

Outershield® 91K2-H

Low Alloy, All Position • AWS E91T1-K2M-H8

Key Features

- ▶ Designed for welding with 75-95% Argon/ balance CO₂ shielding gas
- ▶ Capable of producing weld deposits with tensile strength exceeding 620 MPa (90 ksi)
- ▶ Use on high strength, low alloy steel applications
- ▶ H8 diffusible hydrogen levels

Typical Applications

- ▶ For applications requiring high strength weld metal, such as HY-80, HSLA 80 and ASTM A710 steels

Conformances

AWS A5.29/A5.29M: 2005 E91T1-K2M-H8
ASME SFA-A5.29: E91T1-K2M-H8
ABS: E91T1-K2M-H8

Welding Positions

All, except vertical down

Shielding Gas

75 - 95% Argon / Balance CO₂
Flow Rate: 35 - 45 CFH

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(AWS E91T1-K2M-H8)

DIAMETERS / PACKAGING

Diameter in (mm)	25 lb (11.3 kg) Plastic Spool (Vacuum Sealed Foil Bag)
0.045 (1.1)	ED030975
0.052 (1.3)	ED030976
1/16 (1.6)	ED030977

MECHANICAL PROPERTIES⁽¹⁾ – As Required per AWS A5.29/A5.29M: 2005

	Yield Strength ⁽²⁾ MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %	Charpy V-Notch J (ft•lbf)	
				@ -18°C (0°F)	@ -51°C (-60°F)
Requirements - AWS E91T1-K2M-H8	540 (78) min.	620-760 (90-110)	17 min.	27 (20) min.	–
				–	27 (20) min.
Typical Results⁽³⁾					
As-Welded with 75% Ar/25% CO ₂	565-605 (82-88)	620-690 (90-100)	22-28	81-149 (60-110)	47-95 (35-70)
As-Welded with 95% Ar/5% CO ₂	650 (94)	660 (96)	27	108 (80)	79 (58)

DEPOSIT COMPOSITION⁽¹⁾ – As Required per AWS A5.29/A5.29M: 2005

	%C	%Mn	%Ni	%Si	%Mo
Requirements - AWS E91T1-K2M-H8	0.15 max.	0.50-1.75	1.00-2.00	0.80 max.	0.35 max.
Typical Results⁽³⁾					
As-Welded with 75% Ar/25% CO ₂	0.06	1.35	1.80	0.30	0.02
As-Welded with 95% Ar/5% CO ₂	0.06	1.45	1.80	0.32	0.02
	%P	%S	%Cr	%V	
Requirements - AWS E91T1-K2M-H8	0.030 max.	0.030 max.	0.15 max.	0.05 max.	
Typical Results⁽³⁾					
As-Welded with 75% Ar/25% CO ₂	0.005	0.010	0.03	<0.01	
As-Welded with 95% Ar/5% CO ₂	0.005	0.010	0.03	<0.01	

TYPICAL OPERATING PROCEDURES

Diameter, Polarity Shielding Gas	CTWD ⁽⁴⁾ mm (in)	Wire Feed Speed m/min (in/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate kg/hr (lb/hr)	Deposition Rate kg/hr (lb/hr)	Efficiency (%)
0.045 in (1.2 mm), DC+ 75-95% Ar/ balance CO ₂	25 (1)	4.4 (175)	20-22	130	2.0 (4.3)	1.5 (3.4)	79
		7.0 (275)	23-25	180	3.0 (6.7)	2.4 (5.4)	81
		9.5 (375)	25-27	220	4.1 (9.1)	3.4 (7.4)	81
		12.7 (500)	27-29	265	5.2 (12.2)	4.3 (10.0)	82
		15.9 (625)	30-32	305	6.9 (15.2)	5.8 (12.7)	84
1/16 in (1.6 mm), DC+ 75-95% Ar/ balance CO ₂	25 (1)	3.2 (125)	21-23	170	2.4 (5.3)	2.0 (4.3)	81
		5.1 (200)	22-24	235	3.8 (8.4)	3.2 (7.0)	83
		6.4 (250)	24-25	275	4.8 (10.5)	4.0 (8.8)	84
		7.6 (300)	25-27	310	5.7 (12.5)	4.8 (10.6)	85
		8.9 (350)	27-29	350	6.6 (14.6)	5.6 (12.4)	85
		10.2 (400)	28-30	385	7.6 (16.7)	6.5 (14.2)	85
		10.8 (425)	30-31	400	8.1 (17.8)	6.9 (15.2)	85

⁽¹⁾Typical all weld metal. ⁽²⁾Measured with 0.2% offset. ⁽³⁾See test results disclaimer below. ⁽⁴⁾To estimate ESO, subtract 1/4 in (6.0 mm) from CTWD.

Material Safety Data Sheets (MSDS) and Certificates of Conformance are available on our website at www.lincolnelectric.com

TEST RESULTS

Test results for mechanical properties, deposit or electrode composition and diffusible hydrogen levels were obtained from a weld produced and tested according to prescribed standards, and should not be assumed to be the expected results in a particular application or weldment. Actual results will vary depending on many factors, including, but not limited to, weld procedure, plate chemistry and temperature, weldment design and fabrication methods. Users are cautioned to confirm by qualification testing, or other appropriate means, the suitability of any welding consumable and procedure before use in the intended application.

CUSTOMER ASSISTANCE POLICY

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