

# SUPERARC® L-56®

Mild Steel, Copper Coated ■ AWS ER70S-6 & EH11K



### KEY FEATURES

- High levels of manganese and silicon deoxidizers tolerate medium to heavy mill scale surfaces
- Excellent toe-wetting provides optimal bead appearance
- Copper coated for long contact tip life
- Supports short-circuiting, globular, axial spray and pulsed spray transfer
- MicroGuard® Ultra provides superior feeding and arc stability

### TYPICAL APPLICATIONS

- Medium to heavy mill scale base material
- Sheet metal to 380-485 MPa (55-70 ksi) yield strength material
- Automotive repair
- Robotic or hard automation
- Structural steel
- Pressure vessels

### CONFORMANCES

- AWS A5.18/A5.18M:** ER70S-6
- ASME SFA-A5.18:** ER70S-6
- AWS A5.17/A5.17M:** EH11K
- ABS:** 3YSA
- Lloyd's Register:** 3YS H5
- DNV Grade:** III YMS
- CWB/CSA W48-06:** ER49S-6
- DB:** EN 440 G3Si1
- TUV:** EN 440 G3Si1
- EN ISO 14341-B:** G 49A 3 C S6
- MIL-E-23765/1:** MIL-70S-6

### WELDING POSITIONS

All

### SHIELDING GAS

- 100% CO<sub>2</sub>
- 75-95% Argon / Balance CO<sub>2</sub>
- 95-98% Argon / Balance O<sub>2</sub>
- Flow Rate: 30-50 CFH

### DIAMETERS / PACKAGING

Diameter in (mm)	2 lb (1 kg) Plastic Spool 10 lb (4.5 kg) Master Carton	12.5 lb (5.7 kg) Plastic Spool	33 lb (15 kg) Plastic Spool	33 lb (15 kg) Steel Spool	44 lb (20 kg) Steel Spool
0.025 (0.6)	ED030583	ED015790			
0.030 (0.8)	ED030631	ED023334	ED032926		
0.035 (0.9)	ED030632	ED028676	ED032927	ED031411	ED025945
0.045 (1.1)		ED029042	ED032928	ED031412	ED025946
Diameter in (mm)	44 lb (20 kg) Fiber Spool	60 lb (27.2 kg) Coil	60 lb (27.2 kg) Fiber Spool	250 lb (113.4 kg) Accu-Trak® Drum	
0.030 (0.8)			ED021275	ED029914	
0.035 (0.9)	ED021274, ED033704*			ED029915	
0.040 (1.0)	ED027384		ED021277, ED036730*	ED029916	
0.045 (1.1)	ED021276, ED033703*, ED033328**		ED021279		
0.052 (1.3)	ED021278, ED033705*				
1/16 (1.6)		ED011666, ED033710*			
Diameter in (mm)	500 lb (227 kg) Accu-Trak® Drum	500 lb (227 kg) Accu-Pak® Box	500 lb (227 kg) Infinity-Pak	1000 lb (454 kg) Infinity-Pak	
0.030 (0.8)	ED030771			ED036632	
0.035 (0.9)	ED021056	ED032904		ED036633	
0.040 (1.0)	ED031937		ED034394		
0.045 (1.1)	ED020532	ED032906			
0.052 (1.3)	ED020533	ED032907			
1/16 (1.6)	ED029225, ED033707*, ED036219**				
Diameter in (mm)	900 lb (408 kg) Accu-Pak® Box	1000 lb (454 kg) Accu-Trak® Drum	1000 lb (454 kg) Accu-Pak® Box	1000 lb (454 kg) Precise-Trak® Reel	
0.035 (0.9)	ED032847, ED034429*	ED028827		ED033271	
0.040 (1.0)		ED031032			
0.045 (1.1)		ED028828	ED032849, ED033706*	ED031616	
0.052 (1.3)		ED029084	ED032850, ED033702*	ED031617	
1/16 (1.6)		ED029085	ED032851		

\*Buy America Product \*\*Tested Material

**MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.18/A5.18M**

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft-lbf)	
				@ -29°C (-20°F)	@ -40°C (-40°F)
<b>Requirements</b> - AWS ER70S-6 As-Welded with 100% CO <sub>2</sub>	400 (58) min	485 (70) min	22 min.	27 (20) min.	Not Specified
MIL-70S-6 per MIL-E-23765/1 As-Welded with CO <sub>2</sub> and 98% Ar/2% O <sub>2</sub>	380-550 (55-80)	485 (70) min	22 min	Not Specified	Not Specified
MIL-70S-6 per MIL-E-23765/1 Stress Relieved 1 hr. @ 621°C (1150°F) with CO <sub>2</sub> and 98% Ar/2% O <sub>2</sub>	360 (52) min	485 (70) min	26 min	27 (20) min	Not Specified
<b>Typical Results<sup>(3)</sup></b> As-Welded with 100% CO <sub>2</sub> Stress Relieved 1 hr. @ 621°C (1150°F)	440 (64) 395 (57)	560 (81) 510 (74)	29 29	71 (52) 95 (70)	61 (45) 68 (50)
As-Welded with 75% Ar/25% CO <sub>2</sub> Stress Relieved 1 hr. @ 621°C (1150°F)	460 (67) 415 (60)	565 (82) 540 (78)	27 31	82 (60) 140 (103)	72 (53) 122 (90)
As-Welded with 90% Ar/10% CO <sub>2</sub> Stress Relieved 1 hr. @ 621°C (1150°F)	470 (68) 440 (64)	580 (84) 550 (80)	28 32	119 (88) 183 (135)	78 (57) 156 (115)
As-Welded with 98% Ar/2% O <sub>2</sub> Stress Relieved 1 hr. @ 621°C (1150°F)	455 (66) 415 (60)	565 (82) 545 (79)	27 34	122 (90) 190 (140)	108 (80) 176 (130)

**WIRE COMPOSITION – As Required per AWS A5.18/A5.18M**

	%C	%Mn	%Si	%S	%P
<b>Requirements</b> - AWS ER70S-6	0.06-0.15	1.40-1.85	0.80-1.15	0.035 max	0.025 max
<b>Typical Results<sup>(3)</sup></b>	0.08-0.09	1.42-1.60	0.81-0.87	0.006-0.010	0.004-0.010
	%Cr	%Ni	%Mo	%V	%Cu (Total) <sup>(4)</sup>
<b>Requirements</b> - AWS ER70S-6	0.15 max	0.15 max	0.15 max	0.03 max	0.50 max
<b>Typical Results<sup>(3)</sup></b>	0.01-0.05	≤ 0.04	≤ 0.01	< 0.01	0.17-0.22

**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>0.025 in (0.6 mm), DC+</b>					
Short Circuit Transfer 100% CO <sub>2</sub>	9-12 (3/8-1/2)	2.5 (100)	17	35	0.4 (0.9)
		6.4 (250)	19	80	0.9 (2.0)
<b>0.030 in (0.8 mm), DC+</b>					
Short Circuit Transfer 100% CO <sub>2</sub>	9-12 (3/8-1/2)	1.9 (75)	17	35	0.4 (0.9)
		3.8 (150)	18	70	0.8 (1.8)
		7.6 (300)	22	130	1.6 (3.6)
<b>0.035 in (0.9 mm), DC+</b>					
Short Circuit Transfer 100% CO <sub>2</sub> <sup>(6)</sup>	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>	12-19 (1/2-3/4)	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>					
Short Circuit Transfer 100% CO <sub>2</sub> <sup>(6)</sup>	12-19 (1/2-3/4)	3.2 (125)	19	145	1.5 (3.4)
		3.8 (150)	20	165	1.8 (4.0)
		5.1 (200)	21	200	2.5 (5.4)
Spray Transfer 90% Ar/10% 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 90% Ar/10% CO <sub>2</sub>	12-19 (1/2-3/4)	7.6 (300)	30	300	4.8 (10.7)
		8.1 (320)	30	320	5.2 (11.5)
		12.3 (485)	32	430	7.8 (17.1)
<b>1/16 in (1.6 mm), DC+</b>					
Spray Transfer 90% Ar/10% CO <sub>2</sub>	12-25 (1/2-1)	5.3 (210)	27	325	4.8 (10.7)
		6.0 (235)	28	350	5.4 (12.0)
		7.4 (290)	29	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 <sup>(4)</sup>Copper due to any coating on the electrode plus the copper content of the filler metal itself shall not exceed the stated 0.50% max. <sup>(5)</sup>CTWD (Contact Tip to Work Distance). Subtract 1/4 in (6.4 mm) to calculate Electrical Stickout. <sup>(6)</sup>Procedures in these areas are procedures for short circuiting mode using 100% CO<sub>2</sub>. When using 75% Argon, 25% CO<sub>2</sub>, for short circuit transfer, reduce voltage by 1 to 2 volts.

*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.

#### CUSTOMER ASSISTANCE POLICY

The Lincoln Electric Company is manufacturing and selling high quality welding equipment, consumables, and cutting equipment. Our challenge is to meet the needs of our customers and to exceed their expectations. On occasion, purchasers may ask Lincoln Electric for information or advice about their use of our products. Our employees respond to inquiries to the best of their ability based on information provided to them by the customers and the knowledge they may have concerning the application. Our employees, however, are not in a position to verify the information provided or to evaluate the engineering requirements for the particular weldment. Accordingly, Lincoln Electric does not warrant or guarantee or assume any liability with respect to such information or advice. Moreover, the provision of such information or advice does not create, expand, or alter any warranty on our products. Any express or implied warranty that might arise from the information or advice, including any implied warranty of merchantability or any warranty of fitness for any customers' particular purpose is specifically disclaimed.

Lincoln Electric is a responsive manufacturer, but the selection and use of specific products sold by Lincoln Electric is solely within the control of, and remains the sole responsibility of the customer. Many variables beyond the control of Lincoln Electric affect the results obtained in applying these types of fabrication methods and service requirements.

Subject to Change – This information is accurate to the best of our knowledge at the time of printing. Please refer to [www.lincolnelectric.com](http://www.lincolnelectric.com) for any updated information.