



BHARAT HEAVY ELECTRICALS LIMITED
PIPING CENTRE, MADRAS-600 017

Title : Technical Delivery Condition for galvanised and black fittings to IS:1239

Specification No : TDG:12:0

Project : All

Material : As per IS:1239

Equipment : Fittings

Accepted by

Engineering

Materials
Management

OP&C

Date/Initial/Dept.

15.06.98

Orig. Issue

Rev. 1

Rev. 2

Rev. 3

Rev. 4

Rev. 5

Rev. 6

Revised by

Approved by

Distribution :

Piping Centre

Quality Assurance Department

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**TECHNICAL DELIVERY CONDITION FOR GALVANISED
AND BLACK FITTINGS TO IS:1239**

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1.0 SCOPE

- 1.1 Welded/Plate Formed/Forged fittings of galvanised/black variety conforming to IS:1239 requirements.

2.0 MATERIAL

- 2.1 Raw material shall be of weldable quality conforming to IS:1239. .
[a. Heavy wall thickness of both seamless or ERW
b. Forged]

3.0 PROCESS OF MANUFACTURE

- 3.1 Fittings shall be forged or formed or welded (only for tees) combination amongst these is also acceptable. Dimensions will be in accordance with IS:1239.

- 3.2 GI Bends and plugs shall have external taper thread and other GI fittings shall have internal parallel thread to IS:554.

- 3.3 Fittings shall be galvanised either by hot dipping as per IS:4736 or by electro galvanising. In case of electro galvanising, minimum coating thickness shall be 20 microns and hot dipping shall be 30 microns. Threading to be done after galvanising in case of hot-dip method and before or after in case of electro galvanising.

3.4 Supply Condition:

3.4.1 General :

All black fittings of NB \leq 50mm shall be with socket weld ends as per Table-I and black fittings of size NB $>$ 50mm shall have butt weld ends as per Table-II. Fittings with reduced end size less or equal to NB 50mm alone shall be with butt welded ends as per Table-III. All galvanised fittings shall have threaded ends as per 3.2 above.

- 3.4.2 Elbows made by welding is not acceptable (Mitre Bend Construction). Elbows shall be of forged or formed construction to dimension specified in IS:1239. Elbows formed by machining from forged pieces shall have the bend contour ground to have smooth flow passage.

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- 3.4.3 Tees shall be of forged or formed or welded construction.
- 3.4.4 Reducers shall be made by forming or forging or machining. There shall not be any abrupt change in cross section of the reducer. Dimensions shall conform to IS:1239. For sizes Nb 50mm and below BLACK SOCKET/GI SCREWED Reducers may be supplied.
- 3.4.5 Bends shall be supplied with union at one end and threads on the other. Threads to be protected from transit damage.
- 3.4.6 GI Couplings/Unions shall have socket dimensions as per Table-I and other dimensions to IS:1239.

4.0 INSPECTION/TESTING

Manufacturer

- Dimensions : 10%
- Hydro Test : *1%/Size/Product at 50kg/cm²
- Internal Air Pr. Test : *1%/Size/Product at 7kg/sq.cm(g)
(for threaded fittings)
- Drift expansion test : *1%/Size/Product
for socket or Taper
screw plug test.
- For tees manufactured : *100% LPI
by welding

*** Reports to be submitted. Refer Cl.7.0**

BHEL

10% RANDOM VISUAL/DIMENSIONAL INSPECTION

5.0 WORKMANSHIP

Fittings shall be cleanly finished and free from scale, surface flaws, lamination and other defects. The threads shall be clean and well cut. The end shall be squared and the flow passages shall be smooth and uniform.

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6.0 **PROTECTION OF SURFACE**

- 6.1 All fittings of black variety shall be painted with one coat of Red Oxide Zinc Chromate (Alkyd based) to IS:2074. The machined/threaded surfaces shall be protected with rust preventive fluids. (Bonita CN-9/CN-24 or equivalent). Thread ends shall also be protected from transit damage.

7.0 **DOCUMENTATION**

- 7.1 The manufacturer shall give a guarantee certificate that the fittings are as per IS:1239 and also to furnish the test certificates incorporating the results of all the test done as per Cl. 4.0.

8.0 **IDENTIFICATION**

All the fittings shall be identified with brand name which may be embossed or punched. For fitting size Nb 50mm and above and thickness above 5mm size/BHEL MATERIAL CODE/SPECIFICATION shall be punched or engraved. For less than Nb 50mm should be identified properly by using Aluminium tag or chemical etched.

9.0 **PACKING**

Fittings shall be packed in wooden boxes, each box containing same size/type. Copy of the BHEL's INSPECTION report shall be put inside each wooden box.

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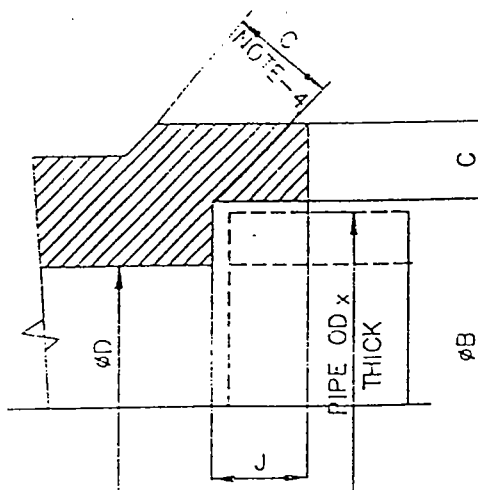
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TABLE-I

SOCKET-WELD (SW) END DETAILS FOR
IS 1239 BLACK FITTINGS (HEAVY) UPTO NB 50

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NB	PIPE OD		PIPE THICK- NESS	ϕB		ϕD		± 0.2	$+1$	
	MIN	MAX		MIN	MAX	MIN	MAX	C	J-0	
15	21.0	21.8	3.25	21.9	22.2	14.5	15.3	4.2	10	
25	33.3	34.2	4.05	34.3	34.6	25.2	26.1	5.2	13	
40	47.9	48.8	4.05	48.9	49.2	39.8	40.7	5.2	13	
50	59.7	60.8	4.50	61.0	61.3	50.7	51.8	6.2	16	



NOTES:

1. TOLERANCES ON CONCENTRICITY OF SOCKET & FITTING BORE - WITHIN 0.8 mm.
2. TOLERANCES ON CONCENTRICITY OF OPPOSITE SOCKET BORES - WITHIN 1.6 mm.
3. COINCIDENCE OF AXES: MAXIMUM ALLOWABLE VARIATION IN THE ALIGNMENT OF THE FITTING BORE & SOCKET BORE - WITHIN 0.5%.
4. "C" SHOULD BE MAINTAINED IN LOCALISED AREA ALSO, AS INDICATED.

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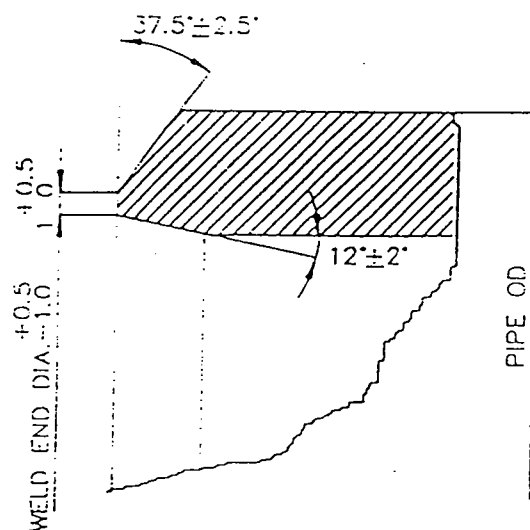
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TABLE-II

WELD END DIAMETER FOR IS 1239 BW BLACK
FITTINGS (HEAVY) NB 65 & ABOVE.

NB	PIPE OD		PIPE THICK- NESS	WELD END DIAMETER.
	MIN	MAX		
65	75.3	76.6	4.50	68.5
80	88.0	89.5	4.85	80.8
100	113.1	115.0	5.40	105.3
150	163.9	166.5	5.40	156.8



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TABLE-III

WELD END DIAMETER FOR IS 1239 BW BLACK
FITTINGS (HEAVY) NB 50 & BELOW.

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NB	PIPE OD		PIPE THICK- NESS	WELD END DIAMETER.	
	MIN	MAX			
15	21.0	21.8	3.25	15.9	
25	33.3	34.3	4.05	26.9	
40	47.9	48.4	4.05	41.5	
50	59.7	60.6	4.50	52.7	

