

S-9018.B3

COVERED ARC WELDING ELECTRODE
FOR WELDING 2.25% Cr – 1% Mo STEEL



❖ Specification

| | |
|------------------|---------------|
| <i>AWS A5.5</i> | E9018-B3 |
| <i>JIS Z3223</i> | DT2416 |
| <i>EN 1599</i> | E CrMo2 B 3 2 |

❖ Applications

Welding of 2.25% Cr – 1% Mo steel used for main steam pipes of boilers for electric power plant and marine use, equipment for oil refining industries and high temperature synthetic industries.
Welding of 2.25%Cr-1%Mo steel casting.

❖ Characteristics on Usage

S-9018.B3 is an iron powder, low hydrogen type electrode. Its coating contains much iron powder, increasing working efficiency. Owing to this high working efficiency, it is most suitable for welding thick main pipes and steel castings.

❖ Note on Usage

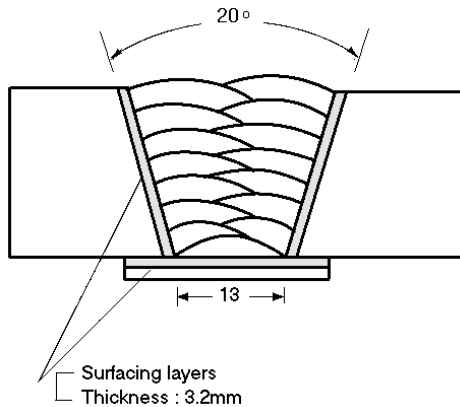
1. Dry the electrodes at 350~400°C (662~752°F) for 30~60 minutes before use.
2. Keep the arc as short as possible, and avoid large width weaving.
3. Adopt back step method or strike the arc on a small steel plate prepared for this particular purpose to prevent blowholes at the arc starting.
4. Use the wind screen against strong wind.



Mechanical Properties & Chemical Compositions of all-Weld Metal

❖ **Welding Conditions**

Method by AWS Rules



Diameter, mm(in) : 4.0 X 400(5/32 X 16)
 Amp./ Volt. : 170 / 24 ~ 26
 Interpass Temp. °C(°F) : 130~145(266~293)
 Polarity : AC or DC +

[Joint Preparation & Layer Details]

❖ **Mechanical Properties of The Weld Metal**

| consumable | Tensile test | | | PWHT | |
|------------|-----------------|-----------------|--------|-----------------|------|
| | YS MPa (ksi) | TS MPa (ksi) | EL (%) | Temp. °C(°F) | Time |
| S-9018.B3 | 670(97) | 760(110) | 24 | 690(1274) | 1hr |
| AWS Spec. | ≥530(77) | ≥620(90) | ≥17 | 690(1274) | 1hr |

❖ **Chemical Analysis of The Weld Metal(wt%)**

| Consumable | Chemical Composition (%) | | | | | | |
|------------|--------------------------|----------|----------|----------|----------|-------------|-------------|
| | C | Si | Mn | P | S | Cr | Mo |
| S-9018.B3 | 0.07 | 0.5 | 0.7 | 0.013 | 0.01 | 2.2 | 1.1 |
| AWS Spec. | 0.05 ~ 0.12 | 0.80 max | 0.90 max | 0.03 max | 0.03 max | 2.00 ~ 2.50 | 0.90 ~ 1.20 |

This information is provided solely for the purpose of confirming product conformance with applicable standards. The serviceability of a product or structure utilizing this type of information is and must be the sole responsibility of the builder/user. Many variables beyond the control of HYUNDAI WELDING CO., LTD. affect the results obtained in applying this type of information. These variables include, but are not limited to, welding procedure, shielding gas, plate chemistry and temperature, weldment design, fabrication methods and service requirements.



Welding Efficiency & Bending Test

❖ Test Conditions of Deposition Efficiency

| Consumable | Base Metal | | Welding conditions | | |
|---|---------------|-----------------------------------|--------------------|------------------------|----------|
| | Specification | Dimension, mm(in) | Amp. (A) | Welding speed (mm/min) | Position |
| S-9018.B3 (4.0 x 400 mm) (5/32 x 16 in) | ASTM A36 | 300 X 100 X12 (12 X 3.9 X 0.5) | 180 | 200 | Flat |

❖ Results of Deposition Efficiency Test

| Consumable | Deposition efficiency (%) | |
|---|---------------------------|---------------|
| | For electrode | For core wire |
| S-9018.B3 (4.0 x 400 mm) (5/32 x 16 in) | 65 ~ 70 | 110 ~ 120 |

❖ Results of Bending Test

| Consumable | Face | Root | Side |
|---|------|------|------|
| S-9018.B3 (4.0 x 400 mm) (5/32 x 16 in) | Good | Good | Good |

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**Weldability
& Diffusible Hydrogen Contents & Proper Welding conditions**

❖ **Weldability**

| Item | Division | Flat position | Vertical position |
|----------------------------------|---------------|---------------|-------------------|
| | Arc stability | | Good |
| Melting rate | | Excellent | Excellent |
| Deposition rate | | Excellent | Excellent |
| Resistance of spatter occurrence | | Good | Good |
| Bead appearance | | Good | Good |
| Slag detachability | | Excellent | Excellent |
| The others | | Good | Good |

❖ **Diffusible Hydrogen Contents of Weld Metal**

| Consumable | Welding current | Diffusible hydrogen contents (ml/gr. Weld metal) | | | | | Test method |
|---|-----------------|--|----------------|----------------|----------------|------|-------------------|
| | | X ₁ | X ₂ | X ₃ | X ₄ | Avg. | |
| S-9018.B3 (4.0 x 400 mm) (5/32 x 16 in) | AC 170 Amp. | 4.68 | 5.20 | 4.87 | 5.97 | 5.18 | Gas Chromatograph |

❖ **Sizes Available and Recommended Currents**

| Diameter, mm(in) | | 2.6 (3/32) | 3.2 (1/8) | 4.0 (5/32) | 5.0 (3/16) | 6.0 (15/64) |
|---|------------------------------|---------------|--------------|---------------|---------------|----------------|
| Length, mm(in) | | 350(14) | 350(14) | 400(16) | 400(16) | 450 |
| Recommended current range (AC or DC + Amp.) | Flat position | 55~90 | 90~130 | 130~190 | 190~250 | 250~300 |
| | Vertical & Overhead position | 50~80 | 80~120 | 120~170 | - | - |

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