

AWS ER70S-3

**HB-25****DESCRIPTION:**

**HB-25** is a mild steel, copper coated solid wire formulated with silicon and manganese deoxidizers to produce high quality welds with virtually no porosity or slag. An industry favorite, HB-25 can be used for a wide variety of general fabrication projects. It delivers excellent short circuit welding performance with CO<sub>2</sub> 75% Ar/25% CO<sub>2</sub> and other recommended commercially available shielding gases. It can also be used for spray transfer arc welding applications.

**APPLICATIONS:**

Auto frames, railcars, sheet metal, metal furniture, storage bins and general fabrication with wire feed speeds ranging from very slow to moderately fast.

**FEATURES:**

- High welder appeal
- Low spatter level
- Clean weld deposit

**BENEFITS:**

- Arc is smooth and stable
- Minimal after weld clean up
- Weld is virtually ready to paint or plate, fewer silicon islands than with EROS-6 wire

**SHIELDING GAS:**

100% CO<sub>2</sub>, 75% Ar/25% CO<sub>2</sub>, 90% Ar/10% CO<sub>2</sub>, 92% Ar/8% CO<sub>2</sub> and other commercially available shielding gas mixtures.

**TYPICAL CHEMISTRIES\*:**

	Wire		Weld Deposit		
	AWS Wire Spec	Wire (Melt Button)	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Carbon (C)	.06-0.15	0.09	0.09	0.09	0.09
Manganese (Mn)	0.90-1.40	1.22	0.88	0.92	0.94
Silicon (Si)	0.45—0.75	0.55	0.37	0.39	0.41
Phosphorus (P)	0.025 max	0.013	0.009	0.009	0.009
Sulphur (S)	0.035 max	0.013	0.011	0.011	0.010
Copper (Cu)	0.50 <sup>†</sup>	0.13	0.12	0.11	0.11

<sup>†</sup> Copper content of wire and copper coating shall not exceed .5% max.

**TYPICAL MECHANICAL PROPERTIES\* (AW):**

	AWS Spec (CO <sub>2</sub> )	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Tensile Strength	70,000 psi (min)	85,000 psi (587 MPa)	87,500 psi (604 MPa)	88,500 psi (611 MPa)
Yield Strength	58,000 psi (min)	70,000 psi (483 MPa)	72,500 psi (500 MPa)	74,000 psi (511 MPa)
Elongation % in 2"	22.0%	29.0%	29.5%	30.0%
Reduction in Area	not specified	67.0%	68.0%	71.0%

**TYPICAL CHARPY V-NOTCH IMPACT VALUES\*\*(AW):**

	AWS Spec (CO <sub>2</sub> )	100% CO <sub>2</sub>	75% Ar/25% CO <sub>2</sub>	90% Ar/10% CO <sub>2</sub>
Avg. at room temperature	not specified	102 ft.-lbs (138 J)	135 ft.-lbs (183 J)	147 ft.-lbs (199 J)
Avg. at 0°F (-18°C)	not specified	68 ft.-lbs (92 J)	95 ft.-lbs (129 J)	112 ft.-lbs (152 J)
Avg. at -20°F (-29°C)	20 ft.-lbs (min)	52 ft.-lbs (71 J)	82 ft.-lbs (111 J)	104 ft.-lbs (141 J)
Avg. at -40°F (-40°C)	not specified	47 ft.-lbs (64 J)	72 ft.-lbs (98 J)	92 ft.-lbs (125 J)
Avg. at -60°F (-51°C)	not specified	41 ft.-lbs (56 J)	48 ft.-lbs (65 J)	68 ft.-lbs (92 J)

**CONFORMANCES AND APPROVALS:**

AWS A5.18, ER70S-3 • ASME SFA 5.18, F-6, A-1

\*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 are obtained when welded and tested in accordance with AWS 5.18 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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## SHORT-CIRCUIT TRANSFER WELDING PARAMETERS\*:

Material Thickness <sup>1</sup> size	Material Thickness <sup>1</sup>		Electrode Diameter		Welding Current (DC) amps	Arc Voltage (electrode positive)	Wire Feed Speed ipm	Travel Speed ipm	Deposition Rate lbs/hr
	in. (decimal)	mm	in.	mm					
24 ga.	0.025	0.6	.024	0.6	30-50	13-15	130-160	10-20	1.0-1.3
24 ga.	0.025	0.6	.030	0.8	30-50	15-17	75-100	10-20	1.4-1.8
22 ga.	0.031	0.6	.024	0.6	30-55	13-15	30-200	15-20	1.0-1.6
22 ga.	0.031	0.8	.030	0.8	40-60	15-17	90-130	15-22	1.6-2.3
20 ga.	0.037	0.9	.035	0.9	55-85	16-18	70-120	15-25	1.0-1.6
18 ga.	0.050	1.3	.035	0.9	70-100	17-20	100-160	20-35	1.3-2.1
1/16"	0.063	1.6	.035	0.9	80-120	17-20	120-180	20-35	1.6-2.4
5/64"	0.078	2.0	.035	0.9	100-130	18-21	160-220	20-35	2.1-2.9
1/8"	0.125	3.2	.035	0.9	120-175	19-22	210-290	20-30	2.7-3.8
1/8"	0.125	3.2	.045	1.1	140-160	18-21	120-160	15-25	3.1-4.2
3/16"	0.187	4.7	.035	0.9	140-175	19-22	240-290	14-19	3.1-3.8
3/16"	0.187	4.7	.045	1.1	160-200	19-22	150-225	15-22	3.9-5.9
1/4"	0.250	6.4	.035	0.9	140-160	19-22	240-290	9-13	3.1-3.8
1/4"	0.250	6.4	.045	1.1	180-225	20-23	190-240	12-18	5.0-6.3

**NOTE: Single-pass flat and horizontal fillet positions. Reduce current 10 to 15% for vertical and overhead welding.**

<sup>1</sup> For fillet and groove welds—for fillet welds, size equals metal thickness; for square groove welds, the root opening should equal 1/2 the metal thickness.

<sup>2</sup> Shielding gas is 100% CO<sub>2</sub> or 75% Ar/25% CO<sub>2</sub>; 20-35 cfm.

## SPRAY TRANSFER WELDING PARAMETERS\*:

Material Thickness <sup>1</sup> size	Material Thickness <sup>1</sup>		Electrode Diameter		Welding Current (DC) amps	Arc Voltage (electrode positive)	Wire Feed Speed ipm	Travel Speed ipm	Deposition Rate lbs/hr
	in. (decimal)	mm	in.	mm					
1/8"	0.125	3.2	.035	0.9	160-170	23-24	320-340	17-22	5.1-5.4
1/8"	0.125	3.2	.045	1.1	170-180	23-24	170-185	16-21	4.5-4.8
3/16"	0.187	4.7	.035	0.9	180-190	24-25	360-380	15-20	5.7-6.0
3/16"	0.187	4.7	.045	1.1	190-200	24-25	195-210	14-19	5.1-5.5
1/4"	0.250	6.4	.035	0.9	200-210	24-25	400-420	12-18	6.3-6.6
1/4"	0.250	6.4	.045	1.1	210-220	25-26	220-240	11-17	5.8-6.3
5/16"	0.313	7.9	.035	0.9	220-250	25-26	420-510	11-16	6.6-8.0
5/16"	0.313	7.9	.045	1.1	220-300	26-28	240-375	11-18	6.3-9.8
3/8"	0.375	9.5	.045	1.1	300-350	26-28	375-475	11-19	9.8-12.4
1/2"	0.500	12.7	.045	1.1	325-375	27-29	400-550	12-18	10.5-14.4

\*Shielding gas: 90% Ar/10% CO<sub>2</sub> at 35-50 cfm with electrode stick-out, 3/4" ± 1/8". (Voltage adjustments likely if other spray arc gases are used—85% Ar min.)

<sup>1</sup>Fillet and groove welds (backing may be required on groove welds).

## AVAILABLE DIAMETERS AND PACKAGES:

Diameter in	mm	33-lb. Spool
.035	0.9	S304608-033
.045	1.2	S304612-033

Material Safety Data Sheets on any Hobart Brothers Company product may be obtained from Hobart Customer Service. Because Hobart Brothers Company is constantly improving products, Hobart Brothers reserves the right to change design and/or specifications without notice.

