SEAMLESS FERRITIC ALLOY STEEL PIPES (Gr: P 22) FOR HIGH TEMPERATURE SERVICE

ORDERING DESCRIPTION FOR ASME SA 335, P 22

1.0 GENERAL:

The pipes shall conform to the latest version for ASME SA 335, Gr:P 22 and comply with the following additional requirements.

2.0 APPLICATION:

For high temperature service at stress levels and temperatures allowed by ASME Boiler & Pressure Vessel Code, Section I & Indian Boiler Regulations.

3.0 CONDITION OF MANUFACTURING:

Either hot finished or cold drawn, plain ends, unless other wise specified in BHEL order. Î

4.0 TOLERANCES:

On outside diameter : ± 1%
Other tolerances : As per ASME SA 530.

5.0 HYDROSTATIC TEST / NDT:

Each length of pipe shall be subjected to Hydrostatic test as per ASME SA 530.

As an alternative to the Hydrostatic test, each length of pipe shall be subjected to NDT as given below:

a) For thickness upto 3.6mm, inclusive, Eddy current test as per ASME SE 309 or for thickness upto 12mm, inclusive Flux leakage test can also be conducted as per ASME SE 570.

or

b) Ultrasonic test as per ASME SE 213.

Norms of acceptance shall be as specified in the respective standards mentioned above.

6.0 INSPECTION AT SUPPLIER'S WORKS

BHEL's representative shall have free access at all times to all parts of the manufacture's works, until the work on the contract of BHEL is being performed. The manufacturer shall offer BHEL's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with the specification.

7.0 REPAIRS

7.1 Repairs involving fusion welding is prohibited.

7.2 When defects are repaired by mechanical means, the wall thickness requirements shall be satisfactorily met with and the surfaces shall be smoothly dressed up without any sharp edges.

8.0 CERTIFICATION

Test certificate shall be provided as per IBR FORM-III D issued by WELL KNOWN PIPE MAKER who is recognised by Central Boiler Board. Copy of certification of recognition as Well Known Pipe Maker in FORM XVI - G shall also be enclosed along with the test certificate.

Note: In lieu of IBR form III-D, the manufacturer can also submit test certificate in IBR form III-A duly inspected by IBR approved agency with prior written permission from BHEL."

9.0 PACKING AND MARKING

As per BHEL Standard AA 049 00 01.

10.0 REJECTION AND REPLACEMENT

If each length of pipe does not comply with the requirements of this specification during receipt inspection at BHEL or if any defect is found during further processing of pipes BHEL reserves the right to reject the whole consignment and the supplier shall replace the material free of cost. The rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.

SEAMLESS FERRITIC ALLOY STEEL PIPES (Gr:P 11) FOR HIGH TEMPERATURE SERVICE

ORDERING DESCRIPTION FOR ASME SA 335, P 11

1.0 GENERAL:

The pipes shall conform to the latest version for ASME SA 335, Gr: P 11, and comply with the following additional requirements.

2.0 APPLICATION:

For high temperature service at stress levels and temperatures allowed by ASME Boiler & Pressure Vessel Code, Section I & Indian Boiler Regulations.

3.0 CONDITION OF DELIVERY:

Either hot finished seamless or cold drawn seamless, plain ends, unless other wise specified on BHEL order.

4.0 DIMENSIONS AND TOLERANCES:

4.1 Sizes:

Pipe OD X Thickness shall be as specified in BHEL order. Unless other wise specified, pipes shall be supplied in single random lengths of 5 to 7 metres.

4.2 Tolerances:

On outside diameter : ± 1%

Other tolerances : As per ASME SA 530

5.0 HYDROSTATIC TEST / NDT:

Each length of pipe shall be subjected to Hydrostatic test as per ASME SA 530.

As an alternative to the Hydrostatic test, each length of pipe shall be subjected to NDT as given below:

a) For thickness upto 3.6mm, inclusive, Eddy current test as per ASME SE 309 or for thickness upto 12mm, inclusive Flux leakage test.

or

b) Ultrasonic test as per ASME SE 213.

Norms of acceptance shall be as specified in the respective standards mentioned above.

6.0 INSPECTION AT SUPPLIER'S WORKS:

BHEL's representative shall have free access at all times to all parts of the manufacture's works, until the work on the contract of BHEL is being performed. The manufacturer shall offer BHEL's representative all reasonable facilities, without charge, to satisfy the latter that the material is being furnished in accordance with the specification.

7.0 REPAIRS:

Fusion welding is prohibited.

When done by mechanical means, the wall thickness is to be met with and the surfaces to be smoothly dressed up from any sharp edges.

8.0 CERTIFICATION:

Test certificate shall be provided as per IBR FORM-III D issued by WELL KNOWN PIPE MAKER who is recognised by Central Boiler Board. Copy of certification of recognition as Well Known Pipe Maker in FORM XVI - G shall also be enclosed along with the test certificate.

Note: In lieu of IBR form III-D, the manufacturer can also submit test certificate in IBR form III-A duly inspected by IBR approved agency with prior written permission from BHEL."

9.0 PACKING AND MARKING:

As per BHEL Standard AA 049 00 01.

10.0 REJECTION AND REPLACEMENT:

If each length of pipe does not comply with the requirements of this specification during receipt inspection at BHEL or if any defect is found during further processing of pipes BHEL reserves the right to reject the whole consignment and the supplier shall replace the material free of cost. The rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.

PROCEDURE FOR MARKING AND PACKING OF SEAMLESS STEEL TUBES & PIPES

1.0 SCOPE

This standard specifies the requirements for marking and packing of seamless steel tubes and pipes.

2.0 MARKING

Sl. No.	Particulars	Upto & incl. 33.4 OD and thickness < 6 mm	Above 33.4 and up to & incl. 114.3 OD and thickness < 6 mm	Other sizes and thickness not covered in columns. (3) & (4)
(1)	(2)	(3)	(4)	(5)
I.	**DETAILS TO BE IDENTIFIED**			
1.	Purchase order No.	1 to 7 to be stamped on aluminium metal tag and securely attached to each bundle	2,3,4 & 5 only to be paint stenciled on each tube. 1 to 7 to be stamped on aluminium metal tag and securely attached to each bundle.	3, 4, & 7 to be hard stamped on the body of pipes 2, 5 and 7 to be paint stenciled on the pipes. (Alternatively paint stenciled is permitted on mutual agreement for 3, 4 & 7 only)
2.	Marker's emblem			
3.	Specn.No.& grade			
4.	Melt Number			
5.	Size (OD X TK X length)			
6.	No. of tubes/pipes			
7.	Inspector's seal			
II	**COLOUR CODING:**	Circumferentially/ Longitudinally	Circumferentially/ Longitudinally	Circumferentially/ Longitudinally

Note: If specified on order , the colour code on pipes and tubes shall be as per Annexure - I

2.1 Stamping shall be done at about 100mm from the ends of the pipe with rounded letters and depth of stamping shall not exceed 0.5 mm.

2.2 Stainless steel tubes/pipes shall be paint stenciled only and the paint shall be free from corrosion promoting agents like sulphur and chlorine.

2.3 Marking shall be legibly done in ENGLISH language only, preferably with a stencil of 20 mm.

3.0 PRESERVATION

3.1 All painted details shall be protected with one coat of transparent rust preventive.

3.2 Other than stainless steel, all tubes and pipes shall be applied with rust preventive coating on the outside and either with a rust preventive coating or rust inhibitor on the inside **to provide protection against corrosion for a period of 3 months for out door storage in marine / industrial atmospheres.** For heat exchanger tubes, rust preventive coating shall given dry or wet type as specified in BHEL order.

3.3 The ends of the tubes/pipes shall be closed with end caps made of PVC /plastic which should be securely held so that it will not fall off during transit.

Note: The supplier must specify the type of rust preventive at the time of supply and also the method of its easy removal.

4.0 PACKING

4.1
a) Tubes and pipes upto and including 33.4 mm OD and smaller shall be supplied in bundles.
b) Tubes and pipes above 33.4 to 114.3 OD shall also be supplied in bundles, whenever the wall thickness is less than 6.0 mm.
c) Tubes and pipes of OD above 33.4 mm and wall thickness above 6.0 mm shall be supplied loose.

4.2
a) Weight of each bundle shall not exceed 1 metric ton.
b) No wooden pellets should be used to cover the tubes.
c) The bundle must be fastened by using galvanized wire / metal straps.
d) Two straps must be fastened one at each end of the bundle at one metre from the ends. For the balance length, there shall be a wire bundling at reasonable intervals.

4.3 All the tubes of wall thickness 3.2 mm and below shall be properly packed in wooden crates to avoid any dent formation and other transit damages to the tubes.

4.4 A packing list, sealed in a thick polythene cover, shall be sent along with each consignment with the following details:

1. BHEL order number:
2. Number of bundles (including serial number also):
3. Material specification No. and grade:
4. Size of tube/pipe
5. Customer's Name

COLOUR CODES FOR TUBES AND PIPES ***ANNEXURE - I***

Specification	Colour - 1	Colour - 2	Colour - 3
13 x 1 MF	RED	YELLOW	-
13 Cr Mo 44	ALUMINIUM	BLACK	-
A 200 Gr. T5	ALUMINIUM	RED	YELLOW
A 200 Gr. T9	ALUMINIUM	GREEN	YELLOW
AISI 602	WHITE	YELLOW	-
API 5L Gr. B	ALUMINIUM	-	-
BS 3059 PART2 CDS /HFS 360	ALUMINIUM	BLACK	BROWN
BS 3602 PART 1 CDS 360	ALUMINIUM	BLACK	BLUE
NFA 49 - 213 42 C	ALUMINIUM	BLUE	BROWN
NFA49 - 213 TU 10 CD 9.10	ALUMINIUM	BLUE	RED
NFA49 - 213 TU 15 CD 2.05	ALUMINIUM	BLUE	GREEN
NFA49 - 213 TU Z10 CD 9	ALUMINIUM	BLUE	YELLOW
NFA49 - 213 TU Z10C VNSB 09.01	ALUMINIUM	GREEN	RED
SA 106 Gr. B	RED	-	-
SA 106 Gr. C	BLUE	-	-
SA 179	BLACK	BLUE	GREEN
SA 192	WHITE	-	-
SA 199 T5	BLUE	BROWN	RED
SA 209 Gr. T1	ALUMINIUM	RED	-
SA 210 Gr. A1	YELLOW	-	-
SA 210 Gr. C	BLUE	GREEN	-
SA 213 Gr. T11	ALUMINIUM	YELLOW	-
SA 213 Gr. T12	BROWN	YELLOW	-
SA 213 Gr. T2	BROWN	GREEN	-
SA 213 Gr. T22	GREEN	RED	-
SA 213 Gr. T5	BLACK	BROWN	GREEN
SA 213 Gr. T9	BROWN	WHITE	-
SA 213 Gr. T91	GREEN	YELLOW	-
SA 213 Gr. TP 304	BLUE	GREEN	YELLOW
SA 213 Gr. TP 304 H	BLACK	BLUE	YELLOW
SA 213 Gr. TP 304 L	BLUE	WHITE	YELLOW
SA 213 Gr. TP 304 M	BLACK	BROWN	YELLOW
SA 213 Gr. TP 316	BROWN	-	-
SA 213 Gr. TP 316 Ti	BLACK	BLUE	-
SA 213 Gr. TP 316L	BLUE	BROWN	YELLOW
SA 213 Gr. TP 321	BLUE	WHITE	-
SA 213 Gr. TP 321H	BLACK	WHITE	-
SA 213 Gr. TP 347H	BLACK	YELLOW	-
SA 268 Gr. TP 405	ALUMINIUM	GREEN	-
SA 268 Gr. TP 410	BROWN	RED	YELLOW
SA 268 Gr. TP 443	BLUE	GREEN	WHITE
SA 269 TP 315	GREEN	RED	YELLOW
SA 312 Gr. TP 304	BLUE	YELLOW	-
SA 312 Gr. TP 304L	BLUE	RED	YELLOW
SA 312 Gr. TP 316	BLACK	GREEN	-
SA 312 Gr. TP 304L	BLACK	BLUE	BROWN
SA 312 Gr. TP 321	BLUE	BROWN	-
SA 312 Gr. TP 3347	BLUE	RED	WHITE
SA 333 Gr. 1	BLACK	BROWN	RED
SA 333 Gr. 3	BLACK	GREEN	RED
SA 333 Gr. 6	BLUE	GREEN	RED
SA 334 Gr. 1	BROWN	GREEN	RED
SA 334 Gr. 3	BLACK	RED	YELLOW
SA 334 Gr. 6	BLACK	BLUE	RED
SA 335 Gr. P1	BROWN	GREEN	YELLOW
SA 335 Gr. P11	GREEN	WHITE	-
SA 335 Gr. P12	BLACK	RED	-
SA 335 Gr. P2	BLUE	BROWN	GREEN
SA 335 Gr. P22	BLUE	RED	-
SA 335 Gr. P5	BLACK	BROWN	-
SA 335 Gr. P29	ALUMINIUM	BROWN	-
SA 335 Gr. P291	BROWN	RED	-
SB 163 Incono1	BLACK	GREEN	YELLOW
ST 35.4	ALUMINIUM	BLUE	-
STEEL 20	GREEN	-	-
Structural Tubes & Pipes	BLUE	BROWN	WHITE
X20 Cr Mo V 121	BLACK	-	-