



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

## ER120S-1 DATA SHEET

### Pinnacle Alloys ER120S-1

AWS CLASS ER120S-1

#### CODE AND SPECIFICATION DATA:

AWS A5.28 ASME SFA 5.28; UNS K21030

#### DESCRIPTION:

Pinnacle Alloys ER120S-1 has a nominal composition (wt-%) of **1.5 Mn, 1.75 Ni, 0.40 Mo**. These filler metals deposit high-strength, very tough weld metal for critical applications. They were originally developed for welding HY80 steel for military applications. They are also used for a variety of structural applications where tensile strength requirements exceed 120ksi, and excellent toughness is required to temperatures as low as -60°F. Mechanical properties obtained from weld deposits of this classification will vary depending on the heat input used. Typical base material applications are HY80 and HY100. Preheat and interpass temperatures are typically kept between 300-400°F. PWHT is not required.

**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 (%)
Aluminum (Al)	0.10	0.004
Carbon (C)	0.10	0.06
Chromium (Cr)	0.60	0.08
Copper (Cu)	0.25	0.12
Manganese (Mn)	1.40-1.80	1.64
Molybdenum (Mo)	0.30-0.65	0.42
Nickel (Ni)	2.00-2.80	2.06
Phosphorus (P)	0.01	0.009
Silicon (Si)	0.25-0.60	0.51
Sulfur (S)	0.01	0.007
Titanium (Ti)	0.10	0.001
Vanadium (V)	0.03	0.004
Zirconium (Zr)	0.10	0.001

NOTE: Single values are maximums.

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

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### TYPICAL MECHANICAL PROPERTIES:

	AWS Spec (min)	As Welded (GMAW)	As Welded (GTAW)
Ultimate Tensile Strength	120,000 psi (830 MPa)	124,700 psi (860 MPa)	126,000 psi (870 MPa)
Yield Strength	105,000 psi (730 MPa)	111,700 psi (770 MPa)	117,400 psi (810 MPa)
Percent Elongation in 2"	14%	16%	16%
CVN @ -60°F (-50°C)	50 ft•lb <sub>f</sub> (68 Joules)	52 ft•lb <sub>f</sub> (70 Joules)	70 ft•lb <sub>f</sub> (95 Joules)
CVN @ 68°F (20°C)	Not required	103 ft•lb <sub>f</sub> (140 Joules)	125 ft•lb <sub>f</sub> (170 Joules)
CVN @ -4°F (-30°C)	Not required	74 ft•lb <sub>f</sub> (100 Joules)	96 ft•lb <sub>f</sub> (130 Joules)
CVN @ -40°F (-40°C)	Not required	66 ft•lb <sub>f</sub> (90 Joules)	88 ft•lb <sub>f</sub> (120 Joules)

### TYPICAL WELDING PARAMETERS:

	Diameter	Amperage	Volts	Shielding Gas
GTAW	3/32"	70-210	9-16	100% Ar
	1/8"	90-280	10-19	
	5/32"	120-320	10-19	
GMAW 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 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.

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