



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

70S-2 Carbon Steel Welding Wire and Rod

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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 CO₂, Argon-Oxygen mixtures or mixtures of the two.

TYPICAL GMAW WELDING PROCEDURES; DCEP Short Circuit

Wire Diameter	Wire Speed (ipm)	Amps	Volts	Travel speed (ipm)	CO ₂ (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	⁽¹⁾ 25-35
0.035 ⁽²⁾	360-600	180-280	23-30	11-22	⁽²⁾ 25-35
0.045	170-550	170-375	23-29	12-21	⁽¹⁾ 25-35
0.052	170-480	220-425	24-30	10-20	⁽¹⁾ 25-35
1/16"	175-350	275-475	25-31	9-19	⁽¹⁾ 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% CO₂

	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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