BHARAT HEAVY ELECTRICALS LIMITED
INDUSTRIAL VALVES PLANT, GOINDWAL
(MM Department)

NO:BHEL:IVP:MM:EOI:12-13
Date: 15.10.2012

NOTICE INVITING APPLICATIONS FOR REGISTRATION OF VENDORS

BHARAT HEAVY ELECTRICALS LIMITED [BHEL] IVP is manufacturing Industrial Valves at its Industrial Valves Plant, Goindwal Sahib Unit. The range of valves includes Gate, Globe and Non-return Valves (Flap Valves) of Pressure classes from C150 to C600 of sizes 2" to 24" at present. The plant is heading towards increasing its volume as well as range of items.

Expression of interest and applications for registration are invited from reputed manufacturers who are already manufacturing **Acme threaded valve stems/spindles or alike parts having ACME threads**.

Details:

Valve Stems	Manufacturers having sound Machining facilities like Lathes, CNCs etc. and experience/willingness to supply Acme Threaded Valve Stems required for our valves of sizes from 2" to 24" in material grade SA182 F6A Cl3/F316. Total Annual procurement qty for all class and sizes is around 30000 Nos. Suitable vendors identified, accessed/evaluated to be competent through this expression of interest may be included in the next tender for the item to be issued soon.

MSE's shall be given preferences as described in "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" subject to the submission of proper documentary evidence (i.e. District Industries Centers or Khadi and Village Industries Commission or Khadi and Village Industries Board or Coir Board or National Small Industries Corporation or Directorate of Handicrafts and Handloom or any other body specified by Ministry of Micro, Small and Medium Enterprises) with quotation. "Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012" document can be downloaded from link **http://dcmsme.gov.in/FinalPressorder.pdf** and can also be collected from the office of Manager/MM IVP Goindwal.

BHEL IVP shall evaluate the vendors as per its established vendor selection, evaluation and registration procedure. Supplier registration form can also be downloaded from our website www.bhel.com available as a downloadable link at
http://www.bhel.com/images/pdf/vendor/Guidelines_Indian_Suppliers_SEARP2010Amdt.02.pdf

BHEL IVP invites such vendors to visit its plant located in Goindwal Sahib Punjab Dist Tarn Taran on any working day from Monday to Saturday between 0900 Hrs to 1600 Hrs and contact undersigned for any Clarification regarding:

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Annexure – Sample Item List:

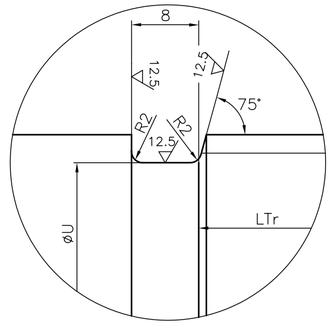
Short text	Comp Drg No	Applicable Valve Size	Matl. Spec.	HT	Ident.	ø	L	Applicable TDC	Qty (Nos.)
STEM-N434 2"-150/300 GV	3VN43417472/02	2-C150/C300-GV	A182F6acl3	H & T	Certify	28	370	TDC:0:307REV 03 & TDC:0:404REV 09	3000
STEM-N357 3"-150 GV	3VN35717472/03	3-C150-GV	A182F6acl3	H & T	Certify	32	415		4000
STEM-N429 3"-300 GV	3VN42917472/03	3-C300-GV	A182F6acl3	H & T	Certify	32	430		1200
STEM-N318 4"-150 GV	2VN31805884/02	4-C150-GV	A182F6acl3	H & T	Certify	32	510		2600
STEM-K848 4"-300 GV	2VK84805884/01	4-C300-GV	A182F6acl3	H & T	Certify	32	510		1000
STEM-N002 6"-150 GV	2VN00205573/03	6-C150-GV	A182F6acl3	H & T	Certify	40	655		2600
STEM-N340	2VN34005884/01	6-C300-GV	A182F6acl3	H & T	Certify	45	690		800
STEM-F504	2VF50406216/01	6-C600-gv	A182F6acl3	H & T	Certify	50	741		300
STEM-N325	2VN32505884/01	8-C150-GV	A182F6acl3	H & T	Certify	45	732		800
STEM-N399	2VN39905884/01	8-C300-GV	A182F6acl3	H & T	Certify	45	800		1200
STEM-N362	2VN36205884/02	10-C150-GV	A182F6acl3	H & T	Certify	50	877		700
STEM-N644	2VN64405884/01	10-C300-GV	A182F6acl3	H & T	Certify	50	875		900
STEM-N588	2VN58805573/02	10-C300-GV-MO	A182F6acl3	H & T	Certify	50	920		300
STEM-N392	2VN39205884/01	12-C150-GV-HW	A182F6acl3	H & T	Certify	50	984		300
STEM-K353	2VK35309157/03	3-C300-RV-HW-L103	A182F6acl3	H & T	Certify	46	490		1600

DRAWING NO. 2-V-0000-05884

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

SL. No.	DRG. No.	COMP. CODE	MATL. SPECN	øD1 –b9	øD2	øU +0.5 0	L	L1	L2	L3	L4	LTr	SCRAP SORT	Tr DxP DIA INCH–N ACME–2G–LEFT	FINISHED Wt.(kg)	SIZE/ RATING
1	2–V–N280–05884/01	93 105 734 0000	A182 F6a cl.3 HT (CERTIFY)	41.275	50	33.6	950	69	47	28	30	432	40	1.625"–4ACME	9.30	10"–300C
2	2–V–N276–05884/02	93 105 826 0000		25.4	32	19.1	492	37	28	16	18	214	40	1.0"–5ACME	1.92	4"–150C MO
3	2–V–N283–05884/01	93 105 827 0000		31.75	45	24.1	725	54	37	22	30	325	40	1.25"–4ACME	4.34	8"–150C MO
4	2–V–N311–05884/02	93 105 828 0000					703						40	1.25"–4ACME	4.69	8"–150C GO
5	2–V–N287–05884/01	93 105 829 0000		34.925	50	27.3	920	69	47	28	30	410	40	1.375"–4ACME	7.35	10"–150C MO
6	2–V–N324–05884/01	93 106 206 0000		25.4	32	19.1	472	37	28	16	18	204	40	1.0"–5ACME	1.59	4"–300C SG
7	2–V–N340–05884/01	93 106 207 0000		31.75	40	24.1	660	52	36	20	20	290	40	1.25"–4ACME	4.286	6"–300C SG
8	2–V–N318–05884/02	93 106 439 0000		25.4	32	19.1	492	37	28	16	18	204	40	1.0"–5ACME	1.87	4"–150C HW
9	2–V–N325–05884/01	93 106 454 0000		31.75	45	24.1	732	54	37	22	30	328	40	1.25"–4ACME	4.40	8"–150C SG
10	2–V–N362–05884/02	93 106 455 0000		34.925	50	27.3	877	69	47	28	30	390	40	1.375"–4ACME	6.70	10"–150C SG
11	2–V–N392–05884/01	93 106 456 0000		38.1	50	30.4	984	69	47	28	30	445	40	1.5"–4ACME	9.8	12"–150C SG
12	2–V–N399–05884/01	93 106 563 0000		34.925	45	27.3	800	64	41	22	30	373	40	1.375"–4ACME	6.3	8"–300C SG
13	2–V–N449–05884/01	93 106 860 0000		38.1	50	30.4	929	69	47	28	30	400	40	1.5"–4ACME	8.7	12"–150C SG
14	2–V–N446–05884/01	93 106 892 0000		41.275	55	33.6	1015	75	52	28	34	477	40	1.625"–4ACME	11.23	12"–300C MO
15	2–V–M616–05884/01	93 107 329 0000	A276–410 DOUBLE TEMPERING CERTIFY	25.4	32	19.1	460	37	28	16	18	204	40	1.0"–5ACME	1.54	4"–300C HW
16	2–V–M617–05884/01	93 107 330 0000		31.5	40	24.1	630	52	36	20	20	290	40	1.25"–4ACME	4.10	6"–300C HW
17	2–V–M619–05884/01	93 107 331 0000		25.4	32	19.1	454	37	28	16	18	196	40	1.0"–5ACME	1.53	4"–150C HW
18	2–V–M620–05884/01	93 107 332 0000		28.575	40	22.2	570	52	36	20	20	263	40	1.125"–5ACME	2.86	6"–150C HW
19	2–V–M621–05884/01	93 107 333 0000		41.275	50	33.6	922	69	47	28	30	388	40	1.625"–5ACME	10.1	10"–300C MO
20	2–V–N606–05884/01	93 107 671 0000	A182 F6a cl.3 HT (CERTIFY)	31.75	45	24.1	793	54	37	22	30	336	40	1.25"–4ACME	4.72	8"–150C MO (SMB–00)
21	2–V–N631–05884/02	93 107 792 0000		41.275	55	33.6	1050	75	52	28	34	480	40	1.625"–4ACME	11.60	12"–300C HW
22	2–V–K800–05884/01	93 107 870 0000	A276–410 DOUBLE TEMPERING CERTIFY	25.4	32	19.1	492	37	28	16	18	200	40	1.00"–5ACME	1.87	4"–150C HW SG
23	2–V–K804–05884/01	93 107 892 0000		28.575	40	22.2	625	52	36	20	20	275	40	1.125"–5ACME	3.06	6"–150C HW SG
24	2–V–N644–05884/01	93 108 058 0000	A182 F6a cl.3 HT (CERTIFY)	41.275	50	33.6	875	69	47	28	30	380	40	1.625"–4ACME	9.35	10"–300C HW SG
25	2–V–N645–05884/02	93 108 089 0000		41.275	55	33.6	1070	75	52	28	34	500	40	1.625"–4ACME	11.81	12"–300C HW SG
26	2–V–K848–05884/01	93 108 084 0000		25.4	32	19.1	492	37	28	16	18	223	40	1"00–5ACME	1.87	4"–300C HW SG
27	2–V–K847–05884/01	93 108 078 0000	A276–410 DOUBLE TEMPERING CERTIFY	25.4	32	19.1	492	37	28	16	18	223	40	1"00–5ACME	1.87	4"–300C HW SG
28	2–V–K857–05884/01	93 108 100 0000		31.75	40	24.1	660	52	36	20	20	290	40	1.24"–4ACME	4.10	6"–300C HW SG
29	2–V–K981–05884/01	93 109 439 0000	A182 F6a cl.3 HT (CERTIFY)	31.75	45	24.1	745	54	37	22	30	325	40	1.25"–4ACME	4.34	8"–150C MO
30	2–V–K982–05884/01	93 109 440 0000		38.1	50	30.4	1014	69	47	28	30	400	40	1.5"–4ACME	8.7	12"–150C MO
31	2–V–N993–05884/01	93 110 014 0000		31.75	45	24.1	760	54	37	22	30	335	40	1.25"–4ACME	4.49	8"–150C MO IQ20

DETAIL–B

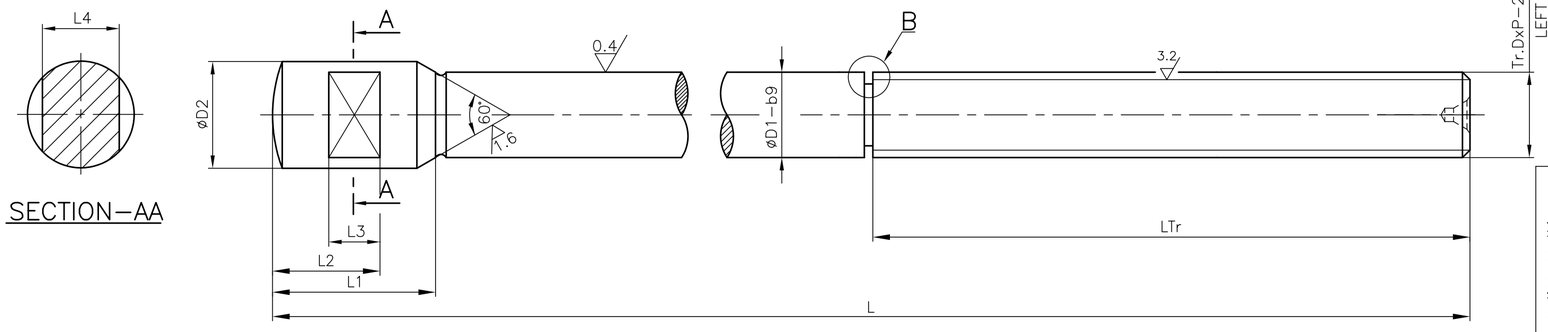


ABOVE & INCLUDING	b9
ø18–ø30	–0.160
	–0.212
ø30–ø40	–0.172
	–0.232
ø40–ø50	–0.180
	–0.242

NOTES:–

1. HARDNESS 250 TO 300 BHN FOR SA182–F6a cl.3
2. HARDNESS 22 HRC (MAX) FOR A276–410

SECTION–AA



REV.	DATE	ALTD: T.R.RAMAMURTHY / CHD & AAPD: P.BOOMINATHAN	ZONE
20	22.10.07	IN SL.No.2 DIMN.LTr 214 WAS 204 IN SL.No.8 DIMN.LTr 204 WAS 200 REFER DCP.800763	
REV 19	DATE 31.07.03	ALTERED K.P.LEON / CHD & APPD P.BOOMINATHAN	ZONE
		SURFACE FINISH 0.8 REVISED TO 0.4 REFER DCP.:–800223	

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: CS

DRG. RETRACED WITH REVISION 20 ON 22.10.2007 (REFER DCN:CS:1155)

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI -620014.
365–120

	NAME	SIGN	DATE	NO.OF VAR.
DRN	T.R.RAMAMURTHY		22.10.07	–
CHD	T.R.RAMAMURTHY		22.10.07	
APPD	P.BOOMINATHAN		22.10.07	

DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
VL	NTS.	–	CAD:C205884 STEM ROUGH DRG. No.CAD:C205897	–
CODE 320				

TITLE	CARD CODE	DRAWING NO.	REV
STEM	U 01	2–V–0000–05884	20

Size A2

भा एच ई एल BHEL QUALITY MANAGEMENT

IVP, GOINDWAL

STANDARD QUALITY PLAN

VALVE MACHINED COMPONENT PROCUREMENT WITH MATERIAL

(Applicable for Gland Follower, Finished Back Seat(F6), Rough Back Seat, Bearing Retainer, Stem, Spacer, L. Rings, Components for Limit Switch Arrangement, Locking Arrangement and Indicator Assembly.)

QP NO. : SQP:IVP:02-01 REV.:02
Date : 10-09-2012

S. NO.	COMPONENT & OPERATION	CHARACTERISTICS	Check CL	Check Type	Quantam of Check M	Quantam of Check S	Reference Doc. /Acceptance Norms	Format of Record	AGENCY M	AGENCY S	AGENCY C	REMARKS
This QP is applicable for Gland Follower, Rough Back Seat, Bearing Retainer, Stem, Spacer, Components for Limit Switch Arrangement, Locking Arrangement and Indicator Assembly.												
1.0	**MATERIALS** Forging/Bar/Plate/Sheet/ Tube/Fasteners: Gland Follower, Rough Back Seat, Bearing Retainer, Stem, Spacer, Components for Limit Switch Arrangement, Locking Arrangement and Indicator Assembly.	a) Chemical, Mechnical Properties & NDE	A	TC Verification	100%	100%	Material to be procured from Manufacturer as per Latest Applicable TDC and Standard to specifications as per drawing	TC	P	V		Refer Note: 1.
		b) Sample testing by BHEL/TPI	A	Chemical & Mechanical Properties, NDE#	As per TDC/Standard/ Min. 1 per Heat	As per TDC/Standard/ Min. 1 per Heat	-do-	R	P	W		# UT -Bars of Dia > 50 mm and Plates of Thk > 40 mm
2.0	**IN PROCESS CONTROL** Machining of all components	a) Dimensions	A	Measurement	100%	20%	Drawings,QCP:003	R	P	W		Refer Note: 2.
		b) Sample testing by BHEL/TPI	A	Chemical & Mechanical Properties	Random	Random	TDC, Standard and Drawings	R	P	W		
3.0	**ASSEMBLY***	Compliance to PO/Drawing	B	Visual	100%	20%	Drawings,QCP:003	-	P	W		*Only For Indicator Assembly
4.0	**IDENTIFICTION** Punching on non-critical area on Machined Components	- Raw Material Heat No., Material Specification & Grade, Material Code & Vendor Code	B	Visual	100%	20%	Drawings,QCP:003	-	P	V		Refer Note: 6.

LEGEND:Cl:Class (A:Critical,B:Major,C:Minor)
** TPI:Third Party Inspection
M: Vendor, C: Customer
S: BHEL/ Nominated Inspection Agency
R: Test / Dimension / Inspection Reports
V: Verification of test/Dimension/Insp Reports
P: Perform, W: Witness

Prepared By
11/9/12

Reviewed & Approved By:
11/9/12

NOTES:

NOTE-1: The material normally used and their TDC Nos. are given below.

	Materials	TDC No.
Forgings/Bars	SA / A105	0:309 & 0:404
	SA / A182 Gr. F11 Cl. 2	0:309
	Gr. F12 Cl. 2	0:309 & 0:404
	Gr. F22 Cl. 3	0:309 & 0:404
	Gr. F91	0:404
	SA / A182 Gr F6A CL. 3	0:307 & 0:404
	SA / A182 Gr F316	0:309 & 0:404
	SA / A182 Gr F304, F316L	0:404
	SA / A182 Gr F430 Modified (Ohtaran)	0:308
	SA / A276 Gr 410,420	0:307
	SA / A479 Ty 410-Cond.2	0:307 & 0:309
	SA / A565 Gr 616-Cond.HT	0:307
	SA / A582 Ty 416	0:307
	SA / A350 LF-2	0:404
	AISI 4140	0:417
	AISI 410	0:307
	X20 Cr Mo V121	0:310
	IS 2004 Cl.III	As per specn.
Plates	ASME SA515 Gr 70	0:202
	ASME SA387 Gr 22	0:202
	ASME SA299	0:201
Fastners:	ASTM A193 B7/B16	5:164
	ASTM A194 Gr.2H/Gr4/Gr7	5:166

Note-2: Raw material to be offered for inspection to BHEL / TPI before machining of components. Records of Raw material clearance by BHEL to be produced during Final inspection.

Note-3: All machined components should be suitably protected.

Note-4: Wherever special contract requirements are envisaged, a separate TDC/CQP may be issued, or special instruction may be provided through P.O or stock material may be upgraded to special requirement.

Note-5: Raw material Heat No., Material Specification & Grade to be transferred to the machined components.

Note-6: Codification may be done for Material Specification, Grade, Vendor Code and Material code after prior approval by BHEL.

LEGEND:Cl:Class (A:Critical,B:Major,C:Minor) ** TPI:Third Party Inspection M: Vendor, C: Customer S: BHEL/ Nominated Inspection Agency R: Test / Dimension / Inspection Reports V: Verification of test/Dimension/Insp Reports P: Perform, W: Witness	Prepared By 11/9/12	Reviewed & Approved By: 11/9/12

Revision Record: Rev:07:AISI 410 forgings added consequent to material rationalization by Engg.Valves.Rev:08:Cl.2.0 modified for clarity. Cl.5.0 modified to include impact test for CS QCNRV & CRHNRV Valves.Cl.6.0 modified for clarity in UT.Rev:09;New materials F23,F92 added in Cl:1.0,Cl:2.0,Cl:4.0 to Cl:6.0.CE marking certification clarity included in Cl:10.0 .

1.0 MATERIAL:

Specification: ASME{Latest on date of Purchase Order (PO)}:
(ASTM also applicable for non pressure parts / Valves)
CARBON STEEL:(CS) : SA 105, SA 350 LF 2
ALLOY STEEL: (AS) : SA 182 F6a Class 3, F12 Class 2, F22 Class 3,
SA 182 F23 (Code Case:2179),SA 182 F91 & F92 (Code Case:2199)
STAINLESS STEEL: (SS) : SA 182 Gr. F 304, 304L, 316, 316L, 316H, 321, 321H, 347 & 347H
AISI 410 for TOA Gland and bushings.
Additional Requirement: As listed below (supplementary to Specification)
Size and Qty.: As per Purchase order & Drawing.

2.0 CHEMICAL COMPOSITION & PROCESS:

- Melting: fully killed. Product analysis per heat:
  CS: C<=0.25%. AS: SA182 P23: Si:0.25-0.50% & Cu:0.25 max .
  SA182 P92: Si:0.10-0.50%; Ni:0.30max & Cu:0.25max
- Steel for forging for IBR items to be inspected at Mill & test certificate countersigned by IBR approved Authority, if the mill is not approved under IBR as well known steel maker.
- Steel for IBR items of SA 182 F12, F22 from indigenous mills to be from following manufacturers approved under IBR for creep resistant steels: (I) Alloy Steel Plant, Durgapur,(ii) Tata Iron & Steel Company, Jamshedpur & (iii) Mahindra Ugine Steel Company, Bombay.(iv) M/S Mukund Limited Karnataka, (v) M/S Kalyani Steels Karnataka.(vi) Remi Metals Gujarat Limited. Gujarat (vil) ISMT Pune.Steel for IBR items of SS and AS other than above shall be imported.
- Forging: to ensure uniformity of structure & strength with reduction ratio in area:1:4min.from ingot to final forging, close to final size & shape. Flow lines to be parallel to axis of openings.
- Blooms / Billets used for forgings (Dia>/= 50mm) shall be UT tested. For Acceptance Norm refer Cl.6.0. For finished bars this can be done at final stage.

3.0 DIMENSIONS AND TOLERANCES:

Tolerances as per Drawing. Untoleranced dimensions for valve components: VL:STDC:023(latest).

4.0 HEAT TREATMENT(HT):

CS: SA 105: Normalised, SA 350 LF 2: Normalised at 880-900 °C & Tempered at 620-640 °C
AS: Normalised and Tempered. For SA182 F91, F92, F23 :Normalizing Temperature: 1050-1080°C
Tempering Temperature: 750°C-780°C. Soaking:1 Hour minimum. Still Air Cooling
AISI 410:Supply in Quenched &Tempered condition as below. Quenching at 955-1010°C in air or water or oil or Polymer.Soaking 30 mts/inch maximum thickness. Tempering at 663°C.min.Soaking :60 mts/inch maximum thickness and Air cool.

5.0 MECHANICAL TESTS:

- Extent of test: for each size/heat/HT batch from sample product or identical test coupon.
- Additional requirements for SA182 F91,F92 and F23:
  F91: Yield Strength:(0.2% offset):450MPa min. Tensile Strength: Min:630 MPa,Max:850MPa
  Hardness(HB):Min:191.Max:250
  F92- Tensile Strength:Min:655 MPa, Max:850 MPa. Hardness(HB):Min:196.Max:250
  F23- Tensile Strength: Min:510 MPa, Max:730 MPa. Hardness(HB):Min:150.Max:220
- AISI 410:Hardness 197-235 BHN. No other mechanical test required.
- Additional requirements of tests: (Other than AISI 410 Only.)
- Bend test: Carbon Steel:1 Sample 19mm.Thick(t) x 25.4mm width to be bent 180 deg. around mandrel of radius 6.35 mm. Alloy Steel: Sample 25.4mm width to be bent 180 deg. Around mandrel of radius =1.5 x t.
- Impact test for QCNR Valves & CRHNR Valves: CS and AS: 1 / HT batch.as per ASTM A 370, 2mm. Charpy-U notch,at Room temperature.Acceptance: Avg of 3specimens:36J,Single Min: 24J.
- CE-marking items: Charpy- V impact test at 20 deg.C as per ASTM A 370 for,
  Acceptance : Avg : 40joules, Min. single value: 27 joules.

6.0 NON DESTRUCTIVE TEST:

- Extent of test: for each product. Stage of test : After heat treatment.
- UT: As per SA 388 Bars of dia. = / > 50mm, Body & yoke of special class valves, all forgings & bars of SA 182 F91, F92, F23. Acceptance: ASME Sec.VIII Div. 2. Cl:3.3.4
- MPI : CS, AS: 100%, As per ASTM E 709, Linear indications like cracks, folds & other injurious defects are unacceptable.
- LPI: for SS: 100%: ASTM E165, No linear indications acceptable.

7.0 WORKMANSHIP AND FINISH:

Items to be proof machined as per drawing or shot blasted for CS/AS, Pickled & passivated as per ASTM A 380 for SS, & be free from scales & defects like laps, seams, folds, cracks, etc. Machined items (except SS) to be coated with a layer of transparent rust preventive before despatch.

8.0 REPAIR:

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9.0 MARKING AND PACKING:

Details of stamping on each item with low stress stamps: Heat number, Specification & grade, Maker's emblem/code & Inspection Authority's seal.Forgings to be properly packed and despatched to avoid damage during transit.

10.0 INSPECTION AND CERTIFICATION:

(A) The inspection and tests to be witnessed by an IBR approved inspecting agency, in case the Forge shop is not recognised as a "Well known Forger" under IBR. Test certificate countersigned by applicable inspection agency for each product with following details shall accompany the product (in format approved by Boiler inspectorate for IBR items).

1. Purchase Order No.(BHEL),TDC No. & Test certificate number
2. Specification, Grade with applicable year of code, Heat Number, Drawing No.,Quantity & Size
3. Melting & forging process, Chemistry including incidental elements - Heat wise.
4. Heat treatment details of the material and test bars.
5. Mechanical test results, NDE test results with reference & acceptance standard.
6. Repair details if any, Certified copy of TC for starting material.

(B) For CE-marking items the TCs with details specified above shall be submitted as per EN-10204 (latest)

1.For pressure parts test certificates of type 3.1 or 3.2 is acceptable.
Type 3.1:Suppliers shall have ISO 9001 certification certified by Notified Body recognized by European community and test certificate certified by suppliers authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by Notified Body recognized by European community.

2.For non pressure parts test certificates of type 2.2 is acceptable.
Type 2.2 – suppliers test certificates signed by suppliers authorized inspection representative with test results as required by TDC.

11.0 AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Supplies found defective during check or subsequent processing at BHEL are liable for rejection.

12.0 END USE

Valve bodies, bonnets, discs, socket ends, body guides etc., Pressure part fittings in boilers & low temperature service like discs, socket weld tees, ells, weld neck flanges & stubs (except drum nozzles) meeting IBR, ASME Section I, ASME B16.34 and API.
Non pressure part items in boilers: For these, requirements on starting material, bend test, and inspection by IBR are not required.

Prepared	Reviewed			Approved
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Revision Record: Rev:00:15.05.94: Fresh
Rev:01:Text re-written, Specifications altered to suit ASTM.,UT reqmt. altered.
Rev:02:Dt 07.07.03:Details of material AISI 410 added in CL 1.0, 2.0, 4.0, 5.0. Stamping requirements added in CL.9.0.
Rev 03: Double tempering for AISI 410 removed.For sizes > or =140 is coverage shifted to TDC 0: 404 as it is procured as forged components..

1.0 MATERIAL

Specification:ASME{Latest on date of Purchase Order (PO)}:
ASTM A182 F6a Cl. 3, A276 Type 410 & 420, A565 Grade 616 - condition HT
ASTM A582 Type 416, ASTM A 479 Type 410 - condition 2
AISI 410 for TOA Gland and bushings.
Additional Requirement: As listed below (supplementary to Specification)
Size and Qty.: As per Purchase order & Drawing.

2.0 CHEMICAL COMPOSITION & PROCESS

Process: Steel shall be of fully killed quality & Bars shall be hot finished.
Chemistry: Product analysis per heat.

A276 Type 420: C = 0.3 to 0.4%
AISI-410: C = 0.15% max, Mn = 1.00% max, Si = 1.0% max, P = 0.040 max, S = 0.030 max, Cr - 11.5 to 13.5.

3.0 DIMENSIONS AND TOLERANCES

Tolerances as per ASTM A484.

4.0 HEAT TREATMENT (HT)

A182 F6a Cl.3: supply: Normalised(N) & tempered(T) to produce hardness as per specification.

A276 Type 410: supply: Hardened(H) and tempered condition to produce a hardness of 24 - 30 HRC (247 - 286 BHN). Minimum tempering temperature: 565 deg.C.
1 test bar per size/melt/HT batch to be oil quenched(Q) at 980-1010 deg.C & tempered at 400-510 deg.C to produce a hardness of 37 HRC (344 BHN) minimum.
A second test bar per size/melt to be annealed(A) and used for mechanical testing.

A276 Type 420: supply: Annealed condition to produce a hardness as per specification.
1 test bar per size/melt/HT batch to be oil quenched at 1010 deg.C and tempered at 455 deg.C to produce a hardness of 50 - 53 HRC (482 - 525 BHN).

A565 Grade 616 condition HT: supply: Annealed condition to produce hardness as per specification.
1 test bar per size/melt/HT batch to be oil quenched and tempered as per specification. to produce hardness as per specification.

A582 Type 416: supply: Annealed condition to produce a hardness as per specification.
1 test bar per size/melt/HT batch to be oil quenched at 980-1010 deg.C and tempered to produce hardness as per specification (Condition T).

A479 Type 410 Condition 2: supply: Normalised & tempered or quenched & tempered as per specification to produce hardness as per specification. Tempering temperature: 600-760 deg.C.

AISI 410 - Supply in Quenched & Tempered condition as below to produce a hardness of 197 - 235 BHN.
Quenching at 955-1010 degC in air or water or oil or polymer/ soaking 30 mts/inch max thick

Tempering at 663 degC. min/ soak 60 mts/inch max. thick/ Air cool

5.0 MECHANICAL TESTS in HT conditions as above.
Extent of test: for each size/heat/HT batch from sample product or identical test coupon.
Mechanical test as per Specification in HT condition as above wherever indicated in specification.
Hardness test as per cl. 4.0.
Impact test : SA 370: for SA 182 F6a Cl.3 (N&T condtion): 2mm. Charpy U-notch, at Room temperature:
Acceptance: Average: 4 Kg.M / sq.cm.
for A565 Gr. 616 condition HT(Q&T): Charpy V-notch, at Room temperature: Acceptance: Min: 11J
Mechanical properties for AISI 410 :
Y.S = 75 ksi min. T.S = 95 ksi min, % E (on 2" G.L) = 18 min, % R.A = 35 min

6.0 NON DESTRUCTIVE TEST
Extent of test: for each product. Stage of test: After heat treatment.
UT: Diameter =/> 50mm: 100% : SA 388. Acceptance: AM 203.2, ASME Sec.VIII Div. 2.

7.0 WORKMANSHIP AND FINISH
As per ASTM A 484. Items to be free of scales & defects like laps, seams, folds, cracks etc.

8.0 REPAIR
Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9.0 MARKING AND PACKING
Details of stamping on each item with low stress stamps and border by paint: Heat number, Specification & grade, Maker's emblem/code & Inspection Authority's seal. Items to be Paint stenciled with above details and UT number where applicable.

The material specification and grade may be stamped/punched with the following abbreviated specification on bars/rounds.

A182 F6a CL3	-	F6aCL3
A276 Type 410	-	A410
A276 Type 420	-	A420
A565 Grade 616	-	A616
A582 Type 416	-	A416
A479 Type 410 condition 2	-	A410 CN2
AISI 410	-	410

Items to be bundled for safe transit using metal strap in weigths < 2 tonnes. Metal / Plastic tag with above detail to be fixed to each bundle.

10.0 INSPECTION AND CERTIFICATION
For IBR items: inspection & tests to be witnessed by an IBR approved inspecting agency, in case the mill is not recognised as a "Well known Steel maker" under IBR.
Test certificate countersigned by applicable inspection agency for each product with following details shall accompany the product (in format approved by Boiler inspectorate for IBR items).
1. Purchase Order No.(BHEL),TDC No. & Test certificate number
2. Specification, Grade with applicable year of code, Heat Number, Drawing No.,Quantity & Size
3. Steel making & finishing process,Chemistry including incidental elements - Heat wise.
4. Heat treatment details of the material and test bars.

5. Mechanical test results, NDE test results with reference & acceptance standard.

11.0 END USE

High pressure Valves and Pressure parts in boilers working at high temperature & pressure meeting IBR, ASME Section I, ANSI B16.34 requirements.

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Prepared	Reveiwed (QA)	eveiwed (Engg)	Approved