

# A516GR70 Steel Plate Usage Guide

## A516GR70 Steel Plate: Key Precautions & Applications

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### 1. Introduction to A516GR70 Steel

A516GR70 is a carbon steel plate for low- and moderate-temperature pressure vessels, compliant with ASTM A516/A516M. It offers excellent weldability, impact resistance at low temperatures, and high tensile strength\*\* ( $\geq 485$  MPa, yield strength  $\geq 260$  MPa).

Typical Chemical Composition:

- C  $\leq 0.27\%$ , Mn 0.85-1.20%, P  $\leq 0.035\%$ , S  $\leq 0.035\%$

### 2. Key Precautions for Using A516GR70

#### 2.1 Welding Requirements

Use low-hydrogen electrodes (e.g., E7018) and preheat to 150-200°C (for plates  $\geq 20$ mm thick).

Post-weld heat treatment (PWHT) at 600-620°C is recommended for stress relief (critical for thicknesses  $> 30$ mm).

#### 2.2 Low-Temperature Applications

- Suitable for temperatures down to -30°C; for lower temperatures, verify Charpy V-notch impact test results (minimum 20J @ -30°C).

#### 2.3 Forming & Machining

Cold bending: Minimum bend radius  $\geq 2x$  plate thickness to avoid cracking.

-Hot forming: Keep temperature 900-950°C to prevent grain coarsening.

## **2.4 Corrosion Protection**

Not weather-resistant—requires protective coatings (e.g., epoxy coal tar) in humid or sulfur-rich environments.

## **2.5 Storage & Handling**

- Store off the ground to avoid moisture; keep away from \*\*chlorides (e.g., salt).

## **3. Common Applications of A516GR70**

### **3.1 Pressure Vessels\*\***

Oil & gas: Reactors, distillation columns (operating range: -30°C to 400°C).

LPG storage tanks (must comply with ASME Section VIII).

### **3.2 Energy Equipment**

Boiler drums, nuclear power auxiliary components (non-radiation zones).

### **3.3 Infrastructure**

Bridge bearings, heavy steel structure joints (requires corrosion-resistant design).

## **4. Frequently Asked Questions (FAQ)**

Q1: Can A516GR70 replace Q345R?

Partial substitution possible, but note differences in P, S content (GB vs. ASTM standards).

Q2: How to detect material failure?

Monitor for surface cracks, thickness reduction (ultrasonic testing), and weld corrosion.

## **5. Conclusion**

A516GR70 is a cost-effective choice for pressure vessels when properly selected and maintained. Always verify MTC (Mill Test Certificates) and impact test reports before procurement.