

Close Analogs: AISI 1045H

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Component	Wt. %
C	0.42 - 0.5
Fe	98.51 - 98.98
Mn	0.6 - 0.9
P	Max 0.04
S	Max 0.05

Material Notes:

Medium-carbon steel, can be hammer forged. Can be heat treated, flame or induction hardened, but not recommended for carburizing or cyaniding. AISI cross reference for JIS S45C and KS SM45C.

Physical Properties	Metric	English	Comments
Density	7.85 g/cc	0.284 lb/in ³	

Mechanical Properties

Hardness, Brinell	179	179	
Hardness, Knoop	200	200	Converted from Brinell hardness.
Hardness, Rockwell B	88	88	Converted from Brinell hardness.
Hardness, Vickers	188	188	Converted from Brinell hardness.
Tensile Strength, Ultimate	625 MPa	90600 psi	
Tensile Strength, Yield	530 MPa	76900 psi	
Elongation at Break	12 %	12 %	In 50 mm
Reduction of Area	35 %	35 %	
Modulus of Elasticity	205 GPa	29700 ksi	Typical for steel

Bulk Modulus	140 GPa	20300 ksi	Typical for steel
Poisson's Ratio	0.29	0.29	Typical For Steel
Machinability	55 %	55 %	Based on AISI 1212 steel. as 100% machinability
Shear Modulus	80 GPa	11600 ksi	Typical for steel

Electrical Properties

Electrical Resistivity	1.62e-005 ohm-cm	1.62e-005 ohm-cm	annealed specimen; 0°C (32°F)
Electrical Resistivity at Elevated Temperature	2.23e-005 ohm-cm	2.23e-005 ohm-cm	annealed specimen; 100°C (212°F)

Thermal Properties

CTE, linear 20°C	11.5 µm/m-°C	6.39 µin/in-°F	0-100°C
CTE, linear 250°C	13 µm/m-°C	7.22 µin/in-°F	0-300°C (68-570°F)
CTE, linear 500°C	14 µm/m-°C	7.78 µin/in-°F	0-500°C (68-930°F)
Specific Heat Capacity	0.486 J/g-°C	0.116 BTU/lb-°F	annealed; 50-100°C (122-212°F)
Specific Heat Capacity at Elevated Temperature	0.519 J/g-°C	0.124 BTU/lb-°F	annealed; 150-200°C (302-392°F)
Specific Heat Capacity at Elevated Temperature	0.586 J/g-°C	0.14 BTU/lb-°F	annealed; 350-400°C (662-752°F)
Thermal Conductivity	49.8 W/m-K	346 BTU-in/hr-ft ² -°F	Typical steel