



ERNi-1

Alloy: ERNi-1 (Alloy 61) Weld Process: GMAW, GTAW and ASAW Welding Processes

AWS Chemical Composition Requirements

Element	Composition (%)
Carbon (C)	0.15 max
Manganese (Mn)	1.0 max
Phosphorus (P)	0.03 max
Sulfur (S)	0.015 max
Silicon (Si)	0.75 max
Copper (Cu)	0.25 max
Nickel (Ni)	93.0 min
Iron (Fe)	1.0 max
Aluminum (Al)	1.50 max
Titanium (Ti)	2.0 – 3.5
Other Elements	0.50 max

Deposited Chemical Composition % (Typical)

Element	Composition (%)
C (Carbon)	0.06
P (Phosphorus)	0.008
Ni (Nickel)	Balance
Mn (Manganese)	0.3
S (Sulfur)	0.003
Ti (Titanium)	3
Fe (Iron)	0.1
Si (Silicon)	0.4
Al (Aluminum)	0.5
Cu (Copper)	0.02

Deposited All Weld Metal Properties % (AW)

Property	Value
Tensile Strength	66,000 psi
Yield Strength	38,000 psi
Elongation	28%

Application

ERNi-1 (NA61) is ideal for GMAW, GTAW, and SAW welding of Nickel 200/201, joining them to stainless/carbon steels, nickel, and copper-nickel alloys. It's also used for steel overlays, offering excellent corrosion resistance, high ductility, & crack resistance, making it suitable for demanding industrial applications.



Recommended Welding Parameters for TIG, MIG, & SAW Welding of Nickel Alloys

Process	Diameter of Wire	Voltage (V)	Amperage (A)	Gas/Flux
TIG	.035 inches x 36	Dec-15	60 - 90	100% Argon
	.045 inches x 36	13 - 16	80 - 110	100% Argon
	1/16 inches x 36	14 - 18	90 - 130	100% Argon
	3/32 inches x 36	15 - 20	120 - 175	100% Argon
	1/8 inches x 36	15 - 20	150 - 220	100% Argon
MIG	.035 inches	26 - 29	150 - 190	75% Argon + 25% Helium
	.045 inches	28 - 32	180 - 220	75% Argon + 25% Helium
	1/16 inches	29 - 33	200 - 250	75% Argon + 25% Helium
SAW	3/32 inches	28 - 30	275 - 350	Suitable Flux may be used
	1/8 inches	29 - 32	350 - 450	Suitable Flux may be used
	5/32 inches	30 - 33	400 - 550	Suitable Flux may be used

Note

- Other shielding gases may be used in MIG and TIG welding, considering cost, quality, and operability.
- Both agglomerated and fused fluxes can be used for submerged arc welding.
- Weld metal chemistry, corrosion resistance, and mechanical properties depend on the flux's chemical composition.