

Stainless Steel Bare Wire

Alloy: WW312

Conforms to Certification: AWS A5.9

Class: ER312

ASME SFA A5.9

Alloy ER312 Welding Data

Weld Process: Used for Mig, Tig, and Submerged Arc

AWS Chemical Composition

C = 0.15 max	Si = 0.30 – 0.65
Cr = 28.0 – 32.0	P = 0.03 max
Ni = 8.0 – 10.5	S = 0.03 max
Mo = 0.75 max	Cu = 0.75 max
Mn = 1.0 – 2.5	

Deposited Chemical Composition % (Typical)

C = 0.11	Mo = 0.15	P = 0.013
Cr = 29.00	Mn = 1.60	S = 0.013
Ni = 9.25	Si = 0.40	

Deposited All Weld Metal Properties

Data is typical for ER312 weld metal deposited by Mig using Argon + 2% oxygen, and tig using Argon as the shielding gas. Data on sub-arc is dependent on the type of flux used.

Mechanical Properties (R.T.)

Yield Strength	75,000psi
Tensile Strength	105,000psi
Elongation	25%
Reduction of Area	30%

Application

ER312 is used to weld cast alloys of similar composition and is used to weld dissimilar metals and weld overlays. This alloy has very high ferrite. When welding similar cast alloys, limit welding to two or three layers only.

Recommended Welding Parameters

GMAW “Mig Process”

Reversed Polarity

Wire Diameter	Wire Feed	Amps	Volts	Shielding Gas	Gas CFH
<u>Short Arc Welding</u>					
.030	13-26	40-120	16-20	Argon+2% O <sub>2</sub>	25
.035	13-26	60-140	16-22	Argon+2% O <sub>2</sub>	25

Spray Arc Welding

.035	20-39	140-220	24-29	Argon+2% O <sub>2</sub>	38
.045	16-30	160-260	25-30	Argon+2% O <sub>2</sub>	38
1/16	10-16	230-350	27-31	Argon+2% O <sub>2</sub>	38

GTAW “Tig Process”

Wire Diameter	Amps DCRP	Voltage	Gases
.035	60-90	12-15	Argon 100%
.045	80-110	13-16	Argon 100%
1/16	90-130	14-16	Argon 100%
3/32	120-175	15-20	Argon 100%

Note: Parameters for tig welding are dependent upon plate thickness and welding position.

Other shielding Gases may be used for Mig and Tig welding. Shielding gases are chosen taking Quality, Cost, and Operability into consideration

Submerged Arc Welding

Reverse Polarity is suggested

Wire Diameter	Amps	Volts
3/32	250-450	28-32
1/8	300-500	29-34
5/32	400-600	30-35
3/16	500-700	30-35

Both Agglomerated and fused fluxes can be used for submerged arc welding. Note: The chemical composition of the flux mainly affects the chemistry of the weld metal and consequently its corrosion resistance and Mechanical properties.

