

M2

Fe-based Alloy Powder for Additive Manufacturing 53/20 µm, Gas Atomized Designed for HS-LMD

Chemical composition similar to UNS T11302, DIN 1.3343

DESCRIPTION

M2 is a gas atomized powder engineered for additive manufacturing (AM). M2, high-speed tool steel is best known for its exceptional combination of hardness, wear resistance, and toughness. It can maintain its cutting-edge sharpness for longer durations, reducing the need for frequent tool changes and enhancing productivity in machining operations making it ideal for applications involving high-speed machining or cutting operations.

KEY PROPERTIES

- Extreme high hardness
- Good wear resistance
- Excellent at maintaining cutting edge sharpness
- Retains toughness at elevated temperatures

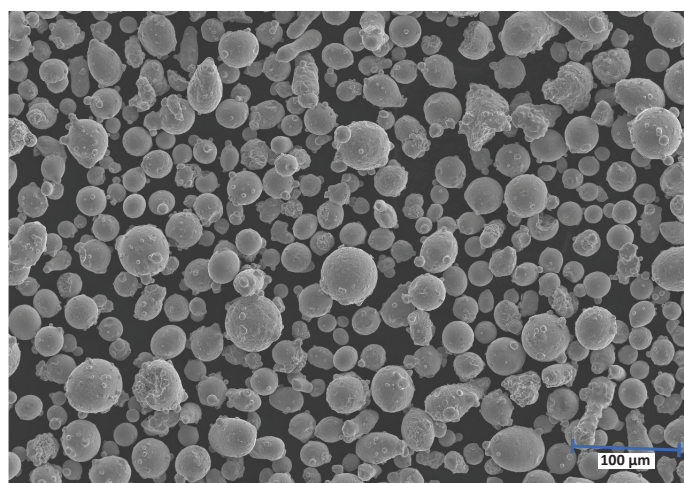
APPLICATIONS

- Cutting tools
- Stamping dies
- Cold work punches
- Shear blades

POWDER CHEMICAL COMPOSITION

Element	Min. (wt%)	Max. (wt%)
Fe	Bal.	Bal.
Si	0.2	0.45
Mn	0.15	0.1
Cr	3.75	4.5
Mo	4.5	5.5
W	5.5	6.75
V	1.75	2.20
C	0.78	0.88
S	-	0.035
P	-	0.05

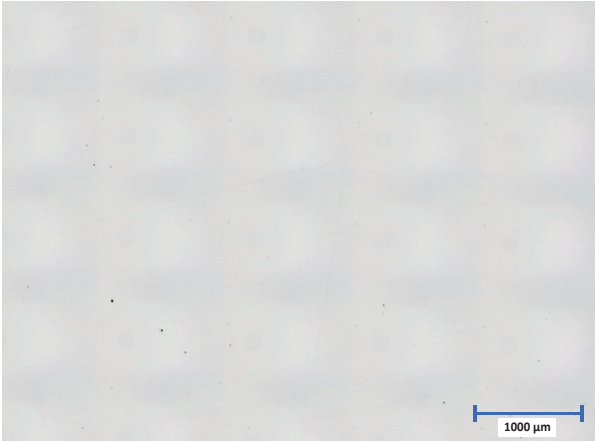
SEM IMAGE



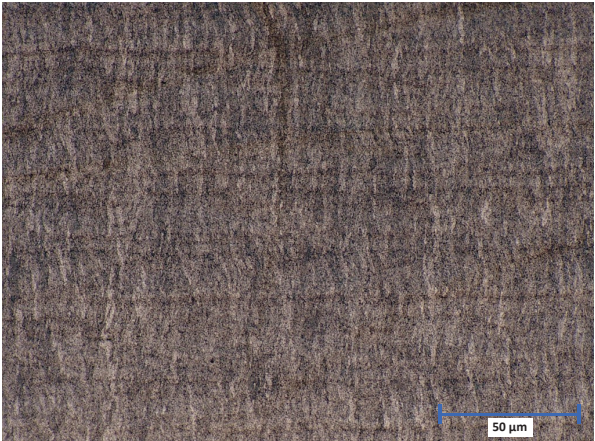
POWDER PROPERTIES (ISO 4490, ISO 3923-1)

Particle Size Range (µm)	Hall Flow (s/50g)	Apparent Density (g/cm³)
20 – 53	20	4.06

MICROGRAPHS



Polished Surface



Microstructure

PHYSICAL PROPERTIES (ISO 3369)

Average Defect Percentage (%)	Density (g/cm³)
< 0.10	> 8.14

MECHANICAL PROPERTIES (ISO 6507-1, ISO 6508-1, ASTM G99)

Hardness (HV _{1.0})	Hardness (HRC)	Specific Wear Rate (mm³/Nm)
809	64	2.58 x 10 ⁻⁵

MELTING POINT

Celsius (°C)	Fahrenheit (°F)
4860	2600

PROCESS INFORMATION:

The properties reported in this Technical Data Sheet are applicable to Makino AM powders tested and distributed by Makino and processed on Makino LMD machine utilizing parameters in accordance with relevant operating guidelines (inclusive of setup conditions and maintenance). The properties are obtained by following recommended protocols. Further information regarding the methods used by Makino can be provided upon inquiry.

DISCLAIMER:

The data and information provided represent, to the best of our knowledge, standard or average values and do not constitute guarantees for upper and lower limit parameters. The recommended applications for the material disclosed are exclusively for illustrative purposes that help the reader to conduct their independent assessments. These suggestions are not intended to be expressed or implied warranties of suitability for the specified applications or any other purposes. The information included may be subject to change at any time without prior notification.

CONTACT US:

Our Safety Datasheet (SDS) is available upon request. For more information or support please contact Makino at sales-am@makino.com.sg or visit www.makino.com.sg