



## ER312 DATA SHEET

**Pinnacle Alloys ER312**

AWS CLASS ER312

**CODE AND SPECIFICATION DATA:**

AWS A5.9 ASME SFA 5.9; UNS S31380

**DESCRIPTION:**

Pinnacle Alloys ER312 has a nominal composition (wt.-%) of 30 Cr, 9 Ni. Filler metals of this classification were originally designed to weld cast alloys of similar composition. It has also been found to be valuable in welding dissimilar metals such as carbon steel to stainless steel, particularly those grades high in nickel. This alloy gives a two-phase weld deposit with substantial percentages of ferrite and an austenite matrix. Even with considerable dilution by austenite-forming elements such as nickel, the microstructure remains two-phase and thus highly resistant to weld metal cracks and fissures. Pinnacle Alloys ER312 has good corrosion oxidation resistance at high temperature due to its high content of chromium. Surface temperatures should be kept below 790°F to prevent formation of secondary brittle phases.

**DIAMETERS:** .035", .045", 1/16", 3/32", 1/8", 5/32"**WELDING POSITIONS:** GTAW & GMAW: All positions**TYPICAL DEPOSIT COMPOSITION:**

|                 | <b>AWS Spec</b> | <b>Weld Metal Analysis (%)</b> |
|-----------------|-----------------|--------------------------------|
| Carbon (C)      | 0.15            | 0.098                          |
| Chromium (Cr)   | 28.0-32.0       | 30.39                          |
| Copper (Cu)     | 0.75            | 0.08                           |
| Manganese (Mn)  | 1.00-2.50       | 1.65                           |
| Molybdenum (Mo) | 0.75            | 0.12                           |
| Nickel (Ni)     | 8.0-10.5        | 9.02                           |
| Nitrogen (N)    | N.S.*           | 0.028                          |
| Phosphorus (P)  | 0.03            | 0.021                          |
| Silicon (Si)    | 0.30-0.65       | 0.43                           |
| Sulfur (S)      | 0.03            | 0.001                          |

\*N.S. means Not Specified.

NOTE: Single values are maximums.

SOWESCO, LLC

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**AN ISO 9001:2015 COMPANY**  
CERTIFICATE NO.: C755336

**FERRITE NUMBER AND PITTING RESISTANCE EQUIVALENT NUMBER:**

To obtain Ferrite Numbers or PRE<sub>N</sub>, please contact SOWESCO technical support at the number below.

**TYPICAL MECHANICAL PROPERTIES:**

|                           | <b>AWS Spec (min)</b> | <b>As Welded</b>      |
|---------------------------|-----------------------|-----------------------|
| Ultimate Tensile Strength | Not required          | 106,000 psi (730 MPa) |
| Percent Elongation in 2"  | Not required          | 25%                   |

**TYPICAL WELDING PARAMETERS:**

|                               | <b>Diameter</b> | <b>Amperage</b> | <b>Volts</b> | <b>Shielding Gas</b>                            |
|-------------------------------|-----------------|-----------------|--------------|-------------------------------------------------|
| <b>GTAW</b>                   | 1/16"           | 80-110          |              | 100% Ar                                         |
|                               | 3/32"           | 90-130          |              |                                                 |
|                               | 1/8"            | 120-175         |              |                                                 |
|                               | 5/32"           | 150-220         |              |                                                 |
| <b>GMAW</b><br>Spray Transfer | .030"           | 130-200         | 23-27        | 98% Ar/ 2% O <sub>2</sub><br>(35 cfh)           |
|                               | .035"           | 150-225         | 23-26        |                                                 |
|                               | .045"           | 200-325         | 24-28        |                                                 |
|                               | 1/16"           | 300-350         | 24-27        |                                                 |
| <b>GMAW</b><br>Short-Circuit  | .030"           | 50-150          | 14-20        | 90% He/ 7½% Ar/ 2½% CO <sub>2</sub><br>(25 cfh) |
|                               | .035"           | 60-200          | 14-22        |                                                 |
|                               | .045"           | 75-225          | 15-23        |                                                 |
|                               | 1/16"           | 100-250         | 16-23        |                                                 |
| <b>SAW</b>                    | 3/32"           | 275-350         | 28-30        | Suitable Flux                                   |
|                               | 1/8"            | 350-450         | 29-32        |                                                 |

**NOTE:** Maintaining a proper welding procedure, including pre-heat and interpass temperatures, may be critical depending on the type and thickness of material 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.

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