

ANNEXURE-I
TECHNICAL SPECIFICATIONS FOR SEAMLESS STAINLESS STEEL
BUTT WELD PIPE FITTINGS TYPE 304-L

1. GENERAL:

- 1.1. The technical specification is for the manufacture, inspection, testing, packing, certification and delivery of Seamless Stainless Steel Pipe fittings as listed in the Requirement Table and intended for acid service.
- 1.2. All material shall be brand new.
- 1.3. The dimensions of the Stainless Steel Pipe fittings shall be as per ANSI B16.9 BW, schedule 80S/40S.
- 1.4. The material shall conform to ASTM-A-182 /403; TP304-L.
- 1.5. The pipe fittings shall be furnished with proper ends. All burrs at the end of the fittings shall be removed.

2. ELIGIBILITY OF THE BIDDER:

- 2.1. Offers submitted by the direct manufacturer or their authorized agents only be considered for techno-commercial evaluation.
- 2.2. Partial offers or incomplete offers would not be considered for techno-commercial evaluation.

3. REQUIREMENT TABLE

For pipe fittings:

Sr. No.	Type of fittings	Size in mm NB	Schedule	Material of construction	Dimension as per	Quantity (Nos)
1	90 ⁰ Elbow(LR)	50	40S	ASTM A 403 F 304-L	ANSI B 16.9 BW	150
2	90 ⁰ Elbow(LR)	25	80S	ASTM A 403 F 304-L	ANSI B 16.9 BW	400
3	90 ⁰ Elbow(LR)	15	40S	ASTM A 403 F 304-L	ANSI B 16.9 BW	175
4	Equal Tee	50	40S	ASTM A 403 F 304-L	ANSI B 16.9 BW	60
5	Equal Tee	25	80S	ASTM A 403 F 304-L	ANSI B 16.9 BW	60
6	Equal Tee	15	40S	ASTM A 403 F 304-L	ANSI B 16.9 BW	80

4. MANUFACTURING:

- 4.1. Seamless Stainless steel butt weld pipe fitting shall be manufactured from seamless pipes by hot or cold extrusion/forming, machining and beveling process. Copies of manufacturer's test certificate for seamless pipe fittings showing mechanical, chemical and metallurgical properties shall be furnished.

- 4.2. The round seamless pipe for fittings shall be inspected thoroughly and degreased before further processing.
- 4.3. Pipe fitting of desired size shall be made by forming process.
- 4.4. The sized pipe fitting shall be solution annealed after de-coating and degreasing.
- 4.5. Annealed pipe fittings shall be machining to desired size.
- 4.6. Overall finish of the fittings should be bright with good workmanship type finish without any surface irregularity burrs and sharp corners. The dimension shall be maintained as given in the ANSI B 16.9.

5. INSPECTION AND TESTING:

- 5.1. Following inspection and testing shall be carried out on each size of pipe fittings by the purchasers or their authorized representatives at the manufacturer's place before the dispatch of the material. All the tests shall be carried out at a NABL laboratory. The laboratory shall be approved by the purchaser. Other tests offered than the listed below shall be detailed out in proposed QAP.
 - 5.1.1. Product Analysis shall be carried out per size as per the supplementary requirements of S1 and shall conform to the chemical requirements specified in Section 6 of ASTM –A-403 TP 304 L (UNS designation : S30403).
 - 5.1.2. The forging/forming will be done on the pieces from above mentioned accepted bars/ rods and seamless pipe (already stamped) in presence of the inspector. If in any case inspector's presence is not possible, one sample per lot (per heat per size per shape) shall be sent for micro-structure grain size test as per ASTM E-112 and the lot shall be accepted if the sample shows uniform grain flow and fine grain size.
 - 5.1.3. Heat treatment of these forming pieces shall be carried out and time temperature curve shall be produced to inspector for his approval. Here, proper stamp transfer shall be carried out.
 - 5.1.4. Inter-granular corrosion test (practice A and C) shall be conducted in accordance with the supplementary requirement S7 of ASTM-A-182/403 on sample drawn on each lot pipe fittings. The permissible corrosion rate shall be 18 m.p.y.
 - 5.1.5. Variation in outside diameter shall not exceed +/- 1% as per ISO tolerance class D2 and variation in wall thickness shall not exceed +/- 10% as per ISO tolerance class T3. Wall thickness shall be measured by certified calibrated instrument.

Note: All the expenditure occurring in above noted inspection and testing shall be borne by vendor.

6. CLEANING, MARKING & PACKING:

6.1. SS fittings shall be pickled and passivated after passing out all the tests. The pickling passivation and high – pressure jet cleaning operations shall be carried out as per procedure approved by the purchaser.

6.2. The pipe fittings shall be marked with jet ink as per ASTM-A-530 and shall carry following marks on each item.

- a) Name of the purchaser(AMMD/BARC)
- b) Name of the manufacturer and their emblem.
- c) Grade specification(ASTM-A-182/403, TP 304 –L, seamless)
- d) Dimension (Outer diameter and wall thickness in mm and SCH 40S/80S)
- e) Heat number

6.3. The pipe fittings shall be neatly packed in sturdy boxes for safe delivery in good condition. The gross weight of each box shall not exceed 500 kg as per ASTM A – 700.

7 CERTIFICATES:

7.1 The vender shall furnish material test certificate for chemical composition & mechanical properties from a government approved laboratory.

7.2 Manufacturer's test certificate with corresponding heat number and Laboratory test certificate from Government approved lab shall be furnished along with the supply.

OTHER TERMS AND CONDITIONS:

- ❖ The manufacturer should preferably possess ISO 9000 certification. Pipe fittings of unknown brands and without national/international quality certification shall not be considered.
- ❖ Purchaser reserves the right to accept the quotation partly or fully.
- ❖ Bidders shall furnish list of customers for SS 304-L pipe fittings for past three years. Details pertaining to purchase order number and name of the concerned officer along with his telephone number shall be clearly mentioned if the items were purchased by BARC or any other unit of DAE.

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