UTP PIPE

API 5L- LINE PIPES

Technical Data of Pipes Conforming to API 5L

Size	Outside Diameter		Wall Thickness		Mass of Plain end Pipe		Standard Test Pressure								
							Gr.A	Gr.B	Gr.X42	Gr.X46	Gr.X52	Gr.X56	Gr.X60	Gr.X65	Gr.X70
	mm	Inch	mm	Inch	kg/m	lb/ft	MPa	MPa	MPa	MPa	MPa	MPa	MPa	MPa	MPa
1/2	21.34	0.840	2.60	0.102	1.20	0.807	5.7	6.7	7.9	8.7	9.8	10.6	11.3	12.3	13.2
			2.77	0.109	1.27	0.852	6.1	7.1	8.4	9.3	10.5	11.3	12.1	13.1	14.1
			3.20	0-126	1.43	0.962	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.73	0.147	1.62	1.089	8.2	9.6	11.4	12.5	14.1	15.3	16.3	17.6	19.0
3/4	26.67	1.050	2.60	0.102	1.54	1.037	5.7	6.7	7.9	8.7	9.8	10.6	11.3	12.3	13.2
			2.87	0.113	1.68	1.132	6.3	7.4	8.7	9.6	10.8	11.8	12.5	13.6	14.6
			3.20	0.126	1.85	1.245	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.91	0.154	2.19	1.475	8.6	10.1	11.9	13.1	14.8	16.0	17.0	18.5	19.9
1	33.4	1.315	3.20	0.126	2.38	1.601	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.38	0.133	2.50	1.681	7.5	8.7	10.3	11.4	12.8	13.8	14.7	16.0	17.2
			4.00	0.157	2.90	1.949	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			4.55	0.179	3.24	2.175	10.0	11.7	13.9	15.3	17.2	18.6	19.8	20.5	20.5
1 1/4	42.16	1.660	3.20	0.126	3.07	2.066	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.56	0.140	3.39	2.277	7.8	9.2	10.8	12.0	13.5	14.6	15.5	16.8	18.1
			4.00	0.157	3.76	2.530	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			4.85	0.191	4.46	2.999	10.7	12.5	14.8	16.3	18.3	19.9	20.5	20.5	20.5
1 1/2	48.26	1.900	3.20	0.126	3.56	2.390	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.68	0.145	4.05	2.719	8.1	9.5	11.2	12.4	13.9	15.1	16.0	17.4	18.7
			4.00	0.157	4.37	2.934	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			5.08	0.200	5.41	3.635	11.2	13.1	15.5	17.1	19.2	20.5	20.5	20.5	20.5
2	60.30	2.375	3.60	0.142	5.03	3.383	7.9	9.3	11.0	12.1	13.6	14.7	15.7	17.0	18.3
			3.91	0.154	5.44	3.654	8.6	10.1	11.9	13.1	14.8	16.0	17.0	18.5	19.9
			4.50	0.177	6.19	4.161	9.9	11.6	13.7	15.1	17.0	18.4	19.6	20.5	20.5
			5.54	0.218	7.48	5.027	12.2	14.2	16.9	18.6	20.5	20.5	20.5	20.5	20.5
2 1/2	73.05	2.875	5.16	0.203	8.64	5.805	11.4	13.3	15.7	17.3	19.5	20.5	20.5	20.5	20.5
3	76.10	2.996	3.60	0.142	6.44	4.325	7.9	9.3	11.0	12.1	13.6	14.7	15.7	17.0	18.3
			4.50	0.177	7.95	5.339	9.9	11.6	13.7	15.1	17.0	18.4	19.6	20.5	20.5
3 1/2	88.90	3.500	4.00	0.157	8.38	5.628	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			5.49	0.216	11.29	7.589	12.1	14.1	16.7	18.4	20.5	20.5	20.5	20.5	20.5
			5.00	0.197	10.35	6.952	11.0	12.9	15.2	16.8	18.9	20.5	20.5	20.5	20.5
4	101.60	4.000	4.00	0.157	9.63	6.470	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			5.00	0.197	11.91	8.004	11.0	12.9	15.2	16.8	18.9	20.5	20.5	20.5	20.5
			5.74	0.226	13.57	9.118	12.7	14.8	17.5	19.3	20.5	20.5	20.5	20.5	20.5
4 1/2	114.3	4.500	3.2	0.125	8.77	5.85	7.1	8.2	9.7	10.8	12.1	13.1	13.9	15.1	16.3
			3.6	0.141	9.83	6.57	7.9	9.3	11.0	12.1	13.6	14.7	15.7	17.0	18.3
			4.0	0.156	10.88	7.24	8.8	10.3	12.2	13.4	15.1	16.4	17.4	18.9	20.4
			4.4	0.172	11.92	7.96	9.7	11.3	13.4	14.8	16.6	18.0	19.2	20.5	20.5
			4.8	0.188	12.96	8.67	10.6	12.3	14.6	16.1	18.1	19.7	20.5	20.5	20.5
			5.2	0.203	13.99	9.32	11.5	13.4	15.8	17.5	19.7	20.5	20.5	20.5	20.5
			5.6	0.219	15-01	10.02	12.3	14.4	17.0	18.8	20.5	20.5	20.5	20.5	20.5
			6.0	0.237	16.02	10.80	13.2	15.4	18.3	20.2	20.5	20.5	20.5	20.5	20.5
			6.4	0.250	17.03	11.36	14.1	16.5	19.5	20.5	20.5	20.5	20.5	20.5	20.5
			7.1	0.281	18.77	12.59	15.7	18.3	20.5	20.5	20.5	20.5	20.5	20.5	20.5
			7.9	0.312	20.73	13.97	17.4	19.0	20.5	20.5	20.5	20.5	20.5	20.5	20.5
5 9/16	141.3	5.563	3.2	0.125	10.90	7.27	5.7	6.7	7.9	8.7	9.8	10.6	11.3	12.2	13.2
			4.0	0.156	13.54	9.02	7.1	8.3	9.9	10.9	12.2	13.2	14.1	15.3	16.5
			4.8	0.188	16.16	10.80	8.6	10.0	11.8	13.0	14.7	15.9	16.9	18.3	19.8
			5.6	0.219	18.74	12.51	10.0	11.7	13.8	15.2	17.1	18.5	19.7	20.5	20.5
			6.6	0.258	21.92	14.63	11.8	13.7	16.3	17.9	20.2	20.5	20.5	20.5	20.5
			7.1	0.281	23.50	15.87	12.7	14.8	17.5	19.3	20.5	20.5	20.5	20.5	20.5
			7.9	0.312	25.99	17.51	14.1	16.4	19.5	20.5	20.5	20.5	20.5	20.5	20.5
			8.7	0.344	28.45	19.19	15.5	18.1	20.5	20.5	20.5	20.5	20.5	20.5	20.5
6 5/8	168.3	6.625	3.2	0.125	13-03	8.69	4.8	5.6	8.3	9.1	10.3	11.1	11.8	12.8	13.8
			3.6	0.141	14.62	9.77	5.4	6.3	9.3	10.3	11.6	12.5	13.3	14.4	15.6
			4.0	0.156	16.21	10.79	6.0	7.0	10.3	11.4	12.8	13.9	14.8	16.0	17.3
			4.4	0.172	17.78	11.87	6.6	7.7	11.4	12.5	14.1	15.3	16.3	17.6	19.0
			4.8	0.188	19.35	12.94	7.2	8.4	12.4	13.7	15.4	16.7	17.8	19.3	20.5
			5.2	0.203	20.91	13.94	7.8	9.1	13.4	14.8	16.7	18.1	19.2	20.5	20.5
			5.6	0.219	22.47	15.00	8.4	9.8	14.5	16.0	18.0	19.5	20.5	20.5	20.5
			6.4	0.250	25.55	17.04	9.6	11.2	16.5	18.3	20.50	20.5	20.5	20.5	20.5
			7.1	0.280	28.22	18.99	10.6	12.4	18.4	20.2	20.5	20.5	20.5	20.5	20.5
			7.9	0.312	31.25	21.06	11.8	13.8	20.4	20.5	20.5	20.5	20.5	20.5	20.5
			8.7	0.344	34.24	23.10	13.0	15.2	20.5	20.5	20.5	20.5	20.5	20.5	20.5
			9.5	0.375	37.20	25.05	14.2	16.6	20.5	20.5	20.5	20.5	20.5	20.5	20.5
8 5/8	219.1	8.625	3.2	0.125	17.04	11.36	3.7	4.3	6.4	7.0	7.9	8.5	9.1	9.9	10.6
			4.0	0.156	21.22	14.12	4.6	5.4	7.9	8.8	9.9	10.7	11.4	12.3	13.3
			4.8	0.188	25.37	16.96	5.5	6.4	9.5	10.5	11.8	12.8	13.6	14.8	15.9
			5.2	0.203	27.43	18.28	6.0	7.0	10.3	11.4	12.8	13.9	14.8	16.0	17.3
			5.6	0.219	29.48	19.68	6.4	7.5	11.1	12.3	13.8	15.0	15.9	17.3	18.6
			6.4	0.250	33.57	22.38	7.4	8.6	12.7	14.0	15.8	17.1	18.2	19.7	20.5
			7.0	0.277	36.61	24.72	8.1	9.4	13.9	15.3	17.3	18.7	19.9	20.5	20.5
			7.9	0.312	41.14	27.73	9.1	10.6	15.7	17.3	19.5	20.5	20.5	20.5	20.5
			8.2	0.322	42.65	28.58	9.4	11.0	16.3	18.0	20.2	20.5	20.5	20.5	20.5
			8.7	0.344	45.14	30.45	10.0	11.7	17.3	19.1	20.5	20.5	20.5	20.5	20.5
			9.5	0.375	49.10	33.07	10.9	12.7	18.9	20.5	20.5	20.5	20.5	20.5	20.5
10 3/4	273.1	10.750	4.0	0.156	26.54	17.67	3.7	4.3	7.2	8.0	9.0	9.7	10.3	11.2	12.1
			4.8	0.188	31.76	21.23	4.4	5.2	8.7	9.6	10.8	11.7	12.4	13.4	14.5
			5.2	0-203	34.35	22.89	4.8	5.6	9.4	10.4	11.7	12.6	13.4	14.6	15.7
			5.6	0.219	36.94	24.65	5.2	6.0	10.1	11.2	12.5	13.6	14.5	15.7	16.9
			6.4	0.250	42.09	28.06	5.9	6.9	11.6	12.7	14.3	15.5	16.5	17.9	19.3
			7.1	0.279	46.57	31.23	6.6	7.6	12.8	14.1	15.9	17.2	18.3	19.9	20.5
			7.8	0.307	51.03	34.27	7.2	8.4	14.1	15.5	17.5	18.9	20.1	20.5	20.5
			8.7	0.344	56.72	38.27	8.0	9.4	15.7	17.3	19.5	20.5	20.5	20.5	20.5
			9.3	0.365	60.50	40.52	8.6	10.0	16.8	18.5	20.5	20.5	20.5	20.5	20.5
			11.1	0.438	71.72	48.28	10.2	11.9	20.0	20.5	20.5	20.5	20.5	20.5	20.5
12 3/4	323.9	12.750	4.4	0.172	34.67	23.13	3.4	4.0	6.7	7.4	8.3	9.0	9.6	10.4	11.2
			4.8	0.188	37.77	25.25	3.7	4.4	7.3	8.1	9.1	9.8	10.5	11.3	12.2
			5.2	0-203	40.87	27.23	4.0	4.7	7.9	8.7	9.8	10.6	11.3	12.3	13.2
			5.6	0.219	43.96	29.34	4.4	5.1	8.5	9.4	10.6	11.5	12.2	13.2	14.3
			6.4	0.250	50.11	33.41	5.0	5.8	9.7	10.7	12.1	13.1	13.9	15.1	16.3
			7.1	0-281	55.47	37.46	5.5	6.4	10.8	11.9	13.4	14.5	15.5	16.8	18.1
			7.9	0.312	61.56	41.48	6.1	7.2	12.0	13.3	14.9	16.2	17.2	18.7	20.1
			8.4	0.330	65.35	43.81	6-5	7.6	12.8	14.1	15.9	17.2	18.3	19.8	20.5
			8.7	0.344	67.62	45.62	6.8	7.9	13.2	14.6	16.4	17.8	18.9	20.50	20.5
			9.5	0.375	73.65	49.61	7.4	8.6	14.5	16.0	17.9	19.4	20.5	20.5	20.5
			10.3	0.406	79.65	53.57	8.0	9.3	15.7	17.3	19.5	20.5	20.5	20.5	20.5
			11.1	0.438	85.62	57.65	8.6	10.1	16.9	18.6	20.5	20.5	20.5	20.5	20.5

UTP PIPE

API 5L-LINE PIPES

Technical Data of Pipes Conforming To API 5L

NOTE : PRESSURE HOLDING TIME = 05 SECOND MINIMUM

1 Mpa = 10 bar

Tolerances : -

1) Outside Diameter of Body & Ends:

Specified Outside Diameter D mm(in)	Body Tolerances mm(in)	Ends Tolerances mm(in)	Out -of-roundness tolerances mm(in)	
			Pipe except the end	Pipe end
< 60.3 (2.375)	- 0.8 (0.031) to + 0.4 (0.016)	- 0.8 (0.031) to + 0.4 (0.016)	1.2 (0.048)	0.9 (0.036)
≥ 60.3 (2.375) to 168.3 (6.625)	±0.0075 D	-0.4 (0.016) to+ 1.6 (0.063)	0.020 D for D/t ≤ 75	0.015 D For D/t ≤ 75
> 168.3(6.625) to 610 (24.000)	± 0.0075 D, but maximum of ±3.2 (0.125)	± 0.005 D, but maximum of ± 1.6 (0.063)	0.020 D	0.015 D

2) Thickness Tolerances mm(in)

≤ 5.0(0.197) = ±0.5 (0.020)
> 5.0(0.197) to < 15.0(0.591) = ± 0.1t
(where t = wall thickness)

3) Mass Tolerances :

a) for pipe in grade A25 = + 10.0 %, - 5.0 % of nominal mass
b) for all other pipes = +10.0 %, - 3.5 % of nominal mass
C) mass of 18 tonnes or more for all other grade = -1.75 %

Mechanical Properties(Tensile):

PSL 1 Pipe	Gr. A or L210	Gr. B or L245	Gr. X42 or L290	Gr. X46 or L320	Gr. X52 or L360	Gr. X56 or L390	Gr. X60 or L415	Gr. X65 or L450	Gr. X70 or L485
Yield Strength MPa (min)	210	245	290	320	360	390	415	450	485
Tensile Strength MPa (min)	335	415	415	435	460	490	520	535	570
Elongation % minimum	Min .Elong. shall be determined by $A_f = 1940\ A^{0.2} / U^{0.9}$ (Where A= Area of test specimen, U= Min. specified tensile strength)								

PSL 2 Pipe	Gr. B orL245	Gr. X42 or L290	Gr. X46 or L320	Gr. X52 or L360	Gr. X56 or L390	Gr. X60 or L415	Gr. X65 or L450	Gr. X70 or L485	Gr. X80 or L555
Yield Strength MPa (min)	245 - 450[e]	290 - 495	320-525	360 - 530	390 - 545	415 - 565	450 - 600	485 - 635	555 - 705
Tensile Strength MPa (min)	415 - 655	415 - 655	435 - 655	460 - 760	490 - 760	520 - 760	535 - 760	570 - 760	625 - 825
Elongation % minimum	Min .Elong. shall be determined by $A_f = 1940\ A^{0.2} / U^{0.9}$ (Where A= Area of test specimen, U= Min. specified tensile strength)								
Ratio (YS/TS) Max.	0.93								

e= For pipe requiring longitudinal testing, the maximum yield strength shall be ≤ 495 Mpa

Chemical Properties : Composition (Max.%)

PSL 1	C	Mn	P	P	Cu	Ni	Cr	Mo	V+Nb Nb+V+Ti	Nb + V + Ti
Grade A or L210	0.22	0.90	0.030	0.030	0.50	0.50	0.50	0.15	--	
Grade B or L245	0.26	1.20	0.030	0.030	0.50	0.50	0.50	0.15	≤ 0.06	≤ 0.15
Grade X42 or L290	0.26	1.30	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X46 or L320	0.26	1.40	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X52 or L360	0.26	1.40	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X56 or L390	0.26	1.40	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X60 or L415	0.26	1.40	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X65 or L450	0.26	1.45	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15
Grade X70 or L485	0.26	1.65	0.030	0.030	0.50	0.50	0.50	0.15	--	≤ 0.15

PSL 2	C	Sl	Mn	P	S	V	Nb	Ti	Cu	Ni	Cr	Mo	CE IIW	CEpcm
Grade B or L245	0.22	0.45	1.20	0.025	0.015	0.05	0.05	0.04	0.50	0.30	0.30	0.15	0.43	0.25
Grade X42 or L290	0.22	0.45	1.30	0.025	0.015	0.05	0.05	0.04	0.50	0.30	0.30	0.15	0.43	0.25
Grade X46 or L320	0.22	0.45	1.30	0.025	0.015	0.05	0.05	0.04	0.50	0.30	0.30	0.15	0.43	0.25
Grade X52 or L360	0.22	0.45	1.40	0.025	0.015	≤ 0.15			0.50	0.30	0.30	0.15	0.43	0.25
Grade X56 or L390	0.22	0.45	1.40	0.025	0.015	≤ 0.15			0.50	0.30	0.30	0.15	0.43	0.25
Grade X60 or L415	0.12	0.45	1.60	0.025	0.015	≤ 0.15			0.50	0.50	0.50	0.50	0.43	0.25
Grade X65 or L450	0.12	0.45	1.60	0.025	0.015	≤ 0.15			0.50	0.50	0.50	0.50	0.43	0.25
Grade X70 or L485	0.12	0.45	1.70	0.025	0.015	≤ 0.15			0.50	0.50	0.50	0.50	0.43	0.25
Grade X80 or L555	0.12	0.45	1.85	0.025	0.015	≤ 0.15			0.50	1.00	0.50	0.50	0.43	0.25

Destructive & Non-Destructive Testing

Hydrostatic testing: 100% of pipe shall be tested at a Pressure specified in above table.

NDT: Weld seam of each pipe shall be tested by online Eddy Current test and online automatic ultrasonic test.

Flattening: i) No opening of the weld before the distance between the plates is less than 50% of the original outside diameter.

ii) There shall be no crack or break other than in the weld before the distance between the plates is less than 33% of the original outside diameter.

iii) No evidence of lamination or burnt metal shall develop during the flattening until opposite wall of the pipe meet.

Metallography: Micro Structure and Micro Hardness (HV10) test are carried out.

Impact Testing: For Only PSL 2 pipes up to Grade X70 (at 0°C), Minimum average absorbed energy = 27 J, Minimum Individual absorbed energy = 21J

Marking: Stencilling as per the specification & customer requirement.