Bohler-Uddeholm BÖHLER W302 SUPERIOR® Premium H13 Tool Steel

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

Material Notes:

A premium grade H13 hot work tool steel featuring:Very good toughness properties meeting the requirements of NADCA 207-97, and the superior quality levels of NADCA 207-2003Very good heat checking resistanceGood temper resistance and high temperature strengthExcellent polishability and texturabilityManufactured for flats greater than 18" in thicknessThe term SUPERIOR refers to Bohler's unique processing method which includes electro-slag remelting (ESR) to obtain a steel with superior mechanical properties. Applications: Dies, cores and inserts for the high pressure die casting of aluminum, magnesium and zinc alloys. Hot forging, shearing, pressing and extrusion tooling including: dies, die holders, liners and stems. The excellent polishability and toughness properties of W302 Superior also make it an excellent choice for demanding larger block plastic molding applications.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Bohler-Uddeholm-BHLER-W302-SUPERIOR-Premium-H13-Tool-Steel.php

Physical Properties	Metric	English	Comments
Density	7.60 g/cc @Temperature 600 °C	0.275 lb/in³ @Temperature 1110 °F	
	7.64 g/cc @Temperature 500 °C	0.276 lb/in³ @Temperature 932 °F	
	7.80 g/cc @Temperature 20.0 °C	0.282 lb/in³ @Temperature 68.0 °F	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	1100 - 1380 MPa @Temperature 315 °C	160000 - 200000 psi @Temperature 599 °F	varies with heat treatment
	1200 - 1590 MPa @Temperature 20.0 °C	174000 - 231000 psi @Temperature 68.0 °F	varies with heat treatment
Tensile Strength, Yield	900 - 1170 MPa @Temperature 315 °C	131000 - 170000 psi @Temperature 599 °F	varies with heat treatment
	1000 - 1380 MPa @Temperature 20.0 °C	145000 - 200000 psi @Temperature 68.0 °F	varies with heat treatment
Reduction of Area	50 % @Temperature 20.0 °C	50 % @Temperature 68.0 °F	
	50 % @Temperature 315 °C	50 % @Temperature 599 °F	

Mechanical Properties	Metric	English	Comments
Modulus of Elasticity	115 GPa	16700 ksi	
	@Temperature 600 °C	@Temperature 1110 °F	
	176 GPa	25500 ksi	
	@Temperature 500 °C	@Temperature 932 °F	
	215 GPa	31200 ksi	
	@Temperature 20.0 °C	@Temperature 68.0 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	11.5 µm/m-°C	6.39 µin/in-°F	
	@Temperature 20.0 - 100 °C	@Temperature 68.0 - 212 °F	
	12.0 µm/m-°C	6.67 µin/in-°F	
	@Temperature 20.0 - 200 °C	@Temperature 68.0 - 392 °F	
	12.2 µm/m-°C	6.78 µin/in-°F	
	@Temperature 20.0 - 300 °C	@Temperature 68.0 - 572 °F	
	12.5 µm/m-°C	6.94 µin/in-°F	
	@Temperature 20.0 - 400 °C	@Temperature 68.0 - 752 °F	
	12.9 µm/m-°C	7.17 µin/in-°F	
	@Temperature 20.0 - 500 °C	@Temperature 68.0 - 932 °F	
	13.0 µm/m-°C	7.22 µin/in-°F	
	@Temperature 20.0 - 600 °C	@Temperature 68.0 - 1110 °F	
	13.2 µm/m-°C	7.33 µin/in-°F	
	@Temperature 20.0 - 700 °C	@Temperature 68.0 - 1290 °F	
Specific Heat Capacity	0.460 J/g-°C	0.110 BTU/lb-°F	
	@Temperature 20.0 °C	@Temperature 68.0 °F	
	0.550 J/g-°C	0.131 BTU/lb-°F	
	@Temperature 500 °C	@Temperature 932 °F	
	0.590 J/g-°C	0.141 BTU/lb-°F	
	@Temperature 600 °C	@Temperature 1110 °F	

Thermal Properties	Metric	English	Comments
Thermal Conductivity	14.4 W/m-K @Temperature 20.0 °C	99.9 BTU-in/hr-ft²-°F @Temperature 68.0 °F	Hardened Condition
	14.7 W/m-K @Temperature 100 °C	102 BTU-in/hr-ft²-°F @Temperature 212 °F	Hardened Condition
	15.5 W/m-K @Temperature 20.0 °C	108 BTU-in/hr-ft²-°F @Temperature 68.0 °F	Annealed Condition
	15.6 W/m-K @Temperature 200 °C	108 BTU-in/hr-ft²-°F @Temperature 392 °F	Hardened Condition
	15.7 W/m-K @Temperature 100 °C	109 BTU-in/hr-ft²-°F @Temperature 212 °F	Annealed Condition
	15.9 W/m-K @Temperature 300 °C	110 BTU-in/hr-ft²-°F @Temperature 572 °F	Hardened Condition
	16.0 W/m-K @Temperature 400 °C	111 BTU-in/hr-ft²-°F @Temperature 752 °F	Hardened Condition
	16.2 W/m-K @Temperature 200 °C	112 BTU-in/hr-ft²-°F @Temperature 392 °F	Annealed Condition
	16.3 W/m-K @Temperature 500 °C	113 BTU-in/hr-ft²-°F @Temperature 932 °F	Hardened Condition
	16.9 W/m-K @Temperature 600 °C	117 BTU-in/hr-ft²-°F @Temperature 1110 °F	Hardened Condition
	17.4 W/m-K @Temperature 300 °C	121 BTU-in/hr-ft²-°F @Temperature 572 °F	Annealed Condition
	17.5 W/m-K @Temperature 700 °C	121 BTU-in/hr-ft²-°F @Temperature 1290 °F	Hardened Condition
	17.9 W/m-K @Temperature 400 °C	124 BTU-in/hr-ft²-°F @Temperature 752 °F	Annealed Condition
	18.2 W/m-K @Temperature 500 °C	126 BTU-in/hr-ft²-°F @Temperature 932 °F	Annealed Condition
	18.7 W/m-K @Temperature 600 °C	130 BTU-in/hr-ft²-°F @Temperature 1110 °F	Annealed Condition
	19.3 W/m-K	134 BTU-in/hr-ft²-°F	

Thermal Properties	Metric	English	Comments
	@Temperature 700 °C	@Temperature 1290 °F	Annealed Condition

Component Elements Properties	Metric	English	Comments
Carbon, C	0.39 %	0.39 %	
Chromium, Cr	5.2 %	5.2 %	
Iron, Fe	91.56 %	91.56 %	As Balance
Manganese, Mn	0.40 %	0.40 %	
Molybdenum, Mo	0.40 %	0.40 %	
Silicon, Si	1.1 %	1.1 %	
Sulfur, S	<= 0.0030 %	<= 0.0030 %	
Vanadium, V	0.95 %	0.95 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000520 ohm-cm @Temperature 20.0 °C	0.0000520 ohm-cm @Temperature 68.0 °F	
	0.0000860 ohm-cm @Temperature 500 °C	0.0000860 ohm-cm @Temperature 932 °F	
	0.0000960 ohm-cm @Temperature 600 °C	0.0000960 ohm-cm @Temperature 1110 °F	

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