

# Crown ER 630 (17-4 PH)

Gas Metal Arc Welding  
(GMAW) MIG Wire

Gas Tungsten Arc Welding  
(GTAW) TIG Wire

Stainless Steel Alloy



"The Royal Line"

**CROWN** ALLOYS COMPANY

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## Precipitation-Hardening Stainless Steel

### Typical Applications

**Crown ER 630 (17-4 PH)** is used primarily in the aerospace and other high-technology industries. The nominal composition (wt.%) of this classification is 16.4 Cr, 4.7 Ni, 3.6 Cu. The composition is designed primarily for welding ASTM A 564 Type 630 and some other precipitation-hardening stainless steels such as 15-5. The composition is modified to prevent the formation of ferrite networks in the martensitic microstructure which have a deleterious effect on mechanical properties. Weld deposits provide excellent mechanical properties with high strength, hardness, corrosion resistance and moderate wear resistance. Dependent on the application and weld size, the weld metal may be used as-welded; welded and precipitation hardened; or welded, solution treated, and precipitation hardened.

### Specifications

AWS A5.9/A5.9M  
ER 630 (17-4 PH)

- Tensile Strength (typical – heat treated and hardened)\* up to 150,000 psi
- Yield Strength (typical – heat treated and hardened)\* up to 135,000 psi
- Elongation in 2" (typical – heat treated and hardened)\* up to 10%

\*Post Weld Heat Treatment Procedure: Heat to 1875°F to 1925°F, hold for one hour (-0, +15 minutes), and air cool to ambient, and then precipitation harden at 1135°F to 1165°F, hold for four hours (-0, +15 minutes), and air cool to ambient.

### Procedure

#### GMAW (MIG) Welding Parameters

##### Short Circuit Transfer Welding

Use DC reverse polarity (DCEP). Settings based on [90% Helium - 7½% Argon - 2½% CO<sub>2</sub>] Tri-mix shielding gas.

Wire Diameter (inches)	Welding Current (amperage)	Arc Voltage (volts)	Wire Feed Speed (ipm)	Gas Flow (cfh)
.035	60 – 150	16 – 22	120 – 330	20-30
.045	90 – 210	17 – 22	100 – 280	25-30

##### Spray Transfer Welding

Use DC reverse polarity (DCEP). Settings based on Argon and 1 to 5 percent Oxygen shielding gas.

.035	170 – 295	23 – 29	250 – 470	25-35
.045	195 – 360	24 – 30	200 – 385	30-35

#### GTAW (TIG) Welding Parameters

Manual Welding – DC straight polarity (DCEN) – Use a 2% thoriated tungsten (Th-2) Red Band – Use Argon Shielding Gas

Metal Thickness	Joint Type	Tungsten Diameter	Filler Rod Diameter	Arc Voltage (volts)	Welding Current (amperage)	Gas Flow (cfh)	Gas Cup Size
1/16 – 1/8"	Butt/Corner	1/16	1/16	9 – 16	70 - 110	15 - 20	3/8"
1/16 – 1/8"	Lap/Fillet	1/16	1/16	10 – 16	80 - 140	15 - 20	3/8"
1/8 – 3/16"	Butt/Corner	1/16 to 3/32	3/32	10 – 16	90 - 200	15 - 20	3/8"
1/8 – 3/16"	Lap/Fillet	1/16 to 3/32	3/32	11 – 18	110 - 250	15 - 20	3/8"
3/16" & up	Butt/Corner	3/32 to 1/8	1/8	11 – 16	105 - 300	20 - 30	½"
3/16" & up	Lap/Fillet	3/32 to 1/8	1/8	12 – 17	130 - 375	20 - 30	½"

All suggested settings are approximate. Inverter-based welders generally require less heat input (lower amps). Welds should be tested to comply to your specifications.

### Sizes and Part Numbers

TIG Diameter	Part Numbers	
	1# Package	10# Package
1/16 x 36"	ST630/TL-BP	ST630/TL
3/32 x 36"	ST630/TN-BP	ST630/TN
1/8 x 36"	ST630/TO-BP	ST630/TO

MIG Diameter	Part Numbers		
	2 lb (4") Spools	8" Spools	33lb Spools
.035	SS630/1F	SS630/2F	SS630/3F
.045	SS630/1G	SS630/2G	SS630/3G



**!!!! WARNING !!!!**



**WELDING FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH.**

**BEFORE USING THIS PRODUCT THE WELDER (END-USER) MUST READ AND UNDERSTAND THE COMPLETE PRODUCT WARNING LABEL AND THE NEW 16 SECTION SAFETY DATA SHEET (SDS).**

**THE SAFETY DATA SHEET (SDS) WHICH OUTLINES THE POTENTIAL HEALTH HAZARDS AND SAFETY INFORMATION RELATED TO THIS PRODUCT CAN BE DOWNLOADED FROM THE SDS PORTION OF THIS WEBSITE. IT IS ALSO AVAILABLE FROM YOUR EMPLOYER AND WELDING SUPPLY DISTRIBUTOR.**

**DO NOT PROCEED WITH USE OF THIS PRODUCT UNTIL YOU READ AND UNDERSTAND THE SAFETY DATA SHEET (SDS) AND PRODUCT WARNING STATEMENT.**

**BE SURE TO CONSULT THE LATEST VERSION OF THE SDS.**

**SEE THE PRODUCT WARNING LABEL AND SDS FOR COMPLETE WARNING INFORMATION.**

