



**WA. ALLOY CO.**

WASHINGTON ALLOY'S Quality Management System is Certified to **ISO 9001:2008**  
Cert # 05-R0925

# 70S-2 Carbon Steel Welding Wire and Rod



**American Welding Society**  
Sustaining Company Member



## ALLOY DESCRIPTION AND APPLICATION;

ER70S-2 is a multiple deoxidized wire containing small amounts of zirconium, titanium and aluminum in addition to the manganese and silicon deoxidizers characteristic of the steel wire group. This wire may be used for MIG or TIG welding on all grades of mild and carbon steels, producing superior quality weld with minimal porosity even over rust and mill scale. ER70S-2 is popular for out of position welding with small diameter wires utilizing the short-circuiting arc type transfer. MIG welding may be accomplished using CO<sub>2</sub>, Argon-Oxygen mixtures or mixtures of the two.

### TYPICAL GMAW WELDING PROCEDURES; DCEP Short Circuit <sup>(1)</sup> 98-95Ar/2-5O<sub>2</sub> <sup>(2)</sup> 85-90Ar/10-15 CO<sub>2</sub>

| Wire Diameter        | Wire Speed (ipm) | Amps    | Volts | Travel speed (ipm) | CO <sub>2</sub> (cfh) |
|----------------------|------------------|---------|-------|--------------------|-----------------------|
| 0.023                | 80-350           | 30-85   | 14-19 | 10-15              | 20-25                 |
| 0.030                | 110-340          | 40-130  | 15-20 | 12-24              | 20-25                 |
| 0.035                | 100-520          | 60-235  | 16-25 | 11-40              | 20-30                 |
| 0.045                | 70-270           | 90-290  | 18-23 | 12-22              | 25-35                 |
| <i>Spray</i> 0.035   | 320-600          | 160-300 | 23-26 | 11-22              | <sup>(1)</sup> 25-35  |
| 0.035 <sup>(2)</sup> | 360-600          | 180-280 | 23-30 | 11-22              | <sup>(2)</sup> 25-35  |
| 0.045                | 170-550          | 170-375 | 23-29 | 12-21              | <sup>(1)</sup> 25-35  |
| 0.052                | 170-480          | 220-425 | 24-30 | 10-20              | <sup>(1)</sup> 25-35  |
| 1/16"                | 175-350          | 275-475 | 25-31 | 9-19               | <sup>(1)</sup> 25-35  |

### TYPICAL GTAW WELDING PROCEDURES; DCEN with EWTh-2 truncated conical tip

| Filler Wire Size | Tungsten | Amps    | Volts | Gas Cup Size | Argon (cfh) | Base thickness |
|------------------|----------|---------|-------|--------------|-------------|----------------|
| 1/16"            | 1/16"    | 100-160 | 12    | 3/8"         | 20          | 1/16-3/32"     |
| 1/16-3/32"       | 3/32"    | 120-250 | 12    | 3/8"         | 20          | 1/8- 3/16"     |
| 1/8"             | 1/8"     | 150-300 | 12    | 1/2"         | 25          | 1/4-1/2"       |

Procedures may vary with change in position, base metals, filler metals, equipment and other changes.

## TYPICAL WIRE CHEMISTRY (%) AND WELD METAL PROPERTIES; 100%CO<sub>2</sub>

|            | AWS Spec.  | 70S-2 |                             | AWS Spec       | Typical   |
|------------|------------|-------|-----------------------------|----------------|-----------|
| Carbon     | 0.07 max.  | 0.05  | Tensile Strength (psi)      | 70,000 min.    | 83,000    |
| Manganese  | 0.90-1.40  | 1.15  | Yield Strength (psi)        | 58,000 min.    | 71,000    |
| Silicon    | 0.40-0.70  | 0.50  | Elongation in 2"            | 22% min.       | 27%       |
| Phosphorus | 0.025 max. | 0.012 | Charpy V-notch at -20°F     | 20 ft·lbs min. | 30 ft·lbs |
| Sulfur     | 0.035 max. | 0.012 | Reduction of area           | n/a            | 58%       |
| Aluminum   | 0.05-0.15  | 0.011 | Average Brinell Hardness    | n/a            | 140       |
| Zirconium  | 0.02-0.12  | 0.09  |                             |                |           |
| Titanium   | 0.05-0.15  | 0.10  | Copper contents and coating | 0.5 max        |           |

**AVAILABLE SIZES:** TC 70S-2 = Spools of .023, .030, .035, .045, 1/16

TT 70S-2 = Cut lengths of .023, .030, .035, .045, 1/16, 3/32, 1/8, 5/32, 3/16

**SPECIFICATIONS; AWS A5.18**

ER 70S-2

ASME SFA 5.18

ER 70S-2



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