



# 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

## 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  
 AWS D1.8  
 FEMA 353

## Typical Applications

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

## Welding Positions

Flat & Horizontal

## Shielding Gas

75-95% Argon / Balance CO<sub>2</sub>  
 Flow Rate: 40-60 CFH

## DIAMETERS / PACKAGING

| Diameter<br>in (mm) | 33 lb (15 kg)<br>Steel Spool | 50 lb (22.7 kg)<br>Fiber Spool | 50 lb (22.7 kg)<br>Coil | 500 lb (227 kg)<br>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                           |

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

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

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

|   | %C        | %Mn       | %Si       | %S        | %P                      | %Cu   |
|---|-----------|-----------|-----------|-----------|-------------------------|---|
| <b>Requirements - AWS E70C-6M H4</b>                          | 0.12 max. | 1.75 max. | 0.90 max. | 0.03 max. | 0.03 max.               | 0.50 max.                                     |
| <b>Typical Results<sup>(3)</sup></b>                          |           |           |           |           |                         |   |
| As-Welded with 75% Argon / 25% CO <sub>2</sub> <sup>(4)</sup> | 0.03-0.05 | 1.25-1.60 | 0.50-0.80 | 0.02-0.03 | 0.01-0.02               | 0.01-0.05                                     |
| As-Welded with 90% Argon / 10% CO <sub>2</sub>                | 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<br>+ %Mo + %V | Diffusible Hydrogen<br>(mL/100g weld deposit) |
| <b>Requirements - AWS E70C-6M H4</b>                          | 0.50 max. | 0.20 max. | 0.30 max. | 0.08 max. | 0.50 max.               | ≤ 4   |
| <b>Typical Results<sup>(3)</sup></b>                          |           |           |           |           |                         |   |
| As-Welded with 75% Argon / 25% CO <sub>2</sub> <sup>(3)</sup> | 0.01-0.03 | 0.01-0.04 | 0.01-0.02 | 0.01-0.02 | 0.05-0.10               | 2-4   |
| As-Welded with 90% Argon / 10% CO <sub>2</sub>                | 0.01-0.03 | 0.01-0.05 | 0.01-0.02 | 0.01-0.02 | 0.05-0.10               |   |

**TYPICAL OPERATING PROCEDURES**

| Diameter, Polarity<br>Shielding Gas                              | CTWD <sup>(5)</sup><br>mm (in) | Wire Feed Speed<br>m/min (in/min) | Voltage <sup>(6)</sup><br>(volts) | Approx.<br>Current<br>(amps) | Melt-Off Rate<br>kg/hr (lb/hr) | Deposition Rate<br>kg/hr (lb/hr) | Efficiency<br>(%) |
|--|--------------------------------|-----------------------------------|-----------------------------------|------------------------------|--------------------------------|----------------------------------|-------------------|
| <b>0.045 in (1.1 mm), DC+</b><br>90% Argon / 10% CO <sub>2</sub> | 19-25<br>(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                             |                                  |                   |
| <b>0.052 in (1.3 mm), DC+</b><br>90% Argon / 10% CO <sub>2</sub> | 19-25<br>(3/4-1)               | 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                             |                                  |                   |
| <b>1/16 in (1.6 mm), DC+</b><br>90% Argon / 10% CO <sub>2</sub>  | 25-32<br>(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                             |                                  |                   |

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer below. <sup>(4)</sup>Required gas mixture 75-80% Argon/Balance CO<sub>2</sub> for AWS testing. <sup>(5)</sup>To estimate ESO, subtract 3/16 in (4.8 mm) from CTWD. <sup>(6)</sup>For greater percentage of CO<sub>2</sub> shielding gas, increase voltage by 1-2 volts. NOTE: This product contains micro-alloying elements. Additional information available upon request.

Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at [www.lincolnelectric.com](http://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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