



Stoichiometric Tantalum Carbide (TaC) and Tantalum Niobium Carbide (TaNbC) can be used as an additive to WC-Co ready-to-press grade powders in order to enhance the physical properties of the sintered structure. TaC and TaNbC are frequently used in steel cutting grade powder attritions to maintain structure edge strength at high temperatures. In addition, TaC can be used as a grain growth inhibitor preventing the formation of large grains and increasing the hardness of the sintered part. Global Tungsten & Powders Corp. co-carburizes Tantalum Pentoxide and Niobium Pentoxide to manufacture TaNbC powders with a wide range of metal ratios.

T a n t a l u m N i o b i u m C a r b i d e

Physical Properties

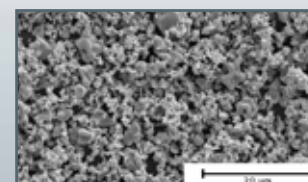
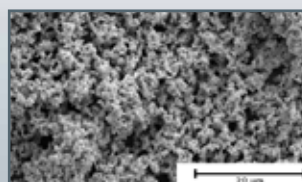
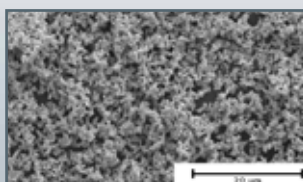
Test	TaNbC 90/10		TaNbC 75/25		TaNbC 60/40	
	Maximum / Range*	Typical	Maximum / Range*	Typical	Maximum / Range*	Typical
FSSS	0.80-3.0 μ	0.86-1.8 μ	0.80-2.0 μ	0.80-1.9 μ	0.80-3.0 μ	0.80-2.3 μ

Chemical Properties

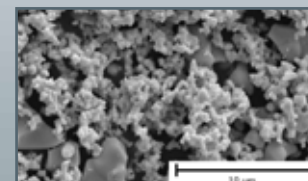
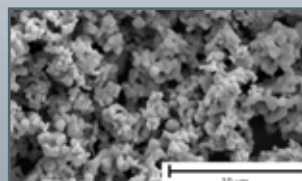
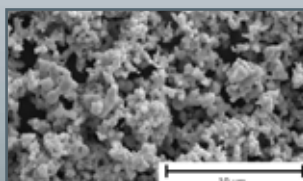
Element	TaNbC 90/10		TaNbC 75/25		TaNbC 60/40	
	Maximum / Range*	Typical	Maximum / Range*	Typical	Maximum / Range*	Typical
Total Carbon	6.25 - 7.25%	6.70%	7.00 - 8.00%	7.50%	7.80 - 8.80%	8.30%
Tantalum	82.90-85.90%	84.20%	70.25-73.25%	71.10%	54.80-57.80%	56.50%
Niobium	7.40 - 10.40%	9.10%	19.30-22.30%	21.30%	33.90-36.90%	35.00%
Oxygen	3000 ppm	1000 ppm	2000 ppm	1250 ppm	3000 ppm	1250 ppm
Nitrogen	2000 ppm	150 ppm	1000 ppm	700 ppm	2000 ppm	700 ppm
Iron	2000 ppm	200 ppm	1000 ppm	150 ppm	1000 ppm	150 ppm
Titanium	50 ppm	<5 ppm	500 ppm	<5 ppm	500 ppm	<5 ppm
Tungsten	5000 ppm	1000 ppm	1500 ppm	450 ppm	2000 ppm	250 ppm
Free Carbon	0.25%	<0.10%	0.10%	<0.10%	0.25%	<0.12%

* TaNbC type 80/20 is also available, the analysis for this type is very similar to TaNbC type 75/25.

SEM photo of each type magnified 2,000 times.



SEM photo of each type magnified 5,000 times.





Tantalum Carbide

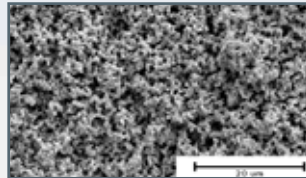
Physical Properties

Test	Maximum / Range*	Typical
FSSS	0.80-2.0 μ	0.80-1.5 μ

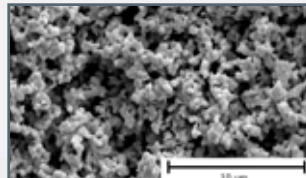
Chemical Properties

Element	Maximum / Range*	Typical
Total Carbon	6.15% to 6.30%	6.20% to 6.30%
Niobium	2500 ppm	300 ppm
Oxygen	2000 ppm	950 ppm
Nitrogen	1000 ppm	250 ppm
Iron	1000 ppm	200 ppm
Titanium	50 ppm	<5 ppm
Tungsten	5000 ppm	2000 ppm
Free Carbon	0.15%	<0.10%

SEM photo of TaC magnified 2,000 times.



SEM photo of TaC magnified 5,000 times.



Niobium Carbide

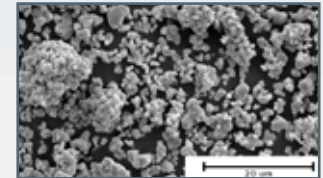
Physical Properties

Test	Maximum / Range*	Typical
FSSS	0.80-3.0 μ	2.0 μ

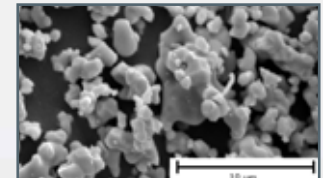
Chemical Properties

Element	Maximum / Range*	Typical
Total Carbon	11.0% to 12.0%	11.50%
Oxygen	3000 ppm	1500ppm
Nitrogen	2000 ppm	850 ppm
Iron	1000 ppm	400 ppm
Titanium	1000 ppm	20 ppm
Tungsten	5000 ppm	2500 ppm
Free Carbon	0.60%	0.35%

SEM photo of NbC magnified 2,000 times.



SEM photo of NbC magnified 5,000 times.



Customization

GTP has the capability to tailor our powder based on specific customer requirements.

Certification

Lot data for the above physical and chemical specifications is reported in a laboratory test that is provided for each shipment. Chemical analysis is performed on every 10th lot. Information is available for customer evaluation.

Packaging

Fifty kilogram (50kg) per yellow pail with polyethylene liner.



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History of Global Tungsten & Powders:

For over 60 years, GTP in Towanda has been producing tungsten, molybdenum, cobalt, and tantalum powder products. GTP produces a wide range of materials, which are used in the manufacture of numerous products. These products include metal working tools for cutting, rolling, and stamping; high temperature jet engine components and protective coatings; circuit manufacturing chemicals for microelectronics; catalysts for petrochemical processing.