

Tungsten Trioxide and Tungsten Blue/Purple Oxides

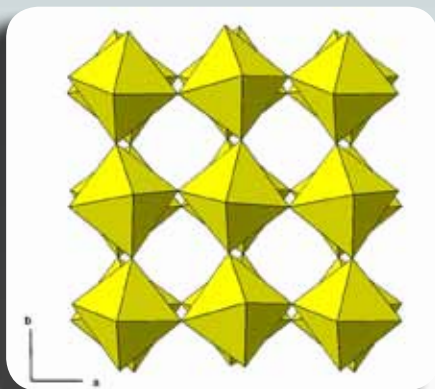
Technical Information Bulletin

Powders That Shape Your World



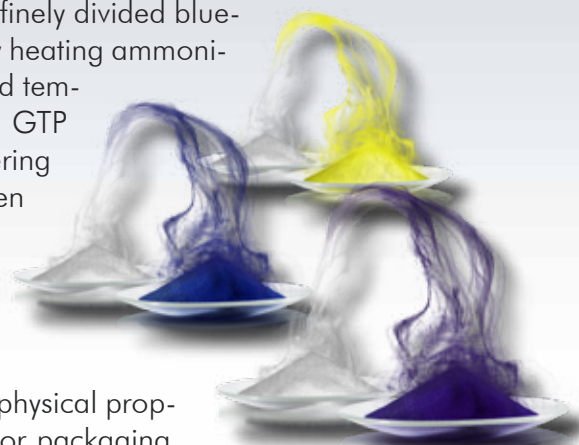
Tungsten trioxide is a thermally stable and water insoluble tungsten compound. Tungsten trioxide and Tungsten blue oxides are both used in the production of tungsten metal powders. Both products are produced at Global Tungsten & Powders from internally manufactured ammonium paratungstate (APT).

Yellow tungsten trioxide is a finely divided, yellow, crystalline powder. It is produced by roasting ammonium paratungstate at closely controlled temperatures to drive off combined water and ammonia. Yellow tungsten oxide is commonly used in the manufacture of coarser tungsten carbide powders.



Polyhedral Representation of WO_3

Tungsten blue and purple oxides are finely divided blue-violet powders. They are produced by heating ammonium paratungstate at closely controlled temperatures in a reducing atmosphere. GTP produces three standard grades differing mainly in oxygen content. Tungsten blue oxides are used primarily for the production of tungsten metal powder and fine tungsten carbide as well as wire products.



Exact time and temperature control determines, to a large extent, the physical properties of the tungsten oxide. Physical characteristics, impurity levels, or packaging, other than our standards, can be discussed upon request by customer.

Impurity Content (upper spec limit):

| Element | Content (PPM) | Element | Content (PPM) |
|---------|---------------|---------|---------------|
| Al | 5 | Na | 10 |
| As | 10 | Ni | 10 |
| Ca | 10 | P | 5 |
| Co | 10 | Pb | 10 |
| Cr | 10 | Si | 10 |
| Cu | 10 | Sn | 5 |
| Fe | 10 | Ta | 25 |
| K | 10 | Ti | 10 |
| Mg | 5 | V | 20 |
| Mn | 5 | S | 10 |
| Mo | 10 | | |

Purity, % by difference (excluding gases): 99.95% Min.

Composition:

| Oxide Type: | Comp. | Oxygen Content |
|---------------|-------------|----------------|
| Yellow Oxide: | WO_3 | 20.7% |
| Blue Oxide: | $WO_{2.90}$ | 20.2% |
| Blue Oxide: | $WO_{2.82}$ | 19.7% |
| Purple Oxide: | $WO_{2.72}$ | 19.1% |

Physical Properties:

| Oxide Type: | Comp. | Particle Size | Density g/cm^3 |
|---------------|-------------|---------------|------------------|
| Yellow Oxide: | WO_3 | 10-25 | 2.5-3.5 |
| Blue Oxide: | $WO_{2.90}$ | 10-25 | 1.8-3.35 |
| Blue Oxide: | $WO_{2.82}$ | 8-20 | 1.5-2.7 |
| Purple Oxide: | $WO_{2.72}$ | 5-20 | 1.5-2.7 |

Notes:

Particle size is Fisher-Sub-Sieve-Size (μm)

Density is bulk density tested via Scott Volumeter

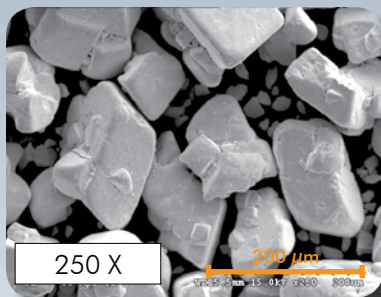
Tungsten Oxide (Blue, Purple & Yellow)

Technical Information Bulletin

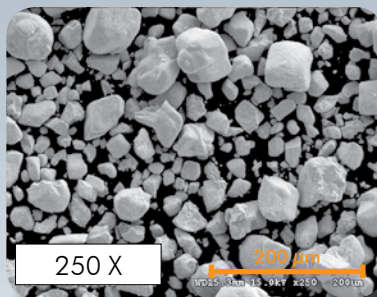
Powders That Shape Your World



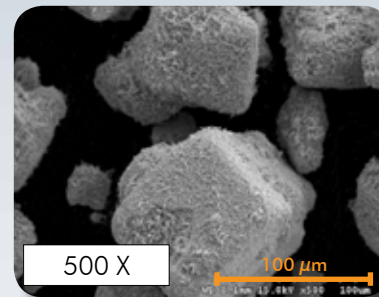
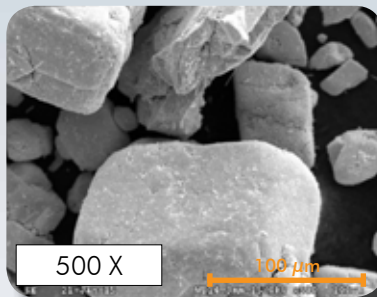
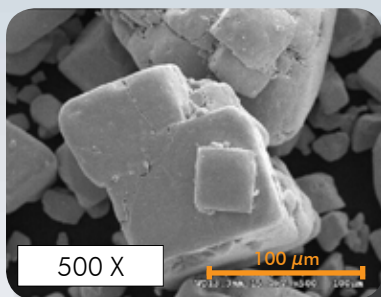
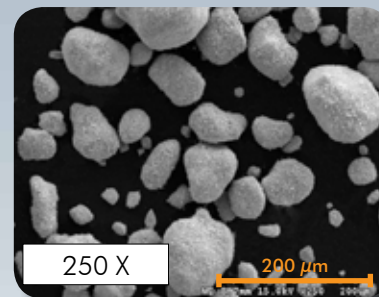
Tungsten Yellow Oxide



Blue Tungsten Oxide



Purple Tungsten Oxide



Customization

GTP can customize the oxides to specific applications. Customer specifications can be developed after technical discussions at time of inquiry.

Ordering

Specify blue, purple, or yellow oxide, oxygen level and particle size.

Certification

Each shipment of powder is accompanied by a standard report, which includes FSSS average particle size, Scott density, and purity level. SEM's are provided on an as requested basis.

Packaging

Available in uniform blends of up to 9,000 kgs. Standard packaging is super sacks packed at 1,000 - 2,000 kgs. Packaging is also available in leverpacks at 100-160 kgs. Additional packaging options can be discussed at time of order placement, some may incur an additional charge.



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History of Global Tungsten & Powders:

For over 70 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.