

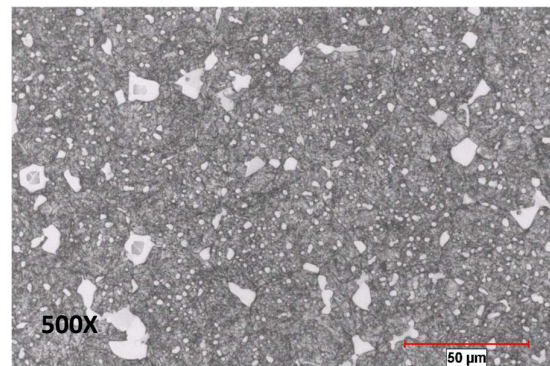
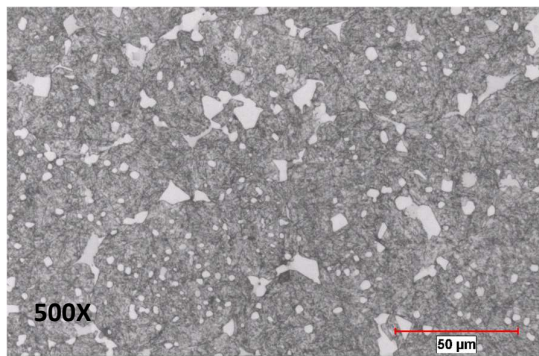
## INDO-MIM BJT-M2 SPECIFICATION SHEET

M2 is a tungsten-molybdenum high-speed steel. It is a popular grade for cutting and non-cutting applications. Having high carbon content, provides higher wear resistance for suitable for cold forming tools like extrusion rams and dies, moulds, and screws.

Chemical Composition (Wt%)												
Element	Fe	C	Ni	Mo	Si	Mn	P	S	Cr	V	W	Others
Min	Bal	0.8	-	4.50	-	-	-	-	3.75	1.50	5.50	-
Max		1.10	0.3	5.50	0.5	0.4	0.05	0.05	4.50	2.20	6.75	1.0

Properties <sup>1)2)3)</sup>		Test Method	HP Metal Jet	Wrought M2 Benchmark
			Heat Treated	Heat Treated
Hardness (HRC)	XYZ	ASTM E18	$\mu=60; \sigma = 1$	60-65
Ultimate Tensile Strength (MPa)	XYZ	ASTM E8	$\mu=1600; \sigma = 171$	900 Min
Elongation (%)	XYZ		1 Max	1 Max
Impact strength (J)	XYZ	ASTM E23	3 Min	-
Wear Loss (gm)	XYZ	ASTM G65	0.23	0.28
Surface Roughness (Ra)	XYZ		$\mu=5.5; \sigma = 1.2$	-
Density	g/cc	ASTM B311	$\mu=8.10, \sigma=0.01$	8.15 (Typical)
	%		$\geq 98$	$\geq 95$

**MICROSTRUCTURE<sup>2)</sup>**: Tempered Martensite with dispersed Fine metal carbides.



<b>THERMAL PROPERTIES<sup>1)2)3)</sup></b>				
<b>Co-efficient of Thermal expansion (<math>\mu\text{m}/\text{m}^\circ\text{C}</math>)</b>		<b>Test Method</b>	<b>HP Metal Jet</b>	<b>Wrought M2 Benchmark</b>
			<b>Heat Treated</b>	<b>Heat Treated</b>
<b>(30°C to 100°C)</b>	XYZ	ASTM C372-81	$\mu=12.30$	10
<b>(30°C to 500°C)</b>	XYZ		$\mu=13.38$	12.2
<b>(30°C to 800°C)</b>	XYZ		$\mu=12.34$	12.6
<b>Thermal Conductivity (<math>\text{W}/\text{m}^\circ\text{K}</math>)</b>				
<b>(30°C to 100°C)</b>	XYZ	ASTM E1461	$\mu=22.77$	27.47
<b>(30°C to 200°C)</b>	XYZ		$\mu=27.56$	31.70
<b>(30°C to 300°C)</b>	XYZ		$\mu=30.01$	33.50
<b>(30°C to 400°C)</b>	XYZ		$\mu=31.96$	34.58
<b>(30°C to 500°C)</b>	XYZ		$\mu=33.07$	34.33

Notes:

1. All reported values are typical properties at nominal composition and density.
2. Reported value is in Heat treated.
3. Disclaimer: All reported values are based on a finite sample size and for reference purposes only. Information contained herein is subject to change without notice and based on specific application designs. No warranty or guarantee is made against these values.

For more information about HP Metal Jet 3D Printing solutions and materials visit <https://www.hp.com/metaljet>