



# METALLOY EM13K-S

**CARBON STEEL COMPOSITE METAL-CORED SUBMERGED ARC ELECTRODE**  
**AWS A5.17/A5.17M**  
**ASME SFA 5.17/SFA 5.17M**  
**Class EC1**

100721 (Replaces 100224)

**CHARACTERISTICS:**

**Metalloy EM13K-S** is a composite metal cored electrode for submerged arc welding designed for similar applications as for the solid wire classification EM12K and EM13K . The richer levels of manganese and silicon give excellent bead tie-in and even ripple pattern at high speeds. Metalloy EM13K-S will tolerate higher levels of rust and mill scale and reduce the likelihood 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) or AC.

**Metalloy EM13K-S Electrode/Flux AWS A5.17 Deposit Chemistry Analysis**

Flux	Electrode Classification	C	Mn	Si	S	P	Cu
AWS A5.17 (Max)	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-511	EC1	0.06	1.29	0.27	0.012	0.017	0.08
Hobart HN-590	EC1	0.07	1.16	0.24	0.022	0.021	0.07

**Metalloy EM13K-S 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-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)
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)	—

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

\*The information contained or otherwise referenced herein is presented only as "typical" without guarantee or warranty, and Hobart Brothers Company expressly disclaims any liability incurred from any reliance thereon. Typical data is obtained when welded and tested in accordance with AWS A5.17 specification. Other tests and procedures may produce different results. No data is to be construed as a recommendation for any welding condition or technique not controlled by Hobart Brothers Company.



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AWS A5.17

## 5/64" Diameter, 1-1/4" Electrical Stickout, DCEP with Hobart HN-590

AMPERAGE	VOLTAGE	APPROXIMATE WIRE FEED SPEED, IPM	DEPOSITION RATE Lbs/hr
200	29	71	4.9
250	30	89	6.5
300	31	115	8.4
350	32	154	11.0
400	33	190	13.7
450	34	233	16.6
500	36	284	20.5

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

AMPERAGE	VOLTAGE	APPROXIMATE WIRE FEED SPEED, IPM	DEPOSITION RATE Lbs/hr
200	28	65	5.9
250	28	75	7.1
300	29	85	8.7
350	30	105	10.7
400	30	125	12.8
450	32	150	15.4
500	37	175	17.8
550	37	210	21.1
600	38	240	24.3
650	39	270	27.7

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

AMPERAGE	VOLTAGE	APPROXIMATE WIRE FEED SPEED, IPM	DEPOSITION RATE Lbs/hr
250	28	40	6.0
300	29	46	7.2
350	30	54	8.6
400	31	64	10.4
450	31	76	12.1
500	32	87	14.7
550	32	100	17.3
600	35	116	20.0
650	36	135	23.0
700	37	153	25.7
750	38	175	29.6
800	40	199	33.0

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

AMPERAGE	VOLTAGE	APPROXIMATE WIRE FEED SPEED, IPM	DEPOSITION RATE Lbs/hr
400	30	45	12.2
500	33	58	14.5
600	35	69	18.5
700	38	90	23.8
800	40	113	29.8
900	42	143	38.7
1000	48	172	42.8

\*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.