

Carpenter No. 883® Hot Work Die Steel (Red-Tough) (AISI H13)

Category : Metal , Ferrous Metal , Tool Steel , Hot Work Steel

Material Notes:

No. 883 hot work die steel is a 5% chromium hot work tool steel designed particularly for applications requiring extreme toughness combined with good red-hardness. It has given an extra margin of safety in tools subject to heavy hammer blows, and those tools containing deep recesses or sharp corners. While No. 833 hot work die steel has been used primarily in hot work tools, it has solved many cold work applications where extra toughness was required at the sacrifice of some wear resistance. Applications: Forging dies, Heavy duty compression tools, Bulldozer dies, Hot forging tools with deep recesses and sharp corners, Die casting dies, Aluminum extrusion dies, Bolt dies, Hot piercing punches, Forming punches, Vastoning dies. Information provided by Carpenter Technology Corporation. No. 883® is a registered trademark of Carpenter Technology Corporation.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carpenter-No-883-Hot-Work-Die-Steel-Red-Tough-AISI-H13.php

Physical Properties	Metric	English	Comments
Specific Gravity	7.77 g/cc	7.77 g/cc	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	360	360	
	@Temperature 538 °C	@Temperature 1000 °F	
	495	495	
	@Temperature 204 °C	@Temperature 400 °F	
Hardness, Rockwell C	28 - 30	28 - 30	Tempered at 1300°F
	51 - 53	51 - 53	As hardened
Tensile Strength, Ultimate	1800 MPa	261000 psi	when tempered at 1000°F
Tensile Strength, Yield	1600 MPa	232000 psi	when tempered at 1000°F
Elongation at Break	11 %	11 %	when tempered at 1000°F
Reduction of Area	35 %	35 %	when tempered at 1000°F
Modulus of Elasticity	210.3 GPa	30500 ksi	
	113.8 GPa	16510 ksi	
	@Temperature 649 °C	@Temperature 1200 °F	
	191 GPa	27700 ksi	
	@Temperature 343 °C	@Temperature 649 °F	
Charpy Impact	22.0 J	16.2 ft-lb	V Notch, when tempered at 1000°F

Mechanical Properties	Metric	English	Comments
	186	186	loss in mm ³ , Tempered at 1200°F; ASTM G65

Thermal Properties	Metric	English	Comments
CTE, linear	11.0 µm/m-°C	6.11 µin/in-°F	
	@Temperature 27.0 - 93.0 °C	@Temperature 80.6 - 199 °F	
	13.1 µm/m-°C	7.28 µin/in-°F	
	@Temperature 27.0 - 649 °C	@Temperature 80.6 - 1200 °F	
	14.8 µm/m-°C	8.22 µin/in-°F	
	@Temperature 427 - 788 °C	@Temperature 801 - 1450 °F	
Specific Heat Capacity	0.460 J/g-°C	0.110 BTU/lb-°F	
Thermal Conductivity	28.6 W/m-K	198 BTU-in/hr-ft²-°F	
	@Temperature 216 °C	@Temperature 421 °F	
Transformation Temperature	818 °C	1500 °F	Ac ₁

Component Elements Properties	Metric	English	Comments
Carbon, C	0.41 %	0.41 %	
Chromium, Cr	5.35 %	5.35 %	
Iron, Fe	90.59 %	90.59 %	As Balance
Manganese, Mn	0.35 %	0.35 %	
Molybdenum, Mo	1.4 %	1.4 %	
Silicon, Si	1.0 %	1.0 %	
Vanadium, V	0.90 %	0.90 %	

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