CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

SPECIFI-CATION	TYPE	STEEL GRADE	CHEMICAL COMPOSITION										MECHANICAL PROPERTIES								IMPACT ENERGY /
		(STEEL NAME)											YIELD STRENGTH				TENSILE STRENGTH				% ELONGATION	HARDNESS
			C	Mn	P	S	Si	V	Nb	Ti	C.E.		Min.		Max.		Min.		Max.			
			Max.	Max.	Max.	Max.				Max.	PCM	IIW	PSI	Mpa	PSI	Mpa	PSI	Mpa	PSI	Mpa	Af	JOULE
API 5L	ERW	L210 or A	0.22	0.90	0.030	0.030	-	-	-	-	-	-	30,500	210	-	-	48.600	335	-	-	U.S. Customary Unit	-
	PSL-1	L245 or B	0.26	1.20	0.030	0.030	-	-	-	-	-	-	35,500	245	-	-	60.200	415	-	-	C = 625,000	-
		L290 or X42	0.26	1.30	0.030	0.030	-	-	-	-	-	-	42,100	290	-	-	60,200	415	-	-	Af= C Axc0.2/u0.9	-
		L320 or X46	0.26	1.40	0.030	0.030	-	-	-	-	-	-	46,400	320	-	-	63,100	435	-	-		-
		L360 or X52	0.26	1.40	0.030	0.030	-	-	-	-	-	-	52,200	360	-	-	66,700	460	-	-		-
		L390 or X56	0.26	1.40	0.030	0.030	-	-	-	-	-	-	56,600	390	-	-	71,100	490	-	-	S.I. Unit	-
		L415 or X60	0.26	1.40	0.030	0.030	-	-	-	-	-	-	60,200	415	-	-	75,400	520	-	-	C = 1940	-
		L450 or X65	0.26	1.45	0.030	0.030	-	-	-	-	-	-	65,300	450	-	-	77,600	535	-	-	Af= C Axc0.2/u0.9	-
		L485 or X70	0.26	1.65	0.030	0.030	-	-	-	-	-	-	70,300	485	-	-	82,700	570	-	-		-
																						T/L
																						27/40
API 5L	ERW	L245N or BN	0.24	1.20	0.025	0.015	0.40	-	-	0.04	0.25	0.43	35,500	245	65,300	450	60,200	415	110,200	760		-DO-
	PSL-2	L290N or X42N	0.24	1.20	0.025	0.015	0.40	0.06	0.05	0.04	0.25	0.43	42,100	290	71,800	495	60,200	415	110,200	760		-DO-
		L320N or X46N	0.24	1.40	0.025	0.015	0.40	0.07	0.05	0.04	0.25	0.43	46,400	320	76,100	525	63,100	435	110,200	760		-DO-
		L360N or X52N	0.24	1.40	0.025	0.015	0.45	0.10	0.05	0.04	0.25	0.43	52,200	360	76,900	530	66,700	460	110,200	760		-DO-
		L390N or X56N	0.24	1.40	0.025	0.015	0.45	0.10	0.05	0.04	0.25	0.43	56,600	390	79,000	545	71,100	490	110,200	760		-DO-
		L415N or X60N	0.24	1.40	0.025	0.015	0.45	0.10	0.05	0.04	AS AGREED		56,600	415	81,900	565	75,400	520	110,200	760		-DO-
		L245M or BM	0.22	1.20	0.025	0.015	0.45	0.05	0.05	0.04	0.25	0.43	35,500	245	65,300	450	60,200	415	110,200	760		-DO-
		L290M or X42M	0.22	1.30	0.025	0.015	0.45	0.05	0.05	0.04	0.25	0.43	42,100	290	71,800	495	;60,200	415	110,200	760		-DO-
		L320M or X46M	0.22	1.30	0.025	0.015	0.45	0.05	0.05	0.04	0.25	0.43	46,400	320	76,100	525	63,100	435	110,200	760		-DO-
		L360M or X52M	0.22	1.40	0.025	0.015	0.45	-	-	-	0.25	0.43	52,200	360	76,900	530	66,700	460	110,200	760		-DO-
		L390M or X56M	0.22	1.40	0.025	0.015	0.45	-	-	-	0.25	0.43	56,600	390	79,000	545	71,100	490	110,200	760		-DO-
		L415M or X60M	0.12	1.60	0.025	0.015	0.45	-	-	-	0.25	0.43	60,200	415	81,900	565	75,400	520	110,200	760		-DO-
		L450M or X65M	0.12	1.60	0.025	0.015	0.45	-	-	-	0.25	0.43	65,300	450	87,000	600	77,600	535	110,200	760		-DO-
		L485M or X70M	0.12	1.70	0.025	0.015	0.45	-	-	-	0.25	0.43	70,300	485	92,100	635	82,700	570	110,200	760		-DO-
																						T=TRANSVERSE
																						L=LONGITUDINAL
IS:1978	ERW	YST-210	0.22	0.90	0.040	0.050	-	-	-	-	-	-	-	210	-	-	-	330		-	e=1942.57 $A^{0.2}$/ $U.^{09}$	
		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		-	e=1942.57 $A^{0.2}$/ $U.^{09}$	
		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**		-		
		YST-480	0.23	1.60	0.040	0.050	-	-	-	-	-	-	-	480	-	-	-	565		-		
				*		Applicable for pipes with , 508mm OD and any Wall thickness, and pipe with 508mm OD and larger, and Wall thickness >9.5mm																	
				**		Applicable for pipes with 508 mm OD and larger and wall thickness ≤ 9.5 mm.																
IS:1239	ERW	-	0.20	1.30	0.040	0.040	-	-	-	-	-	-	-	-	-	-	-	320	-	-	12 UPTO 25 mm NB	
																					20 ABOVE 25 mm NB	
IS:3589	ERW	Fe 330	0.16	1.20	0.040	0.040	-	-	-	-	-	-	-	195	-	-	-	330	-	-	20	
		Fe 410	0.20	1.30	0.040	0.040	-	-	-	-	-	0.45	-	235	-	-	-	410	-	-	18	
		Fe 450	0.25	1.20	0.040	0.040	-	-	-	-	-	0.45	-	275	-	-	-	450	-	-	15	
																					G.L.= 5.65 √Area	
IS:1161	ERW	YST-210	0.12	0.60	0.040	0.040	-	-	-	-	-	-	-	210	-	-	-	330	-	-	20	
		YST-240	0.16	1.20	0.040	0.040	-	-	-	-	-			240	-	-	-	410	-	-	17	
		YST-310	0.25	1.30	0.040	0.040	-	-	-	-	-	0.45	-	310	-	-	-	450	-	-	14	
																					GL=5.65 √ Area	
IS:4270	ERW	Fe 410	-	-	0.040	0.040	-	-	-	-	-	-	-	235	-	-	-	410	-	-	15	Hardness=230 HV Max.
		Fe 450	-	-	0.040	0.040	-	-	-	-	-	-	-	275	-	-	-	450	-	-	13	
																					G.L. =5.65√Area	