Dual Shield 700X

Dual Shield 700X is a high deposition, deep penetration wire for joining of heavy structural steel components. Designed for flat and horizontal position welding using CO2 shielding gas, this X Series wire provides high deposition rates, high efficiency and excellent performance. The bead contour, smooth ripple and slag chemistry allow easy slag removal even in narrow groves.

Classifications:	AWS A5.20:E70T-1CH8/ E70T-9CH8, AWS A5.36:E70T1-C1A2-CS1-H8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , LR , CWB CSA W48 E492T-1, DNV-GL
Industry or Segmentation:	Heavy Equipment, Large Components, Mobile Equipment, Agricultural Equipment

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	545 MPa (79 ksi)	600 MPa (87 ksi)	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	66 J (49 ft-lb)
As Welded	-29 °C (-20 °F)	45 J (33 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.035	1.50	0.55	0.015	0.011

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	TTW Dist.	Efficiency
100% CO2						
1.6 mm (1/16 in.)	149 A	23 V	254 cm/min (100 in./min)	1.3 kg/h (2.8 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	168 A	24 V	305 cm/min (120 in./min)	1.6 kg/h (3.5 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	187 A	24 V	356 cm/min (140 in./min)	1.9 kg/h (4.2 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	205 A	25 V	406 cm/min (160 in./min)	2.2 kg/h (4.9 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	223 A	25 V	457 cm/min (180 in./min)	2.5 kg/h (5.6 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	240 A	25 V	508 cm/min (200 in./min)	2.9 kg/h (6.3 lb/h)	19 mm (3/4 in.)	80 %
1.6 mm (1/16 in.)	257 A	26 V	559 cm/min (220 in./min)	3.2 kg/h (7.0 lb/h)	19 mm (3/4 in.)	81 %
1.6 mm (1/16 in.)	273 A	26 V	610 cm/min (240 in./min)	3.5 kg/h (7.7 lb/h)	19 mm (3/4 in.)	81 %
1.6 mm (1/16 in.)	289 A	26 V	660 cm/min (260 in./min)	3.8 kg/h (8.4 lb/h)	19 mm (3/4 in.)	81 %

Dual Shield 700X

Deposition Data						
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**TTW Dist.**	**Efficiency**
2.4 mm (3/32 in.)	290 A	27 V	381 cm/min (150 in./min)	5.8 kg/h (12.7 lb/h)	25.4 mm (1 in.)	86.9 %
2.4 mm (3/32 in.)	350 A	28 V	508 cm/min (200 in./min)	7.7 kg/h (16.9 lb/h)	25.4 mm (1 in.)	86.3 %
2.4 mm (3/32 in.)	410 A	29 V	635 cm/min (250 in./min)	9.6 kg/h (21.1 lb/h)	25.4 mm (1 in.)	86 %
2.4 mm (3/32 in.)	475 A	32 V	762 cm/min (300 in./min)	11.3 kg/h (25.0 lb/h)	25.4 mm (1 in.)	84.8 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
100% CO2				
1.6 mm (1/16 in.)	180-460 A	25-34 V	343-1270 cm/min (135-500 in./min)	19-25.4 mm (3/4-1 in.)
2.4 mm (3/32 in.)	290-610 A	26-34 V	254-825.5 cm/min (100-325 in./min)	25.4-38 mm (1-1.5 in.)

Dual Shield R-70 Ultra

This flux cored welding wire produces smoother arc characteristics and lower welding fumes than many competitive flux cored wires. Dual Shield R-70 Ultra is also designed to have a greater tolerance of mill scale and surface oxides. The notch toughness in the as welded condition is also improved. Bead contour is flat to slightly convex and slag coverage is complete. Dual Shield R-70 Ultra wire is designed for flat and horizontal single or multi-pass applications on low or medium carbon steels recommended with 100% CO2 shielding gas. Areas of application include railcar, heavy equipment, and general fabrication.

Classifications:	AWS A5.20:E70T-1C-DH8/E70T-1M/E70T-9C-DH8/E70T-9M, AWS A5.36:E70T1-C1A2-CS1-DH8, AWS A5.36:E70T1-M21A2-CS1-DH8 (= or < 1/16"), AWS A5.36:E70T1-C1A2-CS1-D (> 1/16"), ASME SFA 5.20, ASME SFA 5.36
Approvals:	Seismic Certified "D" , ABS , QPL-24403/1 MIL-70T-1C, CWB CSA W48 E492T-9-H8 (= or < 1/16) E492T-9M-H16 (>1/16"), LR , DNV-GL
Industry or Segmentation:	Industrial and General Fabrication, Civil Construction, Ship/Barge Building, Mobile Equipment, Railcars

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
100% CO2				
As Welded	485 MPa (70 ksi)	565 MPa (82 ksi)	63 %	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	38 J (28 ft-lb)
As Welded	-29 °C (-20 °F)	34 J (25 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.02	1.40	0.50	0.008	0.014

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
1.2 mm (.045 in.)	145 A	28 V	508 cm/min (200 in./min)	1.7 kg/h (3.7 lb/h)	76 %
1.2 mm (.045 in.)	190 A	29 V	762 cm/min (300 in./min)	2.5 kg/h (5.6 lb/h)	80 %
1.2 mm (.045 in.)	225 A	29 V	1016 cm/min (400 in./min)	3.4 kg/h (7.6 lb/h)	82 %
1.2 mm (.045 in.)	255 A	32 V	1270 cm/min (500 in./min)	4.4 kg/h (9.6 lb/h)	82 %
1.2 mm (.045 in.)	300 A	33 V	1524 cm/min (600 in./min)	5.3 kg/h (11.6 lb/h)	84 %
1.4 mm (.052 in.)	140 A	25 V	381 cm/min (150 in./min)	1.8 kg/h (3.9 lb/h)	79 %
1.4 mm (.052 in.)	180 A	26 V	508 cm/min (200 in./min)	2.3 kg/h (5.1 lb/h)	80 %

Dual Shield R-70 Ultra

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.4 mm (.052 in.)	250 A	34 V	762 cm/min (300 in./min)	3.4 kg/h (7.4 lb/h)	80 %
1.4 mm (.052 in.)	300 A	35 V	1016 cm/min (400 in./min)	4.7 kg/h (10.3 lb/h)	84 %
1.4 mm (.052 in.)	340 A	36 V	1270 cm/min (500 in./min)	6.1 kg/h (13.4 lb/h)	85 %
1.4 mm (.052 in.)	390 A	35 V	1524 cm/min (600 in./min)	7.3 kg/h (16.1 lb/h)	86 %
1.6 mm (1/16 in.)	195 A	26 V	381 cm/min (150 in./min)	2.3 kg/h (5.0 lb/h)	78 %
1.6 mm (1/16 in.)	265 A	28 V	635 cm/min (250 in./min)	4.0 kg/h (8.7 lb/h)	83 %
1.6 mm (1/16 in.)	325 A	30 V	762 cm/min (300 in./min)	4.8 kg/h (10.6 lb/h)	85 %
1.6 mm (1/16 in.)	365 A	31 V	889 cm/min (350 in./min)	5.6 kg/h (12.4 lb/h)	84 %
1.6 mm (1/16 in.)	385 A	31 V	1016 cm/min (400 in./min)	6.4 kg/h (14.1 lb/h)	84 %
1.6 mm (1/16 in.)	450 A	33 V	1270 cm/min (500 in./min)	8.0 kg/h (17.7 lb/h)	85 %
2.0 mm (5/64 in.)	170 A	27 V	317.5 cm/min (125 in./min)	3.0 kg/h (6.5 lb/h)	80 %
2.0 mm (5/64 in.)	200 A	27 V	381 cm/min (150 in./min)	3.6 kg/h (8.0 lb/h)	83 %
2.0 mm (5/64 in.)	235 A	28 V	508 cm/min (200 in./min)	4.9 kg/h (10.8 lb/h)	84 %
2.0 mm (5/64 in.)	280 A	29 V	635 cm/min (250 in./min)	6.2 kg/h (13.6 lb/h)	85 %
2.0 mm (5/64 in.)	320 A	30 V	762 cm/min (300 in./min)	7.4 kg/h (16.2 lb/h)	84 %
2.4 mm (3/32 in.)	220 A	27 V	254 cm/min (100 in./min)	3.8 kg/h (8.4 lb/h)	88 %
2.4 mm (3/32 in.)	290 A	27 V	381 cm/min (150 in./min)	5.8 kg/h (12.7 lb/h)	87 %
2.4 mm (3/32 in.)	350 A	28 V	508 cm/min (200 in./min)	7.6 kg/h (16.9 lb/h)	86 %
2.4 mm (3/32 in.)	410 A	29 V	635 cm/min (250 in./min)	9.6 kg/h (21.1 lb/h)	86 %
2.4 mm (3/32 in.)	475 A	32 V	762 cm/min (300 in./min)	11.3 kg/h (25.0 lb/h)	85 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	205-230 A	25-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	230-265 A	26-30 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	235-290 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	290-350 A	29-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	270-345 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	345-415 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)
2.0 mm (5/64 in.)	285-375 A	27-31 V	317.5-508 cm/min (125-200 in./min)	19-25.4 mm (3/4-1 in.)
2.0 mm (5/64 in.)	375-475 A	28-32 V	508-762 cm/min (200-300 in./min)	25.4-31.75 mm (1-1.25 in.)
2.4 mm (3/32 in.)	235-500 A	27-30 V	178-508 cm/min (70-200 in./min)	25.4-31.75 mm (1-1.25 in.)
2.4 mm (3/32 in.)	500-630 A	30-34 V	508-698.5 cm/min (200-275 in./min)	31.75-38|mm mm (1.25-1.5 in.)

Dual Shield 111-RB

Dual Shield 111-RB is a low slag, high deposition flux cored electrode designed for joining structural components made of low carbon steel and can be used to weld over some primer compositions. The electrode is designed to be used with 100% CO2 gas shielding. Dual Shield 111-RB can achieve deposition efficiency above 88%. This increases the amount of deposit achieved over a given period of time, as compared to a standard Dual Shield E70T-1 electrode.

Classifications:	AWS A5.20:E70T-1C, AWS A5.29:E80T-1GC, AWS A5.36:E70T1-C1A2-CS1, AWS A5.36:E80T1-C1A2-CS1, ASME SFA 5.20, ASME SFA 5.29, ASME SFA 5.36
Approvals:	ABS , MIL-E-24403/1 70T-1C
Industry or Segmentation:	Mobile Equipment, Industrial and General Fabrication, 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
100% CO2				
As Welded	515 MPa (75 ksi)	600 MPa (87 ksi)	65 %	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	38 J (29 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.05	1.5	0.04	0.015	0.014

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	34 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	35 V	1524 cm/min (600 in./min)	7.52 kg/h (16.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	381 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	635 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	31 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	32 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	35 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 111-RB

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
2.0 mm (5/64 in.)	250 A	26 V	284 cm/min (112 in./min)	2.9 kg/h (6.4 lb/h)	85 %
2.0 mm (5/64 in.)	350 A	28 V	447 cm/min (176 in./min)	4.76 kg/h (10.5 lb/h)	85 %
2.0 mm (5/64 in.)	450 A	31 V	655 cm/min (258 in./min)	6.71 kg/h (14.8 lb/h)	85 %
2.4 mm (3/32 in.)	350 A	30 V	315 cm/min (124 in./min)	4.35 kg/h (9.6 lb/h)	84 %
2.4 mm (3/32 in.)	400 A	30 V	422 cm/min (166 in./min)	5.76 kg/h (12.7 lb/h)	85 %
2.4 mm (3/32 in.)	450 A	31 V	500 cm/min (197 in./min)	6.8 kg/h (15 lb/h)	86 %
2.4 mm (3/32 in.)	500 A	32 V	602 cm/min (237 in./min)	8.39 kg/h (18.5 lb/h)	86 %
2.4 mm (3/32 in.)	550 A	34 V	706 cm/min (278 in./min)	9.66 kg/h (21.3 lb/h)	88 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.6 mm (1/16 in.)	300 A	30 V	574 cm/min (226 in./min)	25.4 mm (1 in.)
1.6 mm (1/16 in.)	400 A	32 V	937 cm/min (369 in./min)	25.4 mm (1 in.)
1.6 mm (1/16 in.)	450 A	32 V	1072 cm/min (422 in./min)	25.4 mm (1 in.)
2.4 mm (3/32 in.)	450 A	31 V	551 cm/min (217 in./min)	25.4 mm (1 in.)
2.4 mm (3/32 in.)	475 A	32 V	622 cm/min (245 in./min)	25.4 mm (1 in.)
2.4 mm (3/32 in.)	500 A	33 V	686 cm/min (270 in./min)	25.4 mm (1 in.)
2.4 mm (3/32 in.)	550 A	34 V	879 cm/min (346 in./min)	25.4 mm (1 in.)

Dual Shield 710X

Dual Shield 710X is an all-position flux cored wire for general purpose welding. It provides outstanding operator appeal with an easily controlled arc, improved operation at both lower and higher current levels, minimal spatter and easily removed slag. Dual Shield 710X can be used with 100% CO_2, recommended in applications where weld joint restraint is high. Applications include rail car, barges, civil construction, light equipment and general fabrication.

Classifications:	AWS A5.20:E71T-1C-DH8/T-9C-DH8, AWS A5.36:E71T1-C1A2-CS1-H8 ASME SFA 5.20, ASME SFA 5.36
Approvals:	Seismic Certified “D” , ABS , CWB CSA W48 E491T-9-H8, LR , DNV-GL
Industry or Segmentation:	Civil Construction, Light Equipment, Barges, Industrial and General Fabrication, Ship/Barge Building, Railcars

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO_2			
As Welded	520 MPa (75 ksi)	625 MPa (87 ksi)	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO_2		
As Welded	-18 °C (0 °F)	77 J (57 ft-lb)
As Welded	-29 °C (-20 °F)	66 J (49 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO_2					
0.03	1.4	0.5	0.009	0.007	0.4

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
Vertical Up 100% CO_2					
1.2 mm (.045 in.)	140 A	23 V	483 cm/min (190 in./min)	1.5 kg/h (3.3 lb/h)	81 %
1.2 mm (.045 in.)	154 A	23 V	559 cm/min (220 in./min)	1.8 kg/h (3.9 lb/h)	81 %
1.2 mm (.045 in.)	167 A	24 V	635 cm/min (250 in./min)	2.0 kg/h (4.5 lb/h)	82 %
1.2 mm (.045 in.)	180 A	24 V	711 cm/min (280 in./min)	2.3 kg/h (5.1 lb/h)	82 %
1.2 mm (.045 in.)	193 A	25 V	787 cm/min (310 in./min)	2.5 kg/h (5.6 lb/h)	82 %
1.2 mm (.045 in.)	205 A	26 V	864 cm/min (340 in./min)	2.8 kg/h (6.2 lb/h)	83 %
1.2 mm (.045 in.)	217 A	26 V	940 cm/min (370 in./min)	3.1 kg/h (6.8 lb/h)	83 %
1.4 mm (.052 in.)	153 A	24 V	406 cm/min (160 in./min)	1.8 kg/h (4.0 lb/h)	81 %
1.4 mm (.052 in.)	159 A	24 V	432 cm/min (170 in./min)	1.8 kg/h (4.0 lb/h)	81 %
1.4 mm (.052 in.)	166 A	25 V	457 cm/min (180 in./min)	2.0 kg/h (4.5 lb/h)	81 %

Dual Shield 710X

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.4 mm (.052 in.)	172 A	25 V	483 cm/min (190 in./min)	2.2 kg/h (4.8 lb/h)	81 %
1.4 mm (.052 in.)	178 A	25 V	508 cm/min (200 in./min)	2.3 kg/h (5.0 lb/h)	81 %
1.4 mm (.052 in.)	184 A	25 V	533 cm/min (210 in./min)	2.4 kg/h (5.3 lb/h)	81 %
1.4 mm (.052 in.)	190 A	26 V	559 cm/min (220 in./min)	2.5 kg/h (5.5 lb/h)	81 %
1.4 mm (.052 in.)	196 A	26 V	584 cm/min (230 in./min)	2.6 kg/h (5.8 lb/h)	82 %
1.4 mm (.052 in.)	201 A	26 V	610 cm/min (240 in./min)	2.7 kg/h (6.0 lb/h)	82 %
1.4 mm (.052 in.)	207 A	26 V	635 cm/min (250 in./min)	2.9 kg/h (6.3 lb/h)	82 %
1.6 mm (1/16 in.)	187 A	24 V	356 cm/min (140 in./min)	1.9 kg/h (4.2 lb/h)	80 %
1.6 mm (1/16 in.)	205 A	25 V	406 cm/min (160 in./min)	2.2 kg/h (4.9 lb/h)	80 %
1.6 mm (1/16 in.)	223 A	25 V	457 cm/min (180 in./min)	2.5 kg/h (5.6 lb/h)	80 %
1.6 mm (1/16 in.)	240 A	25 V	508 cm/min (200 in./min)	2.9 kg/h (6.3 lb/h)	80 %
1.6 mm (1/16 in.)	257 A	26 V	559 cm/min (220 in./min)	3.2 kg/h (7.0 lb/h)	81 %
1.6 mm (1/16 in.)	273 A	26 V	610 cm/min (240 in./min)	3.5 kg/h (7.7 lb/h)	81 %
1.6 mm (1/16 in.)	289 A	26 V	660 cm/min (260 in./min)	3.8 kg/h (8.4 lb/h)	81 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	432-737 cm/min (170-290 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	175-230 A	25-27 V	737-889 cm/min (290-350 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	180-265 A	26-30 V	889-1397 cm/min (350-550 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	330-711 cm/min (130-280 in./min)	12.7-15.8 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	215-290 A	25-29 V	711-1016 cm/min (280-400 in./min)	15.8-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	250-350 A	29-31 V	1016-1524 cm/min (400-600 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	343-673 cm/min (135-265 in./min)	15.8-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	245-345 A	27-30 V	673-1016 cm/min (265-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	290-415 A	28-32 V	1016-1270 cm/min (400-500 in./min)	25.4-31.75 mm (1-1.25 in.)
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	356-610 cm/min (140-240 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	165-225 A	24-27 V	610-775 cm/min (240-305 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	185-265 A	27-29 V	775-1194 cm/min (305-470 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	24-28 V	317.5-686 cm/min (125-270 in./min)	12.7-15.8 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	225-295 A	27-30 V	686-940 cm/min (270-370 in./min)	15.8-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	245-355 A	28-32 V	940-1372 cm/min (370-540 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	356-610 cm/min (140-240 in./min)	15.8-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	250-340 A	27-30 V	610-813 cm/min (240-320 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	285-400 A	28-32 V	813-1168 cm/min (320-460 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 710X-M

Dual Shield 710X-M provides outstanding operator appeal with an easily controlled arc, improved operation at both lower and higher current levels, minimal spatter and easily removed slag. Dual Shield 710X-M is designed to be used with 75/25 Argon CO2 gas mix.

Classifications:	AWS A5.20:E71T-1MD-H8/T-9MD-H8, AWS A5.36:E71T1-M21A4-CS1-DH8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	Seismic Certified "D", ABS , LR , MIL-E-24403A 71T-1M, DNV-GL, CWB CSA W48 E491T-9-H8
Industry or Segmentation:	Barges, Industrial and General Fabrication, Light Equipment, Railcars, 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	Elongation
75% Ar - 25% CO2			
As Welded	510 MPa (74 ksi)	570 MPa (83 ksi)	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	97 J (72 ft-lb)
As Welded	-29 °C (-20 °F)	76 J (56 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.04	1.3	0.5	0.008	0.012

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	356-610 cm/min (140-240 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	165-225 A	24-27 V	610-775 cm/min (240-305 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	185-265 A	27-29 V	775-1194 cm/min (305-470 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	24-28 V	317.5-686 cm/min (125-270 in./min)	12.7-15.8 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	225-295 A	27-30 V	686-940 cm/min (270-370 in./min)	15.8-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	245-355 A	28-32 V	940-1372 cm/min (370-540 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	356-610 cm/min (140-240 in./min)	15.8-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	250-340 A	27-30 V	610-813 cm/min (240-320 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	285-400 A	28-32 V	813-1168 cm/min (320-460 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 7100 Ultra

Like many other Dual Shield products, Dual Shield 7100 Ultra operates in a wider parameter range and generates less welding fumes than many similar welding wires. The low spatter levels and easy slag removal minimizes post weld cleanup. Dual Shield 7100 Ultra can be used with either 100% CO2 or 75% Ar/25% CO2. This versatility in gas selection provides the fabricator greater flexibility in choosing both wire and gas. Applications include railcar and earth moving equipment, as well as general structural steel fabrication.

Classifications:	AWS A5.20:E71T-1C-DH8, AWS A5.20:E71T-9C-DH8, AWS A5.20:E71T-1M-DH8, AWS A5.20:E71T-9M-DH8, AWS A5.36:E71T1-C1A2-CS1-DH8, AWS A5.36:E71T1-M21-CS1-DH8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , BV , LR , DNV-GL , CWB CSA W48; E491T-9-H8
Industry or Segmentation:	Civil Construction, Mobile Equipment, Ship/Barge Building, Industrial and General Fabrication, Bridge Construction, Railcars, Automotive, Process

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	515 MPa (75 ksi)	585 MPa (85 ksi)	26 %
75% Ar - 25% CO2			
As Welded	540 MPa (78 ksi)	605 MPa (88 ksi)	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	58 J (43 ft-lb)
As Welded	-29 °C (-20 °F)	34 J (25 ft-lb)
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	57 J (42 ft-lb)
As Welded	-29 °C (-20 °F)	47 J (35 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.02	1.3	0.5	0.013	0.010
75% Ar - 25% CO2				
0.03	1.6	0.6	0.012	0.010

Dual Shield 7100 Ultra

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
100% CO2					
0.9 mm (.035 in.)	105 A	24 V	635 cm/min (250 in./min)	1.3 kg/h (2.8 lb/h)	86 %
0.9 mm (.035 in.)	140 A	25 V	1016 cm/min (400 in./min)	2.1 kg/h (4.6 lb/h)	87 %
0.9 mm (.035 in.)	165 A	25.5 V	1206.5 cm/min (475 in./min)	2.5 kg/h (5.5 lb/h)	88 %
0.9 mm (.035 in.)	185 A	27 V	1397 cm/min (550 in./min)	2.9 kg/h (6.3 lb/h)	88 %
1.2 mm (.045 in.)	192 A	25.5 V	762 cm/min (300 in./min)	2.5 kg/h (5.5 lb/h)	79 %
1.2 mm (.045 in.)	230 A	27 V	1016 cm/min (400 in./min)	3.3 kg/h (7.4 lb/h)	82 %
1.2 mm (.045 in.)	275 A	28.5 V	1270 cm/min (500 in./min)	4.4 kg/h (9.6 lb/h)	83 %
1.4 mm (.052 in.)	150 A	23.5 V	381 cm/min (150 in./min)	1.6 kg/h (3.6 lb/h)	76 %
1.4 mm (.052 in.)	190 A	24 V	508 cm/min (200 in./min)	2.2 kg/h (4.9 lb/h)	78 %
1.4 mm (.052 in.)	250 A	25.5 V	762 cm/min (300 in./min)	3.5 kg/h (7.7 lb/h)	82 %
1.4 mm (.052 in.)	300 A	27 V	1016 cm/min (400 in./min)	4.7 kg/h (10.3 lb/h)	83 %
1.6 mm (1/16 in.)	195 A	24 V	381 cm/min (150 in./min)	2.5 kg/h (5.5 lb/h)	85 %
1.6 mm (1/16 in.)	290 A	25.5 V	635 cm/min (250 in./min)	4.2 kg/h (9.2 lb/h)	87 %
1.6 mm (1/16 in.)	325 A	26.5 V	762 cm/min (300 in./min)	4.9 kg/h (10.9 lb/h)	86 %
1.6 mm (1/16 in.)	352 A	27 V	889 cm/min (350 in./min)	6.0 kg/h (13.1 lb/h)	88 %
1.6 mm (1/16 in.)	382 A	28.5 V	1016 cm/min (400 in./min)	6.7 kg/h (14.7 lb/h)	87 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
100% CO2				
0.9 mm (.035 in.)	110-135 A	23-25 V	559-838 cm/min (220-330 in./min)	9.5-12.7 mm (3/8-1/2 in.)
0.9 mm (.035 in.)	135-160 A	24-28 V	838-1118 cm/min (330-440 in./min)	12.7-16 mm (1/2-5/8 in.)
0.9 mm (.035 in.)	160-185 A	26-30 V	1118-1397 cm/min (440-550 in./min)	16-19 mm (5/8-3/4 in.)
1.2 mm (.045 in.)	135-205 A	23-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	205-230 A	25-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	230-265 A	26-30 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	235-290 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	290-350 A	29-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	270-345 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	345-415 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 7100 Ultra

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
0.9 mm (.035 in.)	115-145 A	23-25 V	1118-1397 cm/min (440-550 in./min)	9.5-12.7 mm (3/8-1/2 in.)
0.9 mm (.035 in.)	145-165 A	24-27 V	1118-1397 cm/min (440-550 in./min)	12.7-16 mm (1/2-5/8 in.)
0.9 mm (.035 in.)	165-190 A	25-30 V	1118-1397 cm/min (440-550 in./min)	16-19 mm (5/8-3/4 in.)
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 7100 LC

Dual Shield 7100 LC provides outstanding operator appeal with its easily controlled arc, improved operation at lower current levels, minimal spatter and easily removed slag. Dual Shield 7100 LC can be used with CO2 or 75% Ar/25% CO2 shielding, however pure CO2 is recommended in applications where restraint is high.

Classifications:	AWS A5.20:E71T-1C-DH8/T-1MH8/T-9C-DH8/T-9MH8, AWS A5.36:E71T1-C1A4-CS1-DH8, AWS A5.36:E71T1-M21A2-CS1-H8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	Seismic Certified “D”, ABS , LR , DNV-GL , CWB CSA W48 E491T-9-H8, E491-9M-H8
Industry or Segmentation:	Mobile Equipment, Railcars, Ship/Barge Building, Civil Construction, Industrial and General Fabrication, Process, Bridge 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
100% CO2				
As Welded	565 MPa (73 ksi)	560 MPa (81 ksi)	52 %	23 %
75% Ar - 25% CO2				
As Welded	572 MPa (83 ksi)	621 MPa (90 ksi)	64 %	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	92 J (68 ft-lb)
As Welded	-29 °C (-20 °F)	56 J (41 ft-lb)
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	61 J (50 ft-lb)
As Welded	-29 °C (-20 °F)	42 J (31 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.03	1.2	0.5	0.010	0.010
75% Ar - 25% CO2				
0.03	1.4	0.6	0.010	0.010

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
1.2 mm (.045 in.)	145 A	24.5 V	508 cm/min (200 in./min)	1.6 kg/h (3.6 lb/h)	81.2 %
1.2 mm (.045 in.)	190 A	26 V	762 cm/min (300 in./min)	2.5 kg/h (5.4 lb/h)	81.4 %
1.2 mm (.045 in.)	235 A	27.5 V	1016 cm/min (400 in./min)	3.3 kg/h (7.3 lb/h)	82.5 %

Dual Shield 7100 LC

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.2 mm (.045 in.)	265 A	29 V	1270 cm/min (500 in./min)	4.2 kg/h (9.3 lb/h)	82.8 %
1.4 mm (.052 in.)	145 A	25 V	381 cm/min (150 in./min)	1.5 kg/h (3.4 lb/h)	74.3 %
1.4 mm (.052 in.)	180 A	25.5 V	508 cm/min (200 in./min)	2.0 kg/h (4.5 lb/h)	74.6 %
1.4 mm (.052 in.)	230 A	29.5 V	1270 cm/min (500 in./min)	5.5 kg/h (12.2 lb/h)	82.3 %
1.4 mm (.052 in.)	235 A	27.5 V	762 cm/min (300 in./min)	3.2 kg/h (7.0 lb/h)	78.2 %
1.4 mm (.052 in.)	285 A	28.5 V	1016 cm/min (400 in./min)	4.4 kg/h (9.8 lb/h)	81.3 %
1.4 mm (.052 in.)	370 A	30.2 V	1524 cm/min (600 in./min)	6.7 kg/h (14.7 lb/h)	82.7 %
1.6 mm (1/16 in.)	195 A	24.5 V	381 cm/min (150 in./min)	2.0 kg/h (4.5 lb/h)	73.7 %
1.6 mm (1/16 in.)	285 A	26 V	635 cm/min (250 in./min)	3.7 kg/h (8.1 lb/h)	79.4 %
1.6 mm (1/16 in.)	320 A	28 V	762 cm/min (300 in./min)	4.4 kg/h (9.7 lb/h)	79.9 %
1.6 mm (1/16 in.)	345 A	30 V	889 cm/min (350 in./min)	5.2 kg/h (11.5 lb/h)	80.7 %
1.6 mm (1/16 in.)	385 A	32 V	1016 cm/min (400 in./min)	6.1 kg/h (13.4 lb/h)	82.6 %
1.6 mm (1/16 in.)	445 A	32.5 V	1270 cm/min (500 in./min)	7.6 kg/h (16.7 lb/h)	82.8 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	432-737 cm/min (170-290 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	175-230 A	25-27 V	737-889 cm/min (290-350 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	180-265 A	26-30 V	889-1397 cm/min (350-550 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	330-711 cm/min (130-280 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	215-290 A	25-29 V	711-1016 cm/min (280-400 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	250-350 A	29-31 V	1016-1524 cm/min (400-600 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	343-673 cm/min (135-265 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	245-345 A	27-30 V	673-1016 cm/min (265-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	290-415 A	28-32 V	1016-1270 cm/min (400-500 in./min)	25.4-31.75 mm (1-1.25 in.)
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	356-610 cm/min (140-240 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	165-225 A	24-27 V	610-775 cm/min (240-305 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	185-265 A	27-29 V	775-1194 cm/min (305-470 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	24-28 V	317.5-686 cm/min (125-270 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	225-295 A	27-30 V	686-940 cm/min (270-370 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	245-355 A	28-32 V	940-1372 cm/min (370-540 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	356-610 cm/min (140-240 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	250-340 A	27-30 V	610-813 cm/min (240-320 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	285-400 A	28-32 V	813-1168 cm/min (320-460 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 70 Ultra Plus

Dual Shield 70 Ultra Plus is an all-position wire that is uniquely designed to provide high deposition, outstanding all position performance and a fume emission rate approaching that of solid wires. It is optimized for use with 90% Ar/10% CO2 shielding but works well with mixes ranging from 75% Ar/25% CO2 to 95% Ar/5% CO2. Among the outstanding features of Dual Shield 70 Ultra Plus are a very wide operating window, very high out of position deposition rates (vertical up and overhead at over 12 lb/hr), and welds that are virtually spatter free. Dual Shield 70 Ultra Plus may be used in a variety of applications including railcar, automotive, heavy equipment, and general structural steel fabrication. It is especially recommended in applications where reduction of welding fume is a priority.

Classifications:	AWS A5.20:E71T-1M-H8/T-9M-H8, AWS A5.36:E71T1-M21A4-CS1-H8, AWS A5.36:E71T1-M20A2-CS1, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , CWB CSA W48 E491T-1M-H8
Industry or Segmentation:	Bridge Construction, Civil Construction, Railcars, Mobile Equipment, Ship/Barge Building, Industrial and General Fabrication, Steel Industry, Process, Automotive

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
As Welded	525 MPa (76 ksi)	595 MPa (86 ksi)	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	72 J (53 ft-lb)
As Welded	-29 °C (-20 °F)	54 J (40 ft-lb)
90% Ar - 10% CO2		
As Welded	-18 °C (0 °F)	92 J (68 ft-lb)
As Welded	-29 °C (-20 °F)	58 J (43 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.04	1.2	0.6	0.012	0.016

Dual Shield 70 Ultra Plus

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
92% Ar - 8% CO2					
1.2 mm (.045 in.)	150 A	25.5 V	508 cm/min (200 in./min)	1.8 kg/h (3.9 lb/h)	84 %
1.2 mm (.045 in.)	200 A	26.5 V	762 cm/min (300 in./min)	2.7 kg/h (6.0 lb/h)	86 %
1.2 mm (.045 in.)	245 A	27.5 V	1016 cm/min (400 in./min)	3.7 kg/h (8.1 lb/h)	86 %
1.2 mm (.045 in.)	293 A	29 V	1270 cm/min (500 in./min)	4.6 kg/h (10.1 lb/h)	87 %
1.2 mm (.045 in.)	335 A	30.5 V	1524 cm/min (600 in./min)	5.5 kg/h (12.2 lb/h)	87 %
1.4 mm (.052 in.)	157 A	24 V	381 cm/min (150 in./min)	1.8 kg/h (3.9 lb/h)	86 %
1.4 mm (.052 in.)	205 A	24.5 V	508 cm/min (200 in./min)	2.5 kg/h (5.5 lb/h)	86 %
1.4 mm (.052 in.)	265 A	26 V	762 cm/min (300 in./min)	3.7 kg/h (8.2 lb/h)	86 %
1.4 mm (.052 in.)	335 A	27.5 V	1016 cm/min (400 in./min)	5.0 kg/h (11.1 lb/h)	87 %
1.4 mm (.052 in.)	365 A	29 V	1270 cm/min (500 in./min)	6.3 kg/h (13.8 lb/h)	87 %
1.4 mm (.052 in.)	465 A	31.5 V	1524 cm/min (600 in./min)	7.5 kg/h (16.6 lb/h)	87 %
1.6 mm (1/16 in.)	210 A	24.5 V	381 cm/min (150 in./min)	2.5 kg/h (5.5 lb/h)	86 %
1.6 mm (1/16 in.)	315 A	25.5 V	635 cm/min (250 in./min)	4.2 kg/h (9.2 lb/h)	86 %
1.6 mm (1/16 in.)	360 A	26.5 V	762 cm/min (300 in./min)	4.9 kg/h (10.9 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	27.5 V	889 cm/min (350 in./min)	5.7 kg/h (12.7 lb/h)	86 %
1.6 mm (1/16 in.)	432 A	28.5 V	1016 cm/min (400 in./min)	6.7 kg/h (14.7 lb/h)	87 %
1.6 mm (1/16 in.)	545 A	30 V	1270 cm/min (500 in./min)	8.3 kg/h (18.3 lb/h)	87 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed
75% Ar - 25% CO2			
1.2 mm (.045 in.)	150-200 A	25.5-26.5 V	508-762 cm/min (200-300 in./min)
1.2 mm (.045 in.)	245-293 A	27.5-29 V	1016-1270 cm/min (400-500 in./min)
1.2 mm (.045 in.)	335 A	30.5 V	1524 cm/min (600 in./min)
1.4 mm (.052 in.)	157-205 A	24-24.5 V	381-508 cm/min (150-200 in./min)
1.4 mm (.052 in.)	265-335 A	26-27.5 V	762-1016 cm/min (300-400 in./min)
1.4 mm (.052 in.)	365-465 A	29-31.5 V	1270-1524 cm/min (500-600 in./min)
1.6 mm (1/16 in.)	210-315 A	24.5-25.5 V	381-635 cm/min (150-250 in./min)
1.6 mm (1/16 in.)	360-410 A	26.5-27.5 V	762-889 cm/min (300-350 in./min)
1.6 mm (1/16 in.)	432-545 A	28.5-30 V	1016-1270 cm/min (400-500 in./min)

Dual Shield II 70 Ultra

Dual Shield II 70 Ultra is an all-position flux cored wire that displays exceptional impact properties when used with 75% Ar/25% CO2. The improved properties qualify this wire to the Navy's "HY" classification. The "Ultra" series produces smoother arc characteristics and lower welding fumes. Dual Shield II 70 Ultra was developed to join low and medium carbon steel. The Military classification allows Dual Shield II 70 Ultra to be used for attaching steels of less than 81 ksi (560 MPa) yield to HY-80 and HY-100. Commercial applications include construction, shipbuilding, railcar, and heavy equipment industries.

Classifications:	AWS A5.20:E71T1MH8/T9MH8/T12MH8, AWS A5.36:E71T1-M21A4-CS2-H8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , CL , BV , DB , LR , MIL 71T-1M, MIL 71T-1-HYM, DNV-GL , CWB CSA W48 491T-12M-H8
Industry or Segmentation:	Civil Construction, Mobile Equipment, Bridge Construction, Railcars, Ship/Barge Building, 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
75% Ar - 25% CO2				
As Welded	490 MPa (72 ksi)	560 MPa (81 ksi)	75 %	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	173 J (125 ft-lb)
As Welded	-29 °C (-20 °F)	149 J (110 ft-lb)
As Welded	-40 °C (-40 °F)	108 J (80 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.03	1.1	0.45	0.004	0.01

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
0.9 mm (.035 in.)	110 A	22 V	635 cm/min (250 in./min)	1.32 kg/h (2.9 lb/h)	84.00 %
0.9 mm (.035 in.)	140 A	24 V	1016 cm/min (400 in./min)	2.13 kg/h (4.7 lb/h)	85.00 %
0.9 mm (.035 in.)	160 A	24.5 V	1206 cm/min (475 in./min)	2.54 kg/h (5.6 lb/h)	85.00 %
0.9 mm (.035 in.)	180 A	25.5 V	1394 cm/min (550 in./min)	2.94 kg/h (6.5 lb/h)	86.00 %
0.9 mm (.035 in.)	215 A	28 V	1905 cm/min (750 in./min)	4.08 kg/h (9.0 lb/h)	87.00 %

Dual Shield II 70 Ultra

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.2 mm (.045 in.)	145 A	22 V	508 cm/min (200 in./min)	1.79 kg/h (3.94 lb/h)	86.15 %
1.2 mm (.045 in.)	210 A	23 V	762 cm/min (300 in./min)	2.72 kg/h (5.99 lb/h)	85.51 %
1.2 mm (.045 in.)	247 A	24.5 V	1016 cm/min (400 in./min)	3.68 kg/h (8.10 lb/h)	87.55 %
1.2 mm (.045 in.)	275 A	26 V	1270 cm/min (500 in./min)	4.33 kg/h (9.52 lb/h)	82.08 %
1.4 mm (.052 in.)	150 A	21 V	381 cm/min (150 in./min)	1.82 kg/h (4.01 lb/h)	83.25 %
1.4 mm (.052 in.)	192 A	22 V	508 cm/min (200 in./min)	2.48 kg/h (5.44 lb/h)	84.71 %
1.4 mm (.052 in.)	262 A	23.5 V	762 cm/min (300 in./min)	3.69 kg/h (8.12 lb/h)	85.48 %
1.4 mm (.052 in.)	308 A	25 V	1016 cm/min (400 in./min)	4.97 kg/h (10.92 lb/h)	86.31 %
1.6 mm (1/16 in.)	203 A	23 V	381 cm/min (150 in./min)	2.56 kg/h (5.63 lb/h)	87.15 %
1.6 mm (1/16 in.)	298 A	24.5 V	635 cm/min (250 in./min)	4.25 kg/h (9.33 lb/h)	87.56 %
1.6 mm (1/16 in.)	340 A	25.5 V	762 cm/min (300 in./min)	5.05 kg/h (11.10 lb/h)	87.68 %
1.6 mm (1/16 in.)	375 A	26 V	889 cm/min (350 in./min)	6.02 kg/h (13.24 lb/h)	88.35 %
1.6 mm (1/16 in.)	408 A	27.5 V	1016 cm/min (400 in./min)	6.59 kg/h (14.49 lb/h)	85.66 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
0.9 mm (.035 in.)	110-140 A	22-24 V	635-1016 cm/min (250-400 in./min)	15.8 mm (5/8 in.)
0.9 mm (.035 in.)	160-215 A	24.5-28 V	1016-1905 cm/min (400-750 in./min)	15.8 mm (5/8 in.)
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660.4 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660.4-965.2 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965.2-1320.8 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279.4-584.2 cm/min (110-230 in./min)	12.7-15.8 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584.2-863.6 cm/min (230-340 in./min)	15.8-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	863.6-1193.8 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279.4-508 cm/min (110-200 in./min)	15.8-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1066.8 cm/min (300-420 in./min)	25.4-31.8 mm (1-1.25 in.)

Dual Shield II 71 Ultra

Dual Shield II 71 Ultra is an all-position flux cored wire that displays exceptional impact properties when used with CO2. The improved properties qualify this wire to the Navy's "HY" classification. The "Ultra" series produces smoother arc characteristics and lower welding fumes. Dual Shield II 71 Ultra was developed to join low and medium carbon steel. The Military classification allows Dual Shield II 71 Ultra to be used for attaching steels of less than 80 ksi (552 MPa) yield to HY-80 and HY-100. Commercial applications include construction, shipbuilding, railcar, and heavy equipment industries. Weld metal analysis is similar to an E7018 low hydrogen electrode.

Classifications:	AWS A5.20:E71T-1CJ-H8/T-9CJ-H8/12CJ-H8, AWS A5.36:E71T1-C1A4-CS2-H8, AWS A5.36:E71T1-C1P4-CS2-H8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	QPL-24403/1 MIL-71T-1-HYC, QPL-24403/1 MIL-71T-1C, ABS , LR , DNV-GL , CWB CSA W48 E491T-12M-H8
Industry or Segmentation:	Ship/Barge Building, Civil Construction, Railcars, Mobile Equipment, Industrial and General Fabrication, Bridge 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	495 MPa (71 ksi)	540 MPa (79 ksi)	77 %	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	154 J (114 ft-lb)
As Welded	-29 °C (-20 °F)	132 J (98 ft-lb)
As Welded	-40 °C (-40 °F)	72 J (53 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-40 °C (-40 °F)	47 J (35 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
0.03	1.40	0.40	0.010	0.012

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
0.9 mm (.035 in.)	110 A	24.6 V	635 cm/min (250 in./min)	1.13 kg/h (2.48 lb/h)	72.9 %
0.9 mm (.035 in.)	142 A	26 V	1016 cm/min (400 in./min)	2.05 kg/h (4.53 lb/h)	83.5 %
0.9 mm (.035 in.)	158 A	26.5 V	1206.5 cm/min (475 in./min)	2.49 kg/h (5.50 lb/h)	84.2 %
0.9 mm (.035 in.)	177 A	27.5 V	1397 cm/min (550 in./min)	2.82 kg/h (6.23 lb/h)	83.4 %
0.9 mm (.035 in.)	215 A	30 V	1905 cm/min (750 in./min)	3.83 kg/h (8.45 lb/h)	83.5 %
1.2 mm (.045 in.)	142 A	24.5 V	508 cm/min (200 in./min)	1.66 kg/h (3.66 lb/h)	80.2 %

Dual Shield II 71 Ultra

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.2 mm (.045 in.)	193 A	26 V	762 cm/min (300 in./min)	2.55 kg/h (5.63 lb/h)	82.3 %
1.2 mm (.045 in.)	230 A	27.5 V	1016 cm/min (400 in./min)	3.41 kg/h (7.52 lb/h)	83.0 %
1.2 mm (.045 in.)	275 A	29 V	1270 cm/min (500 in./min)	4.33 kg/h (9.55 lb/h)	83.0 %
1.4 mm (.052 in.)	155 A	23.5 V	381 cm/min (150 in./min)	1.79 kg/h (3.94 lb/h)	81.2 %
1.4 mm (.052 in.)	185 A	24.5 V	508 cm/min (200 in./min)	2.29 kg/h (5.06 lb/h)	80.3 %
1.4 mm (.052 in.)	245 A	26 V	762 cm/min (300 in./min)	3.65 kg/h (8.05 lb/h)	83.6 %
1.4 mm (.052 in.)	300 A	27.5 V	1016 cm/min (400 in./min)	4.86 kg/h (10.71 lb/h)	84.3 %
1.4 mm (.052 in.)	345 A	29 V	1270 cm/min (500 in./min)	6.24 kg/h (13.77 lb/h)	86.7 %
1.4 mm (.052 in.)	405 A	30.5 V	1524 cm/min (600 in./min)	7.54 kg/h (16.62 lb/h)	86.9 %
1.6 mm (1/16 in.)	205 A	24 V	381 cm/min (150 in./min)	2.41 kg/h (5.31 lb/h)	81.0 %
1.6 mm (1/16 in.)	290 A	25.5 V	635 cm/min (250 in./min)	3.98 kg/h (8.77 lb/h)	83.2 %
1.6 mm (1/16 in.)	340 A	26 V	762 cm/min (300 in./min)	4.77 kg/h (10.53 lb/h)	83.7 %
1.6 mm (1/16 in.)	375 A	27 V	889 cm/min (350 in./min)	5.60 kg/h (12.35 lb/h)	84.8 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
100% CO2				
1.2 mm (.045 in.)	130-200 A	23-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	25-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	26-30 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	235-290 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	290-350 A	29-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	270-345 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	345-415 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 711X

Dual Shield II 711X is an all-position flux cored wire that displays exceptional impact properties in combination with CO2 shielding gas. This flux cored wire was developed to join low and medium carbon steels where higher impacts and toughness are required. As with all X Series wires, Dual Shield II 711X offers higher top-end current levels for out-of-position welding, broader operating ranges and higher deposition rates in out-of-position applications. Applications include construction, shipbuilding, rail car, light and heavy equipment, and general fabrication where exceptional impacts are required. Weld metal analysis is similar to Atom Arc 7018 and Atom Arc 7018-1.

Classifications:	AWS A5.20:E71T-CJ-DH8/T-9CJ-DH8/T-12CJ-DH8, AWS A5.36:E71T1-C1A4-CS2-DH8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , LR , DNV-GL , CWB CSA W48 E491T-12-H8
Industry or Segmentation:	Railcars, Civil Construction, Industrial and General Fabrication, Ship/Barge Building

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	540 MPa (78 ksi)	595 MPa (86 ksi)	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	130 J (96 ft-lb)
As Welded	-29 °C (-20 °F)	107 J (79 ft-lb)
As Welded	-40 °C (-40 °F)	49 J (36 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
0.04	1.4	0.4	0.010	0.012	0.4

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate
100% CO2				
1.2 mm (.045 in.)	122 A	20.2 V	452 cm/min (178 in./min)	-
1.2 mm (.045 in.)	134 A	20.9 V	521 cm/min (205 in./min)	-
1.2 mm (.045 in.)	146 A	21.6 V	592 cm/min (233 in./min)	-
1.2 mm (.045 in.)	158 A	22.3 V	660 cm/min (260 in./min)	-
1.2 mm (.045 in.)	170 A	23.0 V	732 cm/min (288 in./min)	-
1.2 mm (.045 in.)	182 A	23.7 V	800 cm/min (315 in./min)	-
1.2 mm (.045 in.)	194 A	24.4 V	871 cm/min (343 in./min)	-
1.2 mm (.045 in.)	206 A	25.1 V	940 cm/min (370 in./min)	-
1.2 mm (.045 in.)	218 A	25.8 V	1011 cm/min (398 in./min)	-

Dual Shield II 711X

Deposition Data				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**
1.2 mm (.045 in.)	230 A	26.5 V	1080 cm/min (425 in./min)	3.36 kg/h (7.4 lb/h)
1.4 mm (.052 in.)	150 A	20.5 V	406 cm/min (160 in./min)	-
1.4 mm (.052 in.)	160 A	21.1 V	460 cm/min (181 in./min)	-
1.4 mm (.052 in.)	170 A	21.6 V	511 cm/min (201 in./min)	-
1.4 mm (.052 in.)	180 A	22.2 V	564 cm/min (222 in./min)	-
1.4 mm (.052 in.)	190 A	22.7 V	615 cm/min (242 in./min)	-
1.4 mm (.052 in.)	200 A	23.3 V	668 cm/min (263 in./min)	-
1.4 mm (.052 in.)	210 A	23.8 V	719 cm/min (283 in./min)	-
1.4 mm (.052 in.)	220 A	24.4 V	772 cm/min (304 in./min)	-
1.4 mm (.052 in.)	230 A	24.9 V	823 cm/min (324 in./min)	-
1.4 mm (.052 in.)	240 A	25.5 V	876 cm/min (345 in./min)	-
1.4 mm (.052 in.)	250 A	26.0 V	927 cm/min (365 in./min)	3.95 kg/h (8.7 lb/h)
1.6 mm (1/16 in.)	156 A	22.4 V	345 cm/min (136 in./min)	-
1.6 mm (1/16 in.)	167 A	22.9 V	378 cm/min (149 in./min)	-
1.6 mm (1/16 in.)	178 A	23.3 V	411 cm/min (162 in./min)	-
1.6 mm (1/16 in.)	189 A	23.8 V	445 cm/min (175 in./min)	-
1.6 mm (1/16 in.)	199 A	24.2 V	478 cm/min (188 in./min)	-
1.6 mm (1/16 in.)	210 A	24.7 V	511 cm/min (201 in./min)	-
1.6 mm (1/16 in.)	221 A	25.1 V	544 cm/min (214 in./min)	-
1.6 mm (1/16 in.)	231 A	25.6 V	577 cm/min (227 in./min)	-
1.6 mm (1/16 in.)	242 A	26.0 V	610 cm/min (240 in./min)	3.99 kg/h (8.8 lb/h)

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	432-767 cm/min (170-290 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	175-230 A	25-27 V	767-889 cm/min (290-350 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	180-265 A	26-30 V	889-1397 cm/min (350-550 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	330-711 cm/min (130-280 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	215-290 A	25-29 V	711-1016 cm/min (280-400 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	250-350 A	29-31 V	1016-1524 cm/min (400-600 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	343-673 cm/min (135-265 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	245-345 A	27-30 V	673-1016 cm/min (265-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	290-415 A	28-32 V	1016-1270 cm/min (400-500 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 711X

Recommended Welding Parameters			
Diameter	**Amps**	**Volts**	**Wire Feed Speed**
Vertical Up 100% CO2			
1.2 mm (.045 in.)	122 A	20.2 V	452 cm/min (178 in./min)
1.2 mm (.045 in.)	134 A	20.9 V	521 cm/min (205 in./min)
1.2 mm (.045 in.)	146 A	21.6 V	592 cm/min (233 in./min)
1.2 mm (.045 in.)	158 A	22.3 V	660 cm/min (260 in./min)
1.2 mm (.045 in.)	170 A	23.0 V	732 cm/min (288 in./min)
1.2 mm (.045 in.)	182 A	23.7 V	800 cm/min (315 in./min)
1.2 mm (.045 in.)	194 A	24.4 V	871 cm/min (343 in./min)
1.2 mm (.045 in.)	194 A	25.1 V	940 cm/min (370 in./min)
1.2 mm (.045 in.)	218 A	25.8 V	1011 cm/min (398 in./min)
1.2 mm (.045 in.)	230 A	26.5 V	1080 cm/min (425 in./min)
1.4 mm (.052 in.)	150 A	20.5 V	406 cm/min (160 in./min)
1.4 mm (.052 in.)	160 A	21.1 V	460 cm/min (181 in./min)
1.4 mm (.052 in.)	170 A	21.6 V	510.5 cm/min (201 in./min)
1.4 mm (.052 in.)	180 A	22.2 V	564 cm/min (222 in./min)
1.4 mm (.052 in.)	190 A	22.7 V	615 cm/min (242 in./min)
1.4 mm (.052 in.)	200 A	23.3 V	668 cm/min (263 in./min)
1.4 mm (.052 in.)	210 A	23.8 V	719 cm/min (283 in./min)
1.4 mm (.052 in.)	220 A	24.4 V	772 cm/min (304 in./min)
1.4 mm (.052 in.)	230 A	24.9 V	823 cm/min (324 in./min)
1.4 mm (.052 in.)	240 A	25.5 V	876 cm/min (345 in./min)
1.4 mm (.052 in.)	250 A	26.0 V	927 cm/min (365 in./min)
1.6 mm (1/16 in.)	156 A	22.4 V	345 cm/min (136 in./min)
1.6 mm (1/16 in.)	167 A	22.9 V	378 cm/min (149 in./min)
1.6 mm (1/16 in.)	178 A	23.3 V	412 cm/min (162 in./min)
1.6 mm (1/16 in.)	189 A	23.8 V	444.5 cm/min (175 in./min)
1.6 mm (1/16 in.)	199 A	24.2 V	477.5 cm/min (188 in./min)
1.6 mm (1/16 in.)	210 A	24.7 V	510.5 cm/min (201 in./min)
1.6 mm (1/16 in.)	221 A	25.1 V	543.5 cm/min (214 in./min)
1.6 mm (1/16 in.)	231 A	25.6 V	576.5 cm/min (227 in./min)
1.6 mm (1/16 in.)	242 A	26.0 V	610 cm/min (240 in./min)

Dual Shield II 712X

Dual Shield II 712X is an all-position flux cored wire intended for applications requiring outstanding weld metal toughness. This X Series wire, in combination with 75% Argon/25% CO2 shielding gas, can produce Charpy V-Notch impact results of more than 40 ft-lb (68 J) at -60°F (-51°C) and Crack Tip Opening Displacement (CTOD) results of more than 20 mils (0.5 mm) at -40°F (-40°C). Dual Shield II 712X also provides the smooth arc and low spatter levels characteristic of Dual Shield flux cored wires. Applications include off-shore oil components, shipbuilding and heavy equipment where exceptional Charpy impact/low temperature toughness is required.

Classifications:	AWS A5.20:E71T-1MJH8/T-9MJH8/T-12MJH8, AWS A5.36:E71T1-M21A6-CS2-H8, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , LR , DNV-GL , CWB CSA W48 491T-9MJ-H8
Industry or Segmentation:	Heavy Equipment, Ship/Barge Building, Offshore Oil

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
As Welded	540 MPa (78 ksi)	570 MPa (83 ksi)	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	175 J (129 ft-lb)
As Welded	-40 °C (-40 °F)	125 J (93 ft-lb)
As Welded	-51 °C (-60 °F)	62 J (46 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.05	1.1	0.3	0.010	0.009

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate
75% Ar - 25% CO2				
1.2 mm (.045 in.)	129 A	19.5 V	406 cm/min (160 in./min)	-
1.2 mm (.045 in.)	141 A	20.2 V	483 cm/min (190 in./min)	-
1.2 mm (.045 in.)	153 A	20.9 V	556 cm/min (219 in./min)	-
1.2 mm (.045 in.)	165 A	21.6 V	632 cm/min (249 in./min)	-
1.2 mm (.045 in.)	177 A	22.3 V	706 cm/min (278 in./min)	-
1.2 mm (.045 in.)	189 A	23.0 V	782 cm/min (308 in./min)	-
1.2 mm (.045 in.)	200 A	23.7 V	856 cm/min (337 in./min)	-
1.2 mm (.045 in.)	212 A	24.4 V	932 cm/min (367 in./min)	-

Dual Shield II 712X

Deposition Data				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**
1.2 mm (.045 in.)	224 A	25.1 V	1006 cm/min (396 in./min)	-
1.2 mm (.045 in.)	236 A	25.8 V	1082 cm/min (426 in./min)	-
1.2 mm (.045 in.)	248 A	26.5 V	1156 cm/min (455 in./min)	4.2 kg/h (9.3 lb/h)
1.4 mm (.052 in.)	135 A	20.0 V	330 cm/min (130 in./min)	-
1.4 mm (.052 in.)	148 A	20.6 V	389 cm/min (153 in./min)	-
1.4 mm (.052 in.)	160 A	21.1 V	447 cm/min (176 in./min)	-
1.4 mm (.052 in.)	173 A	21.7 V	505 cm/min (199 in./min)	-
1.4 mm (.052 in.)	185 A	22.2 V	564 cm/min (222 in./min)	-
1.4 mm (.052 in.)	198 A	22.8 V	622 cm/min (245 in./min)	-
1.4 mm (.052 in.)	210 A	23.3 V	681 cm/min (268 in./min)	-
1.4 mm (.052 in.)	223 A	23.9 V	739 cm/min (291 in./min)	-
1.4 mm (.052 in.)	235 A	24.4 V	798 cm/min (314 in./min)	-
1.4 mm (.052 in.)	248 A	25.0 V	856 cm/min (337 in./min)	-
1.4 mm (.052 in.)	260 A	25.5 V	914 cm/min (360 in./min)	4.3 kg/h (9.4 lb/h)
1.6 mm (1/16 in.)	195 A	23.8 V	368 cm/min (145 in./min)	-
1.6 mm (1/16 in.)	213 A	24.0 V	406 cm/min (160 in./min)	-
1.6 mm (1/16 in.)	231 A	24.3 V	445 cm/min (175 in./min)	-
1.6 mm (1/16 in.)	249 A	24.5 V	383 cm/min (190 in./min)	-
1.6 mm (1/16 in.)	267 A	24.8 V	521 cm/min (205 in./min)	-
1.6 mm (1/16 in.)	285 A	25.0 V	559 cm/min (220 in./min)	-
1.6 mm (1/16 in.)	303 A	25.3 V	597 cm/min (235 in./min)	-
1.6 mm (1/16 in.)	321 A	25.5 V	635 cm/min (250 in./min)	4.4 kg/h (9.6 lb/h)

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	356-610 cm/min (140-240 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	165-225 A	24-27 V	610-775 cm/min (240-305 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	185-265 A	27-29 V	775-1194 cm/min (305-470 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	24-28 V	317.5-686 cm/min (125-270 in./min)	12.7-15.9 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	225-295 A	27-30 V	686-940 cm/min (270-370 in./min)	15.9-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	245-355 A	28-32 V	940-1372 cm/min (370-540 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	356-518 cm/min (140-240 in./min)	15.9-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	250-340 A	27-30 V	610-813 cm/min (240-320 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	285-400 A	28-32 V	813-1168 cm/min (320-460 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 712X

Recommended Welding Parameters			
Diameter	**Amps**	**Volts**	**Wire Feed Speed**
Vertical Up 75% Ar - 25% CO2			
1.2 mm (.045 in.)	129 A	19.5 V	406 cm/min (160 in./min)
1.2 mm (.045 in.)	141 A	20.2 V	383 cm/min (190 in./min)
1.2 mm (.045 in.)	153 A	20.9 V	556 cm/min (219 in./min)
1.2 mm (.045 in.)	165 A	21.6 V	632 cm/min (249 in./min)
1.2 mm (.045 in.)	177 A	22.3 V	706 cm/min (278 in./min)
1.2 mm (.045 in.)	189 A	23.0 V	782 cm/min (308 in./min)
1.2 mm (.045 in.)	200 A	23.7 V	856 cm/min (337 in./min)
1.2 mm (.045 in.)	212 A	24.4 V	932 cm/min (367 in./min)
1.2 mm (.045 in.)	224 A	25.1 V	937 cm/min (396 in./min)
1.2 mm (.045 in.)	236 A	25.8 V	1082 cm/min (426 in./min)
1.2 mm (.045 in.)	248 A	26.5 V	1156 cm/min (455 in./min)
1.4 mm (.052 in.)	135 A	20.0 V	330 cm/min (130 in./min)
1.4 mm (.052 in.)	148 A	20.6 V	389 cm/min (153 in./min)
1.4 mm (.052 in.)	160 A	21.1 V	447 cm/min (176 in./min)
1.4 mm (.052 in.)	173 A	21.7 V	505 cm/min (199 in./min)
1.4 mm (.052 in.)	185 A	22.2 V	564 cm/min (222 in./min)
1.4 mm (.052 in.)	198 A	22.8 V	622 cm/min (245 in./min)
1.4 mm (.052 in.)	210 A	23.3 V	681 cm/min (268 in./min)
1.4 mm (.052 in.)	223 A	23.9 V	739 cm/min (291 in./min)
1.4 mm (.052 in.)	235 A	24.4 V	797.5 cm/min (314 in./min)
1.4 mm (.052 in.)	248 A	25.0 V	856 cm/min (337 in./min)
1.4 mm (.052 in.)	260 A	25.5 V	914 cm/min (360 in./min)
1.6 mm (1/16 in.)	195 A	23.8 V	368 cm/min (145 in./min)
1.6 mm (1/16 in.)	213 A	24.0 V	406 cm/min (160 in./min)
1.6 mm (1/16 in.)	231 A	24.3 V	444.5 cm/min (175 in./min)
1.6 mm (1/16 in.)	249 A	24.5 V	483 cm/min (190 in./min)
1.6 mm (1/16 in.)	267 A	24.8 V	521 cm/min (205 in./min)
1.6 mm (1/16 in.)	285 A	25.0 V	559 cm/min (220 in./min)
1.6 mm (1/16 in.)	303 A	25.3 V	597 cm/min (235 in./min)
1.6 mm (1/16 in.)	321 A	25.5 V	635 cm/min (250 in./min)

Dual Shield II 70T-12H4

Each Dual Shield II H4 wire is an all-position flux cored wire that provides excellent low temperature toughness in both the as welded and/or stress relieved conditions (as applicable) when used with 75% Ar / 25% CO2. Each can produce diffusible hydrogen levels of 4 mL/100g over a wide range of welding parameters.
Dual Shield II 70T-12H4 also provides the smooth arc and low spatter levels characteristic of other Dual Shield II wires. Dual Shield II 70T-12H4 can be used in construction, heavy equipment fabrication, offshore oil components, shipbuilding, and railcar. Weld metal analysis is similar to E7018.

Classifications:	AWS A5.20:E71T-1MJ-H4/T-9MJ-H4/T-12MJ-H4, AWS A5.36:E71T1-M21A4-CS2-H4, AWS A5.36:E71T1-M21P2-CS2-H4, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , CWB CSA W48 E491T-12M-JH4, LR , DNV-GL
Industry or Segmentation:	Bridge Construction, Civil Construction, Mobile Equipment, Industrial and General Fabrication, Railcars, 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
75% Ar - 25% CO2				
As Welded	495 MPa (72 ksi)	550 MPa (80 ksi)	71 %	27 %
Stress Relieved 2 hr 621 °C (1150 °F)	460 MPa (68 ksi)	540 MPa (78 ksi)	73 %	30 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-29 °C (-20 °F)	107 J (79 ft-lb)
As Welded	-40 °C (-40 °F)	84 J (62 ft-lb)
Stress Relieved 2 hr 621 °C (1150 °F)	-29 °C (-20 °F)	103 J (76 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.049	1.18	0.37	0.007	0.012

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
C - 25					
1.2 mm (.045 in.)	145 A	24.5 V	508 cm/min (200 in./min)	1.72 kg/h (3.8 lb/h)	81.5 %
1.2 mm (.045 in.)	195 A	26 V	762 cm/min (300 in./min)	2.63 kg/h (5.8 lb/h)	81.8 %
1.2 mm (.045 in.)	245 A	27.5 V	1016 cm/min (400 in./min)	3.58 kg/h (7.9 lb/h)	82.9 %
1.2 mm (.045 in.)	285 A	29 V	1270 cm/min (500 in./min)	4.49 kg/h (9.9 lb/h)	84.6 %
1.4 mm (.052 in.)	155 A	24 V	381 cm/min (150 in./min)	1.58 kg/h (3.5 lb/h)	72.3 %

Dual Shield II 70T-12H4

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.4 mm (.052 in.)	185 A	25 V	508 cm/min (200 in./min)	2.44 kg/h (5.4 lb/h)	82.1 %
1.4 mm (.052 in.)	250 A	26.5 V	762 cm/min (300 in./min)	3.67 kg/h (8.1 lb/h)	83.6 %
1.4 mm (.052 in.)	305 A	28 V	1016 cm/min (400 in./min)	5.03 kg/h (11.1 lb/h)	85.2 %
1.6 mm (1/16 in.)	190 A	24 V	381 cm/min (150 in./min)	2.40 kg/h (5.3 lb/h)	80.3 %
1.6 mm (1/16 in.)	295 A	25 V	635 cm/min (250 in./min)	3.90 kg/h (8.6 lb/h)	80.8 %
1.6 mm (1/16 in.)	335 A	26 V	762 cm/min (300 in./min)	4.89 kg/h (10.8 lb/h)	85.4 %
1.6 mm (1/16 in.)	365 A	27 V	889 cm/min (350 in./min)	5.85 kg/h (12.9 lb/h)	86.9 %
1.6 mm (1/16 in.)	410 A	28 V	1016 cm/min (400 in./min)	6.80 kg/h (15.0 lb/h)	87.9 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-220 A	22-26 V	249-508 cm/min (110-200 in./min)	12.7-16 mm (1/2-5/8 in.)
1.2 mm (.045 in.)	220-280 A	25-29 V	508-762 cm/min (200-300 in./min)	16-19 mm (5/8-3/4 in.)
1.2 mm (.045 in.)	280-320 A	26-31 V	762-1016 cm/min (300-400 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	25.4-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-280 A	25-29 V	584-762 cm/min (230-300 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	280-320 A	26-31 V	762-1016 cm/min (300-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-290 A	24-28 V	279-559 cm/min (110-220 in./min)	16-25.4 mm (5/8-1 in.)
1.6 mm (1/16 in.)	290-350 A	26-30 V	559-838 cm/min (220-330 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield T-75

Dual Shield T-75 is a flux cored wire with a basic slag system designed for multiple pass welding and produces excellent properties in both the as welded and stress relieved conditions. The exceptional impact toughness and low sensitivity to cracking makes it an ideal choice for a variety of low and medium carbon steels. The arc characteristics are globular, but can be improved with argon gas mixtures. The weld metal analysis is similar to an E7018 low hydrogen electrode.

Classifications:	AWS A5.20:E70T-5C-JH4/T-5M-JH, AWS A5.36: E70T5-C1A4-CS1-H4, AWS A5.36:E70T5-M21-CS1-H4, ASME SFA 5.20, ASME SFA 5.36
Approvals:	ABS , QPL-24403/1 MIL-70T-5C (3/32"), LR , DNV-GL (3/32")
Industry or Segmentation:	Industrial and General Fabrication, Railcars, Mobile Equipment, 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
100% CO2				
As Welded	495 MPa (72 ksi)	565 MPa (82 ksi)	65 %	28 %
75% Ar - 25% CO2				
As Welded	505 MPa (73 ksi)	595 MPa (86 ksi)	66 %	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-40 °C (-40 °F)	95 J (70 ft-lb)
75% Ar - 25% CO2		
As Welded	-40 °C (-40 °F)	75 J (55 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
100% CO2				
0.04	1.50	0.60	0.010	0.006
75% Ar - 25% CO2				
0.04	1.70	0.70	0.011	0.004

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	TTW Dist.	Efficiency
100% CO2						
2.4 mm (3/32 in.)	450 A	32 V	551 cm/min (217 in./min)	8.0 kg/h (17.6 lb/h)	25.4 mm (1 in.)	85 %
2.4 mm (3/32 in.)	475 A	32 V	622 cm/min (245 in./min)	9.1 kg/h (20 lb/h)	25.4 mm (1 in.)	87 %
2.4 mm (3/32 in.)	500 A	32 V	686 cm/min (270 in./min)	10.3 kg/h (22.8 lb/h)	25.4 mm (1 in.)	89 %

Dual Shield T-75

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	140-190 A	19-28 V	635-889 cm/min (250-350 in./min)	19-25.4 mm (3/4-1 in.)
1.2 mm (.045 in.)	240-265 A	29-30 V	1143-1397 cm/min (450-550 in./min)	19-25.4 mm (3/4-1 in.)
1.2 mm (.045 in.)	300 A	32 V	1651 cm/min (650 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	220-280 A	29-30 V	457-635 cm/min (180-250 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	280-380 A	31-32 V	635-1016 cm/min (250-400 in./min)	25.4-31.75 mm (1-1.25 in.)
2.4 mm (3/32 in.)	240-370 A	30-32 V	254-508 cm/min (100-200 in./min)	25.4-31.75 mm (1-1.25 in.)
2.4 mm (3/32 in.)	370-460 A	32-33 V	508-813 cm/min (200-320 in./min)	31.75-38 mm (1.25-1.5 in.)

Dual Shield T-5

Dual Shield T-5 is a basic slag flux cored wire that produces crack resistant, highly ductile weld deposits. The small diameter wires, such as .045 & 1/16" diameters can be used out-of-position. The arc characteristics are globular but can be improved with the use of argon mixes. Dual Shield T-5 is recommended for medium to heavy fabrication of many mild steels where superior toughness and crack resistance are required. It is a good choice for mild steel or when being joined to quenched and tempered low alloy high strength steels. The weld metal analysis is similar to an E7018 or E7018-1 low hydrogen electrode.

Classifications:	A5.20:E71T-5C-JH4/T-5M-JH4, AWS A5.36:E71T5-M21A6-CS1-H4, AWS A5.36:E71T5-M21P6-CS1-H4, ASME SFA 5.20, ASME SFA 5.36
Approvals:	TUV
Industry or Segmentation:	Civil Construction, Railcars, Mobile Equipment, 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
75% Ar - 25% CO2				
As Welded	460 MPa (68 ksi)	560 MPa (81 ksi)	71 %	31 %
Stress Relieved 2 hr 621 °C (1150 °F)	355 MPa (52 ksi)	500 MPa (74 ksi)	76 %	34 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	130 J (96 ft-lb)
As Welded	-29 °C (-20 °F)	110 J (81 ft-lb)
As Welded	-40 °C (-40 °F)	96 J (71 ft-lb)
As Welded	-51 °C (-60 °F)	80 J (59 ft-lb)
Stress Relieved 2 hr 621 °C (1150 °F)	-18 °C (0 °F)	236 J (174 ft-lb)
Stress Relieved 2 hr 621 °C (1150 °F)	-29 °C (-20 °F)	178 J (131 ft-lb)
Stress Relieved 2 hr 621 °C (1150 °F)	-40 °C (-40 °F)	140 J (103 ft-lb)
Stress Relieved 2 hr 621 °C (1150 °F)	-51 °C (-60 °F)	126 J (93 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P
75% Ar - 25% CO2				
0.066	1.45	0.52	0.013	0.007

Dual Shield T-5

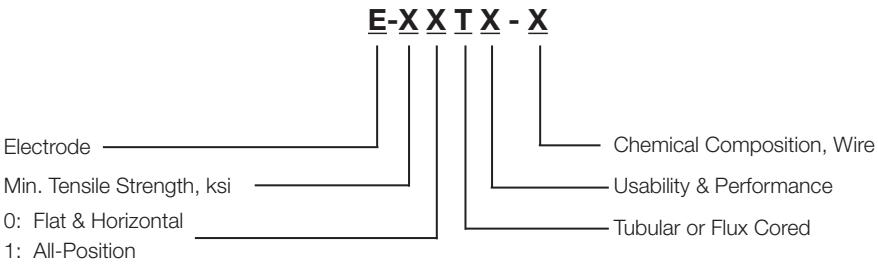
Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	TTW Dist.	Efficiency
75% Ar - 25% CO2						
1.2 mm (.045 in.)	170 A	19 V	724 cm/min (285 in./min)	3.2 kg/h (7.0 lb/h)	19 mm (3/4 in.)	96 %
1.2 mm (.045 in.)	250 A	30 V	1191 cm/min (469 in./min)	4.9 kg/h (10.8 lb/h)	25.4 mm (1 in.)	91 %
1.2 mm (.045 in.)	300 A	32 V	1539 cm/min (606 in./min)	6.4 kg/h (14.2 lb/h)	25.4 mm (1 in.)	92 %
1.6 mm (1/16 in.)	300 A	30 V	574 cm/min (226 in./min)	4.5 kg/h (9.8 lb/h)	25.4 mm (1 in.)	92 %
1.6 mm (1/16 in.)	400 A	32 V	937 cm/min (369 in./min)	7.3 kg/h (16.1 lb/h)	25.4 mm (1 in.)	92 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
75% Ar - 25% CO2				
1.2 mm (.045 in.)	140-190 A	19-28 V	635-889 cm/min (250-350 in./min)	19-25.4 mm (3/4-1 in.)
1.2 mm (.045 in.)	240-300 A	29-32 V	1143-1651 cm/min (450-650 in./min)	19-25.4 mm (3/4-1 in.)
1.2 mm (.045 in.)	300 A	32 V	1651 cm/min (650 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	220-280 A	29-30 V	457-635 cm/min (180-250 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	280-380 A	31-32 V	635-1016 cm/min (250-400 in./min)	25.4-31.75 mm (1-1.25 in.)

AWS FILLER METAL SPECIFICATION A5.29



AWS Classification	External Shielding	Current Polarity
EXXT1-X (Multiple-pass)	CO2	DCEP
EXXT4-X (Multiple-pass)	None	DCEP
EXXT5-X (Multiple-pass)	CO2	DCEP
EXXT8-X (Multiple-pass)	None	DCEN
EXXTX-G (Multiple-pass)	Not Specified	Not Specified

AWS A5.36 Specification - see page 4-4.

Dual Shield 7000-A1

Dual Shield 7000-A1 is an all-position flux cored electrode recommended for 0.5% Mo steels. It is used in the fabrication and erection of boilers, pressure piping and tubing and other pressure vessel applications. Shielding gas of 100% CO2 and 75% Ar, remainder CO2 may be used. The weld metal analysis is similar to an E7018-A1 low hydrogen electrode.

Classifications:	AWS A5.29:E81T1-A1C/A1M, AWS A5.36: E81T1-C1AZ-A1, AWS 5.36: E81T1-C1PZ-A1, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Mobile Equipment, Power Generation, Ship/Barge Building, Civil Construction, 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	566 MPa (82 ksi)	635 MPa (92 ksi)	22 %
Stress Relieved 1 hr 620 °C (1150 °F)	566 MPa (82 ksi)	645 MPa (93 ksi)	26 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Mo
0.05	0.90	0.60	0.01	0.01	0.55

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	TTW Dist.	Efficiency
100% CO2						
1.2 mm (.045 in.)	140 A	24 V	508 cm/min (200 in./min)	1.7 kg/h (3.6 lb/h)	15.9 mm (5/8 in.)	77.8 %
1.2 mm (.045 in.)	192 A	25.5 V	762 cm/min (300 in./min)	2.5 kg/h (5.5 lb/h)	15.9 mm (5/8 in.)	79.3 %
1.2 mm (.045 in.)	230 A	27 V	1016 cm/min (400 in./min)	3.3 kg/h (7.4 lb/h)	19 mm (3/4 in.)	81.8 %
1.2 mm (.045 in.)	275 A	28.5 V	1270 cm/min (500 in./min)	4.4 kg/h (9.6 lb/h)	19 mm (3/4 in.)	83.1 %
1.4 mm (.052 in.)	150 A	23.5 V	381 cm/min (150 in./min)	1.6 kg/h (3.6 lb/h)	19 mm (3/4 in.)	75.8 %
1.4 mm (.052 in.)	190 A	24 V	508 cm/min (200 in./min)	2.2 kg/h (4.9 lb/h)	19 mm (3/4 in.)	77.8 %
1.4 mm (.052 in.)	250 A	25.5 V	762 cm/min (300 in./min)	3.5 kg/h (7.7 lb/h)	19 mm (3/4 in.)	81.7 %
1.4 mm (.052 in.)	300 A	27 V	1016 cm/min (400 in./min)	4.7 kg/h (10.3 lb/h)	19 mm (3/4 in.)	82.5 %
1.4 mm (.052 in.)	345 A	28.5 V	1270 cm/min (500 in./min)	6.0 kg/h (13.3 lb/h)	19 mm (3/4 in.)	84.7 %
1.6 mm (1/16 in.)	195 A	24 V	381 cm/min (150 in./min)	2.5 kg/h (5.5 lb/h)	19 mm (3/4 in.)	85 %
1.6 mm (1/16 in.)	290 A	25.5 V	635 cm/min (250 in./min)	4.2 kg/h (9.2 lb/h)	19 mm (3/4 in.)	86.5 %
1.6 mm (1/16 in.)	325 A	26.5 V	762 cm/min (300 in./min)	4.9 kg/h (10.9 lb/h)	19 mm (3/4 in.)	85.9 %
1.6 mm (1/16 in.)	352 A	27 V	889 cm/min (350 in./min)	6.0 kg/h (13.1 lb/h)	19 mm (3/4 in.)	88.1 %
1.6 mm (1/16 in.)	382 A	28.5 V	1016 cm/min (400 in./min)	6.7 kg/h (14.7 lb/h)	19 mm (3/4 in.)	86.8 %

Dual Shield II 70-Ni1 H4

Dual Shield II 70-Ni1 H4 is an all-position, flux-cored wire designed to be used under 75% Ar/25% CO2 gas protection. It provides excellent low temperature toughness in both as-welded or stress-relieved conditions. Dual Shield II 70-Ni1 H4 produces low diffusible Hydrogen levels – lower than 4ml/100g – over a wide range of welding parameters. The smooth arc, fast-freezing slag, low spatter levels and easy slag release make this an ideal wire for the welding of steel plate in all positions. Nickel content below 1% and Brinell hardness less than 200 meet the requirements for applications where resistance to stress-corrosion cracking is required. Dual Shield II 70-Ni1 H4 is used in the fabrication of storage vessels that need to be stress relieved to minimize the ocurrance of stress corrosion cracking (SCC).

Typical Diffusible Hydrogen: 2 ml/100g of deposited metal

Classifications:	AWS A5.29:E71T-1GMJ-H4, AWS A5.36:E71T1-M21A5-Ni1-H4, AWS A5.36:E71T1-M21P5-Ni1-H4, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Pressure Vessels

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
Flat Position			
As Welded	469 MPa (68 ksi)	531 MPa (77 ksi)	31 %
Stress Relieved 1 hr 621 °C (1150 °F)	427 MPa (62 ksi)	510 MPa (74 ksi)	33 %
Vertical Position			
Stress Relieved 8 hr 621 °C (1150 °F)	427 MPa (62 ksi)	510 MPa (74 ksi)	35 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-29 °C (-20 °F)	182 J (134 ft-lb)
As Welded	-46 °C (-50 °F)	163 J (120 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-29 °C (-20 °F)	233 J (172 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-29 °C (-20 °F)	237 J (175 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-46 °C (-50 °F)	205 J (151 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-46 °C (-50 °F)	164 J (121 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	V	Cu
0.02	1.13	0.25	0.008	0.010	0.90	0.06	0.01	0.005	0.03

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	TTW Dist.	Efficiency
1.2 mm (.045 in.)	130 A	22 V	381 cm/min (150 in./min)	1.8 kg/h (3.9 lb/h)	12.7 mm (1/2 in.)	87 %
1.2 mm (.045 in.)	190 A	26 V	660 cm/min (260 in./min)	2.4 kg/h (5.2 lb/h)	12.7 mm (1/2 in.)	87 %
1.2 mm (.045 in.)	220 A	27 V	965 cm/min (380 in./min)	3.6 kg/h (7.9 lb/h)	19 mm (3/4 in.)	88 %
1.2 mm (.045 in.)	245 A	29 V	1321 cm/min (520 in./min)	4.9 kg/h (10.8 lb/h)	19 mm (3/4 in.)	88 %

Dual Shield II 70-Ni1 H4

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	26-29 V	965-1321 mm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	130-220 A	22-26 V	279-508 cm/min (110-200 in./min)	12.7-15.9 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	220-280 A	25-29 V	508-762 cm/min (200-300 in./min)	15.9-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	280-320 A	26-31 V	762-1016 cm/min (300-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-290 A	24-28 V	279-559 cm/min (110-220 in./min)	15.9-25.4 mm (5/8-1 in.)
1.6 mm (1/16 in.)	290-350 A	26-30 V	559-838 cm/min (220-330 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 810X-Ni1

Dual Shield 810X-Ni1 provides outstanding operator appeal with an easily controlled arc, improved operation at both lower and higher current levels, minimal spatter and easily removed slag. Dual Shield 810X-Ni1 is designed for use with 100% CO2. It is an excellent choice for welding on COR-TEN® steel in applications where weathering grade wires are not desirable.

Classifications:	AWS A5.29:E81T1-Ni1CD-JH8, AWS A5.36:E81T1-C1A6-Ni1-H8 ASME SFA 5.29, ASME SFA 5.36
Approvals:	Seismic Certified “D” , CWB CSA W48 E551T1-Ni1C-H8
Industry or Segmentation:	Railcars, Barges, Power Generation, Industrial and General Fabrication, Light Equipment, Heavy Equipment, Civil Construction, Bridge Construction, Ship/Barge Building

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	590 MPa (86 ksi)	635 MPa (92 ksi)	29 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-29 °C (-20 °F)	81 J (60 ft-lb)
As Welded	-40 °C (-40 °F)	61 J (45 ft-lb)
As Welded	-51 °C (-60 °F)	46 J (33 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
0.04	1.30	0.60	0.009	0.010	1.00

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
Vertical Up 100% CO2					
1.2 mm (.045 in.)	140 A	23 V	483 cm/min (190 in./min)	1.5 kg/h (3.3 lb/h)	81 %
1.2 mm (.045 in.)	154 A	23 V	559 cm/min (220 in./min)	1.8 kg/h (3.9 lb/h)	81 %
1.2 mm (.045 in.)	167 A	24 V	635 cm/min (250 in./min)	2.0 kg/h (4.5 lb/h)	82 %
1.2 mm (.045 in.)	180 A	24 V	711 cm/min (280 in./min)	2.3 kg/h (5.1 lb/h)	82 %
1.2 mm (.045 in.)	193 A	25 V	787 cm/min (310 in./min)	2.5 kg/h (5.6 lb/h)	82 %
1.2 mm (.045 in.)	205 A	26 V	864 cm/min (340 in./min)	2.8 kg/h (6.2 lb/h)	83 %
1.2 mm (.045 in.)	217 A	26 V	940 cm/min (370 in./min)	3.1 kg/h (6.8 lb/h)	83 %
1.4 mm (.052 in.)	153 A	24 V	406 cm/min (160 in./min)	1.8 kg/h (4.0 lb/h)	81 %
1.4 mm (.052 in.)	159 A	24 V	432 cm/min (170 in./min)	1.8 kg/h (4.0 lb/h)	81 %
1.4 mm (.052 in.)	166 A	25 V	457 cm/min (180 in./min)	2.0 kg/h (4.5 lb/h)	81 %

Dual Shield 810X-Ni1

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.4 mm (.052 in.)	172 A	25 V	483 cm/min (190 in./min)	2.2 kg/h (4.8 lb/h)	81 %
1.4 mm (.052 in.)	178 A	25 V	508 cm/min (200 in./min)	2.3 kg/h (5.0 lb/h)	81 %
1.4 mm (.052 in.)	184 A	25 V	533 cm/min (210 in./min)	2.4 kg/h (5.3 lb/h)	81 %
1.4 mm (.052 in.)	190 A	26 V	559 cm/min (220 in./min)	2.5 kg/h (5.5 lb/h)	81 %
1.4 mm (.052 in.)	196 A	26 V	584 cm/min (230 in./min)	2.6 kg/h (5.8 lb/h)	82 %
1.4 mm (.052 in.)	201 A	26 V	610 cm/min (240 in./min)	2.7 kg/h (6.0 lb/h)	82 %
1.4 mm (.052 in.)	207 A	26 V	635 cm/min (250 in./min)	2.9 kg/h (6.3 lb/h)	82 %
1.6 mm (1/16 in.)	187 A	24 V	356 cm/min (140 in./min)	1.9 kg/h (4.2 lb/h)	80 %
1.6 mm (1/16 in.)	205 A	25 V	406 cm/min (160 in./min)	2.2 kg/h (4.9 lb/h)	80 %
1.6 mm (1/16 in.)	223 A	25 V	457 cm/min (180 in./min)	2.5 kg/h (5.6 lb/h)	80 %
1.6 mm (1/16 in.)	240 A	25 V	508 cm/min (200 in./min)	2.9 kg/h (6.3 lb/h)	80 %
1.6 mm (1/16 in.)	257 A	26 V	559 cm/min (220 in./min)	3.2 kg/h (7.0 lb/h)	81 %
1.6 mm (1/16 in.)	273 A	26 V	610 cm/min (240 in./min)	3.5 kg/h (7.7 lb/h)	81 %
1.6 mm (1/16 in.)	289 A	26 V	660 cm/min (260 in./min)	3.8 kg/h (8.4 lb/h)	81 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	432-737 cm/min (170-290 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	175-230 A	25-27 V	737-889 cm/min (290-350 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	180-265 A	26-30 V	889-1397 cm/min (350-550 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	330-711 cm/min (130-280 in./min)	12.7-15.8 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	215-290 A	25-29 V	711-1016 cm/min (280-400 in./min)	15.8-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	250-350 A	29-31 V	1016-1524 cm/min (400-600 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	343-673 cm/min (135-265 in./min)	15.8-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	245-345 A	27-30 V	673-1016 cm/min (265-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	290-415 A	28-32 V	1016-1270 cm/min (400-500 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 80-Ni1 H4

Dual Shield II 80-Ni1H4 produces diffusible Hydrogen levels of <4mL/100g over a wide range of welding parameters. Applications include petrochemical equipment, bridge fabrication, offshore oil construction, ship fabrication railcar, and heavy machinery.

Classifications:	AWS A5.29:E81T1-Ni1MJ-H4, AWS A5.36:E81T1-M21A6-Ni1-H4, AWS A5.36:E81T1-M21P6-Ni1-H4, ASME SFA 5.29, ASME SFA 5.36
Approvals:	ABS , BV , MIL-E-24403/1 MIL-81T1-Ni1M, LR , CWB E551T1-Ni1M-JH4, DNV-GL
Industry or Segmentation:	Railcars, Mobile Equipment, Industrial and General Fabrication, Civil Construction, Bridge 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
75% Ar - 25% CO2				
As Welded	545 MPa (79 ksi)	615 MPa (89 ksi)	71 %	28 %
Stress Relieved 2 hr 621 °C (1150 °F)	505 MPa (73 ksi)	570 MPa (84 ksi)	71 %	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-29 °C (-20 °F)	149 J (100 ft-lb)
As Welded	-40 °C (-40 °F)	114 J (84 ft-lb)
Stress Relieved 2 hr 620 °C (1150 °F)	-29 °C (-20 °F)	122 J (90 ft-lb)
Stress Relieved 2 hr 620 °C (1150 °F)	-40 °C (-40 °F)	68 J (50 ft-lb)
Stress Relieved 1 hr 593 °C (1100 °F)	-51 °C (-60 °F)	87 J (64 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
75% Ar - 25% CO2					
0.05	1.20	0.32	0.009	0.014	0.93

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %

Dual Shield II 80-Ni1 H4

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.6 mm (1/16 in.)	190 A	27 V	381 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	635 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
2.0 mm (5/64 in.)	250 A	26 V	284 cm/min (112 in./min)	2.9 kg/h (6.4 lb/h)	85 %
2.0 mm (5/64 in.)	350 A	28 V	447 cm/min (176 in./min)	4.76 kg/h (10.5 lb/h)	85 %
2.0 mm (5/64 in.)	450 A	31 V	655 cm/min (258 in./min)	6.71 kg/h (14.8 lb/h)	85 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	26-29 V	965-1321 mm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	130-220 A	22-26 V	279-508 cm/min (110-200 in./min)	12.7-15.9 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	220-280 A	25-29 V	508-762 cm/min (200-300 in./min)	15.9-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	280-320 A	26-31 V	762-1016 cm/min (300-400 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-290 A	24-28 V	279-559 cm/min (110-220 in./min)	15.9-25.4 mm (5/8-1 in.)
1.6 mm (1/16 in.)	290-350 A	26-30 V	559-838 cm/min (220-330 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield 88-C3

Dual Shield 88-C3 is a 1% nickel flux cored wire developed for low temperature impact toughness. It is an excellent choice for welding weathering grade steel, such as Cor-Ten® where W grade electrodes are not desireable.
Dual Shield 88-C3 wire is recommended for welding high strength steels in the 70-80 ksi (483-552 MPa) tensile range. The weld metal analysis is similar to an E8018-C3 low hydrogen electrode.

Classifications:	AWS A5.29:E80T1-Ni1C, AWS A5.36:E80T1-C1A2-Ni1, ASME SFA 5.29, ASME SFA 5.36
Approvals:	MIL E-24403/1, MIL 80T1-Ni1C
Industry or Segmentation:	Barges, Bridge Construction, Civil Construction, General Cast Iron Repair and Fabrication, Power Generation, Railcars, 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
100% CO2				
As Welded	517 MPa (75 ksi)	593 MPa (86 ksi)	60 %	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-29 °C (-20 °F)	49 J (36 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
0.087	1.0	0.29	0.015	0.009	0.95

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
2.4 mm (3/32 in.)	350 A	30 V	315 cm/min (124 in./min)	4.35 kg/h (9.6 lb/h)	84 %
2.4 mm (3/32 in.)	400 A	30 V	422 cm/min (166 in./min)	5.76 kg/h (12.7 lb/h)	85 %
2.4 mm (3/32 in.)	450 A	31 V	500 cm/min (197 in./min)	6.8 kg/h (15 lb/h)	86 %
2.4 mm (3/32 in.)	500 A	32 V	602 cm/min (237 in./min)	8.39 kg/h (18.5 lb/h)	86 %
2.4 mm (3/32 in.)	550 A	34 V	706 cm/min (278 in./min)	9.66 kg/h (21.3 lb/h)	88 %

Dual Shield 8000-Ni2

Dual Shield 8000-Ni2 is an all-position flux cored electrode that deposits 2.5% Ni deposit with an 82 ksi (565 MPa) minimum tensile strength. Dual Shield 8000-Ni2 may be used with CO2 or argon mixtures. The argon-CO2 mixtures reduce spatter and further improve weldability especially for small vertical-up fillets. Dual Shield 8000-Ni2 produces superior weld metal properties which make it most desirable for such applications as shipbuilding and heavy machinery construction. The weld metal analysis is similar to an E8018-C1 low hydrogen electrode.

Classifications:	AWS A5.29:E81T1-Ni2C-JH8/E81T1-Ni2M H8,AWS A5.36:E81T1-C1A6-Ni2-H8, AWS A5.36:E81T1M21A4-Ni2-H8, ASME SFA 5.29, ASME SFA 5.36
Approvals:	ABS , MIL-E-24403/1 MIL-81T1-Ni2C-J/Ni2M, CWB CSA W48: E551T1-Ni2M, E551T1-Ni2C-H8
Industry or Segmentation:	Mobile Equipment, Industrial and General Fabrication, Bridge Construction, Process

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
100% CO2				
As Welded	550 MPa (80 ksi)	605 MPa (88 ksi)	67 %	26 %
75% Ar - 25% CO2				
As Welded	565 MPa (82 ksi)	620 MPa (90 ksi)	68 %	27 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	84 J (62 ft-lb)
As Welded	-29 °C (-20 °F)	58 J (43 ft-lb)
As Welded	-40 °C (-40 °F)	53 J (39 ft-lb)
As Welded	-51 °C (-60 °F)	46 J (34 ft-lb)
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	69 J (63 ft-lb)
As Welded	-29 °C (-20 °F)	64 J (47 ft-lb)
As Welded	-40 °C (-40 °F)	54 J (40 ft-lb)
As Welded	-51 °C (-60 °F)	37 J (27 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
0.05	0.90	0.30	0.010	0.012	2.20
75% Ar - 25% CO2					
0.05	1.10	0.40	0.010	0.012	2.20

Dual Shield 8000-Ni2

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 9000-C1

Dual Shield 9000-C1 is an all-position flux cored electrode which produces a 2.5% Ni deposit. The analysis is very similar to the Dual Shield T-90C1 except that this product has out-of-position capability. Dual Shield 9000-C1 is used for welding of 2-3% Ni steels and castings used in applications requiring good toughness at subzero temperatures. Shielding gas 100% CO2 and 75% Ar - Remainder CO2 may be used.

Classifications:	AWS A5.29:E91T1-Ni2C/E91T1-Ni2M, AWS A5.36:E91T1-C1A4-Ni2, AWS A5.36:E91T1-M21A4-Ni2, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Process, Ship and Offshore Yards

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	580 MPa (85 ksi)	665 MPa (96 ksi)	25 %
75% Ar - 25% CO2			
As Welded	610 MPa (89 ksi)	680 MPa (98 ksi)	24 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	52 J (38 ft-lb)
As Welded	-40 °C (-40 °F)	41 J (30 ft-lb)
75% Ar - 25% CO2		
As Welded	-40 °C (-40 °F)	45 J (33 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
0.07	1.20	0.50	0.010	0.013	2.50
75% Ar - 25% CO2					
0.08	1.50	0.70	0.011	0.014	2.60

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %

Dual Shield 9000-C1

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 8000-B2

Dual Shield 8000-B2 is an all-position flux cored electrode which contains 1.25% Cr - 0.5% Mo. The analysis is very similar to Dual Shield 88 CM, except 8000-B2 is for out-of-position welding. The weld metal analysis is similar to an E8018-B2 low Hydrogen electrode. Dual Shield 8000-B2 wire is used for the welding of such steel as 0.5% Cr - 0.5% Mo, 1% Cr-0.5% Mo, and 1.25% Cr - 0.5% Mo. This wire is designed for single or multiple pass welding. Shielding gases of 100% CO2 and 75% Ar - Remainder CO2 may be used.

Classifications:	AWS A5.29:E81T1-B2C/E81T1-B2M, AWS A5.36:E81T1-C1PZ-B2, AWS A5.36:E81T1-M21PZ-B2, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Pipeline, Petrochemical, Power Generation

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
Stress Relieved 1 hr 690 °C (1275 °F)	593 MPa (86 ksi)	680 MPa (99 ksi)	22 %
75% Ar - 25% CO2			
Stress Relieved 8 hr 690 °C (1275 °F)	558 MPa (81 ksi)	648 MPa (94 ksi)	24 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
75% Ar - 25% CO2						
0.06	0.70	0.60	0.008	0.009	1.30	0.50

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %

Dual Shield 8000-B2

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 8000-B2L

Dual Shield 8000-B2L is an all-position flux cored electrode for low carbon grades of 1.25% Cr - 0.5% Mo steels. It is designed for use with 75% - 90% Argon, remainder CO2 shielding gases. The weld metal analysis is similar to an E8018-B2L low Hydrogen electrode.

Classifications:	AWS A5.29:E81T1-B2LM, AWS A5.36:E81T1-M21PZ-B2L, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Pipeline, Petrochemical, Chemical Industry

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
Stress Relieved 1 hr 691 °C (1275 °F)	525 MPa (76 ksi)	605 MPa (87 ksi)	23 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
75% Ar - 25% CO2						
0.02	0.90	0.40	0.010	0.010	1.40	0.50

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 9000-B3

Dual Shield 9000-B3 is an all-position flux cored electrode which deposits a 2.25% Cr - 1% Mo weld metal. The analysis is very similar to Dual Shield 98 CM, except 9000-B3 is for out-of-position welding. The weld metal analysis is similar to an E9018-B3 low hydrogen electrode. Dual Shield 9000-B3 is recommended for welding 2.25% Cr - 1% Mo steels. This wire is designed for single or multiple pass welding. Shielding gas of 100% CO2 and 75% Ar - remainder CO2 may be used.

Classifications:	AWS A5.29:E91T1-B3C, AWS A5.36:E91T1-C1PZ-B3, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Power Generation, Pipeline

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
Stress Relieved 3 hr 690 °C (1275 °F)	642 MPa (93 ksi)	739 MPa (107 ksi)	20 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
100% CO2						
0.06	0.60	0.60	0.008	0.01	2.20	1.00

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield 9000-B3L

Dual Shield 9000-B3L is an all-position flux cored electrode for low carbon grades of 2.25% Cr-1% Mo steels. It is designed for use with 75% - 90% Argon, remainder CO2 shielding gases. The weld metal analysis is similar to an E9018-B3L low hydrogen electrode

Classifications:	AWS A5.29:E91T1-B3LC/B3LM, AWS A5.36:E91T1-M21PZ-B3L, AWS A5.36:E91Ti-C1PZ-B3L, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Pipeline, Petrochemical, Chemical Industry

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 691 °C (1275 °F)	545 MPa (79 ksi)	635 MPa (92 ksi)	22 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
75% Ar - 25% CO2						
0.02	0.80	0.40	0.01	0.01	2.20	1.10

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield B6

Dual Shield B6 is an all-position flux cored electrode designed for use with 75% Ar / 25% CO2 or 100% CO2 shielding gas. Dual Shield B6 is intended for use on pipe and plate steels having a nominal 5% chromium - 0.5% molybdenum composition. These steels are typically used in process piping in the oil, gas, petrochemical, and marine industries.

Classifications:	AWS A5.29:E81T1-B6C/E81T1-B6M, AWS A5.36:E81T1-C1PZ-B6, AWS A5.36:E81T1-M21PZ-B6, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Pipeline, Petrochemical, Power Generation

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
Stress Relieved 2 hr 746 °C (1375 °F)	540 MPa (78 ksi)	640 MPa (93 ksi)	20 %
75% Ar - 25% CO2			
Stress Relieved 2 hr 746 °C (1375 °F)	580 MPa (84 ksi)	676 MPa (98 ksi)	20 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo
100% CO2						
0.08	0.60	0.50	0.006	0.01	4.70	0.50
75% Ar - 25% CO2						
0.05	0.50	0.70	0.007	0.006	5.40	0.50

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %

Dual Shield B6

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield B9

Dual Shield B9 is an all-position flux cored electrode designed for the welding of modified 9% chromium creep resisting steels, such as ASTM A335 Grade P91 or ASTM A213 T91. This product is formulated with a combined Mn & Ni <1.20% to meet stringent customer specifications. Dual Shield B9 is packaged on layer level-wound wire spool baskets to allow the product to be placed in a heated storage oven. In addition, the wire is packaged in a vacuum-sealed foil bag to prevent moisture pick-up until such time the sealed bag has been opened.

Classifications:	AWS A5.29:E91T1-B9M, AWS A5.36:E91T1-M21PZ-B91, ASME SFA 5.29, ASME SFA 5.36, ASME IX F No. 6
Industry or Segmentation:	Power Generation, Pipeline

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
Stress Relieved 2 hr 760 °C (1400 °F)	600 MPa (87 ksi)	738 MPa (107 ksi)	21 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Cr	Mo	V	N	Nb	X-Factor
0.10	0.96	0.18	0.008	0.009	9.25	1.00	0.22	0.04	0.04	< 15

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.85 kg/h (10.7 lb/h)	87 %
1.2 mm (.045 in.)	330 A	34 V	1524 cm/min (600 in./min)	5.76 kg/h (12.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	7.98 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16 lb/h)	87 %
1.6 mm (1/16 in.)	500 A	39 V	1270 cm/min (500 in./min)	9.11 kg/h (20.1 lb/h)	87 %

Dual Shield II 81-K2

The wire produces a smooth stable arc and low spatter levels using a 100% CO2 shielding gas. Dual Shield II 81-K2 was developed for higher tensile steels such as ASTM A302, A533 Class I and A537. Applications include ship fabrication, offshore oil rigs, and heavy equipment construction. This wire is an excellent choice for welding ASTM steels A302, A533 Class I and A537. Dual Shield II 81-K2 produces a smooth stable arc and low spatter levels using 100% CO2 shielding gas. Applications include ship building, offshore oilrigs, and heavy equipment construction.

Classifications:	AWS A5.29:E81T1-K2C-H8, AWS A5.36:E81T1-C1A6-K2-H8, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Civil Construction, Ship/Barge Building, Mobile Equipment, Railcars, Industrial and General Fabrication

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
100% CO2				
As Welded	515 MPa (74 ksi)	570 MPa (82 ksi)	73 %	27 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	136 J (100 ft-lb)
As Welded	-29 °C (-20 °F)	121 J (89 ft-lb)
As Welded	-51 °C (-60 °F)	81 J (60 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
.025	1.18	0.49	0.009	0.013	1.44

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.91 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.86 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.86 kg/h (8.5 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.00 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.31 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.63 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.03 kg/h (13.3 lb/h)	85 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.77 kg/h (6.1 lb/h)	87 %

Dual Shield II 81-K2

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.6 mm (1/16 in.)	300 A	30 V	635 cm/min (250 in./min)	4.63 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.58 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.35 kg/h (14 lb/h)	88 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
100% CO2				
1.2 mm (.045 in.)	135-205 A	23-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	205-230 A	25-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	230-265 A	26-30 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	235-290 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	290-350 A	29-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	270-345 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	345-415 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 90-K2

Dual Shield II 90-K2 is an all-position, high performance flux cored electrode with low diffusible hydrogen levels. This wire provides a smooth stable arc, low spatter, and easy slag removal similar to other Dual Shield II products. Dual Shield II 90-K2 was developed for use on commercial grades of HY-80, ASTM A710, A514 and A517 and other similar HSLA low alloy steels.

Classifications:	AWS A5.29:E91T1-K2M-DH8, AWS A5.36:E91T1-M21A6-K2-DH8, AWS A5.36:E91T1-M21P4-K2-DH8, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Mobile Equipment, Ship/Barge Building, Industrial and General Fabrication

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
As Welded	605 MPa (88 ksi)	650 MPa (94 ksi)	23 %
Stress Relieved 10 hr 579 °C (1075 °F)	520 MPa (76 ksi)	600 MPa (87 ksi)	26 %
Stress Relieved 1 hr 621 °C (1150 °F)	600 MPa (87 ksi)	660 MPa (96 ksi)	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-29 °C (-20 °F)	137 J (101 ft-lb)
As Welded	-40 °C (-40 °F)	122 J (90 ft-lb)
As Welded	-51 °C (-60 °F)	85 J (63 ft-lb)
As Welded	-62 °C (-80 °F)	39 J (29 ft-lb)
Stress Relieved 1 hr 621 °C (1150 °F)	-40 °C (-40 °F)	54 J (40 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
75% Ar - 25% CO2					
0.06	1.42	0.33	0.01	0.014	1.50

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.9 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %

Dual Shield II 90-K2

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	8.0 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.8 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.6 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.6 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.4 kg/h (14.0 lb/h)	88 %
1.6 mm (1/16 in.)	450 A	33 V	1016 cm/min (400 in./min)	7.3 kg/h (16.0 lb/h)	87 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	16-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	16-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 101H4M

Dual Shield II 101H4M is one of a series of low hydrogen flux cored electrodes introduced by ESAB. Each of the new Dual Shield II H4 wires is an all-position flux cored electrode that provides excellent low temperature toughness in both the as welded and/or stress relieved conditions (as applicable) when used with 75% Ar/25% CO2. Each can produce diffusible hydrogen levels of < 4mL/100g deposited over a wide range of welding parameters. Dual Shield II 101H4M is especially designed to weld HY-80 and HSLA-100 steels typically used in shipbuilding. Suitable for single or multi-pass welding applications. This wire was developed to meet the stringent requirements of MIL-E-24403/2 and offshore welding, and it is an ideal choice for HSLA steels.

Classifications:	AWS A5.29:E91T1-GM-H4, AWS A5.36:E91T-M21A6-K2H4, ASME SFA 5.29, ASME SFA 5.36
Approvals:	ABS , QPL-24403/2 MIL-101TM
Industry or Segmentation:	Ship/Barge Building, Pipeline, Mobile Equipment, 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
75% Ar - 25% CO2				
As Welded AWS A5.29 Requirement	640 MPa (93 ksi)	705 MPa (102 ksi)	67 %	23 %
As Welded MIL-E-24403/2 Vertical-Up HY-80 Base Plate	598 MPa (86 ksi)	680 MPa (101 ksi)	68 %	27 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	95 J (70 ft-lb)
As Welded	-50 °C (-60 °F)	66 J (50 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
75% Ar - 25% CO2					
0.059	1.37	0.36	0.010	0.012	2.09

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.8 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %

Dual Shield II 101H4M

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.8 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.6 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.6 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.4 kg/h (14.0 lb/h)	88 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 101-TC

Dual Shield II 101-TC is an all-position flux cored electrode developed to meet the U.S. Navy qualification tests for hydrogen levels of less than 0.05 ml/g of deposited weld metal. This unique formulation designed for CO2 shielding optimizes performance and reduces post-weld cleanup cost. Dual Shield II 101-TC produces exceptional mechanical properties and low temperature impact toughness. It is intended for use on HY-80, ASTM A710, A514, and A517 or other similar HSLA steels.

Classifications:	AWS A5.29:E91T1-K2C-H4, AWS A5.36:E91T1-C1A6-K2-H4, ASME SFA 5.29, ASME SFA 5.36
Approvals:	QPL-24403/2 MIL-101TC, DNV-GL
Industry or Segmentation:	Ship/Barge Building, Mobile Equipment, 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
100% CO2			
As Welded AWS A5.29 Requirement Flat Mild Steel Plate	600 MPa (87 ksi)	640 MPa (94 ksi)	25 %
As Welded MIL-E-24403/2 Vertical-Up HY-80 Base Plate	640 MPa (93 ksi)	710 MPa (103 ksi)	23 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As Welded	-18 °C (0 °F)	104 J (77 ft-lb)
As Welded	-51 °C (-60 °F)	58 J (43 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni
100% CO2					
0.03	1.32	0.35	0.01	0.014	1.64

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
100% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.8 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %

Dual Shield II 101-TC

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.7 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.6 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.5 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.3 kg/h (14.0 lb/h)	88 %

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
100% CO2				
1.2 mm (.045 in.)	130-200 A	23-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	25-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	26-30 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	125-235 A	23-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	235-290 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	290-350 A	29-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	165-270 A	25-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	270-345 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	345-415 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 100-D1

Dual Shield II 100-D1 is an all-position flux cored electrode specially formulated to weld quenched and tempered steels that require a postweld heat treatment using 75% Ar / 25% CO2 shielding gas. Dual Shield II 100-D1 was designed to weld oil field components made of 4130, 8630, API X-80 and similar steels.

Classifications:	AWS A5.29:E101T1-GM, AWS A5.36:E101T1-M21A4-D1, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Mobile Equipment, Industrial and General Fabrication, Civil Construction

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
75% Ar - 25% CO2				
As Welded	650 MPa (94 ksi)	705 MPa (102 ksi)	58 %	23 %
Stress Relieved 8 hr 635 °C (1175 °F)	585 MPa (85 ksi)	650 MPa (94 ksi)	58 %	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-32 °C (-25 °F)	54 J (40 ft-lb)
As Welded	-40 °C (-40 °F)	45 J (33 ft-lb)
Stress Relieved 8 hr 635 °C (1175 °F)	-32 °C (-25 °F)	27 J (20 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Mo
75% Ar - 25% CO2						
0.06	1.60	0.40	0.01	0.009	0.82	0.33

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.8 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	8.0 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.8 kg/h (6.1 lb/h)	87 %

Dual Shield II 100-D1

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.6 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.5 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.3 kg/h (14.0 lb/h)	88 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 100

Dual Shield II 100 is an all-position flux cored electrode that combines a high strength deposit with excellent impact toughness and low diffusible hydrogen levels. The rutile basic slag system produces a smooth spray-like transfer with reduced spatter and low post weld cleanup. Dual Shield II 100 is designed to join high strength steels such as HY-80 and T-1 the as welded or stress relieved condition using a 75% Ar / 25% CO2 shielding gas. It is especially well suited for high tensile steels that are used in sub-zero temperatures. The weld metal analysis is similar to an E10018-M low hydrogen electrode.

Classifications:	AWS A5.29:E101T1-K3MH4, AWS A5.36:E101T1-M21A2-K3H4, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Mobile Equipment, Industrial and General Fabrication

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Reduction in Area	Elongation
75% Ar - 25% CO2				
As Welded	700 MPa (101 ksi)	755 MPa (109 ksi)	60 %	21 %
Stress Relieved 1 hr 566 °C (1050 °F)	685 MPa (99 ksi)	760 MPa (110 ksi)	60 %	22 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	65 J (48 ft-lb)
As Welded	-29 °C (-20 °F)	54 J (40 ft-lb)
As Welded	-40 °C (-40 °F)	43 J (32 ft-lb)
As Welded	-51 °C (-60 °F)	38 J (28 ft-lb)
Stress Relieved 1 hr 566 °C (1050 °F)	-18 °C (0 °F)	45 J (33 ft-lb)
Stress Relieved 1 hr 566 °C (1050 °F)	-29 °C (-20 °F)	41 J (30 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Mo
75% Ar - 25% CO2						
0.05	1.45	0.44	0.01	0.012	1.70	0.40

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.8 kg/h (10.7 lb/h)	87 %

Dual Shield II 100

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency**
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.4 mm (.052 in.)	430 A	37 V	1524 cm/min (600 in./min)	8.0 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	2.8 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	4.6 kg/h (10.2 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	5.5 kg/h (12.3 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	6.3 kg/h (14.0 lb/h)	88 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield II 110

Dual Shield II 110 is an all-position flux cored electrode which produces a smooth spray-like transfer, low spatter levels, low diffusible hydrogen levels, easy slag removal and good arc direction. Dual Shield II 110 was designed to join high strength steel such as HY-100 and T-1 (25.4) in the as welded or stress relieved condition using 75% Ar / 25% CO2 shielding gas. It is well suited for joining high tensile steels that will be used in low temperatures. The weld metal analysis is similar to an E11018-M low hydrogen electrode.

Classifications:	AWS A5.29:E111T1-K3MH4, AWS A5.36:E111T1-M21A4-K3-H4, ASME SFA 5.29, ASME SFA 5.36
Approvals:	ABS , CWB CSA W48 E761T1-K3M- H4
Industry or Segmentation:	Mobile Equipment, 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
75% Ar - 25% CO2				
As Welded	760 MPa (110 ksi)	830 MPa (120 ksi)	54 %	19 %
Stress Relieved 8 hr 621 °C (1150 °F)	745 MPa (108 ksi)	800 MPa (116 ksi)	54 %	19 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-18 °C (0 °F)	54 J (40 ft-lb)
As Welded	-29 °C (-20 °F)	49 J (36 ft-lb)
As Welded	-51 °C (-60 °F)	35 J (26 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-18 °C (0 °F)	39 J (29 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-29 °C (-20 °F)	37 J (27 ft-lb)
Stress Relieved 8 hr 621 °C (1150 °F)	-51 °C (-60 °F)	28 J (21 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Mo
75% Ar - 25% CO2						
0.05	1.91	0.43	0.01	0.013	1.74	0.39

Deposition Data

Diameter	Amps	Volts	Wire Feed Speed	Deposition Rate	Efficiency (%)
75% Ar - 25% CO2					
1.2 mm (.045 in.)	150 A	28 V	508 cm/min (200 in./min)	1.9 kg/h (4.2 lb/h)	86 %
1.2 mm (.045 in.)	210 A	29 V	762 cm/min (300 in./min)	2.8 kg/h (6.3 lb/h)	86 %
1.2 mm (.045 in.)	250 A	30 V	1016 cm/min (400 in./min)	3.9 kg/h (8.5 lb/h)	87 %

Dual Shield II 110

Deposition Data					
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**Efficiency (%)**
1.2 mm (.045 in.)	290 A	33 V	1270 cm/min (500 in./min)	4.8 kg/h (10.7 lb/h)	87 %
1.4 mm (.052 in.)	155 A	25 V	381 cm/min (150 in./min)	2.0 kg/h (4.4 lb/h)	87 %
1.4 mm (.052 in.)	245 A	28 V	635 cm/min (250 in./min)	3.3 kg/h (7.3 lb/h)	86 %
1.4 mm (.052 in.)	310 A	33 V	889 cm/min (350 in./min)	4.6 kg/h (10.2 lb/h)	85 %
1.4 mm (.052 in.)	360 A	36 V	1143 cm/min (450 in./min)	6.0 kg/h (13.3 lb/h)	85 %
1.6 mm (1/16 in.)	190 A	27 V	38 cm/min (150 in./min)	8.0 kg/h (17.6 lb/h)	87 %
1.6 mm (1/16 in.)	300 A	30 V	35 cm/min (250 in./min)	2.8 kg/h (6.1 lb/h)	87 %
1.6 mm (1/16 in.)	365 A	33 V	762 cm/min (300 in./min)	4.6 kg/h (10.2 lb/h)	86 %
1.6 mm (1/16 in.)	410 A	33 V	889 cm/min (350 in./min)	5.5 kg/h (12.3 lb/h)	88 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	130-200 A	22-26 V	381-660 cm/min (150-260 in./min)	9.5-12.7 mm (3/8-1/2 in.)
1.2 mm (.045 in.)	200-225 A	24-27 V	660-965 cm/min (260-380 in./min)	12.7-19 mm (1/2-3/4 in.)
1.2 mm (.045 in.)	225-265 A	27-29 V	965-1321 cm/min (380-520 in./min)	19-25.4 mm (3/4-1 in.)
1.4 mm (.052 in.)	135-250 A	22-26 V	279-584 cm/min (110-230 in./min)	12.7-16 mm (1/2-5/8 in.)
1.4 mm (.052 in.)	250-295 A	25-29 V	584-864 cm/min (230-340 in./min)	16-19 mm (5/8-3/4 in.)
1.4 mm (.052 in.)	295-355 A	27-31 V	864-1194 cm/min (340-470 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	185-285 A	24-28 V	279-508 cm/min (110-200 in./min)	16-19 mm (5/8-3/4 in.)
1.6 mm (1/16 in.)	285-340 A	27-30 V	508-762 cm/min (200-300 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	340-400 A	28-32 V	762-1067 cm/min (300-420 in./min)	25.4-31.75 mm (1-1.25 in.)

Dual Shield T-115

Dual Shield T-115 is a basic slag flux cored electrode designed for applications requiring a high strength weld deposit. Dual Shield T-115 produces weld deposits which are resistant to cracking in heavy sections or under high restraint. It has good usability with a minimum amount of spatter and easy slag removal. It can be used for welding steels such as: T-1, HY-80, HY-90, N-A-XTRA 90, 100 and 110, and the SSS 100 series. The weld metal analysis is similar to an E11018-M low hydrogen electrode. A 100% CO2 shielding gas is recommended for the 3/32" (2.4 mm) size and a 75% Ar / 25% CO2 gas for the .045 " (1.2 mm) and 1/16" (1.6 mm) sizes.

Classifications:	AWS A5.29:E111T5-K4M-H4 (.045", .052", 1/16"), AWS A5.29:E110T5-K4C (3/32"), AWS A5.36:E111T5-M21A6-K4-H4 (.045", .052", 1/16"), AWS A5.36:E110T5-C1A6-K4-H4 (3/32"), ASME SFA 5.29, ASME SFA 5.36
Approvals:	CWB CSA W48 E111T5-K4M-H4 (.045",.052",1/16"), E110T5-K4C-H4 (3/32")
Industry or Segmentation:	Mobile Equipment, 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
100% CO2				
As Welded	810 MPa (117 ksi)	662 MPa (96 ksi)	57 %	22 %
75% Ar - 25% CO2				
As Welded	761 MPa (110 ksi)	815 MPa (118 ksi)	43 %	20 %
Stress Relieved 1 hr 566 °C (1050 °F)	660 MPa (96 ksi)	750 MPa (109 ksi)	65 %	23 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-29 °C (-20 °F)	68 J (50 ft-lb)
As Welded	-51 °C (-60 °F)	49 J (36 ft-lb)
Stress Relieved 1 hr 566 °C (1050 °F)	-29 °C (-20 °F)	65 J (48 ft-lb)
Stress Relieved 1 hr 566 °C (1050 °F)	-51 °C (-60 °F)	43 J (32 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo
100% CO2							
0.06	1.86	0.56	0.012	0.011	2.11	0.44	0.44
75% Ar - 25% CO2							
0.05	1.86	0.52	0.012	0.010	2.04	0.25	0.47

Dual Shield T-115

Deposition Data						
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**Deposition Rate**	**TTW Dist.**	**Efficiency**
75% Ar - 25% CO2						
1.2 mm (.045 in.)	170 A	19 V	724 cm/min (285 in./min)	3.2 kg/h (7.0 lb/h)	19 mm (3/4 in.)	96 %
1.2 mm (.045 in.)	250 A	30 V	1191 cm/min (469 in./min)	4.9 kg/h (10.8 lb/h)	25.4 mm (1 in.)	91 %
1.2 mm (.045 in.)	300 A	32 V	1539 cm/min (606 in./min)	6.44 kg/h (14.2 lb/h)	25.4 mm (1 in.)	92 %
1.6 mm (1/16 in.)	300 A	30 V	574 cm/min (226 in./min)	4.45 kg/h (9.8 lb/h)	25.4 mm (1 in.)	92 %
1.6 mm (1/16 in.)	400 A	32 V	937 cm/min (369 in./min)	7.3 kg/h (16.1 lb/h)	25.4 mm (1 in.)	92 %
100% CO2						
2.4 mm (3/32 in.)	450 A	32 V	551 cm/min (217 in./min)	8 kg/h (17.6 lb/h)	25.4 mm (1 in.)	85 %
2.4 mm (3/32 in.)	475 A	32 V	622 cm/min (245 in./min)	9.1 kg/h (20.0 lb/h)	25.4 mm (1 in.)	87 %
2.4 mm (3/32 in.)	500 A	32 V	686 cm/min (270 in./min)	10.3 kg/h (22.8 lb/h)	25.4 mm (1 in.)	89 %

Recommended Welding Parameters				
Diameter	**Amps**	**Volts**	**Wire Feed Speed**	**TTW Dist.**
75% Ar - 25% CO2				
1.2 mm (.045 in.)	140-190 A	19-28 V	635-889 cm/min (250-350 in./min)	19-25.4 mm (3/4-1 in.)
1.2 mm (.045 in.)	240-300 A	29-32 V	1143-1651 cm/min (450-650 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	220-280 A	29-30 V	457-635 cm/min (180-250 in./min)	19-25.4 mm (3/4-1 in.)
1.6 mm (1/16 in.)	280-380 A	31-32 V	635-1016 cm/min (250-400 in./min)	25.4-31.75 mm (1-1.25 in.)
100% CO2				
2.4 mm (3/32 in.)	240-370 A	30-32 V	254-508 cm/min (100-200 in./min)	25.4-31.75 mm (1-1.25 in.)
2.4 mm (3/32 in.)	370-460 A	32-33 V	508-813 cm/min (200-320 in./min)	31.75-38 mm (1.25-1.5 in.)

Dual Shield II 4130 SR

Dual Shield II 4130 SR is an all position flux cored wire for welding low alloy, high strength steels such as 4130. Ideal for offshore oil and gas topsides and platforms requiring high corrosion resistance with stress relieved high strength and low temperature impact toughness properties. Excellent welder appeal and mechanical properties after PWHT.
Meets ANSI/NACE MR0175/ISO 15156-1.

Typical Diffusible Hydrogen: >4 ml/100g of deposited metal.

Classifications:	AWS A5.29:E101T1-GM-H4, AWS A5.36:E101T1-M21A5-G-H4, AWS A5.36:E101T1-M21P5-G-H4, ASME SFA 5.29, ASME SFA 5.36
Industry or Segmentation:	Offshore Oil

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As Welded	758 MPa (110 ksi)	814 MPa (118 ksi)	24 %
Stress Relieved 2 hr 620 °C (1150 °F)	648 MPa (94 ksi)	731 MPa (106 ksi)	26 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As Welded	-46 °C (-50 °F)	64 J (47 ft-lb)
Stress Relieved 2 hr 620 °C (1150 °F)	-46 °C (-50 °F)	43 J (32 ft-lb)
Stress Relieved 2 hr 620 °C (1150 °F)	-46 °C (-50 °F)	69 J (51 ft-lb)

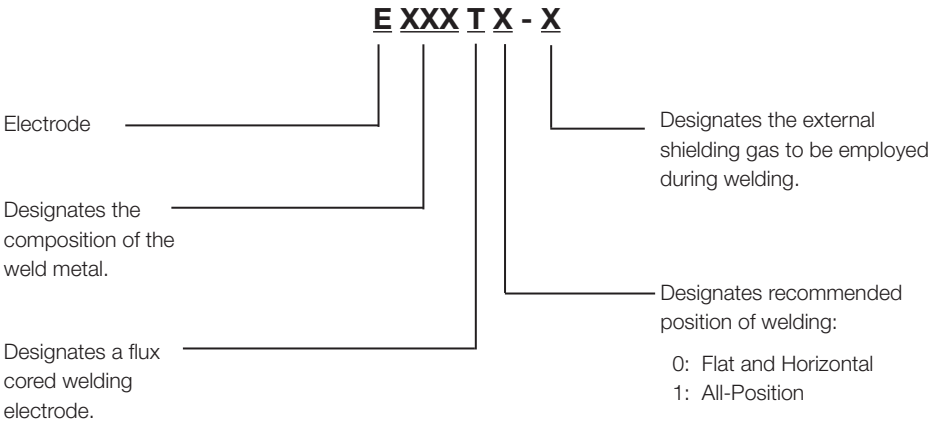
Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo
0.05	2.0	0.3	0.006	0.011	0.90	0.03	0.43

Recommended Welding Parameters

Diameter	Amps	Volts	Wire Feed Speed	TTW Dist.
1.2 mm (.045 in.)	150-170 A	23-24 V	432 m/min (170 in./min)	19 mm (3/4 in.)
1.2 mm (.045 in.)	180-220 A	24-26 V	719 m/min (283 in./min)	16 mm (5/8 in.)
1.2 mm (.045 in.)	230-280 A	26-28 V	1016 m/min (400 in./min)	16 mm (5/8 in.)

AWS FILLER METAL SPECIFICATION A5.22



AWS A5.36 Specification - see page 4-4.

Shield-Bright 2209

Shield-Bright 2209 was developed for the welding of “2205” duplex stainless steels (UNS S31803, S32205, and J92205). It can also be used for the welding of leaner grades of duplex stainless steels. It has been approved with a 25°C critical pitting temperature and impact toughness at -40°F (-40°C).

Classifications Weld Metal:	SFA/AWS A5.22:E2209T1-4, E2209T1-1, EN ISO 17633-A:T 22 9 3 N L P C1 2, EN ISO 17633-A:T 22 9 3 N L P M21 2
Approvals:	CE EN 13479, ABS E2209T1-1 (C1), BV 2205 (C1), CCS 2205-S (C1), DNV Duplex (C1), LR S31803 (C1), VdTÜV 09123 , CWB: AWS A5.22 E2209T1-1, E2209T1-4, DNV-GL Duplex (M21)
Industry or Segmentation:	Pipeline, Process, Pulp and Paper, Petrochemical

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar / 25% CO2			
As Welded	650 MPa (95 ksi)	820 MPa (120 ksi)	25 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-20 °C (-4 °F)	61 J (45 ft-lb)
As Welded	-40 °C (-40 °F)	54 J (40 ft-lb)
As Welded	-51 °C (-60 °F)	47 J (35 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo	N
0.03	1.05	0.45	8.85	22.95	3.44	0.16

Shield-Bright 2507

Shield-Bright 2507 is an all-position stainless steel cored wire designed for welding duplex stainless steel resulting in beautiful beads with excellent slag removal. It can deposit metal of 25% Cr-9% Ni-3.5% Mo-0.25% N. Shield-Bright 2507 is used in duplex stainless steels such as UNS S32520, S32550, S32750, S32760, S32900, JIS 329J4L.

Classifications:	AWS A5.22:E2553T1-G

Typical Tensile Properties		
Yield Strength	**Tensile Strength**	**Elongation**
100% CO2		
628 MPa (91 ksi)	863 MPa (125 ksi)	28 %

Typical Weld Metal Analysis %									
C	**Mn**	**Si**	**S**	**P**	**Ni**	**Cr**	**Mo**	**N**	**Ferrite FN**
100% CO2									
0.03	1.10	0.55	0.008	0.010	9.5	25.0	3.75	0.22	40-65

Shield-Bright 2594

Shield-Bright 2594 is designed for the welding of 25Cr-9Ni-3Mo-0.2N super duplex stainless steel (UNS S32750, S32760). It has excellent slag removal and bead shape with all position welding for use with Ar/CO2 gas mixtures (M21).

Classifications:	EN ISO 17633-A:T 25 9 4 N L P M21 2, SFA/AWS A5.22:E2594T1-4
Industry or Segmentation:	Chemical Industry, Offshore Oil, Petrochemical, Process, Pipeline, Pulp and Paper

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar / 25% CO2			
As Welded	690 MPa (100 ksi)	900 MPa (130 ksi)	28 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
75% Ar - 25% CO2		
As Welded	-29 °C (-20 °F)	43 J (32 ft-lb)
As Welded	-40 °C (-40 °F)	37 J (27 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo	N
0.03	0.95	0.62	9.68	25.34	3.59	0.23

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate	Efficiency (%)
1.2 mm (.045 in.)	130 A	25 V	5.8 m/min (227 in./min)	1.9 kg/h (4.25 lb/h)	84 %
1.2 mm (.045 in.)	165 A	26 V	8.7 m/min (341 in./min)	2.8 kg/h (6.14 lb/h)	83 %
1.2 mm (.045 in.)	190 A	28 V	11.3 m/min (445 in./min)	3.7 kg/h (8.08 lb/h)	84 %
1.2 mm (.045 in.)	220 A	30 V	14.4 m/min (567 in./min)	4.6 kg/h (10.24 lb/h)	84 %

Shield-Bright 308H

Shield-Bright 308H was developed for welding Type 304H stainless steel and can also be used for welding Type 301, 302, and 304 steels. It contains a higher carbon level than 308L filler metals to give greater high temperature strength. The ferrite content is also lower for high temperature service. It has greater ductility than 347 types at high temperatures and for that reason it is sometimes used to weld Types 321 and 347 for service above 750°F (399°C) coupled with high stress.

Classifications Weld Metal:	SFA/AWS A5.22:E308HT1-1, SFA/AWS A5.22:E308HT1-4, KS D 3612:YF 308C, EN ISO 17633-A:T 19 9 H P M21 2, JIS Z 3232:TS308H-FB1
Classifications:	SFA/AWS A5.22:E308HT1-1, SFA/AWS A5.22:E308HT1-4, KS D 3612:YF 308C, EN ISO 17633-A:T 19 9 H P M21 2, JIS Z 3232:TS308H-FB1, EN ISO 17633-A:T 19 9 H P C1 2
Industry or Segmentation:	Power Generation, 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
75% Ar - 25% CO2				
As Welded	565 MPa (82 ksi)	620 MPa (90 ksi)	68 %	27 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
75% Ar - 25% CO2				
0.05	1.08	0.87	9.65	19.21

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate	Efficiency (%)
1.2 mm (.045 in.)	130 A	25 V	5.8 m/min (227 in./min)	1.9 kg/h (4.25 lb/h)	84 %
1.2 mm (.045 in.)	165 A	26 V	8.7 m/min (341 in./min)	2.8 kg/h (6.14 lb/h)	83 %
1.2 mm (.045 in.)	190 A	28 V	11.3 m/min (445 in./min)	3.7 kg/h (8.08 lb/h)	84 %
1.2 mm (.045 in.)	220 A	30 V	14.4 m/min (567 in./min)	4.6 kg/h (10.24 lb/h)	84 %

Shield-Bright 308L

Shield-Bright 308L was developed for welding type 304L stainless steel and can also be used for welding types 301, 302, and 304 steels. It may also be used for welding types 321 and 347 if the service conditions do not exceed an approximate of 750°F (399°C).

Classifications Weld Metal:	SFA/AWS A5.22:E308LT1-4, SFA/AWS A5.22:E308LT1-1, JIS Z 3323:TS308L-FB1 , KS D 3612:YF 308LC, EN ISO 17633-A:T 19 9 L P C1 2 , EN ISO 17633-A:T 19 9 L P M21 2
Approvals:	CE EN 13479, ABS E308LT1-1 (C1), BV 308L (C1), CCS 308L (C1), ClassNK KW308LG(C) (C1), CWB: AWS A5.22 E309LT1-1, E309LT1-4, DNV NV 308L (C1), KR RW308LG (C) (C1), LR 304L (C1), VdTÜV 04832 (M20,M21)

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As welded	410 MPa (59 ksi)	580 MPa (84 ksi)	44 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
100% CO2				
0.030	1.20	0.90	10.0	19.0

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	130-220 A	24-29 V	5.8-14.4 m/min (227-567 in./min)	1.9-4.6 kg/h (4.25-10.24 lb/h)

Shield-Bright 308L Xtra

Shield-Bright 308L X-tra was designed for welding type 304L stainless steel but can be used for types 301, 302, and 304 steels. It may also be used successfully for welding of types 321 and 347 stainless steel. Service conditions should not exceed an approximate of 750°F (399°C). Shield-Bright 308L X-tra was designed for welding in the flat position and for horizontal fillet welds with flat to concave beads with excellent slag removal.

Classifications Weld Metal:	SFA/AWS A5.22:E308LT0-1, SFA/AWS A5.22:E308LT0-4, JIS Z 3323:TS308L-FB0 - KR, KS D 3612:YF 308LC - KR, EN ISO 17633-A:T 19 9 L R C1 3, EN ISO 17633-A:T 19 9 L R M21 3
Approvals:	CE EN 13479, ABS E308LT0-1 (C1), BV 308L (M21), CWB AWS A5.22 E308LT0-1, E308LT0-4, DNV 308L (C1), KR RW308LG(C) (C1), LR 304L S (C1), VdTÜV 06611

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As welded	410 MPa (59 ksi)	580 MPa (84 ksi)	40 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
100% CO2				
0.022	1.40	0.90	9.9	19.6

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	150-250 A	25-32 V	8.0-16.0 m/min (315-630 in./min)	2.5-7.0 kg/h (5.5-15.4 lb/h)
1.6 mm (1/16 in.)	200-350 A	26-34 V	4.0-11.0 m/min (157.5-433 in./min)	3.0-7.5 kg/h (6.6-16.5 lb/h)

Shield-Bright 309L

Shield-Bright 309L is a rutile cored wire designed for the all-positional welding, except vertical down, of stainless steels to carbon or low alloy steels and for the first layer cladding of carbon and low alloy steels with Ar/15-25%CO2 or CO2 shielding gas.

Classifications Weld Metal:	AWS A5.22:E309T1-1/T1-4, A5.22:E309LT1-1/T1-4
Approvals:	ASME IX F No. 6 , TUV , CWB: AWS A5.22 E309LT1-1, E309LT1-4, ASME II SFA 5.22 E309LT1-1/T1-4 , G.L.- AWS A5.22 E309LT1-4, MIL-STD-1689 APPLICATIONS-NAVY , ABS-AWS A5.22 E309LT1-1, AWS A5.22 E309LT1-1/T1-4

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	450 MPa (70 ksi)	580 MPa (84 ksi)	40 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
100% CO2				
0.030	1.30	0.90	12.5	23.5

Shield-Bright 309L Xtra

Shield-Bright 309L X-tra was developed for the welding of stainless steels to carbon or low alloy steels and for the first layer cladding of carbon and low alloy steels. Shield-Bright 309L X-tra was developed for welding in the flat position and for horizontal fillet welds with flat to concave beads with excellent slag removal. For joining thick sections, it is preferred the non-stainless steel be buttered with a layer of Shield-Bright 309L X-tra and the joint completed with Shield-Bright 316L X-tra or 308L X-tra. The service temperature should not exceed approximately 750°F (399°C).

Classifications Weld Metal:	SFA/AWS A5.22:E309LT0-1, SFA/AWS A5.22:E309LT0-4, JIS Z 3323:TS309L-FB0 - KR, KS D 3612:YF 309LC - KR, EN ISO 17633-A:T 23 12 L R C1 3, EN ISO 17633-A:T 23 12 L R M21 3
Approvals:	CE EN 13479, BV 309L (C1), ABS E309LT0-1 (C1), CCS 309LS (C1), CWB: AWS A5.22 E309LT0-1, E309LT0-4, DNV 309L MS (C1), DNV 309L MS (M21), VdTÜV 06594

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As welded	480 MPa (70 ksi)	600 MPa (87 ksi)	35 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As welded	20 °C (68 °F)	40 J (29.5 ft-lb)
As welded	-110 °C (-166 °F)	32 J (24 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
100% CO2				
0.030	1.40	0.80	12.5	24.5

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	150-250 A	25-32 V	8.0-16.0 m/min (315-630 in./min)	2.5-7.0 kg/h (5.5-15.4 lb/h)
1.6 mm (1/16 in.)	200-350 A	26-34 V	4.0-11.0 m/min (157-433 in./min)	3.0-7.5 kg/h (6.6-16.5 lb/h)

Shield-Bright 309LMo

Shield-Bright 309LMo was designed for welding type 316 clad steels on the first pass in cladding steels or for welding dissimilar metals such as molybdenum-containing austenitic stainless steels to carbon steels. It is used in paper mills and in power plants to give greater corrosion resistance. This wire performs best when used out-of-position shielded with either Argon/C02 or 100% C02.

Classifications Weld Metal:	SFA/AWS A5.22:E309LMoT1-1, SFA/AWS A5.22:E309LMoT1-4, JIS Z 3323:TS309LMo-FB1, KS D 3612:YF309MoLC, EN ISO 17633-A:T 23 12 2 L P C1 2, EN ISO 17633-A:T 23 12 2 L P M21 2
Approvals:	DNV VL 309MoL, KR RW 309MoLG(C)
Industry or Segmentation:	Industrial and General Fabrication, Pulp and Paper, Process

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar - 25% CO2			
As Welded	480 MPa (70 ksi)	620 MPa (90 ksi)	30 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo
0.03	1.267	0.63	12.55	22.50	2.69

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate	Efficiency (%)
0.9 mm (.035 in.)	100 A	23 V	6.7 m/min (265 in./min)	1.3 kg/h (2.9 lb/h)	83.9 %
0.9 mm (.035 in.)	120 A	23 V	8 m/min (315 in./min)	1.5 kg/h (3.4 lb/h)	81.4 %
0.9 mm (.035 in.)	140 A	25 V	10.3 m/min (405 in./min)	2.1 kg/h (4.6 lb/h)	82.6 %
0.9 mm (.035 in.)	170 A	26 V	13.5 m/min (530 in./min)	2.6 kg/h (5.7 lb/h)	81.8 %
1.2 mm (.045 in.)	130 A	25 V	5.8 m/min (227 in./min)	1.9 kg/h (4.25 lb/h)	84 %
1.2 mm (.045 in.)	165 A	26 V	8.7 m/min (341 in./min)	2.8 kg/h (6.14 lb/h)	83 %
1.2 mm (.045 in.)	190 A	28 V	11.3 m/min (445 in./min)	3.7 kg/h (8.08 lb/h)	84 %
1.2 mm (.045 in.)	220 A	30 V	14.4 m/min (567 in./min)	4.6 kg/h (10.24 lb/h)	84 %

Shield-Bright 309LMo X-tra

Shield-Bright 309LMo X-tra was developed for the welding of stainless steels to carbon or low alloy steels. For thick sections it is often preferable that the non-stainless steel should be buttered with a layer of Shield-Bright 309L X-tra and the joint made with Shield-Bright 316L X-tra or 308L X-tra. It was also developed for the first layer cladding of carbon and low alloy steels prior to subsequent layers from Shield-Bright 316L X-tra or 317L X-tra. The service temperature of all the resulting weldments should not exceed about 700°F (370°C). Multiple layer cladding with Shield-Bright 309LMo X-tra can be used for additional corrosion resistance in some applications in the pulp and paper industry. Shield-Bright 309LMo X-tra was developed for welding in the flat position and for horizontal fillet welds with flat to concave beads with excellent slag removal. It can be used with either 75% Ar / 25% CO2 or 100% CO2 gases.

Classifications Weld Metal:	SFA/AWS A5.22:E309LMoT0-1, SFA/AWS A5.22:E309LMoT0-4, JIS Z 3323:YF 309MoLC - KR, KS D 3612:YF 309MoLC - KR, EN ISO 17633-A:T 23 12 2 L R C1 3, EN ISO 17633-A:T 23 12 2 L R M21 3
Industry or Segmentation:	Industrial and General Fabrication, Process, Pulp and Paper

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
75% Ar / 25% CO2			
As Welded	550 MPa (80 ksi)	690 MPa (100 ksi)	30 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo
75% Ar / 25% CO2					
0.030	1.2	0.75	13.5	23.5	2.5

Shield Bright 312

Shield-Bright 312 was developed for welding of high carbon steels and for the first layer cladding of carbon and low alloy steels. The best results are obtainable when the “buttering” technique is used. Shield-Bright 312 can be used as a clad layer with superior corrosion resistance or as a buffer layer. It was also designed for welding out-of-position and performs well with minimal slag and easy clean-up. Shield-Bright 312 has limited success on lead-free free-machining steels (example: AISI 11XX, 12XX), 303, 416, and 430F stainless steels. Preheating is only necessary at carbon levels over 0.2% for carbon steels.

Classifications:	AWS A5.22:E312T1-1(4), JIS Z3323:TS312-FB1
Approvals:	JIS

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

Typical Tensile Properties		
Yield Strength	**Tensile Strength**	**Elongation**
100% CO2		
620 MPa (90 ksi)	810 MPa (117.5 ksi)	24 %
75% Ar - 25% CO2		
630 MPa (91 ksi)	830 MPa (120 ksi)	24 %

Typical Weld Metal Analysis %						
C	**Mn**	**Si**	**S**	**P**	**Ni**	**Cr**
100% CO2						
0.10	1.20	0.70	0.006	0.025	9.5	28.3
75% Ar - 25% CO2						
0.10	1.30	0.75	0.006	0.025	9.6	29.0

Shield-Bright 316L

Shield-Bright 316L was developed for the welding of Type 316L stainless steel but can be used for other stainless steels including Types 316 and 304L. In a few cases, e.g. nitric acid service, Shield-Bright 316L should not be used to weld 304L. It contains molybdenum which resists pitting corrosion induced by sulphuric and sulphurous acids, chlorides and cellulose solutions. Used widely in the rayon, dye and paper making industries.

Classifications Weld Metal:	SFA/AWS A5.22:E316LT1-4, SFA/AWS A5.22:E316LT1-1, JIS Z 3323:TS316L-FB1, KS D 3612:YF 316LC, EN ISO 17633-A:T 19 12 3 L P C1 2, EN ISO 17633-A:T 19 12 3 L P M21 2
Approvals:	CE EN 13479, ABS E316LT1-1 (C1), BV 316L (C1), DNV 316L (C1), ClassNK KW316LG (C1), CWB: AWS A5.22 E316LT1-1, E316LT1-4, KR RW316LG(C) (C1), LR 316L (C1), VdTÜV 04834 (M20,M21)

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As welded	450 MPa (65 ksi)	580 MPa (84 ksi)	40 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As welded	-120 °C (-184 °F)	40 J (29.5 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo
100% CO2					
0.030	1.30	0.60	12.0	18.5	2.7

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	130-220 A	24-29 V	5.8-14.4 m/min (228-567 in./min)	1.9-4.6 kg/h (4.2-10.1 lb/h)

Shield-Bright 316L Xtra

Shield-Bright 316L X-tra was developed for the welding Type 316L stainless steel and also can be used for the other stainless steels including Types 316 and 304L. In a few cases, e.g. nitric acid service, Shield-Bright 316L X-tra should not be used to weld 304L. It was designed specifically for applications where the service environment can produce pitting corrosion. Shield-Bright 316L X-tra was developed for welding in the flat position and for horizontal fillet welds with flat to concave beads with excellent slag removal.

Classifications Weld Metal:	SFA/AWS A5.22:E316LT0-1, SFA/AWS A5.22:E316LT0-4, JIS Z 3323:TS316L-FB0 - KR, KS D 3612:YF 316LC - KR, EN ISO 17633-A:T 19 12 3 L R C1 3, EN ISO 17633-A:T 19 12 3 L R M21 3
Approvals:	CE EN 13479, ABS E316LT0-1 (C1), CWB: AWS A5.22 E316LT0-1, E316LT0-4, DNV 316L (C1), KR RW316LG (C1), LR 316L S (C1), VdTÜV 06612

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

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As welded	450 MPa (65 ksi)	580 MPa (84 ksi)	36 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
100% CO2		
As welded	-110 °C (-166 °F)	38 J (28 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo
100% CO2					
0.030	1.30	0.60	12.0	18.5	2.7

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	150-250 A	25-32 V	8.0-16.0 m/min (315-630 in./min)	2.5-7.0 kg/h (5.5-15.4 lb/h)
1.6 mm (1/16 in.)	200-350 A	26-34 V	4.0-11.0 m/min (157-433 in./min)	3.0-7.5 kg/h 6.6-16.5 lb/h)

Shield-Bright 316H

Shield-Bright 316H was developed for welding of type 316H stainless steel and can also be used for type 316. It contains a higher carbon level (0.04% min.) than 316L filler metals to give greater high temperature strength. The ferrite content is also lower for high temperature service. Typically these are found in applications where the service temperature is above 750°F (400°C). Shield-Bright 316H was developed for welding in all positions and performs particularly well in the vertical position with excellent slag removal.

Classifications:	AWS A5.22:E316T1-1(4), JIS Z3323:TS316-FB1
Approvals:	JIS

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

Typical Tensile Properties

Yield Strength	Tensile Strength	Elongation
100% CO2		
452 MPa (65.5 ksi)	595 MPa (86 ksi)	35 %
75% Ar - 25% CO2		
460 MPa (67 ksi)	620 MPa (90 ksi)	35 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	Ferrite FN
100% CO2								
0.062	1.51	0.52	0.006	0.020	11.9	18.9	2.60	3-8
75% Ar - 25% CO2								
0.055	1.10	0.70	0.006	0.020	12.0	19.0	2.60	3-8

Shield-Bright 317L

Shield-Bright 317L is recommended for welding Type 317 and 317L stainless steel. It can also be used for Type 316L where additonal weld metal corrosion resistance, including pitting resistance, is required.This is used in industries where there is severe corrosion applications involving sulfuric and sulfurous acids and their salts.

Classifications:	AWS A5.22:E317LT1-1/T1-4, JIS Z3323:TS317L-FB1
Approvals:	JIS
Industry or Segmentation:	Pulp and Paper, Ship/Barge Building, Industrial and General Fabrication, Process

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

Typical Tensile Properties

Yield Strength	Tensile Strength	Elongation
100% CO2		
460 MPa (67 ksi)	600 MPa (87 ksi)	34 %
75% Ar - 25% CO2		
480 MPa (70 ksi)	620 MPa (90 ksi)	35 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	Ferrite FN
100% CO2								
0.032	1.20	0.80	0.009	0.021	12.5	18.4	3.40	8-15
75% Ar - 25% CO2								
0.03	1.20	0.85	0.009	0.021	13.0	19.50	3.50	8-15

Shield-Bright 347

Shield-Bright 347 was developed for the welding of stainless steel Types 321 and 347. As with all 347 weld metals, for service at temperatures greater than 1000°F (540°C) it can be used in circumstances of lower stress and not under creep conditions. Shield-Bright 347 can also be used for the welding of Types 302, 304 and sometimes 304L stainless steels. Shield-Bright 347 was developed for welding in all positions and performs particularly well in the vertical position with excellent slag removal.

Classifications Weld Metal:	SFA/AWS A5.22:E347T1-1, SFA/AWS A5.22:E347T1-4, EN ISO 17633-A:T 19 9 Nb P M21 2

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As welded	510 MPa (74 ksi)	670 MPa (97 ksi)	34 %

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr
0.03	1.2	0.90	9.8	19.3

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	130-220 A	24-29 V	5.8-14.4 m/min (228-567 in./min)	1.9-4.6 kg/h (4.2-10.1 lb/h)

Shield-Bright 347

Shield-Bright 347 was developed for the welding of stainless steel Types 321 and 347. As with all 347 weld metals, for service at temperatures greater than 1000°F (540°C) it can be used in circumstances of lower stress and not under creep conditions. Shield-Bright 347 can also be used for the welding of Types 302, 304 and sometimes 304L stainless steels. Shield-Bright 347 was developed for welding in all positions and performs particularly well in the vertical position with excellent slag removal.

Classifications Weld Metal:	SFA/AWS A5.22:E347T1-1, SFA/AWS A5.22:E347T1-4, EN ISO 17633-A:T 19 9 Nb P M21 2
Approvals:	JIS Z3323 TS347-FB1

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

Welding Current:	DC+
Alloy Type:	347 stainless

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
100% CO2			
As Welded	433 MPa (63 ksi)	622 MPa (90 ksi)	47 %
75% Ar - 25% CO2			
As Welded	520 MPa (75 ksi)	650 MPa (94 ksi)	35 %

Typical Weld Metal Analysis %

C	Mn	Si	S	P	Ni	Cr	Mo	Ferrite FN
100% CO2								
0.045	1.10	0.80	0.010	0.027	10.0	18.7	0.40	3-8
75% Ar - 25% CO2								
0.030	1.20	0.90	0.007	0.020	10.0	19.5	0.45	3-8

Shield-Bright 410NiMo

Shield-Bright 410NiMo is an all-positional gas shielded flux cored wire for fabrication and repair of hydroelectric turbine “runners” and other similar applications. Its spray-like transfer enhances the arc characteristics while minimizing post-weld clean up and rework. The ease of use and “user-friendly” characteristics minimize training while producing consistent quality welds. The self-peeling slag removal and easy post-weld clean up minimize the cost to deposit while improving performance efficiency. This electrode is designed for use with Argon/CO2 shielding gas (75 to 80% Argon, balance CO2).

Classifications:	AWS A5.22:E410NiMoT1-1/T1-4
Approvals:	JIS
Industry or Segmentation:	Power Generation

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

Typical Tensile Properties			
Condition	**Yield Strength**	**Tensile Strength**	**Elongation**
100% CO2			
PWHT 1 hr 600 °C (1112 °F)	938 MPa (136 ksi)	970 MPa (141 ksi)	19 %
75% Ar - 25% CO2			
PWHT 1 hr 600 °C (1112 °F)	767 MPa (111 ksi)	927 MPa (134 ksi)	17 %

Typical Weld Metal Analysis %							
C	**Mn**	**Si**	**S**	**P**	**Ni**	**Cr**	**Mo**
100% CO2							
0.025	0.34	0.40	0.004	0.020	4.75	11.60	0.45
75% Ar - 25% CO2							
0.027	0.50	0.70	0.004	0.020	4.50	11.30	0.50

Cryo-Shield 308L

Cryo-Shield 308L is an all-position flux cored wire adaptable to a variety of shop and field erection applications. Designed for cryogenic applications where good weld metal toughness is required. Applications include cryogenic vessel fabrication and process piping repair. Cryo-Shield 308L was developed for the welding of types 304 and 304L stainless steels for the low temperature service, even down to liquid helium temperatures. This is done by controlling the composition and the ferrite content to give good toughness at temperatures of -321°F (-196°C) and lower. Cryo-Shield 308L was developed for welding in all positions and performs particularly well in the vertical position with excellent slag removal.

Classifications:	AWS A5.22:E308LT1-1(4), JIS Z3323:TS308L-FB1
Approvals:	DNV , BV , LR , JIS , NK , KR

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

Typical Tensile Properties		
Yield Strength	**Tensile Strength**	**Elongation**
100% CO2		
363 MPa (53 ksi)	552 MPa (80 ksi)	59 %

Typical Charpy V-Notch Properties	
Testing Temperature	**Impact Value**
100% CO2	
-196 °C (-321 °F)	41 J (30 ft-lb)

Typical Weld Metal Analysis %							
C	**Mn**	**Si**	**S**	**P**	**Ni**	**Cr**	**Ferrite FN**
100% CO2							
0.024	1.43	0.67	0.010	0.027	10.0	18.50	Max 8

Cryo-Shield 316L

Cryo-Shield 316L is all position flux cored wire adaptable to a variety of shop and field erection applications. Designed for cryogenic applications where good weld metal toughness is required. Cryo-Shield 316L was developed for the welding of type 316, 316L austenitic stainless steels for the low temperatures. It contains molybdenum which resists pitting corrosion induced by sulphuric and sulphurous acids, chlorides and cellulose solutions. Cryo-Shield 316L was designed titania based slag system with excellent slag removal so they can have high welding speeds because of possible welding in all position in high current area.

Classifications:	AWS A5.22:E316LT1-1(4), JIS Z3323:TS316L-FB1
Approvals:	DNV , BV , LR , JIS , NK , KR

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

Typical Tensile Properties		
Yield Strength	**Tensile Strength**	**Elongation**
100% CO2		
392 MPa (57 ksi)	529 MPa (77 ksi)	50 %

Typical Charpy V-Notch Properties	
Testing Temperature	**Impact Value**
100% CO2	
-196 °C (-321 °F)	40 J (29.5 ft-lb)

Typical Weld Metal Analysis %								
C	**Mn**	**Si**	**S**	**P**	**Ni**	**Cr**	**Mo**	**Ferrite FN**
100% CO2								
0.026	1.50	0.70	0.008	0.025	12.4	17.5	2.20	3-8

Shield-Bright NiCrMo-3

A positional rutile wire for the welding Ni-Cr-Mo alloys with 80% Ar + 20% CO2 shielding gas.

Classifications Wire Electrode:	AWS A5.34:ENiCrMo3T1-4

Typical Tensile Properties

Condition	Yield Strength	Tensile Strength	Elongation
As welded	501 MPa (73 ksi)	788 MPa (114 ksi)	42 %

Typical Charpy V-Notch Properties

Condition	Testing Temperature	Impact Value
As welded	0 °C (32 °F)	75 J (55 ft-lb)
As welded	-196 °C (-321 °F)	70 J (52 ft-lb)

Typical Weld Metal Analysis %

C	Mn	Si	Ni	Cr	Mo	Fe	Nb	Nb+Ta	Ti
0.023	0.24	0.36	64.3	21.89	8.63	0.52	3.8	3.57	0.18

Deposition Data

Diameter	Current	Voltage	Wire Feed Speed	Deposition Rate
1.2 mm (.045 in.)	130-210 A	23-32 V	5.8-13.8 m/min (228-543 in./min)	1.9-4.2 kg/h (4.2-9.3 lb/h)