

AWS ER70S-3

**DESCRIPTON:**

**Quantum Arc 3** is a copper-coated, mild steel solid wire with silicon and manganese deoxidizer levels preferred most for general fabrication. Quantum 3 is recommended for both short-circuit and spray transfer applications.

**APPLICATIONS:**

General fabrication, light sheet metal fabrication, automotive frames or structures, metal storage bins, metal furniture, and railcars. Excellent for robotic, automatic, and semiautomatic welding applications with wire feed speeds ranging from moderately slow to very fast.

**FEATURES:**

- Excellent smooth feedability
- Clean weld deposit

**BENEFITS:**

- Consistent feeding, greater productivity
- Repeatable weld parameters
- Feeds well through longer gun cables
- Weld is virtually ready to paint or plate, fewer silicon islands than with ER70S-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-.15	0.09	0.09	0.09	0.09
Manganese (Mn)	0.90—1.40	1.22	0.90	0.93	0.95
Silicon (Si)	0.45—.75	0.55	0.35	0.38	0.40
Phosphorus (P)	0.025 max	0.013	0.011	0.011	0.011
Sulphur (S)	0.035 max	0.013	0.012	0.012	0.012
Copper (Cu)	.50 <sup>†</sup> max	0.13	0.13	0.12	0.12

<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)	77,000 psi (531 MPa)	79,000 psi (545 MPa)	80,200 psi (553 MPa)
Yield Strength	58,000 psi (min)	64,000 psi (442 MPa)	66,500 psi (459 MPa)	68,000 psi (469 MPa)
Elongation % in 2"	22.0%	26.0%	29.5%	30.0%
Reduction in Area	not specified	67.2%	71.5%	72.3%

**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	103 ft-lbs (140 J)	134 ft-lbs (182 J)	175 ft-lbs (237 J)
Avg. at 0°F (-18°C)	20 ft-lbs (min)	72 ft-lbs (98 J)	110 ft-lbs (149 J)	155 ft-lbs (210 J)
Avg. at -20°F (-29°C)	not specified	64 ft-lbs (87 J)	90 ft-lbs (122 J)	130 ft-lbs (176 J)
Avg. at -40°F (-40°C)	not specified	50 ft-lbs (68 J)	80 ft-lbs (108 J)	122 ft-lbs (165 J)
Avg. at -60°F (-51°C)	not specified	42 ft-lbs (57 J)	72 ft-lbs (98 J)	98 ft-lbs (133 J)

**CONFORMANCES AND APPROVALS:**

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

\*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.

Hobart Brothers Company · 400 Trade Square East · Troy, OH 45373  
PH: (800) 424-1543 · FX: (800)-541-6607 · www.hobartbrothers.com



### SHORT-CIRCUIT TRANSFER WELDING PARAMETERS\*:

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
size	in. (decimal)	mm	in.	mm					
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	20-22	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 cfh.

### SPRAY TRANSFER WELDING PARAMETERS\*:

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
size	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
1/4"	0.250	6.4	.052	1.3	250-275	26-27	235-275	11-18	8.2-9.6
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
5/16"	0.313	7.9	.052	1.3	250-325	26-28	235-325	11-19	8.2-11.4
5/16"	0.313	7.9	1/16	1.6	275-350	26-28	185-250	11-19	9.4-12.8
3/8"	0.375	9.5	.045	1.1	300-350	26-28	375-475	11-19	9.8-12.4
3/8"	0.375	9.5	.052	1.3	300-350	26-28	300-360	11-19	10.5-12.6
3/8"	0.375	9.5	1/16	1.6	325-375	26-28	240-280	10-18	12.2-14.3
1/2"	0.500	12.7	.045	1.1	325-375	27-29	400-550	12-18	10.5-14.4
1/2"	0.500	12.7	.052	1.3	350-425	28-30	360-485	10-15	12.6-17.0
1/2"	0.500	12.7	1/16	1.6	350-450	28-30	250-350	9.15	12.8-17.9

\*Shielding gas: 90% Ar/10% CO<sub>2</sub> at 35-50 cfh 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. Steel Reel™	45-lb. Steel Reel™	60-lb. Spool	600-lb. Robo-Pak®	950-lb. Recyclable RoboPak
0.035	0.9	S307308-033	S307308-045	S307308-028	S307308-011	S307308-070
0.045	1.1	S307312-033	S307312-045	S307312-028	S307312-011	S307312-070
0.052	1.3	--	--	S307315-028	S307315-011	S307315-070
1/16	1.6	S307318-033	--	S307318-028	--	--

\*Other packages may be available. Contact your Hobart Brothers representative for questions on package information.

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.

QuantumArc, Steel Reel and Seamchaser are trademarks of Hobart Brothers Company, Troy, Ohio. RoboPak is registered trademark of Hobart Brothers Company.