



NATIONAL STANDARD

National Standard, LLC
3602 N. Perkins Road
Stillwater, OK 74075

Certificate of Conformance

Product: **Tru-Core MC 110C K4**
Classification: **E110C-K4**
Specification: **AWS A5.28, ASME SFA5.28**
Test completion date: **Sep 20, 2017**
Part Number: **622-140-163**
MO Number: **6156-1MS**

This is to certify that the product named above and referenced on the sales invoice number is of the same classification, manufacturing process, and raw material requirements as the electrode which was used for the tests conducted on the date shown, the results of which are displayed below. All tests required by the specifications required for classification were performed at that time the product tested met all requirements. The Electrode was manufactured and supplied in accordance with the Quality System Program of National Standard Company, located in Stillwater, Oklahoma, U.S.A. This Quality System Program meets the requirements of ISO 9001:2008, and AWS A5.28.

Operating Parameters	AWS/ASME Requirements	Data and Test Results
Electrode Size (in.)	.045"	.045"
Polarity	DCEP	DCEP
Shielding Gas	Ar/5-25% CO ₂	90% Ar/10% CO ₂
Voltage (volts)	--	27.4
Wire Feed Speed (in/min)	--	450
Travel Speed (in/min)	--	12.0
Current (amps)	--	276.7
Average heat input (kJ/in)	--	38.1
Contact tip to work distance (in.)	--	0.75"
Passes/Layers	--	11/5.5
Preheat Temp. °F	300+/-25	300+/-25
Interpass Temp. °F	<325	300+/-25

Test Assembly Material:	ASTM A516 Gr. 70, A370/E23
Radiographic Test:	Acceptable
Fillet Weld Test:	N/A
Tensile Condition:	Original Gage: 2", Aged 210°F for 48 hours
Radiograph:	Pass

General Note:
Mechanical and/or Chemical testing were conducted in accordance with the following standard test procedure: ASTM A370/E23, ASTM E8. The attached results should not be assumed to be the expected results in a particular application. Results will differ depending on many factors, such as temperature, weld procedure, plate chemistry, welding method, and fabrication. It is advised to users to confirm by qualification testing the suitability of any welding before use in their applications.

Mechanical Properties of the Weld Deposit (As-welded condition)

Tensile Strength (ksi)	110 min	113.5
Yield Strength, 0.2% offset (ksi)	98 min	101.7
% Elongation	15 min	22.7
%ROA	N/A	60.6
Average CVN impact properties ft'lbf	20 ft.lbf @ -60°F	26 ft.lbf @ -60°F

Chemical Composition of the Weld Deposit (Weight %)

Element	C%	Mn%	Si%	P%	S%	Cr%	Ni%	Mo%	V%	Al%	Cu%
AWS/ASME Requirements	0.15 Max	.75-2.25 Max	0.80 Max	0.025 Max	0.025 Max	.15-.65	.5-2.5	.25-.65	0.03 Max	-----	0.35 Max
Results	.03	1.86	.48	.008	.008	.49	2.24	.54	.01	.01	.05

Sarang Muley
Sarang Muley, Process Engineer

Date 9/21/17