



ASM Aerospace Specification Metals Inc.



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## Titanium Ti-5Al-2.5Sn, ELI, Annealed

**Subcategory:** Alpha/Near Alpha Titanium Alloy; Metal; Nonferrous Metal; Titanium Alloy

**Key Words:** UNS R54521 (ELI); Ti-5-2.5

| Component | Wt. %    |
|-----------|----------|
| Al        | 5        |
| Fe        | Max 0.25 |
| O         | Max 0.12 |
| Sn        | 2.5      |
| Ti        | 92.5     |

### Material Notes:

Annealed 700-870°C for 15 min-4 hr.

| Physical Properties | Metric           | English                  | Comments |
|---------------------|------------------|--------------------------|----------|
| Density             | <u>4.48 g/cc</u> | 0.162 lb/in <sup>3</sup> |          |

### Mechanical Properties

|                            |                 |            |  |
|----------------------------|-----------------|------------|--|
| Hardness, Brinell          | 311             | 311        | Estimated from Rockwell C.                         |
| Hardness, Knoop            | 337             | 337        | Estimated from Rockwell C.                         |
| Hardness, Rockwell C       | 33              | 33         |  |
| Hardness, Vickers          | 325             | 325        | Estimated from Rockwell C.                         |
| Tensile Strength, Ultimate | <u>775 MPa</u>  | 112000 psi |  |
| Tensile Strength, Yield    | <u>720 MPa</u>  | 104000 psi |  |
| Elongation at Break        | <u>15 %</u>     | 15 %       |  |
| Modulus of Elasticity      | <u>110 GPa</u>  | 16000 ksi  | in tension.  |
| Notched Tensile Strength   | <u>1080 MPa</u> | 157000 psi | K <sub>t</sub> (stress concentration factor) = 6.3 |
| Poisson's Ratio            | 0.31            | 0.31       | Typical for alpha titanium alloy.                  |
| Charpy Impact              | <u>44 J</u>     | 32.5 ft-lb | V-notch  |

|                    |                               |                            |                   |
|--------------------|-------------------------------|----------------------------|-------------------|
| Fatigue Strength   | <u>410 MPa</u>                | 59500 psi                  | 1E+7 cycles       |
| Fracture Toughness | <u>88 MPa-m<sup>1/2</sup></u> | 80.1 ksi-in <sup>1/2</sup> | K <sub>IC</sub>   |
| Shear Modulus      | <u>48 GPa</u>                 | 6960 ksi                   | Standard Ti-5-2.5 |

### Electrical Properties

|                        |                       |                |
|------------------------|-----------------------|----------------|
| Electrical Resistivity | <u>0.00016 ohm-cm</u> | 0.00016 ohm-cm |
|------------------------|-----------------------|----------------|

### Thermal Properties

|                        |                    |                                    |                                |
|------------------------|--------------------|------------------------------------|--------------------------------|
| CTE, linear 20°C       | <u>9.4 μm/m-°C</u> | 5.22 μin/in-°F                     | 0-100°C                        |
| CTE, linear 250°C      | <u>9.5 μm/m-°C</u> | 5.28 μin/in-°F                     | Average over the range 0-315°C |
| Specific Heat Capacity | <u>0.53 J/g-°C</u> | 0.127 BTU/lb-°F                    | 0.674 J/g-°C at 315°C          |
| Thermal Conductivity   | <u>7.8 W/m-K</u>   | 54.1 BTU-in/hr-ft <sup>2</sup> -°F |                                |
| Melting Point          | <u>Max 1590 °C</u> | Max 2890 °F                        | Liquidus                       |
| Liquidus               | <u>1590 °C</u>     | 2890 °F                            |                                |
| Beta Transus           | 1040 - 1090 °C     | 1900 - 1990 °F                     |                                |

### References for this datasheet.

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error.