METALLOY EM13KS

CARBON STEEL COMPOSITE METAL-CORED SUBMERGED ARC ELECTRODE 080428 (Replaces 080107)
AWS A5.17/A5.17M-97: (R2007)
ASME SFA 5.17/SFA 5.17M
Class EC1

CHARACTERISTICS:

Metalloy EM13KS is a composite metal cored electrode for submerged arc welding designed for similar applications as for the solid wire classification EM13K . The richer levels of manganese and silicon give excellent bead tie-in and even ripple pattern at high speeds. Metalloy EM13KS will tolerate higher levels of rust and mill scale and reduce the likeliness of porosity caused by excess rust and mill scale. Typical applications include structural steel, shipbuilding, tank fabrication, wheel fabrication, heavy equipment and offshore fabrication.

ADVANTAGES OVER SOLID ELECTRODES:

Metalloy submerged arc electrodes provide higher deposition rates as compared to the solid wires of equal size, with the same amperage, electrical stickout and flux. Since Metalloy products are made using a steel sheath with alloying metal powders, customers will enjoy industry leading performance. Penetration patterns are broader than solid wires, making it easier to bridge fit-up gaps; and higher current levels can be used on the root passes and thin materials without burn through. Drive roll and straightening roll pressure should be set lower than solid wire as these electrodes are softer. Over tightening drive and straightening rolls may cause the electrode to deform and may cause electrode tracking problems. Metal cored electrodes will also reduce tip and liner wear.

Below results are typical of both direct current electrode positive (DCEP) as well as unbalanced squarewave AC polarity with 66% electrode positive / 34% electrode negative.

Metalloy EM13KS Electrode/Flux AWS A5.17 Deposit Chemistry Analysis Requirements

	Flux	Electrode Classification	C	Mn	Si	S	P	Cu
		EC1	**0.15**	**1.80**	**0.90**	**0.035**	**0.035**	**0.35**
Hobart	HA-495	EC1	0.05	1.07	0.45	0.013	0.025	0.07
Hobart	HN-590	EC1	0.07	1.16	0.24	0.022	0.021	0.07
Hobart	HN-590 (PWHT)	EC1	0.06	1.29	0.27	0.012	0.017	0.08
Hobart	HN-511	EC1	0.07	1.03	0.24	0.012	0.022	0.04
Hobart	HN-511 (PWHT)	EC1	0.08	1.04	0.23	0.012	0.024	0.04

Metalloy EM13KS Electrode/Flux Mechanical Properties

	Flux	Electrode/Flux Classification	Tensile Strength ksi (MPa)	Yield Strength ksi (MPa)	% Elong. in 2"	CVN @ -40°F (40°C) ft•lbs. (J)	CVN @ -80°F (-62°C) ft•lbs (J)	CVN @ -100°F (73°C) ft•lbs (J)
Hobart	HA-495	F7A4-EC1	84.1 (579)	74.8 (517)	28	31 (42)	—	—
Hobart	HN-590	F7A8-EC1	74.0 (510)	63.0 (434)	28	—	59 (80)	—
Hobart	HN-590 (PWHT)	F7P8-EC1	76.0 (524)	60.0 (414)	30	—	88 (120)	—
Hobart	HN-511	F7A10-EC1	76.1 (524)	64.6 (441)	31	—	—	112 (152)
Hobart	HN-511 (PWHT)	F7P10-EC1	73.6 (503)	59.7 (407)	34	—	—	86 (117)

AVAILABLE DIAMETERS: 5/64" (2.0 mm), 3/32" (2.4 mm), 1/8" (3.2 mm), 5/32" (4.0 mm)

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AWS A5.17

3/32" Diameter, 1-1/4" Electrical Stickout, DCEP with Hobart HN-590

AMPERAGE (DCEP)	VOLTAGE	APPROXIMATE WIRE FEED SPEED, ipm		DEPOSITION RATE lbs/hr	
		Metalloy	Solid	Metalloy	Solid
200	28	65	48	5.9	5.3
250	28	75	57	7.1	6.5
300	29	85	70	8.7	8.1
350	30	105	80	10.7	9.2
400	30	125	89	12.9	10.6
450	32	150	103	15.4	12.6
500	37	175	121	17.8	14.8
550	37	210	139	21.1	16.6
600	38	240	156	24.3	18.9
650	39	270	179	27.7	21.3

1/8" Diameter, 1-1/4" Electrical Stickout, DCEP with Hobart HN-590

AMPERAGE (DCEP)	VOLTAGE	APPROXIMATE WIRE FEED SPEED, ipm		DEPOSITION RATE lbs/hr	
		Metalloy	Solid	Metalloy	Solid
250	28	40	38	6.0	6.4
300	29	46	43	7.2	8.1
350	30	54	48	8.6	9.1
400	31	64	54	10.4	10.6
450	31	76	60	12.1	11.8
500	32	87	68	14.7	13.1
550	32	100	75	17.3	14.5
600	35	116	80	20.0	15.6
650	36	135	86	23.0	17.6
700	37	153	94	25.7	19.3
750	38	175	101	29.6	20.9
800	40	199	110	33.0	23.0

5/32" Diameter, 1-1/2" Electrical Stickout, DCEP with Hobart HN-590

AMPERAGE (DCEP)	VOLTAGE	APPROXIMATE WIRE FEED SPEED, ipm		DEPOSITION RATE lbs/hr	
400	30	45	37	12.2	10.9
500	33	58	47	14.5	14.0
600	35	69	55	18.5	17.2
700	38	90	64	23.8	19.6
800	40	113	75	29.8	23.5
900	42	143	88	38.7	28.2
1000	48	172	98	42.8	32.1

***Voltage listed was used for these particular tests. Typically, the voltage can be varied +2 volts depending on flux, material thickness, and application. The deposition rate may vary with the flux used.**

Notice:
Actual use of the product may produce varying results due to conditions and welding techniques over which Tri-Mark has no control, including, but not limited to, plate chemistry, weldment design, fabrication methods,, electrode size, welding procedure, service requirements, and environment. The purchaser is solely responsible for determining the suitability of Tri-Mark products for the purchaser's own use. Any prior representations shall not be binding. Tri-Mark disclaims any warranty of merchantability or fitness for any particular purpose with respect to its products.

Caution:
Consumers should be thoroughly familiar with the safety precautions shown on the Warning Label posted on each shipment and in American National Standard Z49.1, "Safety in Welding and Cutting," published by the American Welding Society, 550 NW LeJeune Road, Miami, FL, 33126, and OSHA Safety and Health Standards 29 CFR 1910, available from the U.S. Department of Labor, Washington, D.C. 20210.