



ISO 9001:2015 REGISTERED
Certificate No.: 50040 & 50415

E81T1-B2C/B2M DATA SHEET

Pinnacle Alloys E81T1-B2C/B2M

AWS CLASS E81T1-B2C, E81T1-B2M

CODE AND SPECIFICATION DATA:

AWS A5.29 ASME SFA 5.29; UNS W52031

DESCRIPTION:

Pinnacle Alloys E81T1-B2C/B2M has a nominal composition (wt-%) of 1.25 Cr, 0.5 Mo. Filler metals of this classification are used to weld $\frac{1}{2}$ Cr- $\frac{1}{2}$ Mo, 1Cr- $\frac{1}{2}$ Mo, $\frac{1}{4}$ Cr- $\frac{1}{2}$ Mo steels for elevated temperatures and corrosive service. These creep resistant steels are typically used in chemical industries for heat exchangers, boilers, piping and pressure vessels at service temperatures up to 1000°F. Careful control of preheat, interpass temperatures, and post heat is essential to avoid cracking. These electrodes are classified after post weld heat treatment. Special care must be used when using them in the as-welded condition due to high strength levels. Preheat and interpass temperatures are typically kept between 325-375°F. This filler metal is used in the PWHT condition, typically around 1275°F for one hour.

DIAMETERS: .035", .045", .052", 1/16"

WELDING POSITIONS: All positions



TYPICAL DEPOSIT COMPOSITION:

| | AWS Spec | Weld Metal Analysis (%) | |
|-----------------|-----------|-------------------------|-----------------------------|
| | | 100% CO ₂ | 75% Ar/ 25% CO ₂ |
| Carbon (C) | 0.05-0.12 | 0.07 | 0.09 |
| Chromium (Cr) | 1.00-1.50 | 1.31 | 1.32 |
| Manganese (Mn) | 1.25 | 0.81 | 0.85 |
| Molybdenum (Mo) | 0.40-0.65 | 0.45 | 0.49 |
| Phosphorus (P) | 0.03 | 0.01 | 0.01 |
| Silicon (Si) | 0.80 | 0.60 | 0.60 |
| Sulfur (S) | 0.03 | 0.01 | 0.01 |

NOTE: Single values are maximums.

www.pinnaclealloys.com

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TYPICAL MECHANICAL PROPERTIES:

| 100% CO ₂ Shielding Gas | AWS Spec (min) | SR 1 HR @ 1275°F |
|------------------------------------|----------------------------------|----------------------|
| Ultimate Tensile Strength | 80,000-100,000 psi (550-690 MPa) | 94,200 psi (650 MPa) |
| Yield Strength | 68,000 psi (470 MPa) | 84,200 psi (580 MPa) |
| Percent Elongation in 2" | 19% | 20% |

| 75% Ar/ 25% CO ₂ Shielding Gas | AWS Spec (min) | SR 1 HR @ 1275°F |
|---|----------------------------------|----------------------|
| Ultimate Tensile Strength | 80,000-100,000 psi (550-690 MPa) | 98,900 psi (680 MPa) |
| Yield Strength | 68,000 psi (470 MPa) | 85,200 psi (590 MPa) |
| Percent Elongation in 2" | 19% | 22% |

TYPICAL WELDING PARAMETERS:

| Diameter | Position | Optimum | | | Amperage Range | Voltage Range |
|----------|-------------|----------|---------|-----------|----------------|---------------|
| | | Amperage | Voltage | WFS (ipm) | | |
| .045" | Flat | 250 | 28 | 450 | 130-300 | 21-32 |
| | Overhead | 190 | 26 | 305 | 150-280 | 21-30 |
| | Vertical Up | 190 | 25 | 305 | 130-260 | 21-29 |
| .052" | Flat | 275 | 28 | 400 | 140-330 | 19-32 |
| | Overhead | 200 | 26 | 245 | 150-290 | 21-28 |
| | Vertical Up | 200 | 25 | 245 | 140-270 | 21-27 |
| 1/16" | Flat | 330 | 29 | 330 | 150-400 | 22-34 |
| | Overhead | 225 | 26 | 180 | 150-310 | 22-28 |
| | Vertical Up | 225 | 25 | 180 | 150-280 | 22-26 |

NOTE: Parameters reflect CO₂ shielding gas - reduce by 1-1½ volts when using 75-80% Ar/ balance CO₂. Maintaining a proper welding procedure, including pre-heat and interpass temperatures, may be critical depending on the type and thickness of steel being welded.

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 the use in the field. The manufacturer disclaims any warranty of merchantability of fitness for any particular purpose with respect to its products.

CAUTION: Consumers should be thoroughly familiar with the safety precautions on the warning label posted in each shipment and in the American National Standards A49.1, "Safety in Welding and Cutting," published by the American Welding Society, 8669 NW 36 Street, #130, Miami, FL 33126: OSHA Safety and Health Standards 29 CFR 1910 is available from the U.S. Department of Labor, Washington, D.C. 20210.

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Pinnacle Alloys SDS sheets may be obtained on the website below.