

Outershield® 71M

Mild Steel, All Position • AWS E71T-1C-J, E71T-9C-J, E71T-1M-J, E71T-9M-J

Key Features

- ▶ Dual classified for both 100% CO₂ and 75% Argon / 25% CO₂ mixed gas
- ▶ Charpy V-Notch impact toughness tested to -40°C (-40°F)
- ▶ High travel speeds
- ▶ Spray like transfer with minimal spatter
- ▶ Rod based manufacturing for industry leading wire stiffness and feedability
- ▶ Increased rigidity allows for easy manual break-off

Typical Applications

- ▶ Bridge, ship, & barge
- ▶ Structural fabrication
- ▶ General fabrication
- ▶ Offshore applications
- ▶ Machinery fabrication

Welding Positions

All, except vertical down

DIAMETERS / PACKAGING

Diameter in (mm)	10 lb (4.5 kg) Plastic Spool	25 lb (11.3 kg) Plastic Spool	33 lb (15 kg) Steel Spool	50 lb (22.7 kg) Coil
0.035 (0.9)	ED026804	ED026805		
0.045 (1.1)	ED020836	ED022659	ED030007	ED020844
0.052 (1.3)		ED022660	ED030008	ED020845
1/16 (1.6)		ED022661	ED030009	ED020846
Diameter in (mm)	300 lb (136 kg) Speed-Feed® Reel	500 lb (227 kg) Accu-Trak® Drum	600 lb (272 kg) Speed-Feed® Reel	
0.035 (0.9)				
0.045 (1.1)		ED027364		
0.052 (1.3)		ED029778		
1/16 (1.6)	ED020848	ED029779	ED020851	

MECHANICAL PROPERTIES⁽¹⁾ – As Required per AWS A5.20/A5.20M: 2005

Requirements	Yield Strength ⁽²⁾	Tensile Strength	Elongation	Charpy V-Notch J (ft•lbf)		
	MPa (ksi)	MPa (ksi)	%	@ -18°C (0°F)	@ -29°C (-20°F)	@ -40°C (-40°F)
AWS E71T-1C-J / E71T-1M-J	400 (58)	480-655	22	27 (20) min.	–	27 (20) min. ^(a)
AWS E71T-9C-J / E71T-9M-J	min.	(70-95)	min.	–	27 (20) min.	27 (20) min. ^(a)
Test Results⁽³⁾						
As-Welded with 100% CO ₂ and 75% Argon/25% CO ₂	500-570 (72-83)	560-630 (81-91)	27-29	176-190 (130-140)	176-190 (130-140)	130-163 (96-120)

^(a)Electrodes with the optional supplemental designator "J" shall meet the minimum Charpy V-Notch impact energy requirement for its classification at a test temperature of 10°C lower than the test temperature for its classification.

Conformances

AWS A5.20/A5.20M: 2005	E71T-1C-J, E71T-9C-J E71T-1M-J, E71T-9M-J
ASME SFA-A5.20:	E71T-1C-J, E71T-9C-J E71T-1M-J, E71T-9M-J
ABS*:	3YSA H15
Lloyd's Register:	3YS H15
DNV Grade:	III YMS H10
BV Grade:	SA3YH (CO ₂ only)
CWB/CSA W48-06:	E491T-9 , E491T-9M
EN ISO 17632-B:	T494T1-1MA-H15 T494T1-1CA-H15
MIL-E-24403/1:	MIL-71T-1C, MIL-71T-1M

*Only for 0.045, 0.052 and 1/16 in. diameters

Shielding Gas

100% CO₂
75% Argon / 25% CO₂
Flow Rate: 40 - 50 CFH

Outershield® 71M

(AWS E71T-1C-J, E71T-9C-J, E71T-1M-J, E71T-9M-J)

DEPOSIT COMPOSITION⁽¹⁾

	%C	%Mn	%Si	%S	%P
Requirements					
AWS E71T-1C-J / E71T-1M-J AWSE71T-9C-J / E71T-9M-J	0.12 max.	1.75 max.	0.90 max.	0.03 max.	0.03 max.
Test Results⁽³⁾					
As-Welded with 100% CO ₂ and 75% Argon/25% CO ₂	0.05-0.07	1.04-1.60	0.25-0.50	≤ 0.01	< 0.01

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas ⁽⁴⁾	CTWD ⁽⁵⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate kg/hr (lb/hr)	Deposition Rate kg/hr (lb/hr)	Efficiency (%)
0.035 in (0.9 mm), DC+ 100% CO ₂	19-25 (3/4-1)	5.1 (200)	20-23	95	1.3 (2.8)	1.1 (2.8)	85
		6.4 (250)	21-24	115	1.6 (3.5)	1.4 (3.5)	85
		7.6 (300)	22-25	130	1.9 (4.2)	1.6 (4.2)	86
		8.9 (350)	23-26	150	2.2 (4.9)	1.9 (4.9)	86
		10.2 (400)	24-27	160	2.6 (5.6)	2.2 (5.6)	86
		12.7 (500)	26-29	185	3.2 (7.0)	2.7 (7.0)	86
		15.2 (600)	28-31	200	3.8 (8.4)	3.3 (8.4)	86
		17.8 (700)	30-33	215	4.4 (9.8)	3.8 (9.8)	86
0.045 in (1.1 mm), DC+ 100% CO ₂	19-25 (3/4-1)	5.1 (200)	23-26	165	2.1 (4.6)	1.8 (3.9)	83
		6.4 (250)	24-27	190	2.6 (5.8)	2.2 (4.8)	84
		7.6 (300)	25-28	220	3.1 (6.9)	2.6 (5.8)	84
		8.9 (350)	26-29	245	3.7 (8.1)	3.1 (6.8)	84
		10.2 (400)	26-29	265	4.2 (9.2)	3.5 (7.8)	84
		12.7 (500)	28-31	295	5.2 (11.5)	4.4 (9.7)	84
		15.2 (600)	30-33	315	6.3 (13.8)	5.3 (11.7)	85
		17.8 (700)	32-35	325	7.3 (16.1)	6.2 (13.7)	85
0.052 in (1.3 mm), DC+ 100% CO ₂	19-25 (3/4-1)	3.8 (150)	22-25	150	2.1 (4.7)	1.7 (3.8)	81
		5.1 (200)	23-26	180	2.8 (6.2)	2.3 (5.1)	83
		6.4 (250)	24-27	210	3.5 (7.7)	2.9 (6.5)	83
		7.6 (300)	25-28	235	4.2 (9.3)	3.5 (7.8)	84
		8.9 (350)	27-30	265	4.9 (10.8)	4.2 (9.1)	84
		11.4 (450)	29-32	305	6.3 (13.9)	5.4 (11.8)	85
		12.7 (500)	30-33	325	7.0 (15.5)	6.0 (13.2)	85
		15.2 (600)	33-36	360	8.4 (18.6)	7.2 (15.8)	85
1/16 in (1.6 mm), DC+ 100% CO ₂	19-25 (3/4-1)	3.2 (125)	23-26	205	2.5 (5.4)	2.0 (4.5)	82
		3.8 (150)	24-27	225	3.0 (6.5)	2.4 (5.4)	82
		5.1 (200)	25-28	260	4.0 (8.7)	3.3 (7.2)	83
		6.4 (250)	26-29	295	4.9 (10.9)	4.1 (9.1)	83
		7.6 (300)	28-31	330	5.9 (13.0)	5.0 (10.9)	84
		10.2 (400)	30-33	395	7.9 (17.4)	6.6 (14.6)	84
		12.7 (500)	33-36	445	9.9 (21.7)	8.3 (18.3)	84

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer below. ⁽⁴⁾When welding under mixed gas, decrease voltage. ⁽⁵⁾To estimate ESO, subtract 1/4 in (6.0 mm) from CTWD.
NOTE: This product contains micro-alloying elements.

Material Safety Data Sheets (MSDS) 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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