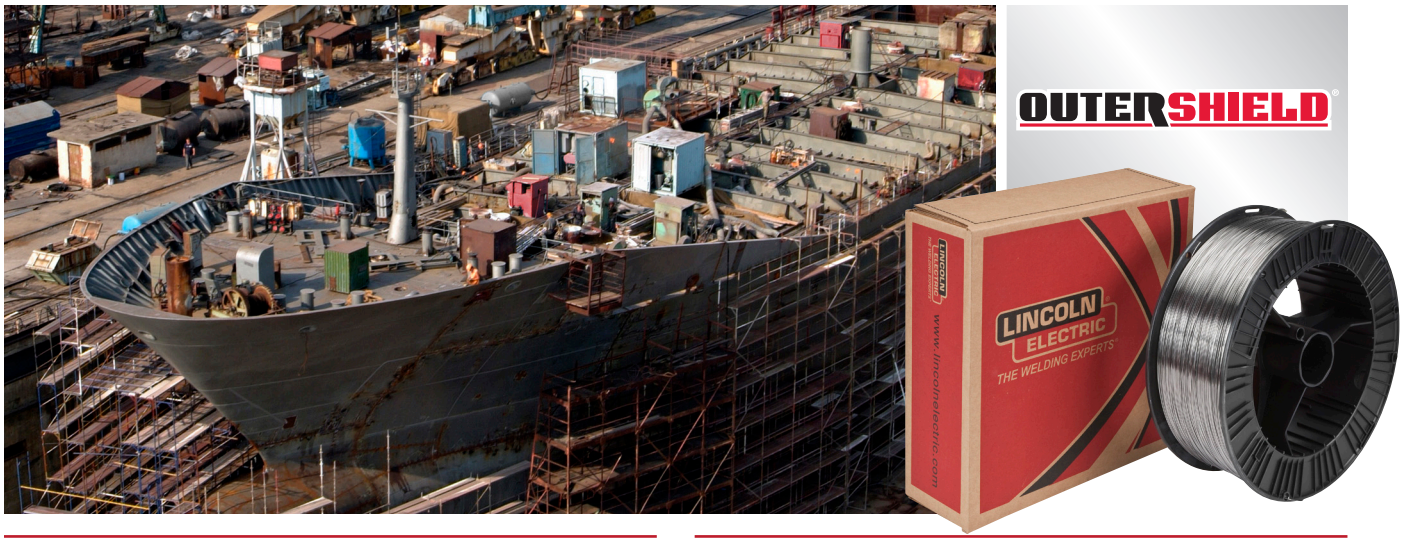
# Outershield® 71M

*AWS E71T-1C-J, E71T-1M-J, E71T-9C-J, E71T-9M-J*




## KEY FEATURES

- NEW! Dual classified for both 100% $CO_2$ and 75% Argon / 25% $CO_2$ mixed gas
- NEW! 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

## CONFORMANCE

| | |
|---|---|
| AWS A5.20/A5.20M: 2005 & 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 |
| MIL-E-24403/1: | MIL-71T-1C, MIL-71T-1M |

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

## APPLICATIONS

- Bridge, ship, and barge
- General fabrication
- Machinery fabrication
- Structural fabrication
- Offshore applications

## WELDING POSITIONS

All, except vertical down

## SHIELDING GAS

100% $CO_2$
75% Argon / 25% $CO_2$
Flow Rate: 40 - 50 CFH

## DIAMETERS / PACKAGING

| Diameter in (mm) | 10 lb (4.5 kg) Plastic Spool | 25 lb (11 kg) Plastic Spool | 33 lb (15 kg) Steel Spool |
|---|---|---|---|
| 0.035 (0.9) | ED026804 | ED026805 | |
| 0.045 (1.1) | ED020836 | ED022659 | ED030007 |
| 0.052 (1.3) | | ED022660 | ED030008 |
| 1/16 (1.6) | | ED022661 | ED030009 |
| **Diameter in (mm)** | **50 lb (23 kg) Coil** | **300 lb (136 kg) Speed-Feed® Reel** | **500 lb (227 kg) Accu-Trak® Drum** |
| 0.045 (1.1) | ED020844 | | ED027364 |
| 0.052 (1.3) | ED020845 | | ED029778 |
| 1/16 (1.6) | ED020846 | ED020848 | ED029779 |
| **Diameter in (mm)** | | **600 lb (272 kg) Speed-Feed® Reel** | |
| 1/16 (1.6) | | ED020851 | |

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THE WELDING EXPERTS®

## *MECHANICAL PROPERTIES*[1] – *As Required per AWS A5.20/A5.20M: 2005*

| | Yield Strength[2] MPa (ksi) | Tensile Strength MPa (ksi) | Elongation % | Charpy V-Notch - J (ft•lbf) @ -18°C (0°F) | @ -29°C (-20°F) | @ -40°C (-40°F) |
|---|---|---|---|---|---|---|
| **Requirements** | | | | | | |
| AWS E71T-1C-J / E71T-1M-J | 400 (58) min. | 480 - 655 (70 - 95) | 22 min. | 27 (20) min. | – | 27 (20) min.[a] |
| AWS E71T-9C-J / E71T-9M-J | | | | – | 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.

## *DEPOSIT COMPOSITION*[1] – *As Required per AWS A5.20/A5.20M: 2005*

| | %C | %Mn | %Si | %S | %P |
|---|---|---|---|---|---|
| **Requirements** | | | | | |
| AWS E71T-1C-J / E71T-1M-J | 0.12 max. | 1.75 max. | 0.90 max. | 0.03 max. | 0.03 max. |
| AWS E71T-9C-J / E71T-9M-J | | | | | |
| **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 |

NOTE: This product contains micro-alloying elements.

## *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.) | 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.

*Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at www.lincolnelectric.com*




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