



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

## ER90S-B3 DATA SHEET

### Pinnacle Alloys ER90S-B3

AWS CLASS ER90S-B3

#### CODE AND SPECIFICATION DATA:

AWS A5.28 ASME SFA 5.28; UNS K30960

#### DESCRIPTION:

Pinnacle Alloys ER90S-B3 has a nominal composition (wt-%) of **2.25 Cr, 1 Mo**. 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. 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 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)	0.07-0.12	0.090
Chromium (Cr)	2.30-2.70	2.413
Copper (Cu)	0.35	0.148
Manganese (Mn)	0.40-0.70	0.560
Molybdenum (Mo)	0.90-1.20	0.938
Nickel (Ni)	0.20	0.048
Phosphorus (P)	0.025	0.008
Silicon (Si)	0.40-0.70	0.502
Sulfur (S)	0.025	0.008

NOTE: Single values are maximums.

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### TYPICAL MECHANICAL PROPERTIES:

	AWS Spec (min)	SR 1 HR @ 1275°F (GMAW)*	SR 1 HR @ 1275°F (GTAW)*
Ultimate Tensile Strength	90,000 psi (620 MPa)	94,200 psi (650 MPa)	94,200 psi (650 MPa)
Yield Strength	78,000 psi (540 MPa)	81,000 psi (560 MPa)	82,600 psi (570 MPa)
Percent Elongation in 2"	17%	20%	22%
CVN @ 68°F (20°C)	Not required	125 ft•lb <sub>f</sub> (170 Joules)	170 ft•lb <sub>f</sub> (230 Joules)

### TYPICAL WELDING PARAMETERS:

	Diameter	Amperage	Volts	Shielding Gas
<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> 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.