

Carpenter S7 Alloy Tool Steel (AISI S7)

Category : Metal , Ferrous Metal , Tool Steel , Air-Hardening Steel , Hot Work Steel

Material Notes:

Carpenter S7 is a general purpose air hardening tool steel having high impact and shock resistance. It has good resistance to softening at moderately high temperatures. This combination of properties makes it suitable for many hot-work and cold-work applications. It is available as a DeCarb-Free product. DCF bars have been cold finished in the mill, eliminating the need for bar bark removal. Both Carpenter S7 and Bearcat, a trademark of Bethlehem Steel Corp., have the same AISI tool steel designation . . . S7. Information provided by Carpenter Technology Corporation.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carpenter-S7-Alloy-Tool-Steel-AISI-S7.php

Physical Properties	Metric	English	Comments
Specific Gravity	7.83 g/cc	7.83 g/cc	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell C	37 - 40	37 - 40	Tempered at 1200°F
	59 - 61	59 - 61	As hardened
Tensile Strength, Ultimate	2025 MPa	293700 psi	when tempered at 400°F
Tensile Strength, Yield	1520 MPa	220000 psi	when tempered at 400°F
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	10 %	10 %	when tempered at 400°F
Reduction of Area	28 %	28 %	when tempered at 400°F

Thermal Properties	Metric	English	Comments
CTE, linear	12.59 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.994 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 200 °C	@Temperature 77.0 - 392 °F	
	13.33 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.406 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 400 °C	@Temperature 77.0 - 752 °F	
	14.27 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.928 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 700 °C	@Temperature 77.0 - 1290 °F	
Transformation Temperature	785 °C	1450 °F	Ac₁

Component Elements Properties	Metric	English	Comments
Carbon, C	0.50 %	0.50 %	
Chromium, Cr	3.25 %	3.25 %	
Iron, Fe	93.85 %	93.85 %	As Balance
Manganese, Mn	0.70 %	0.70 %	
Molybdenum, Mo	1.4 %	1.4 %	
Silicon, Si	0.30 %	0.30 %	

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