

METAL-CORED

GMAW-C
CONSUMABLES

Selection Guide

Metal-Cored (GMAW-C) Wire

Product Name & AWS Class		Key Features	Diameters Available in (mm)		
Mild Steel			0.045 (1.1)	0.052 (1.3)	1/16 (1.6)
Metalshield® MC-6 (E70C-6M H4)	<ul style="list-style-type: none"> Excellent performance in fast follow, high travel speed applications Optimal wetting action, even at low voltages H4 diffusible hydrogen level 	✓	✓	✓	
Metalshield® MC-706 (E70C-6M H4)	<ul style="list-style-type: none"> High deposition rates and travel speed Enhanced silicon island management H4 diffusible hydrogen level 	✓	✓	✓	
Metalshield® MC-710XL (E70C-6M H8)	<ul style="list-style-type: none"> High column strength for excellent feedability Tolerates moderate amounts of surface contaminants 	✓	✓	✓	
Low Alloy			0.045 (1.1)	0.052 (1.3)	1/16 (1.6)
Metalshield® MC-900 (E90C-G H4)	<ul style="list-style-type: none"> Tensile strength of 620 MPa (90 ksi) Produces welds with Charpy V-Notch toughness tested to -50°C (-58°F) Tolerates moderate amounts of surface contaminants 	✓	✓	✓	
Metalshield® MC-1100 (E110C-G H4)	<ul style="list-style-type: none"> Capable of producing 760 MPa (110 ksi) tensile strength Can be used to weld HSLA and quenched and tempered steels Tolerates moderate amounts of surface contaminants 	✓			

INTRODUCTION

STICK

MIG & TIG

METAL-CORED

Metalshield[®] MC-6

Mild Steel
AWS E70C-6M H4

Key Features

- ▶ Excellent performance in fast follow, high travel speed applications
- ▶ Optimal wetting action, even at low voltages
- ▶ H4 diffusible hydrogen level
- ▶ Use with Rapid-Arc[®] Waveform Control Technology[®]
- ▶ Deoxidizing arc action minimizes pre-weld work

Typical Applications

- ▶ Robotics/Hard automation
- ▶ Automotive
- ▶ Structural fabrication
- ▶ Process piping and pressure vessels
- ▶ General fabrication

Welding Positions

All

Conformances

AWS A5.18/A5.18M: 2005	E70C-6M H4
ASME SFA-A5.18:	E70C-6M H4
CWB/CSA W48-06:	E491C-6MJ-H4

Shielding Gas

75 - 95% Argon/Balance CO₂
Flow Rate: 40 - 60 CFH

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool	50 lb (23 kg) Fiber Spool	60 lb (27 kg) Coil	500 lb (227 kg) Accu-Trak [®] Drum
0.045 (1.1)	ED030392	ED030554	ED030549	ED031011
0.052 (1.3)	ED030393	ED030556	ED030550	ED030946
1/16 (1.6)	ED030394	ED030555	ED030577	ED030947

INTRODUCTION

STICK

MIG & TIG

METAL-CORED

Metalshield[®] MC-6

(AWS E70C-6M H4)

MECHANICAL PROPERTIES⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	Yield Strength ⁽²⁾ MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf)	
				@ -29°C (-20°F)	@ -40°C (-40°F)
Requirements AWS E70C-6M H4	400 (58) min.	480 (70) min.	22 min.	27 (20) min.	Not Specified
Typical Performance⁽³⁾ As-Welded					
with 75% Argon / 25% CO ₂ ⁽⁴⁾	450 - 510 (65 - 75)	510 - 590 (75 - 85)	24 - 28	81 - 122 (60 - 90)	47 - 75 (35 - 55)
with 90% Argon / 10% CO ₂	480 - 550 (70 - 80)	550 - 620 (80 - 90)	24 - 28	75 - 102 (55 - 75)	61 - 81 (45 - 60)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	%C	%Mn	%Si	%S	%P	%Cu
Requirements AWS E70C-6M H4	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂ ⁽⁴⁾	0.03 - 0.05	1.25 - 1.60	0.40 - 0.60	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
90% Argon / 10% CO ₂	0.03 - 0.05	1.25 - 1.70	0.40 - 0.70	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
	%Ni	%Cr	%Mo	%V	%Ni + %Cr + %Mo + %V	Diffusible Hydrogen (mL/100g)
Requirements AWS E70C-6M H4	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.	≤ 4
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂ ⁽⁴⁾	0.02 - 0.05	0.01 - 0.04	0.01 - 0.02	0.01 - 0.02	0.05 - 0.10	2 - 4
90% Argon / 10% CO ₂	0.02 - 0.05	0.01 - 0.04	0.01 - 0.02	0.01 - 0.02	0.05 - 0.10	

Metalshield® MC-6

(AWS E70C-6M H4)

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage ⁽⁶⁾ (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+ 90% Argon / 10% CO ₂	19-25 (3/4-1)	5.1 (200)	21-23	170	2.5 (5.6)	2.3 (5.2)	92
		6.4 (250)	22-25	190	2.9 (6.4)	2.7 (6.1)	95
		7.6 (300)	22-26	210	3.5 (7.8)	3.2 (7.1)	92
		8.9 (350)	22-27	245	4.1 (9.1)	3.9 (8.7)	95
		10.2 (400)	23-27	265	4.6 (10.2)	4.5 (9.9)	97
		12.7 (500)	23-28	300	5.7 (12.6)	5.6 (12.4)	98
		15.2 (600)	25-29	335	7.0 (15.4)	6.9 (15.3)	99
		17.8 (700)	26-30	370	8.1 (17.8)	7.9 (17.5)	98
0.052 in (1.3 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	5.1 (200)	22-24	220	3.2 (7.0)	2.9 (6.4)	92
		6.4 (250)	22-26	260	4.0 (8.7)	3.8 (8.3)	95
		7.6 (300)	22-27	300	4.9 (10.7)	4.7 (10.3)	96
		8.9 (350)	23-27	335	5.6 (12.3)	5.5 (12.0)	98
		10.2 (400)	24-28	360	6.3 (13.9)	6.3 (13.8)	99
		12.7 (500)	27-30	410	7.9 (17.4)	7.8 (17.3)	99
1/16 in (1.6 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	2.5 (100)	21-24	175	2.1 (4.7)	2.0 (4.4)	93
		3.8 (150)	22-25	235	3.2 (7.1)	2.9 (6.4)	90
		5.1 (200)	22-26	290	4.3 (9.5)	4.0 (8.9)	94
		6.4 (250)	22-28	345	5.4 (11.9)	5.2 (11.4)	96
		7.6 (300)	23-29	360	6.4 (14.2)	6.3 (13.9)	98
		10.2 (400)	26-31	425	8.5 (18.7)	8.4 (18.5)	99
		12.7 (500)	27-32	485	10.8 (23.8)	10.7 (23.5)	99

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer on pg. 9. ⁽⁴⁾Required gas mixture 75-80% Argon/Balance CO₂ for AWS testing. ⁽⁵⁾To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. ⁽⁶⁾For greater percentage of CO₂ shielding gas, increase voltage by 1-2 volts.

INTRODUCTION

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Metalshield® MC-706

Mild Steel

AWS E70C-6M H4

Key Features

- ▶ High deposition rates and travel speed
- ▶ Enhanced silicon island management
- ▶ H4 diffusible hydrogen level
- ▶ Tolerates high amounts of surface contaminants
- ▶ Superior arc wetting and bead appearance

Typical Applications

- ▶ Robotics/hard automation
- ▶ Structural fabrication
- ▶ Process piping and pressure vessels
- ▶ Shipbuilding
- ▶ Heavy fabrication

Welding Positions

Flat & Horizontal

Conformances

AWS A5.18/A5.18M: 2005	E70C-6M H4
ASME SFA-A5.18:	E70C-6M H4
ABS:	E70C-6M H4
CWB/CSA W48-06:	E492C-6MJ-H4

Shielding Gas

75 - 95% Argon/Balance CO₂
 Flow Rate: 40 - 60 CFH
 Not recommended for use with 100% CO₂

Notes

- ▶ This product contains micro-alloying elements. Additional information available upon request.

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool	50 lb (23 kg) Fiber Spool	50 lb (23 kg) Coil	500 lb (227 kg) Accu-Trak® Drum
0.045 (1.1)	ED031583	ED031586	ED031589	ED031592
0.052 (1.3)	ED031584	ED031587	ED031590	ED031593
1/16 (1.6)	ED031585	ED031588	ED031591	ED031594

Metalshield® MC-706

(AWS E70C-6M H4)

MECHANICAL PROPERTIES⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	Yield Strength ⁽²⁾ MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf)	
				@ -29°C (-20°F)	@ -40°C (-40°F)
Requirements AWS E70C-6M H4	400 (58) min.	480 (70) min.	22 min.	27 (20) min.	Not Specified
Typical Performance⁽³⁾ As-Welded					
with 75% Argon / 25% CO ₂ ⁽⁴⁾	450 - 510 (65 - 75)	510 - 590 (75 - 85)	24 - 28	96 - 137 (71 - 101)	81 - 111 (60 - 82)
with 90% Argon / 10% CO ₂	480 - 550 (70 - 80)	550 - 620 (80 - 90)	24 - 28	57 - 108 (42 - 80)	41 - 94 (30 - 69)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	%C	%Mn	%Si	%S	%P	%Cu
Requirements AWS E70C-6M H4	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂ ⁽⁴⁾	0.03 - 0.05	1.25 - 1.60	0.50 - 0.80	0.02 - 0.03	0.01 - 0.02	0.01 - 0.05
90% Argon / 10% CO ₂	0.03 - 0.05	1.25 - 1.70	0.60 - 0.85	0.02 - 0.03	0.01 - 0.02	0.01 - 0.05
	%Ni	%Cr	%Mo	%V	%Ni + %Cr + %Mo + %V	Diffusible Hydrogen (mL/100g)
Requirements AWS E70C-6M H4	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.	≤ 4
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂ ⁽³⁾	0.01 - 0.03	0.01 - 0.04	0.01 - 0.02	0.01 - 0.02	0.05 - 0.10	2 - 4
90% Argon / 10% CO ₂	0.01 - 0.03	0.01 - 0.05	0.01 - 0.02	0.01 - 0.02	0.05 - 0.10	

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Metalshield[®] MC-706

(AWS E70C-6M H4)

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage ⁽⁶⁾ (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+ 90% Argon / 10% CO ₂	19-25 (3/4-1)	5.1 (200)	21-23	155	2.3 (5.0)	2.1 ((4.6)	92
		6.4 (250)	22-24	185	2.8 (6.2)	2.6 (5.8)	94
		7.6 (300)	22-26	220	3.5 (7.7)	3.2 (7.0)	91
		8.9 (350)	22-27	245	4.0 (8.9)	3.7 (8.2)	93
		10.2 (400)	23-27	260	4.6 (10.1)	4.3 (9.4)	93
		11.4 (450)	23-28	280	5.2 (11.4)	4.9 (10.7)	94
		12.7 (500)	23-29	305	5.7 (12.6)	5.5 (12.2)	97
		14.0 (550)	24-29	315	6.3 (13.9)	6.2 (13.6)	98
		15.2 (600)	25-30	325	6.8 (15.1)	6.7 (14.8)	98
		16.5 (650)	26-30	355	7.5 (16.5)	7.4 (16.3)	98
17.8 (700)	26-30	360	8.0 (17.7)	7.9 (17.5)	99		
0.052 in (1.3 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	5.1 (200)	22-24	210	3.0 (6.7)	2.9 (6.3)	94
		6.4 (250)	22-26	260	3.9 (8.5)	3.5 (7.8)	92
		7.6 (300)	22-27	290	4.6 (10.2)	4.3 (9.5)	94
		8.9 (350)	23-27	315	5.4 (11.8)	5.2 (11.4)	97
		10.2 (400)	24-28	350	6.3 (13.8)	6.1 (13.4)	97
		11.4 (450)	25-28	370	6.9 (15.2)	6.8 (15.1)	99
		12.7 (500)	27-29	390	7.7 (16.9)	7.6 (16.8)	99
		14.0 (550)	27-30	420	8.4 (18.5)	8.3 (18.3)	99
1/16 in (1.6 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	3.8 (150)	22-24	230	3.2 (7.0)	2.8 (6.2)	89
		5.1 (200)	22-25	280	4.3 (9.4)	3.9 (8.7)	93
		6.4 (250)	23-28	310	5.3 (11.6)	5.0 (11.0)	94
		7.6 (300)	24-29	370	6.3 (13.9)	6.3 (13.8)	99
		8.9 (350)	26-30	400	7.4 (16.3)	7.2 (15.9)	98
		10.2 (400)	26-31	450	8.3 (18.4)	8.3 (18.4)	99
		11.4 (450)	27-31	480	9.5 (21.0)	9.3 (20.6)	98

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer on pg. 9. ⁽⁴⁾Required gas mixture 75-80% Argon/Balance CO₂ for AWS testing. ⁽⁵⁾To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. ⁽⁶⁾For greater percentage of CO₂ shielding gas, increase voltage by 1-2 volts.

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MIG & TIG

METAL-CORED

Metalshield® MC-710XL

Mild Steel
AWS E70C-6M H8

Key Features

- ▶ High column strength for excellent feedability
- ▶ Tolerates moderate amounts of surface contaminants

Typical Applications

- ▶ Automotive
- ▶ Structural fabrication
- ▶ Shipbuilding
- ▶ General fabrication

Welding Positions

All

Conformances

AWS A5.18/A5.18M: 2005 E70C-6M H8, E70C-G H8
ASME SFA-A5.18: E70C-6M H8, E70C-G H8
CWB/CSA W48-06: E491C-6M-H8

Shielding Gas

75 - 95% Argon/Balance CO₂
Flow Rate: 40 - 60 CFH

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool	60 lb (27 kg) Coil	500 lb (227 kg) Accu-Trak® Drum
0.045 (1.1)	ED030592	ED028526	ED029524
0.052 (1.3)	ED030593	ED028527	ED028451
1/16 (1.6)	ED030594	ED028528	ED028450

MECHANICAL PROPERTIES⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	Yield Strength ⁽²⁾ MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
Requirements AWS E70C-6M H8	400 (58) min.	480 (70) min.	22 min.	27 (20) min.
Typical Performance⁽³⁾ As-Welded with 75% Argon / 25% CO ₂ ⁽⁴⁾ with 90% Argon / 10% CO ₂	450 - 510 (65 - 75) 480 - 550 (70 - 80)	510 - 590 (75 - 85) 550 - 620 (80 - 90)	24 - 28 24 - 28	54 - 149 (40 - 110) 54 - 149 (40 - 110)

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MIG & TIG

METAL-CORED

Metalshield® MC-710XL

(AWS E70C-6M H8)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.18/A5.18M: 2005

	%C	%Mn	%Si	%S	%P	%Cu
Requirements AWS E70C-6M H8	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.	0.50 max.
Typical Performance⁽³⁾ As-Welded with 75% Argon / 25% CO ₂ ⁽⁴⁾ 90% Argon / 10% CO ₂	0.02 - 0.05 0.02 - 0.05	1.20 - 1.65 1.40 - 1.85	0.50 - 0.75 0.50 - 0.90	0.01 - 0.02 0.01 - 0.02	0.01 - 0.02 0.01 - 0.02	0.01 - 0.05 0.01 - 0.05
	%Ni	%Cr	%Mo	%V	%Ni + %C + %Mo + %V	Diffusible Hydrogen (mL/100g)
Requirements AWS E70C-6M H8	0.50 max.	0.20 max.	0.30 max.	0.08 max.	0.50 max.	≤ 16
Typical Performance⁽³⁾ As-Welded with 75% Argon / 25% CO ₂ ⁽⁴⁾ 90% Argon / 10% CO ₂	0.02 - 0.04 0.02 - 0.05	0.01 - 0.04 0.01 - 0.04	0.01 - 0.02 0.01 - 0.02	0.01 - 0.02 0.01 - 0.02	0.05 - 0.10 0.05 - 0.10	6 - 10

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage ⁽⁶⁾ (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+ 90% Argon / 10% CO ₂	19-25 (3/4-1)	5.1 (200)	24-25	165	2.3 (5.1)	2.2 (4.8)	94
		6.4 (250)	25-26	200	2.9 (6.4)	2.8 (6.1)	95
		8.9 (350)	28-29	230	4.1 (9.0)	3.9 (8.6)	95
		11.4 (450)	30-31	310	5.2 (11.5)	5.0 (11.1)	96
		14.0 (550)	32-33	355	6.4 (14.1)	6.2 (13.7)	97
16.5 (650)	35-36	385	7.6 (16.7)	7.4 (16.2)	97		
0.052 in (1.3 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	4.4 (175)	23-25	195	2.7 (6.0)	2.5 (5.5)	92
		6.4 (250)	25-27	260	3.9 (8.6)	3.6 (8.0)	93
		8.9 (350)	28-30	330	5.4 (11.9)	5.1 (11.2)	94
		11.4 (450)	31-33	390	7.0 (15.4)	6.6 (14.5)	94
14.0 (550)	34-36	430	8.5 (18.8)	8.1 (17.8)	95		
1/16 in (1.6 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	3.8 (150)	24-26	235	3.1 (6.9)	2.9 (6.5)	94
		6.4 (250)	28-30	330	5.2 (11.4)	4.9 (10.8)	95
		8.9 (350)	33-35	410	7.4 (16.3)	7.0 (15.5)	95
		11.4 (450)	35-37	460	9.4 (20.7)	9.0 (19.8)	96

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer on pg. 9. ⁽⁴⁾Required gas mixture 75-80% Argon/Balance CO₂ for AWS testing. ⁽⁵⁾To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. ⁽⁶⁾For greater percentage of CO₂ shielding gas, increase voltage by 1-2 volts.

Metalshield[®] MC-900

Low Alloy
AWS E90C-G H4

Key Features

- ▶ Tensile strength of 620 MPa (90 ksi)
- ▶ Produces welds with Charpy V-Notch toughness tested to -50°C (-58°F)
- ▶ Tolerates moderate amounts of surface contaminants
- ▶ High column strength for excellent feedability

Typical Applications

- ▶ HSLA steels (i.e. HY-80 and ASTM 710)
- ▶ Undermatching 690 MPa (100 ksi) steels
- ▶ Cranes
- ▶ Offshore and shipbuilding
- ▶ Pressure vessels

Welding Positions

All

Conformances

AWS A5.28/A5.28M: 2005 E90C-G H4
ASME SFA-A5.28: E90C-G H4

Shielding Gas

75 - 90% Argon/Balance CO₂
Flow Rate: 40 - 60 CFH

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool
0.045 (1.1)	ED032838
0.052 (1.3)	ED032839
1/16 (1.6)	ED032840

INTRODUCTION

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Metalshield[®] MC-900

(AWS E90C-G H4)

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)	
				@ -40°C (-40°F)	@ -51°C (-60°F)
Requirements AWS E90C-G H4	Not Specified	620 (90) min.	Not Specified	Not Specified	Not Specified
Typical Performance⁽³⁾ As-Welded					
with 75% Argon / 25% CO ₂	550 - 620 (80 - 90)	630 - 690 (92 - 100)	20 - 22	33 - 39 (24 - 36)	33 - 38 (24 - 28)
with 90% Argon / 10% CO ₂	580 - 750 (85 - 110)	620 - 790 (90 - 115)	20 - 24	33 - 59 (24 - 45)	33 - 38 (24 - 28)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.28/A5.28M: 2005

	%C	%Mn	%Si	%S	%P	%Cu
Requirements AWS E90C-G H4	Not Specified ⁽⁴⁾					
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂	0.04 - 0.06	1.20 - 1.75	0.25 - 0.45	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
90% Argon / 10% CO ₂	0.04 - 0.06	1.20 - 1.75	0.25 - 0.45	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
	%Ni	%Cr	%Mo	%V	Diffusible Hydrogen (mL/100g)	
Requirements AWS E90C-G H4	Not Specified ⁽⁴⁾				≤ 4	
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂	1.70 - 1.90	0.01 - 0.10	0.35 - 0.40	0.01 - 0.02	3 - 4	
90% Argon / 10% CO ₂	1.70 - 1.90	0.01 - 0.10	0.35 - 0.40	0.01 - 0.02	3 - 4	

Metalshield® MC-900

(AWS E90C-G H4)

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage ⁽⁶⁾ (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+ 85-95% Argon / Balance CO ₂	19-25 (3/4-1)	5.1 (200)	21-23	170	2.5 (5.6)	2.3 (5.2)	92
		6.4 (250)	22-25	190	2.9 (6.4)	2.7 (6.1)	95
		7.6 (300)	22-26	210	3.5 (7.8)	3.2 (7.1)	92
		8.9 (350)	22-27	245	4.1 (9.1)	3.9 (8.7)	95
		10.2 (400)	23-27	265	4.6 (10.2)	4.5 (9.9)	97
		12.7 (500)	23-28	300	5.7 (12.6)	5.6 (12.4)	98
		15.2 (600)	25-29	335	7.0 (15.4)	6.9 (15.3)	99
17.8 (700)	26-30	370	8.1 (17.8)	7.9 (17.5)	98		
0.052 in (1.3 mm) DC+ 90% Argon / 10% CO ₂	25-32 (1-1 1/4)	5.1 (200)	22-25	195	3.1 (6.9)	2.9 (6.3)	91
		6.4 (250)	23-26	225	3.9 (8.7)	3.7 (8.1)	93
		8.9 (350)	24-28	280	5.5 (12.1)	5.3 (11.6)	96
		11.4 (450)	26-29	340	7.1 (15.6)	6.9 (15.2)	97
		14.0 (550)	27-30	390	8.6 (19.0)	8.5 (18.7)	98

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer on pg. 9. ⁽⁴⁾Must have a minimum of one or more of the following: 0.50% Nickel, 0.30% Chromium or 0.20% Molybdenum. ⁽⁵⁾To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. ⁽⁶⁾For greater percentage of CO₂ shielding gas, increase voltage by 1-2 volts.

PREHEAT / INTERPASS

	Up to 19 mm (3/4 in)	19 - 38 mm (3/4 in to 1-1/2 in)	38 - 64 mm (1-1/2 to 2-1/2 in)	Over 64 mm (2-2/2 in)
Recommended Minimum Preheat Temperature	66°C (150°F)	66°C (150°F)	79°C (175°F)	107°C (225°F)
Recommended Minimum Interpass Temperature	66°C (150°F)	66°C (150°F)	107°C (225°F)	149°C (300°F)

NOTE: Consult steel manufacturer's recommendations regarding minimum and maximum pre-heat temperature, interpass temperature, and heat input.

INTRODUCTION

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Metalshield[®] MC-1100

Low Alloy

AWS E110C-G H4

Key Features

- ▶ Capable of producing 760 MPa (110 ksi) tensile strength
- ▶ Can be used to weld HSLA and quenched and tempered steels
- ▶ Tolerates moderate amounts of surface contaminants
- ▶ High column strength for excellent feedability

Typical Applications

- ▶ HSLA steels (i.e. HY-100 and ASTM 514)
- ▶ Quenched and tempered steels
- ▶ Cranes
- ▶ Offshore and shipbuilding
- ▶ Pressure vessels

Welding Positions

All

Conformances

AWS A5.28/A5.28M: 2005	E110C-G H4
ASME SFA-A5.28:	E110C-G H4
CWB/CSA W48-06:	E76C-G-H4 (E110C-G-H4)

Shielding Gas

75 - 90% Argon/Balance CO₂
Flow Rate: 40 - 60 CFH

DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Steel Spool
0.045 (1.1)	ED032841

Metalshield® MC-1100

(AWS E110C-G H4)

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

Requirements	Yield Strength ⁽²⁾	Tensile Strength	Elongation	Charpy V-Notch	
	MPa (ksi)	MPa (ksi)	%	J (ft•lbf) @ -40°C (-40°F)	@ -51°C (-60°F)
AWS E110C-G H4	Not Specified	760 (110) min.	Not Specified	Not Specified	Not Specified
Typical Performance⁽³⁾ As-Welded					
with 75% Argon / 25% CO ₂	720 - 760 (105 - 110)	760 - 790 (110 - 115)	20 - 23	47 - 65 (35 - 48)	43 - 57 (32 - 42)
with 90% Argon / 10% CO ₂	720 - 820 (105 - 120)	790 - 860 (115 - 125)	20 - 23	43 - 57 (32 - 42)	41 - 54 (30 - 40)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.28/A5.28M: 2005

Requirements	%C	%Mn	%Si	%S	%P	%Cu
	AWS E110C-G H4	Not Specified ⁽⁴⁾				
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂	0.04 - 0.06	1.75 - 1.85	0.55 - 0.65	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
90% Argon / 10% CO ₂	0.04 - 0.06	1.85 - 1.95	0.60 - 0.68	0.01 - 0.02	0.01 - 0.02	0.01 - 0.05
Requirements	%Ni ⁽⁴⁾	%Cr ⁽⁴⁾	%Mo ⁽⁴⁾	%V	Diffusible Hydrogen (mL/100g)	
	Not Specified ⁽⁴⁾					≤ 4
Typical Performance⁽³⁾ As-Welded with						
75% Argon / 25% CO ₂	1.70 - 1.90	0.01 - 0.10	0.35 - 0.40	0.01 - 0.02		
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INTRODUCTION

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Metalshield[®] MC-1100

(AWS E110C-G H4)

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TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage ⁽⁶⁾ (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+ 90% Argon / 10% CO ₂	19-25 (3/4-1)	6.4 (250)	24-26	180	2.9 (6.4)	2.8 (6.1)	95
		8.9 (350)	25-28	225	4.1 (9.0)	3.9 (8.6)	96
		11.4 (450)	26-29	270	5.2 (11.5)	5.1 (11.2)	97
		14.0 (550)	27-30	310	6.4 (14.1)	6.2 (13.7)	97
		16.5 (650)	28-31	345	7.5 (16.6)	7.4 (16.2)	98

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer on pg. 9. ⁽⁴⁾Must have a minimum of one or more of the following: 0.50% Nickel, 0.30% Chromium or 0.20% Molybdenum. ⁽⁵⁾To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. ⁽⁶⁾For greater percentage of CO₂ shielding gas, increase voltage by 1-2 volts.

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