Alloy: COREWELD 630 (17-4Ph) | Class: ER630

Weld Processes: GMAW • GTAW • SAW (Mig, Tig & Submerged Arc)

CERTIFIED TO
AWS A5.9
ASME SFA A5.9

AWS CHEMICAL COMPOSITION REQUIREMENTS | DEPOSITED CHEMICAL COMPOSITION % (TYPICAL)

AWS REQUIREMENT (%)		TYPICAL DEPOSIT (%)	
C	0.05 max	**C**	0.03
Si	0.75 max	**Mo**	0.20
Cr	16.0 – 16.75	**P**	0.020
P	0.03 max	**Cr**	16.51
Ni	4.5 – 5.0	**Mn**	0.54
S	0.03 max	**S**	0.018
Mo	0.75 max	**Ni**	4.75
Cu	3.25 – 4.00	**Si**	0.41
Mn	0.25 – 0.75	**Cu**	3.62
Nb + Ta	0.15 – 0.30	**Nb + Ta**	0.23

Typical values; deposited chemistry may vary with process and shielding gas used.

DEPOSITED ALL WELD METAL PROPERTIES (R.T.)

MECHANICAL PROPERTY	
Yield Strength	150,000 psi
Tensile Strength	135,000 psi
Elongation	10%

Properties are dependent on the post-weld heat treatment and precipitation hardening applied — based on temperature and time exposed. Mechanical properties of this alloy are greatly influenced by the heat treatment.

APPLICATION

COREWELD 630 (17-4Ph) ER630 classification is designed primarily for welding ASTM A564 type 630 and some other precipitation-hardening stainless steels. The composition is modified to prevent the formation of ferrite networks in the martensitic microstructure, which has a great effect on mechanical properties. The weld metal may be used either as welded, welded and precipitation hardened, or welded and solution treated.

RECOMMENDED WELDING PARAMETERS FOR MIG, TIG & SAW WELDING OF ER630 STAINLESS STEEL

PROCESS	WIRE DIAMETER	WIRE DIAMETER (MM)	WIRE FEED	AMPS	VOLTS	SHIELDING GAS	GAS CFH
GMAW — Short Arc Welding (Reversed Polarity)							
	.030 in	0.80	13–26	40–120	16–20	Argon + 2% O_2	25
	.035 in	0.90	13–26	60–140	16–22	Argon + 2% O_2	25
GMAW — Spray Arc Welding (Reversed Polarity)							
	.035 in	0.90	20–39	140–220	24–29	Argon + 2% O_2	38
	.045 in	1.20	16–30	160–260	25–30	Argon + 2% O_2	38
	1/16 in	1.60	10–16	230–350	27–31	Argon + 2% O_2	38
GTAW — Tig Process (DCRP)							
	.035 in	0.90	—	60–90	12–15	Argon 100%	—
	.045 in	1.20	—	80–110	13–16	Argon 100%	—
	1/16 in	1.60	—	90–130	14–16	Argon 100%	—
	3/32 in	2.40	—	120–175	15–20	Argon 100%	—
Submerged Arc Welding (Reverse Polarity Suggested)							
	3/32 in	2.40	—	250–450	28–32	Suitable flux may be used	—
	1/8 in	3.20	—	300–500	29–34	Suitable flux may be used	—
	5/32 in	4.00	—	400–600	30–35	Suitable flux may be used	—
	3/16 in	4.80	—	500–700	30–35	Suitable flux may be 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; gases are chosen taking quality, cost, and operability into consideration.
Note: Both agglomerated and fused fluxes can be used for submerged arc welding. The chemical composition of the flux mainly affects the chemistry of the weld metal and consequently its corrosion resistance and mechanical properties.

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