

## CMW® ELKON 100W Pure Tungsten

Category : Metal , Nonferrous Metal , Refractory Metal , Tungsten Alloy , Pure Element

### Material Notes:

Tungsten, also called Wolfram, occurs as an impure tungsten oxide in wolframite and scheelite ores. It is chemically extracted, refined to an oxide of high purity and reduced to tungsten powder in hydrogen atmosphere furnaces. It is fabricated into wrought metal rods by pressing the powder into ingots, sintering at very high temperatures followed by rolling and swaging. Discs are cut from the rods with abrasive wheels, polished by abrasive tumbling, cleaned and brazed to nickel plated steel backings to form electrical contacts. ELKON® 100W tungsten has a fine grain cold worked structure. The structure is the result of the above method of manufacture. The smaller diameter materials will exhibit finer grain structures than larger materials due to the differences in the total amount of work required to reach the final dimension. Tungsten has many unique properties that contribute to its outstanding performance as an electrical contact. It has very high melting and boiling temperatures, high density, and equates electrical and thermal conductivity. These properties provide it with excellent resistance to sticking or welding, and outstanding resistance to metal transfer and electrical erosion caused by arcing. Its high hardness and strength make it highly resistant to mechanical wear and deformation where the contacts operate with high closed forces and at high repetitive rates. In high humidity atmospheres, tungsten is susceptible to electrochemical corrosion. The corrosion results from a cell action when the tungsten is in contact with an active dissimilar metal such as the copper brazing material which is used to attach the tungsten to its backing. The deposits may be quite heavy to the degree that they completely insulate the contacts. A solution to this problem is to braze the tungsten to backings with a less active solder material such as a silver alloy. Tungsten contacts are limited to about 5 amperes in the current that they can normally carry and switch. This is due to their higher contact resistance and oxidation characteristics. At this current level they are usually provided with closed forces of 2 to 4 pounds and an electrical potential of several volts to insure establishing reliable contact. Tungsten contacts are selected for applications where low arc erosion and anti-weld characteristics are important. Some of the applications include vibrating devices such as automotive horn, magneto ignition and motor speed governor contacts. In other applications, tungsten is selected only for its high resistance to arc erosion. Examples of these arcing applications are furnace igniters and spark gap electrodes. Tungsten is used as a negative contact paired with CMW's ELKONIUM 33 or ELKONIUM 41 alloys in low voltage DC applications such as automotive voltage regulators or small motor speed governors. In these applications, the contacts operate at highly repetitive rates and the polarized combination is used to maintain a low contact resistance and minimize metal transfer and contact sticking. Due to its unique properties tungsten is used in many applications other than electrical contacts. Because of its high density it has been used for weights and radiation shielding. Due to its high hardness and good thermal conductivity it has been used for wear surfaces. It can be found in semi-conductor bases and glass seals because of its low thermal expansion and for applications where low arc erosion and anti-weld characteristics are important. Some of the applications include vibrating devices such as automotive horn, magneto ignition and motor speed governor contacts. In other applications, tungsten Refractory Metals, Series 700 and High Density Tooling, Series 800). CMW's engineering can help with many application needs. Information provided by CMW Inc.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_CMW-ELKON-100W-Pure-Tungsten.php](http://www.lookpolymers.com/polymer_CMW-ELKON-100W-Pure-Tungsten.php)

Physical Properties	Metric	English	Comments
Density	19.3 g/cc	0.697 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments

Hardness, Rockwell A Mechanical Properties	70 Metric	70 English	Comments
Tensile Strength, Ultimate	827 MPa	120000 psi	
Modulus of Elasticity	406 GPa	58900 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	4.43 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	2.46 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	
Thermal Conductivity	166 W/m-K	1150 BTU-in/hr-ft <sup>2</sup> - $^{\circ}\text{F}$	
Melting Point	3410 $^{\circ}\text{C}$	6170 $^{\circ}\text{F}$	
Boiling Point	5900 $^{\circ}\text{C}$	10700 $^{\circ}\text{F}$	

Component Elements Properties	Metric	English	Comments
Tungsten, W	100 %	100 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000550 ohm-cm	0.00000550 ohm-cm	31% IACS

## Contact Songhan Plastic Technology Co.,Ltd.

Website : [www.lookpolymers.com](http://www.lookpolymers.com)

Email : [sales@lookpolymers.com](mailto:sales@lookpolymers.com)

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China