



★提供密封专业方案

Provide professional solutions for sealing

★减少泄漏 保护环境

Reduce leakage to protect the environment

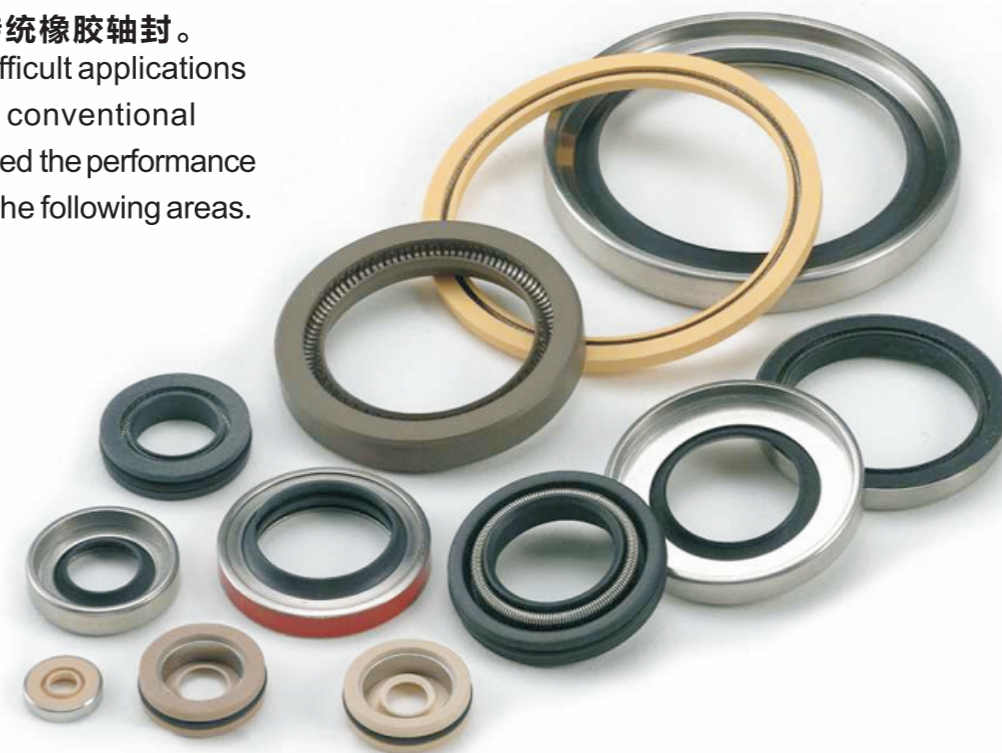
★降低设备运作成本

Reduce equipment operating costs

东莞市华乐密封技术开发有限公司

Dongguan Walle Sealing Technology Development Co., Ltd.

Great Lip®密封圈能够在传统橡胶密封圈不能使用的场合工作。Great Lip®轴封能够在以下领域中超越传统橡胶轴封。Great Lip® seals solve difficult applications which are not used by conventional elastomer seals. It exceed the performance of elastomer lip-seals in the following areas.



- 超强的抗化学性能
Greater chemical resistance
- 低摩擦性
Lower friction
- 能够承受30m/s的表面速度
Capable of surface speeds to 7000 ft/min.
- 极端工作温度 (-60℃至200℃)
Works to temperature extremes (-65°F to 450°F)
- 在干式或研磨介质中超长的密封寿命
Has extended seal life in dry or abrasive media
- 压差可达3.5MPa
Handles pressure in excess of 500 PSID

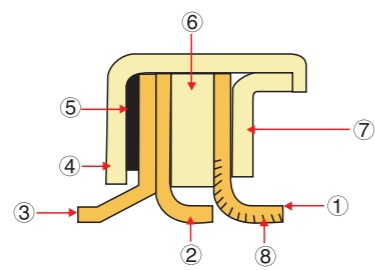


食品级(FDA)GreatCase®

已成功应用在如下场合中 Successful Applications

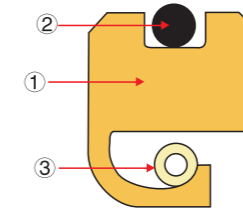
- 液压马达和泵 Hydraulic motors and pumps
- 化工泵 Chemical pumps
- 旋转压缩机 Rotary compressors
- 旋转部件 Rotary unions
- 真空泵 Vacuum pumps
- 风机 Blowers
- 钻探开采心轴 Drilling and tapping spindles
- 高速变速箱 High-speed gearboxes
- 柴油和压缩机曲轴 Crankshafts of engines and compressors
- 机器人 Robotics
- 食品和制药加工设备 Pharmaceutical and food processing equipment
- 搅拌器 Mixers
- 化学加工设备 Chemical processing equipment
- 传动器 Actuators
- 交流发电机及发电机 Alternators and generators
- 雷达和红外线装置 Radar and thermal optical devices
- 电动马达轴 Electric Motor Shafts
- 编码器 Encoders

GreatCase®唇型轴封
GreatCase® Lip Seal >>



- 1.主密封 Primary element
- 2.辅密封 Secondary element
- 3.防尘圈 Wiper seal
- 4.金属外壳 Outer case
- 5.垫片 Gasket (Fluorocarbon)
- 6.垫圈 Washer
- 7.金属内壳 Inner case
- 8.螺旋回流纹 Helical lines

GreatLip®轴封
GreatLip® Seal >>



- 1.密封材料 Seal material
- 2.O型圈 O-Ring(Fluorocarbon)
- 3.不锈钢弹簧 Extension spring(Stainless steel)

密封圈型号 Seal Type	密封圈型号 Seal Type	详细应用 Application Details
L1 系列 Series L1	L2 系列 Series L2	L1和L2系列应用广泛，属于经济型产品，在有无润滑的条件下均可使用，可在轴速最高为25m/s，压力为0.7MPa的润滑介质中使用。典型应用：变速箱和环境密封。 Series L1 and L2 are economical GreatLip seal designs employed in a wide range of applications. They are used in lubricated and non-lubricated environments. They can be used at shaft speeds to 5000 ft./min. in lubricated media and pressures to 100 PSID. Maximum PV 75,000 lubricated, 37,500 non-lubricated. Typical applications are: gear boxes and environmental seals.
T1 系列 Series T1	T2 系列 Series T2	T1和T2系列迷宫式油封，可以通过螺旋密封唇把介质甩出。这种设计仅在润滑介质中使用。使用寿命长，轴速最高可达30m/s，不推荐使用在压力超过0.1MPa的环境中。只适用于单向旋转的轴，顺时针或逆时针方向旋转。定制前需先确定轴的运转方向。 Series T1 and T2 incorporate a threaded sealing lip which pumps the media away from the seal. These designs should only be used in lubricating media. These designs offer long life and positive sealing at shaft speeds to 6000 ft./min. They should not be used for pressures greater than 5 PSID. It only used in single rotary shaft, rotate by clockwise or anti clockwise, please confirm the rotary shaft direction before place order.
F1 系列 Series F1	F2 系列 Series F2	F1和F2系列的设计提供了低扭矩，长使用寿命。轴速最高可为30m/s，但不推荐使用在压力超过0.2MPa的环境中，由于密封唇的轻负载，不推荐在泄漏要求高的场合使用。此系列在的环境密封中应用极佳。典型应用：除尘器，心轴和传送密封。 Series F1 and F2 offer low torque and long life. They can be used at shaft speeds to 6000 ft./min., but are not recommended for pressures greater than 25 PSID. Due to their light lip loading, these designs should not be used where a leak-tight seal is required. They are an excellent environmental seal. Maximum PV 75,000 lubricated, 37,500 non-lubricated. Typical applications are: dust/dirt excluders, spindle and conveyer seals.
S1 系列 Series S1	S2 系列 Series S2	S1和S2系列结合了弹簧负载设计，改善了发生轴跳或轴孔不对中时的密封。这类设计能够保证长期的绝对密封，能够在轴速最高10m/s，压力为0.7MPa下工作。典范应用：搅拌机，齿轮箱和螺旋钻。 Series S1 and S2 incorporate spring loading which improves sealing where shaft runout or bore/shaft misalignment exist. These designs offer positive sealing during long term storage. They can be used at shaft speeds to 2000 ft./min. and pressures to 100 PSID. Maximum PV 75,000 lubricated, 37,500 non-lubricated. Typical applications are : mixers, gear boxes and augers.
H2 系列 Series H2	H3 系列 Series H3	H2和H3系列的设计能够在压力为3.5MPa下润滑介质中密封，轴速最高可达20m/s。典型应用：液压马达，液压泵，液压传送装置和其他高压液压设备。 Series H2 and H3 are designed for pressures up to 500 PSID lubricating media, speeds up to 3500 ft./min. Maximum PV 300,000 lubricated, 50,500 non-lubricated. Typical applications are: hydraulic motors, pumps, hydrostatic transmissions and other high pressure hydraulic equipment.
W2 系列 Series W2	W3 系列 Series W3	W2和W3系列的设计结合了迷宫式主密封唇和标准的辅助密封唇。此类设计用来密封润滑介质，静止或短时间内轴速最高可达25m/s，压力最高为1.5MPa，只适用于单向旋转的轴，顺时针或逆时针方向旋转。定制前需先确定轴的运转方向。典型应用：空气压缩机、制冷压缩机和真空泵。 Series W2 and W3 incorporate a threaded primary sealing lip with a standard secondary sealing lip. These series are designed for sealing lubricating media at high speeds 4,500ft./min and pressures up to 250 PSID. Maximum PV 200,000 lubricated. It only used in single rotary shaft, rotate by clockwise or anti clockwise, please confirm the rotary shaft direction before place order. Typical applications are: air compressors, refrigeration compressors and vacuum pumps.

普通温度下密封圈型号 Seal Type For NORMAL Temperatures	详细应用 Application Details
P1 系列 Series P1	P1系列应用广泛，属于经济型产品。在有无润滑环境下均可使用。在润滑介质中轴速最高可达25m/s，压力可到0.5MPa。典型应用：齿轮箱和环境密封。 Series P1 is economical GreatLip® designs employed in a wide range of applications. They are used in lubricated and non-lubricated environments. They can be used at shaft speeds to 5000ft./min. in lubricated media and pressures to 75 PSID. Maximum PV 75,000 lubricated, 37,500 non-lubricated. Typical applications are: gear boxes and environmental seals.
P2 系列 Series P2	P2系列采用重载唇型设计，在气体和研磨介质中性能良好。还具备抗轴跳能力。轴速与压力范围与P1系列相同。建议轴硬度达到55HRC。典型应用：齿轮箱、潜水泵和搅拌机。 Series P2 is modifications of Series P1 which offer longer life and improved sealing of gasses and abrasive media due to their higher lip load. They also offer additional runout capability, They can operate at speeds, pressure and PV as noted in Series P1. Recommended shaft hardness of 55HRC or greater when operating at the higher PV limits. Typical applications are: gear boxes, submersible pumps/ motors, and mixers.
P3 系列 Series P3	P3系列的设计提供了扭矩、长使用寿命。轴速最高可为30m/s，但不推荐使用在压力超过0.2MPa的环境中。由于其唇边轻载荷的设计，不推荐在泄漏要求高的场合使用。此系列在环境密封中应用极佳。典型应用：除尘器、心轴和传送密封。 Series P3 offer low torque and long life. They can be used at shaft speeds up to 6000ft./min. They are not recommended for pressures greater than 25 PSID. Due to light lip loading, this design should not be used where a leak tight seal is required. They are excellent environmental seals. Maximum PV 75,000 lubricated, 37,500 non-lubricated, 37,500 non-lubricated. Typical applications are: dust/dirt excluders, spindle and conveyer seals.
P4 系列 Series P4	P4系列结合了弹簧负载设计，改善了发生轴跳或轴/孔不对中时的密封。这类设计能够保证长期的绝对密封，能够在轴速最高10m/s压力0.5MPa下工作。典型应用：搅拌机、齿轮箱和螺旋钻。 Series P4 incorporate spring loading which improves sealing where shaft runout or bore/shaft misalignment exist. These designs offer positive sealing during long term storage. They can be used at shaft speeds to 2000 ft./min. and pressures to 75 PSID. Maximum PV 75,000 lubricated, 37,500 non-lubricated. Typical applications are: mixers, gear boxes and augers.
P5 系列 Series P5	P5系列设计用于压力高达1.5MP，速度高达17.5m/s的润滑介质中。典型的应用有：液压马达，泵，液压传动和其他高压液压设备。 Series P5 is designed for pressure up to 200 PSID in lubricating media, speed up to 3,500 ft./min. in lubricating media. Maximum PV 200,000 lubricated, 50,500 non-lubricated. Typical applications are: hydraulic motors, pumps, hydrostatic transmissions and other high pressure hydraulic equipment.

GreatLip®系列的密封性能与GreatCase®系列相似，但是在小批量生产时，GreatLip®的价格更低。因为此类密封圈的外径表面较软，在安装时不会划伤密封座且容易装卸。由于密封圈密封，表面较软。在极端温度下，GreatLip®采用了金属环来减少由于环境温度变化对密封产生的影响。

GreatLip® provides similar performance to the GreatCase® seal but it is more economical in smaller quantities. Because the seal has a soft surface on the OD, the seal will not damage the housing and can easily be installed and removed. Due to the seal's soft sealing on the OD, GreatLip® designed for extreme temperatures utilize a metallic support ring to minimize temperature's effect on the seal.

沟槽尺寸 Groove Size

轴径 Shaft Diameter	孔径 Bore Diameter	密封槽宽度 Seal Width	华乐件号 Walle Part No.
d h9 mm	D H9 mm	L+0.2 mm	
8	22	7	8-22-7
8	24	7	8-24-7
8	26	7	8-26-7
9	22	7	9-22-7
9	24	7	9-24-7
9	26	7	9-26-7
10	22	7	10-22-7
10	24	7	10-24-7
10	26	7	10-26-7
11	22	7	11-22-7
11	26	7	11-26-7
12	24	7	12-24-7
12	28	7	12-28-7
12	30	7	12-30-7
14	28	7	14-28-7
14	30	7	14-30-7
14	35	7	14-35-7
15	26	7	15-26-7
15	30	7	15-30-7
15	32	7	15-32-7
15	35	7	15-35-7
16	28	7	16-28-7
16	30	7	16-30-7
16	32	7	16-32-7
16	35	7	16-35-7
17	28	7	17-28-7
17	30	7	17-30-7
17	32	7	17-32-7
17	35	7	17-35-7
17	40	7	17-40-7
18	30	7	18-30-7
18	32	7	18-32-7
18	35	7	18-35-7
20	40	7	20-40-7
20	32	7	20-32-7
20	35	7	20-35-7
20	40	7	20-40-7
20	47	7	20-47-7
22	35	7	22-35-7
22	40	7	22-40-7
22	47	7	22-47-7
24	35	7	24-35-7
24	37	7	24-37-7
24	40	7	24-40-7
24	47	7	24-47-7
25	40	7	25-40-7
25	42	7	25-42-7
25	47	7	25-47-7
25	52	7	25-52-7
26	37	7	26-37-7
26	42	7	26-42-7
26	47	7	26-47-7
28	40	7	28-40-7
28	47	7	28-47-7
28	52	7	28-52-7
30	40	7	30-40-7
30	42	7	30-42-7
30	47	7	30-47-7
30	52	7	30-52-7
30	62	8	30-62-8
32	45	7	32-45-7
32	47	7	32-47-7
32	52	7	32-52-7
35	47	7	35-47-7
35	50	7	35-50-7
35	52	7	35-52-7
36	62	8	36-62-8
36	47	7	36-47-7
36	50	7	36-50-7
36	52	7	36-52-7
38	62	8	38-62-8
38	52	7	38-52-7
38	55	8	38-55-8
38	62	8	38-62-8
40	52	7	40-52-7
40	55	8	40-55-8
40	60	8	40-60-8
40	62	8	40-62-8
40	72	8	40-72-8
42	55	8	42-55-8
42	60	8	42-60-8
42	62	8	42-62-8
42	72	8	42-72-8

轴径 Shaft Diameter	孔径 Bore Diameter	密封槽宽度 Seal Width	华乐件号 Walle Part No.
d h9 mm	D H9 mm	L+0.2 mm	
45	60	8	45-60-8
45	62	8	45-62-8
45	65	8	45-65-8
45	72	8	45-72-8
48	62	8	48-62-8
48	65	8	48-65-8
48	72	8	48-72-8
50	65	8	50-65-8
50	68	8	50-68-8
50	72	8	50-72-8
50	80	8	50-80-8
52	68	8	52-68-8
52	72	8	52-72-8
55	70	8	55-70-8
55	72	8	55-72-8
55	80	8	55-80-8
55	85	10	55-85-10
56	70	8	56-70-8
56	72	8	56-72-8
56	80	8	56-80-8
56	85	10	56-85-10
58	72	8	58-72-8
58	80	8	58-80-8
60	75	8	60-75-8
60	80	8	60-80-8
60	85	10	60-85-10
60	90	10	60-90-10
62	80	8	62-80-8
62	85	10	62-85-10
62	90	10	62-90-10
63	85	10	63-85-10
63	90	10	63-90-10
65	85	10	65-85-10
65	90	10	65-90-10
65	100	10	65-100-10
68	90	10	68-90-10
68	100	10	68-100-10
70	90	10	70-90-10
70	100	10	70-100-10
72	95	10	72-95-10
72	100	10	72-100-10
75	95	10	75-95-10
75	100	10	75-100-10
78	100	10	78-100-10
80	100	10	80-100-10
80	100	12	80-100-12
85	110	12	85-110-12
85	120	12	85-120-12
90	110	12	90-110-12
90	120	12	90-120-12
95	120	12	95-120-12
95	125	12	95-125-12
100	120	12	100-120-12
100	125	12	100-125-12
100	130	12	100-130-12
105	130	12	105-130-12
105	140	12	105-140-12
110	130	12	110-130-12
110	140	12	110-140-12
115	140	12	115-140-12
115	150	12	115-150-12
120	150	12	120-150-12
120	160	12	120-160-12
125	150	12	125-150-12
125	160	12	125-160-12
130	160	12	130-160-12
130	170	15	130-170-15
138	170	15	138-170-15
140	170	15	140-170-15
145	175	15	145-175-15
150	180	15	150-180-15
160	190	15	160-190-15
170	200	15	170-200-15
180	210	15	180-210-15
190	220	15	190-220-15
200	230	15	200-230-15

沟槽和轴的要求 Housing And Shaft Recommendations

轴的材料和硬度 Shaft Material & Hardness

- 建议使用铸铁和硬化钢。
- 在低压液压油环境下 (0-1.2MPa)，建议轴的硬度达到40至50HRC。在高压液压油，研磨和无润滑的介质和调速轴 (速度为15m/s或者更高) 的环境下，建议轴的硬度应当达到58至65HRC。
- Cast iron or hardenable steel is recommended.
- Shaft hardness of 40 to 58 HRC is recommended for low to moderate hydraulic oil pressure (0-200 PSID). A higher hardness range of 58 to 65 HRC for high pressure hydraulic oil, abrasive or non-lubricating medias, or high speed applications 3000 ft./min. and above.

孔的材料 Bore Material

- 铸铁、钢、铝等其他常用金属和非金属材料均可使用。塑料只能在GreatLIP®中使用。
- Cast iron, steel, aluminum and other are commonly used metallic and nonmetallic materials are acceptable. Plastics are only acceptable for GreatLIP® seals.

轴表面粗糙度 Shaft Surface Roughness

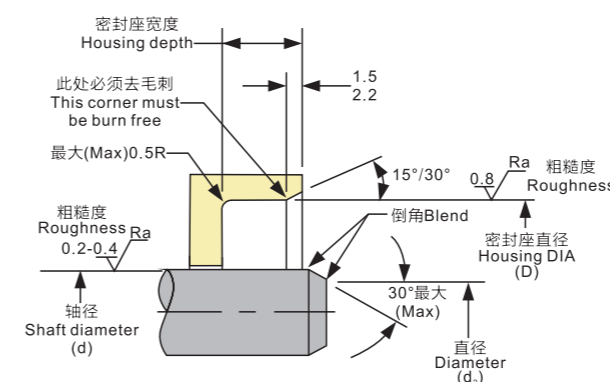
- 轴上与密封圈接触的平面要求达到0.2-0.4umRa。
- The seal contact surface of a plunge ground shaft should be finished to a surface roughness of 8 to 20 u in Ra and be free from machining leads.

孔表面的粗糙度 Bore Surface roughness

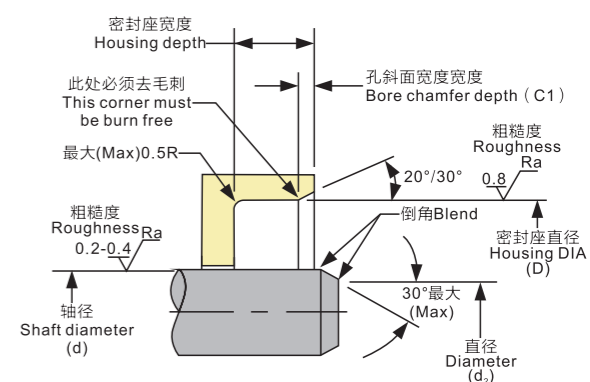
- 为了保证密封效果，孔的抛光要求必须在0.8umRa甚至更好。
- A bore finish of approximately 63 u in Ra or smoother should be maintained to assure proper sealing.

轴的导入斜角 Shaft Lead-In Chamfer

- 轴上应当有一个尺寸为d-d₂，不含毛刺，尖角，无粗糙机械加工痕迹的斜角。
- The shaft should be provided with a lead-in chamfer with a diametral difference of d-d₂ and be out from burrs, sharp corners and rough machining marks.



GreatCase® 轴封



GreatLip® 轴封

轴的导入斜度 Shaft Lead-In Chamfer

直径 Diameter d	直径 Diameter d-d ₂
Up to 10	1,5 min.
11 to 20	2,0 min.
21 to 30	2,5 min.
31 to 40	3,0 min.
41 to 50	3,5 min.
51 to 70	4,0 min.
71 to 100	4,5 min.
101 to 130	5,0 min.
131 to 180	6,0 min.
181 to 210	6,5 min.

孔公差(Bore Tolerance): H8 轴公差(Shaft Tolerance): h11

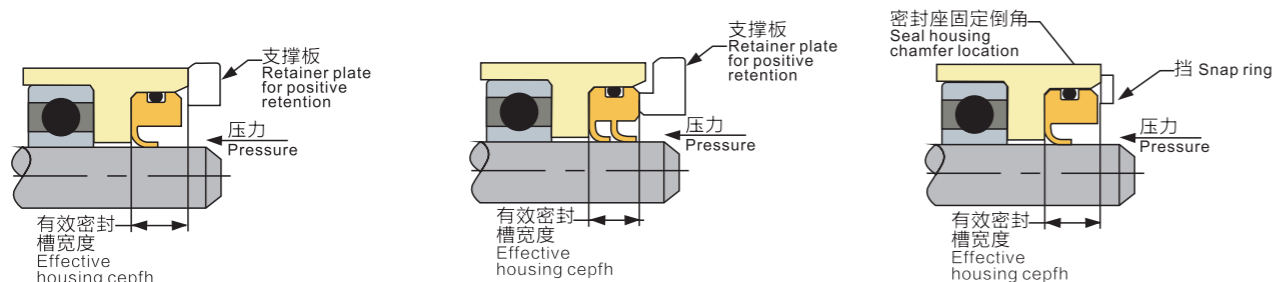
孔的导入斜度 (仅对于GreatLip®而言) Bore Lead-In Chamfer(GreatLip® only)

密封座直径尺寸(Housing Diameter Sizes)	孔斜角尺寸(Bore Chamfer) C ₁
Up 100	1,5/2,0
100 to 200	2,1/2,5

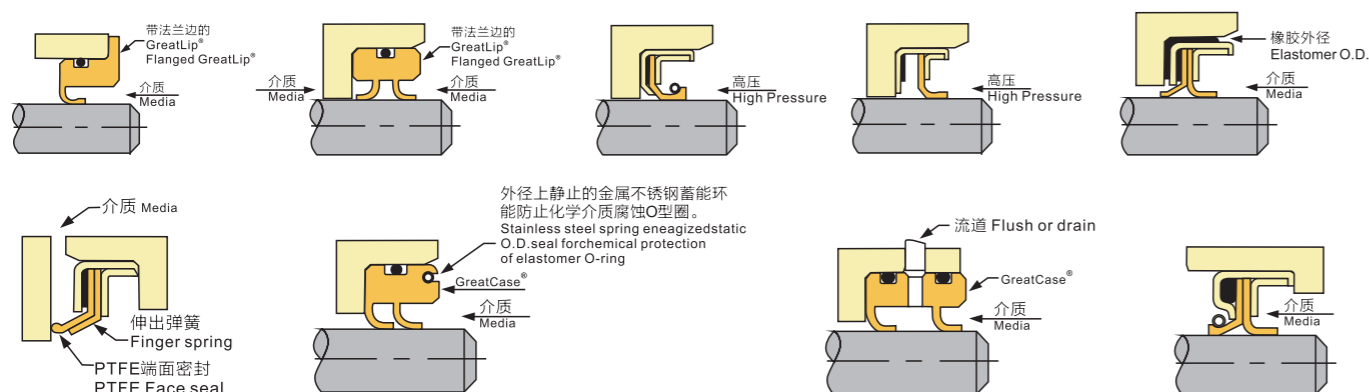
零件变化 Hardware variations >>

密封唇的延伸 Sealing Lip Extension

有的GreatLip®产品结合了2个密封唇,或者包含一个防尘圈, 这些都会造成密封圈宽度的增加。这是设计密封沟槽时, 必须要考虑的。
GreatLip® seal incorporate two sealing lips, or a wiper seal, which will have seal lip extensions as shown. This must be considered when designing a seal gland.



非标准密封结构 Non-Standard Seal Configurations



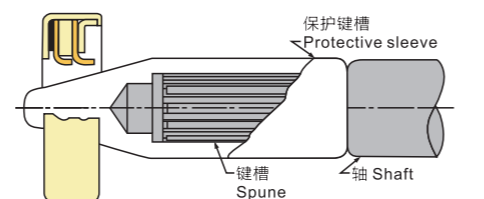
密封圈安装 Seal Installation

在轴穿过密封圈时, 必须小心不要碰坏密封唇。如果能够将轴从大气端穿过密封圈。那安装将变得简单许多, 若不能这样或者轴上有键槽, 花槽, 那请您与我们联系。我们会提供设计和简单的安装工具来保证您安装时, 不会损坏密封圈, GreatCase®和GreatLip®必须平稳, 压入孔中。如图所示的工具会帮助我们简化这个过程。

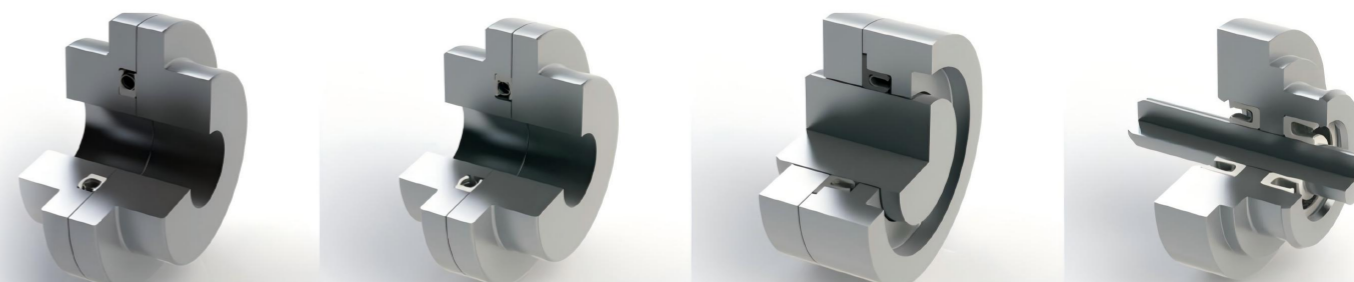
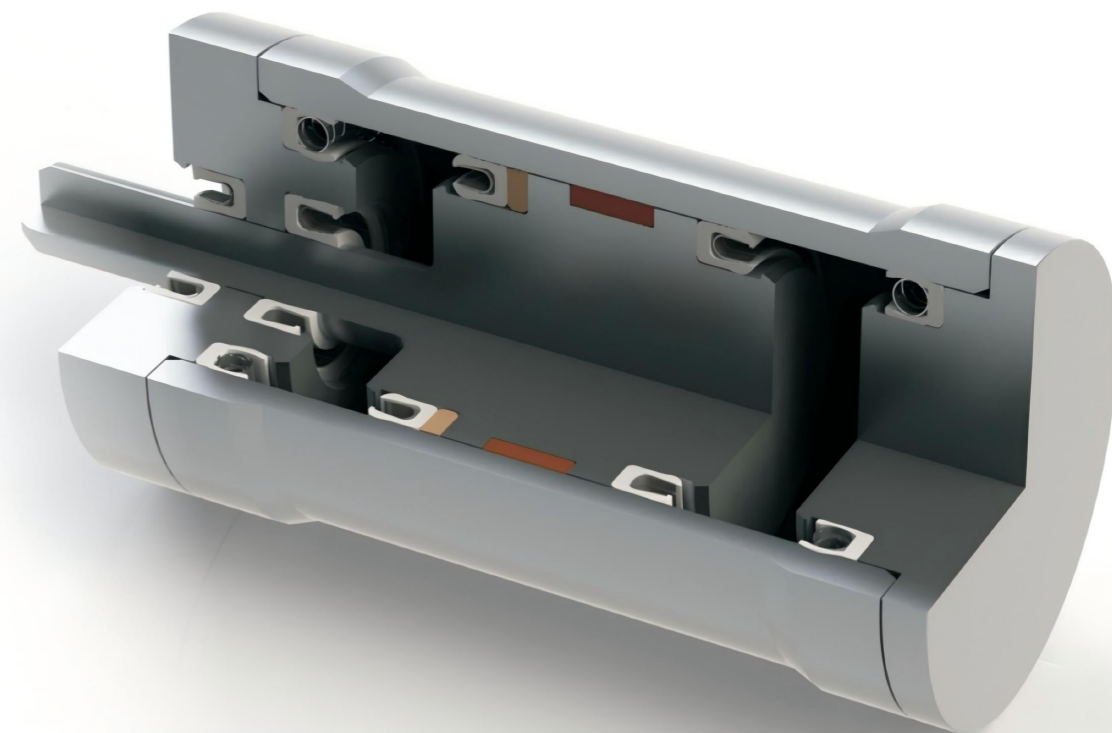
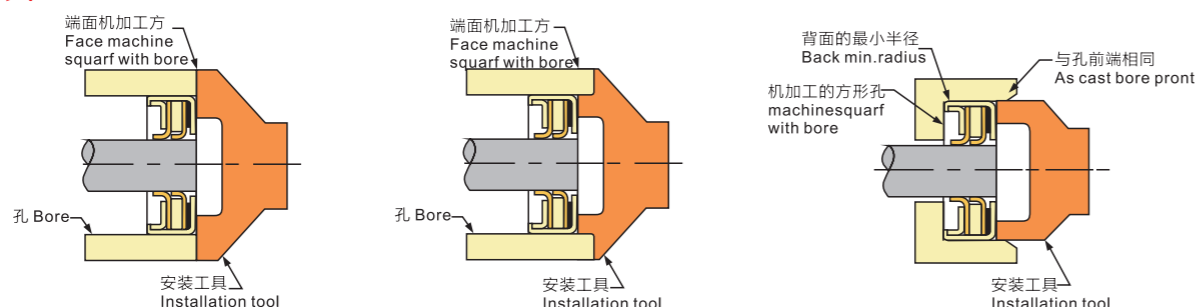
Care must be taken not to damage the sealing lip during the installation of the shaft through the seal. It is much easier to install the seal if the shaft enters the seal from the atmosphere side. If this is not possible, or if the seal must be installed on a shaft which has a keyway or splines, please contact the factory. We can help with the design and manufacture of simple tooling to assure that the seal should be pressed into the bore evenly. A tool, as shown below, simplifies this operation.

安装工具 Installation Tooling

将GreatCase®和GreatLip®装到轴上时必须十分小心, 如果倒角不够大(比密封唇的内径小)或者密封唇要通过花键, 键槽时, 必须要有一个如下图所示的保护装置。此装置可按要求设计。
Care is essential in the installation of GreatCase® & GreatLip® seals onto the shaft. If chamfer (smaller than I.D. of seal lip element) is not enough big, and/or if lip must pass over spline or keyway, a tapered installation sleeve (shown at right) is necessary. Sleeve design information is available on request.



挤压配合工具 Press Fit Tools



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