

ER100S-1

Low-Alloy Steel

SPECIFICATION/CLASSIFICATION: AWS A5.28 & ASME SFA-5.28 / ER100S-1

Description/Application:

Weldcote 100S-1 deposits a high strength where tough weld metal may be needed on a variety of steels in critical applications. 100S-1 developed for high yield steels such as, HY-80, HY-100 & HSLA-80, ASTM A514, A543, A724 and A782 quenched and tempered steels often exceeding the 100,000 psi tensile strengths. Application includes mining, pressure vessels, shipbuilding, military equipment and general high strength fabrication. Weld metal yields a high ductility with a great strength and impact resistance while offering high notch toughness to -60°F. 100S-1 preheat and interpass temperature of 275-350°F may be required. Weld deposit mechanical properties will vary depending on heat input used.

Typical Filler Wire/Rod Chemistry in weight percent:

	C	Mn	Si	S	P	Ti	Cr	Ni	Mo	V	Zr	Cu
AWS ¹	0.08	1.25 -1.80	0.20 - 0.55	0.010	0.010	0.10	0.30	1.40-2.10	0.25-0.55	0.05	0.10	0.25
Result	0.07	1.48	0.31	0.005	0.008	0.010	0.11	1.52	0.38	0.014	0.005	0.20

AWS¹ Chemical Composition Requirements Range with single value maximum. Cu includes any copper coating. Al = 0.10% max

Typical Mechanical Properties of Weld Metal:

	Typical Result	AWS Requirements ²
Tensile Strength (psi)	108,750	100,000
Yield Strength (psi)	89,450	88,000
Elongation % in 2"	18%	16 %
Charpy V-notch ft. lbs.	69	50

AWS Requirements² single value minimum. Charpy V-notch ft. lbs for Impact Test done at the required -60°F

RECOMMENDED WELDING PARAMETERS: ER 100S-1

GMAW (MIG) Parameters (DC Reverse Polarity) Electrode Positive Short Circuit Transfer

Wire Diameter	Amps	Volts	75% Argon/25% CO ²	Wire Feed (ipm)
.030	45-135	14-20	25	110-335
.035	85-180	15-21	25-30	120-320
.045	110-225	17-20	30-35	115-210
.035	180-245	24-27 (Spray)	25-30 (98% Ar/2% O ₂)	365-545
.045	200-365	24-29 ↓	30-35 ↓	270-515
1/16"	275-425	25-35	30-40	195-295

GTAW (TIG) Parameters (DCSP) 2% Thoriated Tungsten Electrode negative⁽³⁾

Material	Tungsten dia ⁽³⁾	Filler Wire Size	Amps	Gas Cup	Argon (cfh)
1/16"	1/16"	1/16"	100-140	3/8	20
3/32"	1/16"	1/16"	100-160	3/8	20
1/8"	3/32"	1/16"	125-200	7/16	20
3/16"	3/32"	3/32"	150-250	7/16	25
1/4"	1/8"	1/8"	150-250	1/2	25
3/8"	1/8"	1/8"	150-275	1/2	25
1/2"	1/8"	1/8"	150-300	1/2	25

F-Number of 6 ; A-Number of 12

842 Oak Grove Rd.
Kings Mountain, NC
28086
704-739-4115
Fax 704-739-6116

5994 Griggs Rd.
Houston, TX
77023

40 Messina Dr.
Braintree, MA
02184
781-849-1200
Fax 781-849-1270

258 S. Kitley Ave.
Indianapolis, IN
46219

1930 Carlos Ave.
Ontario, CA
91761
909-923-2167
Fax 909-923-7016

www.weldcotemetals.com

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Weldcote Metals believes this data to be accurate and to reflect qualified opinion regarding research.

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All parameters are suggested as basic guidelines and will vary depending on joint design, number of passes, and other factors.