



ER70S-3

Specification Compliance: AISI/AWS A5.18 & ASME SFA 5.18 ER 70S-3

Description: ER70S-3 is a premium mild steel solid wire, with silicon and manganese levels suitable for general purpose welding over clean to light levels of rust and mill scale. ER70S-3 has the flexibility to provide trouble-free performance in heavy-duty, high-speed spray or pulse applications to lighter duty, lower speed short-arc applications. ER70S-3 is designed for use with various gas mixtures such as 100% CO₂, 75/25 Ar/CO₂ or 98/2 Ar/O₂. Even in the most difficult applications ER70S-3 produces a smooth stable arc with low spatter, producing a weld bead that ties in evenly with the sides and has a smooth finished appearance.

Applications: Frame fabrication, automotive structures, farm implements, construction equipment, pressure vessels, pipe fabrication, railcar construction and repair, general fabrication. Widely used in high-speed robotic and automatic welding applications and semi-automatic applications.

Nominal Composition:

| | | | | | |
|------------|-------------|----------|-------------|--------------|--------------|
| Carbon | .06-.15 % | Copper | .50 % max. | Manganese | 0.90-1.40 % |
| Silicon | 0.45-0.75% | Sulfur | .035 % max. | Phosphorus | 0.025 % max. |
| Nickel | 0.15 % max. | Chromium | 0.15 % max. | Vanadium | 0.03% max. |
| Molybdenum | 0.15 % max. | Iron | Balance | Others Total | .50 % max. |

Physical Properties:

Density lbs/cu in .283

Typical Mechanical Properties As Welded (Gmaw)

| | | | |
|-------------------------|-----------------|----------------------------|--------------------------|
| Shielding Gas | CO ₂ | 75% Ar/25% CO ₂ | 98% Ar/2% O ₂ |
| Tensile Strength (psi) | 74-77,000 | 75-78,000 | 80-83,000 |
| Yield Strength (psi) | 60,400 | 62-65,000 | 64-66,200 |
| Elongation % in 2" | 28% | 25.6% | 22.2% |
| Reduction of area | 35-70% | 35-70% | 35-70% |
| Charpy V-notch ft. lbs. | 78-81 | 63-65 | 58-61 |

Recommended Welding Parameters:

GMAW(MIG) Parameters (DC Reverse Polarity) Electrode Positive Spray transfer:

| <u>Wire Dia.</u> | <u>Amps</u> | <u>Volts</u> | <u>Argon/ 1-5% O₂</u> | <u>Wire Feed ipm</u> |
|------------------|-------------|--------------|----------------------------------|----------------------|
| .023 | 85-170 | 23-27 | 25 | 360-620 |
| .030 | 135-230 | 24-28 | 25 | 390-670 |
| .035 | 165-300 | 24-28 | 30 | 360-520 |
| .045 | 200-375 | 24-30 | 30-35 | 210-390 |
| 1/16 | 275-500 | 24-32 | 40 | 150-360 |
| 3/32 | 300-600 | 24-33 | 50 | 75-125 |

GTAW (Tig) Parameters (DCSP) 2 % Thoriated Tungsten Electrode negative

| <u>Material</u> | <u>Tungsten dia</u> | <u>Filler Wire Size</u> | <u>Amps</u> | <u>Gas Cup</u> | <u>Argon(cfh)</u> |
|-----------------|---------------------|-------------------------|-------------|----------------|-------------------|
| 1/16" | 1/16" | 1/16" | 100-140 | 3/8 | 20 |
| 3/32" | 1/16" | 1/16" | 100-160 | 3/8 | 20 |
| 1/8" | 3/32" | 1/16" | 125-200 | 7/16 | 20 |
| 3/16" | 3/32" | 3/32" | 150-250 | 7/16 | 25 |
| 1/4" | 1/8" | 1/8" | 150-250 | 1/2 | 25 |
| 3/8" | 1/8" | 1/8" | 150-275 | 1/2 | 25 |
| 1/2" | 1/8" | 1/8" | 150-300 | 1/2 | 25 |

*** All parameters are suggested as basic guidelines and will vary depending on joint design number of passes, and other factors.**

Notice: The results reported are based upon testing of the product under controlled laboratory conditions in accordance with American Welding Society Standards. Actual use of the product may produce different results due to varying conditions. An example of such conditions would be electrode size, plate chemistry, environment, weldment design, fabrication methods, welding procedure and service requirements. Thus the results are not guarantees for use in the field. The manufacturer disclaims any warranty of merchantability or fitness for any particular purpose with respect to its products.

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