Certificate of Conformance to Requirements for Welding Electrode

Product Type:	**SUBCOR 100F3-S**
Classification:	**ECF3**
Specifications:	**AWS A5.23; ASME SFA5.23**
Diameter Tested:	**3/32"**
Date Tested:	**12/18/2023**
Date Generated:	**1/2/2024**

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)
HN-590	345-365 / DCEP	30	135 (3.4)	1 (25)	300(149)	300(149)	12 (30.5)
HN-590	370 / DCEP	29.5	135 (3.4)	1 (25)	300(149)	300(149)	15.5 (39.4)
SWX 120	345-365 / DCEP	30	105 (2.7)	1 (25)	300(149)	300(149)	12 (30.5)
SWX 120	350 / DCEP	30	135 (3.4)	1 (25)	300(149)	300(149)	12 (30.5)
SWX 150	350 / DCEP	30	135 (3.4)	1 1/4 (25)	300(149)	300(149)	12 (30.5)
SWX 150	350 / DCEP	29.5	135 (3.4)	1 (25)	300(149)	300(149)	12 (30.5)

Mechanical Properties - Tensile

Shielding Medium	Ref. No.	Testing Conditions	Ult. Tensile Strength psi (MPa)	Yield Strength psi (MPa)	Elong.% in 2"
HN-590	PE6802	Aged 48 Hrs 220F	115,000 (793)	101,000 (696)	23
HN-590	PE6954	SR 1 Hr @ 1125F	111,000 (765)	99,000 (682)	22
SWX 120	PE6970	Aged 48 Hrs 220F	111,000 (765)	98,000 (675)	24
SWX 120	PE6974	SR 1 Hr @ 1125F	110,000 (758)	94,000 (651)	24
SWX 150	PE6977	Aged 48 Hrs 220F	108,000 (745)	98,000 (678)	24
SWX 150	PE6993	SR 1 Hr @ 1125F	104,000 (717)	90,000 (618)	25

Mechanical Properties - Impact

Shielding Medium	Ref. No.	Testing Conditions	Temp. F (C)	Individuals ft.lb.(J)	Avg. ft.lb.(J)	Type
HN-590	PE6802	As Welded	-60 (-51)	36,35,41 (49,47,56)	37 (51)	Charpy-V-Notch
SWX 120	PE6970	As Welded	-60 (-51)	46,45,44 (62,61,60)	45 (61)	Charpy-V-Notch
SWX 120	PE6974	SR 1 Hr @ 1125F	-60 (-51)	38,31,22 (52,42,30)	30 (41)	Charpy-V-Notch
SWX 150	PE6977	As Welded	-60 (-51)	71,65,73 (96,88,99)	70 (94)	Charpy-V-Notch
SWX 150	PE6993	SR 1 Hr @ 1125F	-60 (-51)	70,82,77 (95,111,104)	76 (103)	Charpy-V-Notch
HN-590	PE7153	SR 1 Hr @ 1025F	-60 (-51)	19,21,26 (26,28,35)	22 (30)	Charpy-V-Notch

Ref.No.	Radiographic Inspection	Fillet Weld Test					
PE6802	Conforms	Horizontal :		Overhead :		Vertical :	
PE6954	Conforms	Horizontal :		Overhead :		Vertical :	
PE6970	Conforms	Horizontal :		Overhead :		Vertical :	
PE6974	Conforms	Horizontal :		Overhead :		Vertical :	
PE6977	Conforms	Horizontal :		Overhead :		Vertical :	
PE6993	Conforms	Horizontal :		Overhead :		Vertical :	

Chemical Analysis

Shielding Medium / Ref. No	C	Mn	P	S	Si	Cu	Cr	V	Ni	Mo	Al	Ti	Nb	Co	B	W	Sn	Fe	Sb	N	Mg	Zn	Be	Sb	As
HN-590 / PE6954	0.08	2.20	0.020	0.010	0.52	0.06	0.07	-	0.79	0.50	-	-	-	-	0.0006	-	-	-	-	-	-	-	-	-	-
SWX 120 / PE6970	0.08	2.10	0.022	0.010	0.44	0.06	0.07	-	0.81	0.51	-	-	-	-	0.0005	-	-	-	-	-	-	-	-	-	-
SWX 150 / PE6977	0.09	1.66	0.013	0.006	0.43	0.06	0.06	-	0.83	0.52	-	-	-	-	0.0010	-	-	-	-	-	-	-	-	-	-

Diffusible Hydrogen Collected per AWS A4.3

SWX 150	6.2 ml/100g of weld metal for 3/32 in diameter 42% relative humidity
HN-590	4.0 ml/100g of weld metal for 3/32 in diameter 33% relative humidity
SWX 120	7.7 ml/100g of weld metal for 3/32 in diameter 17% relative humidity

James A. Owens, Q.A. Specialist

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.