



唯万密封
VONESEALS

多级缸 密封方案

Sealing Solution for Telescopic Cylinder



上海唯万密封科技有限公司
Voneseals Technology (Shanghai) Co., Ltd.

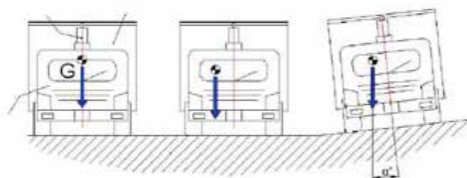
多级缸特点和要求

Telescopic Cylinder Feature & Design

多级缸特点是结构紧凑行程长，叠合长度仅为伸出总长的 20-40%，因此广泛应用于自卸车、矿用支架等需要长行程但安装空间有所限制的场所。

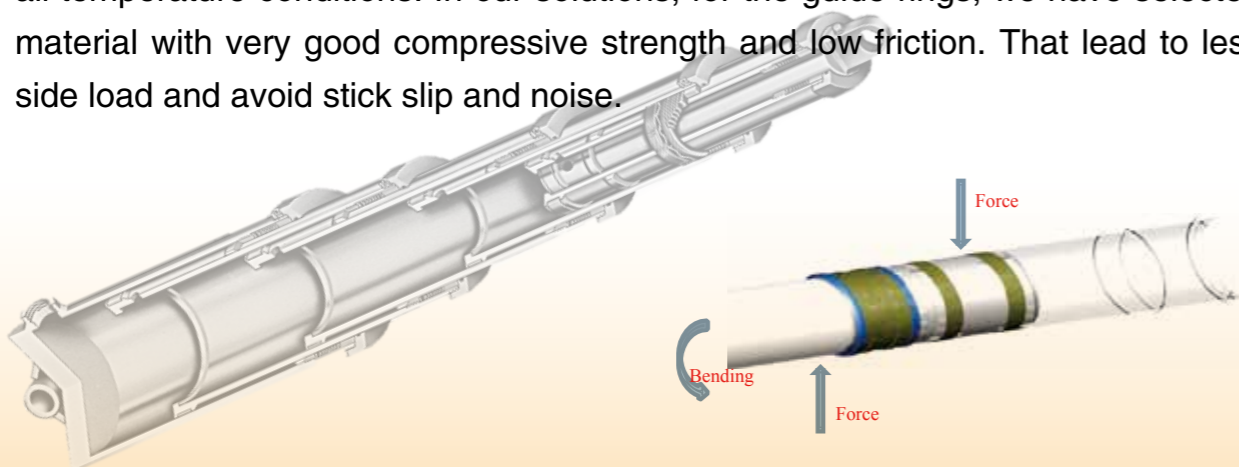
Typical feature of telescopic cylinder is compact structure with long stroke. Major use:

- Dumper
- Roof support in coal mining



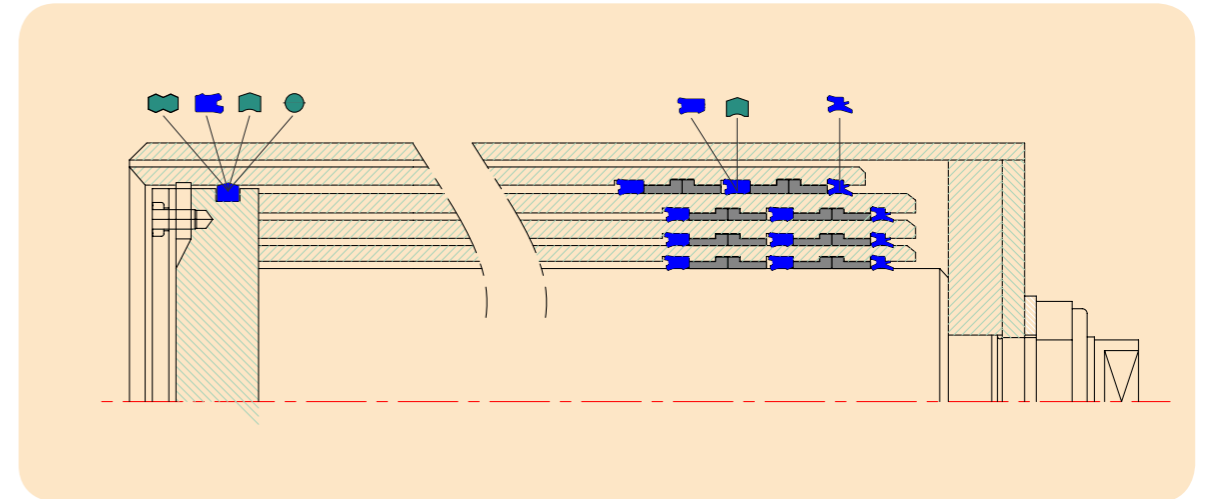
多级缸设计 requirements 是稳定无泄漏。其使用过程中可能会有沙尘、污水等造成污染；侧向载荷和压力冲击导致弯折；低温环境造成密封材料的变形失效等。我们的解决方案就会考虑这些因素，如导向环材料就选用具有极高的强度和较低的摩擦系数，这样就能减少侧向载荷并避免爬行和噪音。

Main request for the telescopic cylinder is stability and zero leakage under all temperature conditions. In our solutions, for the guide rings, we have selected material with very good compressive strength and low friction. That lead to less side load and avoid stick slip and noise.



密封方案

Sealing Solution








方案优点:

1. 摩擦小，导向好，举升更平顺
2. 防水、防尘好，污染小
3. 性价比高
4. 内部支撑作用，减小间隙，强度更高
5. 使用寿命更长

Advantages:

1. Low friction, good guiding cause more smooth operation
2. Good water and dust proof lead
3. Higher cost efficiency
4. Inner support cause higher strength
5. Extend service life

| 产品编号 Product Code | HRD | HWX | HGR | SP | YR |
|------------------------|---|---|---|---|---|
| 结构 Profile |  |  |  |  |  |
| 标准材料 Standard Material | P2006 | P2006 | S009 | P2001 | P2001 |
| 材料种类 Material Type | 耐低温聚氨酯 LT Resistant PUR | 耐低温聚氨酯 LT Resistant PUR | 改性尼龙 Modified PA | 标准聚氨酯 Standard PUR | 标准聚氨酯 Standard PUR |
| 工作温度 Temperature (°C) | -46 ~ +110 | -46 ~ +110 | -50 ~ +120 | -35 ~ +110 | -35 ~ +110 |
| 工作压力 Pressure(MPa) | ≤ 50 | - | - | ≤ 50 | ≤ 50 |
| 速度 Velocity(m/s) | ≤ 1.0 | ≤ 1.0 | ≤ 0.5 | ≤ 1.0 | ≤ 1.0 |
| 工作介质 Media | 液压油 Hydraulic oil | 液压油 Hydraulic oil | 液压油 Hydraulic oil | 液压油 Hydraulic oil | 液压油 Hydraulic oil |

标准材料

Standard Materials

| Material Code 材料编号 | | | P2001 | P2005 | P2006 |
|--------------------------|-------------------|--------------------------|--------------------|--------------------|--------------------|
| Description 描述 | | | TPU 热塑性聚氨酯 | | |
| 硬度 /Hardness | ShA | DIN 53 505 | 92 ± 2 | 95 ± 2 | 95 ± 2 |
| 密度 /Density | g/cm ³ | DIN 53 479 | 1.19 ± 0.02 | 1.20 ± 0.02 | 1.17 ± 0.02 |
| 拉伸强度 Tensile strength | N/mm ² | DIN 53 504 | min. 48 | min. 48 | min. 40 |
| 断裂伸长 /Elongation | % | DIN 53 504 | min. 400 | min. 400 | min. 400 |
| 永久压变 Compression set | % | 24h @ 70°C 70h @ 70°C | max. 24 max. 26 | max. 23 max. 25 | max. 20 max. 23 |
| 回弹性 /Rebound | % | DIN 53 512 | min. 40 | min. 38 | min. 50 |
| 磨损量 /Abrasion | mm ³ | DIN 53 516 | max. 45 | max. 45 | max. 40 |

| 材料 Material | 材料描述 Description | 密度 Density | 拉伸强度 Tensile | 断裂伸长率 Elongation | 弯曲强度 Flexural Strength | 弯曲模量 Flexural Modulus |
|----------------|---------------------|------------------------|-----------------|---------------------|---------------------------|--------------------------|
| S009 | 增强尼龙 | 1.36 g/cm ³ | 135 MPa | 4.3% | 208MPa | 8.6GPa |

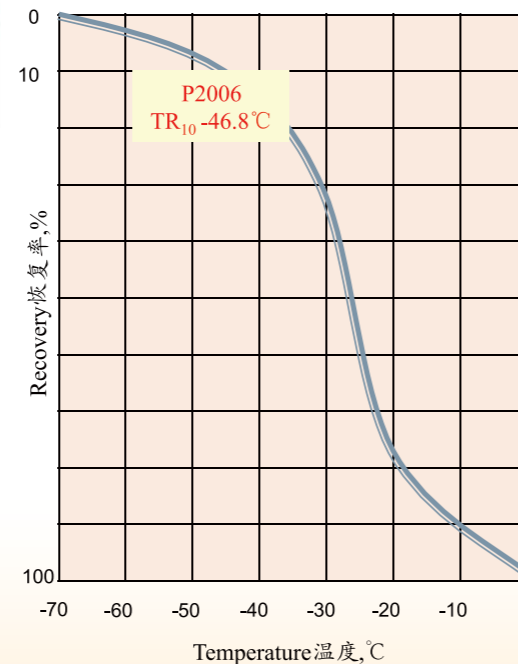


低温测试 TR₁₀

测试标准是 ASTM D1329, 指材料在低温领域内变形的恢复性。TR₁₀ 值为给定变形恢复 10% 时的温度。唇形密封材料的 TR₁₀ 值作为许可最低适用温度的参考基准。

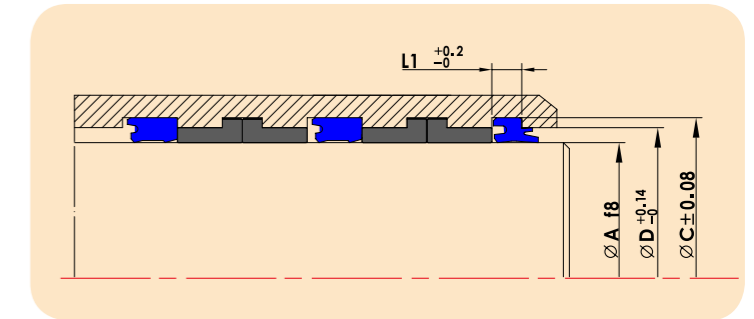
Temperature Retraction Testing

TR₁₀ is a low temperature test according ASTM D 1329. It is an important reference of materials for lip seals applied in low temperature environment.



唯万产品

VONE Parts



主要特点和优点:

特殊设计有效的防止沙尘、水、泥浆等进入体系, 保护导向环。外部防尘唇设计亦可有效防潮, 聚氨酯材料耐磨性、抗挤出、抗臭氧性能等突出, 有利于延长使用寿命。

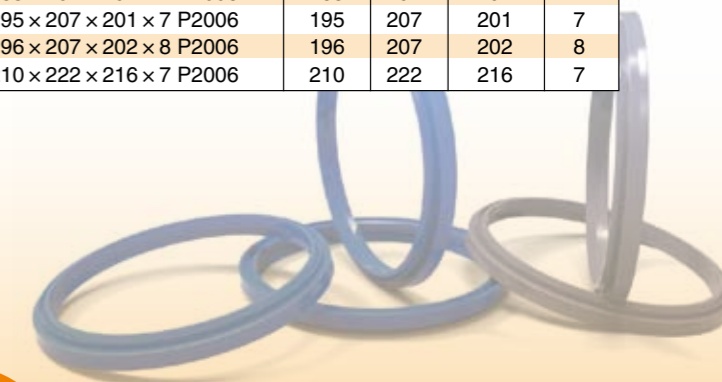
- ✓ 沟槽和密封件有良好保护
- ✓ 延长使用寿命
- ✓ 良好耐磨性
- ✓ 良好抗挤出能力
- ✓ 装配简便, 无需工具
- ✓ 有效防止水分、泥浆等渗入系统
- ✓ 适用于全天候的野外工作环境

Main features & Advantages

Special design largely prevents dust, mud, water, sands, protects the guiding parts. An external sealing lip on the outside diameter contacts the housing in order to prevent moisture entering the groove. The polyurethane compound ensures excellent properties in case of dry run, increased wear-resistance and extended service life due to good resistance against ozone and radiation caused by weather conditions.

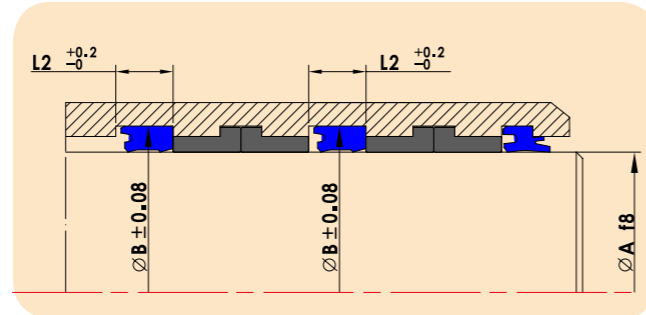
- ✓ External sealing lip for a real housing protection
- ✓ Extended service life
- ✓ Excellent wear-resistance
- ✓ High resistance against extrusion
- ✓ Easy installation without expensive tools
- ✓ Prevent moisture, water, mud penetrate to the system
- ✓ Suitable for all-weather field operation

| 产品编号 | 尺寸 | | | |
|-------------------------------|-----|-----|-----|----|
| | A | C | D | L1 |
| HWX 80 × 92 × 86 × 7 P2006 | 80 | 92 | 86 | 7 |
| HWX 85 × 97 × 91 × 7 P2006 | 85 | 97 | 91 | 7 |
| HWX 90 × 102 × 96 × 7 P2006 | 90 | 102 | 96 | 7 |
| HWX 95 × 107 × 101 × 7 P2006 | 95 | 107 | 101 | 7 |
| HWX 100 × 112 × 106 × 7 P2006 | 100 | 112 | 106 | 7 |
| HWX 100 × 115 × 106 × 7 P2006 | 100 | 115 | 106 | 7 |
| HWX 105 × 117 × 111 × 7 P2006 | 105 | 117 | 111 | 7 |
| HWX 110 × 120 × 116 × 7 P2006 | 110 | 120 | 116 | 7 |
| HWX 110 × 122 × 116 × 7 P2006 | 110 | 122 | 116 | 7 |
| HWX 115 × 127 × 121 × 7 P2006 | 115 | 127 | 121 | 7 |
| HWX 120 × 132 × 126 × 7 P2006 | 120 | 132 | 126 | 7 |
| HWX 125 × 137 × 131 × 7 P2006 | 125 | 137 | 131 | 7 |
| HWX 125 × 140 × 131 × 7 P2006 | 125 | 140 | 131 | 7 |
| HWX 129 × 139 × 135 × 7 P2006 | 129 | 139 | 135 | 7 |
| HWX 130 × 142 × 136 × 7 P2006 | 130 | 142 | 136 | 7 |
| HWX 135 × 147 × 141 × 7 P2006 | 135 | 147 | 141 | 7 |
| HWX 140 × 152 × 146 × 7 P2006 | 140 | 152 | 146 | 7 |
| HWX 145 × 157 × 151 × 7 P2006 | 145 | 157 | 151 | 7 |
| HWX 150 × 160 × 156 × 7 P2006 | 150 | 160 | 156 | 7 |
| HWX 150 × 162 × 156 × 7 P2006 | 150 | 162 | 156 | 7 |
| HWX 150 × 165 × 156 × 7 P2006 | 150 | 165 | 156 | 7 |
| HWX 152 × 164 × 158 × 7 P2006 | 152 | 164 | 158 | 7 |
| HWX 155 × 167 × 161 × 7 P2006 | 155 | 167 | 161 | 7 |
| HWX 160 × 172 × 166 × 7 P2006 | 160 | 172 | 166 | 7 |
| HWX 165 × 177 × 171 × 7 P2006 | 165 | 177 | 171 | 7 |
| HWX 170 × 182 × 176 × 7 P2006 | 170 | 182 | 176 | 7 |
| HWX 172 × 183 × 178 × 8 P2006 | 172 | 183 | 178 | 8 |
| HWX 175 × 187 × 181 × 7 P2006 | 175 | 187 | 181 | 7 |
| HWX 180 × 192 × 186 × 7 P2006 | 180 | 192 | 186 | 7 |
| HWX 180 × 195 × 186 × 7 P2006 | 180 | 195 | 186 | 7 |
| HWX 182 × 194 × 188 × 7 P2006 | 182 | 194 | 188 | 7 |
| HWX 185 × 197 × 191 × 7 P2006 | 185 | 197 | 191 | 7 |
| HWX 195 × 207 × 201 × 7 P2006 | 195 | 207 | 201 | 7 |
| HWX 196 × 207 × 202 × 8 P2006 | 196 | 207 | 202 | 8 |
| HWX 210 × 222 × 216 × 7 P2006 | 210 | 222 | 216 | 7 |



唯万产品

VONE Parts



主要特点和优点:

特别设计用于对压力波动敏感的 U 型密封件。聚氨酯材料加工。

- ✓ 用于径向结构尺寸狭窄的单向轴用密封的需要
- ✓ 低的背压回流和储油能力设计
- ✓ 副唇口防止污染物的侵入，同时起到一定的支撑作用
- ✓ 良好的密封性，低压下也能保持良好性能
- ✓ 延长使用寿命
- ✓ 良好耐磨性
- ✓ 良好抗挤出能力
- ✓ 耐温范围广
- ✓ 对压力波动敏感
- ✓ 装配简便，无需工具

Main features & Advantages

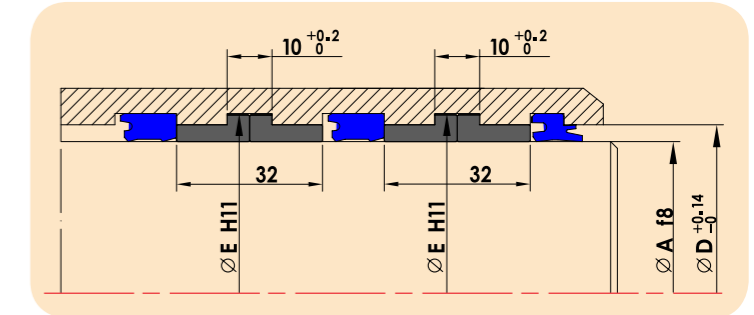
“U” type seals. The materials is a polyurethane compound.

- ✓ Thinner radical size to meet constrict groove
- ✓ Low backflow and oil storage design
- ✓ Secondary lip can prevent contamination, also support to cylinder
- ✓ Good sealing performance as well as low pressure
- ✓ Extended service life
- ✓ Excellent wear-resistance
- ✓ High resistance against extrusion
- ✓ Good temperature resistance
- ✓ Insensitive to pressure fluctuation
- ✓ Easy installation without expensive tools

| 产品编号 | 尺寸 | | |
|----------------------------|-----|-----|------|
| | A | B | L2 |
| HRD 80 × 90 × 11.0 P2006 | 80 | 90 | 11.0 |
| HRD 85 × 95 × 12.5 P2006 | 85 | 95 | 12.5 |
| HRD 90 × 100 × 12.5 P2006 | 90 | 100 | 12.5 |
| HRD 95 × 105 × 12.5 P2006 | 95 | 105 | 12.5 |
| HRD 100 × 110 × 11.0 P2006 | 100 | 110 | 11.0 |
| HRD 100 × 110 × 13.5 P2006 | 100 | 110 | 13.5 |
| HRD 100 × 110 × 12.5 P2006 | 100 | 110 | 12.5 |
| HRD 100 × 112 × 12.0 P2006 | 100 | 112 | 12.0 |
| HRD 105 × 115 × 12.5 P2006 | 105 | 115 | 12.5 |
| HRD 110 × 120 × 11.0 P2006 | 110 | 120 | 11.0 |
| HRD 110 × 120 × 12.5 P2006 | 110 | 120 | 12.5 |
| HRD 115 × 125 × 12.5 P2006 | 115 | 125 | 12.5 |
| HRD 120 × 130 × 12.5 P2006 | 120 | 130 | 12.5 |
| HRD 125 × 135 × 11.0 P2006 | 125 | 135 | 11.0 |
| HRD 125 × 135 × 13.5 P2006 | 125 | 135 | 13.5 |
| HRD 125 × 137 × 12.0 P2006 | 125 | 137 | 12.0 |
| HRD 129 × 139 × 11.0 P2006 | 129 | 139 | 11.0 |
| HRD 130 × 140 × 12.5 P2006 | 130 | 140 | 12.5 |
| HRD 135 × 145 × 12.5 P2006 | 135 | 145 | 12.5 |
| HRD 140 × 150 × 12.5 P2006 | 140 | 150 | 12.5 |
| HRD 145 × 155 × 12.5 P2006 | 145 | 155 | 12.5 |
| HRD 150 × 160 × 13.5 P2006 | 150 | 160 | 13.5 |
| HRD 150 × 162 × 12.0 P2006 | 150 | 162 | 12.0 |
| HRD 152 × 162 × 12.5 P2006 | 152 | 162 | 12.5 |
| HRD 155 × 165 × 12.5 P2006 | 155 | 165 | 12.5 |
| HRD 160 × 170 × 12.5 P2006 | 160 | 170 | 12.5 |
| HRD 165 × 175 × 12.5 P2006 | 165 | 175 | 12.5 |
| HRD 170 × 180 × 12.5 P2006 | 170 | 180 | 12.5 |
| HRD 172 × 183 × 13.5 P2006 | 172 | 183 | 13.5 |
| HRD 175 × 185 × 12.5 P2006 | 175 | 185 | 12.5 |
| HRD 180 × 190 × 13.5 P2006 | 180 | 190 | 13.5 |
| HRD 180 × 192 × 12.0 P2006 | 180 | 192 | 12.0 |
| HRD 182 × 192 × 12.5 P2006 | 182 | 192 | 12.5 |
| HRD 185 × 195 × 12.5 P2006 | 185 | 195 | 12.5 |
| HRD 195 × 205 × 12.5 P2006 | 195 | 205 | 12.5 |
| HRD 196 × 207 × 13.5 P2006 | 196 | 207 | 13.5 |
| HRD 210 × 222 × 13.5 P2006 | 210 | 222 | 13.5 |

唯万产品

VONE Parts



主要特点和优点:

本产品用改性工程塑料加工，次啊了具有高强度、刚性、硬度、抗冲击、回弹性和高温稳定性。

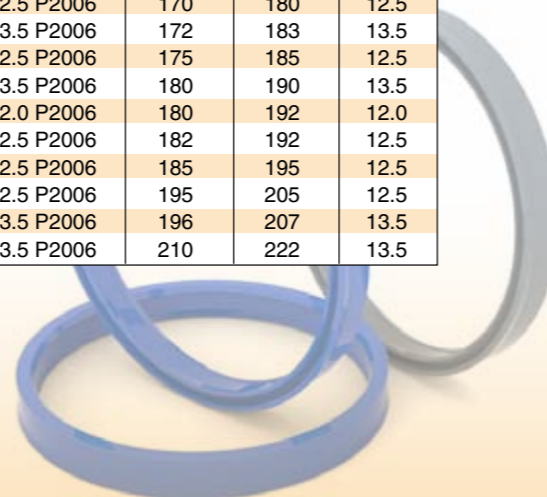
- ✓ 延长使用寿命
- ✓ 良好耐磨性
- ✓ 良好抗挤出能力
- ✓ 沟槽设计简单，摩擦系数低
- ✓ 装配简便，无需工具
- ✓ 抗磨性能优良
- ✓ 高侧向载荷承载能力
- ✓ 减少振动，避免爬行

Main features & Advantages

The compound modified engineering plastic characterized by high strength, rigidity, hardness, impact resistance, resilience and excellent stability to high and low temperature.

- ✓ Extended service life
- ✓ Excellent wear-resistance
- ✓ High resistance against extrusion
- ✓ Simple design of groove and assembly low friction
- ✓ Easy installation without expensive tools
- ✓ High anti-abrasion ability
- ✓ High side-load carrying capacity
- ✓ Reduce vibration, and avoid stick slide

| 产品编号 | 尺寸 | | | |
|---------------------------------|-----|-----|-------|----|
| | A | D | E | L3 |
| HGR 80 × 86 × 90.5 × 16 S009 | 80 | 86 | 90.5 | 16 |
| HGR 85 × 91 × 95.5 × 16 S009 | 85 | 91 | 95.5 | 16 |
| HGR 90 × 96 × 100.5 × 16 S009 | 90 | 96 | 100.5 | 16 |
| HGR 95 × 101 × 105.5 × 16 S009 | 95 | 101 | 105.5 | 16 |
| HGR 100 × 106 × 110.5 × 16 S009 | 100 | 106 | 110.5 | 16 |
| HGR 105 × 111 × 115.5 × 16 S009 | 105 | 111 | 115.5 | 16 |
| HGR 110 × 116 × 120.5 × 16 S009 | 110 | 116 | 120.5 | 16 |
| HGR 115 × 121 × 125.5 × 16 S009 | 115 | 121 | 125.5 | 16 |
| HGR 120 × 126 × 130.5 × 16 S009 | 120 | 126 | 130.5 | 16 |
| HGR 125 × 131 × 135.5 × 16 S009 | 125 | 131 | 135.5 | 16 |
| HGR 129 × 135 × 139.5 × 16 S009 | 129 | 135 | 139.5 | 16 |
| HGR 130 × 136 × 140.5 × 16 S009 | 130 | 136 | 140.5 | 16 |
| HGR 135 × 141 × 145.5 × 16 S009 | 135 | 141 | 145.5 | 16 |
| HGR 140 × 146 × 150.5 × 16 S009 | 140 | 146 | 150.5 | 16 |
| HGR 145 × 151 × 155.5 × 16 S009 | 145 | 151 | 155.5 | 16 |
| HGR 150 × 156 × 160.5 × 16 S009 | 150 | 156 | 160.5 | 16 |
| HGR 152 × 158 × 162.5 × 16 S009 | 152 | 158 | 162.5 | 16 |
| HGR 155 × 161 × 165.5 × 16 S009 | 155 | 161 | 165.5 | 16 |
| HGR 160 × 166 × 170.5 × 16 S009 | 160 | 166 | 170.5 | 16 |
| HGR 165 × 171 × 175.5 × 16 S009 | 165 | 171 | 175.5 | 16 |
| HGR 170 × 176 × 180.5 × 16 S009 | 170 | 176 | 180.5 | 16 |
| HGR 172 × 178 × 182.5 × 16 S009 | 172 | 178 | 182.5 | 16 |
| HGR 175 × 181 × 185.5 × 16 S009 | 175 | 181 | 185.5 | 16 |
| HGR 180 × 186 × 190.5 × 16 S009 | 180 | 186 | 190.5 | 16 |
| HGR 182 × 188 × 192.5 × 16 S009 | 182 | 188 | 192.5 | 16 |
| HGR 185 × 191 × 195.5 × 16 S009 | 185 | 191 | 195.5 | 16 |
| HGR 195 × 201 × 205.5 × 16 S009 | 195 | 201 | 205.5 | 16 |
| HGR 196 × 202 × 206.5 × 16 S009 | 196 | 202 | 206.5 | 16 |
| HGR 210 × 216 × 220.5 × 16 S009 | 210 | 216 | 220.5 | 16 |





上海唯万密封科技有限公司
Voneseals Technology (Shanghai) Co., Ltd.

上海市浦东新区仁庆路 373 号
No.373 Renqing Road Pudong Shanghai China
邮编 /P.R: 201201
电话 /Tel: +86-21-6818 4680
传真 /Fax: +86-21-6818 4670
网址 /http: www.voneseals.com
