

SPECIFICATION FOR SEAMLESS ALLOY STEEL LINE PIPE FOR HIGH TEMPERATURE SERVICE

1. SCOPE

This specification covers seamless alloy steel pipes for use at high temperatures in hydrocarbon and general services in Refinery. Following sizes are considered in this specification -

Nominal Bore (in MM)	Schedule
40 to 80	Sch 80
100 to 600	Sch 40

2. STANDARD APPLICABLE

The Pipes supplied under this specification shall meet the design, manufacturing, inspection and testing requirements of ASTM A335 Grade P5.

3. SERVICE TEMPERATURE LIMITS

Temperature deg C	Pressure kg/cm ²
93	49.2
149	47.8
204	46.7
315	39.0
426	29.0
538	17.9

4. SPECIFIC REQUIREMENTS

4.1 Alloy steel pipes to this specification, shall meet the following requirements -

Mechanical Requirements

Tensile (min) Kg/mm ²	42.2
Yield (min) Kg/mm ²	21.1
Elongation % min (gauge length 50 mm)	30.0

REV	PREPARED BY	APPROVED BY	DATE	REMARKS
1	VMP	PBP	23.09.98	Complete Revision
0	---	NBRC	Oct 85	Original

Chemical composition requirements -

C % = 0.15 (max)
Mn % = 0.30 - 0.60
P % = 0.025 max
S % = 0.03 max
Si = 0.5 max
Cr = 4.00 - 6.00
Mo = 0.45 - 0.65

4.2 Pipes are to be -

- i) Supplied in a hot finished condition followed by Heat Treatment as per A 335 Grade P5.
- ii) Supplied in length as per Purchase order. No pipe shall be under the specified length and not more than 6 mm over that specified.
- iii) Pipe ends - Plain ends. All burrs at ends of the pipe shall be removed.
- iv) Each pipe shall be marked / stenciled alongwith its length as per ASTM A 530
- v) All pipes shall be supplied clean and free of moisture , dirt and loose material of any kind. All pipes shall be protected from rust and corrosion by application of suitable rust preventive oil. Pipe ends shall be suitably protected from probable damage in transit.
- vi) Surface imperfections that penetrate more than 10 % of the nominal wall thickness or encroach on the minimum wall thickness shall not be acceptable.

5. INSPECTION AND TESTING

5.1 Manufacturer shall make necessary arrangements for the testing of pipes by BPCL representatives or any other Inspecting Agency appointed by BPCL.

BPCL Inspector/ Inspecting Agency will carry out inspection of the pipes in accordance with requirements indicated in A 335 Grade P5 specification, and will make out a report with specific reference to :-

- a) Chemical composition of pipes (results to be noted from corresponding mills certificate)
- b) Physical testing (flattening & mechanical)
- c) Tolerances (with respect to wall thickness)
- d) Non destructive testing , if mentioned in Purchase order.
- d) Hydrostatic test of pipes
- e) Marking on the pipes carried out by manufacturer.

Each pipe external surface shall be stamped with seal of Third party inspection agency and the same stamp shall also appear on the test certificates.

5.2 Ultrasonic Examination/ Eddy current testing is not acceptable in lieu of Hydrostatic test

- 5.3 Manufacturer with each order of pipes, shall submit a certificate confirming that the pipes supplied meet the requirements of this specification in all respect together with the Inspection report (containing details as per para 5.1) made out by BPCL Inspector/ Inspection agency pertaining to this batch of pipes.

6. MATERIAL ACCEPTANCE

The pipes alongwith third party inspection reports/ test certificates shall be subjected to visual inspection, review of test certificates and random check of dimensions by BPCL materials inspector. BPCL has got right to reject the materials in case of any non-conformity to this specification and / or Purchase order requirements.