

## Crucible Steel CPM® Rex® 20® (HS) High Speed Steel

Category : Metal , Ferrous Metal , Carbon Steel , High Carbon Steel , Tool Steel

### Material Notes:

CPM Rex 20 is a cobalt-free super high speed steel made by the CPM (Crucible Particle Metallurgy) Process. It has heat treat response and red hardness comparable to that of M42 but offers better wear resistance and greater toughness. CPM Rex 20 was originally designed to replace M42 in any application where cobalt is undesirable. Due to its unique combination of properties, CPM Rex 20 is used in non-cutting applications such as bearings and in plasticizing components such as screw segments, barrels and non-return valves. The CPM process results in a homogeneous microstructure with a finer, more uniform carbide distribution imparting superior dimensional stability, grindability and toughness when compared to steels produced by conventional processes. The CPM process also allows the design of more highly alloyed grades which cannot be produced by conventional steelmaking. Information provided by Crucible Specialty Metals.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Crucible-Steel-CPM-Rex-20-HS-High-Speed-Steel.php](http://www.lookpolymers.com/polymer_Crucible-Steel-CPM-Rex-20-HS-High-Speed-Steel.php)

Physical Properties	Metric	English	Comments
Density	8.17 g/cc	0.295 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	262 - 285	262 - 285	Annealed
Hardness, Rockwell C	65.5	65.5	Hardening Temperature- 1150°C; Tempering Temperature- 550°C
	67.5	67.5	Hardening Temperature- 1205°C; Tempering Temperature- 550°C
Modulus of Elasticity	235 GPa	34100 ksi	
Flexural Strength	3957 MPa	573900 psi	Hardening Temperature- 1150°C, Tempering Temperature- 550°C
	4005 MPa	580900 psi	Hardening Temperature- 1190°C, Tempering Temperature- 550°C
Charpy Impact	16.0 J	11.8 ft-lb	Hardening Temperature- 1190°C; Tempering Temperature- 550°C
	18.0 J	13.3 ft-lb	Hardening Temperature- 1150°C; Tempering Temperature- 550°C

Thermal Properties	Metric	English	Comments
CTE, linear	10.66 µm/m-°C	5.922 µin/in-°F	
	@Temperature 20.0 - 94.0 °C	@Temperature 68.0 - 201 °F	
	11.18 µm/m-°C	6.211 µin/in-°F	
	@Temperature 20.0 - 205 °C	@Temperature 68.0 - 401 °F	

Thermal Properties	Metric	English	Comments
	12.24 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.440 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 20.0 - 540 $^\circ\text{C}$	@Temperature 68.0 - 1000 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	1.3 %	1.3 %	
Chromium, Cr	3.75 %	3.75 %	
Iron, Fe	75.92 %	75.92 %	As Remainder
Molybdenum, Mo	10.5 %	10.5 %	
Sulfur, S	0.060 - 0.22 %	0.060 - 0.22 %	
Tungsten, W	6.25 %	6.25 %	
Vanadium, V	2.0 %	2.0 %	

Descriptive Properties	Value	Comments
Grindability; Metal Removed/Wheel Worn	3.5	

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