

**ZHAOXU**  
东莞朝旭自动化科技有限公司

# 东莞朝旭自动化科技有限公司



# Company Introduction



## 公司介绍

东莞朝旭自动化科技有限公司是一家在 PTFE 产品市场拥有 15 年生产经验的企业。我们从原材料到成品加工进行统一管理、统一生产。我们能为客户提供各类管、棒、片材半成品以及多种矿物填料制成的密封和自润滑产品。

我们拥有丰富的 PTFE 改性填料生产经验，能为关键应用带来长久可靠的使用性能。通过多年的努力，朝旭新材已经为液压、汽车、航天、电器、医疗等行业客户带去了各种 PTFE 材料解决方案。公司致力于不断提升产品工艺，提升质量管控，加强流程控制，为客户带来质量稳定的产品。

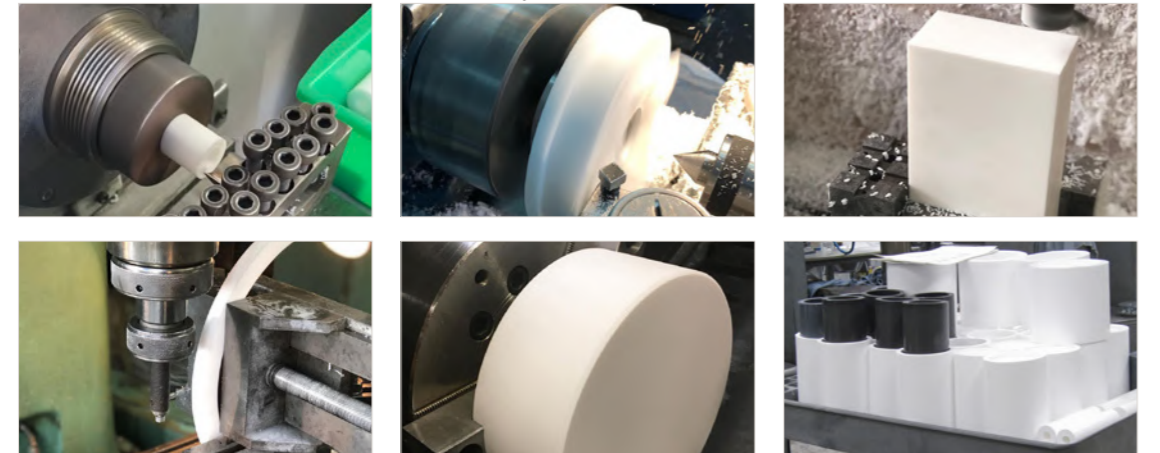
作为一家专业的 PTFE 材料解决方案供应商，我们的目标是为客户提供准确的产品，并提供具有商业竞争力的价格。

*Zhaoxu* is a company with 15 years of production experience in the PTFE products market. We conduct unified management and unified production from raw materials to finished product processing.

We can provide customers with sealing and self-lubricating products made of various semi-finished pipes, rods, sheets and with a variety of mineral fillers available. We have rich experience in the production of PTFE modified fillers, which can bring long-term and reliable performance for key applications. Through years of hard work, *Zhaoxu* has brought a variety of PTFE material solutions to customers in the hydraulic, automotive, aerospace, electrical, medical and other industries.

The company is committed to continuously improving product technology, improving quality control, strengthening process control, and bringing customers stable quality products.

As a professional PTFE material solution manufacturer, our goal is to provide customers with accurate products, and provide commercially competitive prices.



### 产品范围:

超过 2000 种模具尺寸搭配尽可能的做出接近成品的尺寸，同时可以节约客户的模具开发费用。

### Products Range:

Over 2,000 tooling combinations we have that allow production close to finished part size and save customer's tooling cost.

### 服务:

- 普通产品当天报价
- 平均 7-10 天的交货期
- 库存品隔日送达
- 产品包装规范并且标签清晰
- 可以对材料进行机械性能测试

### Services:

- 24 hours quotation for regular components.
- Average 7-10 days delivery
- Ship from stock for next day delivery.
- Packing and labeling to your specification.
- Mechanical testing of materials



我们的氟树脂材料严格从世界认可的供应商处采购!  
Our fluoropolymer materials are purchased strictly from world-recognized manufacturers!



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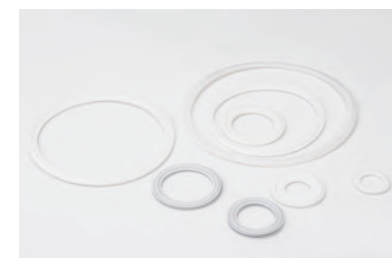
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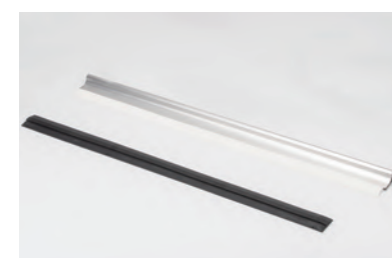
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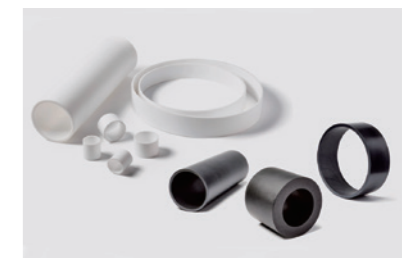
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## Making small parts Making a big difference



## 什么是聚四氟乙烯？ What's the Polytetrafluoroethylene(PTFE) ?



聚四氟乙烯 (PTFE) 是一种由四氟乙烯合成的含氟化合物，其具有广泛的应用，特别在密封技术领域是性能最好的材料之一。并且 PTFE 的摩擦系数是所有固体中最低的，当用作润滑材料时，聚四氟乙烯可以减少磨损并降低机械设备在使用过程中的能量消耗。

### PTFE 的重要特性：

- 宽泛的工作温度范围 -200°C至 +260°C
- 最佳的电绝缘性能和良好的介电性能
- 超长寿命，耐气候性
- 出色的摩擦特性和无“粘滑”现象
- PTFE 具有自润滑性能，这意味着 PTFE 材料的轴承和动密封件在某些条件下可以干润滑使用
- 耐化学性
- 不易燃烧
- 极低的吸水率

Polytetrafluoroethylene(PTFE)is a synthetic fluoropolymer of tetrafluoroethylene that has numerous applications and makes it one of the best-performing materials in the field of sealing technology. PTFE has one of the lowest coefficients of friction of any solid. Where used as a lubricant, PTFE reduces friction, wear, and energy consumption of machinery.

### 典型应用：

- 压缩机活塞环
- 球阀密封阀座
- 旋转密封
- 气动和液压缸体
- 减震和支撑带状活塞环
- 泛塞封
- 变速箱油封
- V形填料环

### Significant Characteristics of PTFE:

- Broad operating temperature range -200°C to +260° C
- Optimum electrical insulating properties and great dielectric properties
- Superior longevity, weather-resistant
- Excellent frictional characteristics, no "stick-slip"
- PTFE is self-lubricating component, which means that bearings and dynamic seals can run dry under certain conditions
- Chemical resistance
- Non-flammable
- Extremely low water absorption

填充 PTFE 材料可以扩展材料低摩擦特性的应用范围，其中纯 PTFE 成分主要提供了材料的耐高温性能，其余填料可以增强材料在负载下的低变形性以及耐磨性。



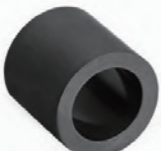




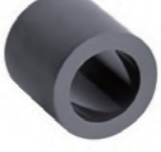
- 使用标准填料（如碳，玻璃纤维和铜粉）或其他特殊填料，可以对 PTFE 的材料性能进行特定的变化。
- 未填充填料的 PTFE 具有耐化学性，这意味着 PTFE 不受酸，碱，氮等化学物质的侵蚀，以及不受高度极化和卤化的有机溶剂，酮，酯和醚类物质的影响。
- 通过添加填充材料可以大大改善 PTFE 的机械性能。朝旭可以针对客户的工况要求提供建议性的材料。

**Filled PTFE compounds extend the range of low-friction applications in which pure PTFE provides high temperature resistance, low deformation under load, and enhanced wear characteristics.**





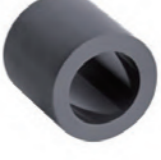




- The use of standard fillers (like carbon, glass fibre, and bronze) or special fillers allow engineers to make specific changes to PTFE's material properties.
- Unfilled PTFE's universal chemical resistance means that the PTFE is not affected by aggressive acids, alkali, nitrides, highly polarized and halogenated organic solvents, ketones, esters, and ethers.
- Many of the characteristics of PTFE can be enhanced with the addition of fillers. Zhaoxu could helps customers to choose the right grade for your application.

### Typical Applications:

- Compressor piston rings
- Ball valve seats
- Rotary seals
- Pneumatic and hydraulic cylinders
- Shock and strut-banded pistons
- Spring-energized seals
- Transmission seals
- V-Packing rings

材料外观 Material Profile	材料类型 Type of the Polymer	材料成分 Material Specification	材料特性 Material Characteristics
	热塑性塑料 Thermoplastic	纯 PTFE Virgin PTFE	纯 PTFE 材料具有很高的耐热性，并且能抵抗大多数化学物质的侵蚀，电性能优异。尽管它具有很高的抗冲击强度，但与其他工程级热塑性塑料相比，其耐磨性，耐用性和抗蠕变性却很低。是 FDA 认证的材料。 Virgin PTFE material is highly resistant to heat, as well as attack from most chemicals. The electrical properties are excellent. Though it's high impact strength, its resistance to wear, durability and creep resistance are low as compared to alternative engineering grade thermoplastics. FDA approved.
	热塑性塑料 Thermoplastic	改性 PTFE Modified PTFE	相较于纯 PTFE，改性 PTFE 具有更好的抗蠕变性和耐磨性。在室温高压（冷流）工况下拥有更好的材料恢复性，是一种比纯 PTFE 更为致密的聚合物材料。 Lower creep than virgin PTFE, good wear resistance. Much lower deformation under pressure(cold flow) at room and elevated temper. Much denser polymer structure than Virgin PTFE.
	热塑性塑料 Thermoplastic	PTFE + 碳纤维 PTFE + Carbon fibre	碳纤维的加入可以提升材料的抗蠕变性、弯曲模量、压缩模量并提高硬度。其热膨胀较低，导电率较高。适用于强碱和氢氟酸环境，在水环境中具有出色的耐磨损性能。 Carbon fibre lowers creep, increases flexural and compressive modulus and raises hardness. Thermal expansion is lower and electrical conductivity is higher. Good for strong bases and hydrofluoric acids. Excellent wear behaviour in aqueous environment.
	热塑性塑料 Thermoplastic	PTFE + 玻纤 + 石墨 PTFE + Glass fibre + Graphite	具有优异的化学稳定性以及更好的导热性和较低的摩擦系数，提高了抗压性能和耐磨性能，在初始运动时具有非常好的自润滑性能。 Excellent chemical stability. Better thermal conductivity and coefficient of friction. Improved compression and wear resistance. Self lubricating properties specially at starting point.
	热塑性塑料 Thermoplastic	PTFE + 玻纤 PTFE + Glass fibre	玻纤的加入对材质的耐压性有着积极影响。大大提高了耐磨性并提升了材质的抗压强度。仅用于非常坚硬的配合面，请勿与强碱或氢氟酸一起使用。 Has positive impact on pressure resistance. Improves wear resistance and offers good compressive strength. Only for use on very hard mating surfaces. Do not use with strong bases or hydrofluoric acid.
	热塑性塑料 Thermoplastic	PTFE + 陶瓷 PTFE + Ceramic	陶瓷填充的 PTFE 具有较低的导热率和合金金属的化学惰性。与玻璃纤维填充的 PTFE 相比，它具有更为出色的耐摩擦磨损特性，并可以降低材质渗透率从而降低了磨料磨损。 Has low heat conductivity and chemical inertia of the alloyed metal. It has outstanding tribological friction and wear characteristics compared to the glass filled PTFE, with reduced permeation producing less abrasive wear.
	热塑性塑料 Thermoplastic	PTFE + 5% 石墨 PTFE + 5% Graphite	相较于纯 PTFE 具有更好的耐磨性。此外其耐高温性也比纯 PTFE 要好得多。拥有更为出色的抗挤压性和耐磨性。非常适合在有腐蚀性物质，蒸汽和热水工况中使用，在无油润滑条件下是一种理想的材料。 Better wear resistance than virgin PTFE materials. Also a much better temperature resistance than virgin PTFE. Better extrusion resistance and higher wear resistance. Excellent for corrosive service, steam and hot water applications. Ideal for unlubricated service.
	热塑性塑料 Thermoplastic	PTFE + 10% 石墨 PTFE + 10% Graphite	随着石墨含量提高到 10%，更多的石墨颗粒可以承受载荷，参与摩擦。填充材料带来较低的摩擦系数，使其成为动态部件的绝佳耐磨材料选择。 As the graphite content increases to 10% percent, more graphite particles can bear the load and participate in friction. The filler produces a lower coefficient of friction making it a great wear choice for dynamic components.

颜色 Color	温度范围 Temperature Range (° C)	耐磨性 Wear Resistance	抗压强度 Pressure Extrusion Resistance	耐化学性 Chemical Resistance	FDA 认证 FDA Compliant
白色 White	-200 +260	低 Low	低 Low	高 High	Yes
自然白 Natural white	-200 +260	低 Low	低 Low	高 High	Yes
黑色 Black	-200 +260	高 High	高 High	高 High	No
灰色 Grey	-200 +260	中等 Moderate	非常高 Very High	高 High	No
象牙白 Ivory	-260 +260	高 High	高 High	高 High	No
奶白色 Cream	-260 +260	高 High	高 High	中等 Moderate	No
灰色 Grey	-200 +300	低 Low	低 Low	高 High	No
深灰色 Dark grey	-200 +260	高 High	高 High	高 High	No

材料外观 Material Profile	材料类型 Type of the Polymer	材料成分 Material Specification	材料特性 Material Characteristics
	热塑性塑料 Thermoplastic	PTFE + 聚苯脂 PTFE + Ekonol	聚苯脂是一种具有热稳定性的聚合物，当与 PTFE 结合后具有非常好的耐高温和耐摩擦性能。随着聚苯脂含量的增加，复合材料的耐磨性会比纯 PTFE 高数十倍。 Ekonol filled PTFE is a very thermally stable polymer that have excellent temperature and wear resistance. As the content of Ekonol increases, the wear resistance of the composite material is several dozen times higher than that of virgin PTFE.
	热塑性塑料 Thermoplastic	PTFE + 铜粉 PTFE + 40% Bronze	铜粉填充 PTFE 的材料比大多数 PTFE 填料具有更好的抗蠕变性。其可以提高材质的导热性和抗承载能力，最常用于液压工况。此外，铜粉填充 PTFE 的材质既可以导热又导电。 Bronze filled PTFE provides a better creep resistance than most of the filled PTFE blend. It exhibits improved thermal conductivity, with high load bearing capacity and hence is most often used in hydraulic systems. Bronze filled PTFE is both thermally and electrically conductive.
	热塑性塑料 Thermoplastic	PTFE + 铜粉 PTFE + 60% Bronze	60% 铜粉填充的 PTFE 材料，特别适用于高压和高速运动的工况，相比于 PTFE+40% 铜粉材质拥有更好的耐摩擦性能。需要注意的是产品不适用于电气应用和化学应用。 60% bronze filled PTFE, especially at higher pressures and speeds, have a better wear properties than the 40% bronze filled PTFE. The components are not appropriate for electrical applications for chemical applications.
	热塑性塑料 Thermoplastic	PTFE + 聚酰亚胺 PTFE + Polyimide	在所有填充 PTFE 材料中具有最低的摩擦性能，在真空和惰性气体中的磨损率很低，在干燥环境中表现出色。它对动态配合面的磨损非常低。聚酰亚胺填充的 PTFE 材料特别适合干摩擦和启停应用中。 The compounds have about the lowest friction properties of all filled PTFE materials, so they provide great performance in non-lubricated (dry) applications. It has very low abrasion to dynamic mating surfaces. It suits dry running and stop-start applications particularly well.
	热塑性塑料 Thermoplastic	PTFE + 二硫化钼 PTFE + MoS2	二硫化钼具有润滑作用，因此可以赋予材料更好的耐磨性能。二硫化钼添加比例很小，通常会与玻纤或铜粉一起进行添加。 MoS2 has a lubricating effect and, therefore, gives better anti-friction properties to the material. MoS2 is added in small percentages in conjunction with other fillers such as glass and bronze.
	热塑性塑料 Thermoplastic	PTFE + 玻纤 + 二硫化钼 PTFE + Glass fibre + MoS2	二硫化钼是最为有名的固体润滑剂之一，可以增加材料表面的硬度并且降低摩擦系数，而玻纤的加入可以增加结构强度。这种化合物经常用于液压和气缸中作为往复密封材料。 One of the best known dry lubricants, MoS2 can increase surface hardness and lower coefficient of friction and wear rate while the glass fibers add structural reinforcement. This compound is very commonly used for reciprocating seals in hydraulic and pneumatic cylinders.
	热塑性塑料 Thermoplastic	PTFE + 碳 PTFE + Carbon	碳可降低材料的蠕变性、增加硬度并提高零件的导热性。碳填充 PTFE 材料具有一定的导电性。如需改善耐磨性，可以添加额外的石墨。 Carbon reduces creep, increases hardness, and elevates the thermal conductivity of parts. Carbon-filled PTFE materials have some electrical conductivity. Wear resistance can be improved by adding graphite.
	热塑性塑料 Thermoplastic	PTFE + 碳 + 石墨 (RPTFE) PTFE + Carbon/graphite (RPTFE)	碳 / 石墨填充 PTFE 材料具有优异的抗挤压性和良好的耐磨性，在润滑和非润滑环境中都能很好地工作。碳 / 石墨填充 PTFE 材料可以用于静态和动态应用。 Compare with carbon filled PTFE, the carbon/graphite filled PTFE materials have a better extrusion resistance and good wear resistance and will work well in both lubricated and non-lubricated environments. Carbon/graphite filled PTFE materials are used in static and dynamic applications.
	热塑性塑料 Thermoplastic	PTFE + PEEK	加入 PEEK 可以改善材料在高温下的耐磨性、蠕变性、变形以及尺寸稳定性，PEEK 还具有更好的抗压强度。 With PEEK added component which improves the wear property, creep, deformation and dimensional stability at high temperature. PEEK also has better compressive strength.

颜色 Color	温度范围 Temperature Range (°C)	耐磨性 Wear Resistance	抗压强度 Pressure Extrusion Resistance	耐化学性 Chemical Resistance	FDA 认证 FDA compliant
棕色 Brown	-150 +260	高 High	中等 Moderate	高 High	No
青铜色 Bronze	-200 +260	高 High	高 High	低 Low	No
绿色 Green	-200 +260	高 High	高 High	低 Low	No
黄褐色 Tan	-200 +310	非常高 Very High	非常高 Very High	中等 Moderate	No
黑色 Black	-200 +260	低 Low	非常高 Very High	中等 Moderate	No
灰色 Grey	-200 +260	高 High	高 High	高 High	No
黑色 Black	-200 +260	高 High	高 High	高 High	No
黑色 Black	-200 +300	低 Low	中等 Moderate	高 High	No
米褐色 Brown beige	-200 +260	高 High	高 High	高 High	No

## 挡圈 Back-up Rings



PTFE 挡圈通常与橡胶 O 形圈搭配装入一个工件的环槽内或装入液压密封件中作为一个组合密封件使用。  
挡圈的主要作用是防止橡胶 O 形圈在高压或高温工况下被挤出，可以有效延长橡胶 O 形圈的使用寿命。  
PTFE back-up ring is normally installed in a groove behind a rubber O-ring or a hydraulic seal as an unit.  
Its main purpose is to prevent extrusion of the seal when high pressure or high temperature is applied to the system, which can effectively extend the life of rubber O-ring.

### 主要优点:

- 挡圈在 O 形圈面临高压工况时使用
- 挡圈在 O 形圈材料硬度比较低时使用
- 填补径向密封间隙
- 用于内周和外周密封应用
- 可用于往复和旋转运动
- 填补大范围温度变化
- 适用于静态和动态应用

### 典型应用:

- 压力过滤器
- 螺纹插装阀
- 节流阀
- 压力控制阀
- 流量阀
- 比例阀
- 弹簧减震器
- 液压油缸

### Main Features:

- Use of O-Rings in high pressure applications
- Use of O-Ring materials with a low hardness
- Compensation of radial sealing gaps
- Use for internal and external sealing applications
- Reciprocating and rotating movements possible
- Compensation for large temperature fluctuations
- Static and dynamic applications

### Typical Applications:

- Hydraulic filters
- Screw-in cartridge valves
- Throttle valves
- Pressure control valves
- Flow valves
- Proportional valves
- Spring shock absorbers
- Hydraulic cylinders

应用备注: 在静态和动态应用中, O 型圈间隙挤出的风险主要由于系统中过高的压力或 O 型圈线径过小有关。因此挡圈必须与 O 型圈组合使用。挡圈自身没有密封作用。

\* 纯 PTFE 材料是标准型材料, 考虑到纯 PTFE 的冷流性不佳, 这些挡圈只用于低至中等负载的工况。对于有更高的负载要求的产品, 必须使用含有填料(如玻璃纤维、铜粉、碳粉等)的 PTFE 材料或者 PEEK 材料, 以延长使用寿命, 并可以提高耐高温性以及改善润滑性。

Application notes: In static and dynamic applications, gap extrusion is a risk typically associated with high pressures or small O-ring cross sections. The back-up ring itself does not have sealing property.

\* The virgin PTFE is a very standard materia. However due to the poor cold flow properties of the virgin PTFE, these rings are only used for low or medium pressure applications. For high pressure applications, you must use the material of additional fillers with PTFE to improve longevity of life, resilience to temperature and pressure or improved lubrication.

### 材料选择 Material Selection:

纯 PTFE(标准材料) Virgin PTFE(Standard material)	PTFE + 玻纤 PTFE + glass fiber	POM, PA, PEEK...
PTFE + 铜粉 PTFE + bronze	PTFE + 碳 PTFE + carbon	*其它材料可根据客户需求提供 *Other materials available upon request

## 挡圈 Back-up Rings

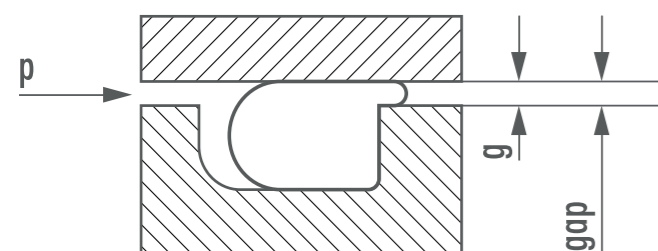
### 挡圈类型 The Type of Back-up Rings:

<b>BU</b>	<ul style="list-style-type: none"> <li>● 矩形结构</li> <li>● 最为常用的挡圈类型</li> <li>● 用于静态和往复或慢速旋转运动</li> </ul>	<ul style="list-style-type: none"> <li>● Rectangular profile</li> <li>● Most common type</li> <li>● For static and reciprocating or slow rotating motions</li> </ul>
<b>BC</b>	<ul style="list-style-type: none"> <li>● 矩形结构, 有斜切口</li> <li>● 当无法使用无切口的挡圈进行安装时, 可以作为一种替代的安装方案</li> <li>● 用于静态和往复运动</li> <li>● 斜切口角度通常为 30°或 45°</li> </ul>	<ul style="list-style-type: none"> <li>● Rectangular profile with cut</li> <li>● An alternative to uncut BU back-up rings where these are not mountable or when a split groove cannot be used</li> <li>● For static and reciprocating motions</li> <li>● Scarf cut at a 30° or 45° angle</li> </ul>
<b>CBU</b>	<ul style="list-style-type: none"> <li>● 凹面结构</li> <li>● 主要用于静态应用, 可以进行往复运动</li> <li>● 扩大的接触表面积可防止 O 形圈在脉动压力下发生极端变形</li> <li>● 由于其形状稳定, 可以对 O 形圈的密封作用和使用寿命产生有利影响</li> </ul>	<ul style="list-style-type: none"> <li>● Concave profile</li> <li>● Predominantly used in static applications, reciprocating movements are possible</li> <li>● The enlarged contact surface area prevents extreme deformation of the O-ring under pulsating pressures</li> <li>● Due to its form stability, the O-ring favorably influences sealing force and service life</li> </ul>
<b>CBC</b>	<ul style="list-style-type: none"> <li>● 凹面结构, 有切口</li> <li>● 主要用于静态应用, 可以进行往复运动</li> <li>● 扩大的接触表面积可防止 O 形圈在脉动压力下发生极端变形</li> <li>● 由于其形状稳定, 可以对 O 形圈的密封作用和使用寿命产生有利影响</li> <li>● 当无法使用无开口类型的挡圈进行安装时, 可以作为替代方案</li> </ul>	<ul style="list-style-type: none"> <li>● Concave profile with cut</li> <li>● Predominantly used in static applications, reciprocating movements are possible</li> <li>● Increased mating surface prevents extreme deformation of the O-ring under pulsating pressures</li> <li>● Due to its form stability, the O-ring favorably influences sealing force and service life</li> <li>● An alternative to the uncut back-up rings BCU where these are not mountable</li> </ul>
<b>SBP</b>	<ul style="list-style-type: none"> <li>● 螺旋结构</li> <li>● 当无法使用无切口的挡圈进行安装时, 可以作为一种替代的安装方案</li> <li>● 用于静态和往复运动</li> <li>● 斜切口角度通常为 30°或 45°</li> <li>● 用于高温波动的应用</li> <li>● 螺旋形结构可以弥补材料的收缩和膨胀带来较大公差变化</li> </ul>	<ul style="list-style-type: none"> <li>● Spiral profile</li> <li>● An alternative to uncut back-up rings where these are not mountable or when a split groove cannot be used</li> <li>● For static and reciprocating motions</li> <li>● Scarf cut at a 30° or 45° angle</li> <li>● Use in high temperature fluctuation applications</li> <li>● Helical contraction and expansion compensates larger tolerance changes</li> </ul>

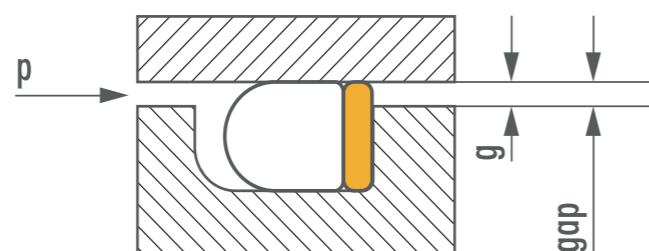
## 挡圈 Back-up Rings

挡圈可以适用于静态或者慢速旋转运动的工况  
Back-up rings are applicable both in static as well as slow rotating motions

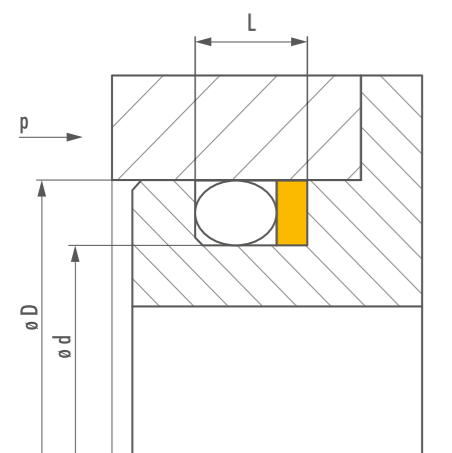
O型圈从间隙中被挤出损坏  
Gap extrusion destroys the O-ring



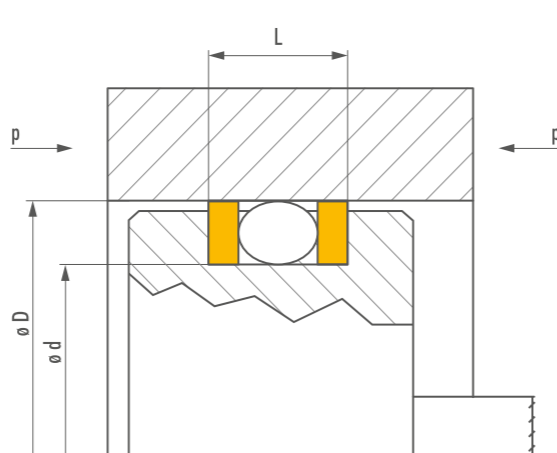
挡圈可以保护支撑住O型圈不被挤出  
Back-up ring protects and supports the O-ring



当压力方向为单向时，挡圈应安装在低压方向那一头  
When pressure is uni-directional, a back-up ring is installed on the low pressure side



当压力方向为双向时，需要在O型圈的两头各安装一个挡圈  
When pressure is bi-directional, two back-up rings should be installed on each side



## 垫片 Gaskets



PTFE 垫片可以用于大量需要密封的工况中，其材质具有出色的耐化学性、高介电强度和宽泛的使用温度范围。此外 PTFE 还具有非常低的吸湿率，耐腐蚀，耐水解，并具有极低的摩擦系数。

是一种理想的静密封材料。

PTFE gaskets are available in a range of grades to suit various sealing applications, providing exceptional resistance to chemicals, high dielectric strength and a broad operating temperature range. They also offer effective resistance to moisture absorption, corrosion, hydrolysis resistance, and has a very low friction coefficient

It is an excellent static sealing material.

### 主要优点:

- 耐化学性
- 非常低的摩擦系数
- 可在低温和高温下运行
- 优异的耐腐蚀性和耐水解性
- 吸湿性极低
- 提供出色的介电强度
- 是化工、食品和制药行业中流行的法兰垫片材料

### Main Features:

- Chemical resistance
- Very low coefficient of friction
- Can operate at low and high temperatures
- Excellent resistance to corrosion and hydrolysis
- Offers very low moisture absorption
- Provides excellent dielectric strength
- Popular gasket material in the chemical, food and pharmaceutical industry

### 典型应用:

- 石化行业
- 制药行业
- 电气工业
- 食品加工行业
- 阀门行业
- 管道
- 压缩机
- 鼓风机

### Typical Applications:

- Petrochemical Industry
- Pharma industry
- Electrical industry
- Food processing industry
- Valve industry
- Pipe connection
- Compressors
- Air blowers

### 材料选择 Material Selection:

材料 Material	特性 Characteristics
纯 PTFE Virgin PTFE	标准材料，低透气性，很好的耐化学性。 Standard material, low air permeability, good chemical resistance
改性 PTFE Modified PTFE	极低的透气性，很好的耐化学性 Low gas permeability, universal chemical resistance
PTFE + 玻纤 PTFE + glass fibre	玻璃纤维的加入，提高了材料的抗蠕变性能 The addition of glass fiber improves the creep resistance of the material

\*其它材料可根据客户需求提供 Other materials available upon request

### 材料参数 Material Data

温度范围 Temperature Range	-200°C ~ +260°C
法兰压力等级 Flange Press Class	2.00 Mpa / 5.00 Mpa (Class 150/Class300)
法兰密封面类型 Flange Face	FF, RF
公称压力 Pressure Rating	PN40
颜色 Color	白色 White



## 膨体法兰垫片 Expanded Flange Gaskets



膨体 PTFE (ePTFE) 垫片是一种可压缩的材料，因此在低压条件下具有更好的密封性能，适用于密封 pH 范围内的大多数化学品。最为重要的是，其可以密封粗糙或者不规则的法兰面。  
The expanded PTFE(ePTFE) gaskets are compressible material with enhanced low stress sealing characteristics and is suitable for sealing most chemicals across the pH range. Most importantly, It seals rough and irregular surfaces.

**主要优点:**

- 可压缩性能
- 容易切割
- 100% 膨体四氟材料
- 可以对不规则法兰进行密封
- 增强了低压力工况下的密封性能
- 优异的耐腐蚀性和耐水解性
- FDA 认证

**典型应用:**

- 石化行业
- 制药行业
- 电气工业
- 食品加工行业
- 阀门行业
- 管道
- 压缩机

**Main Features:**

- Compressibility
- Easy to Cut
- 100% pure expanded PTFE
- Seals Irregular Flanges
- Enhanced low stress sealing
- Excellent resistance to corrosion and hydrolysis
- FDA Compliant

**Typical Applications:**

- Petrochemical Industry
- Pharma industry
- Electrical industry
- Food processing industry
- Valve industry
- Pipes
- Compressors

### 材料数据Material Data:

温度范围 Temperature Range	200°C ~ +260°C
法兰压力等级 Flange Pressure Class	2.00 Mpa / 5.00 Mpa (Class 150/Class300)
最大压力 Max. Pressure	20 Mpa
法兰密封面类型 Flange Face	FF, RF
公称压力 Pressure Rating PN	PN40
颜色 Color	白色



## O - 形圈 O - Rings



PTFE O 形圈主要用于化工、制药和医疗行业，作为法兰连接、端盖等应用中的起到静密封作用。其可以与大多数液体和化学物质兼容。极低的使用温度将可能导致大多数橡胶密封件硬化，以至于材料不再具有任何弹性，再加上材料自身的收缩，意味着橡胶密封件将不再具有密封作用，此时 PTFE O 形圈将是一种理想的替代材料。  
PTFE O-rings are used mainly in the chemical, pharmaceuticals and in medical engineering industry as static seals in flange connections, caps, etc. Due their good chemical resistance they are compatible with most liquids and chemicals. Extremely low temperatures will cause most rubber compounds to harden to the point where any elastomeric properties are no longer present in the material. This combined with contraction of the material can mean it will no longer function effectively as a seal. PTFE O-ring will be an ideal substitute material.

**主要优点:**

- 耐腐蚀性
- 长效的储存时间，不会老化
- 使用温度广泛
- PTFE 不会因为吸水而鼓起
- 纯 PTFE 符合 FDA 标准

**典型应用:**

- 泵阀
- 反应容器
- 机械密封
- 压力容器
- 过滤器
- 管路法兰面
- 气体压缩机
- 泡沫生成器

**Main Features:**

- Corrosion resistance
- Long shelf-life, not aging
- Wide temperature range capabilities
- PTFE does not swell due to moisture absorption
- Virgin PTFE is FDA Compliant

**Typical Applications:**

- Pumps and valves
- Reaction vessels
- Mechanical seals
- Pressure vessels
- Boilers
- Filters
- Piping flange surface
- Gas compressors
- Foam generators

### 应用要求 Application Requirments:

使用范围 Operating Range	工作介质 Operating Media
压力 Pressure ≤ 15Mpa (150 bar)	普遍使用 (熔融碱金属和氟化合物除外) Universal use(except in molten alkali metals and fluorine compounds)
温度 Temp. -200°C ~ +210°C	

### 材料选择Material Selection:

材料 Material	特性 Characteristics	使用条件 Operating Conditions
纯 PTFE Virgin PTFE	低透气性，很好的耐化学性 Low gas permeability, universal	标准材料，可以用于食品行业 Standard material, available for food industry
改性 PTFE Modified PTFE	极低的透气性，很好的耐化学性 Low gas permeability, universal chemical resistance	对气密性和表面质量要求高的工况 For high requirements on gas tightness and surface quality

\* 其它材料可根据客户需求提供  
\* 在正常条件下，PTFE O 形圈的泄漏率将高于其他弹性材料，所以不建议客户在不需极端温度或苛刻化学侵蚀的应用中使用 PTFE O 形圈。  
\* Other materials available upon request.  
\* In general, under normal conditions, the leakage rate for a PTFE O-Ring will be higher than any elastomeric compound. The use of a PTFE O-ring isn't recommended for applications that don't require extreme temperature or severe chemical conditions.

## 阀座 Valve Seats



阀座用于调节阀门管道内流动的流体，在阀门中是一个可拆卸的零部件，用于确保阀门在正确的位置能够完全关闭形成结构密封。而使用填充 PTFE 的化合物可以提供更为出色的耐磨性，耐高压性以及耐高温性。  
The valve seats are used for regulating fluid flowing through a section of pipe, and it is a demountable component in valve for ensuring the valve is completely off at the right position. Also, using the filled PTFE compound could provide a better wear resistance, high temperature resistance and high pressure resistance.

**主要优点:**

- 优良的耐化学性
- 极度耐老化
- 尺寸稳定
- 抗应力开裂
- 优秀的润滑能力
- 低扭矩，易于开关操作阀门
- 在清洁工况中使用具有非常好的密封性能

**典型应用:**

- 浮动球阀
- 过程阀

**Main Features:**

- Excellent chemical resistance
- Extremely resistant to aging
- Dimensional stability
- Resistance to stress cracking
- Excellent lubricating ability
- Lower torque, easy to operate the ball valve
- Excellent sealing performance in clean service application

**Typical Applications:**

- Ball valves
- Process valves

### 阀座 & 密封材料选择指南: Valve seat & seal materials selection guide:

阀门所处理的介质是影响关闭能力的最重要因素之一。使用寿命受以下因素影响：- 压力、温度、压力波动情况和热波动程度、介质类型、循环频率、介质速度和阀门操作速度。以下阀座和密封材料可用于各种阀门，如球阀、插装阀、蝶阀、针型阀等。  
One of the most important factors affecting shutoff capability is the nature of media being handled. Service life is affected by all of the following factors: - pressure, temperature, degree of pressure fluctuation and thermal fluctuation, type of media, cycling frequency, velocity of media & speed of valve operation. The following seat & seal materials can be used in various valve such as ball, plug, butterfly, needle, etc.

## 阀座 Valve Seats



我们在加工和氟化物材料上的丰富经验可以确保严格的尺寸要求。这也确保了阀座在任何气候条件下都能够安装和起到密封作用。  
Our extensive manufacture experience and material could assure a close tolerance. This guarantees that the valve seats will fit and seal in whatever climate the seals are used.

### 材料选择Material Selection:

材料 Material	特性 Characteristics	温度范围 Temperature Range
纯 PTFE Virgin PTFE	纯 PTFE 材料的阀座具有很好的耐化学性和出色的密封性能 This valve seat has a high chemical resistance and excellent sealing performance.	-200°C ~ +260°C
改性 PTFE Modified PTFE	相比于纯 PTFE 具有更出色的抗蠕变性，抗压缩性和耐磨性，并具有较高的弹性和回弹力。此外，它还具有良好的耐化学性，因此可以用于绝大多数的化工行业。Excellent resistance to creep or compression and abrasion service, featuring of high elasticity and resilience. Also it has a good chemical resistance so they can be used for a wide range of chemical industry.	-200°C ~ +260°C
PTFE + 碳纤维 PTFE + carbon fibre	由于填充了加强型的碳纤维材质，该材料具有很高的机械强度和耐磨性能。 With the additional added carbon fibre, this valve seat has a high mechanical strength and abrasion resistance.	-200°C ~ +260°C
PTFE + 碳 / 石墨 (RPTFE) PTFE + carbon/graphite (RPTFE)	碳和石墨的加入进一步提升了 PTFE 的机械性能。该阀座可在最高 300°C 的温度下使用，这是普通阀座中使用温度最高的材质。 PTFE's mechanical properties are enhanced by adding percentage of filler material to provide improved strength, This valve seat can be used at a temperature as high as 300°C, the highest service temperature among based ball seats.	-200°C ~ +300°C
聚醚醚酮 PEEK	PEEK 具有很好的耐化学性，并且还具有较高的耐高温性，是高压工况条件下理想的材料。PEEK 在有辐射的环境下有着非常好的表现。 PEEK has good chemical resistance, and also high temperature tolerance. Ideal for high pressure applications. It performs very well if exposed to radiation.	-40° C ~ +260° C (瞬间温度可达 +310° C) (short periods +310° C)
聚三氟氯乙烯 PCTFE	PCTFE 材料非常适用于低温工况下使用的阀座。 PCTFE is well suited for cryogenic parts such as ball valve seats.	-240°C ~ +120°C
超高分子聚乙烯 UHMW-PE	UHMW-PE 是一种耐用、耐磨、耐腐蚀的材料。它符合 FDA 标准可以用于食品和制药设备，在最高 80°C 的工况下有着最佳的表现。此外 UHMW-PE 是一种理想的低温使用材料适用于核工业、烟草行业等低温要求工况。 UHMWPE is a durable, long-wearing, corrosion resistant material. It meets FDA acceptance for food and pharmaceutical equipment and is a good performance in applications up to 80°C. Also UHMWPE is ideal for applications such nuclear, tobacco, and low temperature.	-260°C ~ +80°C
PTFE + 玻璃纤维 PTFE + glass fibre	加入一定比例的玻璃纤维混合 PTFE，可以提升材料的强度、尺寸稳定性和耐磨性、冷流性以及模压阀座的渗透率。玻璃纤维增强型材料可以在高温、高压下使用。 This material is compounded with a percentage of fiber glass to provide additional strength, size stability and resistance to abrasive wear, cold flow and permeation in molded seats. It could be applied at higher temperature, pressure applications.	-200°C ~ +260°C

\*其它材料可根据客户需求提供 Other materials available upon request

## 塑料球 Plastic Balls



PTFE 塑料球表面光滑，无粘性，广泛用于止回阀、安全阀，浮阀。它们也可以用作低载荷工况下的球轴承。它们拥有卓越的耐化学性能并且在极端温度下有良好的表现。  
PTFE plastic balls offer a nonstick, slippery surface, which are often used in check valves, relief valves, float valves. It also has highly functional in self-lubricating conditions such as ball bearings under light load application. They offer superior chemical resistance and perform well in extreme temperatures.

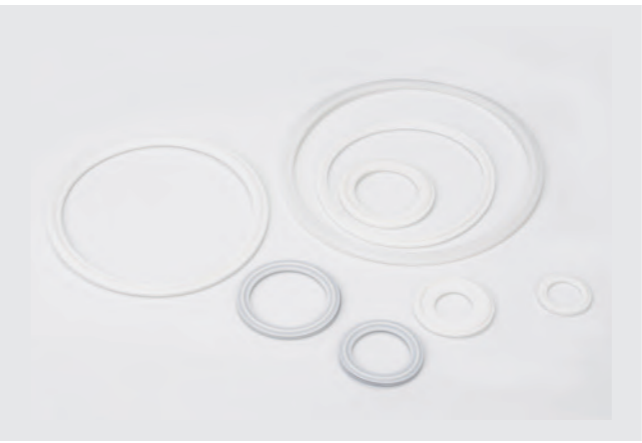
<p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 卓越的耐化学性能。</li> <li>● 零吸水率</li> <li>● 使用温度范围广</li> <li>● 对于大部分的腐蚀液体或气体有化学惰性</li> <li>● 极低的摩擦系数</li> <li>● 洛氏硬度 (Shore D): 50 至 65</li> <li>● 公差: ±0.025 或根据球的直径制定</li> </ul> <p><b>典型应用:</b></p> <ul style="list-style-type: none"> <li>● 化学品处理泵</li> <li>● 球轴承</li> <li>● 止回阀</li> <li>● 气动隔膜泵</li> <li>● 气动板阀泵</li> <li>● 气动粉体泵</li> </ul>	<p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Excellent chemical resistant</li> <li>● Water absorption: 0</li> <li>● Large temperature range</li> <li>● Chemical inertness to most corrosive liquids or gases</li> <li>● Extremely low coefficient of friction</li> <li>● Rockwell hardness(Shore D): 50 to 65</li> <li>● Tolerance: ±0.025mm or as per ball diameter</li> </ul> <p><b>Typical Applications:</b></p> <ul style="list-style-type: none"> <li>● Chemical handling pumps</li> <li>● Ball bearings</li> <li>● Check valves</li> <li>● Pneumatic diaphragm pumps</li> <li>● Heavy duty flap pumps</li> <li>● Powder diaphragm pumps</li> </ul>
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### 材料选择 Material Selection:

材料选择 Material	特性 Characteristics	温度范围 Temperature Range
纯 PTFE Virgin PTFE	标准材料，可以抵御大部分的化学物质并且不导电。 Standard material, which is resistant to most corrosive agents and is electrically nonconductive.	-200°C ~ +260°C
PTFE + 玻璃纤维 PTFE + glass fibre	相比纯 PTFE 更耐磨，具有更好的抗氧化性能和耐酸性能。玻纤加入提升了 PTFE 在一定负载下的形变。 Improved resistance to wear over standard PTFE balls. Highly resistant to oxidation and acids. Lower deformation under load than standard PTFE balls.	-200°C ~ +260°C

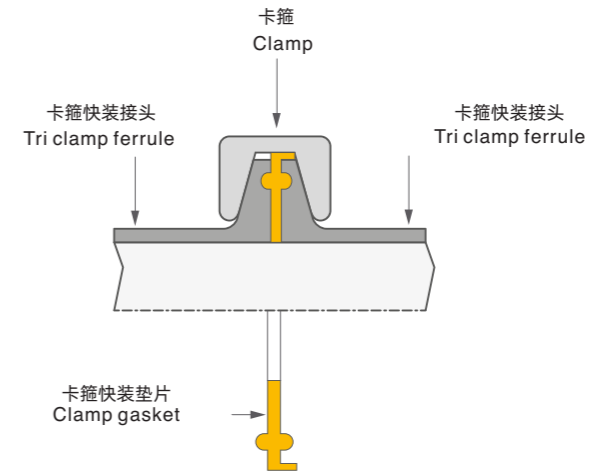
\*其它材料可根据客户需求提供 Other materials available upon request

## 卡箍接头快装垫片 Tri - clamp Gaskets



快装垫片是食品行业中最常见的卡箍连接的密封材质之一。选择正确的密封垫片是确保设备无泄漏、同时保证安全和卫生的重要条件。由于 PTFE 可以在水和蒸汽环境下连续工作能够保持长效的使用寿命，所以是一种优异的卡箍接头快装垫片材料。  
Tri-Clamp Gaskets are one of the most common types of connections in the food industry. Selecting the proper gasket for your application is an important step in ensuring leak free operations, while maintaining safe and sanitary conditions. PTFE can remain in service for longer periods of time in both water and steam for continuous use. Therefore, it is one of the best clamp gasket materials.

<p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 对过程流体具有出色的耐受性</li> <li>● 优异的耐热性</li> <li>● 稳定性好节约成本</li> <li>● 使用寿命更长，无需频繁更换</li> </ul> <p><b>材料选择:</b></p> <ul style="list-style-type: none"> <li>● 纯 PTFE</li> <li>● 改性 PTFE</li> </ul>	<p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Excellent resistance to process fluids</li> <li>● Excellent heat resistance</li> <li>● Good stability and cost saving</li> <li>● Longer life using time, not frequent replacement</li> </ul> <p><b>Material Selection:</b></p> <ul style="list-style-type: none"> <li>● Virgin PTFE</li> <li>● Modified PTFE</li> </ul>
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垫片材质 Gasket Material	温度范围 Temp.range	持续蒸汽 Continuous steam	间歇蒸汽 Intermittent steam	饮用水 Water ambient	热水处理 Hot water process	液体环境处理 Fluids ambient process
PTFE	-70°C ~ +260°C	优异 Excellent	优异 Excellent	优异 Excellent	优异 Excellent	优异 Excellent

易于拆卸的快装垫片是需要快速安全连接管道并持续工作的理想选择。由于采用对称法兰设计，所以无需定向安装密封件。  
Easily disassembled clamp seals are ideal for fast and secure pipeline connections in continuously run systems. Due to the symmetrical flange design an orientated installation of the seals is not required.

## V 形填料 Chevron Packings



V 形填料含有的密封唇结构和较长的接触面积可以实现非常好的密封性能。每个 V 型填料组都由一个上填料、两个或多个中填料，以及一个下填料组成。下填料由内外两个密封唇分别对孔和杆进行密封，上填料和中填料也都有一个 V 形唇口可以使 V 型填料组在不同压力下能够进行自我调整。

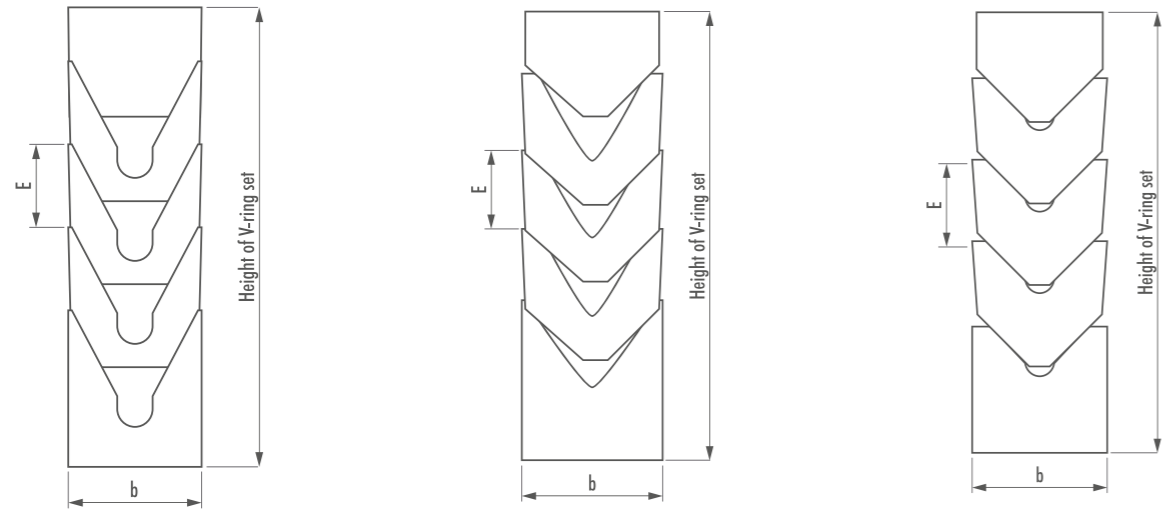
V-Packing rings have a very good sealing performance is achieved through multiple sealing lips and the longer contact surface.

Each V-packing consists of a base ring, two or more intermediate rings, and a non-sealing head ring. The sealing rings have double lips to seal against both the bore and the rod of a system, and the head ring and intermediate rings all have a V-shaped base that enables the V-packing to respond automatically to changes in system pressure.

<p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 长效的使用寿命</li> <li>● 拥有很好的耐磨性能</li> <li>● 拥有较好的延展性</li> <li>● 对轴向和径向振动具有较强的自适应载荷能力</li> <li>● 能承受温度和压力的变化</li> <li>● 易于安装</li> </ul>	<p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● A long service life</li> <li>● Exceptionally wear-resistant</li> <li>● Good elasticity</li> <li>● It has strong adaptive load against axial and radial vibration</li> <li>● It can bear the high temperature and changeable pressure</li> <li>● It is easily to be installed</li> </ul>
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### 填料类型 The Type of Packings:

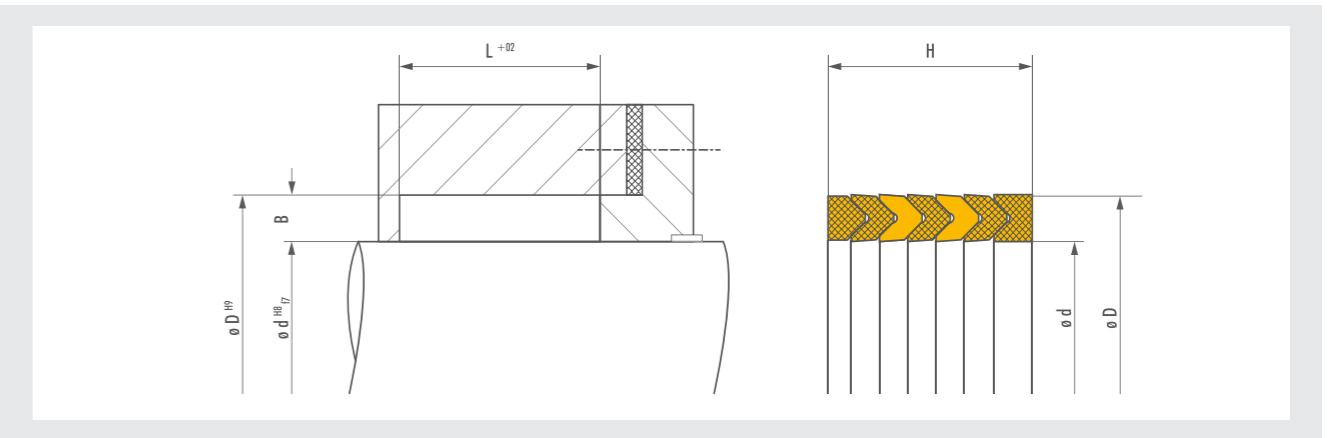
低压 V 形填料组 (LVS) Low pressure V-ring set (LVR)	中压 V 形填料组 (MVS) Medium pressure V-ring set (MVS)	高压 V 形填料组 (HVS) High pressure V-ring set (HVS)
压力范围: < 5Mpa Pressure range: < 5Mpa	压力范围: 5Mpa - 10Mpa Pressure range: 5Mpa - 10Mpa	压力范围: 10Mpa - 25Mpa Pressure range: 10Mpa - 25Mpa



根据应用工况条件, 可以选择纯 PTFE 或填充 PTFE 材料。此外, 我们不仅可以使使用模压工艺来生产填料, 还可以针对尺寸和使用有较高要求的产品, 通过车加工的方式进行生产, 因此可加工的尺寸范围非常广。

Depending on the application field, virgin PTFE or PTFE with filler materials are used to manufacture standard profiles. We can not only provide packings produced by the molding process, but also we can produce products with higher requirements for size and operating conditions through precise machining process. So the range of sizes that can be processed is very wide.

## V 形填料 Chevron Packings



<p><b>典型应用:</b></p> <ul style="list-style-type: none"> <li>● 液压油缸</li> <li>● 气缸</li> <li>● 蝶阀</li> <li>● 闸阀</li> <li>● 注塑机</li> <li>● 柱塞泵</li> <li>● 球阀</li> </ul>	<p><b>Typical Applications:</b></p> <ul style="list-style-type: none"> <li>● Hydraulic cylinders</li> <li>● Pneumatic cylinders</li> <li>● Butterfly valves</li> <li>● Gate valves</li> <li>● Injection molding machines</li> <li>● Piston pumps</li> <li>● Ball valves</li> </ul>
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### 应用要求 Application Requirments:

压力 Pressure	≤30 Mpa
行程速度 Stoke speed	连续运动Continuous operation: 0.5 m/s 间歇运行Intermittent operation: 1.2 m/s
温度范围 Temp. range	- 200 °C ~ +260°C

### 材料选择 Material Selection:

材料 Material	特性 Characteristics
纯PTFE Virgin PTFE	拥有低摩擦系数、低透气性、低导热性, 以及有限的耐磨性, 可以在食品行业中的应用。 Low friction coefficient, low gas permeability, low thermal conductivity, limited abrasion resistance, application in food environments.
PTFE + 玻纤 PTFE + glass fiber	玻纤的加入可以提升压力稳定性, 提高耐磨性, 但是不耐碱性物质。 Enhanced pressure stability, improved wear resistance, not alkaline-resistant, application especially in food environments.
PTFE + 碳 PTFE + carbon	拥有良好的压力稳定性, 改善材料的导热性和耐磨性, 特别适用于以水为介质的工况, 但是填充材料会被氧化性介质侵蚀。 Good pressure stability, improved thermal conductivity, good wear resistance, suited especially for water as medium, filler material can be attacked by oxidizing media.
PTFE + 石墨 PTFE + graphite	拥有良好的滑动和润滑性能, 可以有效保护配合面, 特别适用于材质较软的配合面, 非常适合用于以蒸汽作为驱动的应用, 不适用于硬金属, 填充材料可能会被氧化介质损坏。 Good sliding and lubrication properties, protects counterfaces, especially suited for soft counterfaces, very good in steam-driven applications, not suited for hard metals, filler material can be damaged by oxidizing media.
聚醚醚酮 PEEK	PEEK 具有与 PTFE 相似的耐化学性, 但具有更好的机械特性。符合FDA标准因此适用于食品工业的应用。 PEEK offers chemical resistance that is similar to that of PTFE, but with better mechanical characteristic. FDA-compliant, therefore it is suitable for applications in the food industry.
柔性石墨 Flexible graphite	这种 V 型填料密封具有耐腐蚀、耐高温的性能。同时还具有良好的自润滑性、柔韧性好、扭矩小等特点。 This type of V-packing with corrosion resistance, high temperature performance. But also has good self-lubricating, good flexibility, small torque characteristics.

\* 其它材料可根据客户需求提供 Other materials available upon request

## 生料带 Thread Seal Tapes



PTFE 生料带常在水管中用于密封管道螺纹。生料带被切割成特定的宽度，使用的时候可以很容易缠绕在管道螺纹上。生料带具有润滑性能，使螺纹咬合的更牢固，并有助于防止螺纹在旋转管道时咬死。Thread seal tape is a PTFE film tape commonly used in plumbing for sealing pipe threads. The tape is sold cut to specific widths, making it easy to wind around pipe threads. Thread seal tape lubricates allowing for a deeper seating of the threads, and it helps prevent the threads from seizing when being unscrewed.

**主要优点:**

- 强有力的密封效果
- 极低的摩擦系数
- 拆卸容易
- 耐化学系，不吸水，不易燃
- 使用温度范围广
- 无毒，无铅，无 VOC 成分

**典型应用:**

- PVC, CPVC, ABS 管
- 铜管
- 铝管
- 镀锌钢管
- 淋浴头
- 洒水器
- 管道配件

**Main Features:**

- Strong sealing performance
- Low coefficient of friction
- Easily disassembly
- Chemical resistant, non-absorbent and non- flammable
- Wide temperature range
- Non-toxic, lead free, VOC free

**Typical Applications:**

- PVC, CPVC and ABS pipe
- Brass pipe
- Aluminum pipe
- Galvanized steel pipe
- Shower head
- Sprinklers
- Pipe fittings

### 标准和特种 PTFE 生料带 : Standard and Specialty PTFE Thread Tapes:



标准生料带主要用于供水系统中管道的连接，无论是饮用水还是非饮用水，因为它们耐腐蚀和耐酸性物质。标准生料带最适用于高压管的应用，并且可以与大多数化学物质接触使用。而特种生料带具有特定的颜色主要针对特别的应用场景。这可以让用户在特定工况下使用时能够进行有效的区分。特种生料带也比标准生料带厚得多，并且密度明显更高。Standard PTFE tape is mainly used for water system connections, connections, either potable or non-potable as they are and corrosion acid resistant. The specialty tapes come color coded for specific applications. This makes it easy to ensure you are grabbing the correct tape for each application. Specialty PTFE tape is also much thicker than the standard tape and it has significantly higher density.

## 生料带 Thread Seal Tapes

### 材料选择 Material Selection:

等级 Grade	低密度 Low Denisty (标准型 Standard)	中密度型 Medium Denisty	高密度型 High Denisty	超高密度 Extra High Denisty	天然气管道专用 Gasline PTFE Tape
成分 Ingredients	100% 纯 PTFE 100% virgin PTFE	100% 纯 PTFE 100% virgin PTFE	100% 纯 PTFE 100% virgin PTFE	100% 纯 PTFE 100% virgin PTFE	99% PTFE + < 1.0% 色母 99% PTFE + < 1.0% Pigmen
描述 Description	低密度生料带是最通用的材料也是最经济的选择，适用于所有的需要螺纹密封的设备，它具有化学惰性，可承受较大的温度范围。它可以与所有的管道材料相容，形成永久密封。Low density PTFE thread seal tape is a most common type. It is a thread sealant for all services, chemically inert. It is compatible with all pipe materials, forms a permanent seal for the life of the connection.	密度比标准型大，由100%PTFE材料制作。中等密度使其可在大多数应用中，并可以用于密封所有类型的管道。More dense than standard, made from 100% virgin PTFE resins. Its medium density allows it could be used as a general-purpose thread seal tape in most applications. It could be also used on all types of pipes.	与中密度生料带材料拥有相同的特性和优点，但是由于厚度更厚密度更高，所以其拥有更为强大的密封作用。The same characteristics and advantages of the medium density material, plus thicker and higher in specific gravity so it has a more powerful seal force.	我们最高等级的PTFE生料带，是一种超厚和超高密度材料。适用于氧气管路系统或苛刻的密封工况。Our highest grade of PTFE thread tape, extra thick and extra density material. Suitable for oxygen systems or critical sealing applications.	天然气专用生料带的密度较高，因此更耐用，密封效果更好，特别是在一些使用要求较为苛刻的应用，如有天然气、丙烷、液化天然气、焊接气体等。The high density of this tape makes it more durable and results in better sealing efficiencies indemanding applications such as Natural Gas, Propane, Liquefied Natural Gas, Welding gasses etc.
使用温度(°C) Working temperature(°C)	-240°C ~ +260°C	-240°C ~ +260°C	-240°C ~ +260°C	-240°C ~ +260°C	-240°C ~ +260°C
使用温度(°F) Working temperature(°F)	-450 °F to 500 °F	-450 °F to 500 °F	-450 °F to 500 °F	-450 °F to 500 °F	-450 °F to 500 °F
颜色 Color	白色 White	白色 White	白色 White	白色 White	黄色 Yellow
密度 Density(g/cm³)	0.35-0.45	0.7-0.8	0.9-1.0	1.2-1.5	1.30-1.5
断裂延伸率 Elogation(% at break)	> 25%	> 50%	> 100%	> 100%	> 100%
抗紫外线 UV resistant	YES	YES	YES	YES	YES
标准厚度(公制) Standard thickness(metric)	0.075mm, 0.10mm, 0.15mm, 0.20mm				
标准宽度(公制) Standard width(metric)	10mm, 12mm, 15mm, 19mm, 25mm				
标准宽度(英制) Standard width(Imperial)	1/2", 3/4", 1"				
标准长度(公制) Standard length(metric)	10m,15m,20m				
*可按客户需求定制包装图案和产品尺寸。 *Customized package, product size are availble.					

## 柔性石墨环 Flexible Graphite Rings



柔性石墨是一种理想的密封材料可以用于高温阀门，化工应用以及其它低螺栓载荷的工况。其在高温，高压，有腐蚀性化学物质的环境中依然能够保持其材质自身的稳定性和密封性能。

Flexible Graphite material is ideal for sealing those difficult high temperature valve, chemical applications, and low bolt load applications, withstanding heat, pressure and aggressive/corrosive chemical environments to retain stability and sealing performance in high temperatures and pressure fluctuations.

### 主要优点:

- 安装方便灵活
- 自润滑性能好
- 回弹系数高
- 极佳的耐高温和阻燃性能
- 导热性，导电性
- 拥有低蠕变松弛和不会老化的特点
- 耐化学系，与绝大多数的化学物质相兼容

### Main Features:

- Flexibility for installation
- A excellent self-lubrication feature
- High coefficient of resilience
- Heat and flame resistant
- Thermal conductive, electroconductibility
- Low creep relaxation and no aging
- Chemical resistant, compatible with most corrosive chemicals

### 典型应用:

- 用于石油、化工、热电、核电及一般工业用阀门、泵、膨胀节等部位的密封。
- 用于低泄漏率截止阀、隔离阀、调节阀等阀杆密封。

### Typical Applications:

- Used for the sealing of valves, pumps, expansion joints, etc. in petroleum, chemical, thermoelectric, nuclear power and general industrial applications.
- Used for stem seals such as low leakage rate shut-off valves, isolation valves, and regulating valves.

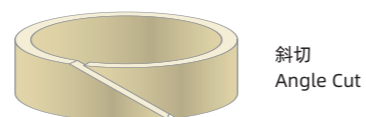
### 材料数据Material Data:

温度范围 Temperature range	-200°C 至 + 450°C (在蒸汽应用可达 650°C, 在非氧化介质环境中可达 1600°C) -200°C to + 450°C (650°C in steam application, 1600°C in non oxidising media)
密度 Denisty	1.0 - 1.2 (g/cm3)
PH 值 PH range	0 - 14
抗拉强度 Tensile strength	≥ 30Mpa (300bar)
含碳量 Carbon content	≥ 95 % (一般应用 General application) ≥ 99 % (核级高纯度, 柔性更好, 导热性能更强 Purity nuclear grade, Better flexibility, better thermal conductivity)
颜色 Color	深灰色 / 亮黑色 Dark grey / Shiny black

### 开口类型 Style of Cut:



直切  
Butt Cut



斜切  
Angle Cut

为了便于安装，特别是当阀门阀盖无法拆卸时，可以使用带有开口缝的密封环。一般开口缝的截面为方形，也可以加工成 V 形或锥形开口。

For ease of installation, when the valve bonnet cannot be removed, split rings should be used. It has square section and also has V-shaped and wedge-shaped section.

## 柔性石墨垫片 Flexible Graphite Gaskets



柔性石墨垫片在极端条件下有着表现的密封表现，能够承受热量、压力并且能够适用于具有腐蚀性化学物品的环境，特别是在高温和压力波动下能够保持良好的尺寸稳定性和密封性能。

The flexible graphite gaskets have an excellent sealing performance under extreme conditions, withstanding heat, pressure and corrosive chemical environments to retain stability and sealing performance in high temperatures and pressure fluctuations.

### 主要优点:

- 适用于高温工况
- 材料的机械性能不会因为载荷的改变而产生较大的变化
- 具有较高的安装灵活性例如密封表面有缺陷
- 几乎没有热蠕变性
- 很好的耐化学性
- 法兰密封最好的材质

### Main Features:

- Can be used at high temperatures
- The mechanical properties of the material will not change significantly due to load changing
- High flexibility when sealing surfaces are unfavorable
- Practically no hot creep
- Universal chemical resistance
- Maximum sealing performance in the flange

### 典型应用:

- 高温阀门
- 泵
- 压力容器
- 热交换器
- 冷凝器
- 空气压缩机
- 蒸汽角座阀

### Typical Applications:

- High temperature valves
- Pumps
- Pressurized containers
- Heat exchangers
- Condensers
- Air compressors
- Steam angel seat valves

### 材料数据Material Data:

温度范围 Temperature range	-200°C 至 + 450°C (在蒸汽应用可达 650°C, 在非氧化介质环境中可达 1600°C) -200°C to + 450°C (650°C in steam application, 1600°C in non oxidising media)
密度 Denisty	1.0 - 1.2 (g/cm3)
PH 值 PH range	0 - 14
抗拉强度 Tensile strength	≥ 30Mpa (300bar)
含碳量 Carbon content	≥ 95 % (一般应用 General application) ≥ 99 % (核级高纯度, 柔性更好, 导热性能更强 Purity nuclear grade, Better flexibility, better thermal conductivity)
颜色 Color	深灰色 / 亮黑色 Dark grey / Shiny black

\* 柔性石墨非常易碎，请小心轻放。

\* 不要将柔性石墨用于食品或可能造成石墨污染的任何应用中。

\* Flexible graphite are very fragile, handle with care.

\* Do not use flexible graphite gaskets for food or any applications where graphite contamination could be an issue.

## 刮板 Scraper Blades



食品 / 纺织面料会粘在加工处理过程中的各种部位以及传送带上，即使皮带做了处理拥有不粘性，但还是可能会导致材料黏在皮带上。因此，刮板的剥离和清洁效果对于食品工业和纺织工业来说非常重要。PTFE 材料拥有极低的摩擦系数，可以从皮带、滚轮或其它表面有效刮起或祛除表面堆积的物质。

Food items/textile fabrics can stick to different types of process and conveying belts, even to belts with non-stick properties. Thus, scraping and cleaning efficiency and effectiveness are key Food Industry and Textile Industries issues. PTFE polymer is manufactured for its low friction properties. The scraper blade could scrape or remove residual material from belting, rollers and other surfaces.

<p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 无毒性</li> <li>● 耐高温</li> <li>● 拥有低摩擦系数因此非常耐磨</li> <li>● 能够简单快速的进行安装</li> <li>● 拥有预紧力无需使用工具即可进行更换</li> <li>● 使用寿命长，可靠性佳</li> <li>● 我们可以提供食品工业传送带使用的刮板</li> </ul> <p><b>典型应用:</b></p> <ul style="list-style-type: none"> <li>● 烹饪机</li> <li>● 热熔粘合机</li> <li>● 搅拌机</li> <li>● 实验室反应器</li> <li>● 牙膏搅拌机</li> <li>● 食品包装流水线</li> </ul>	<p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Non-toxic</li> <li>● High temperature resistance</li> <li>● Low coefficient of friction, resistance to abrasion</li> <li>● Simple and quick assembly</li> <li>● Pre-tension quickly changeable without tools</li> <li>● Cleaning in seconds by simply folding down</li> <li>● Long service life, maximum reliability</li> <li>● Material available for conveying belt in food industry</li> </ul> <p><b>Typical Applications:</b></p> <ul style="list-style-type: none"> <li>● Cooking mixers</li> <li>● Thermo-fusing machines</li> <li>● Agitators</li> <li>● Laboratory reactors</li> <li>● Toothpaste mixing tanks</li> <li>● Food packaging line</li> </ul>
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### 材料选择Material Selection:

纯PTFE (FDA认证) Virgin PTFE (FDA approval)	PTFE + 玻纤 PTFE + glass fiber	PEEK,UHMWPE,Nylon ...
PTFE + 石墨 PTFE + graphite	-	-

\* PTFE 因其具有低摩擦性、不会发生化学反应以及可以与医疗和食品级行业内的多种材料相兼容，因此成为最常用材料。针对不同的工况要求，我们可以供应相应的材料。

\* PTFE is a common material for scraper blades due to its low frictional property, non-reactivity and compatibility to a wide range of materials including medical and food-grade products. According to the requirements of different applications, We can supply corresponding materials.

## 活塞皮碗密封 Piston Cup Seals



在无油静音空压机中，PTFE 活塞皮碗是一个非常重要且易损坏的零部件，其安装在活塞头的边缘提供一个机械密封表面。活塞皮碗的质量直接影响空压机的整体性能和使用寿命。

In the Oil-free quiet air compressor, the PTFE piston cup seal is an very important fragile part which provide a mechanical sealing surface on the edge of piston head. The quality of piston cup seal directly affects the performance of air compressor.

<p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 耐摩擦</li> <li>● 耐高压</li> <li>● 拥有化学惰性</li> <li>● 抗水，防油，耐污渍</li> <li>● 无需润滑</li> <li>● 可以用于多种介质中</li> <li>● 耐极端温度条件</li> <li>● 可以在高速下工作</li> </ul> <p><b>典型应用:</b></p> <ul style="list-style-type: none"> <li>● 真空泵</li> <li>● 医用雾化器</li> <li>● 制氧机</li> <li>● 无油气泵</li> <li>● 无油压缩机</li> <li>● 转向助力泵</li> <li>● 刹车助力泵</li> <li>● 汽车悬挂泵</li> <li>● 空气悬挂压缩机</li> </ul>	<p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Wear resistance</li> <li>● High pressure resistance</li> <li>● Chemically inert</li> <li>● Water, oil and dirt repellent</li> <li>● The seal does not require lubrication</li> <li>● Can be used with a variety of media</li> <li>● Resistant to extreme temperatures</li> <li>● Can run at high RPMs</li> </ul> <p><b>Typical Applications:</b></p> <ul style="list-style-type: none"> <li>● Vacuum pumps</li> <li>● Medical vaporizers</li> <li>● Oxygenerators</li> <li>● Oil-free air pumps</li> <li>● Oil-free air compressors</li> <li>● Brake booster pumps</li> <li>● Brake booster pumps</li> <li>● Automotive suspension pumps</li> <li>● Air suspension compressors</li> </ul>
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### 材料选择Material Selection:

材料 Material	特性 Characteristics
纯 PTFE Virgin PTFE	标准材料，低透气性，很好的耐化学性 Standard material, low air permeability, good chemical resistance
PTFE + 碳 / 石墨 (RPTFE) PTFE + caron/graphite(RPTFE)	非常适用于干润滑或者润滑条件不充分的工况 Excellent for dry and poorly lubricated environments
PTFE + 聚酰亚胺 PTFE + polyimide	聚酰亚胺 (PI) 填料具有非常优异的耐磨性，其在干润滑条件下具有非常棒的表现 The filler of Polyimide(PI) is offering superior wear and abrasion resistance, they provide great performance in non-lubricated (dry) applications

\* 其它材料可根据客户需求提供 Other materials available upon request

## 导向环 / 耐磨环 Guide Rings / Wear Rings



导向环能防止活塞或活塞杆在运动过程中与缸体发生直接接触和摩擦。拥有低摩擦系数的 PTFE 材料可以降低对磨件摩擦运动产生的“粘滑”现象。材料与液压矿物油、润滑油、水基流体和润滑油脂相容。它具有优良的耐热性、抗拉强度和抵抗蠕变性。

Guide rings prevent metal-to-metal contact between moving parts in a working hydraulic cylinder.

The low friction PTFE material reduces "stick slip" between moving parts. The material is compatible with hydraulic mineral oil, lubricating oil, water based fluids and lubricating grease. It has excellent heat resistance and strength to resist creep.

### 主要优点:

- 适用于干润滑条件
- 耐高温
- 拥有高承载能力 (抗压强度)
- 特殊的填充 PTFE 材料可以有效减少磨损降低摩擦系数
- 对于低速下的润滑不足情况具有极高的耐受性
- 安装灵活方便
- 拥有良好的减震能力
- 适用于汽缸维修
- 更大的弹性形变, 可提供更大的接触面积以减小配合面的负载和应力

### 典型应用:

- 液压油缸活塞/活塞杆
- 气动活塞/活塞杆

### Main Features:

- Suitable for dry application use
- Heat resistance
- High load capacity (compressive strength)
- Low wear and reduced friction due to special additive in PTFE material
- High resistance to insufficient lubrication at low speeds
- Flexibility for installation
- Good shock absorbing capability
- Suitable for cylinder repairs
- Larger contact area due to higher degree of elastic
- Deformation distributes the load and reduces stress to countersurface

### Typical Applications:

- Hydraulic cylinder piston/rod
- Pneumatic piston/ rod

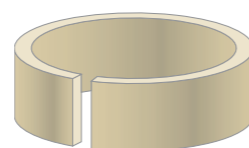
### 使用介质 Operating Media

矿物液压油 Mineral based hydraulic oil	环保液压流体 Environment-friendly hydraulic fluids
油水乳液 Water-oil emulsions	抗燃烧液压流体 Flame-resistant hydraulic fluids

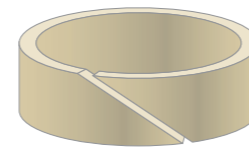
### 使用范围 Operating Range

耐压性能 Pressure resistance	≤ 15 N/mm (25°C)
	≤ 12 N/mm (80°C)
	≤ 8 N/mm(120°C)
速度 Speed	≤ 15 m/s
温度范围 Temperature range	- 30°C ~ + 200°C

### 开口类型 Style of Cut

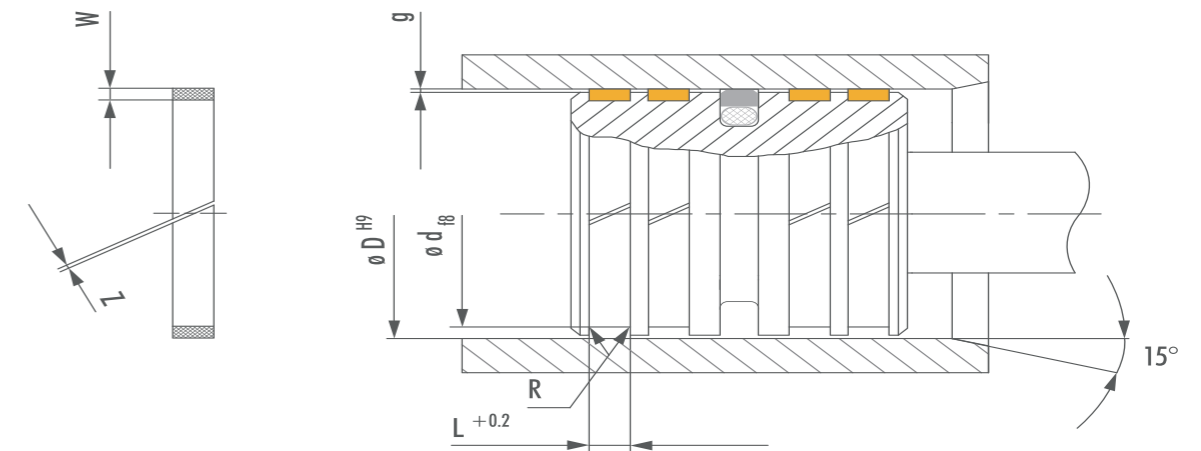


直切  
Butt Cut



斜切  
Angle Cut

## 导向环 / 耐磨环 Guide Rings/Wear Rings



### 安装尺寸 Installation Dimensions

缸径 Cylinder Ø D	间隙 Gap Z	间隙大小 Clearance g	圆角 Radius Rmax.
< 40.0	1.0 - 3.0	0.25 - 0.4	0.2 for Ø D ≤ 250.0
< 80.0	3.0 - 6.0	0.25 - 0.5	
< 140.0	5.0 - 10.0	0.3 - 0.6	0.4 for Ø D ≤ 250.0
< 340.0	7.0 - 14.0	0.4 - 0.6	

### 材料选择 Material Selection:

材料 Material	特性 Characteristics	温度范围 Temperature Range
PTFE + 铜粉 PTFE + Bronze	是硬质配合面的首选材料, 在液压系统中是标准材料。 Preferred use on hard counterfaces, standard material in hydraulic systems.	-200°C ~ +260°C
PTFE + 碳 / 石墨 (RPTFE) PTFE + Carbon/graphite (RPTFE)	用于较软的配合面, 例如不锈钢、铝和铜, 特别是当涉及到介质是水和蒸汽的时候是首选的材料。 Used on softer counterfaces, such as e.g. stainless steel, aluminum and bronze and also preferred when the media water and steam are involved.	-200°C ~ +260°C
酚醛树脂 Phenolic resin	该材料具有承载能力高、耐高温性好、耐磨性好、尺寸稳定性好等特点。 This material is featured in its high load capacity, excellent temperature resistance, abrasion resistance and excellent dimensional stability.	-40°C ~ +130°C
聚甲醛 Polyacetal (POM)	聚缩醛 (POM) 导向环具有良好的摩擦性能、不会出现粘滑现象, 具有较高的承载能力和杰出的耐磨性。 Guide rings of polyacetal (POM) are characterized by good frictional behavior, stick-slip-free running, high load-bearing capacity and optimum wear resistance.	-40°C ~ +110°C

\*其它材料可根据客户需求提供 Other materials available upon request



## 活塞环 Piston Bands



PTFE 材料的活塞环通过环绕安装在减震器活塞上。  
PTFE 活塞环专门为油缸和气缸进行设计。活塞环能够提供极低的滑动摩擦力。PTFE 材料可以耐受所有的液压流体，可在 200°C 的环境温度下连续使用。  
Piston Band of PTFE based sealing material, wrapped around the piston, used in shock absorber.  
The Piston Bands are designed for hydraulic and pneumatic equipments. The PTFE piston bands offer extremely low friction and break-away forces. This material is also resistant to all hydraulic fluids and It can be used continuously at 200°C .

**主要优点:**

- 安装方便
- 极低的摩擦系数
- 非常好的润滑性能
- 提高了大轴向载荷下的稳定性
- 防止金属与金属之间的接触划伤并可以延长设备寿命
- 减少缸体和活塞的径向运动从而延长密封寿命

**典型应用:**

- 汽车减震器
- 摩托车减震器

**Main Features:**

- Ease for installation
- Extremely low coefficient friction
- Good lubrication performance
- Seals as good as composite piston bands.
- Improved stability under large axial loads
- Prevents metal to metal scoring and prolongs equipment life
- Reduces radial movement on both rams and pistons to extend seal life.

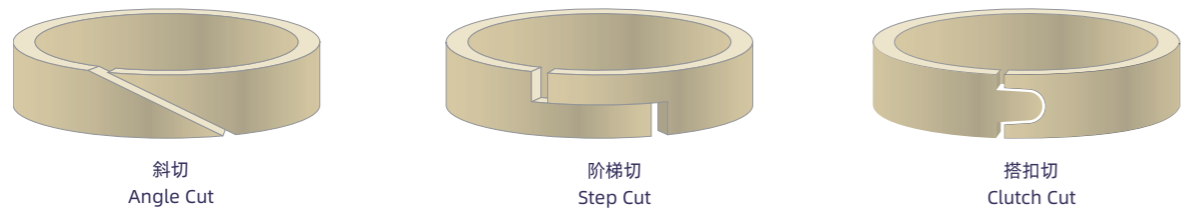
**Typical Applications:**

- Car shock absorbers
- Motorcycle shock absorbers

### 材料选择Material Selection:

PTFE + 铜粉 PTFE + bronze	PTFE + 石墨 PTFE + graphite	PTFE + 石墨 + 二硫化钼 PTFE + graphite + Mo2S
PTFE + 铜粉 + 二硫化钼 PTFE + bronze + Mo2S	PTFE + 玻纤 + 铜粉 PTFE + glass + bronze	* 其它材料可按客户需求提供 *Other materials available upon request

### 开口类型 Style of Cut:



## 活塞包覆片 Piston Band Discs



活塞在减震器中起着重要作用。为了获得最佳的使用性能，它必须具有低摩擦、高侧向负载能力、高耐磨性和可靠的密封性能。而包覆片是活塞性能表现非常重要的零部件。  
Banded Piston plays an important role in shock absorbers. For optimal performance it must operate with low friction, high side-load capacity, wear resistance and reliable sealing. The band disc is a very important component of piston performance.

**主要优点:**

- 防止减震器活塞与缸体的直接摩擦，延长使用寿命
- 更好的耐磨性和更低的摩擦系数
- 具有非常好的自润滑性能
- 承载能力强
- 相较于传统环绕设计，包覆了 PTFE 耐磨片的活塞更为容易安装进入减震器缸体内

**典型应用:**

- 汽车减震器
- 摩托车减震器

**Main Features:**

- Prevents metal to metal scoring and prolongs equipment life
- Greater wear resistance and lower friction coefficient
- Good self-lubrication performance
- Good strength and loading capacity
- Compare with conventional design ease of assembly into pressure tube

**Typical Applications:**

- Car shock absorbers
- Motorcycle shock absorbers

### 材料选择Material Selection:

PTFE + 铜粉 PTFE + bronze	PTFE + 石墨 + 二硫化钼 PTFE + graphite + Mo2S	PTFE + 铜粉 + 二硫化钼 PTFE + bronze + Mo2S
PTFE + 碳纤维 PTFE + carbon fibre	* 其它材料可按客户需求提供 *Other materials available upon request	-



\*对于减震器生产厂家而言，相较于传统的环绕式 PTFE 活塞环，PTFE 盘片在大批量生产时对于活塞的质量和性能更为稳定，生产效率也更高。  
For shock absorber manufacturers, compared with traditional wrapped PTFE piston rings, the quality and performance of the pistons are more stable, and the production efficiency is much higher in high volume.

## 弹簧蓄能密封圈 (泛塞封) Spring Energized Seals



弹簧蓄能密封圈可以用于传统密封设计无法胜任的应用，无论用于密封何种介质，都可以设计出适用的弹簧蓄能密封圈。常用的弹簧蓄能密封圈经常用于作为防爆密封圈，适用于极端温度条件、表面高线速度、无油润滑系统、极端压力、真空应用等。Spring energized seals can be produced for applications where traditional seal design is not adequate. No matter what the media a seal can be designed to fit the application. Common seal applications that call for spring loaded seals range from explosive decompression resistant seals, extreme temperature applications, high surface speeds, non-lubricated systems, Extreme pressure, Vacuum applications and more.

**主要优点:**

- 摩擦系数低，有效减少磨损
- 能够承受高压
- 抗老化，不发生永久弹性变形
- 幅度提高密封能力与使用寿命
- 耐化学腐蚀

**典型应用:**

- 航空液压 & 气动系统
- 冷却机
- 低温旋转接头
- 泵 & 阀
- 灌装机
- 激光设备
- 燃油控制系统
- 燃气涡轮发动机
- 高效液相色谱泵
- 实验室设备
- 低摩擦气动装置
- 医学 & 实验室设备
- 油田设备
- 旋转接头
- 天然气加液枪

**Main Features:**

- Low friction coefficient, effectively reducing wear,
- Able to withstand high pressure
- Anti-aging, no permanent elastic deformation
- Significantly improve the sealing capacity and service life
- Chemical resistance

**Typical Applications:**

- Aviation hydraulic & pneumatic system
- Coolers
- Low temperature rotary joints
- Pumps & valves
- Filling machines
- Laser equipments
- Fuel control systems
- Gas turbine engines
- High performance liquid chromatography pumps
- Laboratory equipments
- Low friction pneumatic equipments
- Medical & laboratory equipments
- Oilfield equipments
- Rotary joints
- LNG Nozzle

### 工作原理 Working Principle:

弹簧蓄能密封圈是一个由 PTFE (或其它聚合材料) 夹套及蓄能弹簧组合的压力辅助密封装置，夹套及蓄能弹簧均具有优异的耐腐蚀能力。当弹簧蓄能密封圈装在密封沟槽内，弹簧受压，促使夹套唇边紧贴密封沟槽，由此形成密封。弹簧给密封夹套提供永久弹力，并弥补材料磨损及配合零件的偏移或偏心，系统压力也会辅助密封夹套蓄能，通过弹簧弹力和系统压力，那么无论在高压或低压下条件下，系统内都可形成有效密封。弹簧蓄能密封圈广泛用于动态和静态运动工况。The spring energized seals consist of a jacket made of the rmoplastic like PTFE(or other polymer materials) and an embedded spring made of different materials. At certain pressures, the system pressure will energize the seal and prevent leakage. But at low pressures, additional energy is required to force the jacket material to mate with the hardware. The solution to this is to add a spring to the seal. The spring provides the needed sealing-energy to prevent leakage at low media pressures. It is widely used in dynamic and static application.

## 弹簧蓄能密封圈 (泛塞封) Spring Energized Seals

### 压力 Pressure:

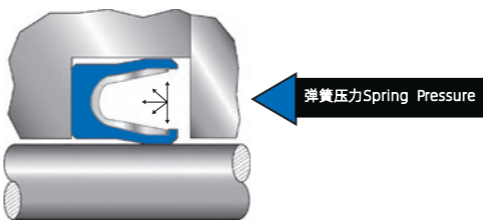


Fig.1  
系统压力低于≈ 0.69Mpa  
Below ≈ 0.69Mpa the spring provides the sealing force

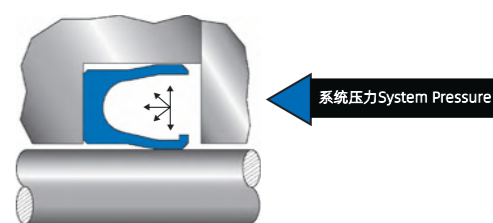


Fig.2  
系统压力大于≈ 0.69Mpa  
Above ≈ 0.69Mpa the system

图 1，代表低压时系统内无法提供足够的密封压力，此时蓄能弹簧就可以提供必要的密封压力。在大约低于 0.69Mpa 时，蓄能弹簧所提供内部压力可以给系统提供有效的密封作用。Figure 1 represents a low-pressure sealing situation where the system pressure alone does not provide enough force to seal. The spring in this situation provides the necessary sealing force. Below approximately 0.69 Mpa the spring energizer supplies the internal force to create a positive seal.

图 2，随着系统压力升高，在临界值大约在 0.69Mpa 时系统压力可以接管蓄能弹簧的作用为系统提供密封作用。Figure 2 represents a higher pressure application where system pressure is sufficient to create a positive seal. This threshold occurs at approximately 0.69Mpa allowing system pressure to take over and provide the sealing force.

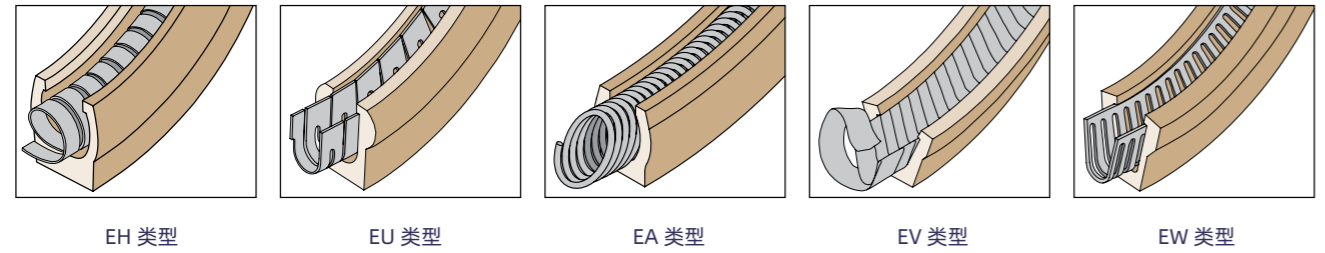
### 材料选择 Material Selection:

材料 Material	特性 Characteristics	温度范围 Temperature Range
纯 PTFE Virgin PTFE	特别适用于轻型到中等动态和静态应用。有限的耐磨损和耐热性。符合 FDA 标准要求。Excellent for static and light to moderate dynamic service. Limited wear and heat resistance. FDA compliant.	-200°C ~ +260°C
改性 PTFE Modified PTFE	特别适用于轻型到中等动态和静态应用。有限的耐磨损和耐热性。低气体渗透率。良好的低温特性。符合 FDA 标准要求，具有较高的抗蠕变和抗咬合性能。Excellent for light to moderate dynamic and static service. Limited wear and heat resistance. Low gas permeability. Good cryogenic properties. FDA compliant. Good in creep and extrusion resistance.	-200°C ~ +260°C
超高分子聚乙烯 UHMW-PE	拥有极好的耐磨性能，但是耐高温和耐化学性能较为有限。符合 FDA 标准要求。Extremely good wear and abrasion resistance, but limited heat and chemical resistance. FDA compliant.	-150°C ~ +80°C
聚醚醚酮 PEEK	具有优异的耐高温性能的高模量材料。High modulus material with excellent high temperature resistance.	-210°C ~ +310°C
PTFE + 玻纤 PTFE + glass fibre	材质坚硬，具有长久的耐磨性能，耐高温。推荐用于高压液压应用中，在表面速度较快的条件下对软金属具有研磨作用。Tough, long wearing, heat resistant. Recommended for high pressure hydraulic application. Can be abrasive running against soft metals at high surface speeds.	-200°C ~ +260°C
PTFE + 聚酰亚胺 PTFE + Polyimide	在真空和惰性气体中的磨损率低，在干燥环境中表现出色。对动态配合表面的磨损极低。适用于高速旋转运动工况。Excellent in dry service with low wear rate in vacuum and inert gases. Very low abrasion to dynamic mating surfaces. It's suitable for high speed rotating applications.	-260 °C ~ +310°C

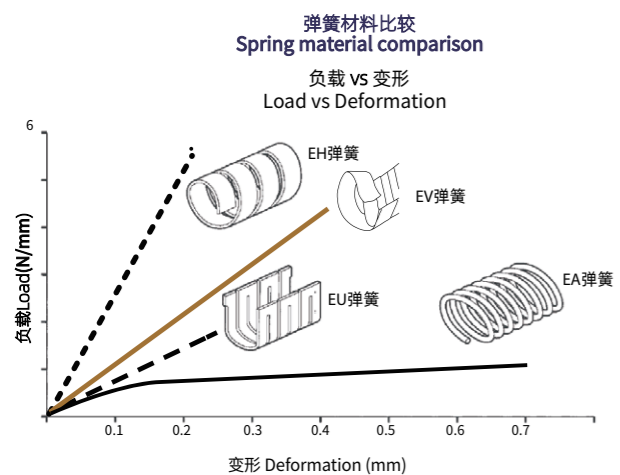
\*其它材料可根据客户需求提供 Other materials available upon request

## 弹簧蓄能密封圈 (泛塞封) Spring Energized Seals

### 弹簧的类型和材料 Spring Types and Materials:



EH 弹簧	EH 弹簧是一组螺旋片形弹簧，弹簧的形状使其具有中等到高的单位载荷和更小的变形范围。在静态端面密封条件下有着出色的表现	Helical wound flat spring design. Features on high spring load with small deflection range. Excellent in static face sealing.
EU 弹簧	EU 弹簧是一组 U 形弹簧，弹簧的形状使它负载集中在密封唇口的前端，使其具有刮擦作用，具有中等单位载荷和变形范围。	Cantilevered finger spring design, The shape of the spring makes its load concentrated on the front end of the sealing lip, which makes it have a scraping effect, with a medium unit load and deformation range.
EA 弹簧	EA 弹簧式由钢丝绕成倾斜弹簧，具有较低的弹簧负载能力，在很宽的变形范围内可以保持相对恒定的负载。	Coiled wire spring design. It has very low spring loading. Constant spring loading over a wide range of deflection.
EV 弹簧	EV 弹簧是特殊的双层排列设计，是最具有弹性的弹簧材料，具有非常高的负载能力，只应用于轴孔密封。	Wrapped and formed ribbon spring type, most resilient spring material. It has a very high spring loading. Only available in radial-type seal design.
EW 弹簧	EW 弹簧是一款具有高载荷的弹簧结构设计，可有效防止环境因素造成的密封力变化，只应用于端面密封。	Heavy duty, high load EW spring design. It can effectively prevent changes in sealing force caused by environmental factors. Only available in static face sealing application.



弹簧材料 Spring Material	介质 Medium
Elgiloy®UNS30003	石油、天然气、低温介质 Petroleum, gas, low temperature medium
SUS301 / SUS302 / SUS304 / SUS316	普通用途 General applications
Hastelloy® C-276	酸，海水 Acid, seawater

注: Elgiloy®是Elgiloy公司的注册商标。Hastelloy®是Haynes公司的注册商标。  
Note: Elgiloy® is the registered trademark of Elgiloy. Hastelloy® is the registered trademark of Haynes.

\* 上述设计指南旨在帮助您理解弹簧蓄能密封圈的作用，并可在您考虑使用弹簧蓄能密封圈时提供参考。更多信息，请联系我们的销售人员以获取弹簧蓄能密封圈详细的样本资料。

\* The above design guide is to assist you in understanding the concept and design considerations when considering the use of a spring energized seal for your application. For more information about our spring energized seals, please contact our sales to get the detailed brochure.

## 挤出棒 / 管 Extruded Rods / Tubes



PTFE 挤出管一般作为机械加工的原材料。由于 PTFE 具有异常出色的耐低温性能，耐化学反应，耐腐蚀和耐应力开裂的特点，客户可以购买棒材后自行加工成各种化学、电气、机械零部件（例如密封件，密封盖等）。

The extruded PTFE Rods are generally used as machining stock to create shapes for any number of chemical, electrical and mechanical components (such as seals, caps, etc.) where the outstanding performance characteristics of PTFE are required.

- 直径尺寸范围 : 8 - 400mm
- 可选的材料 : 纯 PTFE, 改性 PTFE, 矿物填充 PTFE
- Diameter Range: 8 - 400mm
- Available Materials: Virgin PTFE, Modified PTFE, Filled PTFE

## 模压棒/管 Molded Rods/Tubes



PTFE 是已知的最耐化学腐蚀的塑料材质，它的机械性能可以通过填充添加物例如玻纤，碳，石墨，二硫化钼，铜粉进一步的得到改善。我们可以提供模压工艺生产的纯 PTFE 或填充 PTFE 材料，并可以根据客户的使用工况推荐相应的材料，以改善其机械性能。

The PTFE compound is the most chemically resistant plastic known. Mechanical properties can be improved by the addition of fillers such as glass fiber, carbon, graphite, molybdenum disulfide and bronze.

We could supply molded rods and tubes of virgin or filled PTFE to improve its mechanical properties and meet customer's application.

- 直径尺寸范围 : ≤ 920mm
- 可选的材料 : 纯 PTFE, 改性 PTFE, 矿物填充 PTFE
- Diameter Range: ≤ 920mm
- Available Materials: Virgin PTFE, Modified PTFE, Filled PTFE

\* 我们有上千个模具尺寸可以供客户选择，请联系我们的销售团队获取最新的尺寸表，也可接受尺寸定制。  
\* We have thousands of tooling available in the house. Please contact our sales team to get the size list. Customized size is also available.

## 模压板 Molded Sheets



自然光滑的表面使得 PTFE 模压板成为生产轴承，齿轮，和其他滑动或滚动部件的良好材料选择。PTFE 材质的特性远优于其它大部分的塑料，特别其优异的耐化学性和在极端温度下的表现。PTFE 材质易于加工，是优良的电绝缘体材料。The naturally slippery surface makes these PTFE sheets a good choice for bearings, gears, and parts that slide and roll. PTFE surpasses most plastic when it comes to chemical resistance and performance in extreme temperatures. It is easy to machine and is an excellent electrical insulator.

### ● 标准尺寸:

1000x1000mm, 1200x1200mm, 1500x1500mm, 2000x1000mm

### ● 可选的厚度:

> 6mm

### ● 可选的材料:

纯 PTFE, 改性 PTFE, 矿物填充 PTFE

### ● Standard Size:

1000x1000mm, 1200x1200mm, 1500x1500mm, 2000x1000mm

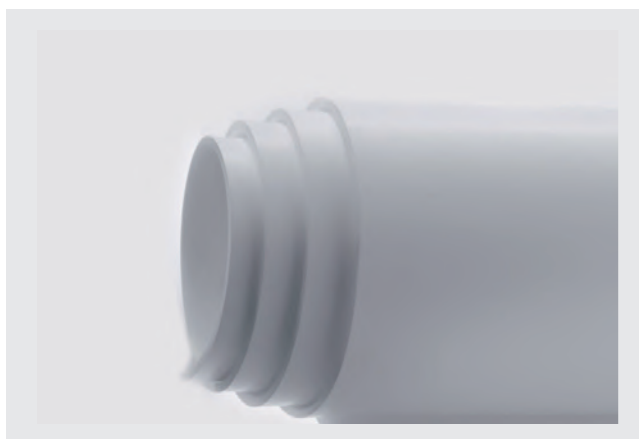
### ● Available Thickness:

> 6mm

### ● Available Materials:

Virgin PTFE, modified PTFE, mineral filled PTFE

## 车削板 Skived Sheets



我们的 PTFE 车削板拥有优异的加工精度和清洁度，广泛应用于各种关键工况。切削板可以用于生产各种垫片，密封件，隔板衬里，刮板，导轨，电绝缘体，桥梁支座滑块，以及用于混凝土楼梯中作为支撑滑块，当地震发生时可以有效降低楼房震动时对上下楼梯的破坏表现，所有又叫做“楼梯板”。

The skived PTFE sheets provide excellent precision and cleanliness for a wide range of critical applications. It's often used to make gaskets, seals, lining partitions, scrapers, guide rails, and electrical insulators, slide bearing plate as bridge supports, and used in concrete stairs as a supporting slide plate, when an earthquake occurs, it can effectively reduce the damage to the stairs chemical resistance and performance in extreme temperatures. So it's also called a "stair bearing board".

### ● 标准尺寸:

1000x1000mm, 1200x1200mm, 1500x1500mm, 2000x1000mm

### ● 可选的厚度:

0.5 - 6mm

### ● 可选的材料:

纯 PTFE, 改性 PTFE

### ● Standard Size:

1000x1000mm, 1200x1200mm, 1500x1500mm, 2000x1000mm

### ● Available Thickness:

0.5 - 6mm

### ● Available Materials:

Virgin PTFE, modified PTFE

## 模压和车加工 Moulding and Machining



PTFE 粉末通过模压工艺增强了材料加工的灵活性，适用于加工成不同材料和形状模压制品，如棒材、管道、片材、轴套、阀座和齿轮等等。PTFE granular powders increase processing flexibility for molding different products and stock shapes, such as rods, tubes, and sheets, bushing, valve seats and gears etc.

### 粉末加工:

加工 PTFE 粉末颗粒首先需要制作预成型件并烧结成型，然后用烧结后的料坯进行机加工成为最终的产品。通常将 5% 至 40% (按重量计) 的无机填料与 PTFE 混合在一起，可以做出其他改性材料，以增强各类性能，例如:

- 减少摩擦磨损
- 增加导热性和导电性
- 提高抗冷流性
- 提高硬度和尺寸热稳定性

### 预成型:

PTFE 在环境温度下经过模压工艺预成型为一个胚料。采用不等的模压压力，并处以不同的保压时间，可以最大限度地提高最终产品使用性能。

### 烧结:

将预成型件从模具中脱模，然后通过严格控制的速率加热至熔点以上(烧结)。这将使得 PTFE 粉末颗粒结合为坚固、均匀的结构。

### Powder Processing:

To process PTFE granular molding powders, prepare and sinter a preform and then fabricate functioning machined parts from the sintered stock shape. Filled compounds can be produced from powders by mixing 5 to 40% (by weight) inorganic fillers to enhance properties such as:

- Reduced wear and friction
- Increased thermal and electrical conductivity
- Improved resistance to cold flow
- Elevated stiffness and thermal dimensional stability

### Pre-forming:

PTFE is compacted at an ambient temperature into a handleable form (preform). Typical preform pressures with variable dwell times, can maximize end-use performance.

### Sintering:

Remove the preform from the mold and heat above the melting point at a very controlled ramp rate (sintering). This coalesces the PTFE particles into a strong, homogeneous structure.

### 功能和优势:

- 我们拥有上千套模压模具，可以最大限度地减少材料浪费
- 减少车加工的时间
- 从原材料到烧结过程可跟踪记录
- 根据客户所需的成品尺寸，我们会以最经济的方式来放大毛胚材料的余量，供车加工使用
- 根据客户图纸要求，我们可以直接模压成型到所需要的成品尺寸和形状

### Features and Benefits:

- We have thousands moulding tools to minimise your material waste
- Reduce your machining time
- Full traceability of manufacturing process from raw material to sintered billet
- Customer specifies the machined part size and we produce the stock shape with an economic machining allowance
- Customer specifies the stock shape dimensions (diameter, section and length) and we make to that size

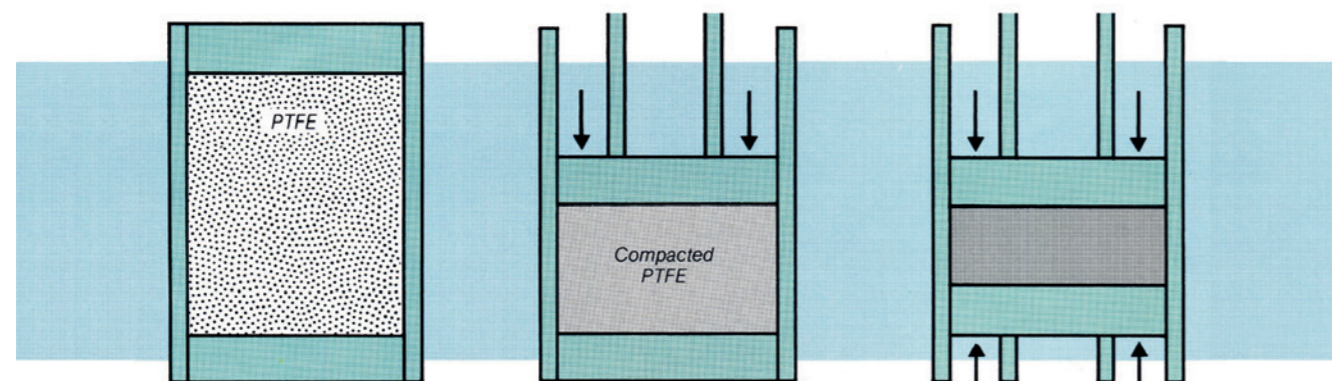
朝旭拥有丰富的烧结经验，以确保客户能够收到质量合格的产品。

Zhaoxu has a wealth of sintering experience to ensure that customers can receive the qualified products.



## 模压和车加工 Moulding and Machining

### PTFE 模压加工过程 PTFE Moulding Process Flow:



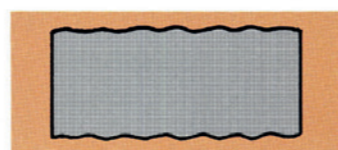
1. 将纯 PTFE 或填充 PTFE 混合物加入到模具中  
Mould virgin PTFE or filled PTFE polymer in one shot

2. 施加一定的压力在 15-75 MPa 之间，具体取决于聚合物类型  
Pressure applied, between 15-75 MPa depending on polymer type

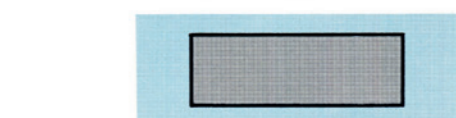
3. 从上下两端再额外施压  
Additional compaction from both ends



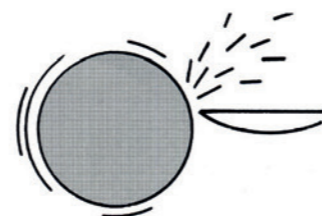
4. 从模具中取出的压实结晶的 PTFE 坯料（预成型）  
Compacted crystalline PTFE powder (preform) removed from mould



5. 在自由状态下将预成型件放入 360°C 的烘箱中进行烧结处理  
Programme-sintered in an oven at 360°C in free state



6. 烧结完后按程序冷却至环境温度  
Programme-cooled to ambient temperature after sintering



7. 待坯料应力完全消除后进行尺寸整形或进行车加工至成品尺寸  
To calibrate the dimension in the tooling, or to machine shop as fully stress-relieved billet for precision manufacture of components

#### 车加工:

PTFE 是一种非常好的可以进一步加工的材料。可以安全容易的使用常见的工艺来加工，例如：

- 车削
- 铣削
- 雕刻
- 冲压

和许多其他聚合物一样，PTFE 具有很高的热膨胀系数。当需要产品尺寸精度很高的时候，温度的控制就必须非常严格。因此，这种膨胀现象使得必须对 PTFE 关键部件进行车加工。

#### 其它高分子材料:

我们的经验不仅限于 PTFE。我们还可以加工其它材料例如：

- PU (聚氨酯)
- PCTFE (聚氯三氟乙烯)
- PVDF (聚偏二氟乙烯)
- UHMWPE (超高分子量聚乙烯)
- PEEK (聚醚醚酮)
- POM (聚缩醛)
- Nylon (尼龙 / 聚酰胺)
- PI (聚酰亚胺)

#### Machining:

Solid PTFE is an excellent material to process further. It is safe and easy to machine using common cutting techniques such as:

- Turning
- Milling
- Shaping
- Stamping

Like many polymers, PTFE has a high coefficient of thermal expansion. Temperature control is critical when working with PTFE with extreme accuracy. As a result, this expansion phenomenon makes it necessary to machine for critical components.

#### Other Polymeric Materials:

Our experience is not confined to PTFE. We also work with:

- PU (polyurethane)
- PCTFE (polychlorotrifluoroethylene)
- PVDF (polyvinylidene fluoride)
- UHMWPE (ultra high molecular weight polyethylene)
- PEEK (polyetheretherketone)
- POM (polyacetal)
- Nylon (polyamides)
- PI (polyimides)

## PTFE 衬套 PTFE Bushings



PTFE 塑料衬套是一种使用在高速和高温的工况下表现优异的材料。衬套可以通过机加工或者模压的方式进行尺寸加工。PTFE Plastic bushings are an excellent choice for performance applications involving high speeds and high temperatures. Bushings can be manufactured to the right size both through mechanical machining and molding.

#### 主要优点:

- 卓越的耐磨性和尺寸稳定性
- 优异的耐化学性
- 极低的吸湿性
- 非常好的热稳定性
- 出色的弯曲和扭转强度
- 出色的耐磨性
- 良好的介电性能
- 良好的抗辐射能力
- 具有自熄性能

#### 典型应用:

- 齿轮、阀座
- 电器零部件，衬套，轴承
- 密封件和密封圈
- 插头连接器、硅片

#### Main Features:

- Superior wear resistance and dimensional stability
- Excellent resistance to chemicals
- Very low moisture absorption
- Very high thermal stability
- Superb flexural and torsional strength
- Abrasion resistant
- Good dielectric properties
- Good resistance to radiation
- Self-extinguishment

#### Typical Applications:

- Gears, valve seats
- Electrical parts, bushings, bearings
- Seals and sealing rings
- Plug connectors, wafers

## 聚醚醚酮 PEEK



PEEK 是极端环境下首选的高性能材料例如在高温、重载的工况。它具有卓越的耐磨性、耐化学性和耐湿性以及具有非常高的强度、尺寸稳定性和硬度。PEEK 可以持续暴露在热水或蒸汽中而不会变形、腐蚀或磨损。

PEEK is the performance material of choice for aggressive environments such as high temperatures, heavy loads. It combines exceptional wear, chemical and moisture resistance with very high strength, dimensional stability and stiffness. PEEK can be continuously exposed to hot water or steam with no distortion, corrosion or galling.

#### 主要优点:

- 卓越的耐磨性和尺寸稳定性
- 非常好的热稳定性
- 良好的介电性能
- 良好的抗辐射能力

#### 应用:

- 齿轮
- 阀座
- 电器零部件
- 衬套、轴承、密封件和密封圈

#### Main Features:

- Superior wear resistance and dimensional stability
- very high thermal stability
- Abrasion resistant
- Good dielectric properties

#### Applications:

- Gears
- Valve seats
- Electrical parts
- Bushings, bearings, seals and sealing rings

## 尼龙 Nylon

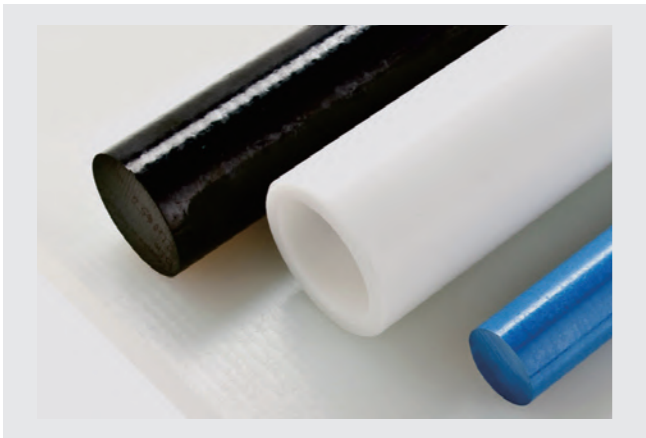


尼龙是一种坚固、坚硬的工程塑料，其出色的耐磨性能可以作为轴承的材料。尼龙经常用于替代金属轴承或衬套，通常无需添加润滑油脂。其材料可以大大减轻零件重量、降低操作噪音以及减少配合零件的磨损。

Nylon is a strong, stiff engineering plastic with outstanding bearing and wear properties. Nylon is frequently used to replace metal bearings and bushings often eliminating the need for external lubrication. Other benefits include a reduction in part weight, less operating noise, and decreased wear on mating parts.

- |  |   |
|--|---|
| <p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 具有出色的承载能力</li> <li>● 耐腐蚀</li> <li>● 重量轻 (是钢铁的 1/8)</li> <li>● 摩擦系数低</li> <li>● 成本相对较低</li> <li>● 优异的耐磨性</li> <li>● 可以减少对磨零件的磨损</li> <li>● 易于加工</li> </ul> | <p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Excellent load bearing capacity</li> <li>● Corrosion resistance</li> <li>● Light weight (1/8 weight of steel)</li> <li>● Low co-efficient of friction</li> <li>● Relatively low cost</li> <li>● Excellent wear resistance</li> <li>● Reduced wear on mating parts</li> <li>● Easy to machine</li> </ul> |
|--|---|

## 聚甲醛 POM



聚甲醛是一种很受欢迎的材料，它是一种高强度、低摩擦性的工程塑料，在潮湿和干燥环境中都具有出色的耐磨性。此外它易于加工，非常适合用于加工尺寸要求高的产品。

POM is a popular materials which is a high strength, low friction engineering plastic that has excellent wear properties in both wet and dry environments. Easy to machine, makes an outstanding choice for applications that require complex, tight tolerances.

- |  |  |
|--|--|
| <p><b>主要优点:</b></p> <ul style="list-style-type: none"> <li>● 材质强壮坚硬</li> <li>● 优良的可加工性</li> <li>● 低吸湿性</li> <li>● 在潮湿和干燥环境中均具有出色的耐磨性</li> <li>● 低摩擦性</li> <li>● 良好的耐化学性</li> </ul> <p><b>典型应用:</b></p> <ul style="list-style-type: none"> <li>● 轴承和衬套</li> <li>● 电器元件</li> <li>● 耐磨板</li> <li>● 食品加工等包装机械零部件</li> <li>● 齿轮</li> <li>● 歧管</li> <li>● 泵阀件</li> </ul> | <p><b>Main Features:</b></p> <ul style="list-style-type: none"> <li>● Strong and stiff</li> <li>● Excellent machinability</li> <li>● Low moisture absorption</li> <li>● Excellent wear properties in both wet and dry environments</li> <li>● Low friction</li> <li>● Good chemical resistance</li> </ul> <p><b>Typical Applications:</b></p> <ul style="list-style-type: none"> <li>● Bearings and bushings</li> <li>● Electrical components</li> <li>● Wear pads</li> <li>● Food processing and other packaging machinery parts</li> <li>● Gears</li> <li>● Manifolds</li> <li>● Pump and valve parts</li> </ul> |
|--|--|

我们的PTFE产品广泛应用于航空航天、汽车、化工、工程机械、液压、医疗、半导体、纺织、阀门 ....

The PTFE components are widely used in Aerospace, Automotive, Chemical, Construction, Hydraulic, Medical, Semiconductor, Textile, Valves Industry...



航空航天 Aerospace



汽车 Automotive



化工 Chemical



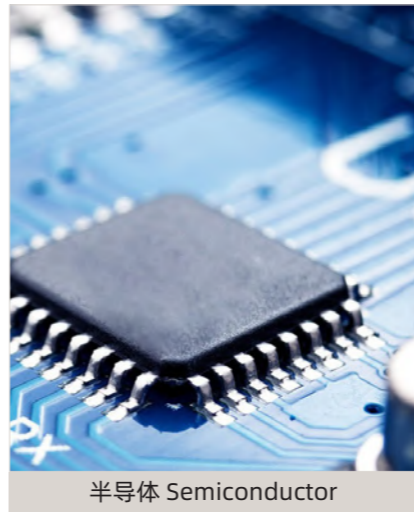
工程机械 Construction



液压 Hydraulic



医疗 Medical



半导体 Semiconductor



纺织 Textile



阀门 Valve

PTFE 化学兼容性参考表  
PTFE Chemical Compatibility Reference Chart

PTFE 是非活性材料，非常适合与绝大多数的化学品一起使用。  
PTFE is very non-reactive and ideal for use with most chemicals.

请参考如下 PTFE 与各种化学品、溶剂、酒精等其它材料的兼容性。  
Review the chemical compatibility of PTFE with various chemicals, solvents, alcohols and other products in the cart below.

乙醛 Acetaldehyde	E	溴 Bromine	E	甲酚 Cresol	E	氟 Fluorine	*	甲乙酮 Methyl Ethyl Ketone	E	醋酸银 Silver Acetate	E
乙酰胺 Acetamide, Sat.	E	溴苯 Bromobenzene	E	环己烷 Cyclohexane	E	10% 甲醛 Formaldehyde, 10%	E	甲基异丁基酮 Methyl Isobutyl Ketone	E	硝酸银 Silver Nitrate	E
5% 醋酸 Acetic Acid, 5%	E	溴仿 Bromoform	E	十氢萘 Decalin	E	40% 甲醛 Formaldehyde, 40%	E	甲基丙基酮 Methyl Propyl Ketone	E	醋酸钠 Sodium Acetate,	E
50% 醋酸 Acetic Acid, 50%	E	丁二烯 Butadiene	E	邻二氯苯 o- Dichlorobenzene	E	3% 甲酸 Formic Acid, 3%	E	二氯甲烷 Methylene Chloride	E	1% 氢氧化钠 Sodium Hydroxide, 1%	E
丙酮 Acetone	E	乙酸正丁酯 n-Butyl Acetate	E	对二氯苯 p- Dichlorobenzene	E	50% 甲酸 Formic Acid, 50%	E	矿物油 Mineral Oil	E	50% 氢氧化钠 Sodium Hydroxide 50%	E
乙腈 Acetonitrile	E	正丁醇 n-Butyl Alcohol	E	二乙苯 Diethyl Benzene	E	98-100% 甲酸 Formic Acid, 98- 100%	E	1-10% 硝酸 Nitric Acid, 1-10%	E	15% 次氯酸钠 Sodium Hypochlorite, 15%	E
丙烯腈 Acrylonitrile	E	仲丁醇 sec-Butyl Alcohol	E	乙醚 Diethyl Ether	E	燃料油 Fuel Oil	E	50% 硝酸 Nitric Acid, 50%	E	硬脂酸晶体 Stearic Acid, Crystals	E
己二酸 Adipic Acid	E	叔丁醇 tert-Butyl Alcohol	E	二乙基酮 Diethyl Ketone	E	汽油 Gasoline	E	70% 硝酸 Nitric Acid, 70%	E	1-6% 硫酸 Sulfuric Acid, 1-6%	E
丙氨酸 Alanine	E	丁酸 Butyric Acid	E	丙二酸二乙酯 Diethyl Malonate	E	冰醋酸 Glacial Acetic Acid	E	硝基苯 Nitrobenzene	E	20% 硫酸 Sulfuric Acid, 20%	E
烯丙醇 Allyl Alcohol	E	氢氧化钙 Calcium Hydroxide, Conc.	E	二甘醇 Diethylene Glycol	E	甘油 Glycerin	E	正辛烷 n-Octane	E	60% 硫酸 Sulfuric Acid, 60%	E
氢氧化铝 Aluminum Hydroxide	E	次氯酸钙 Calcium Hypochlorite, Sat.	E	二甲基甲酰胺 Dimethyl Formamide	E	正庚烷 n-Heptane	E	橙油 Orange Oil	E	98% 硫酸 Sulfuric Acid, 98%	E
铝盐 Aluminum Salts	E	咔唑 Carbazole	E	二甲亚砜 Dimethylsulfoxide	E	己烷 Hexane	E	臭氧 Ozone	E	二氧化硫液体 Sulfur Dioxide Liquid	E
氨基酸 Amino Acids	E	甲醇 Methyl Alcohol	E	1,4- 二氧六环 1,4-Dioxane	E	1-5% 盐酸 Hydrochloric Acid, 1-5%	E	高氯酸 Perchloric Acid	E	湿或干的二氧 化硫 Sulfuric Dioxide, wet or dry	E
氨 Ammonia	E	次氯酸钙 Calcium Hypochlorite, Sat.	E	二丙二醇 Dipropylene Glycol	E	20% 盐酸 Hydrochloric Acid, 20%	E	全氯乙烯 Perchloroethylene	E	硫盐 Sulfur Salts	E

E = 没问题 Excellent

\* = 有严重影响，不建议与其在任何地方使用 Severe Effect, not recommended for ANY use.

请注意：此图表中的信息仅作为在给设备选择具有化学兼容性的化学物质时的参考。具体应该建议咨询朝旭。  
Please Note: The information in this chart is to be used ONLY as a guide in selecting equipment for appropriate chemical compatibility. For specific application recommendations consult with Zhaoxu.

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PTFE is very non-reactive and ideal for use with most chemicals.

请参考如下 PTFE 与各种化学品、溶剂、酒精等其它材料的兼容性。  
Review the chemical compatibility of PTFE with various chemicals, solvents, alcohols and other products in the cart below.

醋酸铵 Ammonium Acetate, Sat.	E	咔唑 Carbazole	E	乙醚 Ether	E	35% 盐酸 Hydrochloric Acid, 35%	E	苯酚, 晶体 Phenol, Crystals	E	酒石酸 Tartaric Acid	E
乙醇酸铵 Ammonium Glycolate	E	二硫化碳 Carbon Disulfide	E	乙酸乙酯 Ethyl Acetate	E	4% 氢氟酸 Hydrofluoric Acid, 4%	E	1-5% 磷酸 Phosphoric Acid, 1-5%	E	四氢呋喃 Tetrahydrofuran	E
5% 氢氧化铵 Ammonium Hydroxide 5%	E	四氯化碳 Carbon Tetrachloride	E	无水乙醇 Ethyl Alcohol (absolute)	E	48% 氢氟酸 Hydrofluoric Acid, 48%	E	85% 磷酸 Phosphoric Acid, 85%	E	亚硫酸氯 Thionyl Chloride	E
30% 氢氧化铵 Ammonium, Hydroxide 30%	E	乙二酸 Adipic Acid	E	40% 乙醇 Ethyl Alcohol, 40%	E	3% 过氧化氢 Hydrogen Peroxide, 3%	E	松树油 Pine Oil	E	甲苯 Toluene	E
草酸铵 Ammonium Oxalate	E	醋酸溶纤剂 Cellosolve Acetate	E	乙苯 Ethyl Benzene	E	30% 过氧化氢 Hydrogen Peroxide, 30%	E	1% 氢氧化钾 Potassium Hydroxide, 1%	E	柠檬酸三丁酯 Tributyl Citrate	E
铵盐 Ammonium Salts	E	金属盐溶液 Salt Solutions, Metallic	E	苯甲酸乙酯 Ethyl Benzoate	E	90% 过氧化氢 Hydrogen Peroxide, 90%	E	氢氧化钾 Potassium Hydroxide	E	三氯乙烯 Trichloroethane	E
乙酸正戊酯 n-Amyl Acetate	E	硬脂酸锌 Zinc Stearate	E	丁酸乙酯 Ethyl Butyrate	E	异丁醇 Isobutyl Alcohol	E	丙烷气体 Propane Gas	E	三氯乙烯 Trichloro- ethylene	E
戊酰氯 Amyl Chloride	E	氯乙酸 Chloroacetic Acid	E	乙基氯化物 Ethyl Chloride	E	乙酸异丙酯 Isopropyl Acetate	E	丙二醇 Propylene Glycol	E	三甘醇 Triethylene Glycol	E
苯胺 Aniline	E	对氯苯乙酮 p-Chloroacetophenone	E	氰基乙酸乙酯 Ethyl Cyanoacetate	E	异丙醇 Isopropyl Alcohol	E	环氧丙烷 Propylene Oxide	E	三丙二醇 Tripropylene Glycol	E
苯甲醛 Benzaldehyde	E	氯仿 Chloroform	E	乳酸乙酯 Ethyl Lactate	E	异丙苯 Isopropyl Benzene	E	间苯二酚盐酸 Resorcinol, Sat.	E	松节油 Turpentine	E
苯 Benzene	E	10% 铬酸 Chromic Acid, 10%	E	氯乙烯, 液体 Ethylene Chloride, Liquid	E	煤油 Kerosene	E	5% 间苯二酚 Resorcinol, 5%	E	十一醇 Undecyl Alcohol	E
苯甲酸 Benzoic Acid, Sat.	E	50% 铬酸 Chromic Acid, 50%	E	乙二醇 Ethylene Glycol	E	乳酸 Lactic Acid	E	水杨醛 Salicylaldehyde	E	尿素 Urea	E
乙酸苄酯 Benzyl Acetate	E	肉桂油 Cinnamon Oil	E	环氧乙烷 Ethylene Oxide	E	氢气 Hydrogen	E	水杨酸粉 Salicylic Acid Powder	E	偏二氯乙烯 Vinylidene Chloride	E
苯甲醇 Benzyl Alcohol	E	10% 柠檬酸 Citric Acid, 10%	E	氟化物 Fluorides	E	油酸甲氧乙酯 Methoxyethyl Oleate	E	水杨酸盐 Salicylic Acid, Sat.	E	二甲苯 Xylene	E

E = 没问题 Excellent

\* = 有严重影响，不建议与其在任何地方使用 Severe Effect, not recommended for ANY use.

请注意：此图表中的信息仅作为在给设备选择具有化学兼容性的化学物质时的参考。具体应该建议咨询朝旭。  
Please Note: The information in this chart is to be used ONLY as a guide in selecting equipment for appropriate chemical compatibility. For specific application recommendations consult with Zhaoxu.