

WC

Spherical Powder for Additive Manufacturing 53/20 μm, Plasma Spheroidized Designed for LMD, HS-LMD

DESCRIPTION

WC is a plasma spheroidized tungsten-based powder engineered for additive manufacturing (AM). This material is characterized by its exceptional hardness and wear resistance properties, making it a material of choice for a variety of applications. It consists of chemically bonded tungsten and carbide with a homogeneous grain structure that enhances its performance characteristics.

The material's enhanced wear resistance and highly spherical morphology makes it suitable for in-situ mixing of AM powders with a Ni or Co-based matrix material to form a metal matrix composite coating. This combination allows for enhanced wear and corrosion resistance performance in many industrial applications.

KEY PROPERTIES

- Extreme high hardness
- Excellent wear resistance
- Extreme high strength
- Suitable for metal matrix composites

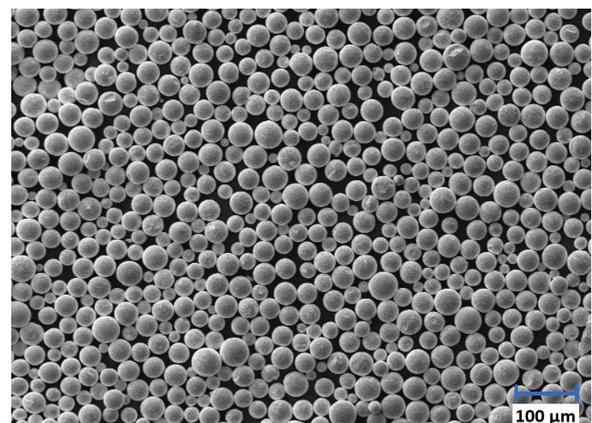
APPLICATIONS

- Machine cutting and drilling tools
- Marine valve components
- Mining and drilling components
- Automotive brake discs

POWDER CHEMICAL COMPOSITION

Element	Min. (wt%)	Max. (wt%)
W	Bal.	Bal.
C	3.80	4.20
Others	-	0.50

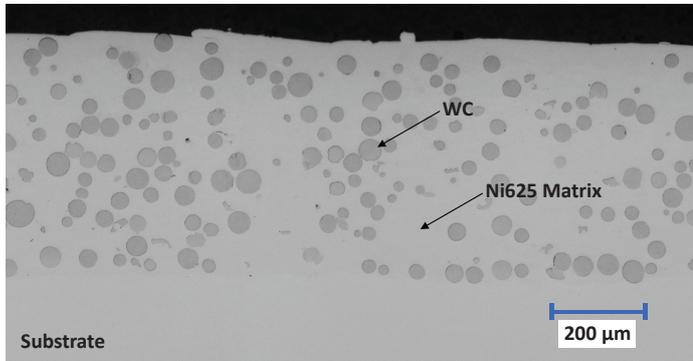
SEM IMAGE



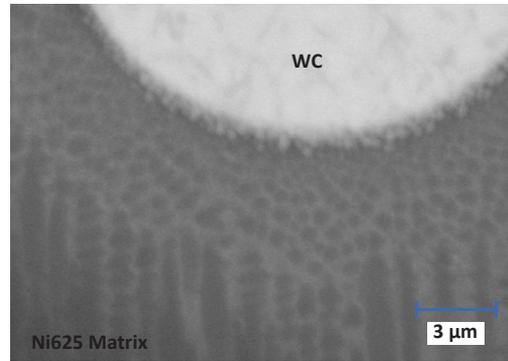
POWDER PROPERTIES (ISO 4490, ISO 3923-1)

Particle Size Range (µm)	Hall Flow (s/50g)	Apparent Density (g/cm ³)
20 – 53	8.2	4.13

MICROGRAPHS



Polished Surface



Microstructure

PHYSICAL PROPERTIES

Average Defect Percentage (%)
< 0.10

MELTING POINT

Celsius (°C)	Fahrenheit (°F)
2870	5198

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

	Hardness (HV _{0.3})	Hardness (HRC)	Specific Wear Rate (mm ³ /Nm)
WC	2438	-	
Ni625	416	42	
Ni625-40 wt% WC*	921	67	2.64 × 10 ⁻⁶

*Consult our AM experts at Makino for more information about selected matrix materials.

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