# UltraCore® 81Ni2C-H

Low Alloy, All Position • AWS E81T1-Ni2C-JH4

#### **Key Features**

- ➤ Capable of producing weld deposits with impact toughness exceeding 54 84 J (40 62 ft•lbf) at -51°C (-60°F)
- Designed for welding with 100% CO<sub>2</sub> shielding gas
- Premium arc performance and bead appearance
- ▶ H4 diffusible hydrogen levels
- ProTech® foil bag packaging

# **Typical Applications**

- Mining
- Bridge fabrication
- Offshore
- High strength fabrication

#### **Conformances**

AWS A5.29/A5.29M: 2005 E81T1-Ni2C-JH4 ASME SFA-A5.29: E81T1-Ni2C-JH4

ABS: 3YSA H5
Lloyd's Register: 3YS H5
DNV Grade: III Y40MS H5
CWB/CSA W48-06: E551T1-Ni20

E551T1-Ni2C-JH4 (E81T1-Ni2C-JH4)

EN ISO 17632-B: T556T1-1CA-N5-H5

## **Welding Positions**

All, except vertical down

#### **Shielding Gas**

100% CO<sub>2</sub>

Flow Rate: 40-50 CFH

#### DIAMETERS / PACKAGING

DIAMETER	DIAMILIENS / FACKAGING							
Diameter in (mm)	33 lb (15 kg) Spool*							
0.045 (1.1)	ED032215							
0.052 (1.3)	ED032278							
1/16 (1.6)	ED032214							

<sup>\*</sup>Spool may be plastic or fiber.

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

	Yield Strength <sup>(2)</sup> Tensile Strength		Elongation	Charpy V-Notch J (ft•lbf)	
	MPa (ksi)	MPa (ksi)	%	@ -40°C (-40°F)	@ -51°C (-60°F)
Requirements <sup>(4)</sup> - AWS E81T1-Ni2C-JH4	470 (68) min.	550-670 (80-100)	19 min.	27 (20) min.	27 (20) min.
Typical Results <sup>(3)</sup> As-Welded with 100% CO <sub>2</sub>	555-600 (80-86)	615-650 (89-94)	26-28	76-111 (56-82)	54-84 (40-62)

# UltraCore® 81Ni2C-H

(AWS E81T1-Ni2C-JH4)

### **DEPOSIT COMPOSITION**<sup>(1)</sup> – As Required per AWS A5.29/A5.29M: 2005

	The riedan earper rive rieselvin 2000					
	%C	%Mn	%Si	%S		
Requirements <sup>(4)</sup> - AWS E81T1-Ni2C-JH4	0.12 max.	1.50 max.	0.80 max.	0.030 max.		
Typical Results <sup>(3)</sup> As-Welded with 100% CO <sub>2</sub>	0.04-0.05	1.14-1.24	0.27-0.32	0.006-0.007		
	%P	%Ni	Diffusible Hydrogen (mL/100g weld deposit)			
Requirements <sup>(4)</sup> - AWS E81T1-Ni2C-JH4	0.030 max.	1.75-2.75	4.0 max.			
Typical Results <sup>(3)</sup> As-Welded with 100% CO <sub>2</sub>	0.006-0.007	1.86-2.19	2-4			

#### **TYPICAL OPERATING PROCEDURES**

All Position	Diameter, Polarity Shielding Gas	CTWD <sup>(5)</sup> mm (in)		ed Speed (in/min)	Voltage (volts)	Approx. Current (amps)	Melt-Off Rate kg/hr (lb/hr)	Deposition Rate kg/hr (lb/hr)	Efficiency (%)
1/16 in (1.6 mm), DC+   1/10 w CO <sub>2</sub>   25(1)   1/16 in (1.6 mm), DC+   1/10 w CO <sub>2</sub>   25(1)   1/16 in (1.6 mm), DC+   1/10 w CO <sub>2</sub>   25(1)			All Positi	All Position					
0.045 in (1.1 mm), DC+ 100% CO₂ 25 (1) 25 (			4.4	(175)	23-28	140	1.8 (4.0)	1.6 (3.5)	
0.045 in (1.1 mm), DC+ 100% CO₂       25 (1)       7.6 (300) (300) (25-30) (26-31) (205) (3.6 (8.0)) (3.2 (7.0)) (3.4 (7.5) (3.5) (10.8 (425)) (27-32) (245) (3.4 (9.7)) (3.8 (8.5)) (3.5 (7.5) (2.5) (10.8 (425)) (27-32) (245) (3.4 (9.7)) (3.8 (8.5)) (3.5 (7.5) (2.5) (1.2 (4.75)) (500) (29-34) (275) (5.2 (11.4)) (4.5 (10.0))       Flat & Horizontal         0.052 in (1.3 mm), DC+ 100% CO₂       25 (1)       All Position       3.8 (150) (23-28) (25-30) (25-			5.1	(200)	24-29	150	2.1 (4.6)	1.8 (4.0)	
100% CO <sub>2</sub> 25 (1) 8.9 (355) 26-31 225 3.9 (8.6) 3.2 (7.0) 9.5 (375) 26-31 225 3.9 (8.6) 3.4 (7.5) 3.8 (8.5)    10.8 (425)   27-32   245   4.4 (9.7)   3.8 (8.5)   12.1 (475) 12.7 (500) 29-34   275   5.2 (11.4)   4.5 (10.0)   4.5 (10.0)   4.7 (185) 24-29   165   2.5 (5.5)   2.2 (4.8) 5.7 (225) 24-29   190   3.1 (6.7)   2.7 (5.9) 10.8 (25) 17.6 (300) 26-31   255   4.1 (9.0) 17.6 (300) 26-31   255   4.1 (9.0) 17.6 (300) 27-32   295   5.1 (11.2)   4.4 (9.8) 17.6 (300) 27-34   310   5.4 (12.0)   4.7 (10.4)   4.7 (10.4)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.5)   4.8 (10.1)   4.8 (10.1)   4.8 (10.1)   4.8 (10.1)   4.8 (10.1)   4.8 (10.1)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.3)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.3)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.8)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.8)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.8)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.4) 2.9 (6.4)   5.1 (200) 25-30 215 3.8 (8.4) 3.3 (7.8)   5.1 (200) 25-30 215 3.8 (8.4) 3.3			6.4	(250)	25-30	165	2.6 (5.7)	2.3 (5.0)	
9.5   3.75   26-31   225   3.9   8.6   3.4   (7.5   10.8   (425   27-32   245   4.4   (9.7   3.8   (8.5   2.5   1.4   4.5   (10.0   4.5   1.8   (10.0   4.4   (9.7   4.5   4.4   (9.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   4.5   4.5   4.5   (10.0   4.0   (8.7   4.5   4.5   4.5   4.5   4.5   4.5   4.5   (10.0   4.0   (8.7   4.5			7.6	(300)	25-30	190	3.1 (6.8)	2.7 (6.0)	
10.8   (425)   27-32   245   4.4   (9.7)   3.8   (8.5)	100% CO <sub>2</sub>	25 (1)	8.9	(350)	26-31	205	3.6 (8.0)	3.2 (7.0)	86-88
Flat & Horizontal   12.1 (475)   28-33   265   4.9 (10.8)   4.3 (9.5)   12.7 (500)   29-34   275   5.2 (11.4)   4.5 (10.0)			9.5	(375)	26-31	225	3.9 (8.6)	3.4 (7.5)	
12.1 (475)   28-33   265   4.9 (10.8)   4.3 (9.5)     12.7 (500)   29-34   275   5.2 (11.4)   4.5 (10.0)			10.8	(425)	27-32	245	4.4 (9.7)	3.8 (8.5)	
12.7 (500)   29-34   275   5.2 (11.4)   4.5 (10.0)			Flat & Ho	orizontal					
All Position			12.1	(475)	28-33	265	4.9 (10.8)	4.3 (9.5)	
3.8   (150)   23-28   150   2.0   (4.5)   1.8   (3.9)			12.7		29-34	275			
3.8   (150)   23-28   150   2.0   (4.5)   1.8   (3.9)			All Positi	on					
0.052 in (1.3 mm), DC+ 100% CO2       4.7 (185)       24-29       165       2.5 (5.5)       2.2 (4.8)         100% CO2       25 (1)       6.4 (250)       25-30       215       3.4 (7.5)       2.9 (6.5)         7.6 (300)       26-31       255       3.7 (8.2)       3.2 (7.2)       86-88         Flat & Horizontal         8.5 (335)       26-31       275       4.5 (10.0)       4.0 (8.7)         9.5 (375)       27-32       295       5.1 (11.2)       4.4 (9.8)         10.2 (400)       27-34       310       5.4 (12.0)       4.7 (10.4)         3.8 (150)       24-29       200       2.9 (6.3)       2.5 (5.5)         4.4 (175)       24-30       210       3.3 (7.4)       2.9 (6.4)         5.1 (200)       25-30       235       3.8 (8.4)       3.3 (7.3)         1/16 in (1.6 mm), DC+ 100% CO2       5.7 (225)       25-31       265       4.3 (9.5)       3.7 (8.2)         5.7 (225)       25-31       265       4.3 (9.5)       3.7 (8.2)         6.4 (250)       26-31       305       4.8 (10.5)       4.2 (9.2)         Flat & Horizontal         To (275)       26-32       305       5.3 (11.6)       4.6 (10.1)<					23-28	150	2.0 (4.5)	1.8 (3.9)	
0.052 in (1.3 mm), DC+ 100% CO2       25 (1)       5.7 (225) (24-29) (25-30) (25-30) (215) (3.4 (7.5) (2.9) (6.5) (3.2) (7.2) (3.0) (275) (300) (26-31) (255) (3.1 (9.0) (3.5) (7.8) (3.0) (26-31) (255) (4.1 (9.0) (3.5) (7.8) (3.2) (7.8)       86-88         Flat & Horizontal         8.5 (335) (335) (26-31) (27-32) (295) (375) (27-32) (295) (375) (27-32) (295) (5.1 (11.2) (4.4 (9.8) (10.4) (10.4) (10.4) (10.4)         All Position         3.8 (150) (24-29) (200) (2.9 (6.3) (2.5 (5.5) (4.4 (175) (24-30) (210) (3.3 (7.4) (2.9 (6.4) (3.3 (7.3) (7.3) (3.2) (3.5) (3				` /			` '	1 ' '	
0.052 in (1.3 mm), DC+ 100% CO2       25 (1)       6.4 (250)       25-30       215       3.4 (7.5)       2.9 (6.5)       86-88         1/16 in (1.6 mm), DC+ 100% CO2       25 (1)       6.4 (250)       25-30       235       3.7 (8.2)       3.2 (7.2)       86-88         1/16 in (1.6 mm), DC+ 100% CO2       8.5 (330)       26-31       275       4.5 (10.0)       4.0 (8.7)       4.4 (9.8)       4.5 (10.0)       4.4 (9.8)       4.5 (10.4)       4.4 (9.8)       4.5 (10.0)       4.7 (10.4)       4.8 (10.5)       4.2 (9.2)       6.4 (2.5)       2.5 (1.2)       2.5 (5.5)       3.8 (8.4)       3.3 (7.3)       3.7 (8.2)       3.6 (8.4)       3.3 (7.3)       3.7 (8.2)       4.8 (10.5)       4.2 (9.2)       86-88       86-88       86-88       86-88       86-88				` ′			, ,	` ′	
100% CO <sub>2</sub>   25 (1)   7.0 (275)   25-30   235   3.7 (8.2)   3.2 (7.2)   86-88	<b>0.052 in (1.3 mm),</b> DC+			` ′			, ,	` ′	
Total   Tota	100% CO <sub>2</sub>	25 (1)		(275)	25-30		, ,	1 ' '	86-88
Flat & Horizontal   8.5 (335)   26-31   275   4.5 (10.0)   4.0 (8.7)     9.5 (375)   27-32   295   5.1 (11.2)   4.4 (9.8)     10.2 (400)   27-34   310   5.4 (12.0)   4.7 (10.4)     1/16 in (1.6 mm), DC+	2	, ,		` ′ ′	26-31		` '	\ '	
8.5 (335)   26-31   275   4.5 (10.0)   4.0 (8.7)     9.5 (375)   27-32   295   5.1 (11.2)   4.4 (9.8)     10.2 (400)   27-34   310   5.4 (12.0)   4.7 (10.4)     10.2 (400)   27-34   310   5.4 (12.0)   4.7 (10.4)     10.3 (1.6 mm), DC+			Flat & Ho						
9.5 (375)   27-32   295   5.1 (11.2)   4.4 (9.8)     10.2 (400)   27-34   310   5.4 (12.0)   4.7 (10.4)     All Position			8.5	(335)	26-31	275	4.5 (10.0)	4.0 (8.7)	
1/16 in (1.6 mm), DC+ 100% CO <sub>2</sub> 1/16 in (275) 1/16 in (2				` '				1 ' '	
1/16 in (1.6 mm), DC+ 100% CO <sub>2</sub> 25 (1)  3.8 (150) 24-29 200 2.9 (6.3) 2.5 (5.5) 4.4 (175) 24-30 210 3.3 (7.4) 2.9 (6.4) 5.1 (200) 25-30 235 3.8 (8.4) 3.3 (7.3) 5.7 (225) 25-31 265 4.3 (9.5) 3.7 (8.2) 6.4 (250) 26-31 305 4.8 (10.5) 4.2 (9.2)  Flat & Horizontal  7.0 (275) 26-32 305 5.3 (11.6) 4.6 (10.1) 8.3 (325) 27-32 335 6.2 (13.7) 5.4 (11.9)			10.2	· /	27-34		, ,	1 ' '	
1/16 in (1.6 mm), DC+ 100% CO <sub>2</sub> 25 (1)  3.8 (150) 24-29 200 2.9 (6.3) 2.5 (5.5) 4.4 (175) 24-30 210 3.3 (7.4) 2.9 (6.4) 5.1 (200) 25-30 235 3.8 (8.4) 3.3 (7.3) 5.7 (225) 25-31 265 4.3 (9.5) 3.7 (8.2) 6.4 (250) 26-31 305 4.8 (10.5) 4.2 (9.2)  Flat & Horizontal  7.0 (275) 26-32 305 5.3 (11.6) 4.6 (10.1) 8.3 (325) 27-32 335 6.2 (13.7) 5.4 (11.9)			All Positi	on					
1/16 in (1.6 mm), DC+ 100% CO <sub>2</sub> 25 (1)  4.4 (175) 24-30 210 3.3 (7.4) 2.9 (6.4) 5.1 (200) 25-30 235 3.8 (8.4) 3.3 (7.3) 5.7 (225) 25-31 265 4.3 (9.5) 3.7 (8.2) 6.4 (250) 26-31 305 4.8 (10.5) 4.2 (9.2) 86-88    Flat & Horizontal			3.8	(150)	24-29	200	2.9 (6.3)	2.5 (5.5)	
1/16 in (1.6 mm), DC+ 100% CO <sub>2</sub> 25 (1) 5.1 (200) 25-30 235 3.8 (8.4) 3.3 (7.3) 5.7 (225) 25-31 265 4.3 (9.5) 3.7 (8.2) 6.4 (250) 26-31 305 4.8 (10.5) 4.2 (9.2) 86-88				· /					
1/16 in (1.6 mm), DC+			5.1	` '			` '	1 ' '	
100% CO <sub>2</sub> 25 (1) 6.4 (250) 26-31 305 4.8 (10.5) 4.2 (9.2) 86-88    Flat & Horizontal	<b>1/16 in (1.6 mm),</b> DC+			· /			, ,	1 ' '	
7.0 (275)     26-32     305     5.3 (11.6)     4.6 (10.1)       8.3 (325)     27-32     335     6.2 (13.7)     5.4 (11.9)	100% CO <sub>2</sub>	25 (1)			26-31		, ,		86-88
7.0 (275)     26-32     305     5.3 (11.6)     4.6 (10.1)       8.3 (325)     27-32     335     6.2 (13.7)     5.4 (11.9)	_		Flat & Horizontal						
8.3 (325) 27-32 335 6.2 (13.7) 5.4 (11.9)					26-32	305	5.3 (11.6)	4.6 (10.1)	
							' '		
0.0 (000)   20 07   000   0.1 (17.11   0.0 (12.0)			8.9	(350)	28-34	365	6.7 (14.7)	5.8 (12.8)	

o'Typical all weld metal. @Measured with 0.2% offset. @See test results disclaimer on pg. 12. @As-Welded with 100% CO<sub>2</sub>. @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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