

Replaces: 091001

AWS ER70S-6

**DESCRIPTION:**

**QUANTUM ARC 6** is a mild steel, copper-coated solid wire that is ideal for general fabrication. Designed for use with CO<sub>2</sub> and argon-rich shielding gases, QUANTUM ARC 6 is an excellent choice for welding light to moderately scaled or lightly rusted plates because its high deoxidizer content reduces the need for some pre-cleaning. In addition to an exceptionally stable and smooth arc, it has good wetting action plus good feedability, making it especially suitable for high-duty cycle applications.

**APPLICATIONS:**

Automotive frames or structures, farm implements, construction equipment, pressure vessels, pipe 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
- Excellent wetting characteristics
- High in deoxidizers

**BENEFITS:**

- Consistent feeding, greater productivity
- Repeatable weld parameters
- Increased consumable life
- Feeds well through longer gun cables
- Smooth weld beads with uniform tie-in
- Best choice for rusty and oily plates, preferred over ER70S-3 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>	92% Ar/8% CO <sub>2</sub>
Carbon (C)	.06-.15	0.10	0.09	0.09	0.07	0.07
Manganese (Mn)	1.40-1.85	1.54	1.13	1.15	1.27	1.27
Silicon (Si)	0.80—1.15	0.92	0.59	0.65	0.73	0.74
Phosphorus (P)	0.025 max	0.013	0.011	0.011	0.008	0.008
Sulphur (S)	0.025 max	0.013	0.012	0.012	0.017	0.017
Copper (Cu)	.50†	0.13	0.13	0.12	0.14	0.14

† 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>	92% Ar/8% CO <sub>2</sub>
Tensile Strength	70,000 psi (min)	86,000 psi (593 MPa)	88,000 psi (607 MPa)	86,000 psi (614 MPa)	86,900 psi (600 MPa)
Yield Strength	58,000 psi (min)	69,000 psi (476 MPa)	73,000 psi (503 MPa)	71,000 psi (510 MPa)	71,300 psi (492 MPa)
Elongation % in 2"	22.0%	28.0%	28.5%	20.0%	22.0%
Reduction in Area	not specified	68.0%	68.0%	42.8%	48.0%

**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>	92% Ar/8% CO <sub>2</sub>
Avg. at room temperature	not specified	96 ft-lbs (130 J)	140 ft-lbs (190 J)	—	—
Avg. at 0°F (-18°C)	not specified	65 ft-lbs (88 J)	100 ft-lbs (136 J)	—	—
Avg. at -20°F (-29°C)	20 ft-lbs (min)	50 ft-lbs (68 J)	88 ft-lbs (119 J)	65 ft-lbs (88 J)	55 ft-lbs (75 J)
Avg. at -40°F (-40°C)	not specified	45 ft-lbs (61 J)	75 ft-lbs (102 J)	—	—
Avg. at -60°F (-51°C)	not specified	43 ft-lbs (58 J)	48 ft-lbs (65 J)	—	—

**CONFORMANCES AND APPROVALS:**

AWS A5.18, ER70S-6 • ASME SFA 5.18, F-6, A-1 • CWB to CSA W48

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

Material Thickness <sup>1</sup>			Electrode Diameter		Welding Current (DC)	Arc Voltage (electrode)	Wire Feed Speed	Travel Speed	Deposition Rate
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 cfm.

### SPRAY TRANSFER WELDING PARAMETERS\*:

Material Thickness <sup>1</sup> size in. (decimal) mm	Electrode Diameter in. mm	Welding Current (DC) amps	Arc Voltage (electrode positive)	Wire Feed Speed ipm	Travel Speed ipm	Deposition Rate lbs/hr
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 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. Steel Reel™	45-lb. Steel Reel™	45-lb. Spool	60-lb. Spool	500-lb. RoboPak®	600-lb. RoboPak®	300-lb. Recyclable RoboPak®	600-lb. Recyclable RoboPak®	950-lb. Recyclable RoboPak®
0.035 0.9	S307608-033	S307608-045	S307608-085	S307608-028	—	S307608-011	S307608-073	S307608-074	S307608-070
0.040 1.0	—	—	S307610-085	—	—	—	—	—	—
0.045 1.2	S307612-033	S307612-045	S307612-085	S307612-028	—	S307612-011	—	S307612-074	S307612-070
0.052 1.3	—	—	—	S307615-028	—	—	—	—	S307615-070
1/16 1.6	—	—	S307618-045	S307618-028	S307618-013	—	—	—	—

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