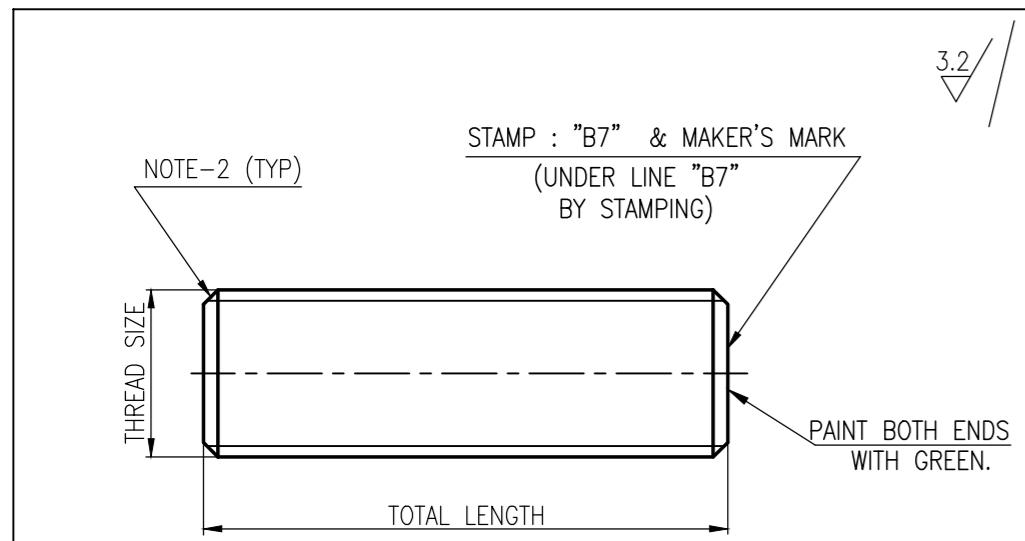
 432-003	ENQUIRY VALVES	Bharat Heavy Electricals Limited (A Government of India undertaking) HIGH PRESSURE BOILER PLANT PURCHASE DEPARTMENT/VALVES TIRUCHIRAPPALLI-620 014.	Phone:0431-257 7802 Email: tender_cell@bheltry.co.in ramnath@bheltry.co.in
	ENQUIRY NO.	DATE	DUE DATE FOR QUOTATION
	EN-SOF1720	29.06.2015	20.07.2015
Please quote Enquiry No., and due date in correspondences This is only a request for quotation and not an order.			
<u>Date , Time & Venue of tender opening :</u> 20.07.2015 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 Xylan coated Fasteners as per the drawings and TDC enclosed. -List of Annexures Annexure 1A- Scope of Supply Annexure 1B- Drawings & TDC Annexure 2- Terms & Conditions Annexure 3- Schedule of Deviation Format Annexure 4 A- Unpriced format Annexure 4 B- Priced format Note: NABL approved LAB test report should be submitted along with the consignment for at least one sample.		
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 in duplicate subject to our terms and conditions , for the above materials, so as to reach us on or before the due date by 14.00 Hrs. (IST) Quotation 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.	<p style="text-align: center;">Yours faithfully,</p> <p style="text-align: center;">For Bharat Heavy Electricals Ltd</p> <p style="text-align: center;">Ramanath Singh Engineer/Purchase/Valves</p>		

ANNEXURE - 1A

S.No	Material Code	Material Description	Drawing No	IND STD DESC	Service	Thread Size	Length	Assy Weight	Flange Rating	Enq Qty
1	964693260000	STUD,FT,W/2NUTS,5/8"X4-1/2",CC,Xylan	2-V-4Z00-20198	B7,2H,ZINC,Xylan	GENERAL	5/8"	4-1/2"	0.26	2-1/16"-2000	1,500
2	964693270000	STUD,FT,W/2NUTS,3/4"X5-1/4",CC,Xylan	2-V-4Z01-20198	B7,2H,ZINC,Xylan	GENERAL	3/4"	5-1/4"	0.45	2-1/16"-10000	6,000
3	964693280000	STUD,FT,W/2NUTS,7/8"X6",CC,Xylan	2-V-4Z02-20198	B7,2H,ZINC,Xylan	GENERAL	7/8"	6"	0.70	2-1/16"-5000	20,000
4	964693290000	STUD,FT,W/2NUTS,1"X6-1/2",CC,Xylan	2-V-4Z03-20198	B7,2H,ZINC,Xylan	GENERAL	1"	6-1/2"	1.03	2-9/16"-5000	4,500
5	964693300000	STUD,FT,W/2NUTS,1"X6-3/4",CC,Xylan	2-V-4Z04-20198	B7,2H,ZINC,Xylan	GENERAL	1"	6-3/4"	1.05	3-1/16"-10000	1,500
6	964693320000	STUD,FT,W/2NUTS,1-1/8"X7-1/4",CC,Xylan	2-V-4Z06-20198	B7,2H,ZINC,Xylan	GENERAL	1-1/8"	7-1/4"	1.55	3-1/8"-5000	5,500
7	964693330000	STUD,FT,W/2NUTS,1-1/8"X8",CC,Xylan	2-V-4Z07-20198	B7,2H,ZINC,Xylan	GENERAL	1-1/8"	8"	1.58	7-1/16"-3000	100
8	964693340000	STUD,FT,W/2NUTS,1-1/4"X8",CC,Xylan	2-V-4Z08-20198	B7,2H,ZINC,Xylan	GENERAL	1-1/4"	8"	2.03	4-1/16"-5000	1,000
9	964693370000	STUD,FT,W/2NUTS,1-3/8"X9-1/2",CC,Xylan	2-V-4Z11-20198	B7,2H,ZINC,Xylan	GENERAL	1-3/8"	9-1/2"	2.63	11"-3000	100
10	964693380000	STUD,FT,W/2NUTS,1-3/8"X10-1/4",CC,Xylan	2-V-4Z12-20198	B7,2H,ZINC,Xylan	GENERAL	1-3/8"	10-1/4"	2.78	13-5/8"-3000	3,000
11	964693390000	STUD,FT,W/2NUTS,1-3/8"X10-3/4",CC,Xylan	2-V-4Z13-20198	B7,2H,ZINC,Xylan	GENERAL	1-3/8"	10-3/4"	2.88	7-1/16"-5000	4,000
12	964693410000	STUD,FT,W/2NUTS,1-1/2"X11-1/4",CC,Xylan	2-V-4Z15-20198	B7,2H,ZINC,Xylan	GENERAL	1-1/2"	11-1/4"	3.64	7-1/16"-10000	1,500
13	964693420000	STUD,FT,W/2NUTS,1-5/8"X11-3/4",CC,Xylan	2-V-4Z16-20198	B7,2H,ZINC,Xylan	GENERAL	1-5/8"	11-3/4"	4.26	21-1/4"-2000	3,500
14	964693430000	STUD,FT,W/2NUTS,1-5/8"X12-1/2",CC,Xylan	2-V-4Z17-20198	B7,2H,ZINC,Xylan	GENERAL	1-5/8"	12-1/2"	4.44	13-5/8"-5000	4,500
15	964693440000	STUD,FT,W/2NUTS,1-3/4"X15",CC,Xylan	2-V-4Z18-20198	B7,2H,ZINC,Xylan	GENERAL	1-3/4"	15"	6.56	11"-10000	2,000
16	964693450000	STUD,FT,W/2NUTS,1-7/8"X13-3/4",CC,Xylan	2-V-4Z19-20198	B7,2H,ZINC,Xylan	GENERAL	1-7/8"	13-3/4"	7.31	11"-5000	5,000
17	964693490000	STUD,FT,W/2NUTS,3/4"X5-1/4",HH,Xylan	2-V-4Z01-20200	B7M,2HM,ZINC,Xylan	SOUR	3/4"	5-1/4"	0.45	2-1/16"-10000	200
18	964693500000	STUD,FT,W/2NUTS,7/8"X6",HH,Xylan	2-V-4Z02-20200	B7M,2HM,ZINC,Xylan	SOUR	7/8"	6"	0.70	2-1/16"-5000	2,500
19	964693510000	STUD,FT,W/2NUTS,1"X6-1/2",HH,Xylan	2-V-4Z03-20200	B7M,2HM,ZINC,Xylan	SOUR	1"	6-1/2"	1.03	2-9/16"-5000	300
20	964693520000	STUD,FT,W/2NUTS,1"X6-3/4",HH,Xylan	2-V-4Z04-20200	B7M,2HM,ZINC,Xylan	SOUR	1"	6-3/4"	1.05	3-1/16"-10000	100
21	964693540000	STUD,FT,W/2NUTS,1-1/8"X7-1/4",HH,Xylan	2-V-4Z06-20200	B7M,2HM,ZINC,Xylan	SOUR	1-1/8"	7-1/4"	1.55	3-1/8"-5000	200
22	964693560000	STUD,FT,W/2NUTS,1-1/4"X8",HH,Xylan	2-V-4Z08-20200	B7M,2HM,ZINC,Xylan	SOUR	1-1/4"	8"	2.03	4-1/16"-5000	500
23	964693600000	STUD,FT,W/2NUTS,1-3/8"X10-1/4",HH,Xylan	2-V-4Z12-20200	B7M,2HM,ZINC,Xylan	SOUR	1-3/8"	10-1/4"	2.78	13-5/8"-3000	200
24	964693610000	STUD,FT,W/2NUTS,1-3/8"X10-3/4",HH,Xylan	2-V-4Z13-20200	B7M,2HM,ZINC,Xylan	SOUR	1-3/8"	10-3/4"	2.88	7-1/16"-5000	300
25	964693630000	STUD,FT,W/2NUTS,1-1/2"X11-1/4",HH,Xylan	2-V-4Z15-20200	B7M,2HM,ZINC,Xylan	SOUR	1-1/2"	11-1/4"	3.64	7-1/16"-10000	100
26	964693640000	STUD,FT,W/2NUTS,1-5/8"X11-3/4",HH,Xylan	2-V-4Z16-20200	B7M,2HM,ZINC,Xylan	SOUR	1-5/8"	11-3/4"	4.26	21-1/4"-2000	100
27	964693660000	STUD,FT,W/2NUTS,1-3/4"X15",HH,Xylan	2-V-4Z18-20200	B7M,2HM,ZINC,Xylan	SOUR	1-3/4"	15"	6.56	11"-10000	200
28	964693670000	STUD,FT,W/2NUTS,1-7/8"X13-3/4",HH,Xylan	2-V-4Z19-20200	B7M,2HM,ZINC,Xylan	SOUR	1-7/8"	13-3/4"	7.31	11"-5000	800
29	964693780000	STUD,DE,W/NUT,5/8"X73,CC,Xylan-4Z00	2-V-4Z00-20199	B7,2H,ZINC,Xylan	GENERAL	5/8"	73	0.14	2-1/16"-2000	1,500
30	964693790000	STUD,DE,W/NUT,5/8"X90,CC,Xylan-4Z01	2-V-4Z01-20199	B7,2H,ZINC,Xylan	GENERAL	5/8"	90	0.17	2-1/16"-2000	2,000
31	964693800000	STUD,DE,W/NUT,3/4"X100,CC,Xylan-4Z02	2-V-4Z02-20199	B7,2H,ZINC,Xylan	GENERAL	3/4"	100	0.30	2-1/16"-10000	4,000
32	964693820000	STUD,DE,W/NUT,7/8"X115,CC,Xylan-4Z04	2-V-4Z04-20199	B7,2H,ZINC,Xylan	GENERAL	7/8"	115	0.46	2-1/16"-5000	15,000
33	964693860000	STUD,DE,W/NUT,1"X124,CC,Xylan-4Z08	2-V-4Z08-20199	B7,2H,ZINC,Xylan	GENERAL	1"	124	0.58	2-9/16"-5000	10,000
34	964693870000	STUD,DE,W/NUT,1"X125,CC,Xylan-4Z09	2-V-4Z09-20199	B7,2H,ZINC,Xylan	GENERAL	1"	125	0.67	2-9/16"-5000	100
35	964693890000	STUD,DE,W/NUT,1-1/8"X131,CC,Xylan-4Z11	2-V-4Z11-20199	B7,2H,ZINC,Xylan	GENERAL	1-1/8"	131	0.88	3-1/8"-5000	5,000
36	964693900000	STUD,DE,W/NUT,1-1/8"X142,CC,Xylan-4Z12	2-V-4Z12-20199	B7,2H,ZINC,Xylan	GENERAL	1-1/8"	142	0.91	3-1/8"-5000	9,000
37	964693910000	STUD,DE,W/NUT,1-1/4"X150,CC,Xylan-4Z13	2-V-4Z13-20199	B7,2H,ZINC,Xylan	GENERAL	1-1/4"	150	1.22	4-1/16"-5000	800
38	964693980000	STUD,DE,W/NUT,1-1/2"X165,CC,Xylan-4Z20	2-V-4Z20-20199	B7,2H,ZINC,Xylan	GENERAL	1-1/2"	165	2.00	5-1/8"-5000	100
39	964694030000	STUD,DE,W/NUT,1-5/8"X213,CC,Xylan-4Z25	2-V-4Z25-20199	B7,2H,ZINC,Xylan	GENERAL	1-5/8"	213	2.72	13-5/8"-5000	2,500
40	964694050000	STUD,DE,W/NUT,1-3/4"X251,CC,Xylan-4Z27	2-V-4Z27-20199	B7,2H,ZINC,Xylan	GENERAL	1-3/4"	251	2.93	11"-10000	100
41	964694060000	STUD,DE,W/NUT,1-7/8"X238,CC,Xylan-4Z28	2-V-4Z28-20199	B7,2H,ZINC,Xylan	GENERAL	1-7/8"	238	4.50	11"-5000	100
42	964694080000	STUD,DE,W/NUT,1-7/8"X283,CC,Xylan-4Z30	2-V-4Z30-20199	B7,2H,ZINC,Xylan	GENERAL	1-7/8"	283	5.02	13-5/8"-10000	200
43	964694090000	STUD,DE,W/NUT,2"X258,CC,Xylan-4Z31	2-V-4Z31-20199	B7,2H,ZINC,Xylan	GENERAL	2"	258	5.37	20-3/4"-3000	1,600
44	964694120000	STUD,DE,W/NUT,3/4"X100,HH,Xylan-4Z02	2-V-4Z02-20201	B7M,2HM,ZINC,Xylan	SOUR	3/4"	100	0.30	2-1/16"-10000	200
45	964694140000	STUD,DE,W/NUT,7/8"X115,HH,Xylan-4Z04	2-V-4Z04-20201	B7M,2HM,ZINC,Xylan	SOUR	7/8"	115	0.46	2-1/16"-5000	1,500
46	964694170000	STUD,DE,W/NUT,1"X117,HH,Xylan-4Z07	2-V-4Z07-20201	B7M,2HM,ZINC,Xylan	SOUR	1"	117	0.63	3-1/16"-10000	200
47	964694190000	STUD,DE,W/NUT,1"X125,HH,Xylan-4Z09	2-V-4Z09-20201	B7M,2HM,ZINC,Xylan	SOUR	1"	125	0.67	2-9/16"-5000	600
48	964694210000	STUD,DE,W/NUT,1-1/8"X131,HH,Xylan-4Z11	2-V-4Z11-20201	B7M,2HM,ZINC,Xylan	SOUR	1-1/8"	131	0.88	3-1/8"-5000	1,000
49	964694220000	STUD,DE,W/NUT,1-1/8"X142,HH,Xylan-4Z12	2-V-4Z12-20201	B7M,2HM,ZINC,Xylan	SOUR	1-1/8"	142	0.91	3-1/8"-5000	100
50	964694230000	STUD,DE,W/NUT,1-1/4"X150,HH,Xylan-4Z13	2-V-4Z13-20201	B7M,2HM,ZINC,Xylan	SOUR	1-1/4"	150	1.22	4-1/16"-5000	1,000
51	964694320000	STUD,DE,W/NUT,1-1/2"X186,HH,Xylan-4Z22	2-V-4Z22-20201	B7M,2HM,ZINC,Xylan	SOUR	1-1/2"	186	2.15	5-1/8"-5000	300
		Total Quantity								1,26,100

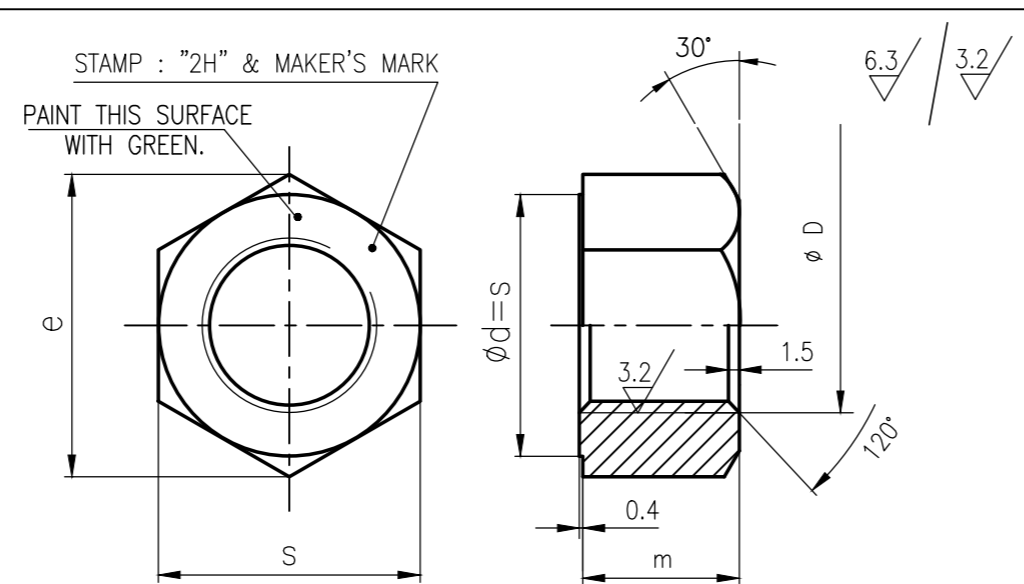
ASSEMBLY DETAILS						DETAILS OF ITEM No. 001					DETAILS OF ITEM No. 002						REMARKS			
SL. No.	DRAWING NUMBER	MATERIAL CODE	API DESIGNATION	FLANGE RATINGS	ASSY wt./kg	MATL. SPECN.	HEAT TREATMENT	THREAD SIZE	TOTAL LENGTH	UNIT Wt (kg)	Ø D	MATL. SPECN.	HEAT TREATMENT	s		e		m		UNIT Wt (kg)
														MAX	MIN	MAX	MIN	MAX	MIN	
01	2-V-4Z00-20198	96 469 326	5/8"x4-1/2"	2-1/16"-2000	0.26			5/8"-11UNC-2A	125 ±1.5	0.19	5/8"-11UNC-2B			26.97	26.19	31.36	29.85	16.02	14.91	0.033
02	2-V-4Z01-20198	96 469 327	3/4"x5-1/4"	2-1/16"-10000	0.45			3/4"-10UNC-2A	140 ±1.5	0.30	3/4"-10UNC-2B			31.75	30.79	36.65	35.11	19.25	18.04	0.076
03	2-V-4Z02-20198	96 469 328	7/8"x6"	2-1/16"-5000	0.70			7/8"-9UNC-2A	162 ±1.5	0.48	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108
04	2-V-4Z03-20198	96 469 329	1"x 6-1/2"	2-9/16"-5000	1.03			1"-8UNC-2A	177 ±1.5	0.70	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165
05	2-V-4Z04-20198	96 469 330	1"x6-3/4"	3-1/16"-10000	1.05				182 ±1.5	0.72										
06	2-V-4Z05-20198	96 469 331	1-1/8"x7"	4-1/16"-3000	1.48				192 ±1.5	0.95										
07	2-V-4Z06-20198	96 469 332	1-1/8"x7-1/4"	3-1/8"-5000	1.55			1-1/8"-8UN-2A	201 ±1.5	1.01	1-1/8"-8UN-2B			46.02	44.61	53.16	50.86	28.93	27.41	0.266
08	2-V-4Z07-20198	96 469 333	1-1/8"x8"	7-1/16"-3000	1.58				217 ±1.5	1.05										
09	2-V-4Z08-20198	96 469 334	1-1/4"x8"	4-1/16"-5000	2.03				220 ±1.5	1.33	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35
10	2-V-4Z09-20198	96 469 335	1-1/4"x9"	13-5/8"-2000	2.18			1-1/4"-8UN-2A	245 ±1.5	1.48										
11	2-V-4Z10-20198	96 469 336	1-3/8" x 9"	9"-3000	2.55				245 ±1.5	1.82										
12	2-V-4Z11-20198	96 469 337	1-3/8" x 9-1/2"	11"-3000	2.63			1-3/8"-8UN-2A	256 ±1.5	1.90	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364
13	2-V-4Z12-20198	96 469 338	1-3/8"x10-1/4"	13-5/8"-3000	2.78				275 ±1.5	2.05										
14	2-V-4Z13-20198	96 469 339	1-3/8"x10-3/4"	7-1/16"-5000	2.88				290 ±1.5	2.15										
15	2-V-4Z14-20198	96 469 340	1-1/2"x10"	5-1/8"-5000	3.37			1-1/2"-8UN-2A	273 ±1.5	2.40	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485
16	2-V-4Z15-20198	96 469 341	1-1/2"x11-1/4"	7-1/16"-10000	3.64				300 ±1.5	2.67										
17	2-V-4Z16-20198	96 469 342	1-5/8"x11-3/4"	21-1/4"-2000	4.26			1-5/8"-8UN-2A	318 ±1.5	3.26	1-5/8"-8UN-2B			65.07	63.02	75.15	71.84	41.45	39.53	0.50
18	2-V-4Z17-20198	96 469 343	1-5/8" x 12-1/2"	13-5/8"-5000	4.44				332 ±1.5	3.44										
19	2-V-4Z18-20198	96 469 344	1-3/4"x15"	11"-10000	6.56			1-3/4"-8UN-2A	400 ±1.5	4.70	1-3/4"-8UN-2B			69.85	67.62	80.64	77.09	44.67	42.65	0.93
20	2-V-4Z19-20198	96 469 345	1-7/8"x13-3/4"	11"-5000	7.31			1-7/8"-8UN-2A	368 ±1.5	4.95	1-7/8"-8UN-2B			74.62	72.24	86.15	82.35	47.90	45.78	1.18
21	2-V-4Z20-20198	96 469 346	1-7/8"x17-1/4"	13-5/8"-10000	8.66				458 ±1.5	6.30										
22	2-V-4Z21-20198	96 469 347	2"x14-1/2"	20-3/4"-3000	8.84			2"-8UN-2A	391 ±1.5	6.10	2"-8UN-2B			79.37	76.84	91.64	87.61	51.13	48.90	1.37



ITEM No. 001

NOTES:-

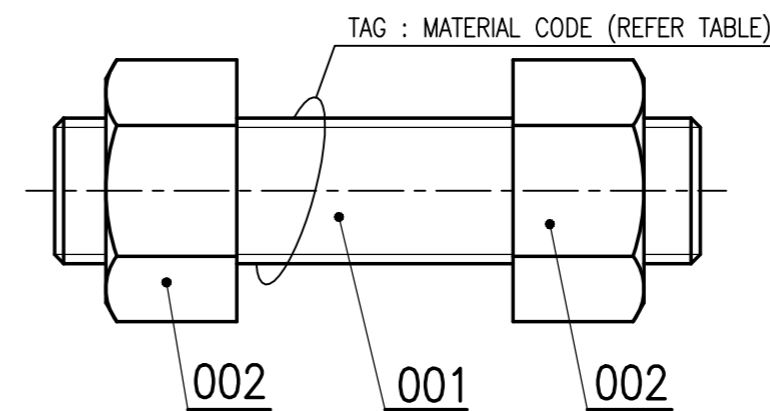
- MATERIAL : ASTM A193-GR.B7 AS PER LATEST APPLICABLE QUALITY PROCEDURE.
- 45° CHAMFER FIRST THREAD
- STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
- TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
- TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



ITEM No. 002

NOTES:-

- MATERIAL : ASTM A194-GR.2H AS PER LATEST APPLICABLE QUALITY PROCEDURE
- NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
- FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)
- TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
- TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



STUD BOLT WITH 2 NUTS

NOTES:-

- ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH TWO NUTS.

PSL-1,2,3 & 4
TEMP. RATING : P,U
MATL. CLASS : AA,BB & CC

UNLESS OTHERWISE SPECIFIED	
BREAK SHARP CORNERS	: 0.25
FILLET RADII	: 0.76±0.12
CONCENTRICITY	: 0.25 FIM
SQUARNESS	: 0.25 IN 254
PARALLELISM	: 0.25 IN 254
RFS EXCEPT WHEN (M) MODIFIED.	

DCP No.	ALTERED	APPD
REV	CHD	DATE
ZONE		

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 (WITH ZINC PLATED YELLOW CHROMATE & XYLAN COATED-BLUE COLOUR)								
	FOR GENERAL SERVICE								
	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI - 620014.			DRN	R.NATARAJAN	SIGN	DATE	NO.OF VAR.	
				CHD	P.ARUNKUMAR	SIGN	28-03-2015		
				APPD	R.ELAYARAJA	SIGN	28-03-2015		
	DEPT VL	SCALE N T S	WEIGHT (KG).	REFERENCE INFORMATION			NO.OF ITEMS		
	CODE 340								
	TITLE			CARD CODE	DRAWING NO.			REV	
	STUD-FULL THREADED WITH 2 NUTS			U 01	2-V-0000-20198				

ASSEMBLY DETAILS

DETAILS OF ITEM No. 001

DETAILS OF ITEM No. 002

REMARKS

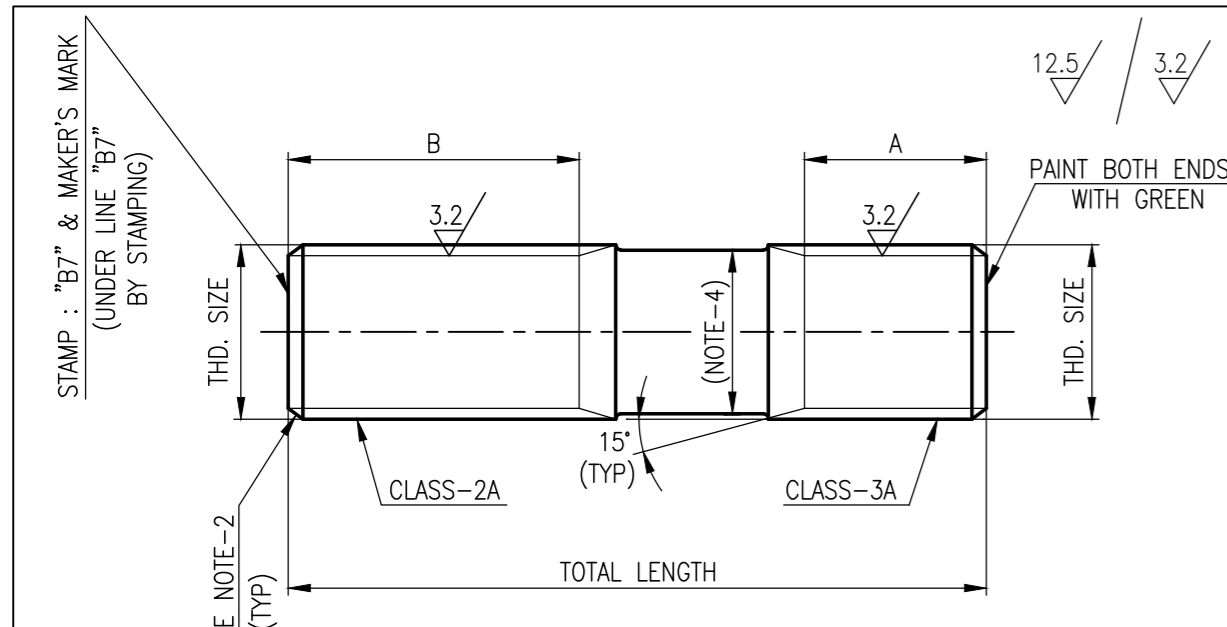
SL. No.	DRAWING NUMBER	MATERIAL CODE	FLANGE RATINGS	ASSY wt./kg	MATL. SPECN.	HEAT TREATMENT	THREAD SIZE	A ^{+1.5/0}	B ^{+1.5/0}	TOTAL LENGTH ±1.5	UNIT Wt (kg)	ø D	MATL. SPECN.	HEAT TREATMENT	s		e		m		UNIT Wt (kg)	REMARKS	
															MAX	MIN	MAX	MIN	MAX	MIN			
01	2-V-4Z00-20199	96 469 378	2-1/16" - 2000	0.14			5/8" - 11UNC	16	44.5	73	0.11	5/8"-11UNC-2B			26.97	26.19	31.36	29.85	16.02	14.91	0.033		
02	2-V-4Z01-20199	96 469 379	2-1/16" - 2000	0.17			5/8" - 11UNC	16	45	90	0.14												
03	2-V-4Z02-20199	96 469 380	2-1/16" - 10000	0.30			3/4" - 10UNC	21	38	100	0.22	3/4"-10UNC-2B			31.75	30.79	36.65	35.11	19.25	18.04	0.076		
04	2-V-4Z03-20199	96 469 381	—	0.36			7/8" - 9UNC	34	42	91	0.25	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108		
05	2-V-4Z04-20199	96 469 382	2-1/16" - 5000	0.46			7/8" - 9UNC	24.5	58	115	0.35												
06	2-V-4Z05-20199	96 469 383	—	0.47			7/8" - 9UNC	27.5	45	99	0.30												
07	2-V-4Z06-20199	96 469 384	3-1/8"-5000(WKM)	0.59			7/8" - 9UNC	27.5	46	106	0.42												
08	2-V-4Z07-20199	96 469 385	3-1/16" - 10000	0.63			1" - 8UNC	27.5	46	117	0.46	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165		
09	2-V-4Z08-20199	96 469 386	2-9/16" - 5000	0.58			1" - 8UNC	27.5	64	124	0.41												
10	2-V-4Z09-20199	96 469 387	2-9/16" - 5000	0.67			1" - 8UNC	30	65	125	0.50												
11	2-V-4Z10-20199	96 469 388	3-1/8" - 5000	0.70			1" - 8UNC	30	70	133	0.53												
12	2-V-4Z11-20199	96 469 389	3-1/8" - 5000	0.88			1-1/8" - 8UN	31	70	131	0.61	1-1/8"-8UN-2B			46.02	44.61	53.16	50.86	28.93	27.41	0.266	FOR FBV	
13	2-V-4Z12-20199	96 469 390	3-1/8" - 5000	0.91			1-1/8" - 8UN	31	77	142	0.64												
14	2-V-4Z13-20199	96 469 391	4-1/16" - 5000	1.22			1-1/4" - 8UN	34	77	150	0.87	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35	FOR FBV	
15	2-V-4Z14-20199	96 469 392	13-5/8" - 2000	1.35			1-1/4" - 8UN	34	87	162	1.00												
16	2-V-4Z15-20199	96 469 393	4-1/16" - 5000	1.70			1-1/4" - 8UN	34	83	230	1.35												
17	2-V-4Z16-20199	96 469 394	9" - 3000	1.61			1-3/8" - 8UN	37	76	170	1.25	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364		
18	2-V-4Z17-20199	96 469 395	11" - 3000	1.67			1-3/8" - 8UN	37	89	175	1.30												
19	2-V-4Z18-20199	96 469 396	13-5/8" - 3000	1.71			1-3/8" - 8UN	37	83	181	1.35												
20	2-V-4Z19-20199	96 469 397	7-1/16" - 5000	1.70			1-3/8" - 8UN	37	102	188	1.34												
21	2-V-4Z20-20199	96 469 398	5-1/8" - 5000	2.00			1-3/8" - 8UN	44	74	165	1.47												
22	2-V-4Z21-20199	96 469 399	3-1/16" - 10000	2.10			1-1/2" - 8UN	40	90	181	1.61	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV	
23	2-V-4Z22-20199	96 469 400	5-1/8" - 5000	2.15			1-1/2" - 8UN	44	74	186	1.66												
24	2-V-4Z23-20199	96 469 401	7-1/16" - 10000	2.19			1-1/2" - 8UN	40	102	200	1.70												
25	2-V-4Z24-20199	96 469 402	9" - 10000	2.39			1-1/2" - 8UN	40	90	219	1.90												
26	2-V-4Z25-20199	96 469 403	13-5/8" - 5000	2.72			1-5/8" - 8UN	43.5	89	213	2.22	1-5/8"-8UN-2B			65.07	63.02	75.15	71.84	41.45	39.53	0.50		
27	2-V-4Z26-20199	96 469 404	—	2.83			1-5/8" - 8UN	53	70	165	1.90												
28	2-V-4Z27-20199	96 469 405	11" - 10000	3.93			1-3/4" - 8UN	46.5	115	251	3.00	1-3/4"-8UN-2B			69.85	67.62	80.64	77.09	44.67	42.65	0.93		
29	2-V-4Z28-20199	96 469 406	11" - 5000	4.5			1-3/4" - 8UN	50	108	238	3.32												
30	2-V-4Z29-20199	96 469 407	16-3/4" - 5000	4.6			1-7/8" - 8UN	50	115	245	3.41	1-7/8"-8UN-2B			74.62	72.24	86.15	82.35	47.90	45.78	1.18		
31	2-V-4Z30-20199	96 469 408	13-5/8" - 10000	5.02			1-7/8" - 8UN	50	115	283	3.84												
32	2-V-4Z31-20199	96 469 409	20-3/4" - 3000	5.37			2" - 8UN	53	113	258	4.00	2"-8UN-2B			79.37	76.84	91.64	87.61	51.13	48.90	1.37		

REFER NOTES 1 AND 3

REFER NOTES 1 AND 3

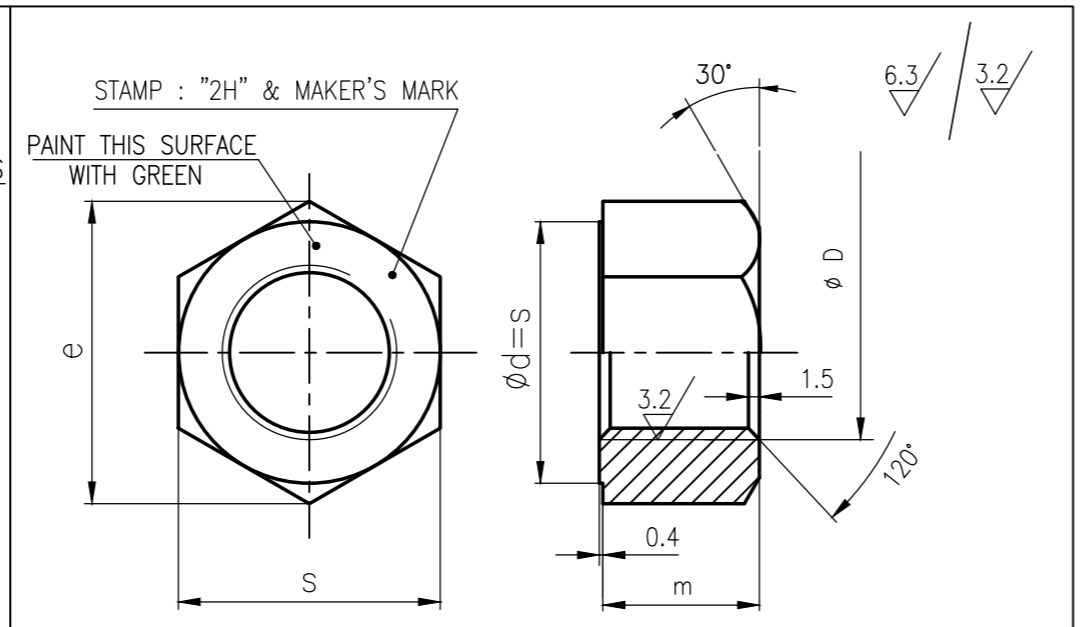
REFER NOTES 1 AND 3

REFER NOTES 1 AND 3



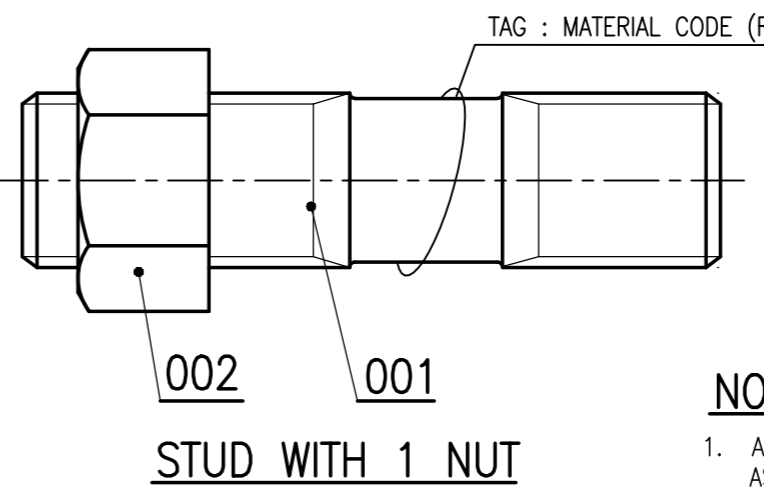
ITEM No. 001

- NOTES:-**
- MATERIAL : ASTM A193-GR.B7 AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - 45° CHAMFER FIRST THREAD
 - STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



ITEM No. 002

- NOTES:-**
- MATERIAL : ASTM A194-GR.2H AS PER LATEST APPLICABLE QUALITY PROCEDURE
 - NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



STUD WITH 1 NUT

- NOTES:-**
- ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH ONE NUT IN CLASS-2A END.

PSL-1,2,3 & 4
TEMP. RATING : P,U
MATL. CLASS : AA,BB & CC

UNLESS OTHERWISE SPECIFIED

BREAK SHARP CORNERS	: 0.25
FILLET RADII	: 0.76±0.12
CONCENTRICITY	: 0.25 FIM
SQUARNESS	: 0.25 IN 254
PARALLELISM	: 0.25 IN 254
RFS EXCEPT WHEN (M) MODIFIED.	

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								
	FOR GENERAL SERVICE (WITH ZINC PLATED YELLOW CHROMATE & XYLAN COATED-BLUE COLOUR)								
	BHARAT HEAVY ELECTRICALS LTD.,		DRN	NAME	SIGN	DATE	NO.OF VAR.		
	UNIT: HIGH PRESSURE BOILER PLANT.		CHD	P.ARUNKUMAR	P. Arj	28-03-2015			
	TIRUCHIRAPALLI - 620014.		APPD	R.ELAYARAJA	R. Elaya	28-03-2015			
	DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATION			NO. OF ITEMS		
	VL	N T S							
	CODE 340			TITLE	CARD CODE	DRAWING NO.	REV		
				STUD-DOUBLE ENDED WITH 1 NUT	U 01	2-V-0000-20199			

ASSEMBLY DETAILS

DETAILS OF ITEM No. 001

DETAILS OF ITEM No. 002

REMARKS

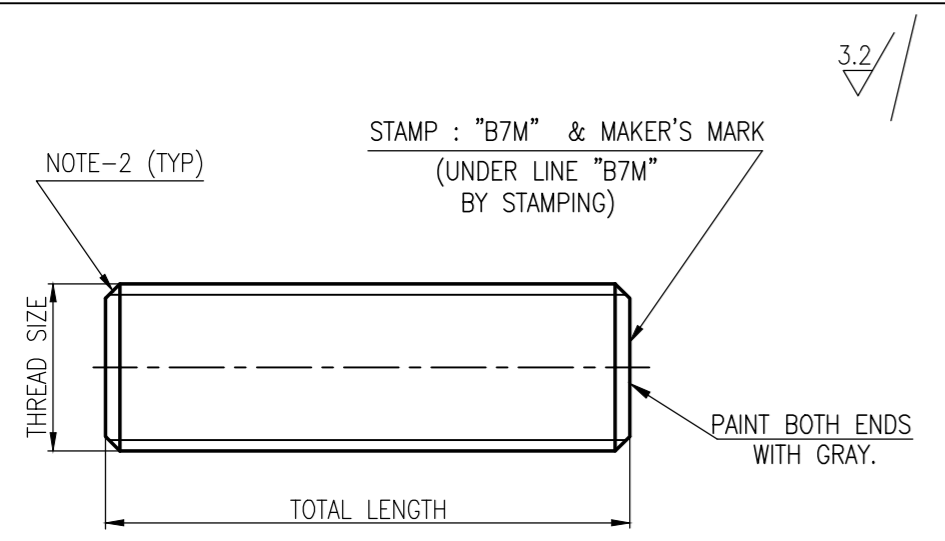
SL. No.	DRAWING NUMBER	MATERIAL CODE	API DESIGNATION	FLANGE RATINGS	ASSY wt./kg	MATL. SPECN.	HEAT TREATMENT	THREAD SIZE	TOTAL LENGTH	UNIT Wt (kg)	Ø D	MATL. SPECN.	HEAT TREATMENT	s		e		m		UNIT Wt (kg)
														MAX	MIN	MAX	MIN	MAX	MIN	
01	2-V-4Z00-20200	96 469 348	5/8"x4-1/2"	2-1/16"-2000	0.26			5/8"-11UNC-2A	125 ±1.5	0.19	5/8"-11UNC-2B			26.97	26.19	31.36	29.85	16.02	14.91	0.033
02	2-V-4Z01-20200	96 469 349	3/4"x5-1/4"	2-1/16"-10000	0.45			3/4"-10UNC-2A	140 ±1.5	0.30	3/4"-10UNC-2B			31.75	30.79	36.65	35.11	19.25	18.04	0.076
03	2-V-4Z02-20200	96 469 350	7/8"x6"	2-1/16"-5000	0.70			7/8"-9UNC-2A	162 ±1.5	0.48	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108
04	2-V-4Z03-20200	96 469 351	1"x 6-1/2"	2-9/16"-5000	1.03			1"-8UNC-2A	177 ±1.5	0.70	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165
05	2-V-4Z04-20200	96 469 352	1"x 6-3/4"	3-1/16"-10000	1.05				182 ±1.5	0.72										
06	2-V-4Z05-20200	96 469 353	1-1/8"x7"	4-1/16"-3000	1.48				192 ±1.5	0.95										
07	2-V-4Z06-20200	96 469 354	1-1/8"x7-1/4"	3-1/8"-5000	1.55			1-1/8"-8UN-2A	201 ±1.5	1.01	1-1/8"-8UN-2B			46.02	44.61	53.16	50.86	28.93	27.41	0.266
08	2-V-4Z07-20200	96 469 355	1-1/8"x8"	7-1/16"-3000	1.58				217 ±1.5	1.05										
09	2-V-4Z08-20200	96 469 356	1-1/4"x8"	4-1/16"-5000	2.03			1-1/4"-8UN-2A	220 ±1.5	1.33	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35
10	2-V-4Z09-20200	96 469 357	1-1/4"x9"	13-5/8"-2000	2.18				245 ±1.5	1.48										
11	2-V-4Z10-20200	96 469 358	1-3/8" x 9"	9"-3000	2.55				245 ±1.5	1.82										
12	2-V-4Z11-20200	96 469 359	1-3/8" x 9-1/2"	11"-3000	2.63			1-3/8"-8UN-2A	256 ±1.5	1.90	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364
13	2-V-4Z12-20200	96 469 360	1-3/8"x10-1/4"	13-5/8"-3000	2.78				275 ±1.5	2.05										
14	2-V-4Z13-20200	96 469 361	1-3/8"x10-3/4"	7-1/16"-5000	2.88				290 ±1.5	2.15										
15	2-V-4Z14-20200	96 469 362	1-1/2"x10"	5-1/8"-5000	3.37			1-1/2"-8UN-2A	273 ±1.5	2.40	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485
16	2-V-4Z15-20200	96 469 363	1-1/2"x11-1/4"	7-1/16"-10000	3.64				300 ±1.5	2.67										
17	2-V-4Z16-20200	96 469 364	1-5/8"x11-3/4"	21-1/4"-2000	4.26			1-5/8"-8UN-2A	318 ±1.5	3.26	1-5/8"-8UN-2B			65.07	63.02	75.15	71.84	41.45	39.53	0.50
18	2-V-4Z17-20200	96 469 365	1-5/8" x 12-1/2"	13-5/8"-5000	4.44				332 ±1.5	3.44										
19	2-V-4Z18-20200	96 469 366	1-3/4"x15"	11"-10000	6.56			1-3/4"-8UN-2A	400 ±1.5	4.70	1-3/4"-8UN-2B			69.85	67.62	80.64	77.09	44.67	42.65	0.93
20	2-V-4Z19-20200	96 469 367	1-7/8"x13-3/4"	11"-5000	7.31				368 ±1.5	4.95										
21	2-V-4Z20-20200	96 469 368	1-7/8"x17-1/4"	13-5/8"-10000	8.66			1-7/8"-8UN-2A	458 ±1.5	6.30	1-7/8"-8UN-2B			74.62	72.24	86.15	82.35	47.90	45.78	1.18
22	2-V-4Z21-20200	96 469 369	2"x14-1/2"	20-3/4"-3000	8.84			2"-8UN-2A	391 ±1.5	6.10	2"-8UN-2B			79.37	76.84	91.64	87.61	51.13	48.90	1.37

REFER NOTES 1 AND 3

REFER NOTES 1 AND 3

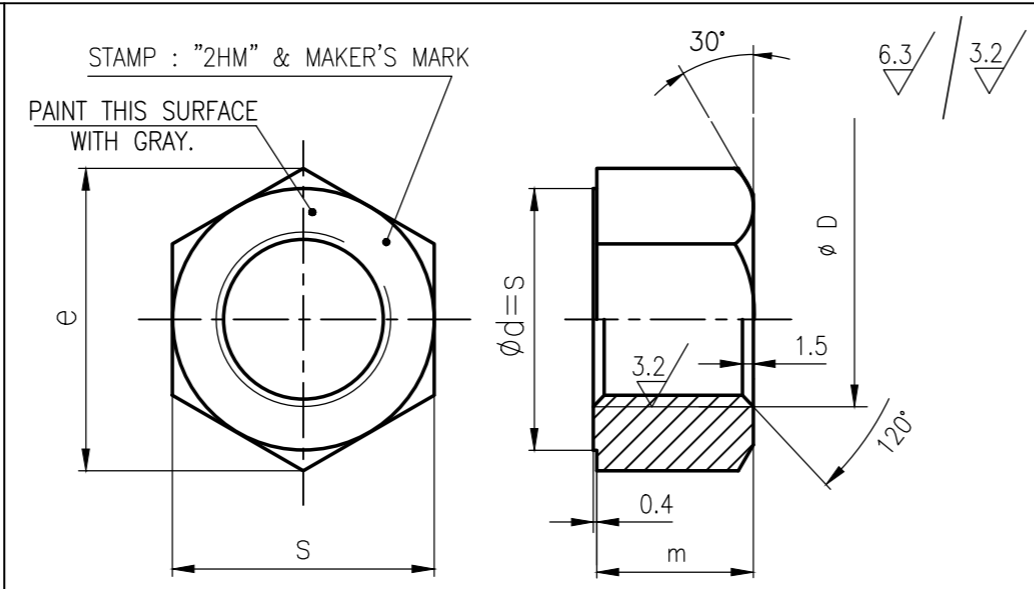
REFER NOTES 1 AND 2

REFER NOTES 1 AND 2



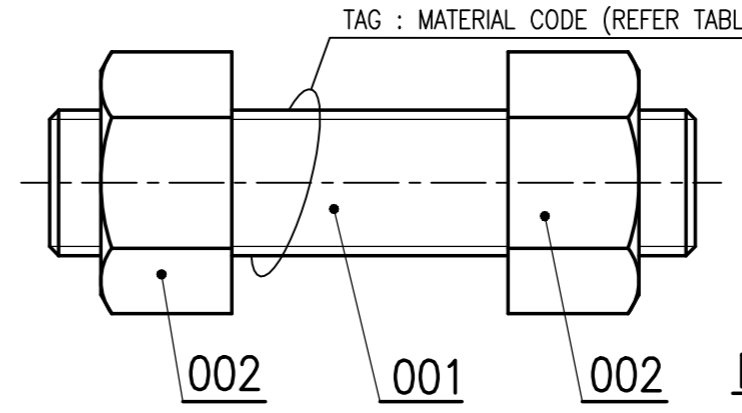
ITEM No. 001

- NOTES:-**
- MATERIAL : ASTM A193-GR.B7M AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - 45° CHAMFER FIRST THREAD
 - STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



ITEM No. 002

- NOTES:-**
- MATERIAL : ASTM A194-GR.2HM AS PER LATEST APPLICABLE QUALITY PROCEDURE
 - NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE XYLAN COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : XYLAN 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



STUD BOLT WITH 2 NUTS

PSL-1,2,3 & 4
TEMP. RATING : P,U
MATL. CLASS : DD,EE,FF,HH &
NACE MR-01-75 CL-II

NOTES:-

- ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH TWO NUTS.

UNLESS OTHERWISE SPECIFIED

BREAK SHARP CORNERS	: 0.25
FILLET RADII	: 0.76±0.12
CONCENTRICITY	: 0.25 FIM
SQUARNESS	: 0.25 IN 254
PARALLELISM	: 0.25 IN 254
RFS EXCEPT WHEN (M) MODIFIED.	

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.

DCP No.	ALTERED	APPD
REV	CHD	DATE
ZONE		

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 (WITH ZINC PLATED YELLOW CHROMATE & XYLAN COATED-BLUE COLOUR)								
	BHARAT HEAVY ELECTRICALS LTD., UNIT: HIGH PRESSURE BOILER PLANT. TIRUCHIRAPALLI - 620014.			DRN	R.NATARAJAN	SIGN	DATE	NO.OF	
				CHD	P.ARUNKUMAR	P. Arj	28-03-2015	VAR.	
				APPD	R.ELAYARAJA	R. Elay	28-03-2015		
	DEPT	VL	SCALE	WEIGHT (KG).	REFERENCE INFORMATION				NO. OF
	CODE	340	N T S						ITEM
	TITLE	STUD-FULL THREADED WITH 2 NUTS			CARD	DRAWING NO.			REV
				U 01	2-V-0000-20200				

ASSEMBLY DETAILS

DETAILS OF ITEM No. 001

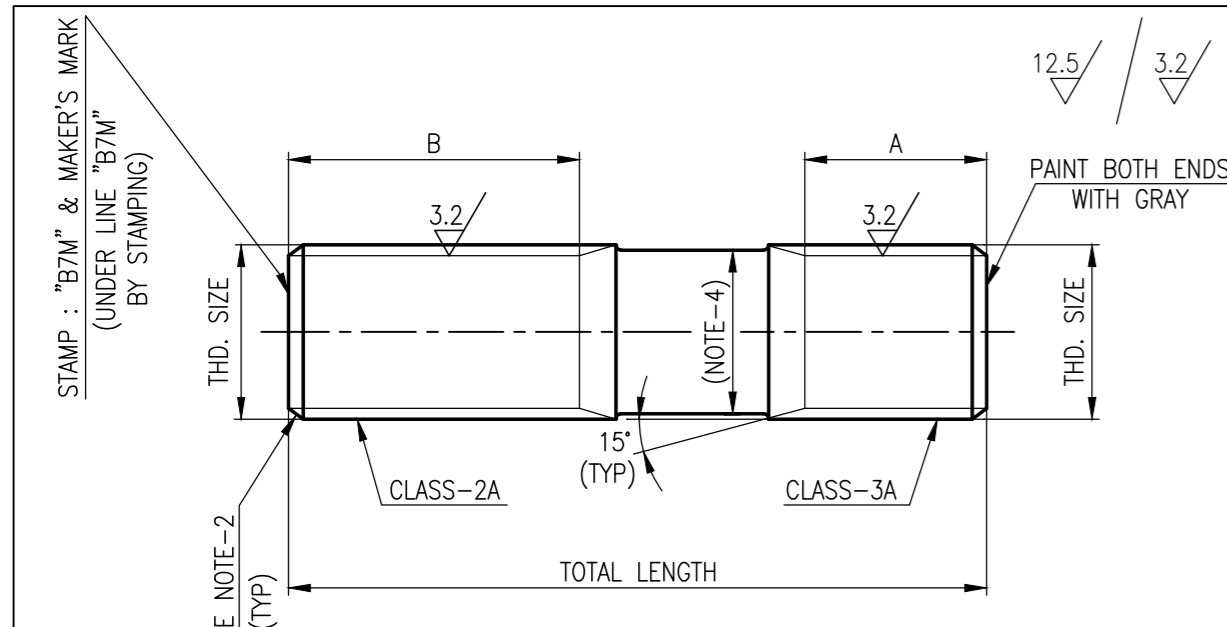
DETAILS OF ITEM No. 002

REMARKS

SL. No.	DRAWING NUMBER	MATERIAL CODE	FLANGE RATINGS	ASSY wt./kg	MATL. SPECN.	HEAT TREATMENT	THREAD SIZE	+1.5		TOTAL LENGTH ±1.5	UNIT Wt (kg)	ø D	MATL. SPECN.	HEAT TREATMENT	s		e		m		UNIT Wt (kg)	REMARKS
								A	B						MAX	MIN	MAX	MIN	MAX	MIN		
01	2-V-4Z00-20201	96 469 410	2-1/16" - 2000	0.14			5/8" - 11UNC	16	44.5	73	0.11	5/8"-11UNC-2B			26.97	26.19	31.36	29.85	16.02	14.91	0.033	
02	2-V-4Z01-20201	96 469 411	2-1/16" - 2000	0.17			5/8" - 11UNC	16	45	90	0.14	5/8"-11UNC-2B			26.97	26.19	31.36	29.85	16.02	14.91	0.033	
03	2-V-4Z02-20201	96 469 412	2-1/16" - 10000	0.30			3/4" - 10UNC	21	38	100	0.22	3/4"-10UNC-2B			31.75	30.79	36.65	35.11	19.25	18.04	0.076	
04	2-V-4Z03-20201	96 469 413	—	0.36			7/8" - 9UNC	34	42	91	0.25	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108	
05	2-V-4Z04-20201	96 469 414	2-1/16" - 5000	0.46			7/8" - 9UNC	24.5	58	115	0.35	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108	
06	2-V-4Z05-20201	96 469 415	—	0.47			7/8" - 9UNC	27.5	45	99	0.30	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108	
07	2-V-4Z06-20201	96 469 416	3-1/8"-5000(WKM)	0.59			7/8" - 9UNC	27.5	46	106	0.42	7/8"-9UNC-2B			36.52	35.41	42.16	40.37	22.47	21.16	0.108	
08	2-V-4Z07-20201	96 469 417	3-1/16" - 10000	0.63			1" - 8UNC	27.5	46	117	0.46	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165	
09	2-V-4Z08-20201	96 469 418	2-9/16" - 5000	0.58			1" - 8UNC	27.5	64	124	0.41	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165	
10	2-V-4Z09-20201	96 469 419	2-9/16" - 5000	0.67			1" - 8UNC	30	65	125	0.50	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165	
11	2-V-4Z10-20201	96 469 420	3-1/8" - 5000	0.70			1" - 8UNC	30	70	133	0.53	1"-8UNC-2B			41.27	40.01	47.65	45.62	25.70	24.29	0.165	
12	2-V-4Z11-20201	96 469 421	3-1/8" - 5000	0.88			1-1/8" - 8UN	31	70	131	0.61	1-1/8"-8UN-2B			46.02	44.61	53.16	50.86	28.93	27.41	0.266	FOR FBV
13	2-V-4Z12-20201	96 469 422	3-1/8" - 5000	0.91			1-1/8" - 8UN	31	77	142	0.64	1-1/8"-8UN-2B			46.02	44.61	53.16	50.86	28.93	27.41	0.266	FOR FBV
14	2-V-4Z13-20201	96 469 423	4-1/16" - 5000	1.22			1-1/4" - 8UN	34	77	150	0.87	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35	FOR FBV
15	2-V-4Z14-20201	96 469 424	13-5/8" - 2000	1.35			1-1/4" - 8UN	34	87	162	1.00	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35	FOR FBV
16	2-V-4Z15-20201	96 469 425	4-1/16" - 5000	1.70			1-1/4" - 8UN	34	83	230	1.35	1-1/4"-8UN-2B			50.80	49.23	58.64	56.11	31.77	30.15	0.35	FOR FBV
17	2-V-4Z16-20201	96 469 426	9" - 3000	1.61			1-3/8" - 8UN	37	76	170	1.25	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364	FOR FBV
18	2-V-4Z17-20201	96 469 427	11" - 3000	1.67			1-3/8" - 8UN	37	89	175	1.30	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364	FOR FBV
19	2-V-4Z18-20201	96 469 428	13-5/8" - 3000	1.71			1-3/8" - 8UN	37	83	181	1.35	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364	FOR FBV
20	2-V-4Z19-20201	96 469 429	7-1/16" - 5000	1.70			1-3/8" - 8UN	37	102	188	1.34	1-3/8"-8UN-2B			55.57	53.83	64.16	61.37	35.00	33.28	0.364	FOR FBV
21	2-V-4Z20-20201	96 469 430	5-1/8" - 5000	2.00			1-1/2" - 8UN	44	74	165	1.47	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV
22	2-V-4Z21-20201	96 469 431	3-1/16" - 10000	2.10			1-1/2" - 8UN	40	90	181	1.61	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV
23	2-V-4Z22-20201	96 469 432	5-1/8" - 5000	2.15			1-1/2" - 8UN	44	74	186	1.66	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV
24	2-V-4Z23-20201	96 469 433	7-1/16" - 10000	2.19			1-1/2" - 8UN	40	102	200	1.70	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV
25	2-V-4Z24-20201	96 469 434	9" - 10000	2.39			1-1/2" - 8UN	40	90	219	1.90	1-1/2"-8UN-2B			60.32	58.42	69.64	66.60	38.22	36.40	0.485	FOR FBV
26	2-V-4Z25-20201	96 469 435	13-5/8" - 5000	2.72			1-5/8" - 8UN	43.5	89	213	2.22	1-5/8"-8UN-2B			65.07	63.02	75.15	71.84	41.45	39.53	0.50	FOR FBV
27	2-V-4Z26-20201	96 469 436	—	2.83			1-5/8" - 8UN	53	70	165	1.90	1-5/8"-8UN-2B			65.07	63.02	75.15	71.84	41.45	39.53	0.50	FOR FBV
28	2-V-4Z27-20201	96 469 437	11" - 10000	3.93			1-3/4" - 8UN	46.5	115	251	3.00	1-3/4"-8UN-2B			69.85	67.62	80.64	77.09	44.67	42.65	0.93	FOR FBV
29	2-V-4Z28-20201	96 469 438	11" - 5000	4.5			1-3/4" - 8UN	50	108	238	3.32	1-3/4"-8UN-2B			69.85	67.62	80.64	77.09	44.67	42.65	0.93	FOR FBV
30	2-V-4Z29-20201	96 469 439	16-3/4" - 5000	4.6			1-7/8" - 8UN	50	115	245	3.41	1-7/8"-8UN-2B			74.62	72.24	86.15	82.35	47.90	45.78	1.18	FOR FBV
31	2-V-4Z30-20201	96 469 440	13-5/8" - 10000	5.02			1-7/8" - 8UN	50	115	283	3.84	1-7/8"-8UN-2B			74.62	72.24	86.15	82.35	47.90	45.78	1.18	FOR FBV
32	2-V-4Z31-20201	96 469 441	20-3/4" - 3000	5.37			2" - 8UN	53	113	258	4.00	2"-8UN-2B			79.37	76.84	91.64	87.61	51.13	48.90	1.37	FOR FBV

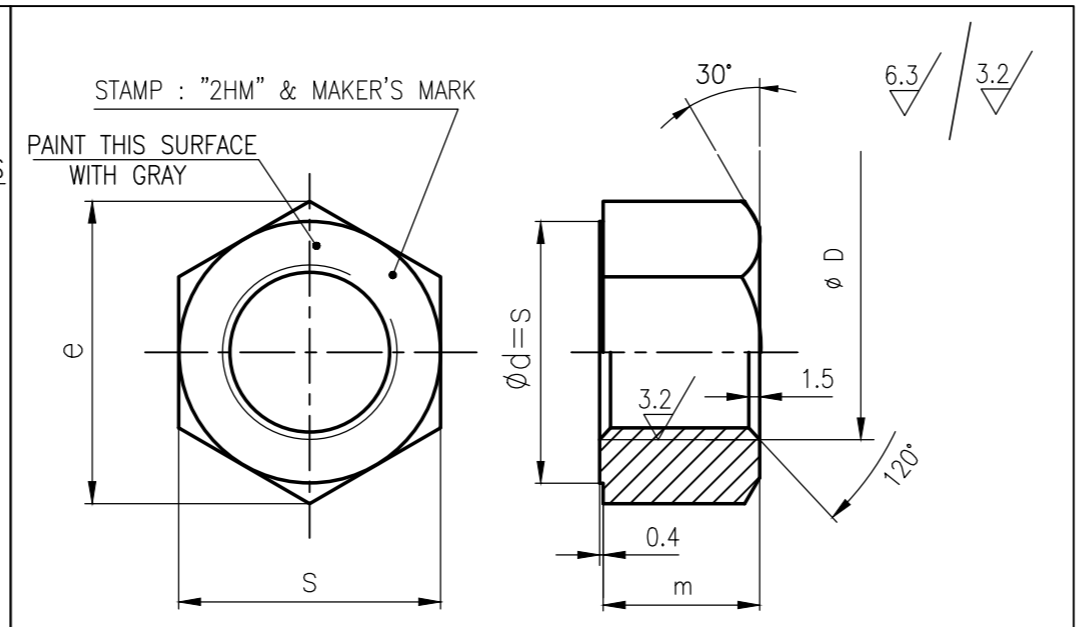
REFER NOTES 1 AND 3

REFER NOTES 1 AND 3



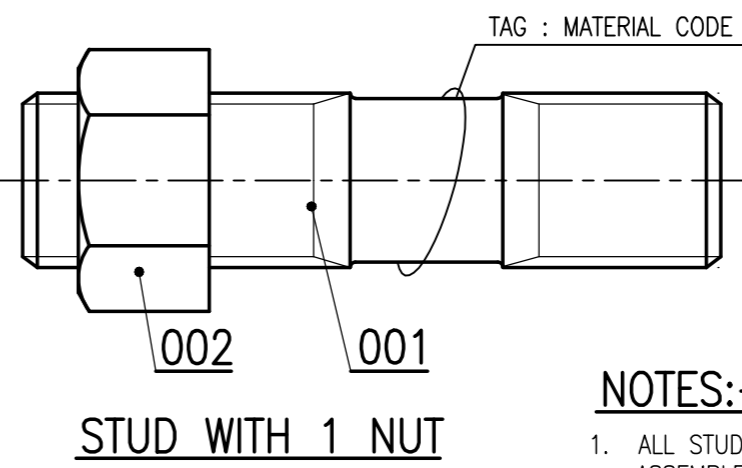
ITEM No. 001

- NOTES:-**
- MATERIAL : ASTM A193-GR.B7M AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - 45° CHAMFER FIRST THREAD
 - STUD BOLTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE Xylan COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : Xylan 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



ITEM No. 002

- NOTES:-**
- MATERIAL : ASTM A194-GR.2HM AS PER LATEST APPLICABLE QUALITY PROCEDURE
 - NUTS SHALL BE HARDNESS TESTED FOR AN ACCEPTABLE HARDNESS AS PER LATEST APPLICABLE QUALITY PROCEDURE.
 - FOR OTHER DIMENSIONS REFER ANSI B18.2.2 (HEAVY HEX.NUT)
 - TO BE ZINC PLATED WITH YELLOW CHROMATE FOR A DEPTH OF 0.005 TO 0.01mm
 - TO BE Xylan COATED AFTER ZINC COATING :
 - GRADE OF TEFLON ON : Xylan 1070
 - MAX. SERVICE TEMPERATURE : 285°C
 - COATING THICKNESS : 25 TO 30 MICRONS.
 - COLOUR : BLUE



STUD WITH 1 NUT

NOTES:-

- ALL STUDS SHOULD BE PACKED SUITABLY TO AVOID THREAD DAMAGE AND SHOULD ASSEMBLED WITH ONE NUT IN CLASS-2A END.

PSL-1,2,3 & 4
TEMP. RATING : P,U
MATL. CLASS : DD,EE,FF,HH &
NACE MR-01-75-CL-II

UNLESS OTHERWISE SPECIFIED

BREAK SHARP CORNERS	: 0.25
FILLET RADII	: 0.76±0.12
CONCENTRICITY	: 0.25 FIM
SQUARNESS	: 0.25 IN 254
PARALLELISM	: 0.25 IN 254
RFS EXCEPT WHEN (M) MODIFIED.	

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								
	FOR SOUR SERVICE (WITH ZINC PLATED YELLOW CHROMATE & Xylan COATED-BLUE COLOUR)								
	BHARAT HEAVY ELECTRICALS LTD.,		DRN	NAME	SIGN	DATE	NO.OF VAR.		
	UNIT: HIGH PRESSURE BOILER PLANT.		CHD	R.NATARAJAN	[Signature]	28-03-2015			
	TIRUCHIRAPALLI - 620014.		APPD	P.ARUNKUMAR	[Signature]	28-03-2015			
	DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATION			NO.OF ITEMS		
	VL	N T S							
	CODE 340								
	TITLE	CARD CODE	DRAWING NO.	REV					
	STUD-DOUBLE ENDED WITH 1 NUT	U 01	2-V-0000-20201						

1.0 MATERIAL SPECIFICATION

SA 193 Gr B7/B7M/B16{latest material standard as per Purchase Order (P.O.)}

2.0 GENERAL

This TDC is suitable for API 6A applications including NACE MR-01-75 Cl.II & Cl.III also.

Shall be manufactured to the relevant size in the drawing & P.O.requirements.

Hot rolled & Cold drawn bars, if used shall be machined at least 2mm(minimum)in radius (ie 4mm in dia) to remove the seams completely. After machining atleast 10% of the bars shall be tested by MPI to ensure that the surface defects are fully removed.

For HT of finished studs/bolts, salt bath or controlled atmosphere furnace to be used,

After HT, the threads shall be thoroughly cleaned to remove all deposits. If acid pickling is done for cleaning, it shall be as per Cl.7.4.

Cadmium plating(Cl.7.1)/Galvanising(Cl.7.2) if specified in Drg/P.O.For all other cases rust preventive fluid coating (Cl.7.3) shall be done.

3.0 CHEMICAL & MECHANICAL PROPERTIES

Mill certificate from steel manufacturer for conformance to the chemistry heat-wise. Additionally, product analysis shall be done for one piece/heat by the stud/bolt manufacturer.

One Tensile test/heat/size/ HT batch in the finished heat-treated condition as per SA193.

HARDNESS

For SA193 B7 & B16:

Hardness check shall be carried out on finished stud/bolt as per SA193,at least in 10% of the lot.Hardness in the finished stud/bolt shall be 25 to 34 HRC or 253 to 319 BHN.For other grades hardness value shall be as per the material specification.

NDE

Magnetic particle inspection shall be carried out in atleast 10% of the finished stud/bolt of all grades.Cracks/Linear indications are unacceptable.

For SA193 B7M:

Hardness check on 100% of stud/bolt.Hardness must be within 201 to 235 BHN.

4.0 FINAL INSPECTION

All inspection shall be in accordance with relevant drawing or BPS and SA193.

The threads shall be checked with calibrated ring gauges in the final heat-treated condition for black variety and in final plated condition for the plated/galvanised variety.

Visual & dimensional checks and acceptance shall be as per IS 2614 Table-I (latest).

5.0 MARKING & PACKING

Punch/emboss each finished stud/bolt with material grade (B7/B7M/B16, etc.) and supplier's emblem underlining the grade symbol.

Punch/emboss Sl.no also in B7M studs/bolts in addition to the above to correlate with hardness.

Protect the threaded ends with plastic end caps.Pack in wooden box/gunny bag of convenient size for easy handling and transportation.Mark quantity in each box/gunny bag.

6.0 CERTIFICATION

The manufacturer shall provide TC (ref. page 3) duly countersigned by the Authorised Inspecting Authority nominated by BHEL in P.O. (if specified) along with Raw Material TC from Steel Maker.Manufacturer's TC shall contain P.O.No,TDC No.,Heat No., Chemical and Mechanical properties,HT parameters,surface coating with coating thickness, baking details,manufacturers' identification mark and certify soundness & confirmation to P.O. requirements.

7.0 SPECIAL REQUIREMENTS

7.1 CADMIUM PLATING REQUIREMENTS

Clean the studs/bolts to make it free from rust, grease, oil, scale, etc.,before plating.

When pickling is considered essential, it shall be done as per Cl 7.4.

Apply Cadmium Plating to the specified thickness on specified areas.

After plating, bake the parts at 175 Deg.C to 205 Deg.C for a minimum period of 3 hours. The elapsed time between plating and baking shall not exceed 8 hours.

Apply a Chromate Conversion coating after plating and baking.

7.2 GALVANISING

Clean the studs/bolts to make it free from rust, grease, oil, scale, etc., before galvanising

When pickling is considered essential, it shall be done as per CI 7.4.

The fasteners shall be galvanised by electroplating process to obtain the minimum coating thickness as specified in PO/drawing.

After galvanising bake the parts at 175 to 205 deg.C for a minimum period of 3 hours. The elapsed time between plating and baking shall not exceed 8 hours.

Apply a Chromate Conversion coating after plating and baking.

7.3 RUST PREVENTIVE COATING REQUIREMENTS

Clean the studs/bolts to make it free from rust, grease, oil, scale, etc., before applying protective coating. When pickling is considered essential it shall be done as per CI 7.4.

One coat of rust preventive fluid of any of the following vendors shall be applied.

CHEMICAL	VENDOR
1. BONITA-RPF	M/s Bonita Chemicals, 64, Industrial Estate, Nunhai, Agra-282 006.
2. CHAMPION-RPF	M/s Guardian Chemicals, 8, Rajaji Ind st, West Lake Area, Nungambakkam, Madras-600 034
3. ECONOL RPF (non-drying type)	M/s Process Aids, Bangalore
4. TECTYL 506	M/s Plastipeel Chemicals and Plastics (P) Ltd, Thane-400 604
5. TRPF	M/s Sundaram Paints Pvt. Ltd., Thanjavur-613 004
6. TRPF	M/s Solar Paints, Pudukkotai.
7. WICOR-P	M/s Western India Paint and Color Co P. Ltd, Madras-600 017

7.4 ACID PICKLING

When pickling is considered essential for cleaning, it shall be done using Hydrochloric acid of 5 to 10% acid concentration at room temperature with inhibitor.

The concentration and type of inhibitors shall be as recommended by any of the following vendors.

1) M/s Agromore Ltd. Bangalore. 2) M/s Prosol Corporation, Hyderabad. 3) M/s Guardian Anti-corrosives, Madras. 4) M/s Mascat Chemicals, Bombay.

After pickling thorough rinsing shall be carried out with water to remove acid residues.

Immediately after pickling, the components shall be dried and baked at 175 to 205 deg C for 3 hours before taking up the next operation (plating).

Revision Record:

Rev:00/17.01.90: First issue, Rev:01/21.06.90: Editorial corrections, Rev:02/21.04.91: TC for studs/bolts added
 Rev:03/04.04.96: Annexure-I amended. CI 3.3.3 & 5.3 modified, Rev:04/20.10.96: NDT, Acid pickling added & re-written, Rev:05/28.04.98: CI 3 modified to include MPI, certificate modified & CI 7.4 deleted
 Rev:06/15.06.99: Title, CI 1 to 5 & 7.1 modified. CI.7.2 changed to CI 7.3. CI 7.3 changed to 7.4 & modified. CI 7.2 Galvanising added. Test certificate sample format modified.

R.Rajasekar
Qual. Assurance
Prepared by

K.Nagarajan
Engg/Valves

Haridoss
Purchase/Valves

G.Mathivanan
Quality Control

P.Vasudevan
Quality assurance

K.Rengachari
Qual Assurance
Approved by

Reviewed by

TEST CERTIFICATES FOR STUDS/BOLTS - SAMPLE FORMAT

TC NO:

DATE:

 CUSTOMER : PO No/Amd :
 TDC No/Rev. : DC No :
 PRODUCT : DRG.No :
 DESCRIPTION : (Spec, dia, pitch, length) THREAD SPEC:
 QUANTITY :

 Requirement Records/observations

 size of bar - Before m/c ing :
 - After m/c ing :
 Type of furnace used for hardening :

 | Mill TC for raw material TC No:
 TDC Cl No|Melt Number.

Product analysis for chemistry. Report No:

Spec (min,max)	C	Si	Mn	P	S	Cr	Mo	V	Others
Actual									

 |Hardening Heat treatment Temperature: Deg C. Soaking time
Tempering after hardening Temperature: Deg C. Soaking time

|Tensile test after H&T & final drying(Finished heat treated condition)

3.0 | Tensile Yield %Elongation on 2"GL %Reduction in area

 |Spec |
 |(mini,max)|
 |Actual |

Hardness measured

|10 % MPI on the finished studs. Report No:

 4.0 |Visual & dimensional checking as per IS 2614 table 1

5.0 |Punching details(identification)
End cap for threaded portion

7.0 |Pickling. Acid: Concentration:
 |Drying after pickling. Temperature: Deg C. Soaking time
 |Type of coating Cadmium/Galvanising/Rust preventive
 |Coating thickness
 |Chromate conversion coating.
Drying after coating. Temperature: Deg C. Soaking time

This confirms that the above results are correct and the parts are as per speccification and P.O requirements.

 Signature
 BHEL/Authorised Inspection agency

Signature
 Incharge of Quality

QUALITY ASSURANCE

QA:3.2.1:003:99

Date:09-02-99

Sub: Release of revised TDC:5:166/04 TDC for Carbon & Alloy steel nuts to specn SA 194 Gr 2H/2HM/Gr4/Gr7 for Valves, Oil field equipments & other applications.

Please find enclosed the subject TDC for your official use and record.

K. Rangachari
(K.Rangachari)
SR.MANAGER/QA

Distribution:

DGM/Valves/Matl Plng/Bldg 6...Sri.R.Prabudoss
DGM/Spares/Matl Plng/Bldg 53..Sri.K.Y.Prabu
DGM/Matl Plng/Bldg 2&4.....Sri.V.Balakrishnan
SM/Purchase/Valves.Bldg 24....Sri.Sam Manohar Nayagam
SM/Purchase/FB/Bldg 24..... Sri.P.Namasivayam
SM/QC (Proc)/Bldg 2&4.....Sri.G.Mathivanan
M/Engg/Valves/Bldg.6.....Sri.K.Nagarajan
Master file

BHEL - Quality Assurance Department. TECHNICAL DELIVERY CONDITION

TDC:5:166 Rev.No.:04 Effective Dt.:13/01/99

Page 1

CARBON & ALLOY STEEL NUTS TO SPECN SA 194 Gr2H/2HM/Gr4/Gr7
for VALVES, OIL FIELD EQUIPMENT & OTHER APPLICATIONS**Revision record:**

Rev:00/11.04.90 : First issue

Rev:01/21.06.90 : Editorial corrections

Rev:02/21.04.91 : TC for nuts added

Rev:03/20.10.96 : NDT, Acid pickling added & rewritten

Rev:04/13/01/99 : Studs/bolts changed as nuts in Cl.5,7.1,7.2

1.0 MATERIAL SPECIFICATION - SA 194 Gr2H/Gr2HM/Gr4/Gr7{latest on date of Purchase Order (P.O)}

2.0 GENERAL

This TDC is applicable for API 6A applications including NACE MR-01-75 cl.II & cl.III also. Shall be manufactured to the relevant drawing and P.O.requirements.

Nuts shall be hot/cold forged or manufactured from hot rolled/cold drawn bars. If made from hexagonal bars, 100% MT is to be done on bars. If made from round bars, the bars shall be machined to remove 2mm from surface, (ie 4mm in dia) to remove all surface defects. At least 10% of the machined bars shall be MT tested to ensure that the surface defects are fully removed.

Nuts shall be heat treated to meet the requirements of SA194 only in a salt bath, or controlled atmosphere furnace. After HT the threads shall be thoroughly cleaned to remove all deposits. When acid pickling is done for cleaning it shall be done as per Cl 7.3.

Cadmium plating as per (Cl 7.1) if specified in drg/P.O. or rust preventive fluid coating as per (Cl 7.2) shall be done.

3.0 CHEMICAL & MECHANICAL PROPERTIES

Mill certificate for chemical composition from steel manufacturer for conformance to the specification heat-wise. Additionally, product analysis shall be done for one piece/heat by the nut manufacturer.

HARDNESS

For SA194 2H, Gr4, & Gr7

Hardness check on finished nut as per SA194, using sampling plan (Cl.7.4).Hardness in the finished nut shall be 24 to 35 HRC or 248 to 352 BHN.

For SA194 Gr2HM:

Hardness check on 100% of nuts.Hardness must be within 159 to 237 BHN.

Proof load test shall be done as per SA194 for all grades.

After final heat treatment, sample nuts shall be heat treated as below and meet the corresponding hardness requirements.

Grade	Temp	Time	Cooling	Hardness at room temp.
2H	540°C	24Hrs	Slow cool	179 BHN (min)
2HM	540°C	-do-	Slow cool	159 BHN (min)
Gr4/Gr7	590°C	-do-	Slow cool	201 BHN (min)

CONE STRIPPING TEST: This test shall be performed as per SA194 in case of visible surface discontinuities. On such cases Proof load shall be as per ASTM A194 (latest std).

4.0 FINAL INSPECTION

All inspection shall be as per drawing and SA194.

The threads shall be checked with calibrated plug gauge in the final heat-treated condition for black variety and in final plated condition for the plated variety.

Visual and Dimensional checks in the finished nuts and their acceptance shall be as per IS 2614 Table-I(latest).

5.0 MARKING & PACKING

Punch/emboss each finished nuts with material grade (2H/2HM/Gr4/Gr7); supplier's emblem.

Punch/emboss Sl.no also in 2HM nuts in addition to the above to co-relate with hardness. In addition, the grade symbol shall be underlined.

Pack in wooden box of convenient size for easy handling & transportation.Mark quantity in each box.

6.0 **CERTIFICATION**

The manufacturer shall provide TC (ref. page 3) duly countersigned by the Authorised Inspecting Authority nominated by BHEL in P.O. (if specified) along with Raw Material TC from Steel Maker. Manufacturer's TC shall contain P.O.No.heat no., Chem & Mech properties, HT parameters, surface coating with coating thickness, baking details and certify soundness & confirmation to P.O. requirements.

7.0 **SPECIAL REQUIREMENTS**

7.1 **CADMIUM PLATING REQUIREMENTS**

Clean the nuts to make it free from rust, grease, oil, scale, etc., before plating.
 When pickling is considered essential, it shall be done as per Cl 7.3.
 Apply Cadmium Plating to the specified thickness on specified areas.
 After plating, Bake the parts at 175 Deg.C to 205 Deg.C for a minimum period of 3 hours. The elapsed time between plating and baking shall not exceed 8 hours.
 Apply a Chromate Conversion coating after plating and baking.

7.2 **RUST PREVENTIVE COATING REQUIREMENTS**

Clean the nuts to make it free from rust, grease, oil, scale, etc., before applying protective coating.
 When pickling is considered essential it shall be done as per Cl 7.3.
 One coat of rust preventive fluid of any of the following vendors shall be applied.

CHEMICAL	VENDOR
1. BONITA-RPF	M/s Bonita Chemicals, 64, Industrial Estate, Nunhai, Agra-282 006.
2. CHAMPION-RPF	M/s Guardian Chemicals, 8, Rajaji Ind st, West Lake Area, Nungambakkam, Madras-600 034
3. ECONOL RPF (non-drying type)	M/s Process Aids, Bangalore
4. TECTYL 506	M/s Plastipeel Chemicals and Plastics (P) Ltd, Thane-400 604
5. TRPF	M/s Sundaram Paints Pvt. Ltd., Thanjavur-613 004
6. TRPF	M/s Solar Paints, Pudukkotai.
7. WICOR-P	M/s Western India Paint and Color Co P. Ltd, Madras-600 017

7.3 **ACID PICKLING**

When pickling is considered essential for cleaning, it shall be done using Hydrochloric acid of 5 to 10% acid concentration at 50 deg C with inhibitor.
 The concentration and type of inhibitors shall be as recommended by any of the following vendors.
 1) M/s Agromore Ltd. Bangalore. 2) M/s Prosol Corporation, Hyderabad. 3) M/s Guardian Anti-corrosives, Madras. 4) M/s Mascat Chemicals, Bombay.
 After pickling thorough rinsing shall be carried out with water to remove acid residues.
 Immediately after pickling, the components shall be dried and baked at 175 to 205 deg C for 3hours before taking up the next operation.

7.4 **SAMPLING PLAN FOR HARDNESS CHECK AFTER HT**

The following double sampling plan shall be used. Hardness values shall be 25 to 34 HRC after HT. IS 2500 (Double Sampling) Normal Inspection, Level 2.

No. of Pieces in the lot	Acceptable Quality Level (2.5%)							
	First sample (n1)	Acceptance number (Ac)	Rejection number (Rc)	Second sample (n2)	Combined sample (n1+n2)	Acceptance number (Ac)	Rejection number	
0 - 500	32	1	4	32	64	4	5	
501 - 1200	50	2	5	50	100	6	7	
1201 - 3200	80	3	7	80	100	8	9	
3201 - 10000	125	5	9	125	250	12	13	
10001 - 35000	200	7	11	200	400	18	19	

Ac:-Acceptance number: Max. no. of defectives allowed in the sample for the acceptance of the lot.

Rc:-Rejection number: Min.no. of defectives in the sample resulting in the lot's rejection.

PROCEDURE FOR OPERATING THIS PLAN : Suppose the lot size is 1,000. From table chose the class, which includes 1,000 viz 501 - 1200. Hence, use the sampling plan given against this class. Take a sample of 50 pieces and test for hardness.

TEST CERTIFICATE FOR NUTS - SAMPLE FORMAT

TC NO:

DATE:

CUSTOMER :

P.O.NO:

Dt:

D.C.NO:

Dt:

Specn :

PRODUCT :

SIZE OF BAR USED:

RAW MATL TC NO:

TDC NO:

HEAT NO.:

DRG NO:

LOT NO:

Thread specn:

QUANTITY:

CHEMICAL COMPOSITION (%) :

C	Si	Mn	P	S	Cr	Ni	Others

HEAT TREATMENT:

HARDENING: TEMP: Deg.C;SOAKING TIME: Minutes;COOLING MEDIUM:
TEMPERING: TEMP: Deg.C.SOAKING TIME: Minutes;COOLING MEDIUM:
BAKING TEMP : Deg.C.BAKING TIME: Minutess.

MECHANICAL TESTING:

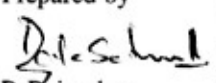
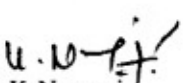
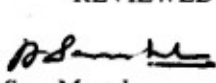
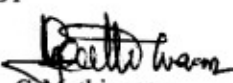
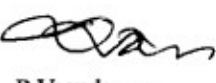
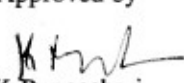
HARDNESS AFTER HT (MIN & MAX) : BHNNO OF SAMPLES
 HARDNESS AFTER 24 HRS TEMPERING ON SAMPLE NUT : BHN
 PROOF LOAD APPLIED : Kgf
 CONE PROOF LOAD TEST : LOAD APPLIED:

MAGNETIC TESTING (IN PROCESS):
 FINAL INSPECTION (VISUAL):

SURFACE COATING : COATING THICKNESS : Micr
 IDENTIFICATION :

It is certified that the above results are correct and the parts are as per specification & P.O. requirements.

Signature
 Incharge of Quality

Prepared by	REVIEWED BY			Approved by
 R. Rajasekar	 K. Nagarajah	 Sam Monohar Nayagam	 G. Mathivanan	 P. Vasudevan
Qual Assurance	Engg/Valves	Purchase/Valves	Quality Control	Quality assurance
				 K. Rengachari Qual Assurance



BHARAT HEAVY ELECTRICALS LTD Annexure-2

VALVES PURCHASE

Trichy - 620 014. India

TERMS AND CONDITIONS

Phone: 0431 2577802

Email: ramnath@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 Rs per unit for each type. Tender should not be addressed to any individual's name but only by designation as below:

The Tender Opening Cell / Valves
Room No. -26, Building -24
Bharat Heavy Electricals Limited
Tiruchirappalli - 620014, Tamilnadu, 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 Bid Systems:** If tender calls for two part bid system (Techno commercial & price Bid). First the Techno Commercial bid will be opened. Techno-commercially suitable vendors alone will be intimated for price bid opening or Reverse Auction.
- e. **PVC:** Price Variation clause 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 No 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. The spares offer should accompany the offer of main equipment; otherwise the quotation will be overlooked.

2. COMMERCIAL TERMS & CONDITIONS:

- a. **Terms of Payment:**
Import: 100% Payment cash against documents after 45 days or Usance LC with 45 days credit period.
Indigenous: Payment 100% after 45 days on satisfactory receipts and acceptance of material at BHEL stores. Offers requesting for advance payment will be rejected.
- b. **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.
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).
- c. **Delivery Terms:**
For Indigenous Suppliers: FOR BHEL Trichy/FOR site as mentioned in enquiry inclusive of freight and insurance.
For Import Suppliers: FOB nearest SEA Port/FCA nearest AIR port.
- d. **Validity of Offer:** Prices should be valid for 06 months from the date of opening of this tender.
- e. **Duties and Taxes:** 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.
- f. **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.
- g. **Risk Purchase:** Alternatively the purchaser at his option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of 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.
- h. **Preferential Delivery:** If a contract is placed on a higher tender as a result of this invitation to tender in preference to the lowest acceptable offer in consideration of the earliest delivery, the seller will be liable to pay to the purchaser the difference between the contract rate and that of the lowest acceptable tender on the basis of final price FOR destination, including all elements of freight, sales tax, duties and other incidents, incidental in case of failure to



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VALVES PURCHASE

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complete supplies in terms of such contract within the date of delivery specified in the tender and incorporated in the contract.

- 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 tender is availing MODVAT credit for his input materials, the effect of proforma invoice should be passed on to the purchaser.
- j. **Miscellaneous:** Any Other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in 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 as per BHEL tender requirement which are as indicated against each item in our tender. If supplier offers more than this delivery period BHEL will operate 0.5% loading factor for evaluation of their offer for every week delay.
- l. **Performance Bank Guarantee:** If tender Calls for Performance Bank Guarantee, Vendor should provide a performance bank guarantee (PBG) for 10% of the total Purchase order value valid for warranty/guarantee period with an additional claim period of 2 months.
- m. **Counter offer:** BHEL reserves the right to counter-offer with vendors other than L1, in order to have broader vendor base for ensuring delivery.
 - (i) If one vendor alone accepting the counter offer rates, loading shall be 60:40 on L1:L2.
 - (ii) If two vendors are accepting the counter offer rates, loading shall be 50:30:20 on L1:L2:L3.
 - (iii) If three vendors are accepting the counter offer rates, loading shall be 40:30:20:10 on L1:L2:L3 & L4.
 - (iv) If four vendors are accepting the counter offer rates, loading shall be 40:20:15:15:10 on L1:L2:L3 , L4 & L5.
 - (v) Highest rate bidder will not be considered for this tender, in case of more than two responses for each enquiry serial numbers.

n. 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.
- o. **Reverse Auction:** BHEL reserves the right to go for a Reverse Auction (RA) instead of Opening the price bid, which will be decided after techno-commercial bid evaluation. Information and general terms and conditions governing RA are given below:-

GENERAL TERMS AND CONDITIONS OF RA

Against this enquiry for the subject item/system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING ON INTERNET.

- i. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
- ii. BHEL will engage the service provider who will provide all the necessary training and assistance before commencement of on line bidding on internet.
- iii. BHEL will inform the vendor in writing in case of reverse auction, the details of Service Provider to enable them to contact & get trained.
- iv. Business rules like event date, time, Start price, bid decrement value; extensions etc. also will be communicated through service provider for compliance.
- v. Vendors have to mail/fax the Compliance form in the prescribed format (provided by the Service provider) before the start of the Reverse auction. Without this, the vendor will not be eligible to participate in the event.
- vi. BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the vendor to enable them to fill-in the price and keep it ready for keying in during the Auction.
- vii. Reverse auction will be conducted on the scheduled date & time.
- viii. At the end of Reverse Auction event, the lowest bidder value will be known on the network.
- ix. The lowest bidder has to mail/fax the duly signed Filled-in prescribed format as provided on case-to-case basis to BHEL through Service provider within 24 hours of Auction without fail.
- x. Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with BHEL as per prevailing procedure.



BHARAT HEAVY ELECTRICALS LTD Annexure-2

VALVES PURCHASE Trichy - 620 014. India TERMS AND CONDITIONS

Phone: 0431 2577802

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3. GENERAL CONDITIONS

- a. BHEL reserves the right to finalize the tender as per item sl no 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.
- e. Supplier shall arrange packing to avoid lose or damages during Road Transport, Site handling & Storage.
- f. Purchase Order, PO Item SI No, 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.

4. DOCUMENTATION:

For Indigenous suppliers:-

- a. **With Consignment:** Duplicate for transporter copy of Invoice, Packing List, Delivery Challan, O&M manual Material Test Certificate, Test Certificates, Calibration Report, Compliance Certificate & Guarantee/Warranty Certificate etc...
- b. **To 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, Tamilnadu.**

To Purchase:

- i. **FOR BHEL TRICHY case-**Copy of Invoice, Packing list, LWB and Delivery challan for reference, original IBR documents/Inspection despatch clearance certificates.
- ii. **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 SI No, Material code, quantity, Unique SI No 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. **Through 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 bankers to BHEL bankers
- c. **To 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.
- d. **Identification:**, Purchase Order, PO item SI No, Material code, quantity, Unique SI No if any should be provided in all materials and packing clearly.

5. TENDER EVALUATION:

PART I (Techno-commercial Bid).

- All Vendors should submit supply record, end user certificate and PO reference, catalogue etc.
- Vendor who are not registered in BHEL Trichy, Product Material Directory (PMD) should register online in <https://www.bheltry.co.in/olsa/> and should submit copy of online registration form with part I bid.
- BHEL reserves right to visit vendor works before registration for verification of facilities.
- Vendor who doesn't have manufacturing capacity/capabilities/credentials will be rejected.
- 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.
- Item quote should be submitted in the BHEL format, annexure-4 A
- Offers from supplier not having technical capability or not agreed for commercial terms, will be rejected

PART II (Price Bid).

- Bidders qualified for part I will be intimated for participating in priced bid opening/Reverse Auction.
- L1 bidder will be decided based on landed cost for the item to BHEL.
- Price Bid should be in BHEL format, Annexure 4 B.
- For evaluation, the exchange rate shall be taken as TT selling rate of SBI on date of Part-1 bid opening.

SCHEDULE OF DEVIATIONS

Enq Ref:

Offer Ref:

Date:

Commercial Deviation:

Annexure / Clause No.	Description	Supplier Deviation

Technical Deviation:

Annexure / Clause No.	Material Code	Matl. Description	Supplier Deviation

We confirm acceptance of all the Technical and Commercial requirements as per BHEL Tender, except the above deviations.

Signature with Seal

