

MECHANICAL PROPERTIES

Norms	Delivery condition	Level	Steel Grade	Yield strength <i>Rt0,5, PSI (MPa)</i>		Tensile strength <i>Rm, PSI (MPa)</i>		Ratio <i>Rt05 / Rm</i>
				<i>minimum</i>	<i>maximum</i>	<i>minimum</i>	<i>maximum</i>	
ASTM A53			Grade A	30000(205)	35000(240)	48000(330)	60000(415)	
			Grade B	30000(205)	35000(240)	48000(330)	60000(415)	
LAPI 5L & ISO 3183	Normalized or normalizing formed	PSL1	L210 or A	30500(210)		48600(335)		
			L245 or r B	35500(245)		60200(415)		
			L290 or X42	42100(290)		60200(415)		
			L320 or X46	46400(320)		63100(435)		
			L360 or X52	52200(360)		66700(460)		
			L390 or X56	56600(390)		71100(490)		
			L415 or X60	60200(415)		75400(520)		
			L450 or X65	65300(450)		77600(535)		
	Normalized	PSL2	L245N or BN	35500(245)	65300(450)	60200(415)	95000(655)	0.93
			L290N or X42N	42100(290)	71800(495)	60200(415)	95000(655)	0.93
			L320N or X46N	46400(320)	76100(525)	63100(435)	95000(655)	0.93
			L360N or X52N	52200(360)	76900(530)	66700(460)	110200(760)	0.93
			L390N or X56N	56600(390)	79000(545)	71100(490)	110200(760)	0.93
			L415N or X60N	60200(415)	81900(565)	75400(520)	110200(760)	0.93
	Quenched and tempered	PSL2	L245Q or BQ	35500(245)	65300(450)	60200(415)	95000(655)	0.93
			L290Q or X42Q	42100(290)	71800(495)	60200(415)	95000(655)	0.93
			L320Q or X46Q	46400(320)	76100(525)	63100(435)	95000(655)	0.93
			L360Q or X52Q	52200(360)	76900(530)	66700(460)	110200(760)	0.93
			L390Q or X56Q	56600(390)	79000(545)	71100(490)	110200(760)	0.93
			L415Q or X60Q	60200(415)	81900(565)	75400(520)	110200(760)	0.93
			L450Q or X65Q	65300(450)	87000(600)	77600(535)	110200(760)	0.93
			L485Q or X70Q	70300(485)	92100(635)	82700(570)	110200(760)	0.93
	Annex H Normalized	PSL2	L245NS or BNS	35500(245)	65300(450)	60200(415)	95000(655)	0.93
			L290NS or X42NS	42100(290)	71800(495)	60200(415)	95000(655)	0.93
			L320NS or X46NS	46400(320)	76100(525)	63100(435)	95000(655)	0.93
			L360NS or X52NS	52200(360)	76900(530)	66700(460)	110200(760)	0.93
	Annex H Quenched and tempered	PSL2	L245QS or BQS	35500(245)	65300(450)	60200(415)	95000(655)	0.93
			L290QS or X42QS	42100(290)	71800(495)	60200(415)	95000(655)	0.93
L320QS or X46QS			46400(320)	76100(525)	63100(435)	95000(655)	0.93	
L360QS or X52QS			52200(360)	76900(530)	66700(460)	110200(760)	0.93	
L390QS or X56QS			56600(390)	79000(545)	71100(490)	110200(760)	0.93	
L415QS or X60QS			60200(415)	81900(565)	75400(520)	110200(760)	0.93	

			L450QS or X65QS	65300(450)	87000(600)	77600(535)	110200(760)	0.93
ISO 3183	Annex A Normalized	PSL2	L245NE or BNE	35500(245)	63800(440)	60200(415)	95000(655)	0.80
			L290NE or X42NE	42100(290)	63800(440)	60200(415)	95000(655)	0.85
			L360NE or X52NSE	52200(360)	74000(510)	66700(460)	110200(760)	0.85
			L415NE or X60NSE	60200(415)	81900(565)	75400(520)	110200(760)	0.85

Standard	Level	Grade	Yield Strength (ksi)		Tensile Strength (ksi)	Total elongation under Load %	Hardness max.		Specified Wall Thickness (In.)	Allowable Hardness Variation
			minim	maxim	minim		HRC	HB W		HRC
API 5CT	PSL1	H40	40	80	60	0.5				
		R95	95	110	105	0.5				
		C110	110	120	115	0.7	30	286	≤0.500	3.0
									0.501 to 0.749	4.0
	T95(1)	95	110	105	0.5	25.4	255	≥1.000	6.0	
≤0.500								3.0		
	PSL2	J55	55	80	75	0.5				