SEAMLESS AND WELDED STEEL PIPE AND TUBING PER ASTM A333 Gr. 6

Rev	Reason of change	Date	Made By	Reviewed By	Approved By	Status
0	Initial release	12-02-2018	Ayush Bahuguna	AS	KKD	Released

1.0 SCOPE

1.1 This specification covers nominal (average) wall seamless and welded carbon and alloy steel pipe intended for use at low temperatures.

2.0 APPLICABLE SPECIFICATIONS

2.1 ASTM A333 Grade 6
2.2 ASTM A370

3.0 CHEMISTRY REQUIREMENTS

3.1 The heat and product analysis shall conform to one of the compositions listed below. Values are weight percentages.

Table 1

	A333 Gr. 6
Carbon, max	0.30
Manganese	0.29 - 1.06
Phosphorus, max	0.025
Sulfur, max	0.025
Silicon, min	0.10
Nickel, max	0.40
Chromium, max	0.30
Copper, max	0.40
Vanadium, max.	0.08
Columbium, max.	0.02
Molybdenum, max	0.12

4.0 MECHANICAL PROPERTIES

Mechanical property requirements are listed below. Each heat shall be tested and the listed mechanical properties shall be reported as per table 2.

Table 2: Mechanical Properties. (All values are minimums unless otherwise noted.)

Tensile strength	60,000 psi (415 MPa)
Yield strength	35,000 psi (240 MPa)
Elongation in 2" or 4D	30%
Brinell Hardness	237 HBW max.

5.0 HEAT TREATMENT

5.1 Mechanical property requirements are listed below. Each heat shall be tested and the listed mechanical properties shall be reported.

PROCESS	ATMOSPHERE/MEDIA	TEMPERATURE	TIME AT TEMPERATURE
Normalized	Air	1500 ºF – 1600 ºF (815 ºC – 871 ºC)	30 Minutes/inch of thickness. Minimum time 30 minute.

5.2 **Charpy V-notch Impact testing:** Impact testing shall be performed at -45 ºC (- 50 °F) or lower as applicable. The average value of 18 joules each set of three specimens with minimum of 14 joules of one specimen shall be acceptable. Similarly, no more than one of the three test results shall be below the required minimum average. Charpy V-notch impact testing will be carried out as per ASTM A-370.

6.0 INSPECTION

6.1 Material shall be inspected for surface imperfections such as seams, laps or tears. Defects of this type shall be removed by grinding.