

API 5L

- ALLLAND Production Standards Overview



Definition and Applications

1. Definition

API 5L primarily specifies the manufacturing processes, materials, properties, testing, and acceptance requirements for seamless and welded steel pipes used for the transportation of petroleum, natural gas, and water. API 5L has two product specification levels (PSL 1 and PSL 2).

2. ALLLAND API 5L Steel Pipe Dimensions

Parameters	Dimensions
O.D.	21.3 mm – 1422.4 mm (1/2" – 56")
WT	2 mm – 50 mm (Sch 10 – Sch 160)
Length	5 m – 14 m (196" – 551")
Material	API 5L PSL1 / PSL2
Process	SEAMLESS / ERW / SSAW / LSAW
Connection	Butt-weld/ Socket-weld/ Threaded

3. Application

API 5L is mainly applied to the main trunk lines, branch lines and gathering and transportation pipelines of onshore and offshore oil and gas transportation, emphasizing the pressure-bearing capacity, weldability and fracture toughness under high pressure and complex environments.

Critical Tolerances

Our API 5L standard steel pipes are manufactured in strict compliance with the specification requirements.

Item	Tolerance	Description
O.D.	±0.5mm	O.D. ≤ 60.3mm
	±0.75% / ±1.0%	O.D. > 60.3mm
WT (SEAMLESS)	+15% / -12.5%	WT < 20mm, O.D. ≤ 73.0mm
	+17.5% / -10%	WT ≥ 20mm, O.D. > 73.0mm
WT (ERW / SSAW / LSAW)	+15.0% / -10%	WT > 5.0mm
	+15.0% / -0.6mm	WT ≤ 5.0mm

Chemical and Mechanical Properties

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

Element	Composition, %				
	Grade A	Grade B	X42	X46 / X52 / X56	X60 / X65 / X70
C, max	0.22	0.28(seamless)/ 0.26(welded)	0.28	0.28	0.28
Mn, max	0.90	1.20	1.20	1.40	1.40
P, max	0.030	0.030	0.030	0.030	0.030
S, max	0.030	0.030	0.030	0.030	0.030
Si	...	...	...	...	...
Ni	0.50	...	...	...	...
Cr	0.50	...	...	...	...
Cu	0.50	...	...	...	...

2. PSL 2 Chemical Composition (wt%, max)

Element	Composition, %				
	Grade B	X42	X46 / X52 / X56 / X60	X65 / X70 / X80	X90 / X100 / X120
C, max	0.24	0.24	0.24	0.24	0.24
Mn, max	1.20	1.30	1.40	1.40	2.10
P, max	0.025	0.025	0.025	0.025	0.020
S, max	0.015	0.015	0.015	0.015	0.010
Si	0.45	0.45	0.45	0.45	0.55
Nb	0.05	0.05	...	...	...
V	0.05	0.05	...	...	...
Ti	0.04	0.04	...	...	...

3. PSL 1 Mechanical Properties

Grade		Tensile Strength, min	Yield Strength, min
Grade A	psi	48600	30500
	MPa	335	210
Grade B	psi	60200	35500
	MPa	415	245
X42	psi	60200	42100
	MPa	415	290
X46	psi	63100	46400
	MPa	435	320
X52	psi	66700	52200
	MPa	460	360
X56	psi	71100	56600
	MPa	490	390
X60	psi	75400	60200
	MPa	520	415
X65	psi	77600	65300
	MPa	535	450
X70	psi	82700	70300
	MPa	570	485
X80	psi	90600	80500
	MPa	625	555

4. PSL 2 Mechanical Properties

Grade		Tensile Strength, min	Yield Strength, min
X42	psi	60200	42100
	MPa	415	290
X46	psi	63100	46400
	MPa	435	320
X52	psi	66700	52200
	MPa	460	360
X56	psi	71100	56600
	MPa	490	390
X60	psi	75400	60200
	MPa	520	415
X65	psi	77600	65300
	MPa	535	485
X70	psi	82700	70300

X80	MPa	570	415
	psi	90600	80500
	MPa	625	555
X90	psi	100800	90600
	MPa	695	625
X100	psi	110200	100000
	MPa	760	690
X120	psi	132700	120400
	MPa	915	830

Dimension Specifications Table

Outside dimension			Wall thickness (mm)						
Size	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. Tensile Test

- Determination of the yield strength, tensile strength, and elongation of steel pipes

2. Hydrostatic Pressure Test

- Each steel pipe must undergo a non-destructive pressure test to verify its integrity and leak-free performance under specified pressure conditions.

3. Flattening Test

- Testing the ductility and plastic deformation capacity of welds and base materials.

4. Hardness Test

- PSL2-grade steel pipes have specific requirements, particularly when used in acidic environments (resistance to hydrogen sulfide stress corrosion) or marine environments, necessitating evaluation of the material's crack resistance and homogeneity.

5. Charpy V-notch impact Test

- Mandatory requirements for PSL2-grade steel pipes test material toughness at low temperatures to prevent brittle fracture. PSL1 steel pipes do not have this requirement.

6. Drop Weight Tear Test

- Testing the resistance to ductile fracture propagation in steel pipes, particularly for high-strength, thick-walled PSL2 steel pipes.

7. Non-destructive Test

All welded steel pipes shall undergo 100% non-destructive testing (such as ultrasonic testing, radiographic testing) on their welds to ensure weld quality.

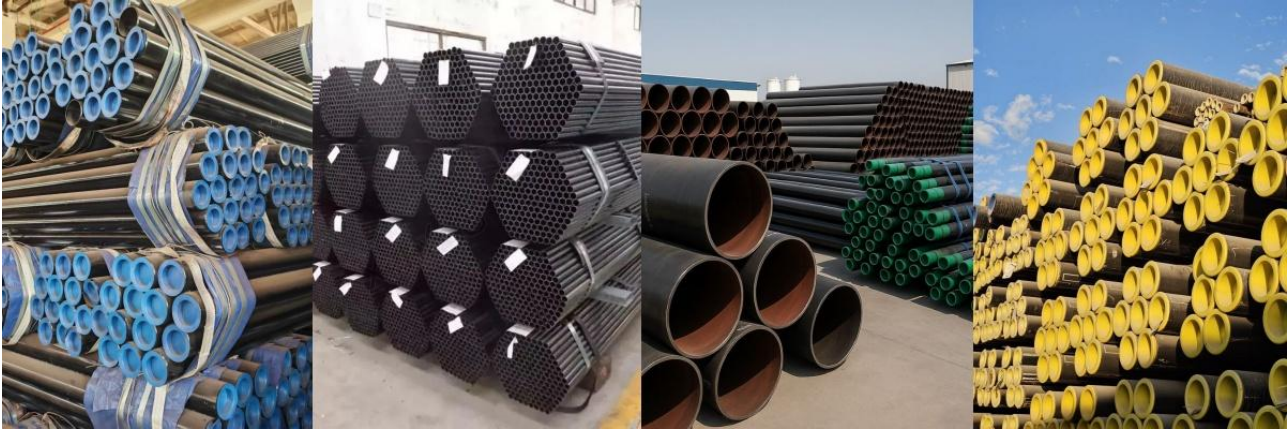
8. Appearance And Dimensions Test

- Inspect whether the outer diameter, wall thickness, length, straightness, bevel, and other dimensions of the steel pipe meet tolerance requirements, and whether the surface has defects that affect usage.

Surface treatment

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

ALLLAND API 5L Product Images



The image shows steel pipes actually produced by our company