

# Atom Arc 7018

Atom Arc 7018 is an all-position low hydrogen moisture resistant electrode. The wider operating ranges and smooth weld metal transfer minimizes post weld clean up. This premium quality electrode meets a multitude of codes and welding specifications. Atom Arc 7018 was developed to weld carbon and low-alloy steels, including a variety of hardenable steels.

<b>Classifications:</b>	AWS A5.1:E7018 H4R, ASME SFA 5.1
<b>Approvals:</b>	CWB CSA W48:E4918, ABS 2Y/AWS A5.1: E7018, DNV 3Y(H10), LR 3m,3Ym(H10), MIL-E-22200/1 MIL-7018
<b>Industry or Segmentation:</b>	Automotive, Railcars, Bridge Construction, Industrial and General Fabrication, Civil Construction, Ship/Barge Building, Mobile Equipment

Approvals are based on factory location. Please contact ESAB for more information.

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	470 MPa (68 ksi)	540 MPa (78 ksi)	75 %	30 %
Stress Relieved 8 hr 621 °C (1150 °F)	395 MPa (57 ksi)	485 MPa (70 ksi)	77 %	33 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-29 °C (-20 °F)	225 J (168 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-29 °C (-20 °F)	260 J (193 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P
0.045	1.10	0.40	0.014	0.015

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.4 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %
6.4 mm (1/4 in.)	300 A	300-400 A	3.5 kg/h (7.7 lb/h)	78 %
6.4 mm (1/4 in.)	350 A	300-400 A	3.9 kg/h (8.7 lb/h)	77 %

# Atom Arc 7018 Acclaim

Atom Arc Acclaim offers the deep, penetrating arc and tough mechanical properties of the original Atom Arc 7018 with greater puddle control resulting in ease of use in out-of-position welding applications and superior arc initiation desired by many newer welders. Both novice and seasoned welders can appreciate its excellent weld performance, wide operating range and easy clean up. Greater puddle control resulting in easier out-of-position welds, superior arc initiation and ease of use with wider operating range and minimal clean-up

<b>Classifications:</b>	AWS A5.1:E7018 H4R, ASME SFA 5.1
<b>Approvals:</b>	CWB CSA W48: E4918-1-H4, DNV 3Y(H10), LR 3m,3Ym(H10), ABS 2Y / AWS A5.1: E7018
<b>Industry or Segmentation:</b>	Civil Construction, Mobile Equipment, Ship/Barge Building, Bridge Construction, Railcars, Automotive, Industrial and General Fabrication

Approvals are based on factory location. Please contact ESAB for more information.

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As Welded	450 MPa (65 ksi)	550 MPa (79 ksi)	36 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	29 °C (-20 °F)	230 J (170 ft-lb)
As Welded	46 °C (-50 °F)	TBA by Dwight Myers 9/13

## Typical Weld Metal Analysis %

C	Mn	Si	S	P
0.05	1.20	0.45	0.008	0.01

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.6 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.4 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 7018-1

Atom Arc 7018-1 is an all-position, low hydrogen electrode that provides exceptional impact toughness at low service temperatures. Atom Arc 7018-1 provides smooth metal transfer, minimal spatter, and easy slag removal. Atom Arc 7018-1 is used to join a wide variety of carbon and low alloy steels. It is also an excellent choice for welding higher strength steels if undermatching welds are specified.

<b>Classifications:</b>	AWS A5.1:E7018-1 H4R, ASME SFA 5.1
<b>Approvals:</b>	CWB CSA W48: E4918-1-H4, DNV 3Y(H10), LR 3m,3Ym(H10), ABS 3,3Y(H10)/A5.1: E7018-1
<b>Industry or Segmentation:</b>	Mobile Equipment, Railcars, Industrial and General Fabrication, Automotive, Civil Construction

Approvals are based on factory location. Please contact ESAB for more information.

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	475 MPa (69 ksi)	565 MPa (81 ksi)	72 %	30 %
Stress Relieved 8 hr 621 °C (1150 °F)	415 MPa (60 ksi)	510 MPa (74 ksi)	72 %	33 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-46 °C (-50 °F)	141 J (104 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-46 °C (-50 °F)	224 J (165 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P
0.04	1.30	0.30	0.015	0.014

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.4 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %
6.4 mm (1/4 in.)	300 A	300-400 A	3.5 kg/h (7.7 lb/h)	78 %
6.4 mm (1/4 in.)	350 A	300-400 A	3.9 kg/h (8.7 lb/h)	77 %

# Atom Arc 7018-SR

Atom Arc 7018-SR is an all-position low hydrogen electrode. The moisture resistance and welder appeal is similar to other Atom Arc electrodes. Atom Arc 7018-SR was developed to maintain 70 ksi (483 MPa) tensile strength after 16 hours stress relieving.

<b>Classifications:</b>	AWS A5.1:E7018 H4R, ASME SFA 5.1
<b>Industry or Segmentation:</b>	Mobile Equipment, Power Generation, Civil Construction, Industrial and General Fabrication

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	475 MPa (68 ksi)	575 MPa (83 ksi)	76 %	32 %
Stress Relieved 8 hr 621 °C (1150 °F)	420 MPa (61 ksi)	520 MPa (76 ksi)	76 %	35 %
Stress Relieved 16 hr 621 °C (1150 °F)	405 MPa (59 ksi)	510 MPa (74 ksi)	77 %	35 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-29 °C (-20 °F)	195 J (114 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-29 °C (-20 °F)	180 J (133 ft-lb)
Stress Relieved 16 hr 621 °C (1150 °F)	-29 °C (-20 °F)	250 J (185 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Mo
0.06	1.30	0.30	0.014	0.014	0.10

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.4 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 7018-B2L

Atom Arc 7018-B2L is a 1 1/4 Cr - 1/2 Mo electrode with sensitivity extra low carbon content. The low carbon content in the weld metal is beneficial in reducing cracking of weldments. Atom Arc 7018-B2L is carefully engineered to produce a stable arc and good slag release when welding low-alloy steels in the categories of 0.5% Cr - 0.5% Mo, 1% Cr - 0.5% Mo, 1.25% Cr - 0.5% Mo steels. Most grades of these steels are used in power piping, boiler work, castings and forgings.

<b>Classifications:</b>	AWS A5.5:E7018-B2L H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Pipeline, Power Generation

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 691 °C (1275 °F)	510 MPa (74 ksi)	607 MPa (88 ksi)	29 %

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
0.04	0.80	0.50	0.008	0.01	1.27	0.54

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 7018-Mo

Atom Arc 7018-Mo electrodes contain 0.5% Mo as alloy addition. They are recommended for welding low-alloy, high tensile steels of 50 ksi (345 MPa) minimum yield strength and also 0.5% Molybdenum steels and pipes. They are widely employed in the fabrication and erection of boilers, pressure piping and tubing and other pressure vessel applications.

<b>Classifications:</b>	AWS A5.5:E7018-A1 H4R, ASME SFA 5.5
<b>Approvals:</b>	ABS AWS A5.5: E7018-A1
<b>Industry or Segmentation:</b>	Civil Construction, Mobile Equipment, Power Generation, Industrial and General Fabrication

*Approvals are based on factory location. Please contact ESAB for more information.*

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As Welded	530 MPa (77 ksi)	600 MPa (87 ksi)	27 %
Stress Relieved 1 hr 620 °C (1150 °F)	518 MPa (75 ksi)	607 MPa (88 ksi)	29 %
Stress Relieved 8 hr 620 °C (1150 °F)	524 MPa (76 ksi)	607 MPa (88 ksi)	28 %
Stress Relieved 20 hr 620 °C (1150 °F)	504 MPa (73 ksi)	587 MPa (85 ksi)	29 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
Stress Relieved 8 hr 620 °C (1150 °F)	0 °C (30 °F)	146 J (108 ft-lb)
Stress Relieved 8 hr 620 °C (1150 °F)	-30 °C (-20 °F)	94 J (69 ft-lb)
Stress Relieved 13 hr 620 °C (1150 °F)	10 °C (10 °F)	183 J (135 ft-lb)
Stress Relieved 20 hr 620 °C (1150 °F)	15 °C (60 °F)	203 J (150 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Mo
0.04	0.80	0.40	0.01	0.012	0.55

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.4 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %

# Atom Arc 8018

Atom Arc 8018 electrodes deposit 1% Ni weld metal. They are used primarily to weld high-tensile steels in the 70-80 ksi (483-552 MPa) tensile strength range, especially where notch toughness at temperatures as low as -40°F (-40°C) is required.

<b>Classifications:</b>	AWS A5.5:E8018-C3 H4R, ASME SFA 5.5
<b>Approvals:</b>	QPL-22200/1 MIL-8018-C3, LR 4Y40M(H10), CWB CSA W48: E5518-C3, ABS 3Y/AWS A5.5: E8018-C3
<b>Industry or Segmentation:</b>	Pipeline, Bridge Construction, Power Generation, Ship/Barge Building, Mobile Equipment, Petrochemical, Industrial and General Fabrication

Approvals are based on factory location. Please contact ESAB for more information.

Typical Tensile Properties			
Condition	Yield Strength	Tensile Strength	Elongation
As Welded	510 MPa (74 ksi)	585 MPa (85 ksi)	30 %
Stress Relieved 8 hr 621 °C (1150 °F)	485 MPa (70 ksi)	560 MPa (81 ksi)	30 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-29 °C (-20 °F)	168 J (124 ft-lb)
As Welded	-40 °C (-40 °F)	154 J (114 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-29 °C (-20 °F)	175 J (129 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-40 °C (-40 °F)	156 J (115 ft-lb)

Typical Weld Metal Analysis %						
C	Mn	Si	S	P	Ni	Mo
0.046	1.11	0.33	0.009	0.011	0.97	0.13

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 8018-B3L

Atom Arc 8018-B3L electrodes contain 2.25% Cr and 1% Mo alloy additions with low carbon content. The electrode is designed for welding 2.25% Cr - 1% Mo steels. The rod operates with a very stable arc and minimal spatter. The low carbon analysis of the weld metal contributes to its crack resistance. The addition of Cr and Mo provide for the excellent creep and stress rupture properties of weldments subjected to elevated temperature service.

<b>Classifications:</b>	AWS A5.5:E8018-B3L H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Mobile Equipment, Pipeline, Power Generation

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 691 °C (1275 °F)	538 MPa (78 ksi)	641 MPa (93 ksi)	25 %

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
0.04	0.70	0.40	0.015	0.017	2.30	1.10

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %



# Atom Arc 8018-B6

Atom Arc 8018-B6 is designed to weld 5% Cr -0.5% Mo creep resisting steels such as ASTM A387 Grade 5, A213-T5 and A335-P5. These steels are normally used in pressure vessels and piping for high temperature service.

<b>Classifications:</b>	AWS A5.5:E8018-B6 H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Power Generation, Pipeline, Ship/Barge Building

Typical Tensile Properties			
Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 746 °C (1375 °F)	593 MPa (86 ksi)	695 MPa (101 ksi)	23 %

Typical Weld Metal Analysis %							
C	Mn	Si	S	P	Cr	Mo	X-Factor
0.07	0.70	0.50	0.009	0.013	5.30	0.60	< 15

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %

# Atom Arc 8018-B6L

Atom Arc 8018-B6L deposits a low carbon 5% Cr, 0.5% Mo weld metal. It is designed for welding ASTM A200-T5, A335-P5, A387-Gr5 and similar steels. Applications tend to be in the petrochemical and petroleum industries, especially where hydrogen attack accelerates metal failure. Additionally, these steels are used in pressure vessels and piping for high temperature service.

<b>Classifications:</b>	AWS A5.5:E8018-B6L H4R, ASME SFA 5.5
<b>Approvals:</b>	MIL-22200/8 MIL-E-502-15
<b>Industry or Segmentation:</b>	Pipeline, Power Generation

*Approvals are based on factory location. Please contact ESAB for more information.*

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 746 °C (1375 °F)	655 MPa (95 ksi)	558 MPa (81 ksi)	25 %

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo
0.04	0.60	0.60	0.011	0.015	0.05	5.40	0.60

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %

# Atom Arc 8018-B8

Atom Arc 8018-B8 is designed to weld 9% Cr - 1% Mo creep resisting steels such as ASTM A213-T9 and A335-P9. These steels are used in pressure vessels and piping for high temperature service.

<b>Classifications:</b>	AWS A5.5:E8018-B8 H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Power Generation, Pipeline, Ship/Barge Building

Typical Tensile Properties			
Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 746 °C (1375 °F)	545 MPa (79 ksi)	676 MPa (98 ksi)	22 %

Typical Weld Metal Analysis %							
C	Mn	Si	S	P	Cr	Mo	X-Factor
0.07	0.80	0.30	0.01	0.01	8.60	1.00	< 15

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 8018-CM

Atom Arc 8018-CM electrodes contain 1.25% Cr and 0.50% Mo as alloy addition. They are used for the welding of such steels as 0.5% Cr - 0.5% Mo, 1% Cr - 0.5% Mo, and 1.25% Cr - 0.5% Mo, which are used principally in power piping and boiler work for the fabrication of plates, pipes, tubes, castings, and forgings.

<b>Classifications:</b>	AWS A5.5:E8018-B2 H4R, ASME SFA 5.5
<b>Approvals:</b>	ABS AWS A5.5: E8018-B2, MIL-E-22200/8 MIL-8018-B2
<b>Industry or Segmentation:</b>	Power Generation, Pipeline, Pressure Vessels

Approvals are based on factory location. Please contact ESAB for more information.

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As Welded	607 MPa (88 ksi)	704 MPa (102 ksi)	24 %
Stress Relieved 1 hr 690 °C (1275 °F)	580 MPa (84 ksi)	669 MPa (97 ksi)	25 %
Stress Relieved 1 hr 705 °C (1300 °F)	621 MPa (90 ksi)	642 MPa (93 ksi)	25 %
Stress Relieved 8 hr 620 °C (1150 °F)	607 MPa (88 ksi)	704 MPa (102 ksi)	24 %
Stress Relieved 8 hr 690 °C (1275 °F)	566 MPa (82 ksi)	662 MPa (96 ksi)	26 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
Stress Relieved 8 hr 607 °C (1125 °F)	0 °C (30 °F)	108 J (80 ft-lb)
Stress Relieved 8 hr 620 °C (1150 °F)	0 °C (30 °F)	113 J (83 ft-lb)
Stress Relieved 8 hr 677 °C (1250 °F)	0 °C (30 °F)	133 J (98 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo	X-Factor
0.06	0.80	0.50	0.008	0.011	1.30	0.57	< 15

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %
6.4 mm (1/4 in.)	300 A	300-400 A	3.5 kg/h (7.7 lb/h)	78 %
6.4 mm (1/4 in.)	350 A	300-400 A	3.9 kg/h (8.7 lb/h)	77 %

# Atom Arc 8018-C1

Atom Arc 8018-C1 electrodes deposit weld metal which contains nominal 2.33% Ni. Their principal use is in the welding of nickel-bearing steels for low temperature applications where toughness of the weld metal at low temperatures is important.

<b>Classifications:</b>	AWS A5.5:E8018-C1 H4R, ASME SFA 5.5
<b>Approvals:</b>	ABS 3Y, CWB CSA W48: E5518-C1, LR 3m,3Ym(H15)
<b>Industry or Segmentation:</b>	Mobile Equipment, Bridge Construction, Petrochemical, Industrial and General Fabrication

Approvals are based on factory location. Please contact ESAB for more information.

Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	550 MPa (80 ksi)	620 MPa (90 ksi)	75 %	30 %
Stress Relieved 1 hr 621 °C (1150 °F)	515 MPa (75 ksi)	595 MPa (86 ksi)	74 %	30 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-59 °C (-75 °F)	64 J (47 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-59 °C (-75 °F)	87 J (64 ft-lb)

Typical Weld Metal Analysis %					
C	Mn	Si	S	P	Ni
0.04	1.10	0.30	0.009	0.011	2.40

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %
6.4 mm (1.4 in.)	300 A	300-400 A	3.5 kg/h (7.7 lb/h)	78 %
6.4 mm (1.4 in.)	350 A	300-400 A	3.9 kg/h (8.7 lb/h)	77 %

# Atom Arc 8018-SR

Atom Arc 8018-SR is an all-position low hydrogen electrode. The moisture resistance and welder appeal is similar to other Atom Arc electrodes. Atom Arc 8018-SR was developed to maintain 80 ksi (552 MPa) after 50 hours stress relieving.

<b>Classifications:</b>	AWS A5.5:E8018-G H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Power Generation

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
Stress Relieved 8 hr 621 °C (1150 °F)	490 MPa (71 ksi)	587 MPa (85 ksi)	75 %	29 %
Stress Relieved 20 hr 621 °C (1150 °F)	495 MPa (72 ksi)	580 MPa (85 ksi)	76 %	30 %
Stress Relieved 50 hr 621 °C (1150 °F)	470 MPa (69 ksi)	562 MPa (82 ksi)	78 %	32 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
Stress Relieved 8 hr 621 °C (1150 °F)	16 °C (60 °F)	217 J (160 ft-lb)
Stress Relieved 20 hr 621 °C (1150 °F)	16 °C (60 °F)	233 J (172 ft-lb)
Stress Relieved 50 hr 621 °C (1150 °F)	16 °C (60 °F)	224 J (165 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-46 °C (-50 °F)	146 J (108 ft-lb)
Stress Relieved 20 hr 621 °C (1150 °F)	-46 °C (-50 °F)	144 J (106 ft-lb)
Stress Relieved 50 hr 621 °C (1150 °F)	-46 °C (-50 °F)	155 J (114 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	P	Ni	Cr	Mo
0.08	1.10	0.30	0.014	1.00	0.007	0.30

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 8018-N

Atom Arc 8018-N electrodes produce excellent weld properties and are used to fabricate components where low temperature notch toughness values are required.

Atom Arc 8018-N is also recommended for welding the 2% to 4% Ni steels.

<b>Classifications:</b>	AWS A5.5:E8018-C2 H4R, ASME SFA 5.5
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Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	625 MPa (91 ksi)	699 MPa (101 ksi)	55 %	26 %
Stress Relieved 1 hr 621 °C (1150 °F)	555 MPa (80 ksi)	639 MPa (93 ksi)	74 %	28 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-10 °C (-50 °F)	77 J (57 ft-lb)
As Welded	-73 °C (-100 °F)	47 J (35 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-73 °C (-100 °F)	33 J (24 ft-lb)

Typical Weld Metal Analysis %					
C	Mn	Si	S	P	Ni
0.045	1.10	0.30	0.015	0.018	3.55

# Atom Arc 9015-B9

Atom Arc 9015-B9 is designed to weld the modified 9% Cr & 1% Mo steels known by the designations T91, P91 or Grade 91. These steels are designed to provide improved creep strength, fatigue, oxidation, and corrosion resistance at elevated temperatures.

<b>Classifications:</b>	AWS A5.5:E9015-B9 H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Pipeline, Petrochemical, Power Generation

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 732 °C (1350 °F)	655 MPa (95 ksi)	787 MPa (114 ksi)	20 %
Stress Relieved 1 hr 746 °C (1375 °F)	704 MPa (102 ksi)	821 MPa (119 ksi)	19 %
Stress Relieved 1 hr 760 °C (1400 °F)	593 MPa (86 ksi)	731 MPa (106 ksi)	23 %

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo	V	Cu	AR	N	Nb	X-Factor
0.10	0.85	0.19	0.009	0.009	8.60	1.00	0.21	0.05	<0.01	0.04	0.04	< 15

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %



# Atom Arc 9018

Atom Arc 9018 electrodes are used for attachment welds on T-1, HY-80 and HY-90 steels and other high tensile, quenched and tempered steels.

<b>Classifications:</b>	AWS A5.5:E9018M H4R, ASME SFA 5.5
<b>Approvals:</b>	QPL-22200/1 MIL-9018-M, ABS 3Y, LR 3Ym(H15)
<b>Industry or Segmentation:</b>	Bridge Construction, Ship/Barge Building, Mobile Equipment, Industrial and General Fabrication, Railcars, Civil Construction

Approvals are based on factory location. Please contact ESAB for more information.

Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	580 MPa (84 ksi)	655 MPa (95 ksi)	69 %	28 %
Stress Relieved 24 hr 593 °C (1100 °F)	470 MPa (68 ksi)	635 MPa (92 ksi)	72 %	27 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-51 °C (-60 °F)	81 J (60 ft-lb)
Stress Relieved 24 hr 593 °C (1100 °F)	-51 °C (-60 °F)	92 J (66 ft-lb)

Typical Weld Metal Analysis %						
C	Mn	Si	S	P	Ni	Mo
0.043	1.00	0.26	0.01	0.012	1.60	0.29

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 9018-B9

Atom Arc 9018-B9 is designed to weld the modified 9% Cr - 1% Mo steels known by the designations T91, P91 or Grade 91. These steels are designed to provide improved creep strength, toughness, fatigue, and oxidation and corrosion resistance at elevated temperatures.

<b>Classifications:</b>	AWS A5.5:E9018-B9 H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Power Generation, Petrochemical, Pipeline

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 746 °C (1375 °F)	711 MPa (103 ksi)	821 MPa (119 ksi)	19 %
Stress Relieved 2 hr 760 °C (1400 °F)	587 MPa (85 ksi)	724 MPa (105 ksi)	25 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
Stress Relieved 2 hr 760 °C (1400 °F)	21 °C (70 °F)	83 J (61 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	V	Al	Cu	N	Nb	X-Factor
0.10	0.80	0.17	0.009	0.008	0.20	8.50	1.00	0.19	<.01	0.04	0.04	0.04	< 15

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %

# Atom Arc 9018-CM

The principal application of Atom Arc 9018-CM electrodes is for welding 2.5% Cr - 1% Mo steels commonly found in pressure vessels, heat exchangers, pipings and other related components.

<b>Classifications:</b>	AWS A5.5:E9018-B3 H4R, ASME SFA 5.5
<b>Approvals:</b>	ABS AWS A5.5: E9018-B3, MIL-E-0022200/8 MIL-9018-B3
<b>Industry or Segmentation:</b>	Power Generation, Pipeline

Approvals are based on factory location. Please contact ESAB for more information.

Typical Tensile Properties			
Condition	Yield Strength	Tensile Strength	Elongation
Stress Relieved 1 hr 690 °C (1275 °F)	587 MPa (85 ksi)	704 MPa (102 ksi)	23 %
Stress Relieved 8 hr 690 °C (1275 °F)	566 MPa (82 ksi)	669 MPa (97 ksi)	26 %
Stress Relieved 20 hr 690 °C (1275 °F)	587 MPa (85 ksi)	690 MPa (100 ksi)	22 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
Stress Relieved 8 hr 685 °C (1275 °F)	-1 °C (30 °F)	131 J (97 ft-lb)

Typical Weld Metal Analysis %							
C	Mn	Si	S	P	Cr	Mo	X-Factor
0.07	0.70	0.40	0.008	0.011	2.20	1.10	< 15

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 9018-SR

Atom Arc 9018SR is an all-position, low hydrogen iron powder electrode with outstanding moisture resistance and welder appeal. The "G" classification of 9018SR is the result of higher Mn and Mo levels and a minimum Ni of 1.1%.

<b>Classifications:</b>	AWS A5.5:E9018-G H4R, ASME SFA 5.5
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## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
Stress Relieved 20 hr 621 °C (1150 °F)	601 MPa (87 ksi)	684 MPa (99 ksi)	68 %	24 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
Stress Relieved 20 hr 621 °C (1150 °F)	16 °C (60 °F)	123 J (91 ft-lb)
Stress Relieved 20 hr 621 °C (1150 °F)	-46 °C (-50 °F)	49 J (36 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
0.09	1.60	0.30	0.009	0.016	1.05	0.03	0.45	0.01	0.01

# Atom Arc 10018

Atom Arc 10018 electrodes are used primarily for applications which require weld joints of at least 100 ksi (690 MPa) tensile strength, good ductility and crack resistance. Good notch toughness at temperatures as low as -60°F (-51°C) is possible with this electrode. Atom Arc 10018 can be used to weld HY-80 and T-1 steel.

<b>Classifications:</b>	AWS A5.5:E10018M H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Ship/Barge Building, Railcars, Mobile Equipment, Bridge Construction, Industrial and General Fabrication

Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	685 MPa (99 ksi)	745 MPa (108 ksi)	64 %	24 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-40 °C (-40 °F)	62 J (46 ft-lb)
As Welded	-51 °C (-60 °F)	38 J (28 ft-lb)

Typical Weld Metal Analysis %						
C	Mn	Si	S	P	Ni	Mo
0.051	1.46	0.31	0.011	0.013	1.72	0.27

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	170 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %

# Atom Arc 10018-M1

Atom Arc 10018-M1 is a low hydrogen, iron powder all-position electrode specially formulated to meet the more stringent requirements of Military Specification MIL-E-0022200/10 for mechanical properties, low coating moisture and diffusible hydrogen content. Hydrogen coupons analyzed by the gas chromatography method showed an average of 0.026 ml/g of diffusible hydrogen. The average percent by weight of coating moisture is 0.07% when removed from a hermetically sealed can and 0.17% after 9 hours exposure at 80°F (27°C) and 80% relative humidity.

Atom Arc 10018-M1 electrode is intended for welding high tensile steels, such as HY-80, HSLA-80, A710 and T-1 steel.

<b>Classifications:</b>	MIL 10018M1
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Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	617 MPa (90 ksi)	672 MPa (97 ksi)	67 %	24 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-18 °C (0 °F)	130 J (96 ft-lb)
As Welded	-51 °C (-60 °F)	91 J (67 ft-lb)

Typical Weld Metal Analysis %						
C	Mn	Si	S	P	Ni	Mo
0.034	1.02	0.21	0.014	0.014	1.98	0.25

# Atom Arc 10018-MM

Atom Arc 10018-MM electrodes are used to weld low-alloy, high-tensile steels where welds of 100 ksi (690 MPa) minimum tensile strength is required. This electrode is recommended for use in the weld repair and fabrication of Mn-Mo steel castings and armor plate.

<b>Classifications:</b>	AWS A5.5:E10018-D2 H4R, ASME SFA 5.5
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Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
Stress Relieved 1 hr 621 °C (1150 °F)	644 MPa (93 ksi)	716 MPa (104 ksi)	68 %	24 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
Stress Relieved 1 hr 621 °C (1150 °F)	-51 °C (-60 °F)	33 J (24 ft-lb)

Typical Weld Metal Analysis %					
C	Mn	Si	S	P	Mo
0.09	1.82	0.33	0.016	0.018	0.35

# Atom Arc 12018

Atom Arc 12018 is recommended for use in fabrication of low-alloy, high tensile steels where welds of 120 ksi (830 MPa) minimum tensile strength are required. Atom Arc 12018 is typically used to weld forging, casting plate and pressure vessels.

<b>Classifications:</b>	AWS A5.5:E12018M H4R, ASME SFA 5.5
<b>Industry or Segmentation:</b>	Automotive, Industrial and General Fabrication, Railcars, Mobile Equipment

## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	830 MPa (120 ksi)	920 MPa (133 ksi)	56 %	18 %

## Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-51 °C (-60 °F)	35 J (26 ft-lb)

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo
0.057	1.75	0.34	0.01	0.014	1.97	0.85	0.47

## Deposition Data

Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %



## Atom Arc 12018-M2

Atom Arc 12018-M2 is a low hydrogen, iron powder all-position electrode specially formulated to meet the more stringent requirements of Military Specification MIL-E-0022200/10 for mechanical properties, low coating moisture and diffusible hydrogen content. Hydrogen coupons analyzed by the gas chromatography method showed an average of 0.026 ml/g of diffusible hydrogen. The average percent by weight of coating moisture is 0.07% when removed from a hermetically sealed can and 0.17% after 9 hours exposure at 80°F (27°C) and 80% relative humidity.

<b>Classifications:</b>	MIL 12018M2
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Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	750 MPa (109 ksi)	820 MPa (118 ksi)	64 %	21 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-18 °C (0 °F)	102 J (75 ft-lb)
As Welded	-51 °C (-60 °F)	81 J (60 ft-lb)

Typical Weld Metal Analysis %						
C	Mn	Si	S	P	Ni	Mo
0.035	1.13	0.15	0.009	0.014	3.65	0.57

# Atom Arc 4340

Atom Arc 4340 is an all-position, iron powder, low hydrogen electrode developed for the welding of heat-treatable, high strength steels such as SAE 4130, 4330, 4340 and steel castings with similar hardening properties.

<b>Classifications:</b>	No AWS Classification
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## Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
Aus. 871 °C (1600 °F) Oil Quenched Tempered at 621 °C (1150 °F)	1179 MPa (171 ksi)	1303 MPa (189 ksi)	38.5 %	12 %
Aus. 871 °C (1600 °F) Oil Quenched Tempered at 510 °C (950 °F)	951 MPa (138 ksi)	1040 MPa (160 ksi)	43 %	15 %

## Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo
0.35	0.85	0.50	0.014	0.011	1.80	0.80	0.25

# Atom Arc T

Atom Arc T was developed for welding T-1 steel in all applications. Mechanical properties of the welded joints equal or exceed the properties of the base steel in either the as welded or stress relieved condition, thus giving 100% design joint efficiency. In addition, Atom Arc T electrodes are suitable for many other applications, particularly where high-strength welds with excellent low temperature impact properties are required.

<b>Classifications:</b>	AWS A5.5:E11018M H4R, ASME SFA 5.5
<b>Approvals:</b>	QPL-22200/1 MIL-11018-M, CWB CSA W48: E7618-M-H4, ABS AWS A5.5: E11018-M
<b>Industry or Segmentation:</b>	Industrial and General Fabrication, Railcars, Mobile Equipment, Bridge Construction, Civil Construction, Ship/Barge Building

Approvals are based on factory location. Please contact ESAB for more information.

Typical Tensile Properties				
Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
As Welded	725 MPa (105 ksi)	795 MPa (115 ksi)	62 %	23 %
Stress Relieved 1 hr 552 °C (1025 °F) Flat Position	705 MPa (102 ksi)	770 MPa (112 ksi)	63 %	23 %

Typical Charpy V-Notch Properties		
Condition	Testing Temperature	Impact Value
As Welded	-18 °C (0 °F)	75 J (55 ft-lb)
As Welded	-40 °C (-40 °F)	65 J (48 ft-lb)
As Welded	-51 °C (-60 °F)	60 J (44 ft-lb)
Stress Relieved 1 hr 552 °C (1025 °F)	-18 °C (0 °F)	68 J (50 ft-lb)
Stress Relieved 1 hr 552 °C (1025 °F)	-40 °C (-40 °F)	57 J (42 ft-lb)
Stress Relieved 1 hr 552 °C (1025 °F)	-51 °C (-60 °F)	34 J (25 ft-lb)

Typical Weld Metal Analysis %							
C	Mn	Si	S	P	Ni	Cr	Mo
0.48	1.48	0.30	0.01	0.012	1.95	0.24	0.38

Deposition Data				
Diameter	Optimal Amps	Amps	Deposition Rate	Efficiency (%)
2.4 mm (3/32 in.)	90 A	70-100 A	0.8 kg/h (1.7 lb/h)	66.3 %
3.2 mm (1/8 in.)	120 A	90-160 A	1.2 kg/h (2.6 lb/h)	71.6 %
3.2 mm (1/8 in.)	140 A	90-160 A	1.2 kg/h (2.7 lb/h)	70.9 %
4.0 mm (5/32 in.)	170 A	130-220 A	1.7 kg/h (3.8 lb/h)	73.5 %
4.0 mm (5/32 in.)	140 A	130-220 A	1.1 kg/h (3.1 lb/h)	75 %
4.8 mm (3/16 in.)	200 A	200-300 A	2.2 kg/h (4.9 lb/h)	76.4 %
4.8 mm (3/16 in.)	250 A	200-300 A	2.4 kg/h (5.4 lb/h)	74.6 %
5.6 mm (7/32 in.)	250 A	250-350 A	2.9 kg/h (6.5 lb/h)	75 %
5.6 mm (7/32 in.)	300 A	250-350 A	3.3 kg/h (7.2 lb/h)	74 %