

# Carbon Steel Alloys

Gas Tungsten Arc Welding  
(GTAW) TIG Alloys



"The Royal Line"

**CROWN** ALLOYS COMPANY

30105 Stephenson Hwy, Madison Heights, MI 48071  
(248) 588-3790 (800) 521-7878 [www.crownalloys.com](http://www.crownalloys.com)

Cut length - (TIG) or (GTAW)

AWS A5.18/A5.18M

## Crown 2 (ER 70S-2)

TIG Diameter	Part Numbers		
	1# Package	10# Package	50# Carton
.045 x 36"	MTCR2/TG-BP	MTCR2/TG-10	MTCR2/TG
1/16 x 36"	MTCR2/TL-BP	MTCR2/TL-10	MTCR2/TL
3/32 x 36"	MTCR2/TN-BP	MTCR2/TN-10	MTCR2/TN
1/8 x 36"	MTCR2/TO-BP	MTCR2/TO-10	MTCR2/TO
3/16 x 36"	MTCR2/TQ-BP	MTCR2/TQ-10	MTCR2/TQ

See next page for TIG welding procedures.

## TYPICAL APPLICATIONS

**Crown 2** is fortified with deoxidants (zirconium, titanium and aluminum), so it can be used for TIG welding steels that have a rusty or dirty surface. This enables **Crown 2** to produce x-ray quality welds over most surface conditions. **Crown 2** is also well suited for use in single side, melt through welding without a protective root shielding gas on the backside of the joint. **Crown 2** is often used for repairs on a variety of mild and low alloy steels, sheet metal applications and the welding of the root pass on pipe.

### Specifications

- Tensile Strength 78,000 psi (typical)
- Yield Strength 60,000 psi (typical)
- Elongation in 2" 25% (typical)

## Crown 3 (ER 70S-3)

TIG Diameter	Part Numbers		
	1# Package	10# Package	50# Carton
.045 x 36"	MTCR3/TG-BP	MTCR3/TG-10	MTCR3/TG
1/16 x 36"	MTCR3/TL-BP	MTCR3/TL-10	MTCR3/TL
3/32 x 36"	MTCR3/TN-BP	MTCR3/TN-10	MTCR3/TN
1/8 x 36"	MTCR3/TO-BP	MTCR3/TO-10	MTCR3/TO

See next page for TIG welding procedures.

**Crown 3** is an economical copper-coated steel TIG alloy for general welding of clean carbon and mild steels. **Crown 3** is commonly used in frame fabrication, automotive structures, farm implements, construction equipment, pipe fabrication, railcar construction and repair. It will also weld structural steel, pressure vessels, carbon steel plate, fittings, castings and forgings.

### Specifications

- Tensile Strength 75,000 psi (typical)
- Yield Strength 61,000 psi (typical)
- Elongation in 2" 27% (typical)

## Crown 7 (ER 70S-6)

TIG Diameter	Part Numbers		
	1# Package	10# Package	50# Carton
.035 x 36"	MTCR7/TF-BP	MTCR7/TF-10	MTCR7/TF
.045 x 36"	MTCR7/TG-BP	MTCR7/TG-10	MTCR7/TG
1/16 x 36"	MTCR7/TL-BP	MTCR7/TL-10	MTCR7/TL
3/32 x 36"	MTCR7/TN-BP	MTCR7/TN-10	MTCR7/TN
1/8 x 36"	MTCR7/TO-BP	MTCR7/TO-10	MTCR7/TO
5/32 x 36"	MTCR7/TP-BP	MTCR7/TP-10	MTCR7/TP

See next page for TIG welding procedures.

**Crown 7** is a copper-coated steel TIG alloy with elevated levels of silicon and manganese which yields:

1. Superior performance on slightly contaminated base metals.
2. Increased fluidity (wetting action) of the weld pool, thus creating a smoother bead appearance and flatter bead shape which results in minimal post-weld grinding.

**Crown 7** is often used for fabrication and repairs on a wide variety of mild and low alloy steels. It performs very well on sheet metal applications. It is also used to weld small diameter pipe and tubing since **Crown 7** produces excellent root passes on pipe.

### Specifications

- Tensile Strength 77,000 psi (typical)
- Yield Strength 65,000 psi (typical)
- Elongation in 2" 28% (typical)

# Carbon Steel TIG Welding Procedure



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## Carbon Steel TIG (GTAW) Welding Parameters

for

**Crown 2 - Crown 3 - Crown 7**  
(ER 70S-2) (ER 70S-3) (ER 70S-6)

**Manual Welding - Direct Current Electrode Negative (DCEN)- Straight Polarity - Argon Gas**

Metal Thickness	Joint Type	Tungsten Diameter	Filler Rod Diameter	Arc Voltage (volts)	Welding Current (amperage)	Gas Flow (cfh)
.020" - .045"	All	.040	.035"	5 – 10	30 – 70	15
.045"	All	.040	.045"	8 – 14	60 – 100	15 – 20
1/16"	Butt / Corner	1/16"	1/16"	10 – 17	70 – 120	15 – 20
1/16"	Lap / Fillet	1/16"	1/16"	10 – 17	90 – 130	15 – 20
1/8"	Butt / Corner	1/16" - 3/32"	3/32"	12 – 18	110 – 175	15 – 20
1/8"	Lap / Fillet	1/16" - 3/32"	3/32"	12 – 18	120 – 185	15 – 20
3/16"	Butt / Corner	3/32"	1/8"	13 – 20	140 – 210	20 – 25
3/16"	Lap	3/32"	1/8"	15 – 20	150 – 220	20 – 25
3/16"	Fillet	3/32"	1/8"	15 – 20	150 – 225	20 – 25
1/4"	Butt / Corner	1/8"	5/32"	15 – 22	170 – 270	20 – 25
1/4"	Lap	1/8"	5/32"	16 – 22	180 – 280	20 – 25
1/4 – 1/2"	Fillet	1/8"	5/32"	16 – 22	180 – 325	20 – 25
1/2"	Butt	1/8"	3/16"	17 – 23	300 – 400	20 – 25
1/2"	Fillet	1/8"	3/16"	17 – 23	325 – 425	20 – 25

**Tungsten:** Traditional choice is a 2% thoriated tungsten (Red Band), however, the more recent and safer introductions of 2% ceriated tungsten (Orange Band) or 1.5% lanthanated tungsten (Gold Band) have demonstrated superior performance in most applications. **Safety note:** Thorium is radioactive & may present risks which are negligible under normal conditions of use.

All suggested settings are approximate and will vary depending on joint design, number of passes and other factors. Inverter-based welders generally require less heat input (lower amps). Welds should be tested to comply to your specifications.



**!!!! 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.**

