18/150
28	3-V-L493-22687/00	974604890000	695	654	4.5	0.9	24/300
29	3-V-LB73-22687/00	974605000000	1060	996	4.5	3	36/150
30	3-V-LB74-22687/00	974605010000	138	119	3.2	0.09	36/150



NOTES:

- COMPRESSED GRAPHITE FILLER TO BE COMPRESSED TO A DENSITY OF 1.6GM/CC TO 1.8GM/CC.
- WINDING MATERIAL SHALL BE SS304/SS316.
- GASKETS SHALL WITHSTAND MAXIMUM SERVICE PRESSURE OF 240 kg/cm² AND MAXIMUM TEMPERATURE OF 550°C
- FOR QUALITY REQUIREMENTS REFER APPLICABLE QUALITY PROCEDURE.

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No	
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										
 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT, TIRUCHIRAPALLI- 620014.					DRN	NAME M.P.S	SIGN M.P.S	DATE 26.05.05	NO.OF VAR.	
					CHD	P.R.K.	P.R.K.	26.05.05		
					APPD	S.N.R	S.N.R	26.05.05		
DEPT VL			SCALE N T S	WEIGHT (KG). --	REFERENCE INFORMATION				NO. OF ITEMS	
CODE 3 2 0										
TITLE SPIRAL WOUND GASKET (GRAFOIL)						CARD CODE U 01	DRAWING NO. 3-V-0000-22687			REV 09

REV

DATE

ALTERED

JALAL

09

08.04.15

CHD & APPD

SANKARAN

REV

DATE

ALTERED

JALAL

08

29.03.14

CHD & APPD

SAKETH

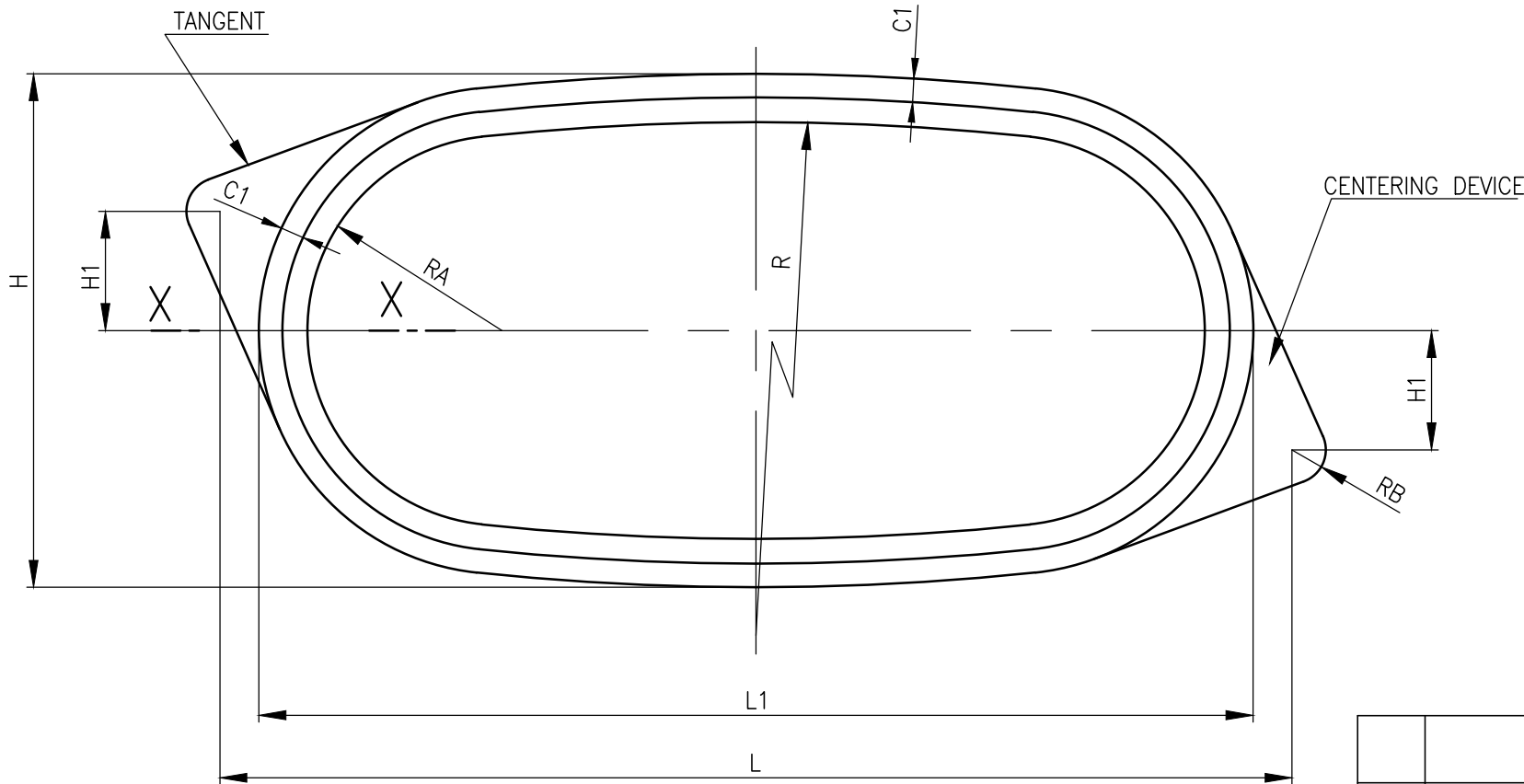
S.No.29 ADDED

NOTES UPDATED

DCP No.: 801721

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.

DRAWING NO. 3-V-0000-24014														
SL. NO.	DRAWING NO.	COMP. CODE	DIMENSIONS										NET WT.(Kg.)	VALVE SPECN.
			L	L1	R	RA	RB	H	H1	C1	C			
01	3-V-NC08-24014	964651460000	319	295.8	772.53	58	10	152.8	35.5	7	8		0.22	8"/150CL
02	3-V-NC10-24014/1	964651630000	382	356	1028	65	10	170	41.8	7	8		0.28	10"/150CL



NOTES:

1. INNER RING OF 316 STAINLESS STEEL SHALL BE PROVIDED.
2. PURCHASE SPECIFICATIONS SHALL BE AS PER APPLICABLE QUALITY WORK INSTRUCTIONS

WORKING CONDITIONS

PRESSURE- 30kg/cm²(524 PSI)

TEMPERATURE - 45°C TO 550°C
(-50°F TO 1085°F)

DIMENSIONAL TOLERANCES FOR GASKET

INSIDE DIMENSIONS ±0.5

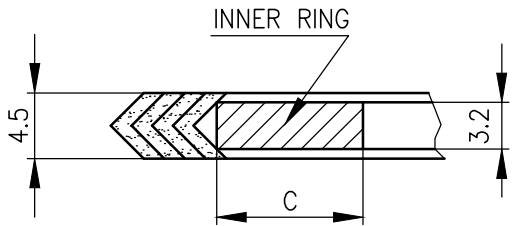
OUTSIDE DIMENSIONS ±0.5

THICKNESS ±0.13

MATERIAL:

SPIRAL WOUND GRAFOIL FILLED WITH AISI 316.

SECTION XX



REV	DATE	ALTERED	MARIMUTHU	REV	DATE	ALTERED	VB
02	02.12.14	CHD & APPD	MA & SSK	1	27.10.03	CHD & APPD	MRK
IN SL. No.02 DIMENSIONS 356, 1028, 65 & 170 WERE 346, 1025.9, 63 & 160 RESPLY. DCP: 801850				SL. No.02 INCLUDED..			

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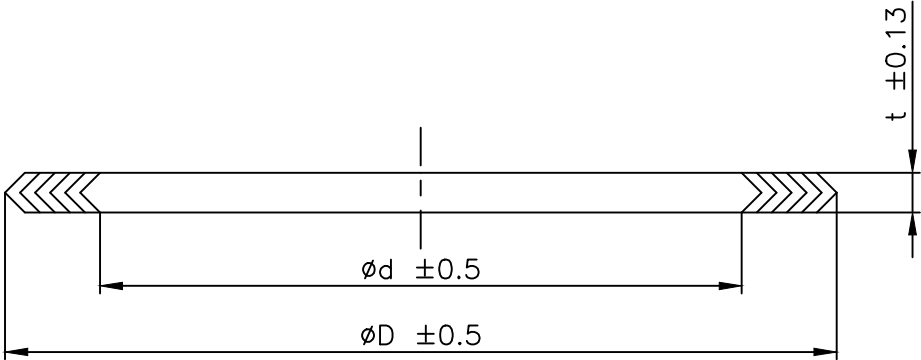
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT REDRAWN WITH REV.1 ON 27.10.03									
BHARAT HEAVY ELECTRICALS LTD. UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI 620014.					DRN	NAME V.BAIRAVAN	SIGN	DATE 27.10.03	NO.OF VAR.
365-121					CHD	R.L.NARAYANAN		27.10.03	—
DEPT VL					APPD	M.RAJAKUMAR		27.10.03	—
CODE 320					REFERENCE INFORMATION				NO. OF ITEMS
TITLE SPIRAL WOUND GASKET					DRAWING NO. 3-V-0000-24014				REV
SCALE NTS.					CARD CODE U 01				2

68696-0000-Λ-Σ ON DRAWING									
SL. NO.	DRAWING NO.	COMPONENT CODE	DIMENSIONS			NET WT.(KG)	APPLICABLE VALVE PARAMETER		
			øD	ød	t		SIZE/RATING	MAX.TEMP.-°F	MAX.PR.-PSIG
01	3-V-B001-95989	964651180000	138	120	4.5	0.12	2"/600C GV	1100	1500
02	3-V-5158-95989	964651190000	146	130	3.2	0.06	2"/150C FV	1100	750
03	3-V-2477-95989	964651200000	102.5	90	3.2	0.03	2"/300C GLV	1100	750
04	3-V-2479-95989	964651210000	159	147	3.2	0.07	4"/300C GLV	1100	750
05	3-V-F502-95989	964651220000	172	152	4.5	0.12	3"/600C GV	1100	1500
06	3-V-F503-95989	964651230000	202	182	4.5	0.14	4"/600C GV	1100	1500
07	3-V-F504-95989	964651240000	258	238	4.5	0.18	6"/600C GV	1100	1500
08	3-V-F505-95989	964651250000	316	290	4.5	0.28	8"/600C GV	1100	1500
09	3-V-F506-95989	964651260000	368	336	4.5	0.41	10"/600C GV	1100	1500
10	3-V-F507-95989	964651270000	444	400	4.5	0.67	12"/600C GV	1100	1500
11	3-V-N598-95989	964651300000	457	422	4.5	0.5	14"/300C GV	1100	750
12	3-V-N964-95989	964651310000	517	476	4.5	0.66	16"/300C GV	1100	750
13	3-V-N595-95989	964651320000	620	580	4.5	0.78	20"/300C GV	1100	750
14	3-V-3211-95989	964651360000	92.0	72.0	4.5	0.05	50/65-3000ADV	1100	7500
15	3-V-P366-95989	964651890000	324	304	4.5	0.22	10"/300C GLV	1100	750
16	3-V-P480-95989	964652660000	316	296.5	4.5	0.18	10"/300C GLV	1100	750
17	3-V-NE96-95989	964652690000	692.5	649.5	4.5	0.63	22"/300C GV	1100	750
18	3-V-Z068-95989	964653140000	304	280	4.5	0.27	8"/600C FV	1100	1500
19	3-V-NF97-95989	964653380000	817	764	4.5	1.47	26"/300C GV	1100	750
20	3-V-P560-95989	964654060000	410	382	4.5	0.34	12"/300C RV	1100	750
21	3-V-P538-95989	964653160000	429.5	385.5	4.5	0.20	12"/600C RV	1100	1500
22	3-V-NH51-95989	964654860000	556.3	524.3	4.5	0.6	16"/300C RV	1100	750

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REV	DATE	ALTERED	DEEPAKRAJ
10	20.06.13	CHD & APPD	DEEPAKRAJ & KRS
	SL.Nos.27 INCLUDED.		

SL. NO.	DRAWING NO.	COMPONENT CODE	DIMENSIONS			NET WT.(KG)	APPLICABLE VALVE PARAMETER		
			øD	ød	t		SIZE/RATING	MAX.TEMP.-°F	MAX.PR.-PSIG
23	3-V-NH52-95989	964654960000	568	508	4.5	0.7	16"/600C RV	1100	1500
24	3-V-Z077-95989	964655030000	1126	1069	4.5	1.75	38"/300C FV	1100	1500
25	3-V-ZA77-95989	964655040000	142	122	3.2	0.05	38"/300C FV	1100	1500
26	3-V-NH50-95989	964655020000	459.5	406.5	4.5	0.96	14"/600C RV	1100	1500
27	3-V-BA51-95989	964655150000	360	334	4.5	0.43	8"/300C BV	1100	750



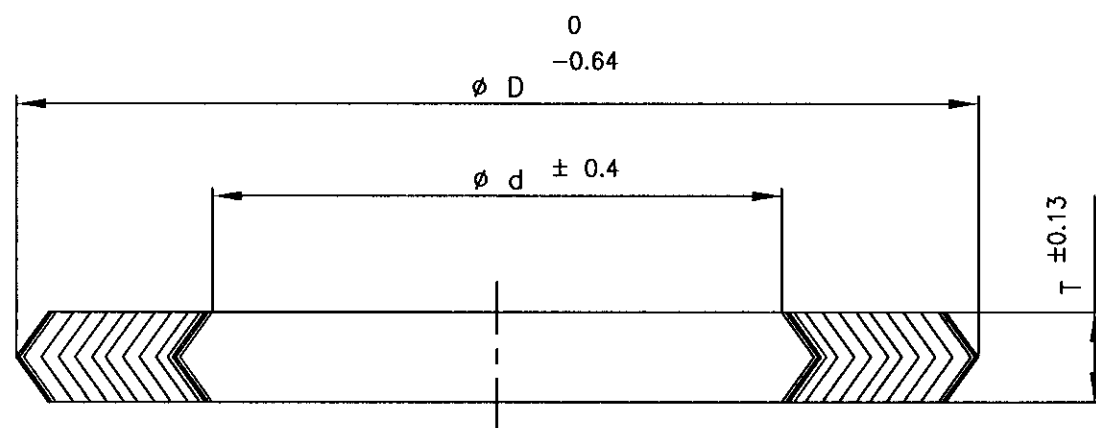
NOTES:-

01. FOR QUALITY REQUIREMENTS REFER LATEST APPLICABLE QUALITY WORK INSTRUCTION.
02. THESE SPIRAL WOUND GASKETS SHALL WITHSTAND A SERVICE PRESSURE AND SERVICE TEMP. AS REFERRED IN THE TABULATION.
03. MATERIAL : AISI 316 WITH GRAFOIL FILLED.
04. LEGENDS : GV – WEDGE GATE VLAVE
FV – SWING CHECK VALVE
GLV – GLOBE VALVE
ADV – ANGLE DRAIN VALVE
RV – REGULATING VALVE

—	—	—	—	—	—	—	—	—	—
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT REDRAWN WITH REV.06 ON 29.10.2009									
 365-121 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.					DRN	NAME K.P.LEON	SIGN	DATE 22.04.02	NO.OF VAR.
					CHD	P.BOOMINATHAN		22.04.02	
					APPD	K.S.RAMAN		22.04.02	
DEPT VL			SCALE N T S	WEIGHT (KG). REF. TABLE	REFERENCE INFORMATIONSCAD REF: C395989				NO. OF ITEMS
CODE 320									
TITLE SPIRAL WOUND GASKET (CIRCULAR GRAFOIL FILLED)						CARD CODE U 01	DRAWING NO. 3-V-0000-95989		REV 10

DRAWING NO. 3-V-0000-17200

SL. No.	DRAWING NUMBER	COMPONENT CODE	DIMENSIONS			Net Wt. in Kg.	BOLT DETAILS			REMARKS
			ϕ D	ϕ d	T		THREAD SIZE	No. of BOLTS	BOLT MATERIAL	
01	3.V.5903.17200/02	96 456 236 0000	40.48	31.75	3.175	0.006	0.375" - 16 UNC	4	A193-B7	
02	3.V.5904.17200/02	96 456 237 0000	50.00	39.70	3.175	0.017	0.500" - 13 UNC	4	A193-B7	
03	3.V.5906.17200/02	96 456 238 0000	60.33	49.20	3.175	0.018	0.5625" - 12 UNC	4	A193-B7	
04	3.V.5907.17200/02	96 456 239 0000	65.10	54.00	3.175	0.018	0.5625" - 12 UNC	4	A193-B7	
05	3.V.5717.17200/02	96 456 240 0000	77.80	61.90	3.175	0.019	0.750" - 10 UNC	4	A193-B7	



NOTES :

1. MATERIAL: TYPE 316 STAINLESS STEEL WITH GRAFOIL FILLER.
2. GASKET SHALL WITHSTAND SERVICE PRESSURES UPTO 141 Kg/Sq.cm AND SERVICE TEMPERATURES UPTO 427°C (800°F)

REV	DATE	ALTERED	M.SRINIVASAN	REV	DATE	ALTERED	M.SRINIVASAN
02	28.05.02	CHD & APPD	K.S.RAMAN	01	20.2.97	CHD & APPD	K.S.RAMAN
DCP : 800067	MATERIAL TYPE 316 WAS TYPE 304.			DCN:FS:0584	1. TOLERANCE IN DIMENSION $\phi d \pm 0.4$ WAS $\phi d \pm 0.64$ $\phi D -0.64$ WAS $\phi D \pm 0.4$		

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.

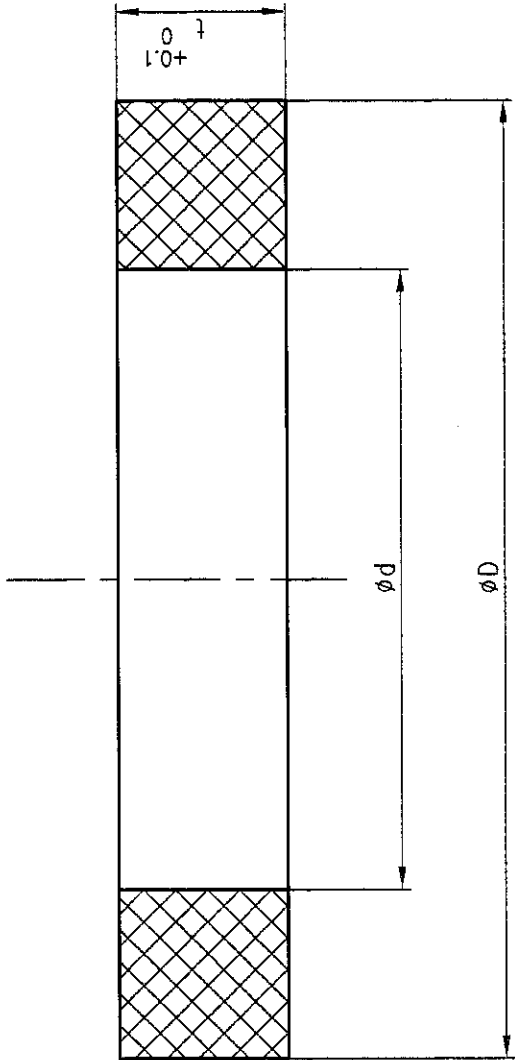
—	—	—	—	—	—	—	—	—	—
NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT									
 BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014. 365-121					DRN	NAME M.SRINIVASAN	SIGN	DATE 28.05.02	NO.OF VAR.
					CHD	P.BOOMINATHAN		28.05.02	
					APPD	K.S.RAMAN		28.05.02	
DEPT VL		SCALE NTS	WEIGHT (KG). REF.TABLE	REFERENCE INFORMATION					NO. OF ITEMS
CODE 320				CAD: F317200					
TITLE SPIRAL WOUND GASKET (GRAFOIL)				CARD CODE U 01	DRAWING NO. 3-V-0000-17200				REV 02

WZ0112-0000-A-Σ
DRAWING NO. 00000000

SL.No	DRAWING No.	MATL.CODE	MATL. SPECN.	DIMENSIONS			WT. (GMS)	SIZE/RATING
				øD	ød	t		
01	3-V-V081-21102	974603770000	GRAFOIL	190 -d12	164 -D12	22.5	292.76	150/1500
02	3-V-V105-21102	974603780000		235 -d12	209 -D12	22.7	370.46	200/1500
03	3-V-V129-21102	974603790000		290 -d13	258 -D13	26.8	664.39	250/1500
04	3-V-V145-21102	974603800000		330 -d13	298 -D13	27.4	778.43	300/1500
05	3-V-V161-21102	974603810000		370 -d13	338 -D13	27.7	887.20	350/1500
06	3-V-V177-21102	974603820000		420 -d13	380 -D13	33.9	1533.60	400/1500
07	3-V-V193-21102	974603830000		475 -d13	435 -D13	34.5	1775.34	450/1500
08	3-V-V209-21102	974603840000		107 -d12	92 -D12	14.2	59.92	65/2500
09	3-V-V225-21102	974603850000		117 -d12	102 -D12	14.3	66.41	80/2500
10	3-V-V241-21102	974603860000		130 -d12	110 -D12	18.1	122.82	100/2500
11	3-V-V257-21102	974603870000		150 -d12	130 -D12	18.5	146.46	125/2500
12	3-V-V305-21102	974603880000		235 -d12	209 -D12	23.9	390.05	200/2500
13	3-V-V329-21102	974603890000		275 -d12	249 -D12	24.2	466.10	250/2500
14	3-V-V345-21102	974603900000		340 -d13	308 -D13	28.7	841.33	300/2500
15	3-V-V377-21102	974603910000		400 -d13	360 -D13	35.3	1517.09	400/2500
16	3-V-V393-21102	974603920000		470 -d13	430 -D13	35.8	1821.99	450/2500
17	3-V-V409-21102	974603930000		120 -d12	100 -D12	18.5	115.07	80/3500
18	3-V-V433-21102	974603940000		180 -d12	154 -D12	23.9	293.41	150/3500
19	3-V-V449-21102	974603950000		305 -d13	265 -D13	34.3	1105.58	350/3500
20	3-V-V465-21102	974603960000		420 -d13	372 -D13	43	2310.98	500/3500
21	3-V-W201- 21102	974604480000		295 -d13	263 -D13	26.8	676.51	250/1500(A)
22	3-V-W185-21102	974604490000		210 -d12	184 -D12	22.5	325.84	150/1500(A)
23	3-V-W433-21102	974604500000		125 -d12	105 -D12	13.5	87.79	80/1500(A)

REV	DATE	ALTERED
1	11-8-01	CHD & APPD KSS K-R
SL. Nos. 21, 22 & 23 INCLUDED.		

80-120 d12	-0.120
80-120 d12	-0.470
120-180 d12	-0.145
120-180 d12	-0.545
180-250 d12	-0.170
180-250 d12	-0.630
250-315 d12	-0.190
250-315 d12	-0.710
250-315 d13	-0.190
250-315 d13	-1.000
315-400 d13	-0.210
315-400 d13	-1.100
400-500 d13	-0.230
400-500 d13	-1.200
80-120 D12	+0.470
80-120 D12	+0.120
120-180 D12	+0.545
120-180 D12	+0.145
180-250 D12	+0.630
180-250 D12	+0.170
250-315 D13	+1.000
250-315 D13	+0.190
315-400 D13	+1.100
315-400 D13	+0.210
400-500 D13	+1.200
400-500 D13	+0.230



RECOMMENDED SUPPLIER

SUPPLIER	MODEL No.
NIPPON PILLAR	P6690 - T

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

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REV	DATE	ALTERED
1	11-8-01	CHD & APPD KSS K-R
SL. Nos. 21, 22 & 23 INCLUDED.		

	BHARAT HEAVY ELECTRICALS LTD., UNT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI-620014.	DRN V.BAIRAVAN	SIGN 	DATE 18.5.99	NO. OF VAR.
DEPT 365-121	SCALE N.T.S	CHD K.RAJASEKAR	APPD M.RAJAKUMAR	19.5.99	
VL CODE 320	WEIGHT (KG).	REFERENCE INFORMATION			
TITLE GASKET (GRAFOIL)		CAD REF. No. : T321102			
CARD CODE U 01		DRAWING NO. 3-V-0000-21102			
		REV 1			

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MILLIMETRES)

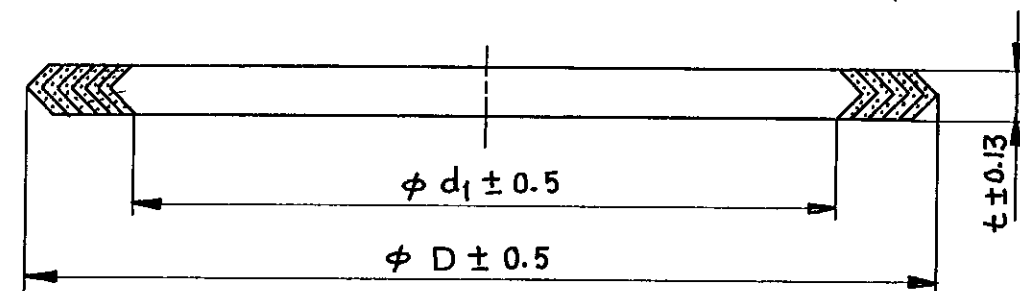
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCD/QPD

CAUTION: THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

SL.No.	DRG. No.	MATL. CODE	DIMENSIONS			NET WT (kg)	SIZE/RATING
			ϕD	ϕd	t		
01	3-V-N097-95046/04	96 456 254	189	171	3.2 4.5	0.10	4"-C300 GV
02	3-V-N017-95046/04	96 456 255	242	222	3.2 4.5	0.14	6"-C300 GV
03	3-V-N089-95046/04	96 456 256	305	284	3.2 4.5	0.16	8"-C300 GV
04	3-V-N065-95046/04	96 456 257	372	345	3.2 4.5	0.23	10"-C300 GV
05	3-V-N081-95046/04	96 456 258	119	109	3.2 4.5	0.05	2"-C300 GV
06	3-V-N105-95046/03	96 456 304	439	411	3.2 4.5	0.28	12"-C300 GV
07	3-V-N049-95046/03	96 456 305	168.5	154	3.2 4.5	0.065	3"-C300
08	3-V-C363-95046/03	96 456 361	700	660	4.5 4.5	0.94	20"-C300
09	3-V-5186-95046/03	96 456 362	188.5	168	3.2	0.094	3"-C300 NRV
10	3-V-5187-95046/03	96 456 363	200.0	180	3.2	0.098	4"-C300 NRV
11	3-V-5188-95046/03	96 456 364	252.2	232	3.2	0.125	6"-C300 NRV
12	3-V-5189-95046/03	96 456 365	295	275	3.2	0.146	8"-C300 NRV
13	3-V-5153-95046/01	96 456 412	168.5	152	3.2	0.065	2"-C300 FV
14	3-V-5156-95046/01	96 456 413	202	188		0.100	4"-C150 FV
15	3-V-5154-95046/01	96 456 414	295	275		0.146	8"-C150 FV
16	3-V-2478-95046/01	96 456 415	122	110		0.035	3"-C300 SV
17	3-V-1381-95046/01	96 456 416	316.5	296		0.159	8"-C300 GV (OLD)
18	3-V-1382-95046/01	96 456 417	376.5	352		0.227	10"-C300 GV (OLD)
19	3-V-0205-95046/01	96 456 418	109	97		0.050	6S/40 SV
20	3-V-5123-95046/01	96 456 423	219	200		0.12	150/16/III-FV
21	3-V-0181-95046/01	96 456 424	349	337		0.21	250/40/III-SV
22	3-V-0546-95046/02	96 456 (435) 415	224	204		0.027	150/40-FV
23	3-V-0533-95046/01	96 456 426	345	320		1.03	250/40-FV

REV 06	DATE 19/7/94	ALTERED: <i>[Signature]</i>	CHECKED: <i>[Signature]</i>	05	DATE 21.5.94	ALTD: <i>[Signature]</i>	CHKD: <i>[Signature]</i>	REV 04	DATE 2.4.94	ALTD: N. DI. ANPIL <i>[Signature]</i>	CHKD: <i>[Signature]</i>
01) IN SL.No. 22 MATL. CODE 96 456 435 WAS 96 456 425				01. SL. No. 13 TO 23 INCLUDED.				1. IN SLNO. 1 TO 8 DIM. 't' CHANGED TO 4.5.			
02) DCN. No. CS: 0355								2. REFER DCN. SLNO: CS: 0298			
REV 03	DATE 30.12.93	ALTD: <i>[Signature]</i>	CHKD: <i>[Signature]</i>	02	DATE 18.12.93	ALTD: <i>[Signature]</i>	CHKD: <i>[Signature]</i>	REV 01	DATE 8.10.92	ALTERED: <i>[Signature]</i>	CHECKED: S.C. <i>[Signature]</i>
FOR SL. NOS. 1 TO 7 EXCEPT 4, DIMENSION ϕd 171, 222, 284, 109, 411 AND 154 WERE 165, 218, 278, 103, 405 AND 152 RESPECTIVELY. NOTE: 2 REVISED & NOT 3 DELETED. DCN No. CS: 0241				SL. NO. 8 TO 12 INCLUDED.				MATL. GRAFOIL & 316 WERE ASBESTOS & 304 RESPECTIVELY. SL. NOS. 06 & 07 ADDED. REFER DCN NO: CV 0059 Dt: 6.10.92			

15



NOTES:-

- THESE SPIRAL WOUND GASKETS SHALL WITHSTAND A SERVICE PRESSURE RANGE OF 365 To 720 PSIG (25.66 To 50.62 kp/cm^2) AND A SERVICE OF -50°F To 1025°F (-45°C To 550°C)
- PURCHASE SPECIFICATIONS SHALL BE AS PER LATEST APPLICABLE QUALITY PROCEDURE.

MATERIAL : SPIRAL WOUND GRAFOIL[®] FILLED AISI TYPE 316[®]

REV 07	DATE 2.1.97	ALTD: T.C. <i>[Signature]</i>	CHKD: BAPPD <i>[Signature]</i>
NOTES UPDATED REFER DCN. CS: 0648			

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECTBharat Heavy Electricals Ltd.,
BOILER PLANT UNIT
TIRUCHIRAPALLI - 620 014

DRN.	NAME	SIGN.	DATE	NO. OF VAR.
K.N. CHEZHIAN	<i>[Signature]</i>	03-07-92		
CHD.	A.V. NATHAN	<i>[Signature]</i>	7.7.92	
APPD	N.S.N. MOHAN	<i>[Signature]</i>		

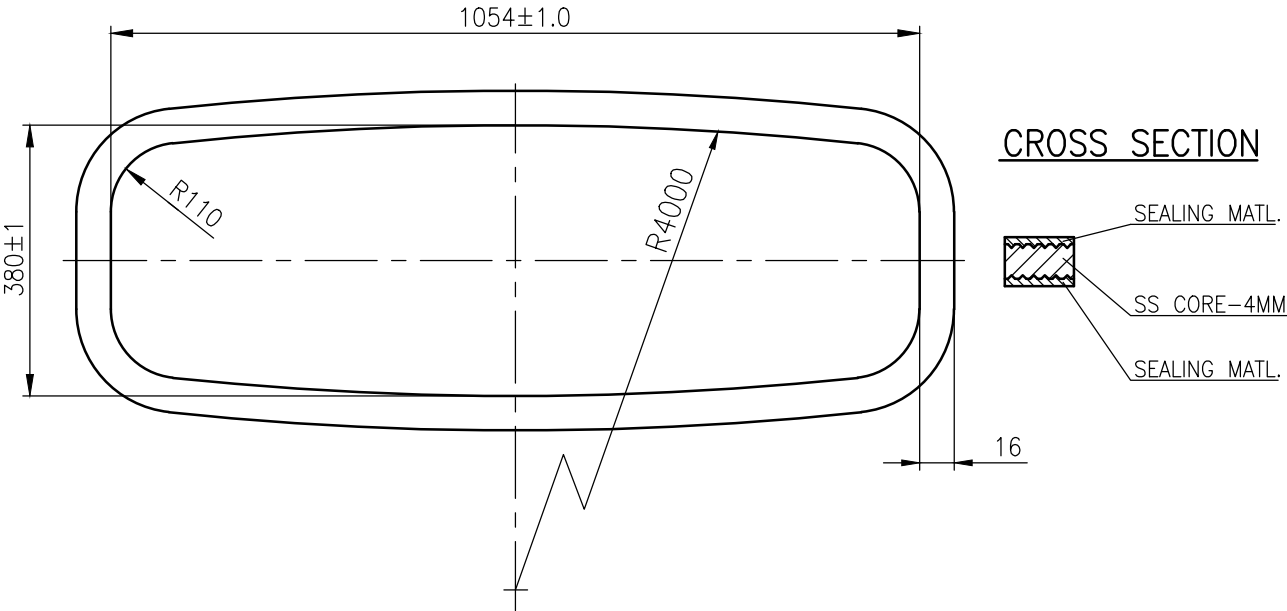
DEPT. VL	GRADE OF UNTOL. DIM.	SCALE	WEIGHT (kg.)	REF. TO ASSY./OLD DRG.	ITEM NO.
320	61M/F	N.T.S	N.T.S		
TITLE			CARD CODE	DRAWING NO.	REV.
SPIRAL WOUND GASKET (CIRCULAR - GRAFOIL FILLED)			U 01	3-V-0000-95046	07

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.

ALL DIMENSIONS ARE IN MILLIMETRES.

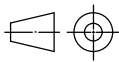
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

REV	DATE	ALTERED
		CHD & APPD



NOTE:

- 1. MATERIAL: SS 316/SS304 STAINLESS STEEL CORE WITH CONCENTRIC GROOVES ON EITHERSIDE WITH GRAFOIL SEALING MATERIAL.
- 2. MAXIMUM WORKING PRESSURE : 35Kg/Sq.CM
- 3. MAXIMUM WORKING TEMPERATURE : 550°C
- 4. GASKET WIDTH SHALL BE UNIFORM AROUND
- 5. MAX. THICKNESS OF GASKET INCLUDING SEALING LAYER = 5.2 MM
- 6. PURCHASE SPECIFICATION AS PER APPLICABLE QUALITY PROCEDURE.

—	—	—	—	—	—	—	—	—	—
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 M.SELVAM	SIGN	DATE 08.02.16	NO.OF VAR
					CHD	M.SRINIVASAN		08.02.16	
					APPD	K.RAJASEKARAN		08.02.16	
DEPT VL		SCALE		WEIGHT (KG).	REFERENCE INFORMATION				NO. OF ITEMS
CODE 320		N T S		1.6	COMPONENT CODE: 96 465 763 0000				
TITLE					CARD CODE	DRAWING NO.			REV
GASKET (CAM PROFILE)					U 01	4-V-NJ66-27269			00



BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

TERMS AND CONDITIONS

Annexure-2

Phone: 0431 257 7210/7086

Email: vinu@bheltry.co.in

vikasverma@bheltry.co.in

1. QUOTATIONS:

- a. **Submission of Tender:** Each offer should be sent in double cover separately and the same should be sealed and super scribed with correct Tender No., item of supply and due date of opening. Two or more quotations should not be sent in one cover. Price Bid should contain only Price in INR per unit for each type. Tender must be strictly sent to the address given below and not in any individual's name.

Tender Opening Cell/Valves
Room No.26, Building-24, High Pressure Boiler Plant
Bharat Heavy Electricals Limited
Tiruchirappalli - 620 014, Tamil Nadu, India
Or
Email ID: tender_cell@bheltry.co.in

- b. **Late tenders:** Late tenders shall not be considered under any circumstance.
- c. **Regulations:** Tender should be accompanied by detailed technical literature, Catalogue and detailed dimensional drawings in ENGLISH. Tenders should be free from CORRECTION AND ERASURES. Corrections if any must be attested. All amounts shall be indicated both in words as well as figures. Where there is difference between amount quoted in words and figures, amount quoted in words shall prevail.
- d. **Two Part Bid Systems:** Tender calls for two part bid system (Techno-Commercial & Price Bid), first the Techno-Commercial bid will be opened. Techno-commercially suitable/qualified vendors alone will be intimated for price bid opening or Reverse Auction.
- e. **PVC:** Price Variation Clause is not acceptable. Prices should be firm.
- f. **Catalogue:** Manufacturer's name, Trade Mark or Patent No. if any should be specified. Illustrative leaflets giving technical particulars are required along with quotation wherever necessary.
- g. **Acceptance:** The purchaser shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.
- h. **Samples:** Samples should be submitted separately if specially requested in tender before due date of the enquiry. They should be clearly marked with the enquiry number and date on the outside cover to facilitate identification.
- i. **Spares:** The tenderer should quote separately for spares that are required for two years trouble free operation (if mentioned in enquiry). The spares offer should accompany the offer of main equipment; otherwise the quotation will be overlooked.

2. COMMERCIAL TERMS & CONDITIONS:

- a. **Technical Terms:** All the items must be delivered strictly as per Drawing/TDC/Standards/Spec (As applicable)
- b. **Terms of Payment:**
For Indigenous supplier: 100% after 45 days on satisfactory receipts and acceptance of material at BHEL stores/ Site acknowledgement.
Any deviation in the above payment terms will attract loading as mentioned below.
Base rate of SBI (As applicable on the date of bid opening. Commercial bid opening date in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.
LC will not be operated for indigenous vendors. Offers with payment terms as LC from Indigenous vendors will be rejected.
For Import supplier: 100% payment on CAD basis after 45 days from the date of receipt of documents, specified in PO, at BHEL's bank. Respective bank charges to respective account.
Any deviation in the above payment term will attract loading as "Base rate of SBI (as applicable on the date of bid opening. Commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders."
In the case of Usance LCs the loading will be considered @ 1.5% on the offered Value. For LC at sight the loading will be considered @ 3.5% on the offered Value.
- c. **Liquidated Damage:** Liquidated damages shall be 0.5% of the total order value or part thereof subject to a maximum of 10% of the total order value. For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.



BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

TERMS AND CONDITIONS

Annexure-2

Phone: 0431 257 7210/7086

Email: vinu@bheltry.co.in

vikasverma@bheltry.co.in

Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offer value).

d. Delivery Terms:

For Indigenous Suppliers: Price should be quoted **FOR BHEL Trichy**/FOR site as mentioned in enquiry inclusive of freight and insurance in transit.

For import Suppliers: CFR/CIF Chennai seaport

e. Validity of Offer: Prices should be valid for 120 days from the date of tender opening.

f. Taxes & Duties: If any Sales Tax is payable as extra to the quoted price, it should be specifically stated in quotation along with CST & T.N.G.S.T No. failing which the purchaser will not be liable for payment of Sales Tax. Our T.N.G.S.T No. 3550005 Dated 01-04-1995 C.S.T. No. 259383 Dt. 11.06.1991.

g. Guarantee Clause: The vendor shall give a guarantee for the performance of his supplies for a period of eighteen months from the date of dispatch or twelve months from the date of commissioning whichever is earlier.

h. Risk Purchase: Alternatively the purchaser at their option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of seller either the whole of 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 substitute therefore. Supplier shall be liable for any loss which the purchaser may sustain by reason for such risk purchases in addition to penalty at the rate mentioned in clause 2.b above.

i. MODVAT/CREDIT: If any Excise Duty is payable, the chapter head/sub-head reference and the rate of the duty should be quoted. If the tenderer is availing MODVAT credit for his input materials, the effect of proforma invoice should be passed on to the purchaser. For imported components, Duty benefits should be passed to BHEL.

j. Miscellaneous: Any other conditions which might have been quoted by the seller and are in contravention to the terms prescribed, the order and which have not been specifically accepted in by Purchaser will not be applicable to the contract.

k. Delivery: Delivery schedule shall be strictly within **4Weeks** from the date of PO.

l. Performance Bank Guarantee: If tender Calls for Performance Bank Guarantee, Vendor should provide a performance bank guarantee (PBG) in BHEL format for 10% of the total Purchase order value valid for warranty/guarantee period with an additional claim period of 2 months. PBG should be issued from list of consortium banks.

m. Special Provisions for Micro and Small Enterprises (MSE):

- i. 20% of the tendered quantity is earmarked for MSE suppliers in this tender.
- ii. Out of the 20% tendered quantity reserved for MSE suppliers, 4% shall be earmarked for procurement from MSE owned by SC/ST entrepreneurs.
- iii. In case MSE vendor participating in the tender quotes within the price band of LI +15%, they will be allowed to supply the portion of the requirement subject to acceptance of LI 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 (Two years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with CA certificate 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. 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.

3. GENERAL CONDITIONS:

- a. BHEL reserves the right to finalize the tender as per item serial number wise or as a total package or project wise. Separate orders will be released for each project and documents should be supplied for each order separately.
- b. BHEL reserves the right to increase or reduce or split the Tender Quantity and to NOT to order for some or all material based on the changes in project.
- c. BHEL shall have the right to visit vendor works during the execution of contract along with end customer for verifying status, inspection and testing of the material.
- d. BHEL reserves the right to negotiate or re-float the tender in case the quoted prices are not acceptable.



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Valves/Purchase, Tiruchirappalli-620014, INDIA

TERMS AND CONDITIONS

Annexure-2

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vikasverma@bheltry.co.in

- e. Supplier shall arrange packing to avoid lose or damages during Road Transport, Site handling & Storage.
- f. Purchase Order, Item Serial Number, Material code, Quantity should marked the Packing clearly.
- g. Confirmation for compliance is to be given in the offer for all the conditions specified above and to the respective Purchase Specification.
- h. BHEL reserves the right to finalize the tender either through price bid opening or through Reverse Auction route.
- i. BHEL reserves the right to reject the offer of a particular bidder due to unsatisfactory past performance in the execution of a contract at any of BHEL projects / units.
- j. The Drawings and Technical documents given in this enquiry are the sole property of BHEL. This should not be modified, reproduced or misused in any form.

4. FRAUD PREVENTION POLICY:

The bidder along with its associate/collaborators/sub-contractors/sub-vendors/consultants/service providers shall strictly adhere to BHEL fraud prevention policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of the BHEL management about any fraud or suspected fraud as soon as it comes to their notice.

5. DOCUMENTATION

For Indigenous suppliers:

- a. **With Consignment:** Duplicate for transporter copy of Invoice, Packing List, Delivery Challan, O&M manual, Material Test Certificate and other test Certificates if any, Calibration Report, Compliance Certificate & Guarantee/Warranty Certificate etc.
- b. **To BHEL Finance:**
Original and Duplicate Invoice for payment with GR reference, should be sent directly to

**Sr Manager/Finance/Valves-Bills section
HPBP, BHEL Tiruchirappalli-620014, Tamil Nadu, India**

To BHEL Purchase:

FOR BHEL TRICHY case: Copy of Invoice, Packing list, LWB and Delivery challan for reference, original IBR documents/Inspection despatch clearance certificates

FOR Site case: Original Excise Invoice, Original LWB, Original Packing List, Original IBR documents, Original despatch clearance Certificate, Original Inspection report, Test certificates as per PO, Original Site Acknowledgment etc.

- c. **Identification:** Purchase Order, PO item serial number, Material code, Quantity, Unique Serial Number if any should be provided in all despatch documents, materials and packing clearly.

For Import suppliers:

- a. **With Consignment:** O&M Manual and Packing List, Fumigation Certificates (In case of SEA shipment).
- b. **To Bank:**

All Original Documents in Triplicate Bill of lading in case of SEA/Airway Bill in case of AIR consignment, the invoice indicating the Unit price & total price, Packing List contains quantity, net & gross weight, Packing dimensions, Certificate of Origin, all Inspection test certificates, Guarantee/warranty certificates are to be sent through supplier's banker to BHEL's banker.

To BHEL Purchase:

One copy of above non-negotiable documents are to be sent to purchase department after dispatch of the materials to follow up with freight forwarder.

- c. **Identification:** Purchase Order, PO item serial number, Material code, Quantity, Unique Serial Number if any should be provided in all despatch documents, materials and packing clearly.



BHARAT HEAVY ELECTRICALS LTD

Valves/Purchase, Tiruchirappalli-620014, INDIA

TERMS AND CONDITIONS

Annexure-2

Phone: 0431 257 7210/7086

Email: vinu@bheltry.co.in
vikasverma@bheltry.co.in

6. TENDER EVALUATION

Part-I Techno-Commercial Bid:

- a. All vendors should submit General arrangement drawing, datasheet and C&I diagrams if any of the offered product.
- b. Point by point technical confirmation of all pages of our technical specifications and commercial conditions are required with your sign and seal along with techno commercial Offer.
- c. Offers from supplier not having technical capability or not agreed for commercial terms, will be rejected

Part-II Price Bid:

- a. Bidders qualified for part II will be intimated for participating in priced bid opening/Reverse Auction.
- b. L1 bidder will be decided based on landed cost for the equipment to BHEL.
- c. For evaluation, the exchange rate shall be taken as TT selling rate of SBI on date of Part-1 bid opening.

7. LOADING CRITERIA

- a. "Base rate of SBI (as applicable on the date of bid opening. Commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.
- b. For import vendors: Usance LCs the loading will be considered @ 1.5% on the offered Value. For LC at sight the loading will be considered @ 3.5% on the offered Value.
- c. Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).
- d. If supplier offers more than the required delivery period BHEL will operate 0.5% loading factor for evaluation of their offer for every week delay.

8. DISCLAIMER CLAUSE:

The Organization (Bharat Heavy Electricals Ltd.) is not responsible for any failure of submission of bids due to failure of internet or other connectivity problems or reasons thereof.

SCHEDULE OF DEVIATIONS**Enquiry Reference:****Offer Reference:****Date:****Commercial Deviation**

Clause No:	Description	Supplier Deviation

Technical Deviation

Clause No:	Description	Supplier Deviation

We confirm the acceptance of all the technical and commercial requirements as per BHEL tender, except the above deviations

Signature with seal



BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

High Pressure Boiler Plant

Tiruchirapalli 620 014

PURCHASE VALVES

(To be filled and submitted along with Offer)

BHEL Commercial Terms and Conditions for INDIGENOUS SUPPLIERS FOR RC / NON RC – TWO BID SYSTEM To be furnished along with offer

Technical confirmation to BHEL's Specification as called for in BHEL Format shall be furnished. If needed additional sheets shall be used.		Supplier's Confirmation / Comments
Tender opening Route	Tender opening consists of two part systems viz: 1. Techno-Commercial Bid & 2. Price Bid. Techno-Commercial Bid will be opened First. After scrutiny and evaluation of Techno-Commercial offers, the Price bid (of techno-commercially qualified) will be opened with due intimation to suppliers.	
Offers	Offers should be submitted in a sealed cover super-scribing clearly the Enquiry No. and due date or by e-mail.	
Prices	Prices shall be quoted item wise /BHEL Material code wise on FIRM PRICE basis only as per the BHEL Enquiry.	
Validity of offer for NON-RC Items	<u>VALIDITY OF OFFER FOR NON-RC ITEMS:</u> Minimum for a period of 120days from the date of tender opening.	
Validity of offer for RC items	<u>VALIDITY OF OFFER FOR RC ITEMS:</u> Minimum for a period of 1 year (One year) from the date of Finalization of tender.	-NA-
Delivery Terms	FOR BHEL/TRICHY basis only inclusive of P & F, Insurance and other charges if any.	
Delivery period	Delivery schedule shall be strictly as per BHEL tender requirement. Indicate the early delivery period in the offer.	
Liquidated damages	Liquidated damages shall be 0.5% of the total order value or part thereof subject to a maximum of 10% of the total order value. For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.	

**BHEL Commercial Terms and Conditions for
INDIGENOUS SUPPLIERS FOR RC / NON RC – TWO BID SYSTEM
To be furnished along with offer**

Confirmation to BHEL'S Drawing / Specs / TDC	Item-wise confirmation to BHEL's Drawing(s) / Specification / TDC is required in the offer itself.	
Inspection	Material must be inspected as per Drawings/BHEL Specifications/Standards. Final inspection by BHEL Inspector at BHEL, Trichy.	
Inspection Charges	Please indicate the Inspection charges if any in the offer itself and indicate the details of Inspection Agency.	-NA-
Payment Terms	100% payment will be made after 45 days on acceptance of materials at our Stores.	
Excise Duty (ED)	Indicate the Excise duty (ED) and Cess in the offer clearly if applicable.	
CST Tax Details	Indicate the CST - details in the offer clearly if applicable.	
VAT Tax Details	Indicate the VAT - details in the offer clearly if applicable.	
Risk Purchase Clause	Risk Purchase shall be applicable as per BHEL Terms and Conditions. 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 or if the same were not available, the best and the nearest available substitute therefore.	
Liability	The supplier shall be liable for any loss which the Purchaser may sustain by reason of such risk purchases	
Guarantee	The supplier shall give a guarantee for the performance of his supplies for a period of eighteen months from the date of dispatch or twelve months from the date of commissioning whichever is earlier.	
Warranty	Any warranty replacement during warranty period shall be supplied free of cost on FOR BHEL / Trichy basis.	
Documents	The supplier shall provide necessary Invoice, Delivery challan, drawings, Test Certificates, Guarantee Certificates and Operation & Maintenance Manuals etc., as called for in the Technical Specification, in the required number of copies at no extra cost.	
NOTE	It is confirmed that all the terms and conditions stipulated in the Enquiry have been fully understood by us and all clarifications and details have been obtained.	

Signature & Office Seal of the supplier