

## Spoolarc 65

Spoolarc 65 is a triple deoxidized (Aluminum, Titanium, Zirconium) welding wire designed for welding over rust and mill scale. The less fluid weld puddle of Spoolarc 65 makes it easy to control when used out of position. Spoolarc 65 is the preferred wire for all position welding of small diameter pipe. It is available in forms suitable for MIG and TIG welding.

### Specifications

|                        |                                                                              |
|------------------------|------------------------------------------------------------------------------|
| <b>Classifications</b> | AWS A5.18 : ER70S-2 H4                                                       |
| <b>Industry</b>        | Power Generation<br>Military Applications<br>Pipeline<br>Ship/Barge Building |

### Typical Tensile Properties

| Condition                        | Yield Strength     | Tensile Strength   | Elongation |
|----------------------------------|--------------------|--------------------|------------|
| <b>98% Ar - 2% O<sub>2</sub></b> |                    |                    |            |
| As Welded                        | 480 MPa ( 70 ksi ) | 565 MPa ( 82 ksi ) | 26 %       |
| <b>100% Ar</b>                   |                    |                    |            |
| As Welded                        | 460 MPa ( 67 ksi ) | 545 MPa ( 79 ksi ) | 26 %       |

### Typical Charpy V-Notch Properties

| Condition                        | Testing Temperature | Impact Value      |
|----------------------------------|---------------------|-------------------|
| <b>98% Ar - 2% O<sub>2</sub></b> |                     |                   |
| As Welded                        | -29 °C ( -20 °F )   | 61 J ( 45 ft-lb ) |
| <b>100% Ar</b>                   |                     |                   |
| As Welded                        | -29 °C ( -20 °F )   | 47 J ( 35 ft-lb ) |

### Typical Wire Composition %

| C    | Mn   | Si   | S     | P     | Ni   | Cr   | Mo   | V    | Al   |
|------|------|------|-------|-------|------|------|------|------|------|
| 0.06 | 1.14 | 0.50 | 0.006 | 0.004 | 0.03 | 0.06 | 0.01 | 0.01 | 0.08 |

### Typical Wire Composition %

| Cu   | Ti   | Zr   |
|------|------|------|
| 0.10 | 0.10 | 0.04 |

### Deposition Data

| Diameter               | Current | Voltage | Wire Feed Speed                | Deposition Type | Deposition Rate            |
|------------------------|---------|---------|--------------------------------|-----------------|----------------------------|
| 0.9 mm<br>( .035 in. ) | 180 A   | 25 V    | 1016 cm/min<br>( 400 in./min ) | Spray Transfer  | 2.9 kg/h<br>( 6.3 lbs/h )  |
| 0.9 mm<br>( .035 in. ) | 197 A   | 26 V    | 1143 cm/min<br>( 450 in./min ) | Spray Transfer  | 3.2 kg/h<br>( 7.1 lbs/h )  |
| 0.9 mm<br>( .035 in. ) | 213 A   | 26 V    | 1270 cm/min<br>( 500 in./min ) | Spray Transfer  | 3.6 kg/h<br>( 7.9 lbs/h )  |
| 0.9 mm<br>( .035 in. ) | 230 A   | 27 V    | 1397 cm/min<br>( 550 in./min ) | Spray Transfer  | 4.0 kg/h<br>( 8.7 lbs/h )  |
| 1.2 mm<br>( .045 in. ) | 260 A   | 25 V    | 762 cm/min<br>( 300 in./min )  | Spray Transfer  | 3.6 kg/h<br>( 7.9 lbs/h )  |
| 1.2 mm<br>( .045 in. ) | 280 A   | 26 V    | 889 cm/min<br>( 350 in./min )  | Spray Transfer  | 4.2 kg/h<br>( 9.2 lbs/h )  |
| 1.2 mm<br>( .045 in. ) | 300 A   | 28 V    | 1016 cm/min<br>( 400 in./min ) | Spray Transfer  | 4.8 kg/h<br>( 10.5 lbs/h ) |
| 1.2 mm<br>( .045 in. ) | 320 A   | 29 V    | 1143 cm/min<br>( 450 in./min ) | Spray Transfer  | 5.4 kg/h<br>( 11.8 lbs/h ) |

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### Deposition Data

| Diameter             | Current | Voltage | Wire Feed Speed              | Deposition Type    | Deposition Rate          |
|----------------------|---------|---------|------------------------------|--------------------|--------------------------|
| 1.2 mm<br>(.045 in.) | 340 A   | 30 V    | 1270 cm/min<br>(500 in./min) | Spray Transfer     | 6.0 kg/h<br>(13.1 lbs/h) |
| 1.6 mm<br>(1/16 in.) | 290 A   | 26 V    | 457 cm/min<br>(180 in./min)  | Spray Transfer     | 4.1 kg/h<br>(9.1 lbs/h)  |
| 1.6 mm<br>(1/16 in.) | 310 A   | 28 V    | 508 cm/min<br>(200 in./min)  | Spray Transfer     | 4.6 kg/h<br>(10.1 lbs/h) |
| 1.6 mm<br>(1/16 in.) | 340 A   | 31 V    | 584 cm/min<br>(230 in./min)  | Spray Transfer     | 5.3 kg/h<br>(11.6 lbs/h) |
| 1.6 mm<br>(1/16 in.) | 370 A   | 34 V    | 660 cm/min<br>(260 in./min)  | Spray Transfer     | 6.0 kg/h<br>(13.2 lbs/h) |
| 1.6 mm<br>(1/16 in.) | 390 A   | 36 V    | 711 cm/min<br>(280 in./min)  | Spray Transfer     | 6.4 kg/h<br>(14.2 lbs/h) |
| 0.9 mm<br>(.035 in.) | 90 A    | 15 V    | 457 cm/min<br>(180 in./min)  | Short Arc Transfer | 1.2 kg/h<br>(2.7 lbs/h)  |
| 0.9 mm<br>(.035 in.) | 113 A   | 16 V    | 559 cm/min<br>(220 in./min)  | Short Arc Transfer | 1.5 kg/h<br>(3.3 lbs/h)  |
| 0.9 mm<br>(.035 in.) | 137 A   | 18 V    | 660 cm/min<br>(260 in./min)  | Short Arc Transfer | 1.8 kg/h<br>(4.0 lbs/h)  |
| 0.9 mm<br>(.035 in.) | 160 A   | 19 V    | 762 cm/min<br>(300 in./min)  | Short Arc Transfer | 2.1 kg/h<br>(4.6 lbs/h)  |
| 1.2 mm<br>(.045 in.) | 130 A   | 17 V    | 318 cm/min<br>(125 in./min)  | Short Arc Transfer | 1.4 kg/h<br>(3.1 lbs/h)  |
| 1.2 mm<br>(.045 in.) | 163 A   | 18 V    | 406 cm/min<br>(160 in./min)  | Short Arc Transfer | 1.8 kg/h<br>(4.0 lbs/h)  |
| 1.2 mm<br>(.045 in.) | 200 A   | 19 V    | 508 cm/min<br>(200 in./min)  | Short Arc Transfer | 2.3 kg/h<br>(5.0 lbs/h)  |

### Recommended Welding Parameters

| Current                   | Wire Diameter        | Voltage | Wire Feed Speed                       |
|---------------------------|----------------------|---------|---------------------------------------|
| <b>Short Arc Transfer</b> |                      |         |                                       |
| 45-90 A                   | 0.6 mm<br>(.023 in.) | 14-16 V | 381-965 cm/min<br>(150-380 in./min)   |
| 70 A                      | 0.6 mm<br>(.023 in.) | 15 V    | 762 cm/min<br>(300 in./min)           |
| 110 A                     | 0.6 mm<br>(.023 in.) | 23 V    | 1143 cm/min<br>(450 in./min)          |
| 100-125 A                 | 0.6 mm<br>(.023 in.) | 23-25 V | 1016-1575 cm/min<br>(400-620 in./min) |
| 160-200 A                 | 0.8 mm<br>(.030 in.) | 24-26 V | 1270-1651 cm/min<br>(500-650 in./min) |
| 60-140 A                  | 0.8 mm<br>(.030 in.) | 14-16 V | 381-889 cm/min<br>(150-350 in./min)   |
| 100 A                     | 0.8 mm<br>(.030 in.) | 15 V    | 559 cm/min<br>(220 in./min)           |
| 180 A                     | 0.8 mm<br>(.030 in.) | 25 V    | 1321 cm/min<br>(520 in./min)          |
| 90-160 A                  | 0.9 mm<br>(.035 in.) | 15-19 V | 457-762 cm/min<br>(180-300 in./min)   |
| 200 A                     | 0.9 mm<br>(.035 in.) | 26 V    | 1219 cm/min<br>(480 in./min)          |

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| Current                       | Wire Diameter        | Voltage | Wire Feed Speed                       |
|-------------------------------|----------------------|---------|---------------------------------------|
| 180-230 A                     | 0.9 mm<br>(.035 in.) | 25-27 V | 1016-1397 cm/min<br>(400-550 in./min) |
| 130 A                         | 0.9 mm<br>(.035 in.) | 17 V    | 635 cm/min<br>(250 in./min)           |
| 260-340 A                     | 1.2 mm<br>(.045 in.) | 25-30 V | 762-1270 cm/min<br>(300-500 in./min)  |
| 130-200 A                     | 1.2 mm<br>(.045 in.) | 17-19 V | 318-508 cm/min<br>(125-200 in./min)   |
| 160 A                         | 1.2 mm<br>(.045 in.) | 18 V    | 381 cm/min<br>(150 in./min)           |
| 300 A                         | 1.2 mm<br>(.045 in.) | 27 V    | 889 cm/min<br>(350 in./min)           |
| 160 A                         | 1.4 mm<br>(.052 in.) | 18 V    | 356 cm/min<br>(140 in./min)           |
| 150-200 A                     | 1.4 mm<br>(.052 in.) | 17-20 V | 343-483 cm/min<br>(135-190 in./min)   |
| 275-400 A                     | 1.4 mm<br>(.052 in.) | 26-33 V | 673-991 cm/min<br>(265-390 in./min)   |
| 325 A                         | 1.4 mm<br>(.052 in.) | 28 V    | 787 cm/min<br>(310 in./min)           |
| 290-400 A                     | 1.6 mm<br>(1/16 in.) | 26-36 V | 457-711 cm/min<br>(180-280 in./min)   |
| 340 A                         | 1.6 mm<br>(1/16 in.) | 27 V    | 508 cm/min<br>(200 in./min)           |
| <b>Spray Transfer Optimum</b> |                      |         |                                       |
| 45-90 A                       | 0.6 mm<br>(.023 in.) | 14-16 V | 381-965 cm/min<br>(150-380 in./min)   |
| 70 A                          | 0.6 mm<br>(.023 in.) | 15 V    | 762 cm/min<br>(300 in./min)           |
| 110 A                         | 0.6 mm<br>(.023 in.) | 23 V    | 1143 cm/min<br>(450 in./min)          |
| 100-125 A                     | 0.6 mm<br>(.023 in.) | 23-25 V | 1016-1575 cm/min<br>(400-620 in./min) |
| 160-200 A                     | 0.8 mm<br>(.030 in.) | 24-26 V | 1270-1651 cm/min<br>(500-650 in./min) |
| 60-140 A                      | 0.8 mm<br>(.030 in.) | 14-16 V | 381-889 cm/min<br>(150-350 in./min)   |
| 100 A                         | 0.8 mm<br>(.030 in.) | 15 V    | 559 cm/min<br>(220 in./min)           |
| 180 A                         | 0.8 mm<br>(.030 in.) | 25 V    | 1321 cm/min<br>(520 in./min)          |
| 90-160 A                      | 0.9 mm<br>(.035 in.) | 15-19 V | 457-762 cm/min<br>(180-300 in./min)   |
| 200 A                         | 0.9 mm<br>(.035 in.) | 26 V    | 1219 cm/min<br>(480 in./min)          |
| 180-230 A                     | 0.9 mm<br>(.035 in.) | 25-27 V | 1016-1397 cm/min<br>(400-550 in./min) |
| 130 A                         | 0.9 mm<br>(.035 in.) | 17 V    | 635 cm/min<br>(250 in./min)           |
| 260-340 A                     | 1.2 mm<br>(.045 in.) | 25-30 V | 762-1270 cm/min<br>(300-500 in./min)  |

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| Current               | Wire Diameter        | Voltage | Wire Feed Speed                       |
|-----------------------|----------------------|---------|---------------------------------------|
| 130-200 A             | 1.2 mm<br>(.045 in.) | 17-19 V | 318-508 cm/min<br>(125-200 in./min)   |
| 160 A                 | 1.2 mm<br>(.045 in.) | 18 V    | 381 cm/min<br>(150 in./min)           |
| 300 A                 | 1.2 mm<br>(.045 in.) | 27 V    | 889 cm/min<br>(350 in./min)           |
| 160 A                 | 1.4 mm<br>(.052 in.) | 18 V    | 356 cm/min<br>(140 in./min)           |
| 150-200 A             | 1.4 mm<br>(.052 in.) | 17-20 V | 343-483 cm/min<br>(135-190 in./min)   |
| 275-400 A             | 1.4 mm<br>(.052 in.) | 26-33 V | 673-991 cm/min<br>(265-390 in./min)   |
| 325 A                 | 1.4 mm<br>(.052 in.) | 28 V    | 787 cm/min<br>(310 in./min)           |
| 290-400 A             | 1.6 mm<br>(1/16 in.) | 26-36 V | 457-711 cm/min<br>(180-280 in./min)   |
| 340 A                 | 1.6 mm<br>(1/16 in.) | 27 V    | 508 cm/min<br>(200 in./min)           |
| <b>Spray Transfer</b> |                      |         |                                       |
| 45-90 A               | 0.6 mm<br>(.023 in.) | 14-16 V | 381-965 cm/min<br>(150-380 in./min)   |
| 70 A                  | 0.6 mm<br>(.023 in.) | 15 V    | 762 cm/min<br>(300 in./min)           |
| 110 A                 | 0.6 mm<br>(.023 in.) | 23 V    | 1143 cm/min<br>(450 in./min)          |
| 100-125 A             | 0.6 mm<br>(.023 in.) | 23-25 V | 1016-1575 cm/min<br>(400-620 in./min) |
| 160-200 A             | 0.8 mm<br>(.030 in.) | 24-26 V | 1270-1651 cm/min<br>(500-650 in./min) |
| 60-140 A              | 0.8 mm<br>(.030 in.) | 14-16 V | 381-889 cm/min<br>(150-350 in./min)   |
| 100 A                 | 0.8 mm<br>(.030 in.) | 15 V    | 559 cm/min<br>(220 in./min)           |
| 180 A                 | 0.8 mm<br>(.030 in.) | 25 V    | 1321 cm/min<br>(520 in./min)          |
| 90-160 A              | 0.9 mm<br>(.035 in.) | 15-19 V | 457-762 cm/min<br>(180-300 in./min)   |
| 200 A                 | 0.9 mm<br>(.035 in.) | 26 V    | 1219 cm/min<br>(480 in./min)          |
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| 260-340 A             | 1.2 mm<br>(.045 in.) | 25-30 V | 762-1270 cm/min<br>(300-500 in./min)  |
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| 275-400 A                         | 1.4 mm<br>(.052 in.) | 26-33 V | 673-991 cm/min<br>(265-390 in./min)   |
| 325 A                             | 1.4 mm<br>(.052 in.) | 28 V    | 787 cm/min<br>(310 in./min)           |
| 290-400 A                         | 1.6 mm<br>(1/16 in.) | 26-36 V | 457-711 cm/min<br>(180-280 in./min)   |
| 340 A                             | 1.6 mm<br>(1/16 in.) | 27 V    | 508 cm/min<br>(200 in./min)           |
| <b>Short Arc Transfer Optimum</b> |                      |         |                                       |
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