

Stainless Steel Bare Wire

Alloy: WW309L
Class: ER309L

Conforms to Certification: AWS A5.9
ASME SFA A5.9

Alloy ER309L Welding Data

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

AWS Chemical Composition Requirements

C = 0.03 max	P = 0.03 max
Cr = 23.0 – 25.0	S = 0.03 max
Ni = 12.0 – 14.0	Mo = 0.75 max
Mn = 1.0 – 2.5	Cu = 0.75 max
Si = 0.30 – 0.65	

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 ₂	25
.035	13-26	60-140	16-22	Argon+2% O ₂	25

Deposited Chemical Composition % (Typical)

C = 0.015	P = 0.012
Cr = 23.50	S = 0.010
Si = 0.40	Ni = 13.50
Mn = 2.0	

Spray Arc Welding

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

Deposited All Weld Metal Properties

Data is typical for ER309L weld metal deposited by Mig using Argon + 2% oxygen and Tig using 100% Argon as the shielding gas. Data on sub-arc is not presented, as sub-arc is dependent on the type of flux used.

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

Mechanical Properties (R.T.)

Yield Strength	58,000psi
Tensile Strength	87,000psi
Elongation	40%
Reduction of Area	60%

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

Application

ER309L has the same qualities as ER309 but with the lower carbon content deemed necessary in many chemical applications. ER309L is preferred over ER309 for cladding over carbon or low alloy steels, or dissimilar joints that are heat treated.

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.

