API 5L PSL 2 Pipe Mechanical Properties
Tensile Strength, Yield Strength, Elongation

Pipe grade	Pipe body of seamless and welded pipes						Weld seam of HFW, SAW and COW pipes
	Yield strength [a]		Tensile strength [a]		Ratio [a,c]	Elongation (on 50 mm or 2 in)	Tensile strength [d]
	$R_{t0.5}$		Rm		$R_{t0.5}/R_m$	A_f	Rm
	MPa (psi)		MPa (psi)			%	MPa (psi)
	minimum	maximum	minimum	maximum	maximum	minimum	minimum
L245R or BR L245N or BN L245Q or BQ L245M or BM	245 (35 500)	450 e (65 300) e	415 (60 200)	655 (95 000)	0.93	f	415 (60 200)
L290R or X42R L290N or X42N L290Q or X42Q L290M or X42M	290 (42 100)	495 (71 800)	415 (60 200)	655(95 000)	0.93	f	415 (60 200)
L320N or X46N L320Q or X46Q L320M or X46M	320 (46 400)	525 (76 100)	435 (63 100)	655 (95 000)	0,93	f	435 (63 100)
L360N or X52N L360Q or X52Q L360M or X52M	360 (52 200)	530 (76 900)	460 (66 700)	760 (110 200)	0,93	f	460 (66 700)
L390N or X56N L390Q or X56Q L390M or X56M	390 (56 600)	545 (79 000)	490 (71 100)	760 (110 200)	0,93	f	490 (71 100)
L415N or X60N L415Q or X60Q L415M or X60M	415 (60 200)	565 (81 900)	520 (75 400)	760 (110 200)	0,93	f	520 (75 400)
L450Q or X65Q L450M or X65M	450 (65 300)	600 (87 000)	535 (77 600)	760 (110 200)	0,93	f	535 (77 600)
L485Q or X70Q L485M or X70M	485 (70 300)	635 (92 100)	570 (82 700)	760 (110 200)	0,93	f	570 (82 700)
L555Q or X80Q L555M or X80M	555 (80 500)	705 (102 300)	625 (90 600)	825 (119 700)	0,93	f	625 (90 600)
L625M or X90M	625 (90 600)	775 (112 400)	695 (100 800)	915 (132 700)	0,95	f	695 (100 800)
L625Q or X90Q	625 (90 600)	775 (112 400)	695 (100 800)	915 (132 700)	0,97 [g]	f	695 (100 800)
L690M or X100M	690 [b] (100 100) [b]	840 [b] (121 800) [b]	760 (110 200)	990 (143 600)	0,97 [h]	f	760 (110 200)
L690Q or X100Q	690 [b] (100 100) [b]	840 [b] (121 800) [b]	760 (110 200)	990 (143 600)	0,97 [h]	f	760 (110 200)
L830M or X120M	830 [b] (120 400) [b]	1050 [b] (152 300) [b]	915 (132 700)	1 145 (166 100)	0,99 [h]	f	915 (132 700)

a. For intermediate grades, the difference between the specified maximum yield strength and the specified minimum yield strength shall be as given in the table for the next higher grade, and the difference between the specified minimum tensile strength and the specified minimum yield strength shall be as given in the table for the next higher grade. For intermediate grades up to Grade L320 or X46, the tensile strength shall be ≤ 655 MPa (95 000 psi). For intermediate grades greater than Grade L320 or X46 and lower than Grade L555 or X80, the tensile strength shall be ≤ 760 MPa (110 200 psi).For intermediate grades higher than Grade L555 or X80, the maximum permissible tensile strength shall be obtained by interpolation. For SI units, the calculated value shall be rounded to the nearest 5 MPa. For USC units, the calculated value shall be rounded to the nearest 100 psi.

b. For grades > L625 or X90, Rp0,2 applies.

c. This limit applies for pipe with *D* > 323,9 mm (12.750 in).

d. For intermediate grades, the specified minimum tensile strength for the weld seam shall be the same value as was determined for the pipe body using footnote a).

e. For pipe requiring longitudinal testing, the maximum yield strength shall be ≤ 495 MPa (71 800 psi).

f. The specified minimum elongation, *A* f, shall be as determined using the following equation:

$$A_f = C\frac{A_{xc}^{0,2}}{U^{0,9}}$$

Where

C is 1940 for calculations using IS units and 625000 for calculations using USC units;

Axc is the applicable tensile test piece cross-section area, expressed in square mm or square inch, as follows:

- for circular cross-section test pieces, 130mm^2 for 12.7 mm and 8.9 mm diameter test pieces; and 65 mm^2 (0.10 in^2) for 6,4 mm (0.250 in) diameter test pieces;
- for full-section test pieces, the lesser of a) 485 mm^2 (0.75 in^2) and b) the cross-sectional area of the test piece, derived using the specified outside diameter and the specified wall thickness of the pipe, rounded to the nearest 10 mm^2 (0.01 in^2);
- for strip test pieces, the lesser of a) 485 mm2 (0.75 in2) and b) the cross-sectional area of the test piece, derived using the specified width of the test piece and the specified wall thickness of the pipe, rounded to the nearest 10 mm2 (0.01 in^2);

U is the specified minimum tensile strength, expressed in megapascals (pounds per square inch).

Lower values of *R* t0,5/*R* m may be specified by agreement.

g. Lower values of Rt0,5/Rm may be specified by agreement.

h. For grades > L625 or X90, Rp0,2 /Rm applies. Lower values of Rp0,2 /Rm may be specified by agreement.

For more info please visit http://www.octalsteel.com/api-5l-pipe-specification