

# Certificate of Conformance to Requirements for Welding Electrode

Product Type: SubCOR EM12KS 5/32 60 CL

Classification: EC1

Specifications: AWS A5.17-97; ASME SFA5.17

Diameter Tested: 5/32"

 Date Tested:
 12/03/2014

 Date Generated:
 12/16/2014

This is to certify that the product named above and supplied on the referenced order number is of the same classification, manufacturing process, and material requirements as the material which was used for the test that was concluded on the date shown, the results of which are shown below. All tests required by the specifications shown for classification were performed at that time and the material tested met all requirements. It was manufactured and supplied by the Quality System Program of Hobart Brothers, which meets the requirements of ISO 9001, ANSI/AWS A5.01, and other specification and Military requirements, as applicable. This document supplies actual test results of non-specific inspection in conformance with the requirements of EN 10204, type 2.2 certification.

## THE STEEL USED IN THIS LOT OF MATERIAL WAS MELTED AND MANUFACTURED IN THE U.S.A.

#### **Test Settings**

Shielding Medium	Amps / Polarity	Volts	WFS in/min(m/min)	ESO in(mm)	Preheat F(C)	Interpass F(C)	Travel Speed in/min(cm/min)
SWX 150 (F7A4-EC1)	525 / DCEP	28.5	65 (1.7)	1.5 (38)	Room Temp	300(149)	16 (40.6)
SWX 110 (F7A4-EC1)	525 / DCEP	28.5	65 (1.7)	1.5 (38)	Room Temp	300(149)	16 (40.6)
SWX 130 (F7A6-EC1)	525 / DCEP	28.5	65 (1.7)	1.5 (38)	Room Temp	300(149)	16 (40.6)
SWX 120 (F7A6-EC1)	525 / DCEP	28.5	15 (0.4)	1.5 (38)	Room Temp	300(149)	16 (40.6)
SWX 135 (F7A4-EC1)	525 / DCEP	28.5	60 (1.5)	1.5 (38)	Room Temp	300(149)	16 (40.6)
HA-590	525 / DCEP	30	60 (1.5)	1.5 (38)	Room Temp	300(149)	15 (38.1)
HA-495	525 / DCEP	28		1.5 (38)	Room Temp	300(149)	16 (40.6)

## **Mechanical Properties - Tensile**

Shielding Medium	Ref. No.	Testing Conditions	Testing Conditions   Ult. Tensile Strength psi   Yield		Elong.% in 2"
·		-	(MPa)	- ' ' '	-
SWX 150 (F7A4-EC1)	PC1217	Aged 48 Hrs 200F	71,000 ( 487 )	60,000 ( 416 )	32
SWX 110 (F7A4-EC1)	PC1247	Aged 48 Hrs 200F	71,000 ( 488 )	59,000 ( 410 )	29
SWX 130 (F7A6-EC1)	PC1285	Aged 48 Hrs 200F	71,000 ( 488 )	60,000 ( 411 )	29
SWX 120 (F7A6-EC1)	PC1711	Aged 48 Hrs 200F	70,000 ( 483 )	60,000 ( 414 )	32
SWX 135 (F7A4-EC1)	PC1712	Aged 48 Hrs 200F	70,000 ( 486 )	58,000 ( 400 )	29
HA-590	PC4578	Aged 48 Hrs 220F	79,000 ( 545 )	68,000 ( 467 )	28
HA-495	PC4869	Aged 48 Hrs 220F	85,000 ( 587 )	76,000 ( 526 )	26

#### **Mechanical Properties - Impact**

Shielding Medium	Ref. No.	Testing Conditions	Temp. F (C)	Individuals ft.lb.(J)	Avg. ft.lb.(J)	Туре
SWX 150 (F7A4-EC1)	PC1217	As Welded	-40 (-40)	124,143,23 (168,194,31)	97 ( 131 )	Charpy-V-Notch
SWX 110 (F7A4-EC1)	PC1247	As Welded	-40 (-40)	17,82,37 (23,111,50)	45 ( 61 )	Charpy-V-Notch
SWX 130 (F7A6-EC1)	PC1285	As Welded	-60 (-51)	84,90,79 (114,122,107)	84 ( 114 )	Charpy-V-Notch
SWX 120 (F7A6-EC1)	PC1711	As Welded	-60 (-51)	120,98,112 (163,133,152)	110 ( 149 )	Charpy-V-Notch
SWX 135 (F7A4-EC1)	pc1712	As Welded	-40 (-40)	69,78,74 (94,106,100)	74 ( 100 )	Charpy-V-Notch
HA-590	PC4578	As Welded	-60 (-51)	44,47,59 (60,64,80)	50 ( 68 )	Charpy-V-Notch
HA-495	PC4869	As Welded	-20 (-29)	22,18,23 (30,24,31)	21 ( 28 )	Charpy-V-Notch

Ref.No.	Radiographic Inspection		Fillet Weld Lest	
PC1217	Conforms	Horizontal :	Overhead :	Vertical:
PC1247	Conforms	Horizontal :	Overhead :	Vertical:
PC1285	Conforms	Horizontal:	Overhead:	Vertical:
PC1711	Conforms	Horizontal :	Overhead:	Vertical:
PC1712	Conforms	Horizontal :	Overhead:	Vertical:
PC4578	Conforms	Horizontal :	Overhead:	Vertical:
PC4869	Conforms	Horizontal :	Overhead:	Vertical:

## **Chemical Analysis**

Shielding Medium / Ref. No	С	Mn	Р	S	Si	Cu	Cr	V	Ni	Мо	ΑI	Ti	Nb	Со	В	W	Sn	Fe	Sb	N	Mg	Zn	Ве
HA-495 / CB84551	0.06	1.07	0.020	0.003	0.62	0.05	0.04	< .01	0.03	0.01													
SWX 150 (F7A4-EC1) / PC1217	0.05	0.91	0.012	0.005	0.24	0.05	0.03	< .01	0.04	0.01										П			
SWX 110 (F7A4-EC1) / PC1247	0.04	1.18	0.015	0.008	0.31	0.06	0.03	< .01	0.03	0.01										Ш			
SWX 130 (F7A6-EC1) / PC1285	0.05	1.19	0.015	0.009	0.23	0.05	0.03	< .01	0.04	0.01													
SWX 120 (F7A6-EC1) / PC1711	0.05	1.21	0.015	0.009	0.24	0.06	0.02	< .01	0.02	0.01													
SWX 135 (F7A4-EC1) / PC1712	0.06	1.25	0.018	0.009	0.27	0.06	0.02	< .01	0.02	0.01										П			
HA-590 / PC4578		1.39	0.020	0.010	0.33	0.07	0.05	< .01	0.04	0.01	<u> </u>			Ľ									

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Dave Thomas, Quality Assurance Rep.

Certification and Limited Warranty - Data for the above supplied product are those obtained when welded and tested in accordance with the above specification. All tests for the above classification were satisfied. Other tests and procedures may produce different results. Hobart Brothers produces welding consumables under continuing quality assurance programs audited and approved by the American Bureau of Shipping ("ABS").