METALSHIELD® MC®-80Ni1

Low Alloy ▪ AWS E80C-Ni1

KEY FEATURES

- H4 diffusible hydrogen levels
- Low spatter and excellent arc stability
- Deoxidizing agents minimize pre- and post-weld clean up
- Enhanced silicon island management
- Low temperature impact properties – Capable of exceeding 40 J (29 ft▪lbf) @ -45°C (-50°F)
- Excellent bead shape and profile
- Meets the AWS E80C-Ni1 H4 requirement for tensile and yield strength in both the as-welded condition and after 2 hrs of post-weld heat treating (PWHT)
- Designed to accommodate applications requiring Nickel content of 1% max

WELDING POSITIONS

All

CONFORMANCES

AWS A5.28, ASME SFA-5.28:	E80C-Ni1-H4
AWS A5.36, ASME SFA-5.36:	E80T15-M13A5-Ni1-H4, E80T15-M12A5-Ni1-H4, E80T15-M21A5-Ni1-H4
CWB/CSA W48-06:	E55C-Ni1 H4 (E80C-Ni1 H4)

TYPICAL APPLICATIONS

- Robotics/hard automation
- Weathering grades of the appropriate strength ASTM A588 & A709 steels
- Structural fabrication
- Heavy fabrication
- Meets requirements for NACE applications

SHIELDING GAS

75-95% Argon / Balance CO_2
95-99% Argon / Balance O_2
Flow Rate: 40-60 CFH

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Plastic Spool (Vacuum Sealed Foil Bag)	500 lb (227 kg) Accu-Trak® Drum
0.045 (1.1)	ED034213	ED034216
0.052 (1.3)	ED034214	ED034217
1/16 (1.6)	ED034215	ED034218

MECHANICAL PROPERTIES[1] – *As Required per AWS A5.28/A5.36*

	Yield Strength[2] MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft▪lbf) @ -45°C (-50°F)
Requirements - AWS A5.28: E80C-Ni1-H4 AWS A5.36: E80T15-M13A5-Ni1-H4	470 (68) min	550 (80) 550-690 (80-100)	24 min 19 min	27 (20) min
Test Results[3] As-Welded with 98% Argon / 2% O_2	530-620 (77-90)	605-660 (88-96)	24-28	60-100 (43-76)
As-Welded with 92% Argon / 8% CO_2 Stress Relieved 2 hrs. @ 621°C (1150°F)	510 - 570 (74 - 83) 540 (78)	585 - 635 (85 - 92) 620 (90)	27 - 29 29	85 - 120 (61 - 89) 85 (61)
As-Welded with 75% Argon / 25% CO_2 Stress Relieved 2 hrs. @ 621°C (1150°F)	480 - 540 (70 - 78) 470 (68)	565 - 615 (82 - 89) 565 (82)	28 - 31 29	40 - 95 (29 - 70) 80 (58)

[1] Typical all weld metal. [2] Measured with 0.2% offset. [3] See test results disclaimer

DEPOSIT COMPOSITION[1]

	%C	%Mn	%Si	%S	%P	%Cu
Requirements - AWS A5.28: E80C-Ni1-H4	0.12 max	1.50 max	0.90 max	0.030 max	0.025 max	0.35 max
AWS A5.36: E80T15-M13A5-Ni1-H4		1.75 max	0.80 max		0.030 max	Not Specified
Test Results[3]						
As-Welded with 98% Argon / 2% O_2	0.07 - 0.08	1.31 - 1.35	0.48 - 0.50	0.024 max	0.012	0.03 - 0.05
As-Welded with 92% Argon / 8% CO_2	0.05 - 0.07	1.22 - 1.30	0.43 - 0.47	0.024 max	0.012	0.03 - 0.05
As-Welded with 75% Argon / 25% CO_2	0.05 - 0.06	1.14 - 1.19	0.38 - 0.42	0.024 max	0.012	0.04 - 0.06

	%Ni	%Cr	%Mo	%V	%B	Diffusible Hydrogen (mL/100g weld deposit)
Requirements - AWS A5.28: E80C-Ni1-H4	0.80 - 1.10	Not Specified	0.30 max	0.03 max	Not Specified	4.0 max
AWS A5.36: E80T15-M13A5-Ni1-H4		0.15 max	0.35 max	0.05 max		4 max
Test Results[3]						
As-Welded with 98% Argon / 2% O_2	0.84 - 0.86	0.05 max	0.10 max	0.01 max	0.003-0.004	3 - 4
As-Welded with 92% Argon / 8% CO_2	0.83 - 0.86	0.05 max	0.10 max	0.01 max	0.003-0.004	3 - 4
As-Welded with 75% Argon / 25% CO_2	0.80 - 0.85	0.05 max	0.10 max	0.01 max	0.003-0.004	3 - 4

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD[4] mm (in)	Wire Feed Speed m/min (in/min)	Voltage[5] (Volts)	Approx. Current (Amps)	Melt-Off Rate kg/hr (lb/hr)	Deposition Rate kg/hr (lb/hr)	Efficiency (%)
0.045 in. (1.1 mm), DC+ 92% Argon / 8% CO_2	19-25 (3/4-1)	5.1 (200)	21-23	180	2.5 (5.5)	2.2 (4.9)	89
		6.4 (250)	22-25	220	3.1 (6.8)	2.9 (6.3)	93
		7.6 (300)	22-26	250	3.7 (8.2)	3.4 (7.4)	90
		8.9 (350)	22-27	280	4.4 (9.6)	3.9 (8.9)	92
		10.2 (400)	23-27	310	4.9 (10.9)	4.5 (10.3)	94
		12.7 (500)	23-28	350	6.2 (13.6)	5.6 (13.0)	96
		15.2 (600)	25-29	380	7.4 (16.3)	6.9 (15.6)	96
0.052 in. (1.3 mm), DC+ 92% Argon / 8% CO_2	25-32 (1-1 1/4)	3.8 (150)	22-25	150	2.3 (5.1)	2.1 (4.7)	92
		5.1 (200)	23-26	185	3.0 (6.7)	2.8 (6.2)	93
		6.4 (250)	24-28	210	3.8 (8.4)	3.6 (8.0)	95
		7.6 (300)	26-29	240	4.5 (9.9)	4.3 (9.5)	96
		10.2 (400)	27-30	300	6.1 (13.4)	5.8 (12.8)	96
		11.4 (450)	27-30	345	6.8 (15.0)	6.7 (14.8)	99
		12.7 (500)	27-31	380	7.5 (16.6)	7.5 (16.4)	99
		14.0 (550)	28-31	390	8.3 (18.2)	8.2 (18.1)	99
		15.2 (600)	29-32	410	9.0 (19.9)	9.0 (19.8)	99
1/16 in. (1.6 mm), DC+ 92% Argon / 8% CO_2	25-32 (1-1 1/4)	3.8 (150)	22-25	235	3.4 (7.5)	3.0 (6.7)	89
		5.1 (200)	23-26	295	4.4 (9.7)	4.2 (9.2)	95
		6.4 (250)	24-28	350	5.8 (12.7)	5.4 (11.8)	93
		7.6 (300)	26-29	395	6.9 (15.2)	6.5 (14.3)	94
		10.2 (400)	27-30	465	9.2 (20.2)	8.8 (19.3)	96

[1] Typical all weld metal. [2] Measured with 0.2% offset. [3] See test results disclaimer. [4] To estimate ESO, subtract 1/4 in. (6.0 mm) from CTWD.
[5] For shielding gas blends of 95-99% Argon / Balance O_2, decrease voltage by 1-2 volts.

Safety Data Sheets (SDS) and Certificates of Conformance are available on our website at 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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