



ASM Aerospace Specification Metals Inc.

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**AISI Type S15500 (15Cr-5Ni) Precipitation Hardening Stainless Steel tested at -195°C (-320°F), condition H1150M**

**Subcategory:** Ferrous Metal; Metal; Precipitation Hardening Stainless; Stainless Steel; T S10000 Series Stainless Steel

**Key Words:** 15-5 PH, 15-5PH, 15/5 PH, 15/5PH, XM12, AMS 5862, ASME SA705 (XM-12), ASTM A564 (XM-12), ASTM A693 (XM-12), ASTM A705 (XM-12), AFNOR NF A35-581 Z6CNU15.05, DIN 1.4540, DIN X4CrNiCuNb164, Cr-Ni 15-5, UNS S15500, AMS 5658, AMS 5659, AMS 5826

| Component | Wt. %    | Component | Wt. % | Component | Wt. %    |
|-----------|----------|-----------|-------|-----------|----------|
| C         | Max 0.07 | Mn        | Max 1 | P         | Max 0.04 |
| Cr        | 14.8     | Nb + Ta   | 0.3   | S         | Max 0.03 |
| Cu        | 3.5      | Ni        | 4.5   | Si        | Max 1    |
| Fe        | 75       |           |       |           |          |

**Material Notes:**

Martensitic, precipitative hardening (maraging), combining high strength and hardness with excellent corrosion resistance. Applications include valve parts, fittings and fasteners, shafts, gears, chemical process equipment, paper mill equipment, aircraft components and nuclear reactor components.

| Physical Properties | Metric          | English                  | Comments  |
|---------------------|-----------------|--------------------------|---|
| Density             | <u>7.8 g/cc</u> | 0.282 lb/in <sup>3</sup> | Solution treated plus 480°C for 1 hour, air cooled. |

**Mechanical Properties**

|                            |                 |            |   |
|----------------------------|-----------------|------------|---|
| Tensile Strength, Ultimate | <u>1386 MPa</u> | 201000 psi |   |
| Tensile Strength, Yield    | <u>1007 MPa</u> | 146000 psi | at 0.2% offset  |
| Elongation at Break        | <u>27 %</u>     | 27 %       | gage length is 4 times diameter   |
| Modulus of Elasticity      | <u>200 GPa</u>  | 29000 ksi  | Typical elastic modulus for stainless steel                             |
| Charpy Impact              | <u>236 J</u>    | 174 ft-lb  | at 24°C, 233 J at -12°C, 226 J at -40°C, 206 J at -73°C, 45 J at -195°C |

## Electrical Properties

|                        |                                 |                 |   |
|------------------------|---------------------------------|-----------------|---|
| Electrical Resistivity | <a href="#">7.7e-005 ohm-cm</a> | 7.7e-005 ohm-cm | Solution treated plus 480°C for 1 hour, air cooled. |
| Magnetic Permeability  | 95                              | 95              | approximate value for the annealed condition at RT  |

## Thermal Properties

|                        |                              |                                   |  |
|------------------------|------------------------------|-----------------------------------|--|
| CTE, linear 20°C       | <a href="#">10.8 μm/m-°C</a> | 6 μin/in-°F                       | at 21-93°C, 10.4 μm/m°C at -73-21°C, 10.8 μm/m°C at 21-205°C               |
| CTE, linear 250°C      | <a href="#">11.3 μm/m-°C</a> | 6.28 μin/in-°F                    | at 21-315°C, 11.7 μm/m°C at 21-425°C                                       |
| CTE, linear 500°C      | <a href="#">15.6 μm/m-°C</a> | 8.67 μin/in-°F                    | Typical CTE from 0 - 1000°C for stainless steel.                           |
| Specific Heat Capacity | <a href="#">0.42 J/g-°C</a>  | 0.1 BTU/lb-°F                     | Solution treated plus 480°C for 1 hour, air cooled.                        |
| Thermal Conductivity   | <a href="#">17.8 W/m-K</a>   | 124 BTU-in/hr-ft <sup>2</sup> -°F | at 150°C, 19.5 W/m-°C at 260°C, 22.5 W/m-°C at 460°C, 22.7 W/m-°C at 480°C |
| Melting Point          | 1405 - 1440 °C               | 2560 - 2620 °F                    | Solution treated plus 480°C for 1 hour, air cooled.                        |
| Solidus                | <a href="#">1405 °C</a>      | 2560 °F                           |  |
| Liquidus               | <a href="#">1440 °C</a>      | 2620 °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.