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|-----------------------|-------------------------|
| Quality | F12 |
| According to Standard | ASTM A 182/A 182M - 10a |
| Number | - |

| Comparable Standards | EN | W.N. | BS |
|----------------------|-----------|--------|----|
| | 16CrMo4-4 | 1.7337 | - |

| Chemical Analysis - Class 1 | C % | Mn % | Si % | P% | Cr % | Ni % | Mo % | S% | Other Elements |
|-----------------------------|--------------|--------------|--------------|-----------|--------------|--------------|--------------|--------------|----------------|
| | | 0.05 to 0.15 | 0.30 to 0.60 | 0.50 max. | 0.045 | 0.80 to 1.25 | — | 0.44 to 0.65 | 0.045 |
| Class 2 | C % | Mn % | Si % | P% | Cr % | Ni % | Mo % | S% | Other Elements |
| | 0.10 to 0.20 | 0.30 to 0.80 | 0.10 to 0.60 | 0.040 | 0.80 to 1.25 | — | 0.44 to 0.65 | 0.040 | — |

Hot Work and Heat Treatment Temperatures

| Grade | Heat Treat Type | Austenitizing/Solutioning Temperature, Minimum or Range, °F [°C]^ | Cooling Media | Quenching Cool Below °F [°C] | Tempering Temperature, Minimum or Range, °F [°C] |
|------------------|----------------------|---|---------------|------------------------------|--|
| | | Low Alloy Steels | | | |
| F 12, Class 1, 2 | anneal | 1650 [900] | furnace cool | - | - |
| | normalize and temper | 1650 [900] | air cool | - | 1150 [620] |

Mechanical Properties at Room Temperature

| Grade Symbol | Tensile Strength, min, ksi [Mpa] | Yield Strength, min, ksi [Mpa] | Elongation in 2 in, [50 mm] of 4D, min, % | Reduction of Area, min, % | Brinell Hardness Number, HBW |
|--------------|----------------------------------|--------------------------------|---|---------------------------|------------------------------|
| F12 Class 1 | 60 [415] | 32 [220] | 20 | 45 | 121-174 |
| F12 Class 2 | 70 [485] | 40 [275] | 20 | 30 | 143-207 |