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SA266 Grade 2 Forging Material Specification

SA266 Specification covers for grades of carbon steel forgings for boiler and pressure vessels and associated equipment.

SA266 Grade 2 is the most popular forged grade

Standard	**A266 Gr.2**
Chemical composition(%)	
Carbon (C)	**0.30 max**
Manganese (Mn)	**0.40~1.05**
Phosphorus (P)	**0.025 max**
Sulfur (S)	**0.025 max**
Silicon (Si)	**0.15~0.35**
Tensile Strength (MPa)	**485~655**
Yield Strength (MPa)	**250 min**
Elongation (%)	**18 min**
Reduction Area (%)	**33 min**

Mechanical properties	**Grade 2**
Tensile strength, min. Mpa	**485-655**
Yield strength, min. Mpa	**250**
Elongation in. 2 or 50 mm, min, %	**20**
Reduction of area, min. %	**33**

Applications

ASTM A266 Grade 2 is commonly used for:

- Forged flanges
- Pipe fittings
- Valve components
- Rings and round bars
- Other pressure vessel components

Following Test could be made upon request

S4. Magnetic Particle Examination

- All accessible surfaces must be examined using a magnetic particle method per ASTM A 275/A 275M.
- Acceptance limits to be agreed upon by manufacturer and purchaser.

S5. Liquid Penetrant Examination

- Required after heat treatment (quenching and tempering) for checking quench cracks.
- Test method: ASTM E 165 (alternative to magnetic particle exam).

S6. Macroetch Test

- A forging sample is sectioned and etched to reveal flow lines/internal flaws.
- Test per ASTM E 381.
- Details to be agreed upon by the manufacturer and purchaser.

S9. Hardness

- Brinell hardness limits based on grade:
  - Grade 2 & 4: 137 – 197

S10. Grain Size

- Austenitic grain size must be between 1 and 5 per ASTM E 112.

S11. Restriction on Residual Elements (Heat Analysis)

- Maximum limits:
  - Nickel: 0.25%
  - Chromium: 0.20%
  - Molybdenum: 0.08%