

Product Type: METALLOY EM12KS
 Classification: EC1
 Specifications: AWS A5.17-97; ASME SFA5.17
 Diameter Tested: 5/32"
 Date Tested: 10/22/07
 Date Generated: 12/11/2007

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 ISO9000, ANSI/AWS A5.01, and other specification and Military requirements, as applicable.

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)
HPF-N90 FLUX (F7A4-EC1)	525 / DCEP	29	61 (1.5)	1 (25)	Room Temp	300(149)	16 (40.6)
HN-590 FLUX (F7A6-EC1)	525 / DCEP	29	63 (1.6)	1 (25)	Room Temp	300(149)	16 (40.6)
HPF-A95 FLUX (F7A2-EC1)	525 / DCEP	29	63 (1.6)	1.5 (38)	65(18)	300(149)	16 (40.6)
HPF-N90 FLUX (F6P6-EC1)	525 / DCEP	29	63 (1.6)	1.5 (38)	65(18)	300(149)	16 (40.6)

Mechanical Properties - Tensile

Shielding Medium	Ref. No.	Testing Conditions	Ult. Tensile Strength psi (MPa)	Yield Strength psi (MPa)	Elong.% in 2"
HN-590 FLUX (F7A6-EC1)	PA4764	As Welded	75,000 (516)	65,000 (445)	27
HPF-N90 FLUX (F7A4-EC1)	PA1716	As Welded	70,000 (484)	58,000 (401)	28
HPF-A95 FLUX (F7A2-EC1)	PA6320	Aged 48 Hrs 200F	82,000 (563)	70,000 (482)	26
HPF-N90 FLUX (F6P6-EC1)	PA6235	SR 1 Hr @ 1150F	63,000 (434)	48,000 (332)	33

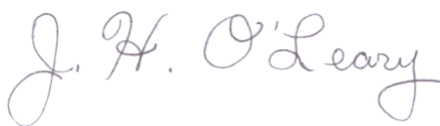
Mechanical Properties - Impact

Shielding Medium	Ref. No.	Testing Conditions	Temp. F (C)	Individuals ft.lb.(J)	Avg. ft.lb.(J)	Type
HN-590 FLUX (F7A6-EC1)	PA4764	As Welded	-60 (-51)	47,31,30 (64,42,41)	36 (49)	Charpy-V-Notch
HPF-N90 FLUX (F7A4-EC1)	PA1716	As Welded	-40 (-40)	60,53,50 (81,72,68)	54 (74)	Charpy-V-Notch
HPF-A95 FLUX (F7A2-EC1)	PA6320	As Welded	-20 (-29)	60,56,72 (81,76,98)	63 (85)	Charpy-V-Notch
HPF-N90 FLUX (F6P6-EC1)	PA6235	SR 1 Hr @ 1150F	-60 (-51)	76,85,87 (103,115,118)	83 (112)	Charpy-V-Notch

Ref.No.	Radiographic Inspection	Fillet Weld Test			
PA4764	Conforms	Horizontal :	Overhead :	Vertical :	
PA1716	Conforms	Horizontal :	Overhead :	Vertical :	
PA6320	Conforms	Horizontal :	Overhead :	Vertical :	
PA6390	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
HPF-N90 FLUX (F7A4-EC1) / PA1716	0.05	0.98	0.018	0.016	0.22	0.05	0.04	< .01	0.04	0.02													
HN-590 FLUX (F7A6-EC1) / PA4764	0.06	1.23	0.026	0.023	0.24	0.06	0.04	0.01	0.04	0.02													
HPF-N90 FLUX (F6P6-EC1) / PA6235	0.03	1.08	0.015	0.017	0.29	0.07	0.04	< .01	0.04	0.01													
HPF-A95 FLUX (F7A2-EC1) / PA6320	0.07	1.34	0.017	0.012	0.63	0.09	0.04	< .01	0.03	0.01													



Joe O'Leary, Manager, Quality Assurance



Melvin Seitz, Quality Manager

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").