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## 钨产品

## TUNGSTEN PRODUCTS

### ● TUNGSTEN PARTS 钨加工件

#### ◇ Chemical Composition(成分):

钨含量 Tungsten content	其他杂质含量总和 The sum of other elements	各元素含量 Content of each element
≥99.95%	≤0.05%	≤0.01%

#### ◇ Properties of the products (性能):

- 高熔点—3410℃  
High melting point—3410℃
- 高沸点—5927℃  
High boiling Point—5927℃
- 高密度—19.3 g/cm<sup>3</sup>  
High-density —19.3 g/cm<sup>3</sup>
- 内部结构稳定  
Internal stable structure
- 优异的导热性  
Outstanding thermal conductivity
- 具有耐腐蚀性  
Excellent resistance to electrochemical corrosion
- 具有高温氧化性能  
Excellent resistance to oxidation at high temperatures

#### ◇ Products Description (种类):

Description 产品名称	Used
Tungsten boat/box 钨舟	used for the evaporation 用于蒸发系统
Tungsten crucible 钨坩埚	applied in high temperature vacuum furnace melting environment such as sapphire growing furnace, etc 用于蓝宝石单晶生长炉等工业炉内容器等
Other tungsten parts 其他	Surface decoration, Glass coating, micro-electronics, Miniature components, Optical communication, Medical devices, etc 高温炉零件及坩埚加热元件等

注：所有产品均可按照客户要求生产。

Note: All the products can be supplied in according to customer's requirement.

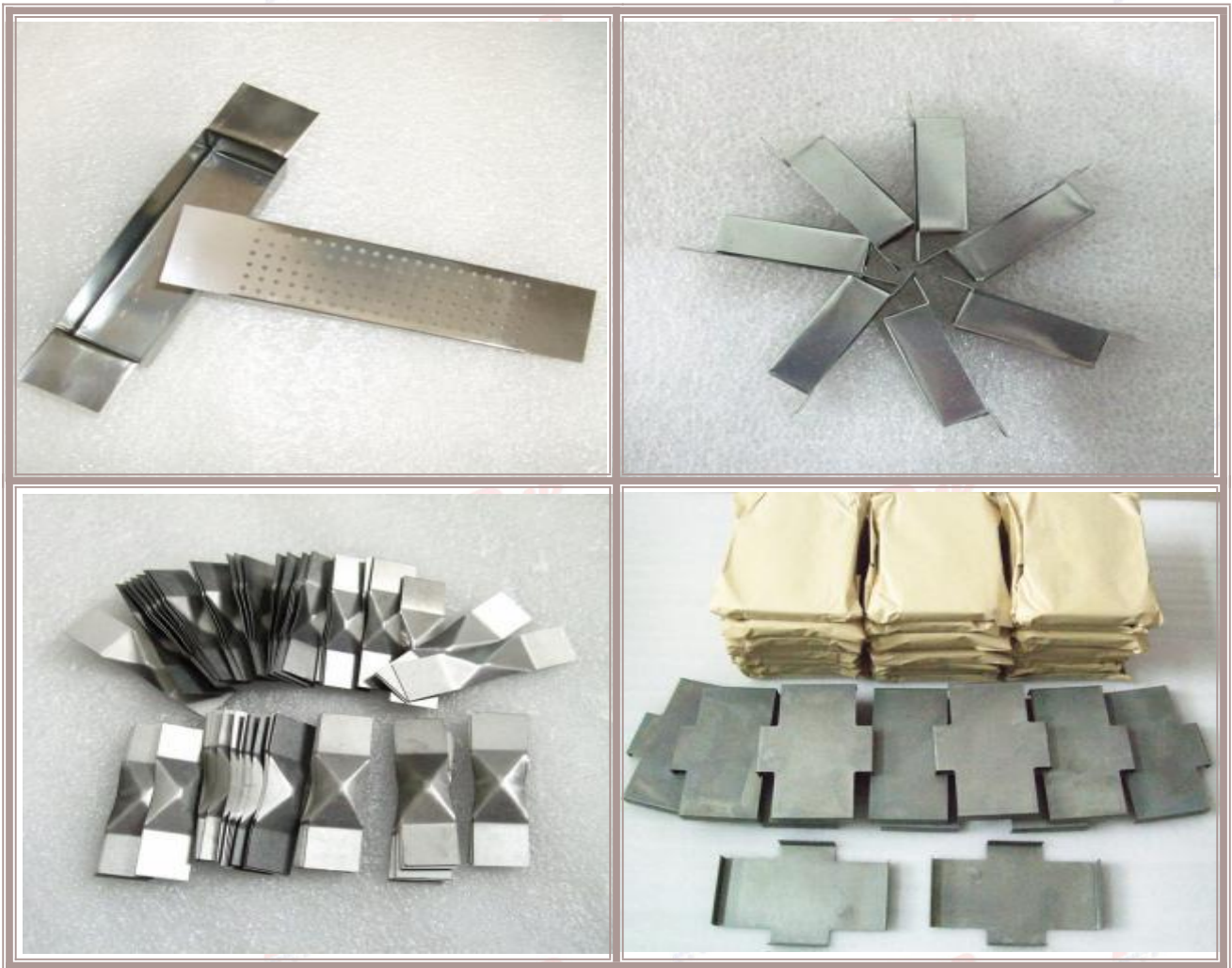
## ● TUNGSTEN PARTS——Boat/Box

### 钨加工件—— 钨舟、钨盒

#### ◇ Range of use (用途):

- Widely used in Metalizing, Electron-beam Spraying as well as sintering annealing in reducing atmosphere in electronics, military and light industries
- Used to evaporate small lengths of wire or to evaporate materials which would not properly "wet" the surface of an evaporation filament.
- Ideal for use in small evaporation systems, such as bell jars, for experimental and prototype work.
- Used for the vacuum evaporation of materials that are in granular or pellet form.
- 用于军事和轻工业
- 用于蒸发小长度的电线或蒸发材料。
- 用于小型蒸发系统，如钟罩，实验和原型的工作。
- 用于真空蒸发。

#### ◇ Products show (展示):



## ● TUNGSTEN PARTS——Crucible

### 钨加工件—— 钨坩埚

#### ◇ Range of use (用途):

- Tungsten crucible is widely applied in high temperature vacuum furnace melting environment such as sapphire growing furnace, quartz glass melting furnace, and rare earth melting furnace. The working temperature of tungsten crucible is above 2000°C.
- For sapphire crystal growing furnace, high-purity, high-density, no crack tungsten crucible with other features of exact measurement and smooth surface has decisive influence on the success of crystal growth, quality control of pulling crystal, discharging and service life during sapphire growing process.
- 钨坩埚被广泛应用于蓝宝石单晶生长炉、石英玻璃熔化炉、特种陶瓷烧结等工业炉内的核心容器，其使用的工作温度一般要达到 2000°C 以上。
- 特别对于蓝宝石单晶生长炉来说，具有高纯度、高密度、无内裂纹、尺寸精准、内外壁光洁，低碳、低氧、低铁等特征对蓝宝石晶体生长过程中的长晶成功率、拉晶质量控制、脱晶粘锅以及使用寿命起到了关键性的作用。

#### ◇ Specification (规格):

供应状态 Delivery condition	规格 Specification		公差 Tolerance		壁厚 Thickness (mm)	光洁度 Roughness ( $\mu$ m)
	直径 Diameter (mm)	高度 Height (mm)	直径 Diameter (mm)	高度 Height (mm)		
烧结 Sintering	10~500	10~750	$\pm 3.0$	$\pm 3.0$	8~20	
烧结后精加工 Final Finished	10~450	10~550	$\pm 0.5$	$\pm 1.0$	7~18	<3.2

注：特殊产品尺寸可以根据客户的要求定制生产  
Note: Special sizes can be manufactured based on customers' requirements

#### ◇ Manufacturing process and equipment (生产工序和设备):

序号 Item	工序 Process	设备 Equipment	质量检查方法 Quality Check
1	粉料提纯 Powder purified	真空提纯炉 Purified furnace	GDMS GDMS
2	冷等静压 Isostatic pressing	冷等静油压机 Isostatic pressing machine	坯料尺寸、密度状况检查 Measurement of rough-processed
3	烧结 IF forging	高温真空烧结炉 High-accuracy forging machine	尺寸、密度状况检查 Dimension measurements for product
4	锻压轧制 IF sintering	高精度锻轧机 High temperature vacuum sintering furnace	尺寸、密度、表面内部状况检查 Dimension measurements for product
5	精加工 Final machining	数控加工中心 High-accuracy turning machine	尺寸、密度、表面内部状况检查 Surface quality/ roughness and density
6	包装 Package		出货检测报告 Quality Test Report



## ◇ Advantage of Tungsten crucibles (技术优点)

—Specially precise forming technology for tungsten crucible body

—Uniform grain with densified microstructure ensures longer life time

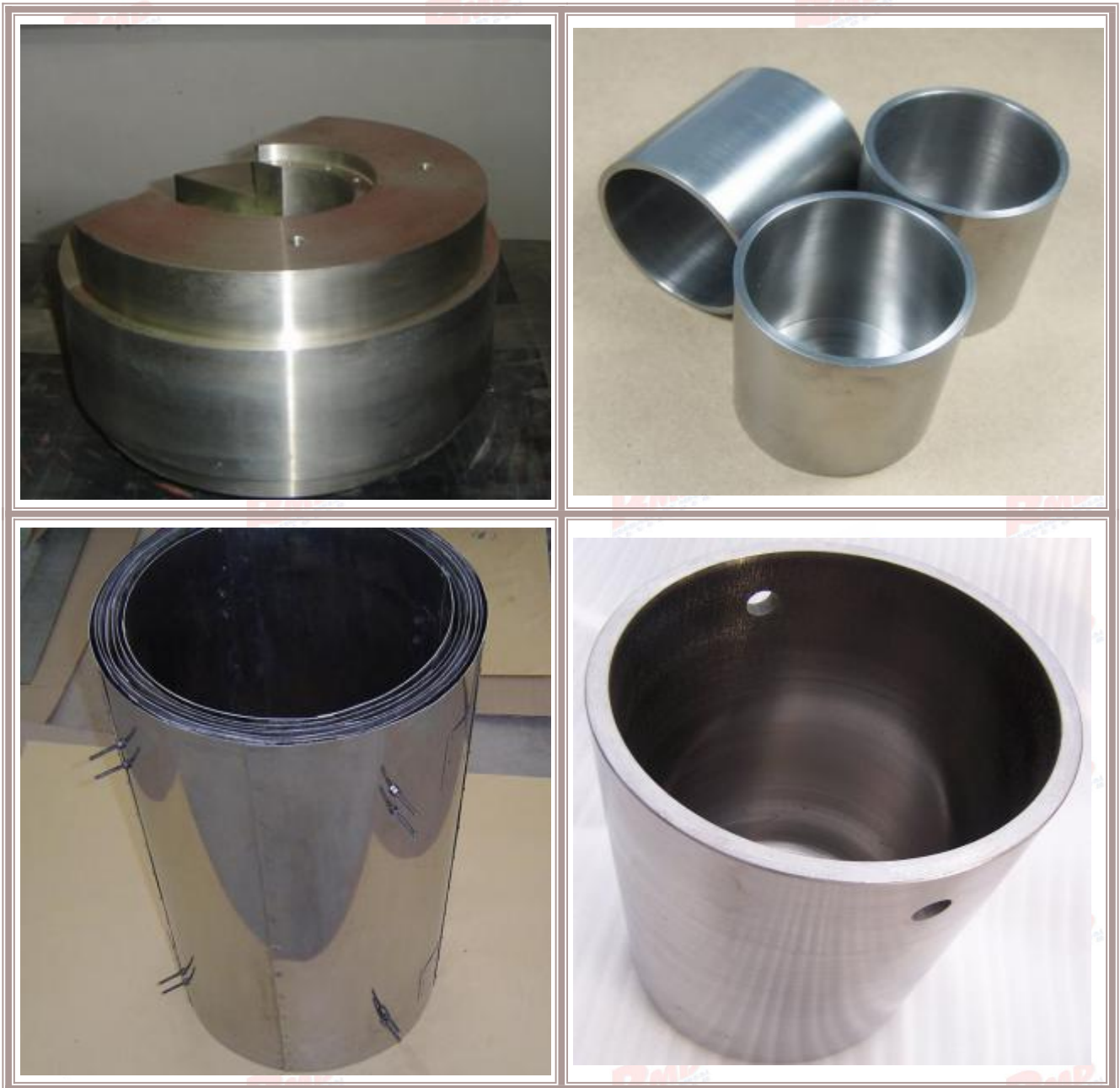
—Ready for use parts with precise machining tolerancel.

—根据蓝宝石生长温控曲线研发材料热力学性能，原材料独特配比，用于超高温工况条件下 高温蠕变屈服强度、耐高温性能远远优于普通坩埚，使您的高温使用更有保障 抗高温变形稳定性非常优越

—原材料严格控制氧、碳、铁等杂质元素存在，使客户的使用免受外来杂质元素的污染，保证生产的高纯环境

—产品具有均匀的晶粒结构、高致密度、无缺陷、尺寸精准、具有更长使用时间，提高长晶成功率，单位数量产出率，直接降低单位生产成本

## ◇ Products show(展示):



● TUNGSTEN PARTS——Other tungsten parts  
钨加工件——其他

◇ Products show(展示):

