



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, Pipe fittings, tube & tube fittings, valves 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<br>(1) Purchase Order details<br>(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<br>(1) Purchase Order details<br>(2) LR copies / invoices  |



### Specification for Hookup material Package

**1. SCOPE**

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.

**2. SCOPE of SUPPLY** – As per Bill of Material [BOM] mentioned in this specification.

**3. INSTRUCTIONS TO BIDDERS**

3.1 Bidders **are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry.** 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 **and the decision of Purchaser shall be final & binding on Bidder, without any cost & delivery implications. In the event of conflict, most stringent requirements shall be followed in general.**

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.

3.3 Any technical features [over & above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.

3.4 Bidder shall submit the “Duly filled & Signed copy of Check list” compulsorily along with technical offer without which offer is liable for rejection without any further interaction with the Bidder

**4. ORDER EXECUTION PHILOSOPHY**

4.1 BOM listed in this specification along with their technical description, MOC, size, quantity and IBR requirement etc.

4.2 Vendor to consider all the material in their scope of supply. No deviation is acceptable.

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.

4.4 However, vendor to ensure that end connection & thickness of each item matching to the item connected to it.

4.5 Vendor shall follow the latest version of referred standards

**5. SUB VENDOR LIST :**

Bidder shall supply the BOM as per enclosed vendor list(Annexure-1) only. No deviation is acceptable

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|  |              |               |               |            |
|--|--------------|---------------|---------------|------------|
| Revisions:<br>Refer to record of revisions | 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<br>(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.<br>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> .<br>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<br>ASME B 36.19 - for SS pipes                     |
| 2.    | Material Grade standard                  | : ASTM A 106 – For CS pipes<br>ASTM A 335 – For AS pipes<br>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<br>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<br>ANSI B 16.9 - for pr. class 6000lbs & 9000lbs |
| 6.    | Material Grade standard | : ASTM A 105 – For CS fittings<br>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<br>ASTM A 335 – For AS pipes<br>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<br>ANSI B 16.5 – For Caps   |
| 2.    | Material Grade standard | : ASTM A 106 – For CS pipes<br>ASTM A 335 – For AS pipes<br>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<br>2) Front ferrule hardness shall be 95 (+/-5) HR-B scale<br>3) Proof pressure test shall be carried out for 375 Kg/cm <sup>2</sup> for at least one hour without any visible leakage.<br>4) Minimum Hydraulic burst pressure of 600 kg/cm <sup>2</sup> 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/cm <sup>2</sup> (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<br>ASME: SA182 – For AS & SS |
| 3.    | End Connections         | SW ends : ANSI B 16.11<br>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<br>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.

- a) Duly filled & Signed copy of Check list (To be submitted compulsorily without fail)
- b) 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)
- c) Unpriced price schedule (To be submitted compulsorily without fail)
- d) Copy of BHEL specification duly stamped & signed by vendor as a total compliance
- e) 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)

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



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**Notes::**

- 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.
- b) Further BHEL will provide comments on vendor submitted document within 07 working days for revision & resubmission. Vendor shall follow up with BHEL for non-receipt of comments/approvals.
- 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.
- 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.
- e) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.
- 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.**

## 9.3 Documents to be submitted during final shop testing &amp; before equipment dispatch. (10 sets + 2 CD ROM)

(Note: 2 sets to be included with item dispatch and balance to BHEL purchase department and submission of these documents is commercially linked)

- a) All documents approved by BHEL.
- 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
- c) Inspection report
- d) Guarantee and all test certificates

**10. MARKING**

10.1 Each packing shall be marked as (Font Size: as visible with naked eye)

- |                              |                     |
|------------------------------|---------------------|
| a) Size,                     | b) Pressure class,  |
| c) Material of Construction, | d) End Connections, |
| e) Heat number/code,         | f) Material code.   |

10.2 Each Item shall be marked with following details (Font size:8MM)

- 1) Position No (as per various schemes)
- 2) Item Name, Material of construction, Size, End connection, pressure class
- 3) BHEL PO Number,

If space is constraint on the item to be marked, vendor shall provide additional tag plate wired to each item.

**11. PACKING**

- 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.
- 11.2 BOM listed in each scheme shall be packed material code wise on ONE packing wooden box except pipes/tubes.
- 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.
- 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.
- 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.



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- 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.
- 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).
- 11.8 Part number/Dispatch link-up of all the equipment's/items supplied and also their co-relation with system/drawing/approved BOQ.
- 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.
- 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.
- 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.
- 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.
- 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.
- 11.14 The following minimum packing procedures shall be followed:-
- a) All items shall be dry, clean and free from moisture, dirt and loose foreign material of all kinds.
  - b) All items shall be protected from rust, corrosion, and mechanical damage during transportation and handling.
  - 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.
  - d) All electrical, instrumentation etc., shall be properly packed to prevent damage during transport, storage, handling at site.
  - 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.
  - 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.
  - g) Mandatory Spare parts shall be packaged separately and clearly marked as 'Mandatory Spares'.
  - h) Commissioning spares, Tools & tackles to be packed separately & suitably tagged.
- 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*
- 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.

**12. GUARANTEE**

- 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.
- 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.



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

| S.No.                        | Item  | MOC          | Size   | IBR | Swagelok/<br>Parker | QTY | Units | Unit Price | Total Price | Vendor List              | Remarks |
|------------------------------|---|--------------|--|-----|---------------------|-----|-------|------------|-------------|--------------------------|---------|
| 1                            | Gate Valve                                    | A182 GR.F22  | 1/2" SW,#800   | Yes | No                  | 20  | No.s  |            |             | As per enclosed EIL list |         |
| 2                            | Globe Valve                                   | A182 GR.F22  | 1/2" SW,#800   | Yes | No                  | 20  | No.s  |            |             | As per enclosed EIL list |         |
| 3                            | Condensate pot                                | A 335 GR P91 | 3/4" BW,sch160   | Yes | No                  | 20  | No.s  |            |             | BHEL PMD Approved Vendor |         |
| 4                            | Flange Adaptor for Diff. Pr. Transmitter(DPT) | SS304        | Suitable to supplied DPT,Make & model shall be shared during after PO placement. | Yes | No                  | 35  | No.s  |            |             | As per enclosed EIL list |         |
| <b>Total Supply Price ::</b> |   |              |  |     |                     |     |       |            |             |                          |         |

1.Any repeat order/Ammendment of order as per BHEL policies.Observations / Objections, if any, of the Bidder, to the "Unit Price Fixing Factor" shall be brought to the notice of BHEL, during Pre-Bid Stage.

NO Observations / Objections shall be entertained after the Techno-Commercial Bid is opened.

2.Bidder to indicate "Quoted" in the column "Unit Price & Total Price" as a confirmation of their bid to the respective item.Duly signed & stamped un-priced price schedule format shall be submitted by vendor in the technical offer as a token of concurrence that price schedule would be submitted in this format. Any tampering / modification / additions, etc. are NOT allowed and is liable for rejection of the offer.

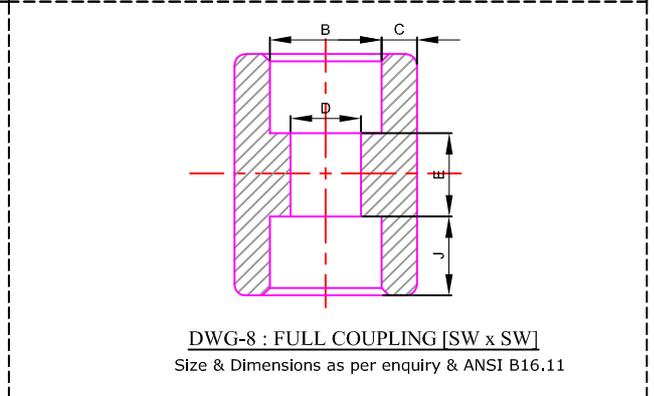
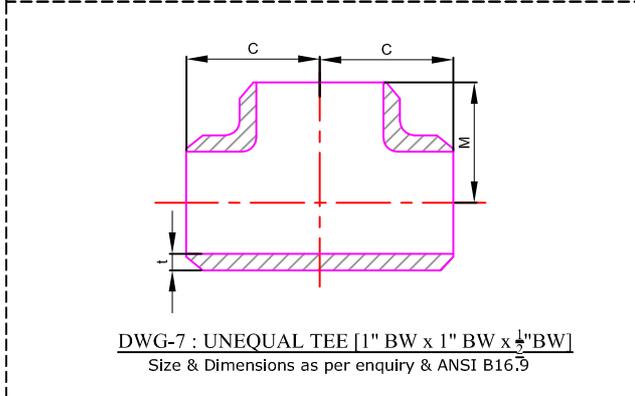
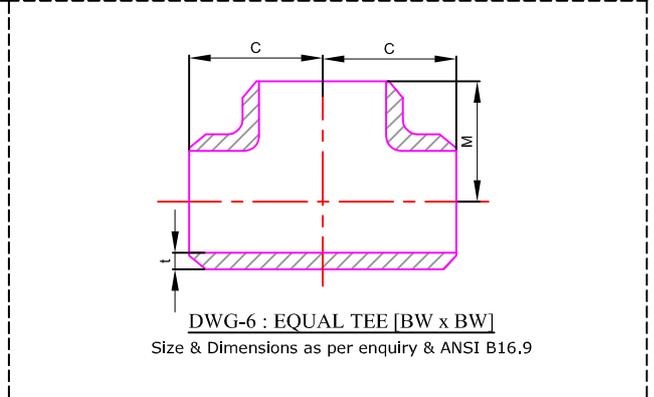
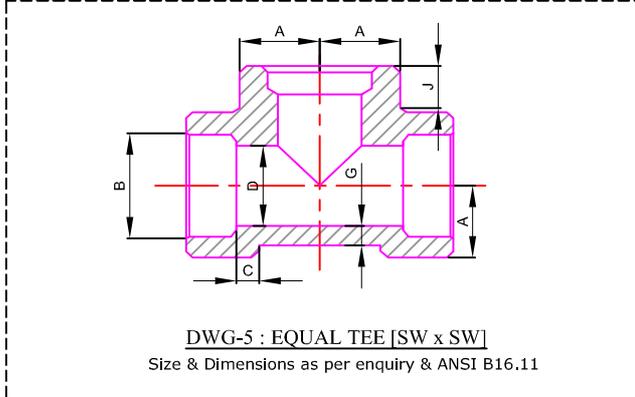
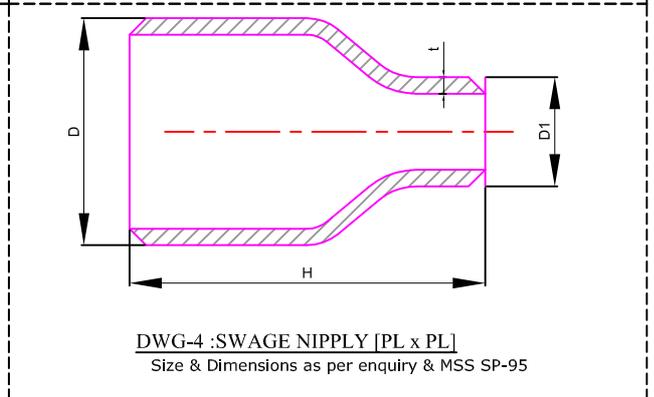
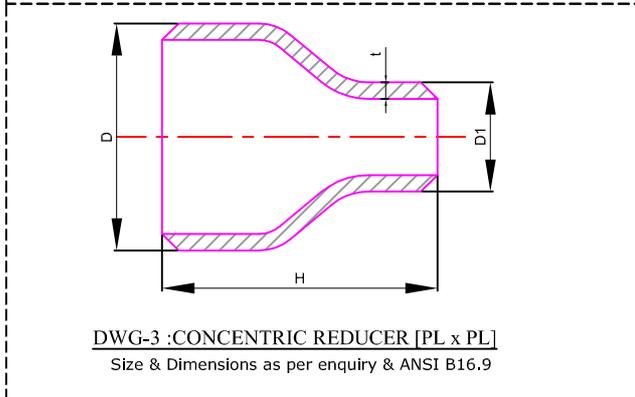
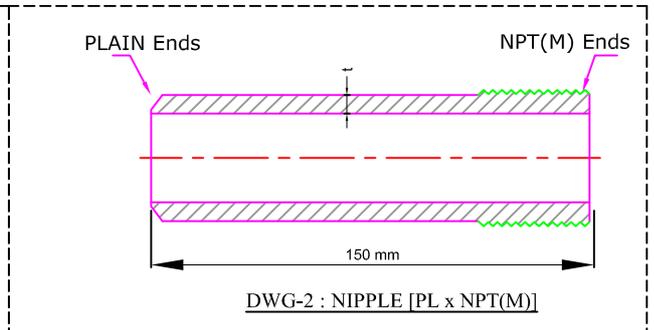
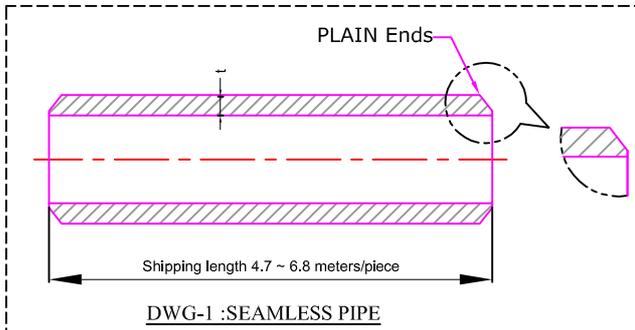
3.Bidders shall be evaluated on overall L1 basis.

4.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. These would include the cost up to engineering, installation of the item, wiring up in the panel and seamless integration with main system at works/site without any cost implications. All accessories required for this purpose shall be included in the price quoted.



**PRODUCT STANDARD**  
**PROJECT ENGINEERING & SYSTEMS DIVISION**  
**HYDERABAD**

**FABRICATION DRAWINGS**



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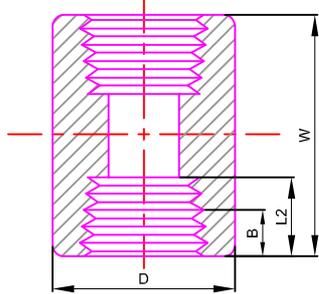


# PRODUCT STANDARD

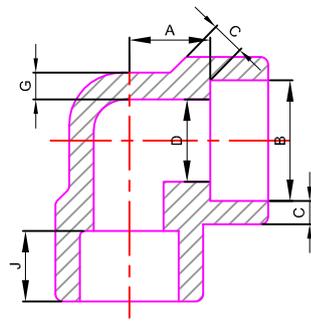
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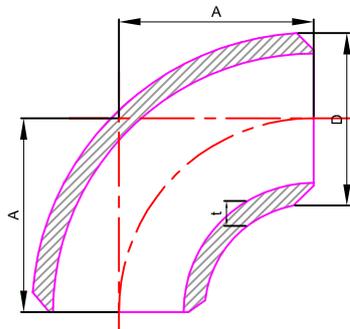
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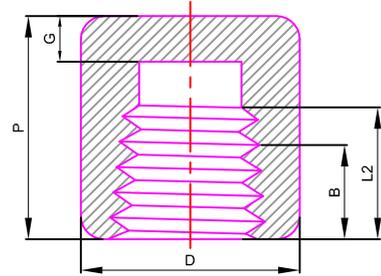
**DWG-10 : FULL COUPLING [NPT(F) x NPT(F)]**  
Size & Dimensions as per enquiry & ANSI B16.11



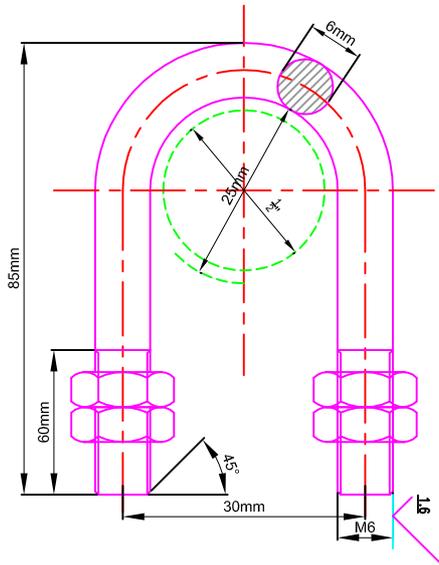
**DWG-11 : 90° ELBOW [SW x SW]**  
Size & Dimensions as per enquiry & ANSI B16.11



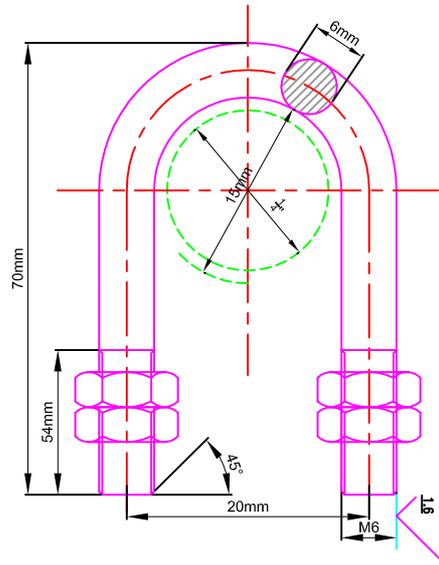
**DWG-12 : 90° ELBOW [BW x BW]**  
Size & Dimensions as per enquiry & ANSI B16.9



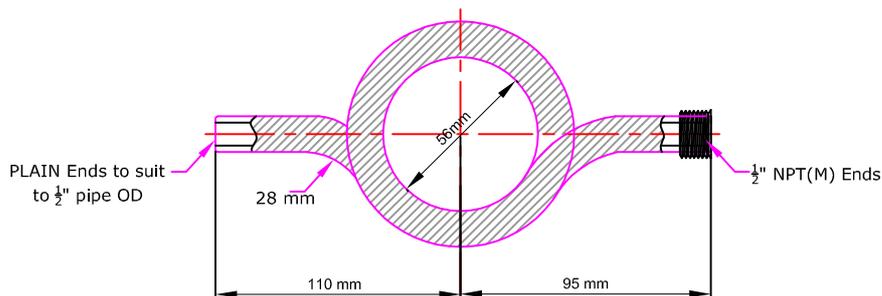
**DWG-13 : CAP [NPT(F)]**  
Size & Dimensions as per enquiry & ANSI B16.11



**DWG-14 : 1/2" U-BOLT**



**DWG-15 : 1/4" U-BOLT**



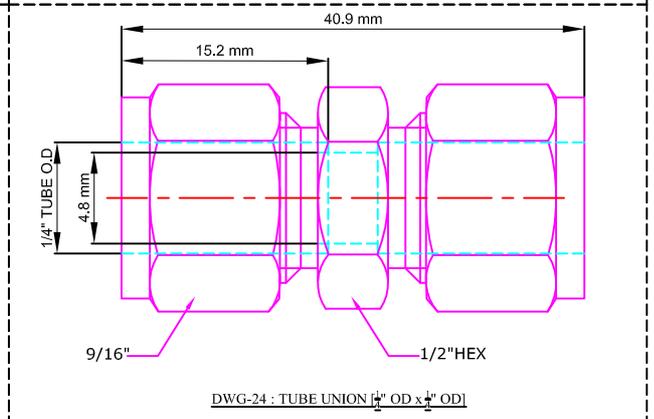
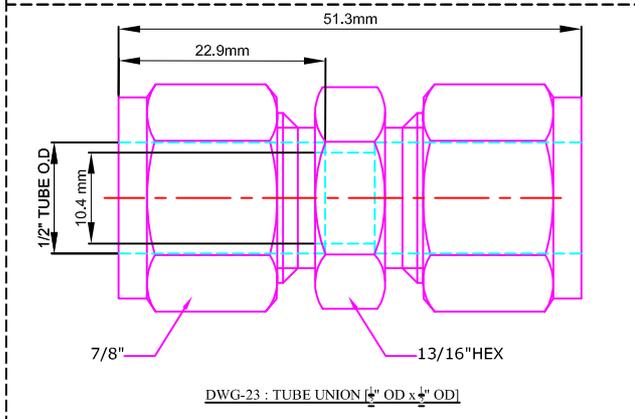
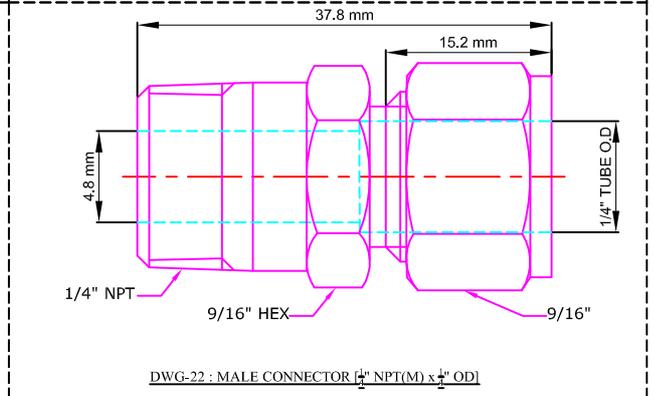
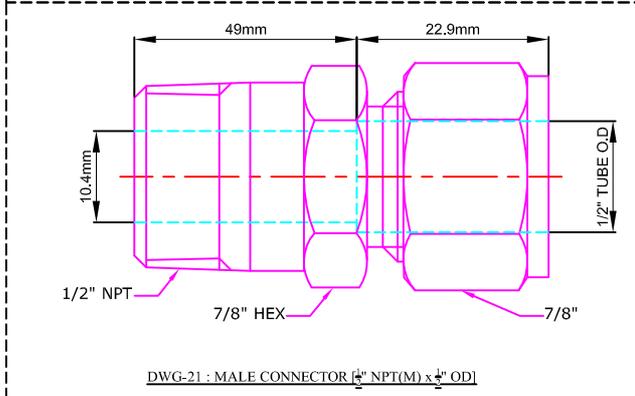
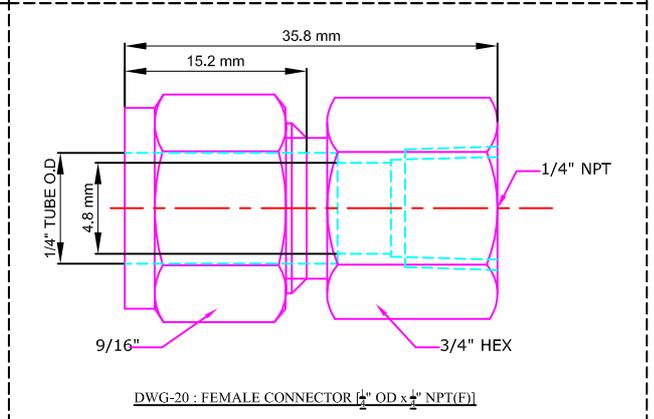
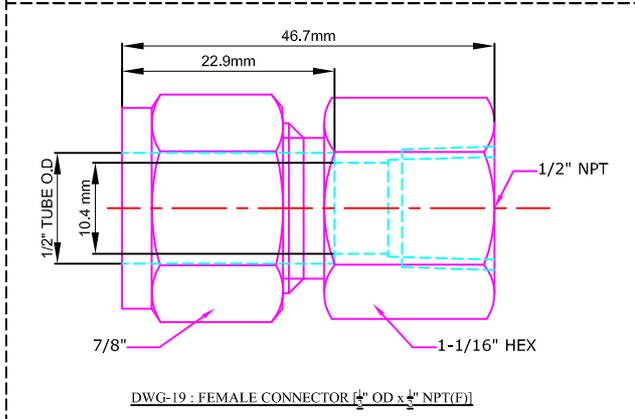
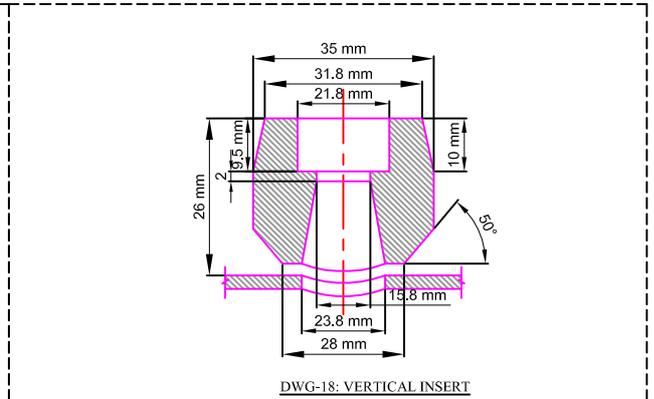
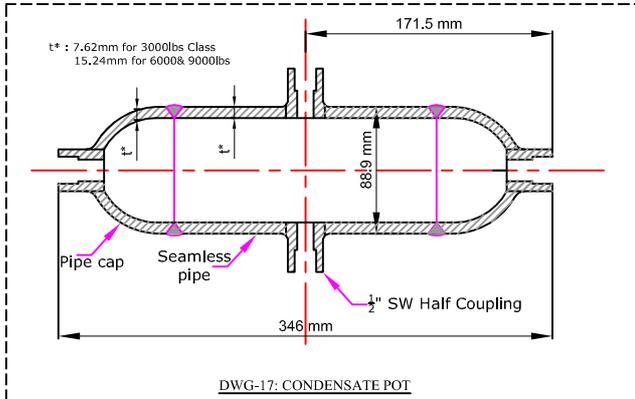
**DWG-16 : SCROLL SYPHON**



# PRODUCT STANDARD

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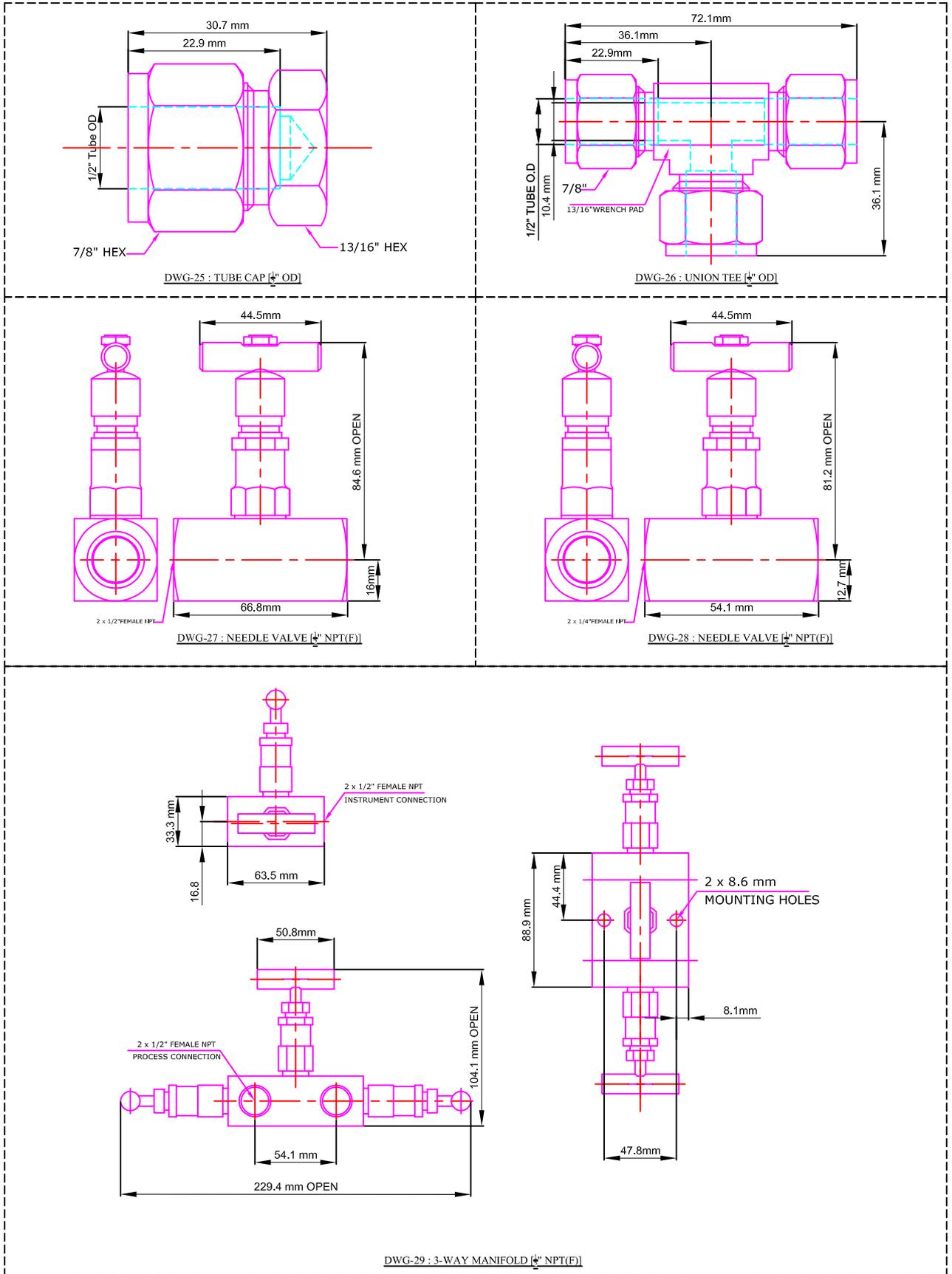


# PRODUCT STANDARD

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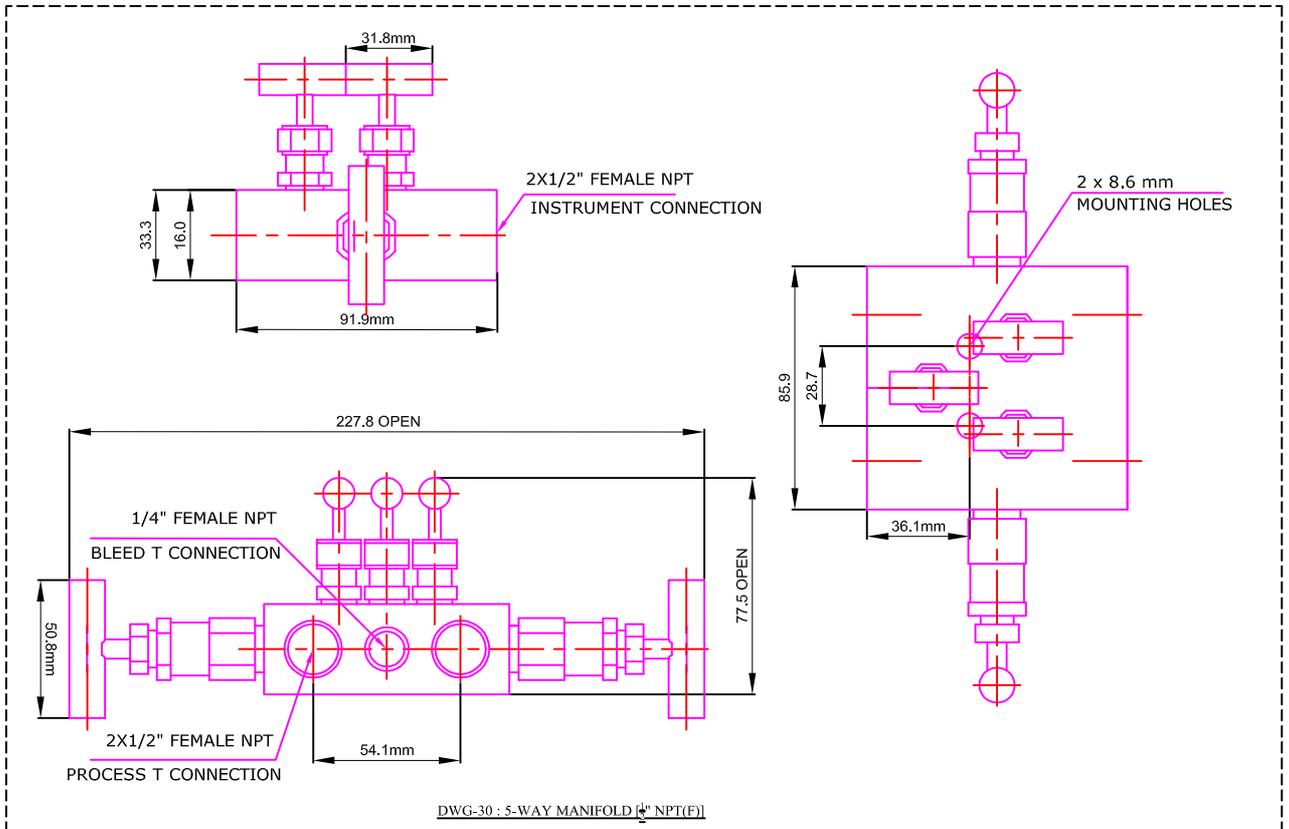


# PRODUCT STANDARD

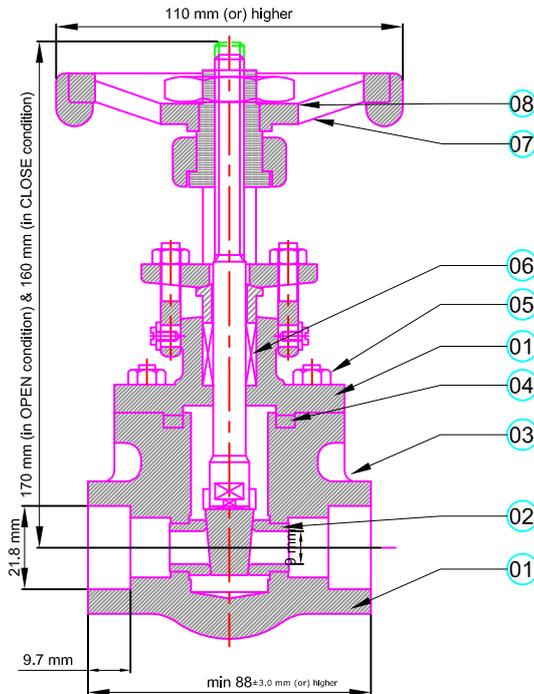
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DWG-30 : 5-WAY MANIFOLD (1/4" NPT(F))

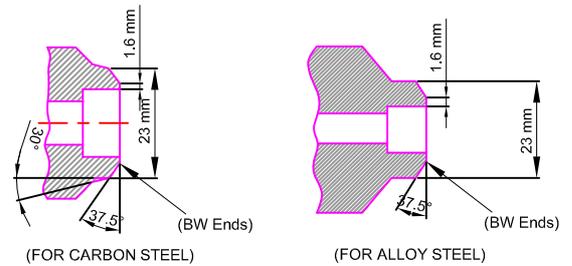


DWG-31 : GATE VALVE (1/4")

Size & Dimensions as per enquiry & 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                 |



## Project Supplier List for HPCL

| Item Code : 15ED          |  | Description : INSTRUMENT VALVES& MANIFOLDS |             |
|---------------------------|--|--|-------------|
| Supplier Code             | Supplier Name                            |  | Description |
| <b>Approved Suppliers</b> |  |  |             |
| A710                      | ANDERSON GREENWOOD CROSBY                |  |             |
| A345                      | ARYA CRAFTS & ENGINEERING PVT LTD        |  |             |
| A240                      | ASTECC VALVES & FITTINGS PVT. LTD.       |  |             |
| A701                      | AUTOCLAVE ENGINERS FLUID COMPONENTS      |  |             |
| B213                      | BAUMER TECHNOLOGIES INDIA PVT.LTD (W058) |  |             |
| C015                      | CHEMTROLS INDUSTRIES LTD                 |  |             |
| C714                      | CIRCOR INSTR. TECHNOLOGIES INC-FORM.H608 |  |             |
| C220                      | COMFIT & VALVES PVT. LTD.                |  |             |
| E104                      | EXCEL HYDRO PNEUMATICS PVT LTD           |  |             |
| E008                      | EXCELSIOR ENGG. WORKS                    |  |             |
| F146                      | FLUID CONTROLS PVT LTD                   |  |             |
| M010                      | MICRO PRECISION PRODUCTS PVT LTD         |  |             |
| P307                      | PANAM ENGINEERS                          |  |             |
| P671                      | PARKER HANNIFIN CORPORATION              |  |             |
| P240                      | PRECISION ENGINEERING INDUSTRIES         |  |             |
| P303                      | PRIME ENGINEERS                          |  |             |
| <del>S773</del>           | <del>SWAGELOK CO.</del>                  | Rev 4                                      |             |
| 27414                     | SWAGELOK COMPANY,                        |  |             |
| 27409                     | SWAGELOK LIMITED,                        |  |             |
| S303                      | SWASTIK ENGINEERING WORKS                |  |             |
| T761                      | TK FUJIKIN CORPORATION                   |  |             |
| 3630                      | WESMEC ENGINEERING PVT LTD               | REV 4                                      |             |

Project Supplier List for HPCL

| Item Code : 50AD          |  | Description : VALVE GATE FORGED |             |
|---------------------------|--|---------------------------------|-------------|
| Supplier Code             | Supplier Name                            |                                 | Description |
| <b>Approved Suppliers</b> |  |                                 |             |
| B690                      | BFE SRL                                  |                                 |             |
| B015                      | BHEL (TRICHY)                            |                                 |             |
| B725                      | BOTELI VALVE GROUP CO.                   |                                 |             |
| D679                      | DOUGLAS CHERO SPA                        |                                 |             |
| G186                      | GM ENGINEERING PVT. LTD.                 |                                 |             |
| I125                      | INTERVALVE POONAWALLA LIMITED            |                                 |             |
| K088                      | KSB PUMPS LTD (COIMBATTORE)              |                                 |             |
| L001                      | L & T VALVES LIMITED                     |                                 |             |
| M227                      | MH VALVES PVT LTD.                       |                                 |             |
| N016                      | NITON VALVE INDUSTRIES PRIVATE LTD .     |                                 |             |
| O035                      | OSWAL INDUSTRIES LTD                     |                                 |             |
| <del>S360</del><br>3636   | STEEL STRONG VALVES INDIA PVT LTD        | REV 4                           |             |
| 3593                      | VELAN VALVES INDIA PVT LTD               |                                 |             |
| W092                      | WEIR BDK VALVES-A UNIT OF WEIR INDIA PVT |                                 |             |

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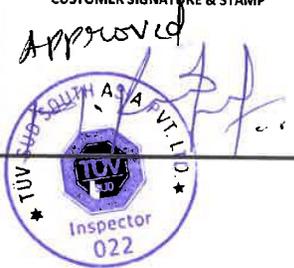
Project Supplier List for HPCL

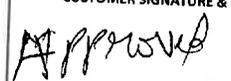
| Item Code : 50BD          |  | Description : VALVE GLOBE FORGED |             |
|---------------------------|--|----------------------------------|-------------|
| Supplier Code             | Supplier Name                            |                                  | Description |
| <b>Approved Suppliers</b> |  |                                  |             |
| B690                      | BFE SRL                                  |                                  |             |
| B015                      | BHEL (TRICHY)                            |                                  |             |
| B725                      | BOTELI VALVE GROUP CO.                   |                                  |             |
| D679                      | DOUGLAS CHERO SPA                        |                                  |             |
| F636A                     | FLOWSERVE PTE (MFR. EDWARD)              |                                  |             |
| G186                      | GM ENGINEERING PVT. LTD.                 |                                  |             |
| I125                      | INTERVALVE POONAWALLA LIMITED            |                                  |             |
| K088                      | KSB PUMPS LTD (COIMBATTORE)              |                                  |             |
| L001                      | L & T VALVES LIMITED                     |                                  |             |
| N016                      | NITON VALVE INDUSTRIES PRIVATE LTD .     |                                  |             |
| O035                      | OSWAL INDUSTRIES LTD                     |                                  |             |
| <del>S360</del><br>3636   | STEEL STRONG VALVES INDIA PVT LTD        | REV 4                            |             |
| 3593                      | VELAN VALVES INDIA PVT LTD               |                                  |             |
| W092                      | WEIR BDK VALVES-A UNIT OF WEIR INDIA PVT |                                  |             |

Engineers India

**ANNEXURE-2 of PY56670**

**NOTE: Vendor to follow the quality requirement for Valves & other items of BOM 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<br>e) Gasket f) Syphon<br>g) Condensate Pot h) Coupling<br>i) Equal Tee j) Cap k) U-Bolts l) Anchor bolts<br>m) Un Equal Tee n) Pipe Clamp<br>o) Fastners p) Stud with 2 Nuts<br>q) Flanges <i>all HookUP material</i> | a) Chemical Analysis<br>b) Mechanical Properties<br>c) IBR (WHERE EVER APPLICABLE) | Major | Chemical & Mechanical           | One per lot/batch/Heat     | As Per Technical Specification :<br>PY56309 REV:00 / As Per Component<br>Relevant Standard for Components | Test Report/<br>Lab Report |                   | v                          | 2   | - | 1 |         |
| 1.20  | Valves <i>As per spec (PY 56309 R.O) cl. 7</i>  |  |       |                                 |                            |   |                            |                   |                            |   |   |   |         |
|   | a) Gate Valves b) Globe Valves<br>c) Ball Valves  | a) Chemical Analysis<br>b) Mechanical Properties<br>c) IBR (Where ever applicable) | Major | Chemical. Mechanical            | One per lot/batch/Heat     | As Per Technical Specification :<br>PY56309 REV:00 / As Per Component<br>Relevant Standard for Components | Test Report/<br>Lab Report |                   | v                          | 2   | - | 1 |         |
| 1.30  | Tube and Swage Nipples  |  |       |                                 |                            |   |                            |                   |                            |   |   |   |         |
|   |   | a) Chemical Analysis<br>b) Mechanical Properties<br>c) Bend Test                   | Major | Chemical & Mechanical           | One per lot/batch/Heat     | As Per Technical Specification :<br>PY56309 REV:00 / As Per Component<br>Relevant Standard for Components | Test Report/<br>Lab Report |                   | v                          | 2   | - | 1 |         |
| 1.40  | Tube Fittings   |  |       |                                 |                            |   |                            |                   |                            |   |   |   |         |
| 1.41  | a) Female Connector , Male Connector , Tube Union   |  |       |                                 |                            |   |                            |                   |                            |   |   |   |         |
|   |   | a) Chemical Analysis<br>b) Mechanical Properties<br>c) Hardness Test               | Major | Chemical. Mechanical & Hardness | One per lot/batch/Heat     | As Per Technical Specification :<br>PY56309 REV:00 / As Per Component<br>Relevant Standard for Components | COC / Test Report          |                   | v                          | 2   | - | 1 |         |
| 1.50  | a) Manifold Valve   |  |       |                                 |                            |   |                            |                   |                            |   |   |   |         |
|   |   | a) Chemical Analysis<br>b) Mechanical Properties                                   | Major | Chemical & Mechanical           | One per lot/batch/Heat     | As Per Technical Specification :<br>PY56309 REV:00 / As Per Component<br>Relevant Standard for Components | Test Report/<br>Lab Report |                   | v                          | 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   |  |                                   |       |   |                  |   |                  |                            |   |                            |         |   |
|--|--|-----------------------------------|-------|---|------------------|---|------------------|----------------------------|---|----------------------------|---------|---|
|  |  | 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 :<br>PY56309 REV:00 / As Per Component<br>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 :<br>PY56309 REV:00 / As Per Component<br>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 :<br>PY56309 REV:00 / As Per Component<br>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 |
| <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  |                            |         |   |
|  |  |                                   |       |   |                  |                      |                  |                            |  |                            |         |   |



| 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 |                            |  |  |
| 2.40   | Valves   |  |       |   |                  |   |                   |                   |                            |        |   |   |                            |  |  |
|  | 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 Sest |       | As per test pressure mentioned in relavent                | 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 relavent 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 relavent                | 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)

Inspection testing of

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



stamp to be verified.