

Crown 21 and ER 90S-B3

Gas Tungsten Arc Welding
(GTAW) TIG Alloy

Gas Metal Arc Welding
(GMAW) MIG Wire

Chrome-Moly Steel



"The Royal Line"

CROWN ALLOYS COMPANY

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2 ¼ Chrome – 1 Moly Steel for GTAW (TIG) and GMAW (MIG)

Typical Applications

Crown 21 (TIG) and **Crown ER 90S-B3 (MIG)** are used to weld various chrome-moly steels. Specifically, they are designed to weld 2¼ percent Cr – 1 percent Mo steels (P22). These alloys can also be used to join carbon steels to various chrome-moly steels. Cracking may occur if proper preheat, interpass temperature and postweld heat treatment are not adhered to. Used extensively to fabricate and repair high temperature/high pressure power piping, pressure vessels, heat exchangers and boilers in the power generation industry. Used also in the petroleum and petrochemical industries. The chromium provides good oxidation and corrosion resistance, and the molybdenum increases strength at elevated temperatures. **Crown 21** and **Crown ER 90S-B3** are heat-treatable.

Specifications

AWS A5.28/A5.28M

ER 90S-B3

Chemical Composition

Silicon	0.40 - 0.70%	Nickel	0.200% max
Carbon	0.07 - 0.12%	Chromium	2.30 - 2.70%
Manganese	0.40 - 0.70%	Molybdenum	0.90 - 1.20%
Phosphorus	0.025% max	Copper	0.350% max
Sulfur	0.025% max	Others, Total	0.500% max

- Tensile Strength* 94,000 psi (typical)
- Yield Strength* 79,000 psi (typical)
- Elongation in 2"* 27% (typical)

*Post weld heat treated (stress relieved) between 1250°F and 1300°F for one hour.

Procedure

Base metal must be clean. A preheat and interpass temperature between 375°F & 425°F should be maintained during welding.

GTAW (TIG) Welding Parameters

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

Material Thickness (inches)	Tungsten Diameter	Filler Rod Diameter	Arc Voltage (volts)	Welding Current (amperage)	Gas Flow (cfh)
1/16 to 3/32	1/16	1/16	9 – 14	100 – 160	20
1/8	3/32	1/16	12 – 15	125 – 200	20
3/16	3/32	3/32	12 – 17	130 – 195	25
3/16 to 1/2	1/8	1/8	15 – 20	150 – 300	25
1/4 and up	1/8 to 5/32	5/32	15 – 22	160 – 350	20 – 30

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

GMAW (MIG) Welding Parameters

Short Circuit Transfer Welding

DC reverse polarity (DCEP) – Use [100% CO₂] or [75% Argon – 25% CO₂] shielding gas

Wire Diameter (inches)	Welding Current (amperage)	Arc Voltage (volts)	Wire Feed Speed (ipm)	Gas Flow (cfh)
.035	70 – 140	18 – 25	150 – 340	20-25
.045	80 – 160	19 – 26	100 – 220	20-25

Spray Transfer Welding

DC reverse polarity (DCEP) – Use [98% Argon – 2% Oxygen] or [75% Argon – 25% CO₂] shielding gas

.035	140 – 250	24 – 32	360 – 520	30 – 35
.045	180 – 280	24 – 34	210 – 390	30 – 35

Sizes and Part Numbers

TIG Diameter	Part Numbers	
	1# Package	5# Package
1/16 x 36"	MTCR21/TL-BP	MTCR21/TL
3/32 x 36"	MTCR21/TN-BP	MTCR21/TN
1/8 x 36"	MTCR21/TO-BP	MTCR21/TO
5/32 x 36"	MTCR21/TP-BP	MTCR21/TP

MIG Diameter	Part Numbers		
	2 lb (4") Spools	8" Spools	33 lb Spools
.035	MS90SB3/1F	MS90SB3/2F	MS90SB3/3F
.045	MS90SB3/1G	MS90SB3/2G	MS90SB3/3G



!!!! 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.

