

## Crucible Steel CPM® 10V® (AISI A11) Tool Steel

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

### Material Notes:

CPM 10V was the first in the family of high vanadium tool steels made by the Crucible Particle Metallurgy process. Crucible engineers optimized the vanadium content to provide superior wear resistance while maintaining toughness and fabrication characteristics comparable to D2 and M2. Since its introduction in 1978, CPM 10V has become recognized world-wide and sets the standard for highly wear resistant industrial tooling. Its exceptional wear resistance and good toughness make it an excellent candidate to replace carbide and other highly wear resistant materials in cold work tooling applications, particularly where tool toughness is a problem or where cost effectiveness can be demonstrated. The CPM process produces very homogeneous, high quality steel characterized by superior dimensional stability, grindability, and toughness compared to steels produced by conventional processes. Information provided by Crucible Specialty Metals.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Crucible-Steel-CPM-10V-AISI-A11-Tool-Steel.php](http://www.lookpolymers.com/polymer_Crucible-Steel-CPM-10V-AISI-A11-Tool-Steel.php)

Physical Properties	Metric	English	Comments
Density	7.418 g/cc	0.2680 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	255 - 277	255 - 277	Annealed
Hardness, Rockwell C	60	60	
Modulus of Elasticity	221 GPa	32100 ksi	
Flexural Strength	4322 MPa	626900 psi	Hardening Temperature- 1175°C, Tempering Temperature- 540°C
	4377 MPa	634800 psi	Hardening Temperature- 1120°C, Tempering Temperature- 550°C
Charpy Impact	20.0 J	14.8 ft-lb	Hardening Temperature- 1175°C; Tempering Temperature- 540°C
	30.0 J	22.1 ft-lb	Hardening Temperature- 1120°C; Tempering Temperature- 550°C
	35.0 J	25.8 ft-lb	Hardening Temperature- 1065°C; Tempering Temperature- 550°C

Thermal Properties	Metric	English	Comments
CTE, linear	10.7 µm/m-°C	5.94 µin/in-°F	
	@Temperature 21.0 - 93.0 °C	@Temperature 69.8 - 199 °F	
	11.1 µm/m-°C	6.17 µin/in-°F	

Thermal Properties	@Temperature 21.0 - Metric 260 °C	@Temperature 69.8 - English 500 °F	Comments
	12.3 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.83 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 21.0 - 593 °C	@Temperature 69.8 - 1100 °F	
Thermal Conductivity	20.39 W/m-K	141.5 BTU-in/hr-ft <sup>2</sup> -°F	
	21.54 W/m-K	149.5 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 100 °C	@Temperature 212 °F	
	24.85 W/m-K	172.5 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 300 °C	@Temperature 572 °F	
	26.3 W/m-K	183 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 500 °C	@Temperature 932 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	2.45 %	2.45 %	
Chromium, Cr	5.25 %	5.25 %	
Iron, Fe	81.25 %	81.25 %	As Remainder
Molybdenum, Mo	1.3 %	1.3 %	
Vanadium, V	9.75 %	9.75 %	

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