



Tungsten Carbide Powders

A fully integrated producer with more than 80 years of experience, GE is a recognized world source for tungsten carbide powders.

We offer high quality WC powders in controlled particle size distributions, completely equipped laboratories for technical support, and the close process controls required for product consistency.

GE manufactures tungsten carbide from high purity, carefully controlled tungsten powder. State of the art carburization equipment and processes are used to produce a full range of micron sizes specifically engineered for hardmetal applications.

Our focus on consistency in chemical and physical characteristics, from ore, APT and through tungsten carbide, assures uniformity of properties in our powder products.



Applications

GE tungsten carbide powders are engineered for a broad range of applications in the hardmetal industry. Our sub-micron Angstromet™ powders, used extensively in fine circuit board drills, are also finding applications in dies and punches, where improved toughness is desired and can

be obtained without sacrificing wear resistance. The mid-range of our standard powders, 1.2-3.5 microns, are used in a wide variety of cutting tool applications. The coarser grades, 4.5 micron and above, find application in mining and drilling. General Electric application engineers

work with customers to develop materials and processes specifically tailored to various end uses. Our analytical and hardmetal laboratories are equipped with the latest equipment and techniques to support these efforts.



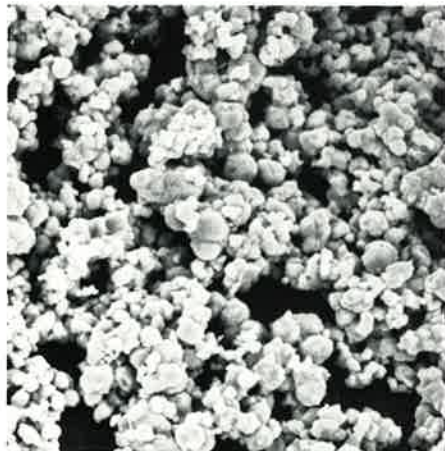
Tricone drilling heads used in oil exploration need the hardness and toughness that tungsten carbide imparts to the cutting edges.



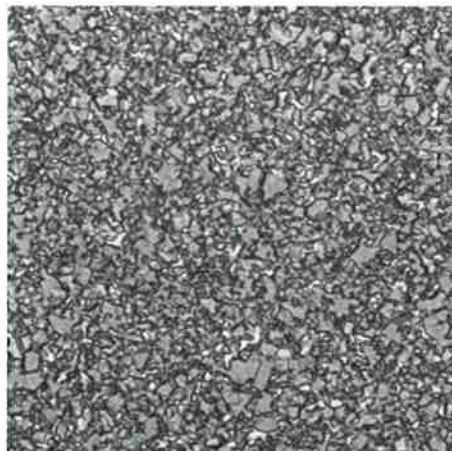
Tool bits for turning and milling operations require specific tungsten carbide formulations to achieve the desired production rates. (Photo courtesy of Carboloy, Inc.)



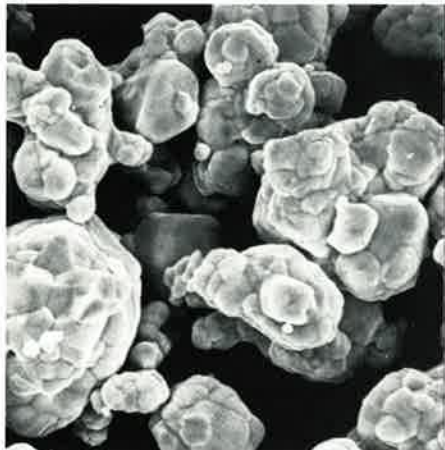
Inductively coupled plasma spectrometer is used to analyze impurities in tungsten, from ore to finished product.



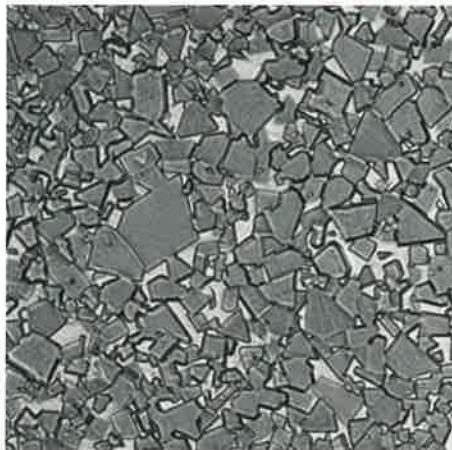
3000X SEM of 1.55 micron WC powder



1500X Optical of 1.55 micron WC 6% cobalt hardmetal



3000X SEM of 7 micron WC powder



1500X Optical of 7 micron WC 10% cobalt hardmetal

Quality Control

Fully equipped laboratories staffed with experienced specialists assure the highest level of quality in GE tungsten carbide powders. In the inductively coupled plasma spectrometer shown left, simultaneous quantitative analysis of impurities are found in the PPM to PPB range. Other QC operations used for quality control of tungsten carbide powders include computer generated particle size distribution, bulk density and flowability determinations, atomic absorption spectroscopy, direct current plasma analysis, scanning electron microscopy, X-ray fluorescence, and many others. QC studies are conducted on incoming materials, at key points in the manufacturing process, and on the end products.

Availability

General Electric's standard tungsten carbide powders are manufactured continuously and can usually be shipped from stock when your order is received.

Special product formulations may take an additional 4-6 weeks lead time to manufacture, depending on additional process work involved. In addition, other programs and customer services are available to ensure a responsive and reliable source of supply to your operations.

Material Specifications

Standard Product Specifications

Micron Size	Fisher Size Range	Carbon-%			Oxygen-ppm (Max.)
		Total	Free	Combined	
0.80	0.70- 0.90	6.10-6.18	0.05 max.	6.08 min.	1500
1.2	1.1 - 1.3	6.10-6.15	0.05 max.	6.09 min.	1000
1.55	1.40- 1.65	6.10-6.15	0.05 max.	6.09 min.	600
2.0	1.8 - 2.2	6.10-6.15	0.05 max.	6.09 min.	500
3.5	3.2 - 3.9	6.10-6.15	0.05 max.	6.09 min.	400
4.5	4.0 - 4.9	6.10-6.15	0.05 max.	6.09 min.	350
7.0	6.3 - 7.7	6.10-6.15	0.05 max.	6.09 min.	300
10.0	9.0 -11.0	6.10-6.15	0.05 max.	6.08 min.	250
18.0	14.0 -20.0	6.09-6.15	0.05 max.	6.07 min.	250
Trace impurity limits by spectrographic analysis - ppm (max.): Mo - 450 Fe - 200 Cr - 60					

GE Components/Quartz Marketing & Sales Operation is a source for tungsten, molybdenum, glass, fused quartz, Lucalox® ceramic, phosphors, chemicals, Dumet and Cumet wire, leads, bases and other components used by the lamp, electronics, cemented carbide and other industries. Technical and engineering assistance is available on all products.

Packaging

All material is packaged in polyethylene lined containers.

Container sizes available are:

5 gallon pail/
maximum kgs. – 50

20 gallon drum/
maximum kgs. – 250

Backfilling under Argon and heat sealing with dessicant are available.

Ordering Information

For further information or to order tungsten carbide powders, contact your Sales Operation representative, sales headquarters, or the Tungsten Products Plant customer service representative.

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21800 Tungsten Road
Cleveland, Ohio 44117

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Domestic (216) 266-2451
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Components/Quartz Marketing & Sales Operation