



ASM Aerospace Specification Metals Inc.



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## 17-7 PH Stainless Steel, TH1050, bar and forgings

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

**Key Words:** UNS S17700, double treatment alloy, TH1050, bar and forgings, 17-7PH, 17-7 PH, 17/7PH, 17/7 PH, Precipitation Hardening

Component	Wt. %
Al	0.75 - 1.5
C	Max 0.09
Cr	16 - 18
Mn	Max 1
Ni	6.5 - 7.75
P	Max 0.04
S	Max 0.04
Si	Max 1

### Material Notes:

Properties are measured in the longitudinal direction.

**Processing:** TH1050 - heated to austenitic range, 1040°C (1900°F), and water quenched. Reheated to 760°C (1400°F) to precipitate carbides. Carbides cause the austenite transform to martensite after cooling below 15°C (60°F). Tempered at 565°C (1050°)

**Applications:** high strength high temperature applications, chemical processing equipment, heat exchangers, power boilers, superheater tubes

**Corrosion Resistance:** 17-7 PH is suitable for use in fresh water, industrial and marine atmospheres, and mild chemical and oxidizing environments. 17-7 PH should not be used in salt water or reducing environments.

Physical Properties	Metric	English	Comments
Density	<u>7.8 g/cc</u>	0.282 lb/in <sup>3</sup>	

### Mechanical Properties

Hardness, Rockwell C	38	38
Tensile Strength, Ultimate	<a href="#">1170 MPa</a>	170000 psi
Tensile Strength, Yield	<a href="#">965 MPa</a>	140000 psi
Elongation at Break	<a href="#">6 %</a>	6 %
Reduction of Area	<a href="#">25 %</a>	25 %
Modulus of Elasticity	<a href="#">204 GPa</a>	29600 ksi

### Electrical Properties

Electrical Resistivity	<a href="#">8.3e-005 ohm-cm</a>	8.3e-005 ohm-cm
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### Thermal Properties

CTE, linear 20°C	<a href="#">11 <math>\mu\text{m}/\text{m}\cdot\text{°C}</math></a>	6.11 $\mu\text{in}/\text{in}\cdot\text{°F}$	from 0-100°C (32-212°F)
CTE, linear 250°C	<a href="#">11.6 <math>\mu\text{m}/\text{m}\cdot\text{°C}</math></a>	6.44 $\mu\text{in}/\text{in}\cdot\text{°F}$	from 0-315°C (32-600°F)
Specific Heat Capacity	<a href="#">0.46 J/g·°C</a>	0.11 BTU/lb·°F	from 0-100°C (32-212°F)
Thermal Conductivity	<a href="#">16.4 W/m-K</a>	114 BTU-in/hr-ft <sup>2</sup> -°F	at 100°C(212°F); 21.8 W/m-K at 500°C (930°F)
Melting Point	1400 - 1450 °C	2550 - 2640 °F	
Solidus	<a href="#">1400 °C</a>	2550 °F	
Liquidus	<a href="#">1450 °C</a>	2640 °F	

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.