

2018 STATE HIGHWAY CERTIFICATES OF CONFORMANCE INDEX

The certificates below serve to document that ESAB Welding & Cutting Products welding consumables conform to the referenced specifications.

<u>The ESAB Group Electrode</u>	<u>AWS Classification</u>	<u>AWS Specification</u>
Atom Arc 7018	E7018H4R	AWS A5.1: 2012
Atom Arc 7018-1	E7018-1H4R	AWS A5.1: 2012
Atom Arc 7018 Acclaim	E7018H4R	AWS A5.1: 2012
Atom Arc 8018	E8018-C3H4R	AWS A5.5: 2014
Atom Arc 9018	E9018-MH4R	AWS A5.5: 2014
Atom Arc T	E11018-MH4R	AWS A5.5: 2014
Coreweld C6	E70C-6M	AWS A5.18: 2017
Coreweld 70	E70C-6M	AWS A5.18: 2017
Coreshield 8	E71T-8 H8	AWS A5.20: 2005
Dual Shield 70 Ultra Plus	E71T-1M/T-9M	AWS A5.20: 2005
Dual Shield R-70 Ultra	E70T-1C-DH8/T-1M/T-9C-DH8/T-9M	AWS A5.20: 2005
Dual Shield T-75	E70T-5CJH4	AWS A5.20: 2005
Dual Shield II 70T12-H4	E71T-1MJH4/T-12MJH4	AWS A5.20: 2005
Dual Shield 7100 Ultra (75/25)	E71T-1C-DH8/T-1M/T-9C-DH8/T-9M	AWS A5.20: 2005
Dual Shield 7100 Ultra (CO ₂)		
Dual Shield 7100LC (75/25)	E71T-1C-DH8/T-1M/T-9C-DH8/T-9M	AWS A5.20: 2005
Dual Shield 7100LC (CO ₂)		
Dual Shield II 70 Ultra	E71T-1M/T-12M	AWS A5.20: 2005
Dual Shield II 71 Ultra	E71T-1CJ/T-12CJ	AWS A5.20: 2005
Dual Shield 700X	E70T-1C	AWS A5.20: 2005
Dual Shield 710X (75/25)	E71T-1C-DH8/T-1M/T-9C-DH8/T-9M	AWS A5.20: 2005
Dual Shield 710X (CO ₂)		
Dual Shield 710-M (75/25)	E71T-1C/T-1M-DH8/T-9C/T-9M-DH8	AWS A5.20: 2005
Dual Shield 710-M (CO ₂)		
Dual Shield II 712X	E71T-1MJH8/T-12MJH8	AWS A5.20: 2005
Dual Shield II 80Ni1H4	E81T1-Ni1M-JH4	AWS A5.29: 2010
Dual Shield 810X-Ni1	E81T1-Ni1C-JH8	AWS A5.29: 2010
Dual Shield 8100W (75/25)	E81T1-W2C/W2M	AWS A5.29: 2010
Dual Shield 8100W (CO ₂)		

2018 STATE HIGHWAY
CERTIFICATES OF CONFORMANCE

FLUX CORED WIRES AND STICK ELECTRODES

ESAB WELDING & CUTTING PRODUCTS

We hereby certify that the results provided on the following pages for welding rods, electrodes and filler metals are a true representation of the tests and results recorded as performed at our facilities.

These welding rods, electrodes and filler metals meet the classification requirements of their respective AWS/ASME specifications as identified in the Index on the previous page.



Robert B. Lenker, Quality Specialist

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 1/23/2018
Test Number: 2-59492-00
Moisture (RC-412): (P) 0.07% / (E) 0.23%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 1.5 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 9%

Chemical Analysis (%)

Carbon: 0.06
Manganese: 1.09
Silicon: 0.44
Phosphorus: 0.014
Sulfur: 0.018
Chromium: 0.18
Nickel: 0.05
Molybdenum: 0.05
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	6	---	---	24.9	101	DC+

Mechanical Test Results

As Welded
Yield (psi): 76,874
Tensile (psi): 90,104
Elongation 2" (%): 23.0
Reduction of Area (%): 52.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 83-86-91-96-92 Avg. = 90

Fillets: OK Vertical / Overhead

Atom Arc 7018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

ESAB Welding & Cutting Products
1500 Karen Lane
Hanover, PA 17331

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 2/14/2018
Test Number: 2-59493-00
Moisture (RC-412): (P) 0.08% / (E) 0.26%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.05
Silicon: 0.42
Phosphorus: 0.013
Sulfur: 0.018
Chromium: 0.06
Nickel: 0.05
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.09

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	24.0	180	DC+

Mechanical Test Results

	As Welded
Yield (psi):	65,048
Tensile (psi):	78,782
Elongation 2" (%):	29.0
Reduction of Area (%):	73.0


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 114-105-126-125-105 Avg. = 115

Filletts: OK Vertical / Overhead

Atom Arc 7018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 2/13/2018
Test Number: 2-59494-00
Moisture (RC-412): (P) 0.1% / (E) 0.23%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.01
Silicon: 0.43
Phosphorus: 0.015
Sulfur: 0.012
Chromium: 0.06
Nickel: 0.06
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.13

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	235	DC+

Mechanical Test Results

	As Welded
Yield (psi):	63,483
Tensile (psi):	77,748
Elongation 2" (%)	31.0
Reduction of Area (%):	75.0


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 90-35-114-118-113 Avg. = 106

Filletts: OK Horizontal

Atom Arc 7018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 1/4"
Test Date: 3/28/2017
Test Number: 2-58715-00
Moisture (RC-412): (P) 0.08% / (E) 0.26%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 4.0 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 14%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.09
Silicon: 0.50
Phosphorus: 0.017
Sulfur: 0.015
Chromium: 0.07
Nickel: 0.06
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	9	---	---	23.7	275	DC+

Mechanical Test Results

As Welded
Yield (psi): 66,366
Tensile (psi): 79,830
Elongation 2" (%): 32.0
Reduction of Area (%): 76.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 17-11-42-92-120 Avg. = 56

Filletts: OK Horizontal

Atom Arc 7018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018-1, classification E7018-1H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018-1H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 10/25/2017
Test Number: 2-59234-00
Moisture (RC-412): (P) 0.08% / (E) 0.20%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 1.9 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 20%

Chemical Analysis (%)

Carbon: 0.06
Manganese: 1.24
Silicon: 0.51
Phosphorus: 0.015
Sulfur: 0.012
Chromium: 0.05
Nickel: 0.04
Molybdenum: 0.02
Vanadium: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	6	---	---	23.7	101	DC+

Mechanical Test Results

As Welded

Yield (psi): 80,657
Tensile (psi): 91,992
Elongation 2" (%): 28.0
Reduction of Area (%): 74.0

Charpy V-Notch Impacts Tested @ -50°F

Ft. Lbs. 49-44-84-77-82 Avg. = 67

Filletts: OK Vertical / Overhead

Atom Arc 7018-1 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

ESAB Welding & Cutting Products
1500 Karen Lane
Hanover, PA 17331

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018-1, classification E7018-1H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018-1H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 4/4/2017
Test Number: 2-58717-00
Moisture (RC-412): (P) 0.05% / (E) 0.15%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.30
Silicon: 0.48
Phosphorus: 0.013
Sulfur: 0.010
Chromium: 0.06
Nickel: 0.05
Molybdenum: 0.02
Vanadium: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	180	DC+

Mechanical Test Results

	As Welded
Yield (psi):	70,665
Tensile (psi):	84,162
Elongation 2" (%)	32.0
Reduction of Area (%):	76.0


Charpy V-Notch Impacts Tested @ -50°F

Ft. Lbs. 92-73-102-106-108 Avg. = 96

Filletts: OK Vertical / Overhead

Atom Arc 7018-1 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

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By: 

R. Lenker, Quality Engineer, ESAB

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This is to certify that the supplied ATOM ARC 7018-1, classification E7018-1H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018-1H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 1/5/2018
Test Number: 2-59379-00
Moisture (RC-412): (P) 0.06% / (E) 0.15%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.32
Silicon: 0.50
Phosphorus: 0.019
Sulfur: 0.011
Chromium: 0.06
Nickel: 0.04
Molybdenum: 0.02
Vanadium: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	7	---	---	23.0	230	DC+

Mechanical Test Results

	As Welded
Yield (psi):	68,535
Tensile (psi):	82,453
Elongation 2" (%)	23.0
Reduction of Area (%):	49.0


Charpy V-Notch Impacts Tested @ -50°F

Ft. Lbs. 72-89-104-78-85 Avg. = 86

Filletts: OK Horizontal

Atom Arc 7018-1 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018-1, classification E7018-1H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018-1H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 1/4"
Test Date: 3/27/2017
Test Number: 2-58716-00
Moisture (RC-412): (P) 0.07% / (E) 0.34%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 3.7 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 14%

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.27
Silicon: 0.49
Phosphorus: 0.019
Sulfur: 0.013
Chromium: 0.07
Nickel: 0.04
Molybdenum: 0.01
Vanadium: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	9	---	---	23.0	275	DC+

Mechanical Test Results

As Welded
Yield (psi): 68,296
Tensile (psi): 82,094
Elongation 2" (%): 30.0
Reduction of Area (%): 74.0

Charpy V-Notch Impacts Tested @ -50°F

Ft. Lbs. 15-12-61-72-70 Avg. = 46

Fillets: OK Horizontal

Atom Arc 7018-1 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018 Acclaim, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 1/8/2018
Test Number: 2-59378-00
Moisture (RC-412): (P) 0.05% / (E) 0.13%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 1.2 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 16%

Chemical Analysis (%)

Carbon: 0.06
Manganese: 1.08
Silicon: 0.48
Phosphorus: 0.020
Sulfur: 0.020
Chromium: 0.06
Nickel: 0.05
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.08

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	6	---	---	23.0	98	DC+

Mechanical Test Results

As Welded
Yield (psi): 69,369
Tensile (psi): 83,992
Elongation 2" (%): 28.0
Reduction of Area (%): 72.0


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 100-118-94-83-95 Avg. = 98

Filletts: OK Vertical / Overhead

Atom Arc 7018 Acclaim is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018 Acclaim, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 1/8"
Test Date: 1/12/2018
Test Number: 2-59495-00
Moisture (RC-412): (P) 0.06% / (E) 0.12%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.00
Silicon: 0.42
Phosphorus: 0.013
Sulfur: 0.016
Chromium: 0.06
Nickel: 0.06
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.13

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	6	---	---	23.0	140	DC+

Mechanical Test Results

As Welded
Yield (psi): 66,181
Tensile (psi): 79,630
Elongation 2" (%): 36.0
Reduction of Area (%): 78.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 151-148-182-115-121 Avg. = 143

Filletts: OK Vertical / Overhead

Atom Arc 7018 Acclaim is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018 Acclaim, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 1/25/2018
Test Number: 2-59496-00
Moisture (RC-412): (P) 0.05% / (E) 0.14%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.09
Silicon: 0.49
Phosphorus: 0.017
Sulfur: 0.015
Chromium: 0.10
Nickel: 0.05
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.14

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	180	DC+

Mechanical Test Results

	As Welded
Yield (psi):	69,295
Tensile (psi):	83,410
Elongation 2" (%):	29.0
Reduction of Area (%):	74.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 108-115-116-116-99 Avg. = 111

Filletts: OK Vertical / Overhead

Atom Arc 7018 Acclaim is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 7018 Acclaim, classification E7018H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.1:2012 were performed in conformance with this specification, and the tested E7018H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.1:2012. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 2/13/2018
Test Number: 2-59497-00
Moisture (RC-412): (P) 0.05% / (E) 0.13%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 2.3 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 9%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.02
Silicon: 0.36
Phosphorus: 0.016
Sulfur: 0.014
Chromium: 0.07
Nickel: 0.04
Molybdenum: 0.02
Vanadium: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	240	DC+

Mechanical Test Results

As Welded
Yield (psi): 66,252
Tensile (psi): 80,031
Elongation 2" (%): 29.0
Reduction of Area (%): 71.0


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 95-90-110-90-81 Avg. = 92

Fillets: OK Horizontal

Atom Arc 7018 Acclaim is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 8018, classification E8018-C3H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E8018-C3H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 4/18/2017
Test Number: 2-58933-00
Moisture (RC-412): (P) 0.07% / (E) 0.15%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 2.0 ml/100 gr
Atmospheric Temperature: 73°F
Relative Humidity: 18%

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.06
Silicon: 0.36
Phosphorus: 0.021
Sulfur: 0.016
Chromium: 0.07
Nickel: 0.84
Molybdenum: 0.13
Vanadium: 0.01
Copper: 0.11

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	6	---	---	24.2	98	DC+

Mechanical Test Results As Welded

Yield (psi): 83,942
Tensile (psi): 93,655
Elongation 2" (%): 27.0
Reduction of Area (%): 66.0

Charpy V-Notch Impacts Tested @ -40°F

Ft. Lbs. 86-97-85-81-82 Avg. = 86

Filletts: OK Vertical / Overhead

Atom Arc 8018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 8018, classification E8018-C3H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E8018-C3H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 12/18/2017
Test Number: 2-59444-00
Moisture (RC-412): (P) 0.07% / (E) 0.14%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.07
Silicon: 0.34
Phosphorus: 0.013
Sulfur: 0.013
Chromium: 0.07
Nickel: 0.82
Molybdenum: 0.12
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	180	DC+

Mechanical Test Results

	As Welded
Yield (psi):	75,475
Tensile (psi):	88,090
Elongation 2" (%):	26.0
Reduction of Area (%):	63.0


Charpy V-Notch Impacts Tested @ -40°F

Ft. Lbs. 80-69-86-102-82 Avg. = 84

Filletts: OK Vertical / Overhead

Atom Arc 8018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

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By: 

R. Lenker, Quality Engineer, ESAB

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This is to certify that the supplied ATOM ARC 8018, classification E8018-C3H4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E8018-C3H4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 06/26/2017
Test Number: 2-58954-00
Moisture (RC-412): (P) 0.10% / (E) 0.16%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 3.3 ml/100 gr
Atmospheric Temperature: 70°F
Relative Humidity: 16%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.02
Silicon: 0.33
Phosphorus: 0.011
Sulfur: 0.013
Chromium: 0.08
Nickel: 0.89
Molybdenum: 0.12
Vanadium: 0.01
Copper: 0.14

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	8	---	---	23.0	240	DC+

Mechanical Test Results As Welded

Yield (psi): 72,728
Tensile (psi): 85,098
Elongation 2" (%): 29.0
Reduction of Area (%): 72.0

Charpy V-Notch Impacts Tested @ -40°F

Ft. Lbs. 80-91-91-93-66 Avg = 84

Fillets: OK Horizontal

Atom Arc 8018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

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By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 9018, classification E9018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E9018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 01/08/2018
Test Number: 2-59445-00
Moisture (RC-412): (P) 0.07% / (E) 0.14%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 1.6 ml/100 gr
Atmospheric Temperature: 66°F
Relative Humidity: 17%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 0.88
Silicon: 0.30
Phosphorus: 0.017
Sulfur: 0.018
Chromium: 0.07
Nickel: 1.53
Molybdenum: 0.30
Vanadium: 0.01
Copper: 0.13

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	2	2	1	23.0	97	DC+

Mechanical Test Results As Welded

Yield (psi): 93,768
Tensile (psi): 103,230
Elongation 2" (%): 26.0
Reduction of Area (%): 65.0


Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 66-73-74-78-81 Avg = 74

Fillets: OK Horizontal

Atom Arc 9018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 9018, classification E9018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E9018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 07/11/2017
Test Number: 2-58955-00
Moisture (RC-412): (P) 0.10% / (E) 0.20%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.06
Silicon: 0.33
Phosphorus: 0.010
Sulfur: 0.011
Chromium: 0.10
Nickel: 1.61
Molybdenum: 0.33
Vanadium: 0.01
Copper: 0.10

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	3	5	---	23.0	185	DC+

Mechanical Test Results

As Welded
Yield (psi): 88,298
Tensile (psi): 97,720
Elongation 2" (%): 26.0
Reduction of Area (%): 71.0

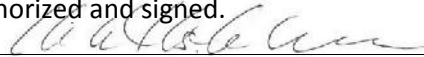
Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 45-71-61-50-70 Avg = 59

Filletts: OK Vertical / Overhead

Atom Arc 9018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC 9018, classification E9018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E9018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 02/20/2018
Test Number: 2-59589-00
Moisture (RC-412): (P) 0.08% / (E) 0.16%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 2.3 ml/100 gr
Atmospheric Temperature: 68°F
Relative Humidity: 8%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.10
Silicon: 0.31
Phosphorus: 0.012
Sulfur: 0.017
Chromium: 0.10
Nickel: 1.66
Molybdenum: 0.29
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	5	2	---	22.0	240	DC+

Mechanical Test Results

As Welded
Yield (psi): 84,995
Tensile (psi): 96,370
Elongation 2" (%): 25.0
Reduction of Area (%): 69.0

Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 35-56-58-53-72 Avg = 55

Filletts: OK Horizontal

Atom Arc 9018 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC T, classification E11018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E11018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/32"
Test Date: 2/14/2018
Test Number: 2-59498-00
Moisture (RC-412): (P) 0.05% / (E) 0.15%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 2.2 ml/100 gr
Atmospheric Temperature: 71°F
Relative Humidity: 9%

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.35
Silicon: 0.23
Phosphorus: 0.014
Sulfur: 0.013
Chromium: 0.30
Nickel: 1.89
Molybdenum: 0.38
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	4	1	---	23.8	100	DC+

Mechanical Test Results As Welded

Yield (psi): 110,226
Tensile (psi): 121,540
Elongation 2" (%): 23.0
Reduction of Area (%): 55.0

Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 53-49-39-45-47 Avg = 47

Filletts: OK Vertical / Overhead

Atom Arc T is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

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R. Lenker, Quality Engineer, ESAB

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This is to certify that the supplied ATOM ARC T, classification E11018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E11018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 5/32"
Test Date: 2/16/2018
Test Number: 2-59500-00
Moisture (RC-412): (P) 0.06% / (E) 0.14%
Concentricity: 2.0%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.73
Silicon: 0.30
Phosphorus: 0.016
Sulfur: 0.013
Chromium: 0.27
Nickel: 1.94
Molybdenum: 0.37
Vanadium: 0.01
Copper: 0.12

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	1	6	---	23.0	180	DC+

Mechanical Test Results

As Welded
Yield (psi): 107,991
Tensile (psi): 114,739
Elongation 2" (%): 22.0
Reduction of Area (%): 61.0


Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 48-49-58-53-53 Avg = 52

Filletts: OK Vertical / Overhead

Atom Arc T is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

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R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied ATOM ARC T, classification E11018-MH4R, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.5:2014 were performed in conformance with this specification, and the tested E11018-MH4R material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.5:2014. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 3/16"
Test Date: 2/14/2018
Test Number: 2-59499-00
Moisture (RC-412): (P) 0.06% / (E) 0.12%
Concentricity: 2.0%
Radiography: Satisfactory
Diffusible Hydrogen: 3.0 ml/100 gr
Atmospheric Temperature: 69°F
Relative Humidity: 14%

Chemical Analysis (%)

Carbon: 0.06
Manganese: 1.65
Silicon: 0.33
Phosphorus: 0.014
Sulfur: 0.012
Chromium: 0.25
Nickel: 1.88
Molybdenum: 0.36
Vanadium: 0.01
Copper: 0.14

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	1	6	---	22.5	230	DC+

Mechanical Test Results As Welded

Yield (psi): 105,907
Tensile (psi): 114,447
Elongation 2" (%): 21.0
Reduction of Area (%): 57.0


Charpy V-Notch Impacts Tested @ -60°F

Ft. Lbs. 37-53-36-26-32 Avg = 35

Filletts: OK Horizontal

Atom Arc T is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied COREWELD C6, classification E70C-6M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.18:2017 were performed in conformance with this specification, and the tested E70C-6M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.18:2017. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Test Date: 03/07/2018

Test Number: 2-59594-00

Travel Speed: 12.7 IPM

Diffusible Hydrogen: 1.8 %

Atmospheric Temperature: 69°F

Relative Humidity: 9%

Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.02

Manganese: 1.61

Silicon: 0.72

Phosphorus: 0.009

Sulfur: 0.013

Chromium: 0.03

Nickel: 0.02

Molybdenum: 0.01

Vanadium: <0.01

Copper: 0.04

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	5	---	---	27.0	290	DC+

Mechanical Test Results As Welded

Yield (psi): 63,337

Tensile (psi): 77,290

Elongation 2" (%): 32.0

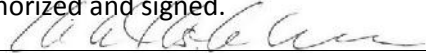
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 46-94-104-23-74 Avg = 68

Coreweld C6 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied COREWELD 70, classification E70C-6M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.18:2017 were performed in conformance with this specification, and the tested E70C-6M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.18:2017. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Test Date: 02/20/2018
Test Number: 2-59504-00
Travel Speed: 14.0 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.54
Silicon: 0.57
Phosphorus: 0.015
Sulfur: 0.018
Chromium: 0.05
Nickel: 0.02
Molybdenum: 0.01
Vanadium: 0.01
Copper: 0.06

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.5	305	DC+

Mechanical Test Results

As Welded
Yield (psi): 62,593
Tensile (psi): 78,553
Elongation 2" (%): 30.0
Reduction of Area (%): 71.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 70-44-75-68-65 Avg = 64

Coreweld 70 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied CORESHIELD 8, classification E71T-8 H8, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-8 H8 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Size (Diameter): 1/16"
Test Date: 01/18/2018
Test Number: 2-59446-00
Travel Speed: 9.9 IPM
Radiography: Satisfactory
Diffusible Hydrogen: 6.6 ml/100 gr.
Atmospheric Temperature: 66°F
Relative Humidity: 7%

Chemical Analysis (%)

Carbon: 0.19
Manganese: 0.40
Silicon: 0.09
Phosphorus: 0.009
Sulfur: 0.002
Chromium: 0.04
Nickel: 0.02
Molybdenum: 0.02
Vanadium: 0.01
Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
---	4	3	---	20.8	260	DC+

Mechanical Test Results

As Welded
Yield (psi): 70,553
Tensile (psi): 86,215
Elongation 2" (%): 29.0
Reduction of Area (%): 66.0

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 37-36-35-38-32 Avg = 36

Filletts: OK Vertical-Up / Overhead

Coreshield 8 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 70 ULTRA PLUS, classification E71T-1M/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1M/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"
Test Date: 2/21/2017
Test Number: 2-58558-00
Travel Speed: 12.3 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.03
Manganese: 1.03
Silicon: 0.63
Phosphorus: 0.011
Sulfur: 0.002
Chromium: 0.04
Nickel: 0.03
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.07

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.0	289	DC+

Mechanical Test Results As Welded

Yield (psi): 76,423
Tensile (psi): 81,872
Elongation 2" (%): 29.0
Reduction of Area (%): 75.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 29-126-79-104-84 Avg = 84

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 48-55-56-90-68 Avg = 63

Filletts: OK Vertical-Up / Overhead

Dual Shield 70 Ultra Plus is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD R-70 ULTRA, classification E70T-1C-DH8/T-1M/T-9C-DH8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E70T-1C-DH8/T-1M/T-9C-DH8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂

Size (Diameter): 1/16"
Test Date: 04/04/2017
Test Number: 2-58727-00
Travel Speed: 11.3 IPM
Diffusible Hydrogen: 4.8 ml/100 gr.
Atmospheric Temperature: 71°F
Relative Humidity: 14%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.55
Silicon: 0.59
Phosphorus: 0.015
Sulfur: 0.012
Chromium: 0.04
Nickel: 0.43
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.05

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.5	274	DC+

Mechanical Test Results

As Welded
Yield (psi): 78,303
Tensile (psi): 88,972
Elongation 2" (%): 27.0
Reduction of Area (%): 66.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 31-37-46-41-41 Avg = 39


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 31-31-31-42-28 Avg = 33

Fillets: OK Horizontal

Dual Shield R-70 Ultra is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD T-75, classification E71T-5MJH4, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-5MJH4 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"
Test Date: 02/16/2018
Test Number: 2-59503-00
Travel Speed: 10.0 IPM
Diffusible Hydrogen: 2.3 ml/100 gr.
Atmospheric Temperature: 69°F
Relative Humidity: 19%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.57
Silicon: 0.60
Phosphorus: 0.008
Sulfur: 0.009
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.24
Vanadium: 0.01
Copper: 0.06

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	5	---	---	29.0	300	DC+

Mechanical Test Results As Welded

Yield (psi): 75,209
Tensile (psi): 87,363
Elongation 2" (%): 29.0
Reduction of Area (%): 70.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 102-98-103-100-118 Avg = 102


Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 97-84-98-75-97 Avg = 93

Filletts: OK Horizontal

Dual Shield T-75 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD II 70T-12H4, classification E71T-1MJH4/T-12MJH4, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1MJH4/T-12MJH4 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"
Test Date: 03/08/2018
Test Number: 2-59595-00
Travel Speed: 12.0 IPM
Diffusible Hydrogen: 1.9 ml/100 gr.
Atmospheric Temperature: 69°F
Relative Humidity: 9%
Radiography: Satisfactory (upon retest)

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.24
Silicon: 0.36
Phosphorus: 0.017
Sulfur: 0.008
Chromium: 0.05
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.03
Copper: 0.04

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.2	281	DC+

Mechanical Test Results

	As Welded	As Welded Retest 1	As Welded Retest 2
Yield (psi):	87,209	79,036	82,510
Tensile (psi):	90,639	87,917	86,309
Elongation 2" (%):	26.0	26.0	28.0
Reduction of Area (%):	74.0	70.0	72.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 107-128-100-126-110 Avg = 114

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 98-90-116-110-142 Avg = 111

Charpy V-Notch Impacts Tested @ -40°F

Ft. Lbs. 110-112-87-66-112 Avg = 97

Filletts: OK Vertical-Up / Overhead

Dual Shield II 70T-12H4 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 7100 ULTRA, classification E71T-1C-DH8/T-1M-D/T-9C-DH8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M-D/T-9C-DH8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"
Test Date: 09/13/2017
Test Number: 2-59110-00
Travel Speed: 12.9 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.02
Manganese: 1.74
Silicon: 0.77
Phosphorus: 0.012
Sulfur: 0.007
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.0	268	DC+

Mechanical Test Results As Welded

Yield (psi): 85,210
Tensile (psi): 93,119
Elongation 2" (%): 26.0
Reduction of Area (%): 68.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 60-63-52-79-60 Avg = 63

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 61-55-64-23-48 Avg = 50

Fillets: OK Vertical-Up / Overhead

Dual Shield 7100 Ultra is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 7100 ULTRA, classification E71T-1C-DH8/T-1M-D/T-9C-DH8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M-D/T-9C-DH8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂
Size (Diameter): 1/16"
Test Date: 02/27/2018
Test Number: 2-59596-00
Travel Speed: 11.6 IPM
Diffusible Hydrogen: 4.2 ml/100 gr.
Atmospheric Temperature: 69°F
Relative Humidity: 9%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.02
Manganese: 1.51
Silicon: 0.64
Phosphorus: 0.016
Sulfur: 0.007
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	28.0	280	DC+

Mechanical Test Results

As Welded
Yield (psi): 76,169
Tensile (psi): 85,818
Elongation 2" (%): 30.0
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 113-37-55-124-102 Avg = 86

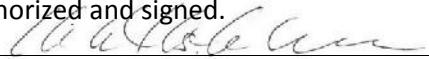
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 33-92-64-53-49 Avg = 58

Filletts: OK Vertical-Up / Overhead

Dual Shield 7100 Ultra is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 7100 LC, classification E71T-1C-DH8/T-1M/T-9C-DH8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M/T-9C-DH8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"
Test Date: 02/23/2018
Test Number: 2-59597-00
Travel Speed: 11.6 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.036
Manganese: 1.56
Silicon: 0.72
Phosphorus: 0.009
Sulfur: 0.008
Chromium: 0.03
Nickel: 0.01
Molybdenum: <0.01
Vanadium: 0.03
Copper: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.2	280	DC+

Mechanical Test Results

	As Welded
Yield (psi):	84,804
Tensile (psi):	94,009
Elongation 2" (%):	26.0
Reduction of Area (%):	67.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 50-68-90-73-85 Avg = 73

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 66-51-24-68-71 Avg = 56

Filletts: OK Vertical-Up / Overhead

Dual Shield 7100 LC is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 7100 LC, classification E71T-1C-DH8/T-1M/T-9C-DH8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M/T-9C-DH8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂
Size (Diameter): 1/16"
Test Date: 06/01/2017
Test Number: 2-58899-00
Travel Speed: 13.19 IPM
Diffusible Hydrogen: 7.2 ml/100 gr.
Atmospheric Temperature: 75°F
Relative Humidity: 16%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.03
Manganese: 1.30
Silicon: 0.51
Phosphorus: 0.014
Sulfur: 0.005
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.03
Copper: 0.02

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.0	290	DC+

Mechanical Test Results

As Welded
Yield (psi): 81,778
Tensile (psi): 87,376
Elongation 2" (%): 27.0
Reduction of Area (%): 66.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 104-78-36-81-94 Avg = 79

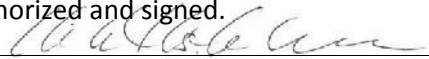
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 85-74-82-51-50 Avg = 68

Fillets: OK Vertical-Up / Overhead

Dual Shield 7100 LC is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD II 70 ULTRA, classification E71T-1M/T-12M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1M/T-12M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"

Test Date: 02/16/2018

Test Number: 2-59507-00

Travel Speed: 10.7 IPM

Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04

Manganese: 1.16

Silicon: 0.70

Phosphorus: 0.011

Sulfur: 0.007

Chromium: 0.04

Nickel: 0.01

Molybdenum: <0.01

Vanadium: 0.02

Copper: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	26.5	270	DC+

Mechanical Test Results

As Welded

Yield (psi): 78,148

Tensile (psi): 85,698

Elongation 2" (%): 29.0

Reduction of Area (%): 71.0

Charpy V-Notch Impacts Tested @ 0°F
Ft. Lbs. 87-117-96-58-100 Avg = 94

Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 58-29-36-59-72 Avg = 51

Fillets: OK Vertical-Up / Overhead

Dual Shield II 70 Ultra is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD II 71 ULTRA, classification E71T-1CJ/T-12CJ, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1CJ/T-12CJ material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂
Size (Diameter): 1/16"
Test Date: 01/08/2018
Test Number: 2-59380-00
Travel Speed: 13.61 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.28
Silicon: 0.42
Phosphorus: 0.014
Sulfur: 0.008
Chromium: 0.05
Nickel: 0.42
Molybdenum: 0.01
Vanadium: 0.03
Copper: 0.04

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.0	259	DC+

Mechanical Test Results

As Welded
Yield (psi): 76,773
Tensile (psi): 86,742
Elongation 2" (%): 28.0
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ 0°F
Ft. Lbs. 91-71-90-49-56 Avg = 71

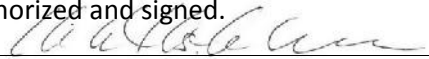
Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 23-49-41-70-61 Avg = 49

Charpy V-Notch Impacts Tested @ -40°F
Ft. Lbs. 42-19-18-33-45 Avg = 31

Filletts: OK Vertical-Up / Overhead

Dual Shield II 71 Ultra is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 700X, classification E70T-1C, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E70T-1C material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂

Size (Diameter): 1/16"
Test Date: 04/04/2017
Test Number: 2-58728-00
Travel Speed: 11.1 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04
Manganese: 1.53
Silicon: 0.46
Phosphorus: 0.013
Sulfur: 0.013
Chromium: 0.04
Nickel: 0.02
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.04

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.2	265	DC+

Mechanical Test Results

As Welded
Yield (psi): 8,457
Tensile (psi): 91,309
Elongation 2" (%): 27.0
Reduction of Area (%): 63.0

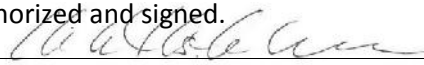
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 32-40-40-31-38 Avg = 36

Filletts: OK Horizontal

Dual Shield 700X is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 
R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 710X, classification E71T-1C-DH8/T-1M/T-9C-H8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M/T-9C-H8/T-9M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂

Size (Diameter): 1/16"

Test Date: 04/04/2017

Test Number: 2-57829-00

Travel Speed: 10.2 IPM

Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.04

Manganese: 1.55

Silicon: 0.67

Phosphorus: 0.012

Sulfur: 0.007

Chromium: 0.03

Nickel: 0.44

Molybdenum: 0.01

Vanadium: 0.03

Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	26.0	270	DC+

Mechanical Test Results As Welded

Yield (psi): 76,672

Tensile (psi): 88,722

Elongation 2" (%): 28.0

Reduction of Area (%): 72.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 67-57-52-45-69 Avg = 58

Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 56-42-48-25-24 Avg = 39

Fillets: OK Vertical / Overhead

Dual Shield 710X is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 710X, classification E71T-1C-DH8/T-1M/T-9C-H8/T-9M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C-DH8/T-1M/T-9C-H8/T-9 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂

Size (Diameter): 1/16"
Test Date: 04/28/2017
Test Number: 2-58784-00
Travel Speed: 12.47 IPM
Radiography: Satisfactory
Diffusible Hydrogen: 7.5 ml/100 gr.
Atmospheric Temperature: 88°F
Relative Humidity: 21%

Chemical Analysis (%)

Carbon: 0.03
Manganese: 1.25
Silicon: 0.48
Phosphorus: 0.011
Sulfur: 0.008
Chromium: 0.03
Nickel: 0.42
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.2	280	DC+

Mechanical Test Results

As Welded
Yield (psi): 72,750
Tensile (psi): 83,512
Elongation 2" (%): 28.0
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 67-79-86-29-88 Avg = 70

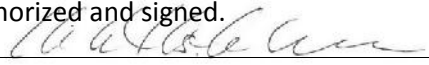
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 37-79-40-30-73 Avg = 52

Filletts: OK Vertical / Overhead

Dual Shield 710X is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 
R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 710X-M, classification E71T-1C/T-1M-DH8/T-9C/T-9M-DH8, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C/T-1M-DH8/T-9C/T-9M-DH8 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 25% CO₂
Size (Diameter): 1/16"
Test Date: 12/11/2017
Test Number: 2-59235-00
Travel Speed: 12.9 IPM
Radiography: Satisfactory
Diffusible Hydrogen: 6.7 ml/100 gr.
Atmospheric Temperature: 71°F
Relative Humidity: 19%

Chemical Analysis (%)

Carbon: 0.03
Manganese: 1.15
Silicon: 0.44
Phosphorus: 0.012
Sulfur: 0.007
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.03
Copper: 0.02

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.0	306	DC+

Mechanical Test Results

As Welded
Yield (psi): 77,362
Tensile (psi): 82,904
Elongation 2" (%): 28.0
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 121-108-144-120-110 Avg = 121

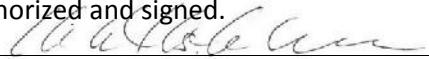
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 107-129-92-85-96 Avg = 102

Filletts: OK Vertical / Overhead

Dual Shield 710X-M is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 710X-M, classification E71T-1C/T-1M-DH8/T-9C/T-9M-DH8, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1C/T-1M-DH8/T-9C/T-9M-DH8 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂

Size (Diameter): 1/16"
Test Date: 11/29/2017
Test Number: 2-59236-00
Travel Speed: 11.9 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.03
Manganese: 0.82
Silicon: 0.26
Phosphorus: 0.011
Sulfur: 0.007
Chromium: 0.03
Nickel: 0.01
Molybdenum: <0.01
Vanadium: 0.02
Copper: 0.02

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.0	275	DC+

Mechanical Test Results

As Welded

Yield (psi): 68,208
Tensile (psi): 75,785
Elongation 2" (%): 30.0
Reduction of Area (%): 75.0

Charpy V-Notch Impacts Tested @ 0°F

Ft. Lbs. 34-127-129-141-124 Avg = 111

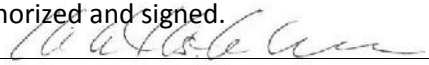
Charpy V-Notch Impacts Tested @ -20°F

Ft. Lbs. 107-78-126-88-171 Avg = 114

Filletts: OK Vertical / Overhead

Dual Shield 710X-M is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 
R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD II 712X, classification E71T-1MJH8/T-12MJH8, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.20:2005 were performed in conformance with this specification, and the tested E71T-1MJH8/T-12MJH8 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.20:2005. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 100% CO₂
Size (Diameter): 1/16"
Test Date: 10/16/2017
Test Number: 2-59238-00
Travel Speed: 10.8 IPM
Diffusible Hydrogen: 7.4 ml/100 gr.
Atmospheric Temperature: 72°F
Relative Humidity: 23%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.18
Silicon: 0.39
Phosphorus: 0.010
Sulfur: 0.008
Chromium: 0.04
Nickel: 0.01
Molybdenum: 0.01
Vanadium: 0.02
Copper: 0.03

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	28.0	270	DC+

Mechanical Test Results

As Welded
Yield (psi): 77,156
Tensile (psi): 85,601
Elongation 2" (%): 28.0
Reduction of Area (%): 73.0

Charpy V-Notch Impacts Tested @ 0°F
Ft. Lbs. 104-89-96-119-106 Avg = 103

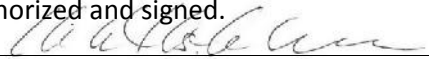
Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 93-83-96-93-88 Avg = 91

Charpy V-Notch Impacts Tested @ -40°F
Ft. Lbs. 62-74-53-57-53 Avg = 60

Filletts: OK Vertical-Up / Overhead

Dual Shield II 712X is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD II 80-Ni1H4, classification E81T1-Ni1M-JH4, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.29:2010 were performed in conformance with this specification, and the tested E81T1-Ni1M-JH4 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.29:2010. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 100% CO₂
Size (Diameter): 1/16"
Test Date: 01/08/2018
Test Number: 2-59381-00
Travel Speed: 13.4 IPM
Diffusible Hydrogen: 1.8 ml/100 gr.
Atmospheric Temperature: 71°F
Relative Humidity: 16%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.22
Silicon: 0.30
Phosphorus: 0.010
Sulfur: 0.008
Chromium: 0.03
Nickel: 0.95
Molybdenum: <0.01
Vanadium: 0.02
Copper: 0.01

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.0	290	DC+

Mechanical Test Results

As Welded
Yield (psi): 80,031
Tensile (psi): 88,168
Elongation 2" (%): 28.0
Reduction of Area (%): 75.0

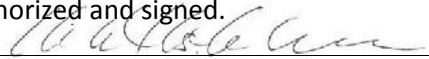
Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 148-133-134-148-143 Avg = 141

Charpy V-Notch Impacts Tested @ -60°F
Ft. Lbs. 99-106-133-126-95 Avg = 112

Fillets: OK Vertical-Up / Overhead

Dual Shield II 80Ni1H4 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 810X-Ni1, classification E81T1-Ni1C-JH8, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.29:2010 were performed in conformance with this specification, and the tested E81T1-Ni1C-JH8 material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.29:2010. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂
Size (Diameter): 1/16"
Test Date: 01/08/2018
Test Number: 2-59382-00
Travel Speed: 13.09 IPM
Diffusible Hydrogen: 5.5 ml/100 gr.
Atmospheric Temperature: 71°F
Relative Humidity: 16%
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 1.20
Silicon: 0.59
Phosphorus: 0.012
Sulfur: 0.008
Chromium: 0.03
Nickel: 0.99
Molybdenum: 0.01
Vanadium: 0.03
Copper: 0.04

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	7	---	---	27.5	300	DC+

Mechanical Test Results

As Welded
Yield (psi): 85,758
Tensile (psi): 92,660
Elongation 2" (%): 28.0
Reduction of Area (%): 73.0

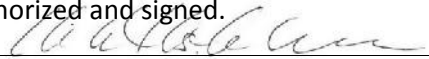
Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 73-78-55-85-53 Avg = 69

Charpy V-Notch Impacts Tested @ -40°F
Ft. Lbs. 53-40-59-56-42 Avg = 50

Fillets: OK Vertical-Up / Overhead

Dual Shield 810X-Ni1 is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 8100 W, classification E81T1-W2C/W2M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.29:2010 were performed in conformance with this specification, and the tested E81T1-W2C/W2M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.29:2010. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 75% Ar / 100% CO₂

Size (Diameter): 1/16"
Test Date: 2/22/2018
Test Number: 2-59505-00
Travel Speed: 10.5 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.043
Manganese: 0.83
Silicon: 0.64
Phosphorus: 0.012
Sulfur: 0.006
Chromium: 0.61
Nickel: 0.60
Molybdenum: 0.01
Aluminum: <0.01
Vanadium: 0.02
Copper: 0.54

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	26.5	290	DC+

Mechanical Test Results As Welded

Yield (psi): 83,337
Tensile (psi): 92,583
Elongation 2" (%): 24.0
Reduction of Area (%): 53.0

Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 27-25-23-22-24 Avg = 24

Fillets: OK Vertical-Up / Overhead

Dual Shield 8100-W is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

CERTIFICATE OF CONFORMANCE TO REQUIREMENTS FOR WELDING ELECTRODES

This is to certify that the supplied DUAL SHIELD 8100 W, classification E81T1-W2C/W2M, is of the same classification, manufacturing process and material requirements as the electrodes tested and reported herein. All tests required by specification AWS A5.29:2010 were performed in conformance with this specification, and the tested E81T1-W2C/W2M material satisfied all associated requirements. The electrodes were marked in conformance with AWS A5.29:2010. The chemistry and mechanical properties of the deposited weld metal were as follows:

Shielding Gas: 100% CO₂
Size (Diameter): 1/16"
Test Date: 02/27/2018
Test Number: 2-59506-00
Travel Speed: 10.4 IPM
Radiography: Satisfactory

Chemical Analysis (%)

Carbon: 0.05
Manganese: 0.67
Silicon: 0.47
Phosphorus: 0.012
Sulfur: 0.008
Chromium: 0.54
Nickel: 0.54
Molybdenum: 0.01
Aluminum: <0.01
Vanadium: 0.02
Copper: 0.50

Weld Parameters

Full	Split	Triple	Quad	Volts	Amps	Polarity
1	6	---	---	27.0	280	DC+

Mechanical Test Results

As Welded
Yield (psi): 72,110
Tensile (psi): 84,912
Elongation 2" (%): 24.0
Reduction of Area (%): 56.0

Charpy V-Notch Impacts Tested @ -20°F
Ft. Lbs. 33-26-24-24-27 Avg = 27

Fillets: OK Vertical-Up / Overhead

Dual Shield 8100-W is manufactured in the USA, and the steel used in this product is melted and processed in the USA.
Product complies with "Buy America"

This is to certify that the original is duly authorized and signed.

By: 

R. Lenker, Quality Engineer, ESAB

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