

# SuperArc® LA-100

Low Alloy, Copper Coated • AWS ER100S-G, ER110S-G & EM2

## Key Features

- ▶ Capable of producing welds with 690 MPa (100 ksi) tensile strength
- ▶ Excellent for welding quenched and tempered steels and HY-80 base materials
- ▶ MicroGuard® Ultra provides superior feeding and arc stability
- ▶ Supports short-circuiting, globular, axial spray and pulsed spray transfer

## Typical Applications

- ▶ HY-80 base material
- ▶ ASTM A514, A543, A724 and A782 quenched and tempered plate
- ▶ Various heat input conditions
- ▶ Military low alloy applications

## Conformances

AWS A5.28/A5.28M: 2005	ER100S-G, ER110S-G
ASME SFA-A5.28:	ER100S-G, ER110S-G
AWS A5.23/A5.23M: 2007	EM2
ABS:	4YQ550SA
CWB/CSA W48-06:	ER69S-G (ER100S-G)
DB:	EN 12534 T 69 5 Mn3Ni1, 5 Mo
TUV:	EN 12534 T 69 5 Mn3Ni1, 5 Mo
EN ISO 16834-B:	G 69A 5 A N3M2
MIL-E-23765/2:	MIL-100S-1

## Welding Positions

All

## Shielding Gas

90-95% Argon / Balance CO<sub>2</sub>  
 95-98% Argon / Balance O<sub>2</sub>  
 Flow Rate: 30 - 50 CFH

## DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool	44 lb (20 kg) Steel Spool	60 lb (27.2 kg) Coil	500 lb (227 kg) Accu-Trak® Drum
0.035 (0.9)	ED031417	EDS30778	ED010996	ED031445
0.045 (1.1)		EDS30779		EDS01162
1/16 (1.6)				

## WIRE COMPOSITION

	%C	%Mn	%Si	%Ni	%Mo
Requirements - AWS ER100S-G, ER110S-G	-	-	-	(A)	(A)
Typical Results <sup>(3)</sup>	0.05-0.06	1.63-1.69	0.46-0.50	1.88-1.96	0.43-0.45
	%Cr	%S	%P	%V	%Al
Requirements - AWS ER100S-G, ER110S-G	(A)	-	-	-	-
Typical Results <sup>(3)</sup>	0.04-0.06	0.002-0.005	0.005-0.009	≤ 0.01	≤ 0.01
	%Ti	%Zr	%Cu		
Requirements - AWS ER100S-G, ER110S-G	-	-	-		
Typical Results <sup>(3)</sup>	0.03-0.04	≤ 0.01	0.11-0.14		

(A) Must have the minimum of one or more of the following: 0.50% Ni, 0.30% Cr, or 0.20% Mo.

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## MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.28/A5.28M: 2005

	Yield Strength <sup>(2)</sup>	Tensile Strength	Elongation	Charpy V-Notch J (ft•lbf)	
	MPa (ksi)	MPa (ksi)	%	@ -18°C (0°F)	@ -51°C (-60°F)
<b>Requirements - AWS ER100S-G</b> As-Welded - Gas Not Specified	Not Specified	690 (100) min.	Not Specified	Not Specified	Not Specified
AWS ER110S-G As-Welded - Gas Not Specified	Not Specified	760 (110) min.	Not Specified	Not Specified	Not Specified
MIL-100S-1 per MIL-E-23765/2C, 2D, 2E & T9074-BC-G1B-010/0200 As-Welded with 98% Ar /2% O <sub>2</sub>	565-825 (82-120)	Not Specified	16 min.	81 (60) min.	47 (35) min.
<b>Typical Results<sup>(3)</sup></b>					
As-Welded at 30 kJ/in with 95% Ar/5% CO <sub>2</sub>	750 (109)	790 (115)	22	164 (121)	138 (102)
As-Welded at 45 kJ/in with 98% Ar/2% O <sub>2</sub>	730 (106)	780 (114)	20	- -	118 (87)
<b>Pulse</b>					
As-Welded at 110 kJ/in with 95% Ar/5% CO <sub>2</sub>	580 (84)	745 (108)	25	138 (102)	70 (52)
<b>CV</b>					
As-Welded at 110 kJ/in with 95% Ar/5% CO <sub>2</sub>	620 (90)	740 (107)	25	170 (125)	106 (78)
As-Welded at 45 kJ/in with 95% Ar/5% CO <sub>2</sub>	682 (99)	765 (111)	20	- -	117 (86)

## TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD <sup>(5)</sup> mm (in)	Wire Feed Speed m/min (in/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate kg/hr (lb/hr)
<b>0.035 in (0.9 mm), DC+</b>					
Short Circuit Transfer 90% Ar/25% CO <sub>2</sub>	9-12 (3/8-1/2)	2.5 (100)	18	80	0.7 (1.6)
		3.8 (150)	19	120	1.1 (2.4)
		6.4 (250)	22	175	1.8 (4.0)
Spray Transfer 90% Ar/10% CO <sub>2</sub>	9-12 (3/8-1/2)	9.5 (375)	23	195	2.7 (6.0)
		12.7 (500)	29	230	3.6 (8.0)
		15.2 (600)	30	275	4.4 (9.6)
<b>0.045 in (1.1 mm), DC+</b>					
Pulsed Spray Transfer <sup>(5)</sup>	12-19 (1/2-3/4)	5.1 (200)	19-21	130	2.4 (5.4)
		6.4 (250)	20-23	140	3.0 (6.7)
Spray Transfer 98% Ar/2% O <sub>2</sub> 95% Ar/5% CO <sub>2</sub>	12-19 (1/2-3/4)	8.9 (350)	27	285	4.2 (9.2)
		12.1 (475)	30	335	5.7 (12.5)
		12.7 (500)	30	340	6.0 (13.2)
<b>0.052 in (1.3 mm), DC+</b>					
Spray Transfer 98% Ar/2% O <sub>2</sub> 95% Ar/5% CO <sub>2</sub>	12-25 (1/2-1) 12-25 (1/2-1)	5.3 (210)	25	325	4.8 (10.7)
		6.0 (235)	27	350	5.4 (12.0)
		7.4 (290)	28	430	6.7 (14.8)

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer below. <sup>(4)</sup>CTWD (Contact Tip to Work Distance). Subtract 1/4 in (6.4 mm) to calculate Electrical Stickout.

<sup>(5)</sup>Procedures in this area are for pulse MIG mode for welding in the vertical up and overhead welding positions. Actual results are dependent on joint, material thickness, as well as wave shape and pulse frequency.

Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at [www.lincolnelectric.com](http://www.lincolnelectric.com)

### TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

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