



ASM Aerospace Specification Metals Inc.

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AISI Type S21904 (Alloy 21-6-9) Stainless Steel, annealed sheet and strip, tested at 315°C (600°F)

Subcategory: Ferrous Metal; Heat Resisting; Metal; Stainless Steel; T S20000 Series Stainless Steel

Close Analogs: AISI Type S21900

Key Words: UNS S21904, AMS 5595, AMS 5656, ASME SA412, ASTM A269 (XM-11), ASTM A276 (XM-11), ASTM A314 (XM-11), ASTM A412 (XM-11), ASTM A473 (XM-11), ASTM A580 (XM-11)

| Component | Wt. % | Component | Wt. % | Component | Wt. % |
|-----------|----------|-----------|-------|-----------|----------|
| C | Max 0.04 | Mn | 9 | P | Max 0.06 |
| Cr | 20 | N | 0.23 | S | Max 0.03 |
| Fe | 64 | Ni | 6 | Si | Max 1 |

Material Notes:

Austenitic, high strength, excellent corrosion resistance, and low magnetic permeability. Applications include aircraft applications such as ducting and bellows systems, tail pipes and exhaust systems, clamps, fasteners, flanges, and hydraulic tubing.

| Physical Properties | Metric | English | Comments |
|---------------------|------------------|--------------------------|----------|
| Density | <u>7.83 g/cc</u> | 0.283 lb/in ³ | |

Mechanical Properties

| | | | |
|----------------------------|----------------|-----------|--------------------------------------------------|
| Tensile Strength, Ultimate | <u>594 MPa</u> | 86200 psi | |
| Tensile Strength, Yield | <u>259 MPa</u> | 37600 psi | at 0.2% offset |
| Elongation at Break | <u>33 %</u> | 33 % | in 50 mm. Broke on gage mark. |
| Modulus of Elasticity | <u>200 GPa</u> | 29000 ksi | Typical for stainless steel |
| Machinability | <u>30 %</u> | 30 % | Based on 100% machinability for AISI 1212 steel. |

Electrical Properties

| | | |
|------------------------|------------------------|-----------------|
| Electrical Resistivity | <u>7.3e-005 ohm-cm</u> | 7.3e-005 ohm-cm |
|------------------------|------------------------|-----------------|

Thermal Properties

| | | | |
|------------------------|---------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CTE, linear 20°C | 16.7 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ | 9.28 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$ | at 25-95°C, 17.3 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ at 25-205°C. Annealed |
| CTE, linear 250°C | 18.2 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ | 10.1 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$ | at 25-315°C. Annealed |
| CTE, linear 500°C | 19.1 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ | 10.6 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$ | at 25-540°C, 20.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ at 25-760°C, 20.0 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ at 25-870°C, 20.5 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ at 25-980°C. Annealed |
| Specific Heat Capacity | 0.48 $\text{J}/\text{g}\cdot^\circ\text{C}$ | 0.115 BTU/lb-°F | Typical value for stainless steel. |
| Thermal Conductivity | 13.8 $\text{W}/\text{m}\cdot\text{K}$ | 95.8 BTU-in/hr-ft ² -°F | 13.8 at 95°C, 7.8 $\text{W}/\text{m}\cdot^\circ\text{C}$ at -180°C, 10.9 $\text{W}/\text{m}\cdot^\circ\text{C}$ at -73°C, 16.1 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 205°C, 18.2 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 315°C, 20.2 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 425°C, 22.5 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 540°C, 24.7 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 650°C, 26.8 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 760°C, 28.9 $\text{W}/\text{m}\cdot^\circ\text{C}$ at 870°C |

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.