



STEELS TABLE

CHEMICAL ANALYSIS AND MECHANICAL PROPERTIES

| NORM | GRADE | EXECUTION | CHEMICAL ELEMENTS (% on mass) | | | | | | | | | | | Yield strength Rt0.5 (Mpa) | Tensile strength Rm (Mpa) |
|-----------------|-------|-----------|-------------------------------|------------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|-------------------------------|------------------------------|
| | | | C max. | Mn max. | P max. | S max. | V max. | Nb max. | Ti max. | Cu max. | Ni max. | Cr max. | Mo max. | | |
| API 5L PSL 1 | A | S | 0.22 | 0.90 | 0.030 | 0.030 | - | - | - | 0.50 | 0.50 | 0.50 | 0.15 | 210 | 335 |
| | | W | 0.22 | 0.90 | | | - | - | - | | | | | | |
| | B | S | 0.28 | 1.20 | | | a,b | a,b | b | | | | | 245 | 415 |
| | | W | 0.26 | 1.20 | | | a,b | a,b | b | | | | | | |
| | X42 | S | 0.28 | 1.30 | | | b | b | b | | | | | 290 | 415 |
| | | W | 0.26 | 1.30 | | | b | b | b | | | | | | |
| | X46 | S | 0.28 | 1.40 | | | b | b | b | | | | | 320 | 435 |
| | | W | 0.26 | 1.40 | | | b | b | b | | | | | | |
| | X52 | S | 0.28 | 1.40 | | | b | b | b | | | | | 360 | 460 |
| | | W | 0.26 | 1.40 | | | b | b | b | | | | | | |
| | X56 | S | 0.28 | 1.40 | | | b | b | b | | | | | 390 | 490 |
| | | W | 0.26 | 1.40 | | | b | b | b | | | | | | |
| | X60 | S | 0.28 | 1.40 | | | b | b | b | | | | | 415 | 520 |
| | | W | 0.26 | 1.40 | | | b | b | b | | | | | | |
| X65 | S | 0.28 | 1.40 | b | b | b | 450 | 535 | | | | | | | |
| | W | 0.26 | 1.45 | b | b | b | | | | | | | | | |
| X70 | S | 0.28 | 1.40 | b | b | b | 485 | 570 | | | | | | | |
| | W | 0.26 | 1.65 | b | b | b | | | | | | | | | |
| ASTM A53 | A | S | 0.25 | 0.95 | 0.05 | 0.045 | 0.08* | - | - | 0.40* | 0.40* | 0.40* | 0.15* | 205 | 330 |
| | | W (ERW) | 0.25 | 0.95 | 0.05 | 0.045 | 0.08* | - | - | 0.50* | 0.40* | 0.40* | 0.15* | | |
| | B | S | 0.30 | 1.20 | 0.05 | 0.045 | 0.08* | - | - | 0.40* | 0.40* | 0.40* | 0.15* | 240 | 415 |
| | | W (ERW) | 0.30 | 1.20 | 0.05 | 0.045 | 0.08* | - | - | 0.50* | 0.40* | 0.40* | 0.15* | | |

a Nb + V ≤ 0.06 %

b Nb + V + Ti ≤ 0.15 %

S = seamless pipes

W = welded pipes

* V + Cu + Ni + Cr + Mo < 1.00 %

Note: the yield and tensile strength values stated in the table here above are the minimum requirements foreseen by the norm, that does not foresee maximum values.