



OK Autrod 12.51

A copper coated, G3Si1/ER70S-6 solid wire for GMAW of all general structural and engineering unalloyed and low-alloyed carbon-manganese steels. The electrode may be welded with either a gas mixture or with pure CO₂ as the shielding gas. OK Autrod 12.51 delivered in the unique Esab Octagonal Marathon Pac is an excellent choice in mechanised welding applications

Specifications

Classifications	EN ISO 14341-A : G 38 3 C1 3Si1 EN ISO 14341-A : G 42 4 M20 3Si1 EN ISO 14341-A : G 42 4 M21 3Si1 EN ISO 14341-A : G 3Si1 SFA/AWS A5.18 : ER70S-6 CSA W48 : B-G 49A 3 C1 S6 JIS Z 3312 : YGW 12(C1)
Approvals	ABS : 3YSA BV : SA3YM (C1) CE : EN 13479 DB : 42.039.06 DNV-GL : III YMS LR : 3YS H15 (C1) LR : 3YS H15 (M21) LR : 3YS H15 (M21) LR : 3YS H15 PRS : 3YS (C1) PRS : 3YS (C1) PRS : 3YS (M21) PRS : 3YS (M21) RINA : 3YS (C1) RINA : 3YS (M21) RINA : 3YS (M21) RS : 3YMS VdTÜV : 00899 CWB : B-G 49A 3 C1 S6 JIS : YGW12 NAKS/HAKC : 0.8-2.0 mm NAKS/HAKC : 1.2-1.6 mm

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

Alloy Type	Carbon-manganese steel (Mn/Si-alloyed)
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Tensile_Properties					
Testing Condition	Yield Strength	Tensile Strength	Elongation	Stress Relieved Temperature	Stress Relieved Testing Time
EN 80Ar/20CO2 (M21)					
As Welded	460 MPa (67 ksi)	560 MPa (81 ksi)	26 %		
Stress Relieved	370 MPa (54 ksi)	495 MPa (72 ksi)	28 %	620 °C (1148 °F)	15 hour(s)
As Welded	430 MPa (62 ksi)	530 MPa (77 ksi)	30 %		
As Welded	440 MPa (64 ksi)	540 MPa (78 ksi)	25 %		
EN CO2 (C1)					
As Welded	460 MPa (67 ksi)	560 MPa (81 ksi)	26 %		
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Charpy Testing

Testing Condition	Testing Temp	Impact Value	Test Condition Time	Test Condition Temp
EN 80Ar/20CO2 (M21)				
As Welded	-40 °C (-40 °F)	90 J (67 ft-lb)		
As Welded	-30 °C (-22 °F)	75 J (56 ft-lb)		
As Welded	-30 °C (-22 °F)	100 J (74 ft-lb)		
Stress Relieved	20 °C (68 °F)	120 J (89 ft-lb)	15 hour(s)	620 °C (1148 °F)
Stress Relieved	-20 °C (-4 °F)	90 J (67 ft-lb)	15 hour(s)	620 °C (1148 °F)
As Welded	20 °C (68 °F)	110 J (81 ft-lb)		
As Welded	20 °C (68 °F)	130 J (96 ft-lb)		
As Welded	-20 °C (-4 °F)	120 J (89 ft-lb)		
As Welded	-30 °C (-22 °F)	75 J (56 ft-lb)		
EN CO2 (C1)				
As Welded	-40 °C (-40 °F)	90 J (67 ft-lb)		
As Welded	-30 °C (-22 °F)	75 J (56 ft-lb)		
As Welded	-30 °C (-22 °F)	100 J (74 ft-lb)		
Stress Relieved	20 °C (68 °F)	120 J (89 ft-lb)	15 hour(s)	620 °C (1148 °F)
Stress Relieved	-20 °C (-4 °F)	90 J (67 ft-lb)	15 hour(s)	620 °C (1148 °F)

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AWS CO2 (C1)				
As Welded	-40 °C (-40 °F)	90 J (67 ft-lb)		
As Welded	-30 °C (-22 °F)	75 J (56 ft-lb)		
As Welded	-30 °C (-22 °F)	100 J (74 ft-lb)		
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Analysis				
C	Si	Mn	P	S
CO2 (C1)				

Analysis				
C	Si	Mn	P	S
0.08	0.63	0.94	0.013	0.012
Typical Wire Composition %				
0.078	0.85	1.46	-	-
80Ar/20CO2 (M21)				
0.10	0.72	1.11	0.013	0.012

Deposition Data				
Diameter	Amps	Deposition Rate	Wire Feed Speed	Volts
0.6 mm (0.025 in.)	30-100 A	0.7-1.7 kg/h (1.5-3.7 lbs/h)	5.5-13.0 m/min (217-512 in./min)	15-20 V
0.8 mm (0.030 in.)	60-200 A	0.8-2.3 kg/h (1.8-5.1 lbs/h)	3.2-10.0 m/min (126-394 in./min)	18-24 V
0.9 mm (0.035 in.)	70-250 A	0.9-3.5 kg/h (2.0-7.7 lbs/h)	3.0-12.0 m/min (118-472 in./min)	18-26 V
1.0 mm (0.040 in.)	80-300 A	1.0-5.5 kg/h (2.2-12. lbs/h)	2.7-15.0 m/min (106-591 in./min)	18-32 V
1.14 mm (0.045 in.)	100-350 A	1.2-7.0 kg/h (2.6-15. lbs/h)	2.6-15.0 m/min (102-591 in./min)	18-34 V
1.2 mm (0.047 in.)	120-380 A	1.3-8.0 kg/h (2.9-17. lbs/h)	2.5-15.0 m/min (98-591 in./min)	18-35 V
1.32 mm (0.052 in.)	130-400 A	1.5-8.5 kg/h (3.3-18. lbs/h)	2.4-15.0 m/min (94-591 in./min)	19-35 V
1.4 mm (0.055 in.)	150-420 A	1.6-8.7 kg/h (3.5-19. lbs/h)	2.3-12.0 m/min (91-472 in./min)	22-36 V
1.6 mm (1/16 in.)	225-550 A	2.1-9.4 kg/h (4.6-20. lbs/h)	2.3-10.0 m/min (91-394 in./min)	28-38 V
2.0 mm (5/64 in.)	300-650 A	4.4-10.2 kg/h (9.7-22.5 lbs/h)	3.0-7.0 m/min (118-276 in./min)	32-44 V