



भारत हेवी इलेक्ट्रिकल्स लिमिटेड

( भारत सरकार का उपक्रम )




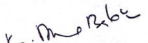
**BHARAT HEAVY ELECTRICALS LIMITED**

(A Govt. of India Undertaking)

Bidder shall comply the following points.

1.0	<b>Technical Pre-qualification Criteria</b>
a	The bidder should have Engineered, Tested, Supplied Hook up material package(Package consists of Pipe fittings, tube & tube fittings,as minimum items, of size below 1”) as a single point responsibility within the period not exceeding Seven (7) years reckoned from bid submission date in any of the captive power plant applications / hydrocarbon industries like Refinery, Petrochemical and gas processing plants .
b	The bidder should have executed at least two (2) jobs in last 7 years for establishment of business continuity.

2.0	<b>Following Documents / Information to be submitted in support of Technical Pre-Qualification Criteria above</b>
a	Bidder shall provide the following documents in support of s.no. 1.0 (a) above (1) Purchase Order details (2) End user Approved drawings /documents/BOM (OR) any other document which provides the above item details
b	Bidder shall provide the following documents in support of s.no. 1.0 (b) above (1) Purchase Order details (2) LR copies / invoices

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<p style="text-align: center;"><b><u>Specification for Hookup material Package</u></b></p> <p><b>1. SCOPE</b> This technical specification covers the Design, Engineering, Manufacturing, testing at vendor works, inspection by purchaser, packing and transportation to site of instrument Hookup materials like Seamless pipes/Tubes, compression fittings, erection materials, etc.</p> <p><b>2. SCOPE of SUPPLY</b> – As per Bill of Material [BOM] mentioned in this specification.</p> <p><b>3. INSTRUCTIONS TO BIDDERS</b></p> <p>3.1 Bidders <b>are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry.</b> In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications before bid submission <b>and the decision of Purchaser shall be final &amp; binding on Bidder, without any cost &amp; delivery implications. In the event of conflict, most stringent requirements shall be followed in general.</b></p> <p>3.2 Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder.</p> <p>3.3 Any technical features [over &amp; above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.</p> <p>3.4 Bidder shall submit the “Duly filled &amp; Signed copy of Check list” compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder</p> <p><b>4. ORDER EXECUTION PHILOSOPHY</b></p> <p>4.1 BOM listed in this specification along with their technical description, MOC, size, quantity and IBR requirement etc.</p> <p>4.2 Vendor to consider all the material in their scope of supply. No deviation is acceptable.</p> <p>4.3 Vendor shall supply all the material listed in BOM table in LOOSE in fully packed condition (As per packing specifications). Assembling/welding of BOM items is not in vendor scope.</p> <p>4.4 However, vendor to ensure that end connection &amp; thickness of each item matching to the item connected to it.</p> <p>4.5 Vendor shall follow the latest version of referred standards</p> <p><b>5. SUB VENDOR LIST :</b> Bidder shall supply the BOM as per enclosed vendor list(Annexure-1) only. No deviation is acceptable</p>				
<p><b>Revisions:</b> Refer to record of revisions</p>				
Prepared By:		Checked By :	Approved :	Date :
 Nahid		 T Kamal Kumar	 K. Anand Babu	02.11.2022

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**6. CHECK LIST** (To be filled by BIDDER and submitted along with Technical offer is compulsorily)

Vendor shall submit the following documents mandatorily as part of COMPLTE technical offer.

Enquiry No. / Date :

Name of the Bidder :

Project Name :

Item Description :

S. No	Document	Bidder confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications and its associated annexures, pre-bid clarifications in Toto and there are no technical deviations. Signed and stamped copy of this specification along with annexures enclosed along with technical offer.		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in <b>BHEL format</b> .  In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>		
3	All items are manufactured conforming to latest version of material grade standard and manufacturing standard mentioned in this specifications		
4	<b>Bidder to quote as per BHEL price format only. No other format is acceptable.</b> Bidder to attach un-priced price bid format by indicating "QUOTED" against each item and submit with technical offer duly signed & stamped.		
5	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of + 10% and -30% of order Value.		
6	Bidder to agree that Bill of materials / list of equipment furnished in the offer is only for information; Vendor shall supply all the material to meet the performance, sizing & technical requirement as per specification & its Annexures, scope matrix etc.		

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\_\_\_\_\_  
 (Bidder's Signature and stamp with date)



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**DEVIATION FORMAT**

Enquiry No.:Item:Name of Bidder:Offer Ref. No.:

Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks

**NOTES:**

1. Technical offer of the bidder will be evaluated only on the basis of Deviation Schedule. Deviation Schedule constitutes this sheet (with these Notes) duly signed and stamped.
2. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
3. Additional sheets in the same format can be attached by the vendor, if necessary.
4. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
5. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny, then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
6. Reasons for the deviations shall be specified in the Remarks column.
7. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format.
8. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder

SIGNATURE OF THE BIDDER\_\_\_\_\_

NAME\_\_\_\_\_

DESIGNATION\_\_\_\_\_

DATE\_\_\_\_\_

COMPANY SEAL



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**7. TECHNICAL SPECIFICATIONS of HOOKUP Materials****7.1 SEAMLESS PIPEs / PIPE NIPPLEs**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	ASME B 36.10 - for CS & AS pipes ASME B 36.19 - for SS pipes
2.	Material Grade standard	:	ASTM A 106 – For CS pipes ASTM A 335 – For AS pipes ASTM A 312 – For SS pipes
3.	Shipping length without joints for pipes	:	6 meters
4.	Dimensions	:	As per ENQUIRY & FABRICATION Drawings

**7.2 Concentric SWAGE NIPPLE**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	MSS SP-95
2.	Material Grade standard	:	ASTM A 105 – For CS fittings ASTM A 182 – For AS & SS fittings
3.	End connections	:	Threading : ANSI B 2.1; Beveled ends: ASME B 16.25
4.	Dimensions	:	As per ENQUIRY & FABRICATION Drawings

**7.3 PIPE FITTINGS [CONCENTRIC REDUCERS / TEE / FULL COUPLING / ELBOW / CAP]**

S.No.	Description	:	Requirement
5.	Manufacturing standard	:	ANSI B 16.11 - for pr. class 3000lbs ANSI B 16.9 - for pr. class 6000lbs & 9000lbs
6.	Material Grade standard	:	ASTM A 105 – For CS fittings ASTM A 182 – For AS & SS fittings
7.	Threading	:	As per ANSI B 2.1
8.	Dimensions	:	As per ENQUIRY & FABRICATION Drawings

**7.4 SYPHON:**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	DIN 162825
2.	Material Grade standard	:	ASTM A 106 – For CS pipes ASTM A 335 – For AS pipes ASTM A 312 – For SS pipes
3.	Dimensions	:	As per ENQUIRY & FABRICATION Drawings

**7.5 CONDENSATE POT with drain / vent valves & nipples:**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	ASME B 36.10 – for CS & AS pipes ANSI B 16.5 – For Caps
2.	Material Grade standard	:	ASTM A 106 – For CS pipes ASTM A 335 – For AS pipes ASTM A 312 – For SS pipes
3.	End connections	:	SW ends : ANSI B 16.11; Condensate Pot shall be made from seamless pipe, ellipsoidal pipe caps and couplings
4.	Dimensions	:	As per ENQUIRY & FABRICATION Drawings

**7.6 ANCHOR BOLT** shall be made from Mild Steel material with Total Length =160mm; threaded length = 25mm; thread size = M10; Supply quantity: As per various schemes & enquiry.

**7.7 U-BOLT**

S.No.	Description	:	Requirement
1.	Material	:	IS 226 supply shall be in galvanized condition along with 4 nuts;
2.	Nuts	:	As per IS 1364 Pt. 6 & IS 4218 – 6H; Thread tolerances applicable after galvanization
3.	U-Bolt Size	:	As per BOM mentioned in various schemes
4.	Dimensions	:	As per FABRICATION Drawings

**7.8 VERTICAL INSERT**

S.No.	Description	:	Requirement
1.	Application	:	Suitable for pressure class 3000
2.	Size, Body material & End connections	:	As per BOM mentioned in various schemes



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**7.9 SEAMLESS TUBES**

S.No.	Description	:	Requirement
1.	Application	:	Seamless, hot finished or cold drawn tube of SS 316L material as per ASTM A 269 & ASTM A 213 (IBR service)
2.	Tube Hardness	:	Up to 200HV & 90 HRB ( As per ASTM A269)
3.	Size	:	As per BOM mentioned in various schemes
4.	Shipping Length	:	6 meters

**7.10 TUBE FITTINGS [Female Connector / Male connector / Tube union / Tube cap /Union TEE/ Manifolds]**

S.No.	Description	:	Requirement
1.	Application	:	Shall be designed suitable for pressure class 6000PSig
2.	End connections	:	As per FABRICATION Drawings
3.	Material	:	SS 316
4.	Dimensions	:	As per FABRICATION Drawings
5.	Others	:	1) Back ferrule hardness shall be 90 (+5/-2) HR-B scale 2) Front ferrule hardness shall be 95 (+/-5) HR-B scale 3) Proof pressure test shall be carried out for 375 Kg/cm2 for at least one hour without any visible leakage. 4) Minimum Hydraulic burst pressure of 600 kg/cm2 for a period of 5 minutes.

**7.11 NEEDLE VALVE**

S.No.	Description	:	Requirement
1.	Application	:	NEEDLE VALVE suitable for pressure class 6000lbs
2.	Max. working pressure & temp	:	40Kg/cm2(g) & 300 Deg C
3.	Type	:	Integral Bonnet Bar stock valve
4.	Orifice Size	:	3.2 mm for ¼" valve ; 6.4 mm for ½" valve
5.	Material	:	SS 316

**7.12 GLOBE VALVE**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	BS 5352 – for pr. class 800, 1500 & 2500
2.	Material Grade standard	:	ASME: SA105 – For CS ASME: SA182 – For AS & SS
3.	End Connections	:	SW ends : ANSI B 16.11 BW ends : ANSI B 16.25
4.	Body	:	Forged, Leakage class-IV
5.	Dimensions	:	As per applicable Standard

**7.13 FLANGE**

S.No.	Description	:	Requirement
1.	Manufacturing standard	:	ANSI B16.5 – for pr. class 800, 1500 & 2500
2.	Material Grade standard	:	ASME: SA105 – For CS ASME: SA182 – For AS & SS
3.	Edge Preparation	:	As per ANSI B16.5
4.	Body	:	Forged
5.	Dimensions	:	As per applicable Standard

**7.14 GASKET, STUD, BOLTS & NUTS**

S.No.	Description	:	Requirement
1.	Gasket Body	:	Non-Asbestos MSW (SS304) + Graphite
2.	Stud & Material	:	A193 Gr. B7
3.	Nuts Material	:	A194 Gr. 2H
4.	Dimensions	:	Suitable to applicable Flange Sizes



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**8. INSPECTION & TESTING**

HOOKUP materials shall be subjected to inspection and testing at vendor works by BHEL/Third party Inspector (TPI). Test procedure shall include but not be limited to the following. All the tests being conducted shall be clearly brought out in the Quality Assurance Plan (QAP) by Vendor.

S. No	Test	For	Reference	Scope of inspection
1.	BOM Check	All items	As per P.O. quantity	100% Witness
2.	Visual check	All items	As per P.O. quantity	Witness for 5% qty of each size & type
3.	Dimensional checks	All items	As per fabrication drawings given in this specification	Witness for 5% qty of each size & type
4.	IBR test form IIIC	As per various schemes		100% Certificate review
5.	Thickness test	All items	As per applicable standard	5% Witness for each size & type
6.	PMI Test	SS & AS materials	As per applicable standard	100% certificate review & 5% random witness
7.	Hydraulic test	Manifolds, Condensate Chamber and Valve's body & seat	As per applicable standard	100% certificate review & 5% random witness
8.	Leakage test for seat	All Valves	As per applicable standard	100% certificate review
9.	Bend test	Tubes	As per IS-2329	100% certificate review
10.	Material test	All items (Chemical & Mechanical properties)	As per applicable standard	100% certificate review
11.	Radiography test	Weld joints of Condensate chamber	As per applicable standard	100% certificate review
12.	Liquid penetration test	At knuckle of Elbows, Reducers & neck portions of Tee	As per applicable standard	100% certificate review
13.	Magnetic Particle Test	All Fillet joints	As per applicable standard	100% certificate review
14.	Heat treatment	Forged items	As per applicable standard	100% certificate review
15.	Workmanship, finish, markings	All items	-	100%, witness
16.	Preservation & packing	All items	-	100% review
17.	Hardness	All Tube & Tube Fitting	As per applicable standard	100% review
18.	Proof pressure test	All Tube & Tube Fitting	As per applicable standard	Type test certificate review
19.	Minimum Hydraulic burst pressure	All Tube & Tube Fitting	As per applicable standard	Type test certificate review

**9. DOCUMENTATION****9.1 Information** to be included with offer

Vendor shall make the offer in detail, with respect to every item of the Purchaser's specifications. Any offer not conforming to this shall be summarily rejected.


- Duly filled & Signed copy of Check list (To be submitted compulsorily without fail)
- Deviation list, if any (as per "No deviation format" given in this specification). If there are no deviations, bidders shall submit "Deviation format" by mentioning deviations "Nil". (To be submitted compulsorily without fail)
- Unpriced price schedule (To be submitted compulsorily without fail)
- Copy of BHEL specification duly stamped & signed by vendor as a total compliance
- Bill of materials (only for information)

**9.2 Documentation submission** within 2 weeks of placement of LOI (for approval by BHEL and / or BHEL's customer in 4 sets)

- Bill of material
- Comprehensive Bill of material along with heat code/numbers**
- Comprehensive Quality Assurance plan.
- Packing List (To be submitted compulsorily without fail)

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<div>CONFIDENTIAL AND CONFIDENTIAL</div> <div>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.</div>		<div>Notes::</div> <div><div>a) All vendor documents of Hookup package and its sub-items shall be submitted to Customer / Consultant for approval during order execution (if applicable). Any comment furnished by Customer / Consultant / BHEL shall be taken care by vendor during ordering execution.</div><div>b) Further BHEL will provide comments on vendor submitted document within 07 working days for revision &amp; resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.</div><div>c) Revised drawings / Documents shall be submitted by Bidder in 07 days of receipt of comments / observations from BHEL. BHEL shall revert within 7 days on receipt of these revised documents / drawings from vendor for approvals.</div><div>d) All the approvals required for manufacturing shall be completed within 2 months from P.O to meet the P.O delivery schedule. Accordingly vendor shall ensure the submission of approval category documents (which are required for manufacturing) and obtain their approvals.</div><div>e) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.</div><div>f) It is vendor’s responsibility to obtain approvals from BHEL as earliest as possible to meet PO delivery schedules. Accordingly vendor to plan and execute the supplies in time.</div></div>					
		<div>9.3 Documents to be submitted during final shop testing &amp; before equipment dispatch. (10 sets + 2 CD ROM)</div> <div>(Note: 2 sets to be included with item dispatch and balance to BHEL purchase department and submission of these documents is commercially linked)</div> <div><div>a) All documents approved by BHEL.</div><div>b) Material test certificates. In case of pipes made from plates, Test certificates as per pipe standard ANSI B36.10 shall be submitted with plate material</div><div>c) Inspection report</div><div>d) Guarantee and all test certificates</div></div>					
		<div>10. MARKING</div> <div>10.1 Each packing shall be marked as (Font Size: as visible with naked eye)</div> <div><div><div>a) Size,</div><div>c) Material of Construction,</div><div>e) Heat number/code,</div></div><div><div>b) Pressure class,</div><div>d) End Connections,</div><div>f) Material code.</div></div></div> <div>10.2 Each Item shall be marked with following details (Font size:8MM)</div> <div><div>1) Position No (as per various schemes)</div><div>2) Item Name, Material of construction, Size, End connection, pressure class</div><div>3) BHEL PO Number,</div></div> <div>If space is constraint on the item to be marked, vendor shall provide additional tag plate wired to each item.</div>					
		<div>11. PACKING</div> <div>11.1 Before packing of the material all the tube, tube fittings, Pipe and pipe fitting material shall be dried, cleaned, and entire surface shall be well covered with good quality rust preventive material that will become fluid and run off at 65 Deg C. Pipe threads shall be protected with suitable grease. Openings of the supplied material shall be covered with plastic make dummy plugs to avoid any entry of foreign material.</div> <div>11.2 BOM listed in each scheme shall be packed material code wise on ONE packing wooden box except pipes/tubes.</div> <div>11.3 Packing of pipes / tubes shall be as per vendor practice and shall be provided with end caps to avoid any entry of foreign material.</div> <div>11.4 Material shall be packed properly to protect from mechanical damage during transportation and storage for long time. The packing shall be in accomplished with acceptable commercial practices for domestic applications.</div> <div>11.5 However, for foreign shipments packing shall be Sea-worthy or Air-Transportation packing shall be done as per latest revision of AA0490004 and type of packing applicable for Hookup materials is “CQ”. This specification shall be obtained by vendor on request.</div>					



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<div>CONFIDENTIAL AND CONFIDENTIAL</div> <div>The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.</div>	<div>11.6 All items shall be marked (stamped/etched) in accordance with the applicable code/standard/specification. In addition, the item code, if available, shall also be marked.</div> <div>11.7 For ease of identification, the color of painted strip shall be as per enclosed STANDARD SPECIFICATION No. 6-82-0003 Rev.2(Annexure-2).</div> <div>11.8 Part number/Dispatch link-up of all the equipment’s/items supplied and also their co-relation with system/drawing/approved BOQ.</div> <div>11.9 Paint or ink for marking shall not contain any harmful metal or metal salts which can cause corrosive attack either ordinarily or in service. Special items/smaller items shall have attached corrosion resistant tag providing salient features.</div> <div>11.10 The equipment shall be transported to site by the vendor in fully assembled condition. However, in case some components are liable to be damaged during transit, the same shall be dismantled and supplied separately, to be reassembled at site the vendor. Assembly of the item supplied loose at site and repairing of any item damaged during transport shall be in the vendor’s scope. The vendor shall send each consignment to site with a detailed packing list.</div> <div>11.11 All the equipment shall be divided into several sections for protection and ease of handling during transportation. The equipment shall be properly packed for transportation by ship/rail or trailer. The equipment shall be wrapped in polythene sheets before being placed in crates/cases to prevent damage to the finish. Crates/cases shall have skid bottom for handling.</div> <div>11.12 Special notations such as 'Fragile', 'This side up', 'Center of gravity', 'Weight', 'Owner's particulars', 'PO Nos.' etc. shall be clearly marked on the package together with other details as per purchaser order.</div> <div>11.13 The equipment/items may be stored outdoors for long periods before installation. The packing shall be completely suitable for outdoor storage in areas with heavy rains/high ambient temperature, unless otherwise agreed.</div> <div>11.14 The following minimum packing procedures shall be followed:-<div><div>a) All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.</div><div>b) All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.</div><div>c) Each variety and size of item shall be supplied in separate packaging marked with the purchase order no., item code (if available), and the salient specifications.</div><div>d) All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.</div><div>e) All the items which the Bidders considered liable to be damaged during shipment or storage, shall be packaged for separate shipment. If instruments are removed from the panel, they and their connection shall be suitably tagged to ensure simple re installation at the job site. Each instrument shall be sealed in plastic bags containing moisture absorbing dessicants.</div><div>f) It shall be bidder’s sole responsibility to protect all the material during period of dispatch, storage and erection against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid atmosphere, rough handling in transit and including delays in transit.</div><div>g) Mandatory Spare parts shall be packaged separately and clearly marked as ‘Mandatory Spares’.</div><div>h) Commissioning spares, Tools &amp; tackles to be packed separately &amp; suitably tagged.</div></div></div> <div>11.15 If mandatory spare items are ordered, same shall be sent in pre-decided lots in containers /secure wooden boxes distinctly marked in GREEN color with boldly written "S "mark on each face of the containers /secure wooden boxes</div> <div>11.16 Loose vendor items sent by vendor to sites shall be quantified/numbered/tagged and not merely mentioned as ONE lot of loose items.</div>				
	<div>12. GUARANTEE</div> <div>12.1 Guarantee certificate shall furnish a guarantee certificate stating that the fittings supplied shall be suitable for use at the relevant pressure temperature ratings. The guarantee shall be valid for a minimum period of 24 months from the date of supply or 18 months from the date of commissioning whichever is earlier.</div> <div>12.2 In case of any defect in the material during manufacturing process, transportation activities, vendor is sole responsible for the replacement with in a period of 3 weeks from the supply/identified as defective.</div>				

**TABLE - 1 : BOM & Price format**

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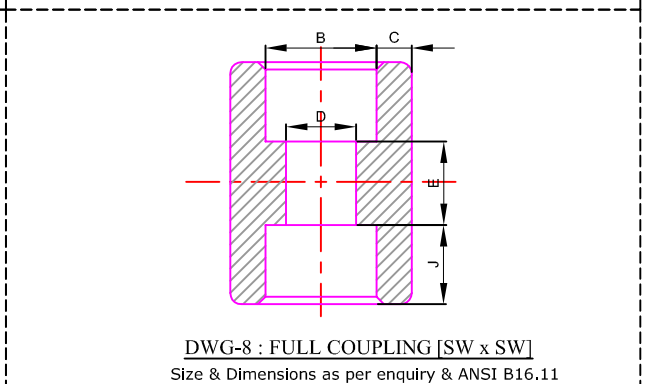
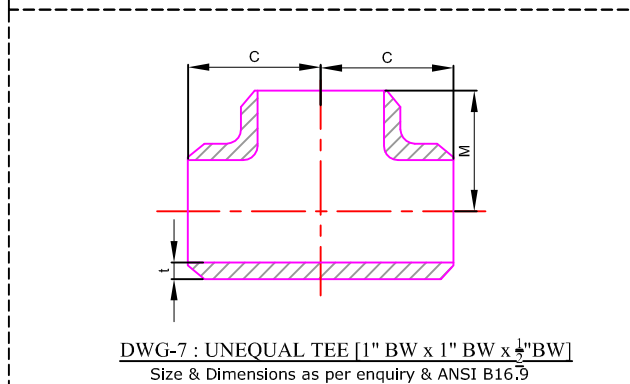
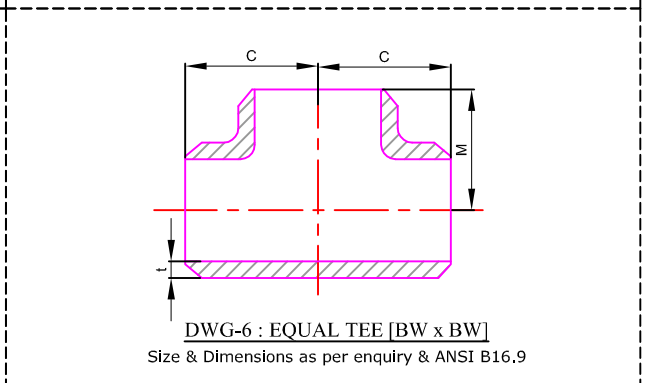
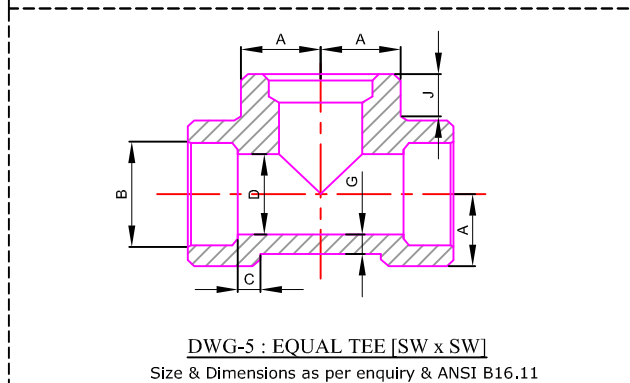
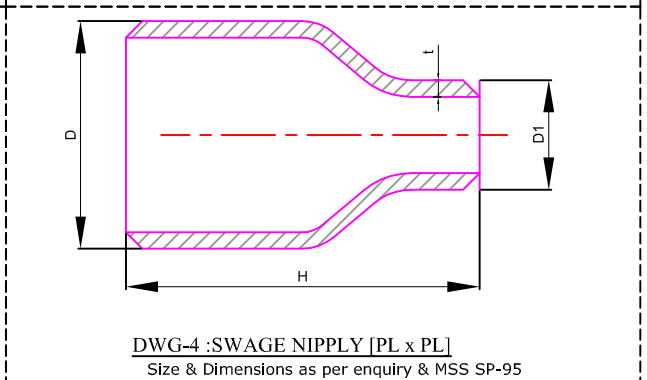
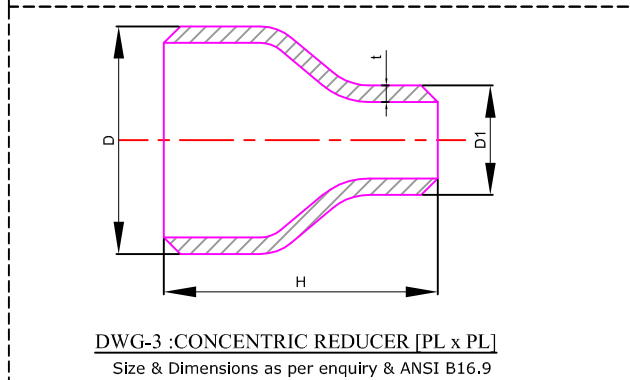
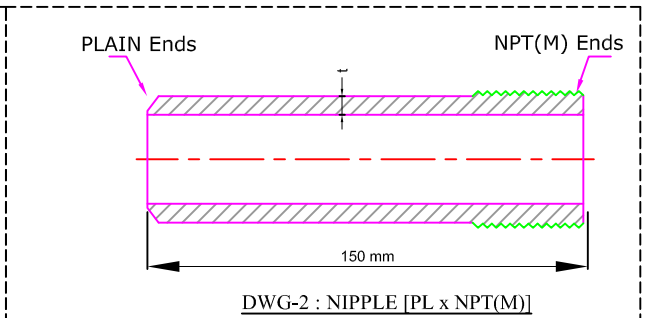
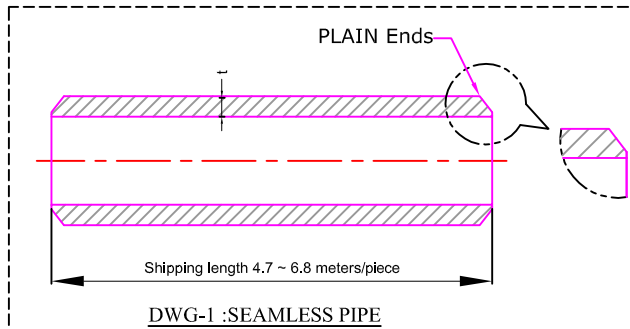
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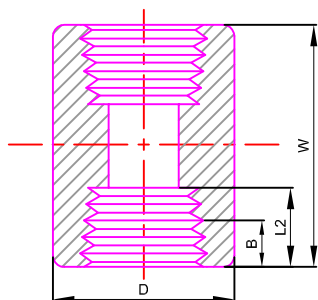
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### FABRICATION DRAWINGS

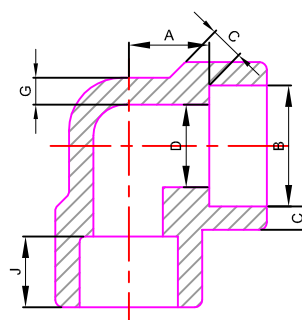


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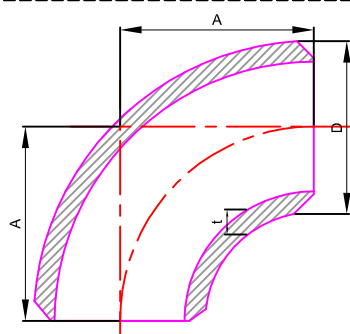
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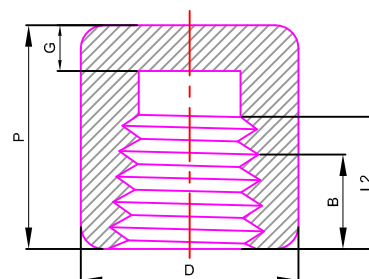
**DWG-10 : FULL COUPLING [NPT(F) x NPT(F)]**  
Size & Dimensions as per enquiry & ANSI B16.11



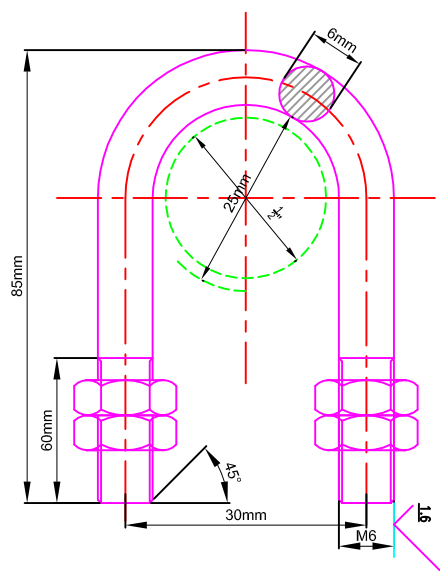
DWG-11 : 90° ELBOW [SW x SW]  
Size & Dimensions as per enquiry & ANSI B16.11



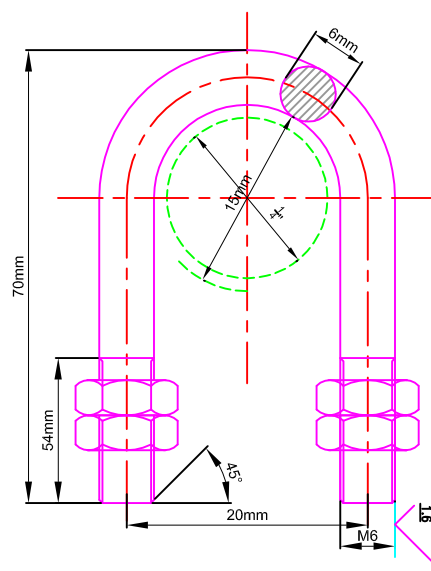
DWG-12 : 90° ELBOW [BW x BW]  
Size & Dimensions as per enquiry & ANSI B16.9



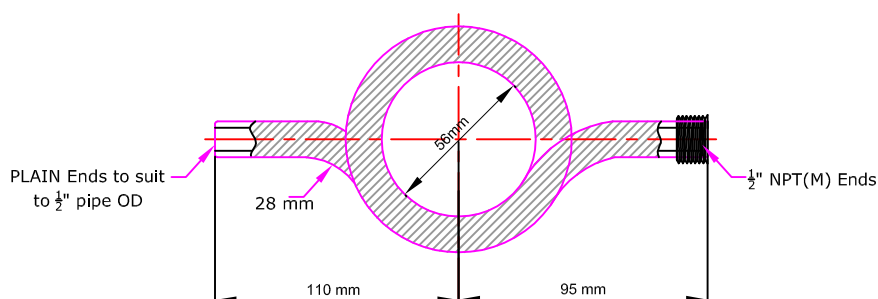
DWG-13 : CAP [NPT(F)]  
Size & Dimensions as per enquiry & ANSI B16.11



DWG-14 :  $\frac{1}{2}$ " U-BOLT



DWG-15 :  $\frac{1}{4}$ " U-BOLT



DWG-16 : SCROLL SYPHON

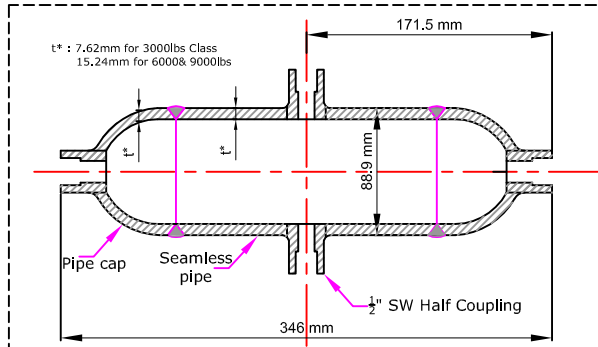


# PRODUCT STANDARD

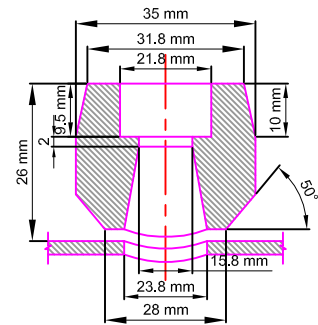
## PROJECT ENGINEERING & SYSTEMS DIVISION

### HYDERABAD

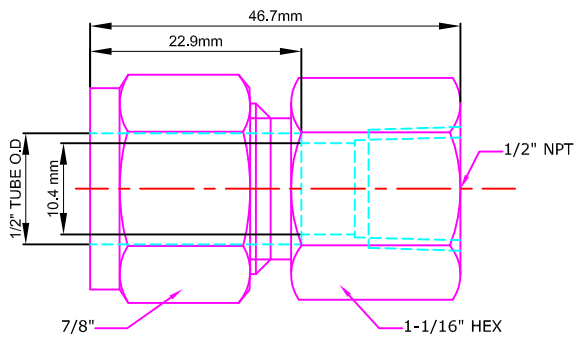
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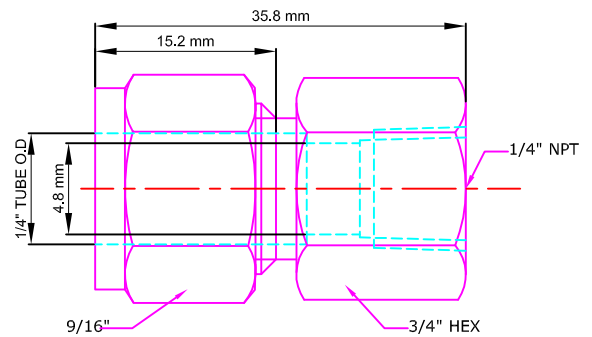
DWG-17: CONDENSATE POT



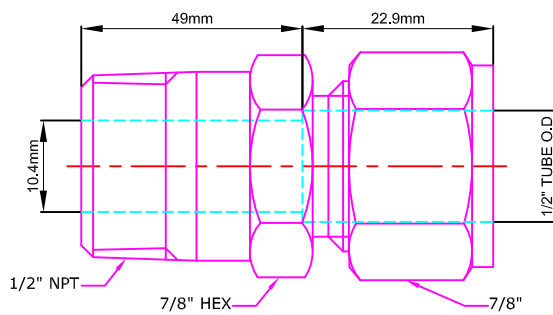
DWG-18: VERTICAL INSERT



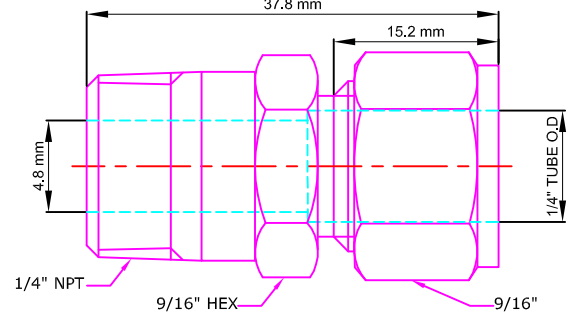
DWG-19: FEMALE CONNECTOR [1/4" OD x 1/2" NPT(F)]



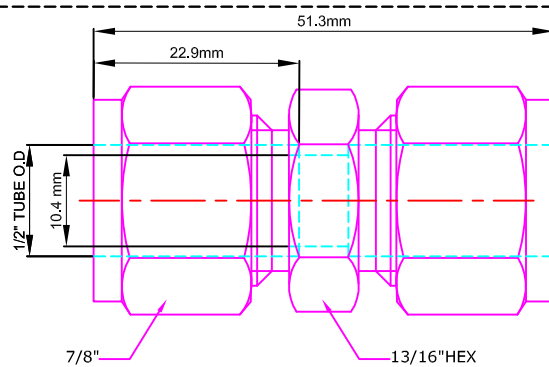
DWG-20: FEMALE CONNECTOR [1/4" OD x 1/2" NPT(F)]



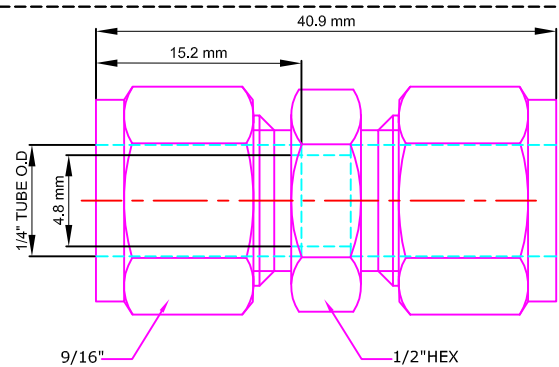
DWG-21: MALE CONNECTOR [1/2" NPT(M) x 1/2" OD]



DWG-22: MALE CONNECTOR [1/4" NPT(M) x 1/4" OD]



DWG-23: TUBE UNION [1/2" OD x 1/2" OD]



DWG-24: TUBE UNION [1/4" OD x 1/4" OD]



# PRODUCT STANDARD

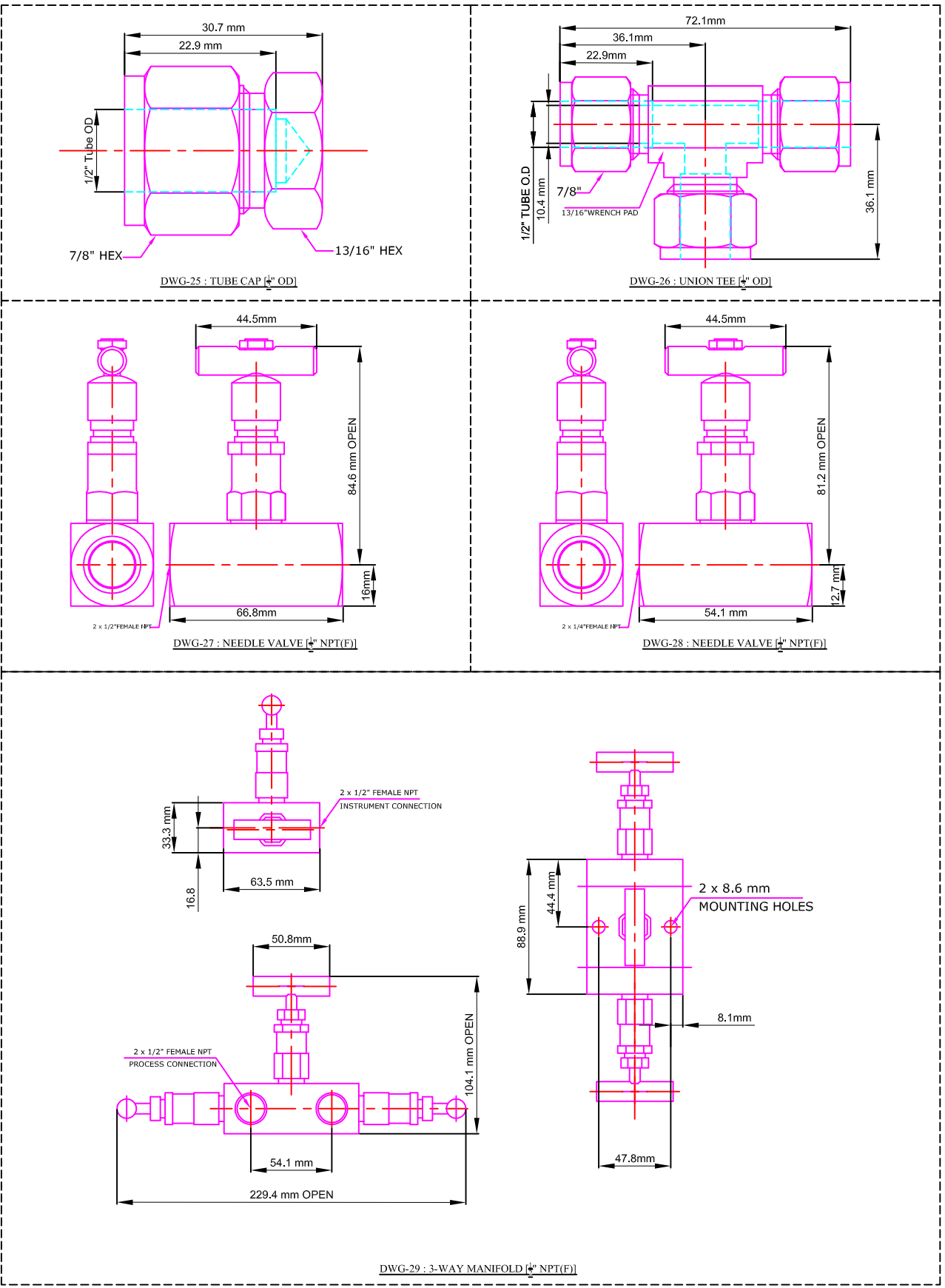
## PROJECT ENGINEERING & SYSTEMS DIVISION

### HYDERABAD

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## PRODUCT STANDARD

PROJECT ENGINEERING & SYSTEMS DIVISION  
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Std. / Doc. Number

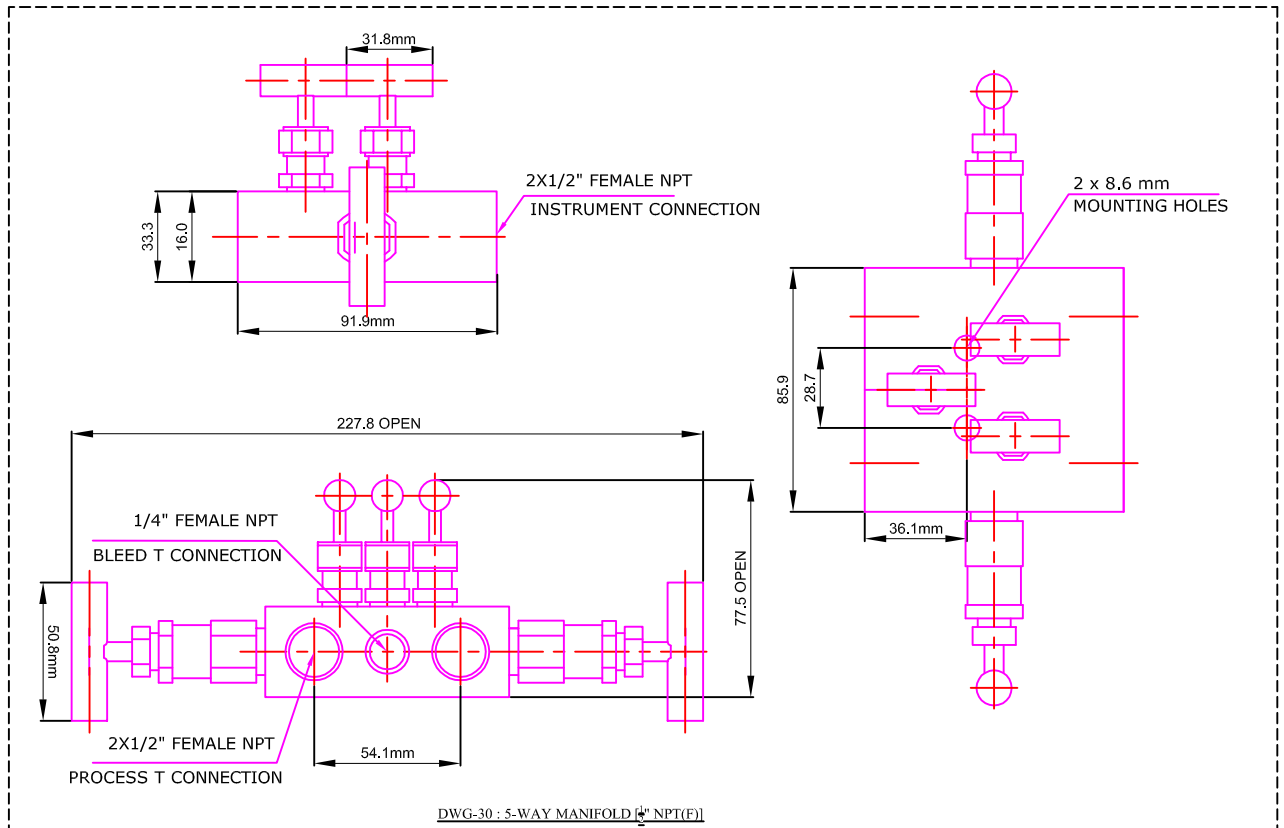
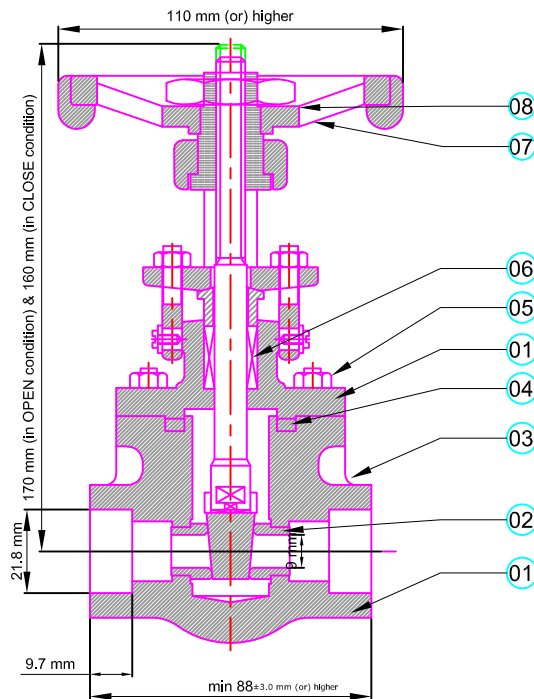
PY

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01

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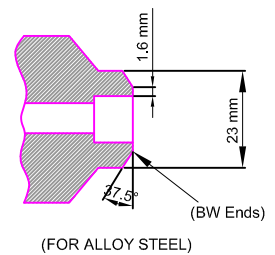
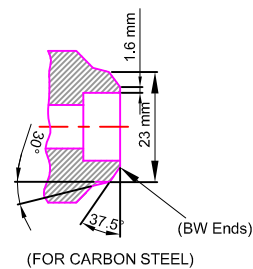
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Size &amp; Dimensions as per enquiry &amp; Applicable standards

## MATERIAL OF CONSTRUCTION

PART NO.	PART NAME	MATERIAL
01	VALVE BODY, BONNET & YOKE	As per various schemes
02	SEAT RING	STELLITE ON SS
03	SPNDLE	13% cr SS
04	GASKET	SPW SS + GRAPHITE
05	STUD/NUT	A 193 Gr.B7 / A 194 Gr.2H
06	GLAND PACKING	GRAPHITE
07	HAND WHEEL	SS IRON
08	NAME PLATE	STAINLESS STEEL



## APPLICABLE STANDARDS

DESIGN STD.	API 602 / BS 5352 / BS 5253
TESTING STD.	API 598
SOCKET WELD ENDS	ANSI B 16.11
BUTT WELD ENDS	ANSI B16.25



PRODUCT STANDARD  
PROJECT ENGINEERING & SYSTEMS DIVISION  
HYDERABAD

Std. / Doc. Number
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PY 56669

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## RECORD OF REVISIONS

Rev. No.

Date \_\_\_\_\_

## Revision Details

Revised By

Approved By

00

02.11.22

Original issue

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K. Anand Babu

K. M. Rabe

## CONSENT AND CONFIDENTIALITY

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Project Supplier List for HPCL VRMP Project

Item Code : 72AA		Description : FITTINGS FROM SEAMLESS PIPE-CARBON STEEL	
Supplier Code	Supplier Name		Holiday Desc
<b>Approved Suppliers</b>			
A732	ALLIED INTERNATIONAL S.R.L.		
A755	APCO PIPE FITTINGS CO LTD		
A687	AWAJI MATERIA (THAILAND) CO. LTD.		
C209	CSA FITTINGS		
D111	DEE DEVELOPMENT ENGINEERS LIMITED		
E588	ERNE FITTINGS GMBH		
E630	EZEFLOW INC.		
G125	GUJRAT INFRAPIPES PVT. LIMITED		
I597	IBF S P A		
I604	ITM S.R.L.		
J615	JIANGYIN LONGSHAN PIPE SOLUTIONS CO. LTD		
J614	JIANGYIN TIANNING METAL PIPE FITTING CO		
K218	K.S.PIPE FITTINGS (P) LTD		
M057	M.S. FITTINGS MFG. CO PVT LTD		
M507	MUNRO & MILLER FITTINGS LTD		
P315	P.K.TUBES & FITTINGS PVT.LTD.		
P340	PATTECH FITWELL TUBE COMPONENTS		
P325	PETRO CHEM INDUSTRIES		
P694	PIANA S.P.A		
R607	RACCORTUBI SPA		
S102	SAWAN ENGINEERS PVT LTD		
S265	SIDHARTH & GAUTAM ENGINEERS		
S810	SUNGKWANG BEND CO. LTD		
T019	TEEKAY TUBES PVT LTD		
T746	TK CORPORATION		
T221	TOPAZ PIPING INDUSTRIES		
T050	TUBE BEND (CALCUTTA) PVT LTD		
U144	U I PIPE FITTINGS PVT LTD		
V608A	VALVITALIA SPA-TECNOFORGE DIVISION		
V594	VIRGILIO CENA & FIGLI S.p.A.		
W615	WEIFANG HUODA PIPE FITTINGS MANUFACTURE		
W510	WILH SCHULZ GmbH		
Y634	YINGKOU LIAOHE PIPE FITTINGS CO. LTD		
3637	FITTECH INDUSTRIES PVT. LTD.	REV 4	

<b>Item Code : 72AB</b>		<b>Description : FITTINGS FROM SEAMLESS PIPE- ALLOY STEEL</b>	
Supplier Code	Supplier Name		Holiday Desc
<b>Approved Suppliers</b>			
A732	ALLIED INTERNATIONAL S.R.L.		
C209	CSA FITTINGS		
D111	DEE DEVELOPMENT ENGINEERS LIMITED		
E588	ERNE FITTINGS GMBH		
E630	EZEFLOW INC.		
G125	GUJRAT INFRAPIPES PVT. LIMITED		
I597	IBF S P A		
J614	JIANGYIN TIANNING METAL PIPE FITTING CO		
M507	MUNRO & MILLER FITTINGS LTD		
P315	P.K.TUBES & FITTINGS PVT.LTD.		
P694	PIANA S.P.A		
R607	RACCORTUBI SPA		
S102	SAWAN ENGINEERS PVT LTD		
S265	SIDHARTH & GAUTAM ENGINEERS		
S810	SUNGKWANG BEND CO. LTD		
T019	TEEKAY TUBES PVT LTD		
T746	TK CORPORATION		
T221	TOPAZ PIPING INDUSTRIES		
V608A	VALVITALIA SPA-TECNOFORGE DIVISION		
V594	VIRGILIO CENA & FIGLI S.p.A.		
W615	WEIFANG HUODA PIPE FITTINGS MANUFACTURE		
W510	WILH SCHULZ GmbH		
Y634	YINGKOU LIAOHE PIPE FITTINGS CO. LTD		
3637	FITTECH INDUSTRIES PVT. LTD.	REV 4	

# ANNEXURE-2 of PY56669


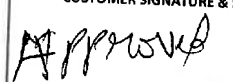
NOTE: Vendor to follow the quality requirement for fittings as per this document.

MANUFACTURING QUALITY PLAN												QAP NO : UEEPL/PED/QAP/359	
CUSTOMER : M/s BHEL - HYDERABAD				BHEL P.O NO :				REV : 00					
PROJECT : HPCL, Vizag				P.O DATE : 06.12.2018				DATE : 26.12.2018					
PRODUCT : HOOK UP PACKAGES				BHEL SPEC : PY56309 REV:00				Page 1 OF 3					
Sl. No	Components	Characteristics	Class	Types of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	* D	Agency	Remarks		
									P	W	V		
1.00	RAW MATERIAL INSPECTION												
1.10	Pipes & Pipe Fittings												
	a) Reducers b) Pipes c) Elbows d) Pipe Nipples e) Gasket f) Syphon g) Condensate Pot h) Coupling i) Equal Tee j) Cap k) U-Bolts l) Anchor bolts m) Un Equal Tee n) Pipe Clamp o) Fasteners p) Stud with 2 Nuts q) Flanges	a) Chemical Analysis b) Mechanical Properties c) IPR (WHERE EVER APPLICABLE)	Major	Chemical & Mechanical	One per lot/batch/Heat	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	Test Report/ Lab Report		✓	2	-	1	
1.20	Valves <i>As per spec PY 56309 R.O. c 1.7</i>												
	a) Gate Valves b) Globe Valves c) Ball Valves	a) Chemical Analysis b) Mechanical Properties c) IPR (Where ever applicable)	Major	Chemical. Mechanical	One per lot/batch/Heat	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	Test Report/ Lab Report		✓	2	-	1	
1.30	Tube and Swage Nipples												
		a) Chemical Analysis b) Mechanical Properties c) Bend Test	Major	Chemical & Mechanical	One per lot/batch/Heat	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	Test Report/ Lab Report		✓	2	-	1	
1.40	Tube Fittings												
1.41	a) Female Connector , Male Connector , Tube Union	a) Chemical Analysis b) Mechanical Properties c) Hardness Test	Major	Chemical. Mechanical & Hardness	One per lot/batch/Heat	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	COC / Test Report		✓	2	-	1	
1.50	a) Manifold Valve	a) Chemical Analysis b) Mechanical Properties	Major	Chemical & Mechanical	One per lot/batch/Heat	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	Test Report/ Lab Report		✓	2	-	1	
LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W & V COLUMNS. * FOR ITEMS MARKED (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.						PREPARED BY : VENDOR'S SIGNATURE & STAMP		APPROVED BY : BHEL QA SIGNATURE & STAMP		APPROVED BY : CUSTOMER SIGNATURE & STAMP			



MANUFACTURING QUALITY PLAN													
		CUSTOMER : M/s BHEL - HYDERABAD								BHEL P.O NO :		QAP NO : UEEPL/PED/QAP/359	
		PROJECT : HPCL, Vizag								P.O DATE : 06.12.2018		REV : 00	
		PRODUCT : HOOK UP PACKAGES								BHEL SPEC : PY56309 REV:00		DATE : 26.12.2018	
Sl. No	Components	Characteristics	Class	Types of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	* D	Agency			Remarks
										P	W	V	
2.00	IN-PROCESS INSPECTION												
2.10	Pipes & Tubes	a) Dimensional	Major	Measurement	100%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components		Inspection Report	V	2	-	1	
		b) Identification Mark / Punching		Identification Check	100%			COC / Test Report	V	2	-	1	
		c) Hydro Test		Leakage check ( as per test pressure mentioned in relevant specification)	100%			COC / Test Report	V	2	-	1	
2.20	Pipe Fittings												
2.21	a) Reducers b) Pipes c) Elbows d) Pipe Nipples e) Gasket f) Syphon g) Stud with 2 Nuts h) Coupling i) Equal Tee j) Cap k) U-Bolts l) Anchor bolts m) Un Equal Tee n) Pipe Clamp o) Fastners q) Flanges	a) Dimensional	Major	Measurement	100%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components		Inspection Report	V	2	-	1	
		b) Identification Mark / Punching		Identification Check	100%			Inspection Report	V	2	-	1	
2.30	Condensating Pot	a) Dimensional	Major	Measurement	100%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components		Inspection Report	V	2	-	1	
		b) Hydro Static Test Pressure		Leakage check ( as per test pressure mentioned in relevant specification)	5%			Inspection Report	V	2	2	1	
		c) Dry Penetrant Test		DPT at the Weld joints	All Weld joints			Inspection Report	V	2	2	1	

LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) & 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT / CHARACTERISTIC UNDER P, W & V COLUMNS. \* FOR ITEMS MARKED (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.

PREPARED BY :	APPROVED BY :	APPROVED BY :
VENDOR'S SIGNATURE & STAMP	BHEL, QA SIGNATURE & STAMP	CUSTOMER SIGNATURE & STAMP
		



MANUFACTURING QUALITY PLAN														QAP NO : UEEPL/PED/QAP/359	
		CUSTOMER : M/s BHEL - HYDERABAD				BHEL P.O NO				REV : 00					
		PROJECT : HPCL, Vizag				P.O DATE : 06.12.2018				DATE : 26.12.2018					
		PRODUCT : HOOK UP PACKAGES				BHEL SPEC : PY56309 REV:00				Page 3 OF 3					
Sl. No	Components	Characteristics	Class	Types of Check	Quantum of Check	Reference Documents	Acceptance Norms	Format of Records	* D	Agency			Remarks		
										P	W	V			
	Valves														
2.40	Gate Valve	a) Dimensional / Visual	Major	As per Spec	100%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components		Inspection Report	✓	2	2	1			
		b) Hydro test for Body, Seat & Back Seat		As per test pressure mentioned in relevant	100%			Test Report	✓	2	2	1			
2.50	Tube Fittings														
2.51	a) Female Connector , Male Connector, Tube Union	a) Hydrostatic test	Major	As per test pressure mentioned in relevant specification.	100%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components	COC / Test Report	✓	2	-	1				
		b) Dismantling Test & Reassembly Test	Major		100%			✓	2	-	1				
		c) Proof Pressure Test	Major		100%			✓	2	-	1				
		d) Dimensional	Major	Measurement	100%			✓	2	-	1				
2.60	b) 2 Way Manifold Valve	a) Hydro test for Body, Seat	Major	As per test pressure mentioned in relevant	100%			✓	2	-	1				
3.00	FINAL INSPECTION & TESTING														
3.10	All Items as in BOM	a) Dimension, hydro, visual	Major	Measurement	10%	As Per Technical Specification : PY56309 REV:00 / As Per Component Relevant Standard for Components		Inspection Report	✓	2	1	1			
		b) Identification Mark / Punch	Major	Identification Check	10%			Inspection Report	✓	2	1	1			
		c) BOM Check	Major	Witness of items as per BOM	100%			BOM	✓	2	1	1			
		d) Chrome plating	Major	Certificate Review	100%			TC	✓	2	2	1			
		e) IBR FORM IIIC	Major	Certificate Review	100%			TC	✓	2	2	1			
4.00	PRESERVATION & PACKING														
4.1	All Items as in BOM	a) Packing	Major	Visual	100%	As Per BHEL Purchase Order	Packing List	✓	2	1	1				
<p>LEGEND: P: PERFORM, W: WITNESS, V: VERIFICATION. INDICATE 1 FOR BHEL CQS (OR BHEL NOMINATED INSPECTION AGENCY) &amp; 2 FOR VENDOR/SUB VENDOR AS APPROPRIATE AGAINST EACH COMPONENT /CHARACTERISTIC UNDER P, W &amp; V COLUMNS. * FOR ITEMS MARKED (TICK) IN COLUMN 'D', TEST CERTIFICATES SHALL BE SUBMITTED TO BHEL FOR RECORDS.</p>															
PREPARED BY :						APPROVED BY :				APPROVED BY :					
VENDOR'S SIGNATURE & STAMP						BHEL, QA SIGNATURE & STAMP				CUSTOMER SIGNATURE & STAMP					

\* For not mentioned Activities TPI should Follow spech (py 56309 REV:00)

Inspection Testing of

\* All material should procure from EIL Approved source only.

