Metalshield® MC®-80Ni1

AWS E80C-Ni1 H4

Metalshield® MC®-80Ni1 is a low alloy metal-cored wire designed for high strength welding where tensile requirements of 550 MPa (80ksi) are required. This low alloy metal-cored wire produces weld deposits that meet H4 diffusible hydrogen levels required in many industries, including structural fabrication. For an electrode designed with excellent arc stability – choose Metalshield® MC®-80Ni1.

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)

WELDING POSITIONS

All

APPLICATIONS

- Robotics/hard automation
- Structural fabrication
- Heavy fabrication
- Weathering grades of the appropriate strength ASTM A588 & A709 steels

CONFORMANCES

AWS A5.28/A5.28M: 2005	E80C-Ni1 H4
ASME SFA-5.28	E80C-Ni1 H4
CWB / CSA W48-06	E55C-Ni1 H4 (E80C-Ni1 H4)

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

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THE WELDING EXPERTS®

MECHANICAL PROPERTIES[1] – *As Required per AWS A5.28/A5.28M: 2005*

	Yield Strength[2] MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -45°C (-50°F)
Requirements - AWS E80C-Ni1 H4 As-Welded with Argon / 1-5% O_2	470 (68) min.	550 (80)	24 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)

DEPOSIT COMPOSITION[1] – *As Required per AWS A5.28/A5.28M: 2005*

	%C	%Mn	%Si	%S	%P
Requirements - AWS E80C-Ni1 H4 As-Welded with Argon / 1-5% O_2	0.12 max.	1.50 max.	0.90 max.	0.030 max.	0.025 max.
Test Results[3] As-Welded with 98% Argon / 2% O_2 As-Welded with 92% Argon / 8% CO_2 As-Welded with 75% Argon / 25% CO_2	 0.07 - 0.08 0.05 - 0.07 0.05 - 0.06	 1.31 - 1.35 1.22 - 1.30 1.14 - 1.19	 0.48 - 0.50 0.43 - 0.47 0.38 - 0.42	 0.024 0.024 0.024	 0.012 0.012 0.012

	%Cu	%Ni	%Mo	%V	Diffusible Hydrogen (mL/100g weld deposit)
Requirements - AWS E80C-Ni1 H4 As-Welded with Argon / 1-5% O_2	0.35 max.	0.80 - 1.10	0.30 max.	0.03 max.	≤ 4
Test Results[3] As-Welded with 98% Argon / 2% O_2 As-Welded with 92% Argon / 8% CO_2 As-Welded with 75% Argon / 25% CO_2	 0.03 - 0.05 0.03 - 0.05 0.04 - 0.06	 0.84 - 0.86 0.83 - 0.86 0.80 - 0.85	 0.10 0.10 0.10	 0.01 0.01 0.01	 3 - 4 3 - 4 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) 6.4 (250) 7.6 (300) 8.9 (350) 10.2 (400) 12.7 (500) 15.2 (600)	21-23 22-25 22-26 22-27 23-27 23-28 25-29	180 220 250 280 310 350 380	2.5 (5.5) 3.1 (6.8) 3.7 (8.2) 4.4 (9.6) 4.9 (10.9) 6.2 (13.6) 7.4 (16.3)	2.2 (4.9) 2.9 (6.3) 3.4 (7.4) 3.9 (8.9) 4.5 (10.3) 5.6 (13.0) 6.9 (15.6)	89 93 90 92 94 96 96
0.052 in. (1.3 mm), DC+ 92% Argon / 8% CO_2	25-32 (1-1 1/4)	3.8 (150) 5.1 (200) 6.4 (250) 7.6 (300) 10.2 (400)	22-25 23-26 24-28 26-29 27-30	200 250 290 320 360	2.4 (5.3) 3.2 (7.0) 4.0 (8.8) 4.8 (10.5) 6.4 (14.0)	2.2 (4.8) 3.0 (6.6) 3.8 (8.4) 4.7 (10.4) 6.4 (14.0)	91 94 95 99 99
1/16 in. (1.6 mm), DC+ 92% Argon / 8% CO_2	25-32 (1-1 1/4)	3.8 (150) 5.1 (200) 6.4 (250) 7.6 (300) 10.2 (400)	22-25 23-26 24-28 26-29 27-30	235 295 350 395 465	3.4 (7.5) 4.4 (9.7) 5.8 (12.7) 6.9 (15.2) 9.2 (20.2)	3.0 (6.7) 4.2 (9.2) 5.4 (11.8) 6.5 (14.3) 8.8 (19.3)	89 95 93 94 96

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

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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