



E91T1-B9M DATA SHEET

Pinnacle Alloys E91T1-B9M

AWS CLASS E91T1-B9M

CODE AND SPECIFICATION DATA:

AWS A5.29, ASME SFA 5.29; UNS W50531

DESCRIPTION:

Pinnacle Alloys E91T1-B9M has a nominal composition (wt-%) of 9 Cr, 1 Mo. This filler metal contains small additions of nitrogen, niobium and vanadium to improve the creep resistance. Filler metals of this classification are used to weld materials such as ASTM A 387 Gr 91 plate, A 182 F91 forgings, and A 335 P91 piping. These creep resistant steels are typically used in power plant valves, fittings, headers and piping. Careful control of preheat, interpass temperatures, and post heat is essential to avoid cracking. These electrodes are classified after post weld heat treatment. Preheat and interpass temperatures are typically kept between 400-600°F. This filler metal is used in the PWHT condition, typically around 1400°F for two hours.

DIAMETERS: .045", .052", 1/16"**WELDING POSITIONS:** All positions**TYPICAL DEPOSIT COMPOSITION:**

	AWS Spec	Weld Metal Analysis (%)
Aluminum (Al)	0.04	<0.01
Carbon (C)	0.25	0.10
Chromium (Cr)	8.00-10.50	9.00
Manganese (Mn)	1.20	0.70
Molybdenum (Mo)	0.85-1.20	1.00
Nickle (Ni)	0.80	0.35
Niobium (Nb)	0.02-0.10	0.04
Nitrogen (N)	0.02-0.07	0.04
Phosphorus (P)	0.02	0.01
Silicon (Si)	0.50	0.25
Sulfur (S)	0.015	0.01
Vanadium (V)	0.15-0.30	0.20

NOTE: Single values are maximums.

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**TYPICAL MECHANICAL PROPERTIES:**

75% Ar/ 25% CO ₂ Shielding Gas	AWS Spec (min)	SR 2 HR @ 1375°F
Ultimate Tensile Strength	90,000-120,000 psi (620-830 MPa)	104,200 psi (718MPa)
Yield Strength	78,000 psi (540 MPa)	84,200psi (580 MPa)
Percent Elongation in 2"	16%	20%

TYPICAL WELDING PARAMETERS:

Diameter	Position	Optimum			Amperage Range	Voltage Range
		Amperage	Voltage	WFS (ipm)		
.045"	Flat	230	27	282	100-280	21-32
	Overhead	180	25	265	150-260	21-29
	Vertical Up	180	24	265	130-240	21-28
.052"	Flat	275	27	360	140-330	19-32
	Overhead	200	25	245	150-290	21-28
	Vertical Up	200	24	245	140-270	21-27
1/16"	Flat	330	28	300	150-400	22-34
	Overhead	225	25	160	150-310	22-28
	Vertical Up	225	24	160	150-280	22-27

NOTE: Parameters reflect 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 CRF 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.