



Pinnacle Alloys are products of SOWESCO

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

## E91T1-K2C/K2M DATA SHEET

### Pinnacle Alloys E91T1-K2C/K2M

AWS CLASS E91T1-K2C, E91T1-K2M

#### CODE AND SPECIFICATION DATA:

AWS A5.29 ASME SFA 5.29; UNS W21231

#### DESCRIPTION:

Pinnacle Alloys E91T1-K2C/K2M has a nominal composition (wt-%) of 1.5 Ni and up to 0.35 Mo. These electrodes are used on many high-strength applications with steels having yield strengths of 80ksi and higher. Typical applications would include the welding of offshore structures and many structural applications where excellent low-temperature toughness is required. Filler metals of this classification are used to weld materials such as HY-80, HY-100, ASTM A 710, A 514, and similar high strength steels. Preheat and interpass temperatures are typically kept between 275-325°F. This filler metal is used in the as welded condition.

**DIAMETERS:** .045", .052", 1/16"

**WELDING POSITIONS:** All positions



#### TYPICAL DEPOSIT COMPOSITION:

|                 | AWS Spec  | Weld Metal Analysis (%) |                             |
|-----------------|-----------|-------------------------|-----------------------------|
|                 |           | 100% CO <sub>2</sub>    | 75% Ar/ 25% CO <sub>2</sub> |
| Carbon (C)      | 0.15      | 0.05                    | 0.04                        |
| Chromium (Cr)   | 0.15      | 0.07                    | 0.04                        |
| Manganese (Mn)  | 0.50-1.75 | 1.32                    | 1.40                        |
| Molybdenum (Mo) | 0.35      | 0.24                    | 0.27                        |
| Nickel (Ni)     | 1.00-2.00 | 1.64                    | 1.60                        |
| Phosphorus (P)  | 0.03      | 0.01                    | 0.01                        |
| Silicon (Si)    | 0.80      | 0.51                    | 0.55                        |
| Sulfur (S)      | 0.03      | 0.01                    | 0.01                        |
| Vanadium (V)    | 0.05      | 0.02                    | 0.02                        |

NOTE: Single values are maximums.



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### TYPICAL MECHANICAL PROPERTIES:

| 100% CO <sub>2</sub> Shielding Gas | AWS Spec (min)                    | As Welded                         |
|------------------------------------|-----------------------------------|-----------------------------------|
| Ultimate Tensile Strength          | 90,000-110,000 psi (620-760 MPa)  | 103,400 psi (710 MPa)             |
| Yield Strength                     | 78,000 psi (540 MPa)              | 91,700 psi (630 MPa)              |
| Percent Elongation in 2"           | 17%                               | 22%                               |
| CVN @ -20°F (-30°C)                | 20 ft•lb <sub>f</sub> (27 Joules) | 37 ft•lb <sub>f</sub> (50 Joules) |

| 75% Ar/ 25% CO <sub>2</sub> Shielding Gas | AWS Spec (min)                    | As Welded                         |
|---|-----------------------------------|-----------------------------------|
| Ultimate Tensile Strength                 | 90,000-110,000 psi (620-760 MPa)  | 105,000 psi (725 MPa)             |
| Yield Strength                            | 78,000 psi (540 MPa)              | 96,000 psi (660 MPa)              |
| Percent Elongation in 2"                  | 17%                               | 21%                               |
| CVN @ -20°F (-30°C)                       | 20 ft•lb <sub>f</sub> (27 Joules) | 39 ft•lb <sub>f</sub> (53 Joules) |

### TYPICAL WELDING PARAMETERS:

| Diameter | Position    | Optimum  |         |           | Amperage Range | Voltage Range |
|----------|-------------|----------|---------|-----------|----------------|---------------|
|          |             | Amperage | Voltage | WFS (ipm) |                |               |
| .045"    | Flat        | 250      | 28      | 282       | 100-300        | 21-32         |
|          | Overhead    | 200      | 26      | 265       | 150-280        | 21-29         |
|          | Vertical Up | 200      | 25      | 265       | 100-230        | 21-28         |
| .052"    | Flat        | 300      | 28      | 360       | 100-330        | 19-32         |
|          | Overhead    | 225      | 26      | 245       | 150-310        | 21-28         |
|          | Vertical Up | 225      | 25      | 245       | 150-280        | 21-27         |
| 1/16"    | Flat        | 350      | 29      | 300       | 150-400        | 22-34         |
|          | Overhead    | 225      | 26      | 160       | 150-310        | 22-28         |
|          | Vertical Up | 225      | 25      | 160       | 150-280        | 22-27         |

**NOTE:** Parameters reflect CO<sub>2</sub> shielding gas - reduce by 1-1½ volts when using 75-80% Ar/ balance CO<sub>2</sub>. 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.

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