

# ULTRACORE® 81NI1M-H PLUS

Low Alloy, All Positions ▪ AWS E81T1-Ni1M-JH4

## KEY FEATURES

- Innovative design capable of superior toughness at -60°F 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
- Designed to accommodate applications requiring Nickel content of 1% max

## WELDING POSITIONS

All

## SHIELDING GAS

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

## CONFORMANCES

<b>AWS A5.29/A5.29M:</b>	E81T1-Ni1M-JH4
<b>AWS A5.36/A5.35M:</b>	E81T1-M21A6-Ni1-H4, E81T1-M21P4-Ni1-H4
<b>ASME SFA-5.29/SFA-5.29M:</b>	E81T1-Ni1M-JH4
<b>ABS:</b>	4YQ460SA H5
<b>Lloyds Register:</b>	4Y46S H5
<b>DNV Grade:</b>	IV 46MS H5
<b>CWB/CSA W48-06:</b>	E551T1-Ni1M-JH4, E81T1-Ni1M-JH4

## TYPICAL APPLICATIONS

- Offshore drilling rigs
- Low temperature storage tanks
- Ship building
- Construction
- Mining Equipment

## DIAMETERS / PACKAGING

Diameter in (mm)	33 lb (15kg) Plastic Spool
0.045 (1.1)	ED034855
0.052 (1.3)	ED034856
1/16 (1.6)	ED034857

## 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: E81T1-Ni1M-JH4 As-Welded with 75% Ar / 25% CO <sub>2</sub>	470 (68) min	550-690 (80-100)	19 min	27 (20) min	-
AWS A5.36: E81T1-M21A6-Ni1-H4 As-Welded with 75% Ar / 25% CO <sub>2</sub>	470 (68) min	550-690 (80-100)	19 min	-	27 (20) min
AWS A5.36: E81T1-M21P4-Ni1-H4 Stress Relieved with 75% Ar / 25% CO <sub>2</sub> for 1 hr @ 621°C (1150°F)	470 (68) min	550-690 (80-100)	19 min	27 (20) min	-
<b>Typical Results<sup>(3)</sup></b>					
As-Welded with 75% Ar / 25% CO <sub>2</sub>	505-530 (73-77)	582-605 (84-88)	26-28	92-104 (68-77)	80-89 (59-66)
Stress Relieved with 75% Ar / 25% CO <sub>2</sub> for 1 hr @ 621°C (1150°F)	475-493 (69-71)	575-588 (83-85)	27-29	80-96 (59-71)	-

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

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

	%C	%Mn	%Si	%S	%P
<b>Requirements</b> AWS A5.29: E81T1-Ni1M-JH4 AWS A5.36: E81T1-M21A6-Ni1-H4, E81T1-M21P4-Ni1-H4	0.12 max	1.50 max	0.80 max	0.030 max	0.030 max
		1.75 max			
<b>Typical Results<sup>(3)</sup></b> with 75% Argon / 25% CO <sub>2</sub>	0.05-0.06	1.31-1.38	0.41-0.44	0.007	0.012
	%Ni	%Cr	%Mo	%V	Diffusible Hydrogen (mL/100g weld deposit)
<b>Requirements</b> AWS A5.29: E81T1-Ni1M-JH4 AWS A5.36: E81T1-M21A6-Ni1-H4, E81T1-M21P4-Ni1-H4	0.80-1.10	0.15 max	0.35 max	0.05 max	4.0 max
					4 max
<b>Typical Results<sup>(3)</sup></b> with 75% Argon / 25% CO <sub>2</sub>	0.83-0.87	0.05	0.01	0.00	2-4

**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 (%)
0.045 in (1.1 mm), DC+ 75% Argon / 25% CO <sub>2</sub>							
Optimal Settings	25 (1)	10.7 (420)	26	200	1.8-5.1 (3.9-11.3)	1.5-4.4 (3.4-9.8)	85-88
Min - Max	19-25 (3/4-1)	4.4-12.7 (175-500)	24-32	115-214			
0.052 in (1.3 mm), DC+ 75% Argon / 25% CO <sub>2</sub>							
Optimal Settings	25 (1)	7.6 (300)	25	210	2.1-5.0 (4.7-11.0)	1.7-4.2 (3.8-9.2)	85-88
Min - Max	19-25 (3/4-1)	3.8-8.9 (150-350)	24-31	148-231			
1/16 in (1.6 mm), DC+ 75% Argon / 25% CO <sub>2</sub>							
Optimal Settings	25 (1)	7.6 (300)	25	280	2.9-6.8 (6.4-15.0)	2.4-5.6 (5.3-12.4)	85-88
Min - Max	19-25 (3/4-1)	3.8-8.9 (150-350)	25-31	189-299			

<sup>(1)</sup> Typical all weld metal. <sup>(3)</sup> See test results disclaimer <sup>(4)</sup> 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](http://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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