

SA-516

Carbon Steel Pressure Vessel Plates For Moderate & Lower Temperatures

TABLE 1 CHEMICAL REQUIREMENTS

| Elements | Composition, % | | | |
|---------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | Grade 55 (Grade 380) | Grade 60 (Grade 415) | Grade 65 (Grade 450) | Grade 70 (Grade 485) |
| Carbon, max ^a : | | | | |
| 1/2 in. (12.5 mm) and under | 0.18 | 0.21 | 0.24 | 0.27 |
| Over 1/2 in. to 2 in. (12.5 to 50 mm), incl | 0.20 | 0.23 | 0.26 | 0.28 |
| Over 2 in. to 4 in. (50 to 100 mm), incl | 0.22 | 0.25 | 0.28 | 0.30 |
| Over 4 to 8 in. (100 to 200 mm), incl | 0.24 | 0.27 | 0.29 | 0.31 |
| Over 8 in. (200 mm) | 0.26 | 0.27 | 0.29 | 0.31 |
| Manganese: | | | | |
| 1/2 in (12.5) and under: | | | | |
| Heat analysis ^b | 0.60-0.90 | 0.60-0.90 | 0.85-1.20 | 0.85-1.20 |
| Product analysis ^b | 0.55-0.98 | 0.55-0.98 | 0.79-1.30 | 0.79-1.20 |
| Over 1/2 in (12.5): | | | | |
| Heat analysis | 0.60-1.20 | 0.85-1.20 | 0.85-1.20 | 0.85-1.20 |
| Product analysis | 0.55-1.30 | 0.79-1.30 | 0.79-1.30 | 0.79-1.30 |
| Phosphorus, max ^a | 0.035 | 0.035 | 0.035 | 0.035 |
| Sulfur, max ^a | 0.04 | 0.04 | 0.04 | 0.04 |
| Silicon: | | | | |
| Heat analysis | 0.15-0.40 | 0.15-0.40 | 0.15-0.40 | 0.15-0.40 |
| Product analysis | 0.13-0.45 | 0.13-0.45 | 0.13-0.45 | 0.13-0.45 |

^a Applies to both heat and product analysis

^b Grade 60 plates 1/2 in. (12.5 mm) and under in thickness may have 0.85-1.20% manganese on heat analysis and 0.79-1.30% manganese on product analysis.

TABLE 2 TENSILE REQUIREMENTS

| | Grade | | | |
|--------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| | 55(380) | 60(415) | 65(450) | 70(485) |
| Tensile strength, ksi (MPa) | 55-75(380-515) | 60-80(415-550) | 65-85(450-585) | 70-90(485-620) |
| Yield strength, min ^b ksi (MPa) | 30(205) | 32(220) | 35(240) | 38(260) |
| Elongation in 8 in. (200 mm), min. % | 23 ^a | 21 ^a | 19 ^a | 17 ^a |
| Elongation in 2 in. (50 mm), min. % | 27 ^a | 25 ^a | 23 ^a | 21 ^a |

^a See Specification A 20/A 20M.

^b Determined by either the 0.2% offset method or the 0.5% extension-under-load method.

SA-285/SA-283

Low & Intermediate Tensile Strength Carbon Steel Pressure Vessel Plates

TABLE 1 CHEMICAL REQUIREMENTS

| Elements | Composite, percent | | |
|------------------------------|--------------------|---------|---------|
| | Grade A | Grade B | Grade C |
| Carbon, max ^a | 0.17 | 0.22 | 0.28 |
| Manganese, max | | | |
| Heat analysis | 0.90 | 0.90 | 0.90 |
| Product Analysis | 0.98 | 0.98 | 0.98 |
| Phosphorus, max ^a | 0.035 | 0.035 | 0.035 |
| Sulfur, max ^a | 0.040 | 0.040 | 0.040 |

^a Applied to both heat and product analysis

TABLE 2 TENSILE REQUIREMENTS

| | Grade A | | Grade B | | Grade C | |
|------------------------------------------------------|---------|-----------|---------|-----------|---------|-----------|
| | ksi | (MPa) | ksi | (MPa) | ksi | (MPa) |
| Tensile strength | 45-65 | (310-450) | 50-65 | (345-450) | 55-75 | (380-515) |
| Yield strength, min ^A | 24 | (165) | 27 | (185) | 30 | (205) |
| Elongation in 8 in. or (200 mm), min. % ^B | 27 | | 25 | | 23 | |
| Elongation in 2 in. or (50 mm), min. % | 30 | | 28 | | 27 | |

^A Determined by either the 0.2% offset method or the 0.5% extension-under-load method.

^B See Specification A 20/A 20M

