



## ER80S-B3L DATA SHEET

### Pinnacle Alloys ER80S-B3L

AWS CLASS ER80S-B3L

#### CODE AND SPECIFICATION DATA:

AWS A5.28 ASME SFA 5.28; UNS K30560

#### DESCRIPTION:

Pinnacle Alloys ER80S-B3L has a nominal composition (wt-%) of **2.25 Cr, 1 Mo, with C restricted to 0.05 maximum**. Filler metals of this classification are used to weld materials such as ASTM A 387 Gr 21 & 22, A 182 F22, and A 217 WC9. These creep resistant steels are typically used in chemical industries for heat exchangers, boilers, piping and pressure vessels at service temperatures up to 1100°F. Due to the low carbon content, and thus lower strength level, this alloy exhibits greater resistance to cracking and is more suitable for welds to be left in the as welded condition than ER90S-B3. This classification was previously ER90S-B3L in the A5.28-79 specification. The strength requirements and classification designator have been changed to reflect the true strength capabilities of the chemical composition. Preheat and interpass temperatures are typically kept between 375-425°F. This filler metal is used in the PWHT condition, typically around 1275°F for one hour.

**DIAMETERS:** .035", .045", 1/16", 3/32", 1/8", 5/32"

**WELDING POSITIONS:** All positions

GMAW spray transfer limited to flat and horizontal fillet positions only



#### TYPICAL DEPOSIT COMPOSITION:

|                 | AWS Spec  | Weld Metal Analysis (%) |
|-----------------|-----------|-------------------------|
| Carbon (C)      | 0.05      | 0.042                   |
| Chromium (Cr)   | 2.30-2.70 | 2.374                   |
| Copper (Cu)     | 0.35      | 0.050                   |
| Manganese (Mn)  | 0.40-0.70 | 0.615                   |
| Molybdenum (Mo) | 0.90-1.20 | 0.960                   |
| Nickel (Ni)     | 0.20      | 0.061                   |
| Phosphorus (P)  | 0.025     | 0.009                   |
| Silicon (Si)    | 0.40-0.70 | 0.504                   |
| Sulfur (S)      | 0.025     | 0.007                   |

NOTE: Single values are maximums.



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CERTIFICATE NO.: C755336

**TYPICAL MECHANICAL PROPERTIES:**

|                           | <b>AWS Spec (min)</b> | <b>SR 1 HR @ 1275°F<br/>(GMAW)</b>  | <b>SR 1 HR @ 1275°F<br/>(GTAW)</b>  |
|---------------------------|-----------------------|-------------------------------------|-------------------------------------|
| Ultimate Tensile Strength | 80,000 psi (550 MPa)  | 82,700 psi (570 MPa)                | 79,800 psi (550 MPa)                |
| Yield Strength            | 68,000 psi (470 MPa)  | 66,700 psi (460 MPa)                | 68,000 psi (470 MPa)                |
| Percent Elongation in 2"  | 17%                   | 23%                                 | 23%                                 |
| CVN @ 68°F (20°C)         | Not required          | 110 ft•lb <sub>f</sub> (150 Joules) | 184 ft•lb <sub>f</sub> (250 Joules) |

**TYPICAL WELDING PARAMETERS:**

|                               | <b>Diameter</b> | <b>Amperage</b> | <b>Volts</b> | <b>Shielding Gas</b>      |
|-------------------------------|-----------------|-----------------|--------------|---------------------------|
| <b>GTAW</b>                   | 3/32"           | 70-210          | 9-16         | 100% Ar                   |
|                               | 1/8"            | 90-280          | 10-19        |                           |
|                               | 5/32"           | 120-320         | 10-19        |                           |
| <b>GMAW</b><br>Spray Transfer | .035"           | 200-260         | 26-32        | 98% Ar/ 2% O <sub>2</sub> |
|                               | .045"           | 240-360         | 26-34        |                           |
|                               | 1/16"           | 270-450         | 27-38        |                           |

**NOTE:** 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.

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

[www.pinnaclealloys.com](http://www.pinnaclealloys.com)

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