

# UltraCore® 121K3M-H Plus

Low Alloy, All Positions • AWS E121T1-GM-H4

## Key Features

- ▶ Innovative design capable of superior toughness at -60°F
- ▶ Designed to meet AWS strength and toughness requirements in both the as-welded and stress-relieved conditions
- ▶ Designed for welding with 75-80% Argon / Balance CO<sub>2</sub> shielding gas
- ▶ H4 diffusible hydrogen levels
- ▶ Q2 Lot® - Certificate showing actual deposit chemistry and mechanical properties per lot available online
- ▶ ProTech® foil bag packaging

## Conformances

AWS A5.29:	E121T1-GM-H4
AWS A5.36:	E121T1-M21A6-K3-H4
AWS A5.36:	E111T1-M21P4-K3-H4
ABS:	E121T1-GM-H4
ABS:	E121T1-M21A6-K3-H4

## Shielding Gas

75-80% Argon / Balance CO<sub>2</sub>  
Flow Rate: 40-50 CFH

## Typical Applications

- ▶ Offshore drilling rigs
- ▶ Ship building
- ▶ Low temperature storage tanks
- ▶ Construction

## Welding Positions

All

## DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15 kg) Plastic Spool
0.045 (1.1)	ED035423
0.052 (1.3)	ED035424

## MECHANICAL PROPERTIES<sup>(1)</sup>

	Yield Strength <sup>(2)</sup> MPa (ksi)	Tensile Strength MPa (ksi)	Elongation (%)	Charpy V-Notch J (ft•lbf)	
				-40°C (-40°F)	-51°C (-60°F)
<b>Requirements</b> AWS A5.29 E121T1-GM-H4 As-Welded with 75% Ar / 25% CO <sub>2</sub>	745 (108) min	825-965 (120-140)	14 min	-	-
AWS A5.36 E121T1-M21A6-K3-H4 As-Welded with 75% Ar / 25% CO <sub>2</sub>	745 (108) min	825-965 (120-140)	14 min	-	27 (20) min
AWS A5.36 E111T1-M21P4-K3-H4 Stress Relieved with 75% Ar / 25% CO <sub>2</sub> for 1 hr. @ 620°C (1150°F)	675 (98) min	760-895 (110-130)	15 min	27 (20) min	-
<b>Typical Results<sup>(3)</sup></b> As-Welded with 75% Argon / 25% CO <sub>2</sub>	815-840 (118-122)	850-875 (123-127)	17-18	65-67 (48-50)	59-61 (44-45)
Stress Relieved with 75% Ar / 25% CO <sub>2</sub> for 1 hr. @ 620°C (1150°F)	745-765 (108-111)	805-820 (116-119)	18-23	32-37 (23-27)	-

<sup>(1)</sup> Typical all weld metal. <sup>(2)</sup> Measure with 0.2% offset. <sup>(3)</sup> See test results disclaimer below.

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**UltraCore® 121K3M-H Plus**

(AWS E121T1-GM-H4)

**DEPOSIT COMPOSITION<sup>(1)</sup>**

	%C	%Mn	%Si	%S	%P
<b>Requirements</b>					
AWS A5.29 E121T1-GM-H4	Not Specified	0.50 <sup>(4)</sup>	1.00 max	0.030 max	0.030 max
AWS A5.36 E121T1-M21A6-K3-H4, E111T1-M21P4-K3-H4	0.15 max	0.75-2.25	0.80 max	0.030 max	0.030 max
<b>Typical Results<sup>(3)</sup></b>					
As-Welded with 75% Argon / 25% CO <sub>2</sub>	0.06-0.07	1.61-1.81	0.26-0.35	0.007-0.012	0.010-0.011
	%Ni	%Cr	%Mo	%V	Diffusible Hydrogen (mL/100g weld deposit)
<b>Requirements</b>					
AWS A5.29 E121T1-GM-H4	0.50 <sup>(4)</sup>	0.30 <sup>(4)</sup>	0.20 <sup>(4)</sup>	0.10 <sup>(4)</sup>	4.0 max
AWS A5.36 E121T1-M21A6-K3-H4, E111T1-M21P4-K3-H4	1.25-2.60	0.15 max	0.25-0.65	0.05 max	4 max
<b>Typical Results<sup>(3)</sup></b>					
As-Welded with 75% Argon / 25% CO <sub>2</sub>	2.21-2.46	0.04-0.07	0.58- 0.65	0.00	1-3

**TYPICAL OPERATING PROCEDURES**

Diameter, Polarity Shielding Gas	CTWD <sup>(4)</sup> 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 (%)
<b>0.045 in (1.1 mm), DC+</b> 75% Argon / 25% CO <sub>2</sub>	Optimal Settings	19 (3/4)	8.9 (350)	27	220	1.9-5.2 (4.1-11.5)	1.7-4.6 (3.7-10.2)
	Min - Max	19-25 (3/4-1)	4.4-12.7 (175-500)	24-33	127-280		
<b>0.052 in (1.3 mm), DC+</b> 75% Argon / 25% CO <sub>2</sub>	Optimal Settings	19 (3/4)	7.0 (275)	27	235	2.1-5.6 (4.6-12.4)	1.7-4.7 (3.8-10.4)
	Min - Max	19-25 (3/4-1)	3.8-10.2 (150-400)	24-33	150-300		

<sup>(1)</sup>Typical all weld metal. <sup>(3)</sup>See test results disclaimer below.<sup>(4)</sup>In order to meet the requirements of the G group, the undiluted weld metal shall have not less than the minimum specified for one or more of the elements listed.<sup>(6)</sup>To estimate ESO, subtract 1/4 in (6.0 mm) from CTWD.**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.

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