



SA 387 Gr 12 / SA 387 Gr 5 / SA 387 Gr 9 / SA 387 Gr 91

Overview SA 387 Gr 12 / SA 387 Gr 5 / SA 387 Gr 9 / SA 387 Gr 91

Certain applications with the Refining and Power Industries along with specific environments within Chemical Plants require grades which address limited corrosion and elevated temperature concerns.

SA 387 Gr 12 is utilized to address low to moderate temperature challenges. For conditions with higher elevated operating temperatures, our SA 387 Gr 5, SA 387 Gr 9 and SA 387 Gr 91 are often used. Minimum tempering temperature for these cr / mo grades are:

SA 387 Gr 12 (1150 °F)

SA 387 Gr 9 (1250 °F)

SA 387 Gr 5 (1300 °F)

SA 387 Gr 91 (1350 °F)

- Thickness' from 3/16" – 6"
- Supplemental testing available to simulate application and environment conditions
- These grades can be specified in either Class 1 or Class 2



- Computer controlled processing per customer specifications

In the tables use SA 387 Gr 12, SA 387 Gr 5, SA 387 Gr 9, and SA 387 Gr 91

Chemical Requirements

*Elements represented in percentage

Element Composition %	SA 387 Grade 12	SA 387 Grade 5	SA 387 Grade 9	SA 387 Grade 91
Carbon, max:				
Heat analysis	0.05-0.17	0.15 max	0.15 max	0.08-0.12
Product analysis	0.04-0.17	0.15 max	0.15 max	0.06-0.15
Manganese, max:				
Heat analysis	0.40-0.65	0.30-0.60	0.30-0.60	0.30-0.60
Product analysis	0.35-0.73	0.25-0.66	0.25-0.66	0.25-0.66
Phosphorus, max:				
Heat analysis	0.025	0.025	0.025	0.020
Product analysis	0.025	0.025	0.025	0.025
Sulfur, max:				



Element Composition %	SA 387 Grade 12	SA 387 Grade 5	SA 387 Grade 9	SA 387 Grade 91
Heat analysis	0.025	0.025	0.025	0.010
Product analysis	0.025	0.025	0.025	0.012
Silicon:				
Heat analysis	0.15-0.40	0.50 max	1.00 max	0.20-0.50
Product analysis	0.13-0.45	0.55 max	1.05 max	0.18-0.56
Chromium:				
Heat analysis	0.80-1.15	4.00-6.00	8.00-10.00	8.00-9.50
Product analysis	0.74-1.21	3.90-6.10	7.90-10.10	7.90-9.60
Molybdenum:				
Heat analysis	0.45-0.60	0.45-0.65	0.90-1.10	0.85-1.05
Product analysis	0.40-0.65	0.40-0.70	0.85-1.15	0.80-1.10

Tensile Requirements For Class 1 Plates

	SA 387 Grade 12	SA 387 Grade 22, 5, 9
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	SA 387 Grade 12	SA 387 Grade 22, 5, 9
Tensile strength, ksi [MPa]	55 to 80 [380 to 550]	60 to 85 [415 to 585]
Yield strength min. ksi [MPa]	33	30
Elongation in 8 in. [200 mm], min. %	18	
Elongation in 2 in. [50 mm], min. %	22	18
Reduction of area, min %		45 40

Tensile Requirements For Class 2 Plates

	SA 387 Grade 12	SA 387 Grade 5, 9	SA 387 Grade 91
Tensile strength, ksi [MPa]	65 to 85 [450 to 585]	75 to 100 [515 to 690]	85 to 110 [585 to 760]
Yield strength min. ksi [MPa]/(0.2% offset)	40 [275]	45 [310]	60 [415]



	SA 387 Grade 12	SA 387 Grade 5, 9	SA 387 Grade 91
Elongation in 8 in. [200 mm], min. %B	19	...	...
Elongation in 2 in. [50 mm], min. %B	22	18	18
Reduction of area, min %	...	45 40	...