



ASM Aerospace Specification Metals Inc.

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AISI Type 651 (19-9) Stainless Steel cold drawn and stress relieved

Subcategory: Ferrous Metal; Heat Resisting; Metal; Stainless Steel; T 600 Series Stainless Steel

Key Words: UNS K63198, AMS 5369, AMS 5526, AMS 5527, AMS 5720, AMS 5721, AMS 5722, ASTM A453, ASTM A457, ASTM 458, ASTM A477, SAE J467(19-9 DL), MIL SPEC MIL-S-46042

Component	Wt. %	Component	Wt. %	Component	Wt. %
C	0.28 - 0.35	Mo	1 - 1.75	S	Max 0.03
Cr	18 - 21	Nb	0.25 - 0.6	Si	0.3 - 0.8
Cu	Max 0.5	Ni	8 - 11	Ti	0.1 - 0.35
Fe	64	P	Max 0.04	W	1 - 1.75
Mn	0.75 - 1.5				

Material Notes:

Charpy V-Notch Impact properties and hardness

Physical Properties	Metric	English	Comments
Density	<u>7.94 g/cc</u>	0.287 lb/in ³	

Mechanical Properties

Hardness, Brinell	286	286	
Hardness, Knoop	319	319	Converted from Brinell hardness.
Hardness, Rockwell C	26.5	26.5	Converted from Brinell hardness.
Hardness, Vickers	303	303	Converted from Brinell hardness.
Modulus of Elasticity	<u>200 GPa</u>	29000 ksi	Typical for stainless steel
Charpy Impact	<u>30 J</u>	22.1 ft-lb	at 24°C; 18 J at -195°C, 26 J at -76°C
Machinability	<u>45 %</u>	45 %	Based on 100% machinability for AISI 1212 steel.

Thermal Properties

CTE, linear 20°C	15.3 $\mu\text{m}/\text{m}\cdot\text{°C}$	8.5 $\mu\text{in}/\text{in}\cdot\text{°F}$	at 21-93°C (70-200°F), 16.3 $\mu\text{m}/\text{m}\cdot\text{°C}$ at 21-205°C (70-400°F)
CTE, linear 250°C	16.7 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.28 $\mu\text{in}/\text{in}\cdot\text{°F}$	at 21-315°C (70-600°F), 17.3 $\mu\text{m}/\text{m}\cdot\text{°C}$ at 21-425°C (70-800°F)
CTE, linear 500°C	17.6 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.78 $\mu\text{in}/\text{in}\cdot\text{°F}$	at 21-540°C (70-1000°F), 18.0 $\mu\text{m}/\text{m}\cdot\text{°C}$ at 21-815°C (70-1500°F)
Specific Heat Capacity	0.42 $\text{J}/\text{g}\cdot\text{°C}$	0.1 $\text{BTU}/\text{lb}\cdot\text{°F}$	from 0-100°C (32-212°F)
Thermal Conductivity	13.5 $\text{W}/\text{m}\cdot\text{K}$	93.7 $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot\text{°F}$	at 21°C, 18.5 $\text{W}/\text{m}\cdot\text{K}$ at 425°C, 21.3 $\text{W}/\text{m}\cdot\text{K}$ at 650°C
Melting Point	1420 - 1435 °C	2590 - 2620 °F	
Solidus	1420 °C	2590 °F	
Liquidus	1435 °C	2620 °F	
Maximum Service Temperature, Air	780 °C	1440 °F	Continuous Service
Maximum Service Temperature, Air	955 °C	1750 °F	Intermittent Service

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.