



BHARAT HEAVY ELECTRICALS LIMITED

PIPING CENTRE, MADRAS-600 017

Title : Quality Control Procedure for surface preparations, painting and stencilling, identification, end protection of piping components

Specification No : QCP:07:2

Project : All

Material : All

Equipment : All

Concurred

Engineering

QC

OP&C

[Handwritten signatures for Engineering, QC, and OP&C]

Date/Initial/Dept.
05-01-94

16-07-94 28-12-94

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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Dt28.12.94

Rev.No	Revised Clause	Description
1	1.1	Corrected
1	2.0	Corrected
1	3.1	Corrected (QCP:09 added)
1	4.2.1	Corrected
1	4.2.2	Corrected (Flow direction)
1	Annexure 1A&1B	Corrected
2	4.2.3	Clear Varnish added
2	6.1.C	Corrected
2	Annexure 1A	Corrected

P. Kant Sharma

QUALITY CONTROL PROCEDURE FOR SURFACE | QCP:07:2
PREPARATIONS, PAINTING AND STENCILLING ,
IDENTIFICATION, END PROTECTION OF PIPING COMPONENTS | Dt28.12.94

1.0 SCOPE

1.1 This procedure specifies the requirement of surface preparation, painting and stencilling, Identification and end capping of all items including those covered under painting and stencilling contracts.

2.0 SURFACE PREPARATION

The surface preparation & cleaning shall be carried out as as per QCP:09.

3.0 PAINTING

3.1 The painting of all Piping components shall be as per QCP:09 . It shall be ensured that paints shall be used before the expiry date.

4.0 IDENTIFICATION

4.1 Identification of Raw Materials:

4.1.1 Immediately on receipt of materials from Stores, the contractors shall identify and segregate all the materials based on the gate pass and SMIV copies.

4.2 Identification of finished components:

4.2.1 The following details shall be punched on each item within 200mm from the free end.

- a. Firm Code
- b. Work Order No.
- c. DU No.
- d. Quantity (No. off)
- f. Boiler Inspectors /BHEL seal if applicable.
- g. Material specification and Melt No.

For pipes and tubes, fittings, and rods of diameter less than 76.1mm and / or thickness less than 6mm, punch code as per Annexure I (b) alone to be hard stamped. Identification on stainless steel tubes shall be by engraving /stencilling.



4.2.2 The following details shall be stencilled on each item:

- a. Name of the project
- b. Work Order No.
- c. DU No.
- d. Quantity (No. off)
- e. Weight in Kg
- f. Firm code
- g. Melt No.
- h. Material specification
- i. Arrowmark indicating the flow direction.

4.2.3 The details stencilled shall be protected by applying a coat of clear varnish over the stencilled area.

4.2.4 The details hard stamped shall be highlighted by applying a coat of aluminium paint over the punched area.

4.2.5 The material identification colour code as per the enclosed Annexure IA shall be applied on ends.

5.0 END PROTECTION

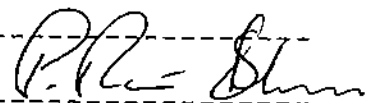
5.1 All tubes and fittings of diameters $\leq$ 76.1mm shall be provided with plastic end caps.

5.2 All pipes and fittings of diameter above 76.1mm shall be provided with metallic caps, as detailed in Annexure II enclosed.

6.0 DOCUMENTS FOR INSPECTION

6.1 The availability of following documents shall be ensured by the firm, before taking up the job.

- a. Purchase order with details of work order, DU, Qty, Weight, specification and full description of the items including size.
- b. GMS, if P.O. does not specify the full description.
- c. Test Certificate / Group Test Certificate as applicable
- d. Applicable drawing.



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ANNEXURE - IA

COLOUR CODES FOR (SEAMLESS) STEEL PIPES/TUBES/BENDS:

<u>Specification</u>	<u>Colour Code</u>
01. ASME-SA / ASTM-A - 106 Gr.A	Aluminium
02. ASME-SA / ASTM-A - 106 Gr.B	Red
03. ASTM-SA / ASTM-A - 106 Gr.C	Blue
04. ASME-SA / ASTM-A 335 P11	Blue & Red
05. ASTM-SA / ASTM-A 335 P12	Yellow & Silver
06. ASME-SA / ASTM-A 335 P22	Red & Green
07. ASME-SA / ASTM 312 TP 304L	Blue & Brown
08. ASME-SA / ASTM 312 TP 304H	Blue & Yellow
09. BS 3604 (HFS / CDS) 622/31	Red & Green
10. BS 3604 (HFS / CDS) 660	White & Silver
11. 13 Cr MO44 of DIN 17175	Yellow & Silver
12. DIN 2391 St 35.4	Green & Black
13. ST 35 & DIN 1629	White
14. X20 Cr MOV 121	Black
15. ASME-SA / ASTM-A 179	Blue & Green
16. ASTM-SA / ASTM-A 192	White
17. ASTM-SA / ASTM-A 209 Gr. T1	Red & Silver
18. ASME-SA / ASTM-A 210 Gr. A1	Yellow
19. ASME-SA / ASTM-A 210 Gr. C	Blue
20. ASME-SA / ASTM-A 213 Gr. T11	Black & Red
21. ASTM-SA / ASTM-A 213 Gr. T12	Yellow & Silver
22. ASME-SA / ASTM-A 213 Gr. T22	Red & Green
23. ASME-SA / ASTM-A 213 Gr. TP304H	Blue & Yellow

P.R. Sharma

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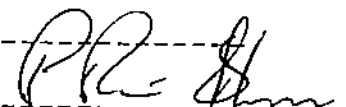
24.	ASME-SA / ASTM-A 213 Gr.TP321H	Blue & White
25.	ASME-SA / ASTM-A 213 Gr.TP347H	Yellow & Black
26.	ASME-SA / ASTM-A 268 Gr.TP410	Yellow & Brown
27.	ASME-SA / ASTM-A 268 Gr.TP443	Green & White

COLOUR CODES FOR (WELDED) STEEL PIPES/TUBES/BENDS:

01.	API 5L Gr. B (ERW)	Pink
02.	ASME-SA / ASTM-A 312 TP304L	Blue & Brown
03.	ASME-SA / ASTM-A 672 B60 CL22	Red & White
04.	ASME-SA / ASTM-A 672 B65 CL22	Red & Blue
05.	ASME-SA / ASTM-A 672 B65 CL42	White & Brown
06.	ASME-SA / ASTM-A 691 B12 CL42	Yellow & Silver
07.	ASME-SA / ASTM 691 B22 CL41	Red & Green
08.	ASME-SA / ASTM 672 B70 CL22	Red & Aluminium
09.	IS 3589	Silver & Brown

COLOUR CODES FOR (SEAMLESS & WELDED) STEEL FITTINGS:

01.	ASME-SA / ASTM-A 234 Gr. WPB	Red
02.	ASME-SA / ASTM-A 234 Gr. WPBW	Red
03.	Special forged fittings of ASME-SA / ASTM-A 105	Red
04.	ASME-SA / ASTM-A 243 Gr. WPC	Blue
05.	ASME-SA / ASTM-A 234 Gr. WP 11	Black & Red
06.	ASME-SA / ASTM-A 234 Gr. WP 12	Yellow & Silver
07.	ASME-SA / ASTM-A 234 Gr. WP 22	Red & Green



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08. Special forged fittings of ASME-SA / ASTM-A 234 WP 12 Yellow & Silver
09. Special forged fittings of ASME-SA / ASTM-A 234 WP 22 Red & Green

ANNEXURE 1b

Sl. No.	Colour Code	ASME / ASTM		DIN		BS	
		Specifi- cation	Punch code	Specifi- cation	Punch code	Specifi- cation	Punch code
1.	White	SA/A 192	192	ST 35.8	35.8	BS 3059 Steel 33	33
2.	Brown	-	-	-	-	BS 3059 STEEL 45	45
3.	Yellow	A 210 GR A1	GRA1	ST 45.8	45.8	-	-
4.	Red	A 106 GR B	AGRB	-	-	-	-
5.	Blue	A 106 GR C	AGRC	-	-	-	-
6.	Red & Silver	A 209 GR T1	T1	15 Mo 3	15 Mo	-	-
7.	Black & Red	A 335 P11	P11	-	-	-	-
8.	Yellow & Silver	A 213 T11 A 335 P12	T11 P12	13CrMo 44	13Cr	BS 3059 Steel 620	620
9.	Red & Green	A 213 T22 A 335 P22	T22 P22	10CrMo 910	10Cr	BS 3059 Steel 622	622
10.	White & Silver	-	-	14MoV 63	14Mo	BS 3604 HF 660 CD 660	660
11.	White & Red	-	-	X10Cr AL13	X10	-	-
12.	White & Black	A 213 T9	T9	X12Cr Mo91	X12	-	-

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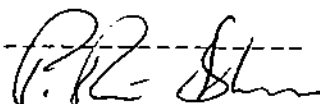
ANNEXURE - I b

Stainless Steel:

Sl. No.	Colour Code	ASTM		DIN		BS	
		Specifi- cation	Punch code	Specifi- cation	Punch code	Specifi- cation	Punch code
1.	White & Blue	A 213 TP 321/ TP 321H	321 321H	X10CrNi 189	T1 189	BS 3605 CDS 822/T1	822 T1
2.	Yellow & Black	A 213/ TP 347	347	X10CrNi Nb 189	Nb 189	-	-

Welded Steel Pipes/Tubes:

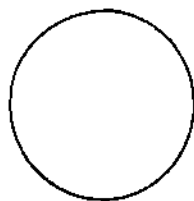
Sl No.	Colour code	Specification	Punch code
1.	Pink	API 5L GR B	LGRB



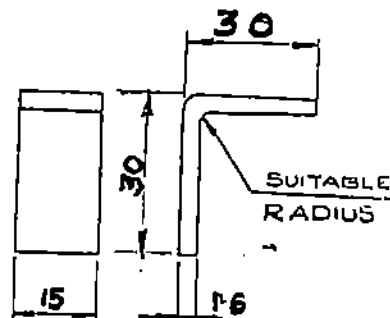
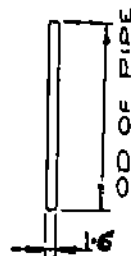
ANNEXURE II

a] $\leq \phi 76.1 \text{ mm}$ PLASTIC END CAPS

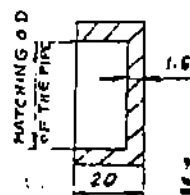
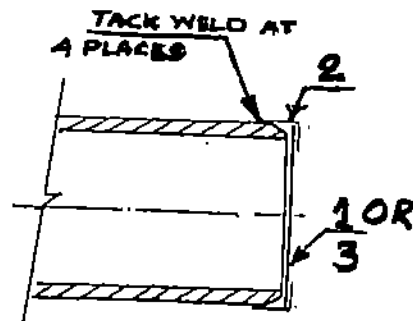
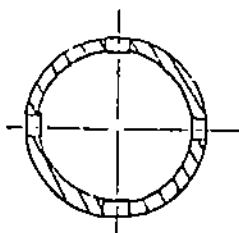
b] $> \phi 76.1 \text{ mm} \leq \phi 159 \text{ mm}$



1 DISC



2 ELL



3 COVER

ANNEXURE II

c] $> \phi 159$ mm AND ALL FITTINGS

