

CHEMICAL & MECHANICAL PROPERTIES

Specification	Type	Grade	Chemical Composition										Mechanical Properties								Impact Energy J (Ft.lb) (min.)	Hydrostatic Test Pressure	
			C %	Mn %	P %	S %	Si %	V %	Nb %	Ti %	C.E.		Yield Strength				Tensile Strength						% Elongation e
											PCM	IIV	Min		Max		Min		Max				
													PSI	MPa	PSI	MPa	PSI	MPa	PSI	MPa			
API 5L	ERW PSL - 1	L210 or A	0.22	0.90	0.030	0.030	-	-	-	-	-	-	30500	210	-	-	48600	335	-	-	U.S Customary Unit e = 625,000 A ^{0.2} / U ^{0.9} S.I Unit e = 1940 A ^{0.2} / U ^{0.9} Legend : e = specified min. elongation A=Tensile test piece cross sectional area. U=Specified min. tensile strength.	U.S Customary Unit, P = 2ST / D S.I Unit P = 2000 ST/D S = Fibre Stress in PSI (MPa) = 60% of Min. Y.S for all sizes for Grade A & B . = 60% of Min.Y.S for all sizes ≤5 9/16" for Grade X-42 and above. = 75% of Min. Y.S for size > 5 9/16" & ≤ 8 5/8" for Grade X-42 and above. =85% of Min. Y.S for size >8 5/8" & <20" for Gr X-42 and above .	
		L245 or B	0.26	1.20	0.030	0.030	-	-	-	-	-	-	35500	245	-	-	60200	415	-	-			
		L290 or X-42	0.26	1.30	0.030	0.030	-	-	-	-	-	-	42100	290	-	-	60200	415	-	-			
		L320 or X-46	0.26	1.40	0.030	0.030	-	-	-	-	-	-	46400	320	-	-	63100	435	-	-			
		L360 or X-52	0.26	1.40	0.030	0.030	-	-	-	-	-	-	52200	360	-	-	66700	460	-	-			
		L390 or X-56	0.26	1.40	0.030	0.030	-	-	-	-	-	-	56600	390	-	-	71100	490	-	-			
		L415 or X-60	0.26	1.40	0.030	0.030	-	-	-	-	-	-	60200	415	-	-	75400	520	-	-			
		L450 or X-65	0.26	1.45	0.030	0.030	-	-	-	-	-	-	65300	450	-	-	77600	535	-	-			
		L485 or X-70	0.26	1.65	0.030	0.030	-	-	-	-	-	70300	485	-	-	82700	570	-	-				
API 5L	ERW PSL - 2	L245M or BM	0.22	1.20	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	35500	245	65300	450	60200	415	110200	760	e = 1942.57 A ^{0.2} / U ^{0.9} e = 1942.57 A ^{0.2} / U ^{0.9} * Applicable for pipes with < 508 mm OD and any wall thickness, and pipe with 508 mm and larger, and wall thickness > 9.5 mm ** Applicable for pipes with 508 mm OD and larger wall thickness ≤ 9.5 mm	P = 2000 ST/D (limited to 19.3 MPa) S = YST 210 = 124 for Std. Pressure, 155 for ALT pressure YST 240=145 for std. Pressure 181 for ALT pressure, P = 2000 ST / D or 20700 Kpa whichever smaller S = Fibre Stress equal to specified minimum Y.S Pipe Size 168.3 to 219.1 mm OD = 75% 273.0 to 457.2 mm OD = 85% 508 mm OD and large = 90%	
		L290M or X42M	0.22	1.3	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	42100	290	71800	495	60200	415	110200	760			
		L320M or X46M	0.22	1.3	0.025	0.015	0.45	0.050	0.050	0.040	0.25	0.43	46400	320	76100	525	63100	435	110200	760			
		L360M or X52M	0.22	1.4	0.025	0.015	0.45	-	-	-	0.25	0.43	52200	360	76900	530	66700	460	110200	760			
		L390M or X56M	0.22	1.4	0.025	0.015	0.45	-	-	-	0.25	0.43	56600	390	79000	545	71100	490	110200	760			
		L415M or X60M	0.12	1.6	0.025	0.015	0.45	-	-	-	0.25	0.43	60200	415	81900	565	75400	520	110200	760			
		L450M or X65M	0.12	1.6	0.025	0.015	0.45	-	-	-	0.25	0.43	65300	450	87000	600	77600	535	110200	760			
		L485M or X70M	0.12	1.7	0.025	0.015	0.45	-	-	-	0.25	0.43	70300	485	92100	635	82700	570	110200	760			
		L555M or X80M	0.12	1.85	0.025	0.015	0.45	-	-	-	0.25	0.43	80500	555	102300	705	90600	625	119700	825			
IS:1978	ERW	YST - 210	0.22	0.90	0.040	0.050	-	-	-	-	-	-	210	-	-	-	330	-	-	e = 1942.57 A ^{0.2} / U ^{0.9} e = 1942.57 A ^{0.2} / U ^{0.9}	P = 2000 ST/D (limited to 19.3 MPa) S = YST 210 = 124 for Std. Pressure, 155 for ALT pressure YST 240=145 for std. Pressure 181 for ALT pressure, P = 2000 ST / D or 20700 Kpa whichever smaller S = Fibre Stress equal to specified minimum Y.S Pipe Size 168.3 to 219.1 mm OD = 75% 273.0 to 457.2 mm OD = 85% 508 mm OD and large = 90%		
		YST - 240	0.27	1.15	0.040	0.050	-	-	-	-	-	-	240	-	-	-	410	-	-				
IS:1979	ERW	YST - 290	0.28	1.25	0.040	0.050	-	-	-	-	-	-	290	-	-	-	410	-	-				
		YST - 320	0.30	1.35	0.040	0.050	-	-	-	-	-	-	320	-	-	-	430	-	-				
		YST - 360	0.30	1.35	0.040	0.050	-	-	-	-	-	-	360	-	-	-	450*/500**	-	-				
		YST - 390	0.26	1.35	0.040	0.050	-	-	-	-	-	-	390	-	-	-	490*/520**	-	-				
		YST - 410	0.26	1.35	0.040	0.050	-	-	-	-	-	-	410	-	-	-	520*/540**	-	-				
		YST - 450	0.26	1.40	0.040	0.050	-	-	-	-	-	-	450	-	-	-	530*/550**	-	-				
ASTM A - 53	ERW	A	0.25	0.95	0.050	0.045	-	-	-	-	-	30000	205	-	-	48000	330	-	-	e = 625,000 A ^{0.2} / U ^{0.9} G.L = 5.65 √ area	P = 2 ST / D or 2800 PSI (19.3 MPa) whichever smaller S = 0.60 times min. specified Y.S PSI (Kpa) P = 2ST / D shall not exceed 5 MPa S = Stress which shall be taken 40% of min. specified T.S		
		B	0.30	1.20	0.050	0.045	-	-	-	-	-	35000	240	-	-	60000	415	-	-				
IS:3589	ERW	Fe 330	0.16	1.20	0.040	0.040	-	-	-	-	-	-	195	-	-	-	330	-	-				
		Fe 410	0.20	1.30	0.040	0.040	-	-	-	-	-	-	235	-	-	-	410	-	-				
		Fe 450	0.25	1.20	0.040	0.040	-	-	-	-	-	-	275	-	-	-	450	-	-				
IS:4270	ERW	Fe 410	-	-	0.040	0.040	-	-	-	-	-	-	235	-	-	-	410	-	-	Hardness= 230 HV max. G.L = 5.65 √ area	P = 280 T/D for Fe 410 P = 350 T/D for Fe 450 Max. pressure applied shall be 7 MPa		
		Fe 450	-	-	0.040	0.040	-	-	-	-	-	-	275	-	-	-	415	-	-				

NOTE : Refer current editions of Relevant specification for Dimensions and Propertie data
* Specifications are subjected to change without any prior notice

A = Specimen crosssectional area P = Test Pressure PSI (MPa)
U = Specified Min. T.S T = Specified wall thickness