

# ASTM A333

## - ALLLAND Production Standards Overview



## Definition and Applications

### 1. Definition

ASTM A333 primarily specifies the manufacturing, performance, and inspection requirements for seamless or welded pipes made of low-temperature carbon steel and low-alloy steel. The main steel grades include Grade 1, Grade 3, Grade 6, and Grade 6L.

### 2. ALLLAND ASTM A333 Steel Pipe Dimensions

Parameters	Dimensions
<b>O.D.</b>	21.3 mm – 610 mm (0.84" – 24")
<b>WT</b>	2.77 mm – 25.4 mm (Sch 10 – Sch 80)
<b>Length</b>	5.8 m – 12 m (19' – 40')
<b>Material</b>	ASTM A333 Grade 1 / 3 / 6 / 6L
<b>Process</b>	SEAMLESS/ ERW/ SSAW/ LSAW
<b>Connection</b>	Butt-weld/ Socket-weld/ Threaded

### 3. Application

ASTM A333 is primarily used in pipeline systems transporting fluids in low-temperature environments, such as oil, natural gas, chemical plants, and facilities in cold regions.

## Critical Tolerances

Our ASTM A333 standard steel pipes are manufactured in strict compliance with the specification requirements. The pipe surfaces are free from cracks, pores, and noticeable pits, ensuring smooth pipeline installation and extended service life.

Item	Tolerance	Description
<b>O.D.</b>	±1% (Seamless) ±1–2% (Welded)	Small diameter ≤ ±0.8 mm
<b>WT</b>	±12.5% (Seamless) ±10–12.5% (Welded)	Slightly wider tolerance for thick-walled pipes
<b>Length</b>	±0.5% or ±50 mm	Standard 5.8–12 m

## Chemical and Mechanical Properties

### 1. Chemical Composition (wt%, max)

Elem ent	Composition, %								
	Grade 1A	Grade 3	Grade 4	Grade 6A	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11
C, max	0.3	0.19	0.12	0.3	0.19	0.13	0.2	0.2	0.1
Mn	0.40– 1.06	0.31– 0.64	0.50– 1.05	0.29– 1.06	0.90 max	0.90 max	0.40– 1.06	1.15– 1.50	0.60 max
P, max	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.035	0.025
S, max	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.015	0.025
Si	...	0.18– 0.37	0.08– 0.37	0.10 min	0.13– 0.32	0.13– 0.32	...	0.10– 0.35	0.35 max
Ni	...	3.18– 3.82	0.47– 0.98	...	2.03– 2.57	8.40– 9.60	1.60– 2.24	0.25 max	35.0– 37.0
Cr	...	...	0.44– 1.01	...	...	...	...	0.15 max	0.50 max
Cu	...	...	0.40– 0.75	...	...	...	0.75– 1.25	0.15 max	...
Al	...	...	0.04– 0.30	...	...	...	...	0.06 max	...
V, max	...	...	...	...	...	...	...	0.12	...
Nb, max	...	...	...	...	...	...	...	0.05	...
Mo, max	...	...	...	...	...	...	...	0.05	0.50 max
Co	...	...	...	...	...	...	...	...	0.50 max

### 2. Mechanical Properties

Grade		Tensile Strength, min	Yield Strength, min
Grade 1	psi	55000	30000
	MPa	380	205
Grade 3	psi	65000	35000
	MPa	450	240
Grade 4	psi	60000	35000
	MPa	415	240
Grade 6	psi	60000	35000
	MPa	415	240
Grade 7	psi	65000	35000
	MPa	450	240
Grade 8	psi	100000	75000
	MPa	690	515
Grade 9	psi	63000	46000
	MPa	435	315
Grade 10	psi	80000	65000
	MPa	550	450
Grade 11	psi	65000	35000
	MPa	450	240

## Dimension Specifications Table

Size	Outside demension			Wall thickness (mm)					
	Inch	OD	SCH5S	SCH10S	SCH10	SCH 20	SCH30	SCH40	SCH60
DN6	1/8"	10.3	-	1.24	-	-	-	1.73	-
DN8	1/4"	13.7	-	1.65	-	-	-	2.24	-
DN10	3/8"	17.1	-	1.65	-	-	-	2.31	-
DN15	1/2"	21.3	1.65	2.11	-	-	-	2.77	-
DN20	3/4"	26.7	1.65	2.11	-	-	-	2.87	-
DN25	1"	33.4	1.65	2.77	-	-	-	3.38	-
DN32	1 1/4"	42.2	1.65	2.77	-	-	-	3.56	-
DN40	1 1/2"	48.3	1.65	2.77	-	-	-	3.68	-
DN50	2"	60.3	1.65	2.77	-	-	-	3.91	-
DN65	2 1/2"	73	2.11	3.05	-	-	-	5.16	-
DN80	3"	88.9	2.11	3.05	-	-	-	5.49	-
DN90	3 1/2"	101.6	2.11	3.05	-	-	-	5.74	-
DN100	4"	114.3	2.11	3.05	-	-	-	6.02	-
DN125	5"	141.3	2.77	3.4	-	-	-	6.55	-
DN150	6"	168.3	2.77	3.4	-	-	-	7.11	-
DN200	8"	219.1	2.77	3.76	-	6.35	7.04	8.18	10.31
DN250	10"	273.1	3.4	4.19	-	6.35	7.8	9.27	12.7
DN300	12"	323.9	3.96	4.57	-	6.35	8.38	10.31	14.27
DN350	14"	355.5	3.96	4.78	6.35	7.92	9.53	11.13	15.09



DN400	16"	406.4	4.19	4.78	6.35	7.92	9.53	12.7	16.66
DN450	18"	457.2	4.19	4.78	6.35	7.92	11.13	14.27	19.05
DN500	20"	508	4.78	5.54	6.35	9.53	12.7	15.09	20.62
DN550	22"	558.8	4.78	5.54	6.35	9.53	12.7	-	22.23
DN600	24"	609.6	5.54	6.35	6.35	9.53	14.27	17.48	24.61
DN650	26"	660.4	-	-	7.92	12.7	-	-	-
DN700	28"	711.6	-	-	7.92	12.7	15.88	-	-
DN750	30"	762	6.35	7.92	7.92	12.7	15.88	-	-
DN800	32"	812.8	-	-	7.92	12.7	15.88	17.48	-
DN850	34"	863.6	-	-	7.92	12.7	15.88	17.48	-
DN900	36"	914.4	-	-	7.92	12.7	15.88	19.05	-
DN950	38"	965.2	-	-	-	-	-	-	-
DN1000	40"	1015	-	-	-	-	-	-	-
DN1050	42"	1066.8	-	-	-	-	-	-	-
DN1100	44"	1117.6	-	-	-	-	-	-	-
DN1150	46"	1188.4	-	-	-	-	-	-	-
DN1200	48"	1219.2	-	-	-	-	-	-	-

Outside demension			Wall thickness (mm)							
Size	Inch	OD	SCH 80	SCH 100	SCH120	SCH140	SCH160	STD	XS	XXS
DN6	1/8"	10.3	2.42	-	-	-	-	1.73	2.41	-
DN8	1/4"	13.7	3.02	-	-	-	-	2.24	3.02	-
DN10	3/8"	17.1	3.2	-	-	-	-	2.31	3.2	-
DN15	1/2"	21.3	3.73	-	-	-	4.78	2.77	3.73	7.47
DN20	3/4"	26.7	3.91	-	-	-	5.56	2.87	3.91	7.82
DN25	1"	33.4	4.55	-	-	-	6.35	3.38	4.55	9.09
DN32	1 1/4"	42.2	4.85	-	-	-	6.35	3.58	4.85	9.7
DN40	1 1/2"	48.3	5.05	-	-	-	7.14	3.68	5.08	10.15
DN50	2"	60.3	5.54	-	-	-	8.74	3.91	5.54	11.07
DN65	2 1/2"	73	7.01	-	-	-	9.53	5.16	7.01	14.02
DN80	3"	88.9	7.62	-	-	-	11.13	5.49	7.52	15.24
DN90	3 1/2"	101.6	8.08	-	-	-	-	5.74	8.08	-
DN100	4"	114.3	8.58	-	11.13	-	13.49	6.02	8.56	17.12
DN125	5"	141.3	9.53	-	12.7	-	15.88	6.55	9.53	18.05
DN150	6"	168.3	10.97	-	14.27	-	18.26	7.11	10.97	21.95
DN200	8"	219.1	12.7	15.09	18.26	20.62	23.01	8.18	12.7	22.23
DN250	10"	273.1	15.09	18.26	21.44	25.4	28.58	9.27	12.7	25.4
DN300	12"	323.9	17.48	21.44	25.4	28.58	33.32	9.53	12.7	25.4
DN350	14"	355.5	19.05	23.83	27.79	31.75	35.71	9.53	12.7	-
DN400	16"	406.4	21.44	26.19	30.96	36.53	40.49	9.53	12.7	-
DN450	18"	457.2	23.83	29.36	34.93	39.67	45.24	9.53	12.7	-
DN500	20"	508	26.19	32.54	38.1	44.45	50.01	9.53	12.7	-
DN550	22"	558.8	28.58	34.93	41.28	47.63	53.98	9.53	12.7	-
DN600	24"	609.6	30.96	38.89	46.02	52.37	59.54	9.53	12.7	-



DN650	26"	660.4	-	-	-	-	-	9.53	12.7	-
DN700	28"	711.6	-	-	-	-	-	9.53	12.7	-
DN750	30"	762	-	-	-	-	-	9.53	12.7	-
DN800	32"	812.8	-	-	-	-	-	9.53	12.7	-
DN850	34"	863.6	-	-	-	-	-	9.53	12.7	-
DN900	36"	914.4	-	-	-	-	-	9.53	12.7	-
DN950	38"	965.2	-	-	-	-	-	9.53	12.7	-
DN1000	40"	1015	-	-	-	-	-	9.53	12.7	-
DN1050	42"	1066.8	-	-	-	-	-	9.53	12.7	-
DN1100	44"	1117.6	-	-	-	-	-	9.53	12.7	-
DN1150	46"	1188.4	-	-	-	-	-	9.53	12.7	-
DN1200	48"	1219.2	-	-	-	-	-			

## Testing Requirements

### 1. Chemical Composition Test

- Conducted to verify compliance with the specified chemical limits of each grade.
- Typical analysis methods: Spectrometric analysis, Wet chemical analysis.

### 2. Tensile Test

- Determines: Tensile strength, Yield strength, Elongation.
- Test specimens: Transverse or longitudinal samples taken from the pipe body.

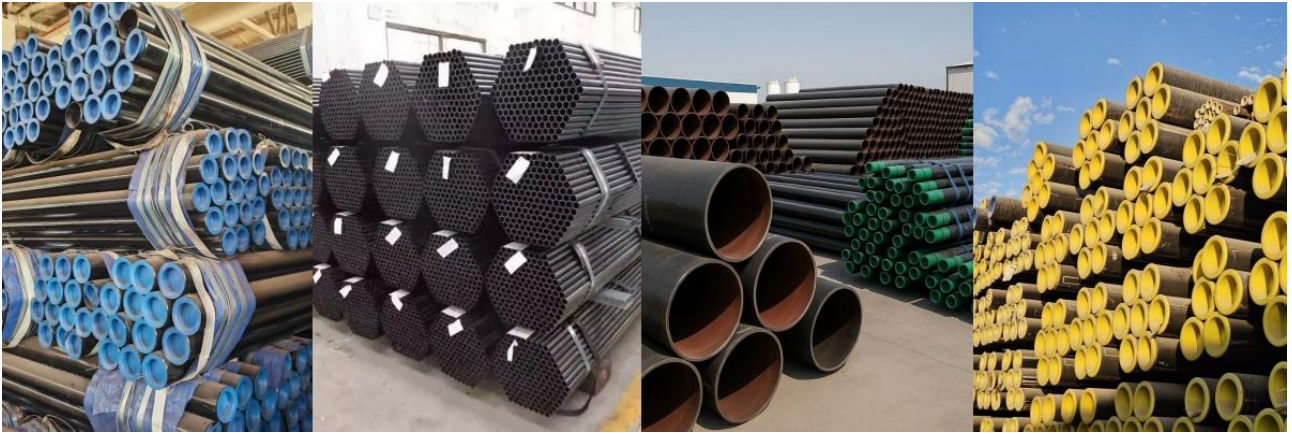
### 3. Impact Test

- Mandatory test for ASTM A333, Conducted per ASTM A370.
- Test temperature: Specified by grade (e.g. Grade 6 typically at  $-45^{\circ}\text{C}$  /  $-50^{\circ}\text{F}$ ).
- Requirements:
  - Minimum absorbed energy values
  - Lateral expansion may also be specified

## Surface treatment

Method: Oil Coating, Black Coating, Clear Coating, FBE, 3LBE, 3LPP.

## ALLLAND ASTM A333 Product Images



The image shows steel pipes actually produced by our company