

Submerged Arc Welding Flux



GJ-EM12

Copper-Coated Solid Wire

(Medium-manganese, low-silicon steel)

- ▶ AWS A5.17 EM12
- ▶ EN ISO 14171-A-S2

Product description

GJ-EM12 is a medium-manganese, low-silicon solid wire strictly complying with AWS A5.17 EM12. The low silicon content makes it ideal for use with active fluxes that supply additional alloying elements, providing precise control over weld metal chemistry.

Key Advantages

- ▶ Flexible Chemistry Control: Low silicon content allows active fluxes to precisely control final weld metal composition.
- ▶ Stable Arc & Clean Welds: High-purity steel with ultra-low S/P ensures clean, defect-free weld deposits every time.
- ▶ Excellent Slag Release: Produces smooth, uniform beads with easily removable slag for high-productivity welding operations.

Application Guide

- ▶ With GJ-101G (Basic Flux): For pressure vessels, shipbuilding, and structural steel requiring excellent low-temperature toughness.
- ▶ With GJ-501H (Active Flux): For high-speed welding where the flux supplements Mn and Si for optimal mechanical properties.
- ▶ With GJ-301 (Neutral Flux): For general structural steel fabrication and heavy plate welding with consistent quality.

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● Main constituents

Elements	C (Carbon)	Mn (Manganese)	Si (Silicon)	S (Sulfur)	P (Phosphorus)	Cu (Copper)
AWS Requirement	0.06 - 0.15	0.80 - 1.10	≤0.07	≤0.030	≤0.030	≤0.35
Typical Actual Value	0.07	0.95	0.04	0.010	0.013	0.08

● Typical Mechanical Properties of Deposited Metal

The mechanical properties of EM12 must be evaluated in combination with a specific flux. The following data is based on testing combined with an AWS F6A2 neutral agglomerated flux (e.g., SJ301).

Test Item	Yield Strength	Tensile Strength	Elongation	Impact Value@ -20°C
AWS F6A2 Requirement	≥330 MPa	415 - 550 MPa	≥22%	≥27 J
Typical Actual Result	400 MPa	500 MPa	28%	92 J

● Reference Welding Parameters

Wire Diameter	1.6 mm (1/16")	2.5 mm(3/32")	3.2 mm (1/8")	4.0 mm (5/32")	5.0 mm (3/16")
Amperage	250 - 420	350 - 500	400 - 550	470 - 600	550 - 650
Voltage	26 - 30	27 - 30	28 - 31	28 - 32	30 - 34