

Application environment and temperature requirements for A516GR70 steel plate

A516 Gr.70 Steel Plate: Service Conditions & Temperature Limits

1. Applicable Environments

Oil & Gas: Storage tanks, separators, reactors, and pressure vessels.

Chemical Processing: Equipment for LPG, ammonia, ethylene, and other pressurized media.

Power Industry: Boiler components, steam pipelines (temperature restrictions apply).

Low-Temperature Service: Cryogenic pressure vessels (subject to impact testing requirements).

2. Temperature Requirements

Standard Range: -29°C to $+343^{\circ}\text{C}$ (per ASME standards).

Low-Temperature Use: Down to -46°C if supplemental Charpy V-notch impact testing is performed (e.g., A516 Gr.70N or customer-specified impact energy).

High-Temperature Limit: Beyond 343°C , tensile strength degrades; consider Cr-Mo alloys for elevated temperatures.

3. Key Considerations

-Low-Temperature Toughness: For service $\leq -29^{\circ}\text{C}$, specify "N" grade (A516 Gr.70N) or require impact-certified plates.

PWHT (Post-Weld Heat Treatment): Mandatory for thick sections or high-stress applications to relieve residual stresses.

Corrosive Environments: For sour service (H_2S exposure), opt for HIC-resistant (Hydrogen-Induced Cracking) tested plates.

4. Governing Standards

Primary: ASTM A516/A516M (ASME SA516 for pressure vessels).

Equivalent Grades:

- EN 10028-2: P355GH (European standard).
- GB 713: Q345R (Chinese standard, similar but not identical).

5. Summary

A516 Gr.70 is suitable for moderate/low-temperature pressure vessels (-29°C to 343°C). For cryogenic or high-temperature applications, verify material certifications and design codes (e.g., ASME VIII Div.1).