

The Lincoln Electric Co.  
 22801 St. Clair Avenue  
 Cleveland, Ohio 44117-1199



Product: UltraCore 71A85  
 Lot No.: 11274141  
 Classification: E71T-1M-H8, E71T-9M-H8  
 Specification: FEMA 353  
 Test Completed: December 1, 2006

This is to certify that the above listed product was tested according to the procedures shown. Mechanical and chemical composition of the weld deposit were as shown.

The product stated herein was manufactured and supplied in accordance with the Quality System Program of The Lincoln Electric Co., Cleveland, Ohio, U.S.A. as outlined in our Quality Assurance Manual. The Quality System Program of The Lincoln Electric Co. has been accepted by ASME, ABS and approved by VdTUV, and is certified to ISO 9001:2000 by Certificate No. 30275 with an expiration date of November 13, 2008.

Test Conditions	Requirements <b>FEMA 353</b>	High Heat Input	Low Heat Input
		Results	Results
Electrode Size (inch)		1/16	1/16
Electrode Polarity		<b>444</b> (175)	<b>318</b> (125)
Wire Feed Speed cm/min (inch/min.)		DC+	DC+
Current (amps)		220	185
Arc Voltage (volts)		24	22
Contact Tip to Work Distance mm (inch)		<b>25</b> (1)	<b>25</b> (1)
Passes / Layers		7/5 (See Note below)	21/8
Preheat Temp. °C (°F)		<b>150</b> (300)	<b>20</b> (72)
Interpass Temp. °C (°F)		<b>260</b> (500)	<b>90</b> (200)
Shielding Gas (per AWS A5.32)		75% Ar/25% CO <sub>2</sub> (SG-AC-25)	75% Ar/25% CO <sub>2</sub> (SG-AC-25)
Heat Input kJ/mm (kJ/in) avg.		<b>3.2</b> (81)	<b>1.1</b> (28)
Weld Position		3G	1G

**Mechanical Properties**

Tensile Strength MPa (ksi)	(70 min.)	<b>550</b> (80)	<b>620</b> (90)
Yield Strength, 0.2% offset MPa (ksi)	(58 min.)	<b>480</b> (69)	<b>580</b> (84)
Elongation (%)	22% min.	28	27
<b>Avg. Charpy V-notch Impact Properties</b>		<b>155</b> (114)	<b>185</b> (136)
<b>Joules @ 20 °C (ft-lbf @ 70°F)</b>	(40 min.)	<b>148,154,163</b> (109,114,120)	<b>174,179,201</b> (128,132,148)
<b>Avg. Joules @ -18 °C (ft-lbf @ 0°F)</b>	Not Required	<b>34</b> (25)	<b>108</b> (80)
		<b>30,34,37</b> (22,25,27)	<b>100,111,114</b> (74,82,84)

**Chemical composition (weight %) AWS A5.20-2005**

C	0.12 max.	0.05	0.03
Mn	1.75 max.	1.23	1.33
Si	0.90 max.	0.43	0.47
S	0.03 max.	0.01	0.01
P	0.03 max.	0.01	0.01

This product satisfies the requirements of FEMA 353, Appendix D after exposure for eight weeks at 80°F, 80% relative humidity.

Strength values in SI units are reported to the nearest 10 MPa converted from actual data. Preheat and interpass temperature values in SI units are reported to the nearest 5 degrees.

The strength and elongation properties were obtained from **12.5 mm** (0.500 in), A4 tensile specimen artificially aged at **105 °C** (220 °F) for 48 hours, as permitted by AWS A5.20-2005. A naturally aged tensile specimen may take months to achieve the specified properties. See AWS A5.20-2005, paragraph A8.3. The time required for the natural aging of weld deposits is dependent upon ambient conditions, weldment geometry, the metallurgical structure of the weld deposit and other factors.

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 David A. Fink, Manager, Compliance Engineering,  
 Consumable R&D Department, Date

*Phillip J. Woodring* January 9, 2008  
 Phillip J. Woodring,  
 Certification Supervisor, Date