



# Tungsten Metal Powder

**Tungsten powder is a versatile starting material used in the manufacture of tungsten lamp filaments, cathodes and electrodes, electrical contacts, X-ray targets and a number of other parts requiring high strength at elevated temperatures.**

Because of its importance in the lighting industry, GE has been a major producer of tungsten metal powder for over 75 years. In that time, we have developed effective procedures for controlling the purity, particle size, particle size distribution and other parameters of this very specialized engineering material.

### Controlled Process

A tightly controlled manufacturing environment is required for attaining high purity levels in tungsten powder. GE utilizes the most up-to-date processing methods to produce a full range of micron sizes specifically engineered for hardmetal applications. A high degree of consistency in chemical and physical characteristics is maintained throughout processing to achieve uniformity of properties in the final product.

Our equipment is capable of making powder lots of up to 25,000 lbs. that are completely homogeneous with minimum variations in particle size.



Tungsten powder is produced by the hydrogen reduction of an oxide. Powders are a mixture of semi-sintered aggregates of small basic particles.

Such properties as flowability, green strength, green density, apparent density and tapped (or packed) density depend on the particle size of the powder.

### Purity

Purity is highly dependent on the type of powder. Minimum tungsten content for standard, high

green strength and coarse powders is 99.9% on a gas free basis.

Granular type powders have 99.5% minimum purity but are typically better than 99.7% on the same basis as above.

### Reports

A standard report is furnished for each powder lot shipped, certifying powder characteristics as determined in GE labs under standard conditions according to sampling and analytical techniques believed to be most reliable.

### Specification Tests

A number of tests are used to measure the properties of tungsten powder. Those commonly used have been standardized by the American Society for Testing Materials or the Metal Powder Industries Federation. There are many other tests, however, that are not standard throughout the industry. Samples of tungsten powder can be tested in the "as supplied," agglomerated condition, or after the powder has been de-agglomerated. The major tests used to evaluate powders are shown in Table I.

**Table I - Test For Evaluating Tungsten Powders**

Property	Test or Tests
Average particle diameter	ASTM B-330 (Fisher sub-sieve sizer)
Milled average particle diameter	ASTM 430 (Fisher sub sieve sizer)
Particle size distribution	ASTM B-430 (Turbidimeter)
Apparent density	ASTM B-329, ASTM B-212 or ASTM B-417, depending on unit of measure
Tap or pack density	ASTM B-527 (tapping a weighed sample)
Sieve analysis	ASTM B-214
Flowability	MPIF 3-45 (time/flow test, coarsest powders only)
Green strength	(ASTM B-312 transverse rupture test does not apply, but powders can be tested for compressive rupture strength by any accepted means)
Surface area	Conventional means (volumetric or galvanometric apparatus or by using continuous flow analyzers)

### Packaging

All material is packaged in polyethylene lined containers. Container sizes available are:

- 5 gallon pail (maximum capacity, 50 Kg)
- 20 gallon drum (maximum capacity, 200Kg)

### Ordering Information

Standard tungsten powders are usually ordered by nominal Fisher sub-sieve sizer numbers. For other types of powder, the specific type, Fisher number, sieve size, and other pertinent requirements should be stated.

**For further information or to place an order, contact your Sales Operation representative, GE Lighting Components headquarters, or the Tungsten Products Plant customer service representative.**

**Table II - Particle Size Range Of Tungsten Powders**

Powder Designation	Standard Sizes Within Range	Standard Sifting Within Range
U0.8	0.8 +/- 0.08	100
U1.0	1.0 +/- 0.1	230
U1.2	1.2 +/- 0.1	230
U1.35	1.3 +/- 0.1	230
U1.8	1.8 +/- 0.15	230
U2.1	2.1 +/- 0.2	230
U2.4	2.4 +/- 0.2	230
U3.0	3.0 +/- 0.3	230
U4.0	4.0 +/- 0.3	230
U4.5	4.5 +/- 0.3	230
<b>UB5.0*</b>	<b>5.0 +/- 0.5</b>	<b>100</b>
U6.0	6.0 +/- 0.3	230
U9.0	9.0 +/- 1.0	100
U16.5	18.0 +/- 2.5	40
Blue Oxide	14-20 Micron Size	79.2-79.4% W Contained

\*High Green Strength

**GE Lighting Components**  
 Building 315, Nela Park  
 Cleveland, OH 44112  
 Phone: Domestic - (216) 266-2815  
 International - (216) 266-3295

**GE Lighting Components**  
 Tungsten Products Plant  
 Customer Service - Powders  
 21800 Tungsten Road  
 Cleveland, OH 44117  
 Phone: (216) 266-3600



**GE Lighting**  
 Components