

# Excalibur® 7018 MR®

Mild Steel, Low Hydrogen • AWS E7018 H4R

## Key Features

- ▶ Improved coating integrity
- ▶ Extreme bendability
- ▶ 60% less moisture pickup vs. competition
- ▶ Reduction of arc starting porosity
- ▶ Clear puddle and a smooth arc

## Typical Applications

- ▶ Power generation
- ▶ Pressure piping
- ▶ Petrochemical
- ▶ Mild steel
- ▶ Pressure vessels

## Conformances

AWS A5.1/A5.1M: 2004	E7018 H4R
ASME SFA-A5.1:	E7018 H4R
ABS:	3Y H5
Lloyd's Register:	3YM H5
DNV Grade:	3 YH5
GL:	3YH5
BV Grade:	3YHHH
CWB/CSA W48-06:	E4918

## Welding Positions

All, except vertical down

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	1 lb (0.5 kg) Plastic Tube 6 lb (2.7 kg) Master Carton	10 lb (4.5 kg) Easy Open Can 30 lb (13.6 kg) Master Carton	50 lb (22.7kg) Easy Open Can
3/32 (2.4)	14 (350)	ED032086	ED032588	ED028280
1/8 (3.2)	14 (350)	ED031468	ED032589	ED028281
5/32 (4.0)	14 (350)		ED032590	ED028282
3/16 (4.8)	14 (350)			ED028283
7/32 (5.6)	18 (450)			ED028917
1/4 (6.4)	18 (450)			ED028918

## MECHANICAL PROPERTIES<sup>(1)</sup>

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
Requirements - AWS E7018 H4R	400 (58) min.	490 (70) min.	22 min.	27 (20) min.
Typical Results <sup>(3)</sup> - As-Welded	430-510 (62-74)	510-605 (74-88)	25-37	121-332 (89-246)

## DEPOSIT COMPOSITION<sup>(1)</sup>

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7018 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup>	0.03-0.08	1.01-1.55	0.34-0.68	0.01-0.02	≤ 0.01	0.01-0.06
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7018 H4R	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
Typical Results <sup>(3)</sup>	0.02-0.07	≤ 0.05	≤ 0.02	1.04-1.75	2-3	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)					
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)	3/16 in (4.8 mm)	7/32 in (5.6 mm)	1/4 in (6.4 mm)
DC+	70-110	90-160	130-210	180-300	250-330	300-400
AC	80-120	100-160	140-210	200-300	270-370	325-420

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer on pg. 18. <sup>(4)</sup>Preferred polarity is listed first.

\* Extreme bendability apply to 3/32, 1/8 and 5/32 in. diameters.

# Excalibur® 7018 MR® N

Mild Steel • AWS E7018

## Key Features

- ▶ Q2 Lot® - Certificate showing actual deposit composition and actual mechanical properties available online
- ▶ Available as Batch Managed Inventory
- ▶ “N” Designator - design modified to meet properties after 48 hours stress relief
- ▶ Premium arc performance
- ▶ Square coating burn-off
- ▶ Easy strike and re-strike
- ▶ Effortless slag removal
- ▶ Minimal spatter for enhanced operability and clean weld surface
- ▶ Impact toughness tested to -46°C (-50°F)
- ▶ Capable of exceeding AWS minimum requirement of 480 MPa (70 ksi) tensile and 400 MPa (58 ksi) yield strength after 48 hours of stress relieving at 590-620°C (1100-1150°F)
- ▶ Capable of meeting drop weight testing requirements as commonly required for nuclear applications
- ▶ Prior to using this material for ASME Boiler and Pressure Vessel Code Section III applications, please contact the Lincoln Electric Specials Department to receive a Certified Material Test Report (CMTR) which meets all requirements of NCA-3860.
- ▶ Each rod is marked with AWS classification and LOT number

## Typical Applications

- ▶ Nuclear power plant construction and maintenance
- ▶ Power generation
- ▶ Petrochemical
- ▶ Pressure vessels
- ▶ Pressure piping
- ▶ Fill and cap pass welding of up to X65 grade pipe

## ASME IX Qualification

ASME IX Qualification: QW432 F-No 4,  
QW442 A-No 1

## Conformances

AWS A5.1/A5.1M: 2004: E7018 H4R, E7018-1 H4R  
ASME SFA-A5.1: E7018 H4R, E7018-1 H4R

## Welding Positions

All, Except Vertical Down

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	8 lb (3.6 kg) Easy Open Can 24 lb (10.9 kg) Master Carton	10 lb (4.5 kg) Easy Open Can 30 lb (13.6 kg) Master Carton
3/32 (2.4)	12 (300)	ED033940	
1/8 (3.2)	14 (350)		ED033838
5/32 (4.0)	14 (350)		ED033839

**Excalibur® 7018 MR® N**

(AWS E7018)

**MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004**

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf)		
				@ -29°C (-20°F)	@ -46°C (-50°F)	@ -50°C (-60°F)
<b>Requirements</b> AWS E7018-1 H4R	400 (58) min.	490 (70) min.	22 min.	27 (20) min.	27 (20) min.	Not Specified
<b>Typical Results<sup>(3)</sup></b> As-Welded	440-530 (64-77)	540-630 (79-91)	27-29	90-135 (67-233)	28-177 (21-131)	32-210 (24-155)
Stress Relieved 48 hrs @ 620°C (1150°F)	410-470 (59-68)	500-560 (72-81)	29-31	172-352 (127-260)	–	23-284 (17-210)

**DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004**

	%C	%Mn	%Si	%P	%S
<b>Requirements</b> AWS E7018-1 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.35 max.
<b>Typical Results<sup>(3)</sup></b>	0.06 - 0.08	0.78 - 1.16	0.16 - 0.38	≤0.01	≤0.01
	%Ni	%Cr	%Mo	Diffusible Hydrogen (mL/100g weld deposit)	
<b>Requirements</b> AWS E7018-1 H4R	0.30 max.	0.20 max.	0.30 max.	4.0 max.	
<b>Typical Results<sup>(3)</sup></b>	≤0.02	≤0.03	0.20 - 0.25	1 - 3	

**TYPICAL OPERATING PROCEDURES**

Polarity <sup>(4)</sup>	Current (Amps)		
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)
DC+	70-110	90-160	130-210
AC	80-120	100-160	140-210

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer on pg. 12.

# Excalibur® 7018-1 MR®

Mild Steel, Low Hydrogen • AWS E7018-1 H4R

## Key Features

- ▶ Premium arc performance
- ▶ Square coating burn-off
- ▶ Easy strike and re-strike and effortless slag removal
- ▶ Impact toughness tested to -46°C (-50°F)
- ▶ Q2 Lot® - Certificate showing actual deposit chemistry available online

## Typical Applications

- ▶ Power generation
- ▶ Pressure piping
- ▶ Petrochemical
- ▶ Fill and cap pass welding of up to X65 grade pipe
- ▶ Pressure vessels

## Conformances

AWS A5.1/A5.1M: 2004	E7018-1 H4R
ASME SFA-A5.1:	E7018-1 H4R
ABS:	3Y H5
Lloyd's Register:	3YM H5
DNV Grade:	3 YH5
GL:	3YH5
BV Grade:	3YHHH
CWB/CSA W48-06:	E4918-1
TUV:	DIN EN ISO 2560-A:E
EN ISO 2560-B:	E4918-1 A U H5

## Welding Positions

All, except vertical down

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	8 lb (3.6 kg) Easy Open Can 24 lb (10.9 kg) Master Carton	10 lb (4.5 kg) Easy Open Can 30 lb (13.6 kg) Master Carton	50 lb (22.7kg) Easy Open Can
3/32 (2.4)	12 (300)	ED033179	ED032591 ED032592	ED028700 ED028702 ED028704 ED028706
3/32 (2.4)	14 (350)			
1/8 (3.2)	14 (350)			ED028706
5/32 (4.0)	14 (350)			ED028919
3/16 (4.8)	14 (350)			ED028920
7/32 (5.6)	18 (450)			
1/4 (6.4)	18 (450)			

## MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -46°C (-50°F)
<b>Requirements</b> - AWS E7018-1 H4R	400 (58) min.	490 (70) min.	22 min.	27 (20) min.
<b>Typical Results<sup>(3)</sup></b> - As-Welded	405-515 (59-75)	530-605 (77-88)	22-36	56-178 (42-131)

## DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	%C	%Mn	%Si	%P	%S	%Ni
<b>Requirements</b> - AWS E7018-1 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
<b>Typical Results<sup>(3)</sup></b>	0.04-0.07	0.80-1.44	0.28-0.51	0.006-0.019	0.003-0.013	0.01-0.07
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
<b>Requirements</b> - AWS E7018-1 H4R	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
<b>Typical Results<sup>(3)</sup></b>	0.01-0.07	0.11-0.28	≤ 0.01	0.93-1.75	2-3	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)					
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)	3/16 in (4.8 mm)	7/32 in (5.6 mm)	1/4 in (6.4 mm)
DC+	70-110	90-160	130-210	180-300	250-330	300-400
AC	80-120	100-160	140-210	200-300	270-370	325-420

<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>Preferred polarity is listed first.



# Excalibur<sup>®</sup> 7028

AWS E7028 H8 • Mild Steel, Low Hydrogen

## Typical Applications

- ▶ Structural
- ▶ Heavy fabrication
- ▶ Shipbuilding
- ▶ Storage tanks
- ▶ Bridge fabrication

## Conformances

AWS A5.1/A5.1M: 2004	E7028 H8
ASME SFA-A5.1:	E7028 H8
ABS:	E7028, 3Y H10 (Fillet Only)
Lloyd's Register:	3YM H10
DNV Grade:	3 YH10
CWB/CSA W48-06:	E4928 H8

## Key Features

- ▶ High deposition rates
- ▶ Premium arc performance
- ▶ High travel speed
- ▶ H8 diffusible hydrogen levels
- ▶ Capable of producing weld deposits with impact toughness exceeding 84 J (60 ft•lbf) at -40°C (-40°F)

## Welding Positions

Flat & Horizontal

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	50 lb (22.7 kg) Easy Open Can
5/32 (4.0)	14 (350)	ED032636, ED034312*
3/16 (4.8)	18 (450)	ED032790, ED034313*
7/32 (5.6)	18 (450)	ED032638, ED034314*

\*Buy America Product

## MECHANICAL PROPERTIES<sup>(1)</sup>

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -18°C (0°F)
Requirements - AWS E7028 H8	400 (58) min.	490 (70) min.	22 min.	27 (20) min.
Typical Results <sup>(3)</sup> - As-Welded	450-470 (66-69)	540-560 (77-85)	27-34	84-193 (62-142)

## DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7028 H8	0.15 max.	1.60 max.	0.90 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup>	0.03-0.06	1.17-1.51	0.44-0.77	0.007-0.014	0.004-0.008	0.02-0.04
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7028 H8	0.20 max.	0.30 max.	0.08 max.	1.75 max.	8.0 max.	
Typical Results <sup>(3)</sup>	0.02-0.05	0.01-0.03	0.02 max.	1.25-1.62	4-5	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)		
	5/32 in (4.0 mm)	3/16 in (4.8 mm)	7/32 in (5.6 mm)
AC	130-180	190-250	250-310
DC+	125-175	185-245	220-280

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer on pg. 18. <sup>(4)</sup>Preferred polarity is listed first.

# Pipeliners® 16P

AWS E7016 H4 • Mild Steel, Low Hydrogen

## Typical Applications

- ▶ Root pass welding of up to X100 grade pipe

## Conformances

AWS A5.1/A5.1M: 2004 E7016 H4  
ASME SFA-A5.1: E7016 H4

## Welding Positions

All

## Key Features

- ▶ Hot, fill and cap pass welding up to X60
- ▶ Low hydrogen, vertical up capability on X60 grade pipe
- ▶ Q2 Lot® - Certificates showing actual deposit chemistry and mechanical properties available online
- ▶ DC- (DCEN) is the recommended polarity for root pass welding on pipe

## DIAMETERS / PACKAGING

Diameter mm (in)	Length in (mm)	10 lb (4.5 kg) Easy Open Can 30 lb (13.6 kg) Master Carton	12 lb (5.4 kg) Easy Open Can 36 lb (16.3 kg) Master Carton
2.5 (3/32)	14 (350)	ED033835	ED033837
3.2 (1/8)	14 (350)	ED033836	
4.0 (5/32)	18 (450)		

## MECHANICAL PROPERTIES<sup>(1)</sup>

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf)	
				@ -29°C (-20°F)	@ -40°C (-40°F)
Requirements - AWS E7016 H4	400 (58) min.	490 (70) min.	22 min.	27 (20) min.	Not Specified
Typical Results <sup>(3)</sup> - As-Welded	435-545 (63-79)	550-640 (80-93)	23-34	84-161 (62-119)	65-129 (48-95)

## DEPOSIT COMPOSITION<sup>(1)</sup>

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7016 H4	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup> - As-Welded	0.04-0.08	1.10-1.60	0.39-0.67	0.005-0.020	0.004-0.012	< 0.07
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7016 H4	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
Typical Results <sup>(3)</sup> - As-Welded	0.01-0.07	0.01-0.03	0.01-0.02	1.14-1.71	1-4	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)		
	2.5 mm (3/32 in)	3.2 mm (1/8 in)	4.0 mm (5/32 in)
DC± <sup>(5)</sup>	55-105	75-135	120-170
AC	60115	80-150	120-185

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer on pg. 18. <sup>(4)</sup>Preferred polarity is listed first. <sup>(5)</sup>DC- for root pass on pipe; DC± for general welding.

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**LINCOLN**®  
**ELECTRIC**  
THE WELDING EXPERTS®

# Jetweld® LH-70

AWS E7018 H4R • Mild Steel, Low Hydrogen

## Conformances

AWS A5.1/A5.1M: 2004	E7018 H4R
ASME SFA-A5.1:	E7018 H4R
ABS:	E7018, 3Y
Lloyd's Register:	3YM H5
DNV Grade:	3 Y40H5
GL:	3YH5
BV Grade:	3YHHH
CWB/CSA W48-06:	E4918-1
MIL-E-22200/1:	MIL-7018

## Key Features

- ▶ Low hydrogen
- ▶ Smooth arc performance

## Typical Applications

- ▶ General fabrication
- ▶ Military low hydrogen applications

## Welding Positions

All, except vertical down

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	50 lb (22.7 kg) Easy Open Can
3/32 (2.4)	14 (350)	ED010568
1/8 (3.2)	14 (350)	ED010561
5/32 (4.0)	14 (350)	ED010575
3/16 (4.8)	14 (350)	ED010564
7/32 (5.6)	18 (450)	ED010577
1/4 (6.4)	18 (450)	ED010558

## MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
Requirements - AWS E7018 H4R	400 (58) min.	490 (70) min.	22 min.	27 (20) min.
Typical Results <sup>(3)</sup> - As-Welded	400-485 (58-70)	490-570 (71-83)	23-36	156-334 (115-246)

## DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7018 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup>	0.04-0.07	0.95-1.17	0.30-0.53	0.01-0.02	≤ 0.02	0.01-0.05
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7018 H4R	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
Typical Results <sup>(3)</sup>	0.03-0.06	≤ 0.02	≤ 0.02	1.05	1-2	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)					
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)	3/16 in (4.8 mm)	7/32 in (5.6 mm)	1/4 in (6.4 mm)
DC+	70-110	90-150	120-190	170-280	210-330	290-430
AC	80-120	110-170	135-225	200-300	260-380	325-440

<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>Preferred polarity is listed first.

# Jet-LH<sup>®</sup> 78 MR<sup>®</sup>

Mild Steel, Low Hydrogen • AWS E7018 H4R

## Key Features

- ▶ Low hydrogen
- ▶ Smooth arc performance

## Typical Applications

- ▶ General fabrication

## Welding Positions

All, except vertical down

## Conformances

AWS A5.1/A5.1M: 2004	E7018 H4R
ASME SFA-A5.1:	E7018 H4R
ABS:	E7018
Lloyd's Register:	3YM H5
DNV Grade:	3 YH5
GL:	3YH5
BV Grade:	3YHHH
CWB/CSA W48-06	E4918-1

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	5 lb (2.3 kg) Plastic Tube 20 lb (9.1 kg) Master Carton	50 lb (22.7 kg) Easy Open Can
3/32 (2.4)	12 (300)	ED032434	ED015161
1/8 (3.2)	14 (350)	ED032435	ED015198
5/32 (4.0)	14 (350)		ED015141
3/16 (4.8)	14 (350)		ED015186
1/4 (6.4)	18 (450)		ED015383

## MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
Requirements - AWS E7018 H4R	400 (58) min.	490 (70) min.	22 min.	27 (20) min.
Typical Results <sup>(3)</sup> - As-Welded	415-570 (60-83)	495-640 (72-93)	22-34	156-353 (115-260)

## DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7018 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup>	0.04-0.07	0.75-1.35	0.13-0.69	≤ 0.01	≤ 0.01	0.02-0.04
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7018 H4R	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
Typical Results <sup>(3)</sup>	0.02-0.06	≤ 0.03	≤ 0.03	0.85	1-3	

## TYPICAL OPERATING PROCEDURES

Polarity <sup>(4)</sup>	Current (Amps)				
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)	3/16 in (4.8 mm)	1/4 in (6.4 mm)
DC+	65-100	110-160	130-200	180-270	300-400
AC	70-105	120-170	140-230	210-290	325-420

<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>Preferred polarity is listed first.



# Lincoln® 7018 AC

AWS E7018 H8 • Mild Steel, Low Hydrogen

## Conformances

AWS A5.1/A5.1M: 2004	E7018 H8
ASME SFA-A5.1:	E7018 H8
CWB/CSA W48-06:	E4918-H8

## Welding Positions

All, except vertical down

## Key Features

- ▶ AC polarity welding
- ▶ Low open circuit voltage operation
- ▶ Minimal spatter
- ▶ Capable of cold re-strikes

## Typical Applications

- ▶ General fabrication
- ▶ Thin sections
- ▶ Tack and skip welds

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	1 lb (0.5 kg) Plastic Tube 6 lb (2.7 kg) Master Carton	5 lb (2.3 kg) Plastic Tube 20 lb (9.1 kg) Master Carton	50 lb (22.7 kg) Easy Open Can
3/32 (2.4)	14 (350)	ED031714	ED032454	ED031732
1/8 (3.2)	14 (350)	ED031715	ED032455	ED031734
5/32 (4.0)	14 (350)			ED031738

## MECHANICAL PROPERTIES<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
Requirements - AWS E7018 H8	400 (58) min.	490 (70) min.	2 min.	27 (20) min.
Typical Results <sup>(3)</sup> - As-Welded	435-625 (63-91)	515-685 (75-99)	23-29	27-76 (20-56)

## DEPOSIT COMPOSITION<sup>(1)</sup> – As Required per AWS A5.1/A5.1M: 2004

	%C	%Mn	%Si	%P	%S	%Ni
Requirements - AWS E7018 H8	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
Typical Results <sup>(3)</sup>	0.04-0.06	1.00-1.60	0.32-0.63	0.01-0.02	≤ 0.01	0.01-0.03
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
Requirements - AWS E7018 H8	0.20 max.	0.30 max.	0.08 max.	1.75 max.	8.0 max.	
Typical Results <sup>(3)</sup>	0.03-0.08	≤ 0.01	0.02-0.05	1.13	2-4	

## TYPICAL OPERATING PROCEDURES

Polarity	Current (Amps)		
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)
AC	75-120	105-150	130-200
DC+	70-115	100-140	120-185

<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>Preferred polarity is listed first.

# Millennium Arc™ 7018

Mild Steel, Low Hydrogen • AWS E7018 H4R

## KEY FEATURES

- ▶ 50% less moisture pick vs. competition
- ▶ Clear weld puddle without slag interference
- ▶ Flat bead profile
- ▶ Effortless slag removal
- ▶ No intentional addition of zinc for moisture resistance

## TYPICAL APPLICATIONS

- ▶ Power generation
- ▶ Petrochemical
- ▶ Pressure vessels
- ▶ Pressure piping
- ▶ Mild steel

## CONFORMANCES

AWS A5.1/A5.1M: 2012	E7018 H4R
ASME SFA-A5.1:	E7018 H4R
CWB/CSA W48-06:	E4918-H4

## WELDING POSITIONS

All, except vertical down

## DIAMETERS / PACKAGING

Diameter in (mm)	Length in (mm)	50 lb (22.7kg) Easy Open Can
1/8 (3.2)	14 (350)	ED035314
3/32 (2.4)	14 (350)	ED035456
5/32 (4.0)	14 (350)	ED035457

## MECHANICAL PROPERTIES<sup>(1)</sup>

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf) @ -29°C (-20°F)
<b>Requirements</b> AWS E7018 H4R	400 (58) min.	480 (70) min.	22 min.	27 (20) min.
<b>Typical Results<sup>(3)</sup></b> As-Welded	440-550 (64-72)	540-600 (78-86)	>27	120-180 (90-130)

**DEPOSIT COMPOSITION<sup>(1)</sup>**

	%C	%Mn	%Si	%P	%S	%Ni
<b>Requirements</b> AWS E7018 H4R	0.15 max.	1.60 max.	0.75 max.	0.035 max.	0.035 max.	0.30 max.
<b>Typical Results<sup>(3)</sup></b>	0.06-0.08	1.2-1.5	0.4-0.6	0.01-0.02	0.01-0.02	<0.1
	%Cr	%Mo	%V	%Mn + Ni + Cr + Mo + V	Diffusible Hydrogen (mL/100g weld metal)	
<b>Requirements</b> AWS E7018 H4R	0.20 max.	0.30 max.	0.08 max.	1.75 max.	4.0 max.	
<b>Typical Results<sup>(3)</sup></b>	<0.1	<0.1	<0.01	1.3-1.5	1-3	

**TYPICAL OPERATING PROCEDURES**

Polarity <sup>(4)</sup>	Current (Amps)	Current (Amps)	Current (Amps)
	3/32 in (2.4 mm)	1/8 in (3.2 mm)	5/32 in (4.0 mm)
DC+	70-110	90-160	120-220
AC	80-120	100-160	130-220

<sup>(1)</sup>Typical all weld metal. <sup>(2)</sup>Measured with 0.2% offset. <sup>(3)</sup>See test results disclaimer on pg. 18. <sup>(4)</sup>Preferred polarity is listed first.

**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.

**CUSTOMER ASSISTANCE POLICY**

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