AUTOMOTIVE | AEROSPACE | FOOD & BEVERAGE | FLUID TECHNOLOGIES | MOBILE MACHINERY

FRANCEJOINT

SEALING SYSTEMS

GUIDING COMPONENTS

FRANCEJOINT
SEALING SYSTEMS

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SEALING SYSTEMS

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SEALING SYSTEMS

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FRANCEJOINT
SEALING SYSTEMS

Since 1981, FRANCE JOINT – SEALING SYSTEMS has been designing, manufacturing and distributing seals and precision rubber parts for its customers for whom quality is a determining factor.

Faced with tough competition among the big decision-makers of the industrial world, FRANCE JOINT has responded with innovation, research and development, experience in Best-Cost manufacturing, and a consistently high level of quality, thanks to certificates ISO 9001, IATF 16949, EN/AS 9100 and ISO 14001.

Today, FRANCE JOINT is working in close collaboration with its customers, meeting challenges head on with success. Automotive, Aeronautics, Mobile hydraulics, Beverages & Foods, Fluid engineering industries... every solution emerges from a uniquely individual partnership, constantly fostered and renewed.

Our prime objective, based on unrivalled quality, is to find the most suitable solutions for ensuring that you will stand out in what has become an extremely competitive domain. Our position of excellence has led us since the birth of our company to acquire the tools necessary to anticipate and prevent risks and maximize our service; the ultimate objective being of course to help you keep ahead of developments in this more and more technological market.

- AUTOMOTIVE
- AERONAUTICS
- BEVERAGES & FOODS
- FLUID ENGINEERING
- MOBILE HYDRAULICS


Compression molding


Injection molding


Machining / Tooling

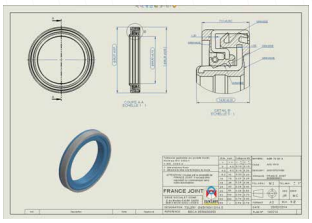

Logistics / Packaging

RESEARCH & **DEVELOPMENT**

Innovation, reliability, safety, minimization of risk: your expectations are our daily concern. To get from the idea to the finished product demands firm managerial control over a wide range of projects in addition to expertise in manufacturing.

FRANCE JOINT's contributors, who are as much inventors as technicians, get the best of fully automated, state-of-the-art technology that takes them from drawing-board to prototype and finally to assembly line. From writing specifications to putting on a major technical event through designing (3D Solidwrks software) and testing for validation and compliance, FRANCE JOINT engineering works hand in hand with you to find the best solutions guaranteeing the level of expected performance.

More than 1000 compounds integrating elastomers, PTFE materials, Polyurethane, or even thermoplastics, as many solutions vis-a-vis the new most complex requirements which will put you in pole position today so that we can all be winners tomorrow. FRANCE JOINT puts in place qualifications in order to examine the behavior of its seals according to various parameters intervening on frictions, pressures, temperatures, speeds, strokes, leakages…



QUALITY **IN OUR CONCERNS**

Several certificates obtained, ISO 9001, IATF 16949, EN/AS 9100 and ISO 14001, testify to the quality department's commitment to constant progress at every level of the company, at all stages of the realization, particularly where continual improvement is what has made FRANCE JOINT the name it is today.

Ambitious with customer satisfaction a priority, FRANCE JOINT has thus obtained the most powerful methods (PPAP, AMDEC, value analysis, Audits, MRP, 8D analysis, SPC, R&R ...) in order to optimize simultaneously the capacity of machines and processes, operational manpower performances, organizational methods, and finally, product and financial results.

FRANCE JOINT guarantees the best technology and pursues its daily objectives of a "Zero defects" production, through physico chemical controls (rheometer, spectrometer, durometer…), through dimensional and final aspects (unit controlling equipment, 3D camera ...). This is because the search for competitiveness is as important as the search for continuous improvement.

3D test device

CERTIFIÉ ISO 9001 CERTIFIED

CERTIFIÉ ISO 14001 CERTIFIED

CERTIFIÉ IATF 16949 CERTIFIED

CERTIFIÉ EN 9100 CERTIFIED

HYDRAULIC SEALS

1. Introduction

There are a number of sealing systems designed for all types of machines, ranging from the simplest to the most complex and depending on field of application. Correctly defining the functional parameters is an essential step in the choice of sealing system and the materials that should be prioritised; each profile and material is designed to meet the specific and varied stresses of different hydraulic systems, including hydraulic cylinders. Working closely with its customers, FRANCE JOINT actively participates in development projects, using its expertise and recommendations to select sealing components.

As critical elements in the correct operation of hydraulic machinery, sealing systems must meet increasingly specialist technical requirements:

- **wear resistance**
- **compatibility with media**
- **resistance to the effects of temperatures**
- **resistance to pressure**
- **resistance to speed**
- **reduced friction loads**

In certain fields of application, typically in heavy-duty mobile machinery where requirements are very important, a single seal is not compatible with all types of stress; that's why FRANCE JOINT offers a wide range of sealing systems. All of these sealing systems are designed for heavy-duty rod applications, and are configured as follows: a buffer seal, secondary seal, wiper seal and guiding components; for the piston part: a piston seal and guiding components.

Hydraulic seals must contain the fluids and maintain the hydraulic pressure (piston seals, rod seals, static seals), to stop the inlet of impurities and to maintain the lubricating film on the rod (wiper seals), and to resist any deformation under a radial load by guiding the piston and rod (wear rings and guide strips).

2. Environment

2.1 FRICTION/LUBRICANT RELATIONSHIP

When hydraulic machinery is in operation, there are different phases of friction until a lubricating film is formed. The thickness of the lubricant film, which is located between the seal and the contact sliding face, greatly influences the nature of the friction. There are different phases of friction as the hydraulic system reaches its operating speed.

The first is a dry friction between the seal and the contact mechanical part, which has a significant force called adhesive friction, and which takes shape during system start-up.

As the system accelerates, a lubricating film forms little by little between the seal and the contact mechanical part, which considerably reduces friction. This is a mixed friction located between the seal and the lubricated mechanical part.

Finally, as the speed continues to increase, so does the force of the friction, transforming it into a viscous friction between two bodies with a hydrodynamic lubrication.

These different phases remain similar for all types of operation, but at different levels for each material used.

The diagram below indicates that PTFE is recommended for lower pressures and speeds, as it reaches the viscous friction phase more quickly.

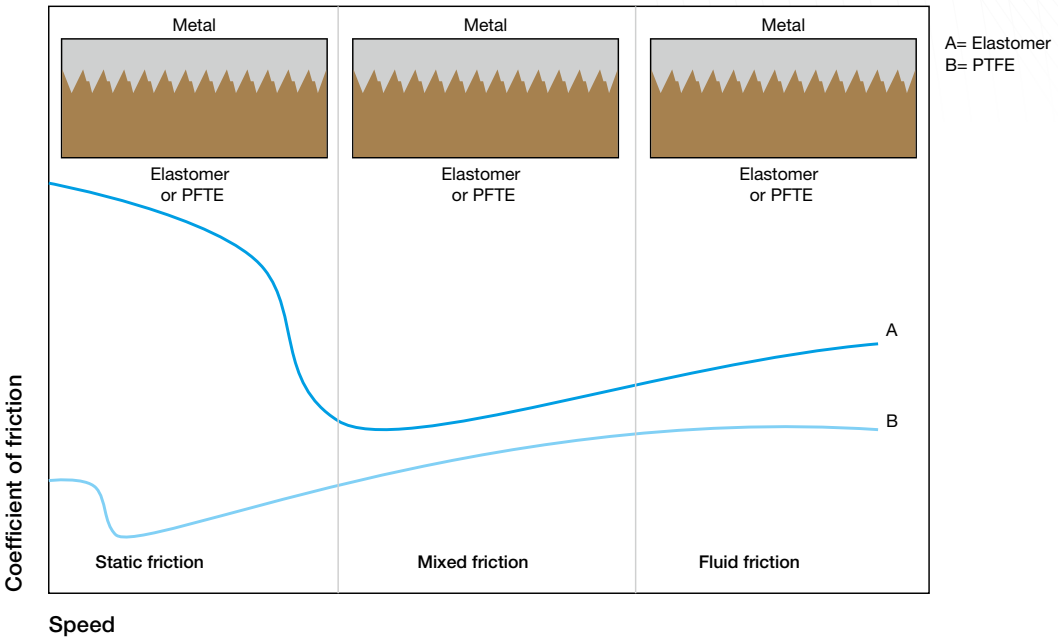


Diagram 2.1-1

2.2 TEMPERATURE

The temperature of the hydraulic fluid as well as the surrounding temperature plays a determining role in the choice of material. The ideal temperature for optimal seal operation is between +30°C and +60°C. However, the choice of material must also be determined, taking into account the heat created at the point of contact on the sealing lip under friction. When using hydraulic cylinders, the temperature usually reached is +80°C and, in extreme cases, +110°C.

When the temperature increases, the seal's material becomes more elastic and its resistance to deformation is reduced. That's why we have developed seal profiles in which the sealing lips are pre-stressed by the inclusion of a metal spring or O'Ring. For temperatures that exceed +100°C, FRANCE JOINT offers special materials, including HNBR – FKM – high-temperature PU – PTFE, among others.

On the other hand, when the temperature is reduced to negative values, the seal's material has a tendency to harden and become less elastic. However, the seal's operational safety is not really influenced by the increase in fluid viscosity. For temperatures that could go lower than -40°C, FRANCE JOINT offers special materials, including NBR – FKM – HNBR – PU – PTFE.

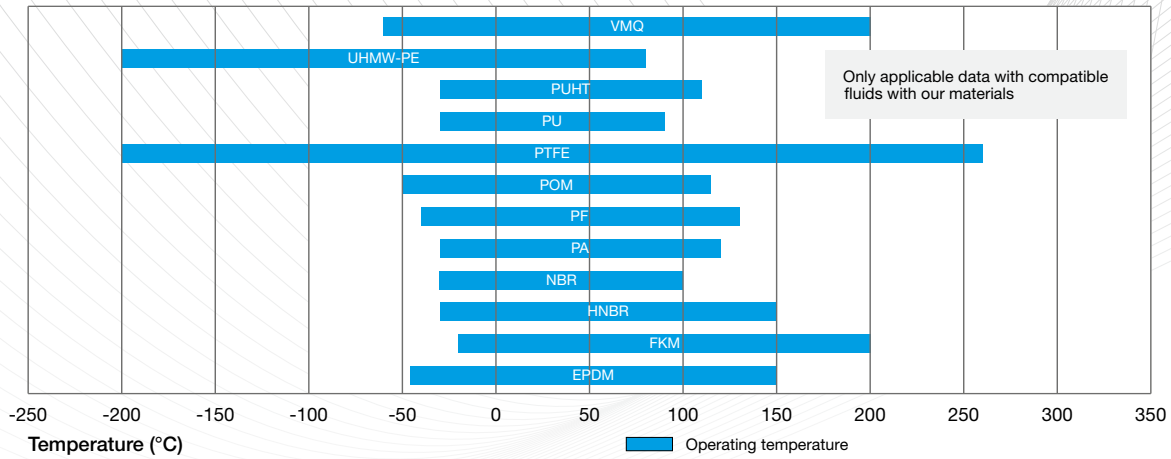


Table 2.2-1

2.3 OPERATING AND DRAG PRESSURE

Pressure is a determining factor to be taken into account when choosing the seal and material hardness. Along with the cylinder size, the pressure of the hydraulic system determines the thrust. From one application to another, we consider the pressure exerted to be defined as:

- **Machine tools:** 8 – 16 MPa
- **Material handling - Lifting:** 16 – 25 MPa
- **Hydraulic presses:** 16 – 28 MPa
- **Construction – Mining – Heavy industry:** 28 – 40 MPa

In certain applications, fluctuations in very high point pressures can appear – mechanical impacts, water hammer – particularly in mobile machinery. FRANCE JOINT offers strong seals designed to efficiently cope with such stresses.

Moreover, when gaps are very tight at the guide in a fitting such as a hydraulic cylinder, hydrodynamic pressures, also called drag pressures, may be generated. With a much smaller gap between the guide and the rod, and a constant flow rate, additional pressures (which can reach up to several dozen MPa) can appear in front of the seal, causing it to deteriorate.

THIS PRESSURE INCREASE IS EXPRESSED BY THE FOLLOWING FORMULA:

$$\Delta P = p1 - p = \frac{6 \times \eta \times v \times L}{Hs^2}$$

P: pressure
η: dynamic viscosity of the fluid
v: speed
L: length of the guide
Hs: radial extrusion gap

There are ways to prevent the formation of such drag pressures. Helicoidal grooves are provided with a section that is larger than that of the seal; this is in order to prevent the premature destruction of the seal and certain mechanical parts. For BECA 005 – 006 – 007 wear rings, an opening has already been created, preventing the creation of return ducts.

2.4 SPEED

The choice of material is also determined by the system's operation speed. The rubbers and polyurethanes in friction against the moving surface can withstand speeds between 0.1 m/s and 0.5 m/s. For PTFE materials, speeds up to 5 m/s, or even greater, are permitted. For particularly low stresses, the speed can be limited to up to 0.05 m/s, increasing the friction and limiting the formation of lubricating film.

In such conditions, "stick-slip effects" may appear, which are defined as jerking movements caused by a succession of slipping phases followed by sticking phases.

To guard against such effects, FRANCE JOINT has developed a suitable range of seals, where the parts subject to friction are made from PTFE with optimised geometries. Other special materials are also available, such as PE-UHMW.

2.5 HYDRAULIC FLUIDS

a. Introduction to oils

Fluid holds a prominent place in the hydraulics field. It encourages:

- the transmission of power to different working components (transmission of energy as pressure)
- the lubrication of mechanical parts to limit the amount of wear on moving parts
- the protection of the entire hydraulic system
- the removal of heat

The hydraulic fluid most commonly used is mineral oil. Water is the ideal hydraulic fluid (low compressibility, non-flammable, negligible cost) if it does not present serious drawbacks (corrosion, lubrication fault, etc.) to the operation of machinery. A significant number of fluids are used to meet specific requirements. There are:

- mineral oils
- fire-resistant oils
- biodegradable oils

b. Oil classification

Mineral oils

ISO Classification	Properties	Applications
HH	Additive-free mineral oil	This oil only ensures energy transmission and is rarely used today
HL	Oil + additives with antioxidant and anti-corrosion properties to combat ageing	This oil is used for low-stress environments and works very well with water
HM	It has the same features as HL coupled with anti-wear properties to encourage resistance to wear and loads	This oil is heavily used for significant pressures
HLPD	It has the same features as HM coupled with detergent additives	This oil is heavily used for significant pressures with water intake
HR	It has the same features as HL coupled with an improved tolerance to viscosity/temperature	This oil is used during major temperature fluctuations
HV	It has the same features as HM coupled with an improved tolerance to viscosity/temperature	This oil is used during major temperature fluctuations and at low temperatures
HS	Synthetic oil without special fire resistance properties	Special properties
HG	It has the same features as HM coupled with additives to improve its anti-stick-slip properties	This oil is used for machines where lubrication is common to hydraulic parts, rails and joints
HD	Oil + additives for antioxidant, anti-wear and detergent properties	This oil is heavily used in mobile hydraulic systems and in engines

Fire-resistant oils

Group	Temperature	Properties	Applications
Aqueous fluids			
HFAE	+5°C to +60°C	Oil-in-water emulsion with more than 80% water (generally 95 - 98%)	These oils are used in hydraulic presses and in systems where leaks are significant
HFAS		Synthetic oils in aqueous solution with more than 80% water (generally 95 - 98%)	
HFB		Oil-in-water emulsion with more than 40% water	This oil is little used today aside from in the United Kingdom
HFC	-30°C to +60°C	Polymer solution (polyethylene glycol or polypropylene glycol) with more than 35% water (less than 80% water)	This oil is used in industrial environments with a maximum temperature of +60°C and average stresses

Group	Temperature	Properties	Applications
Non-aqueous fluids			
HFDR	-30°C to +150°C	Phosphoric ester base, free from water	This oil is used for significant stresses and for very high temperatures
HFDU		Synthetic fluid with specific composition	
HFDS		Chlorinated hydrocarbon base, free from water	
HFDT		HFDR and HFDS mixture	

Biodegradable oils

ISO Classification	Properties	Applications
HETG	Vegetable oil	This oil is used in the agriculture and forestry sectors
HEPG	Polyglycol	This oil is used in water protection areas
HEEG	Synthetic ester	This oil is mainly used in construction machinery

c. Impurities and air in oil

A fluid's cleanliness is an important factor in optimising the operation of a hydraulic system. Limited hydraulic filtration will lead to a disruption in the mechanism, which is caused by impurities. These impurities have multiple guises, such as metal shavings and other abrasive particles, silica, external dusts, oxidised products (rust), etc. and can lead to premature seal deterioration. It is therefore essential to perform regular checks and reconditioning on filtration systems.

Moreover, the air in the oil can lead to a breakdown of the seal through a phenomenon known as micro explosions. Hydraulic fluids actually contain air particles dissolved in the oil, which will compress and connect as the pressure increases and will tend to relax and escape when the pressure lessens. These particles are always positioned between the seal and the spaces in the groove and closest to the gaps formed by them.

This simultaneous compression and relaxation of air particles in the oil will heat up their epicentre, suddenly increasing the temperature and provoking self-ignition, also known as the "diesel effect".

If this occurs regularly enough, it can lead to the destruction of the back of the seal and even the destruction of mechanical parts and guides as they are blasted and burned. To prevent such risks, it is imperative to bleed the hydraulic systems to limit these micro explosions.

2.6 VISCOSITY

The viscosity determines a hydraulic fluid's capacity to flow. It is, essentially, the resistance that the fluid's molecules encounter, and they move by sliding between each other. The term used today is "fluidity".

Factors that will influence viscosity are essentially temperature and pressure. ISO standard 3448 classes all industrial oils according to their viscosity, expressed in mm²/s at a reference temperature of +40°C.

As the temperature increases, the viscosity has a tendency to decrease. On the other hand, the viscosity can increase when the temperature decreases. A continually increasing pressure can also lead to a continually increased viscosity. Generally speaking, we consider that at a consistent temperature, the viscosity follows a very marginally exponential curve, depending on the pressure.

IT CAN BE EXPRESSED USING THE FOLLOWING FORMULA:

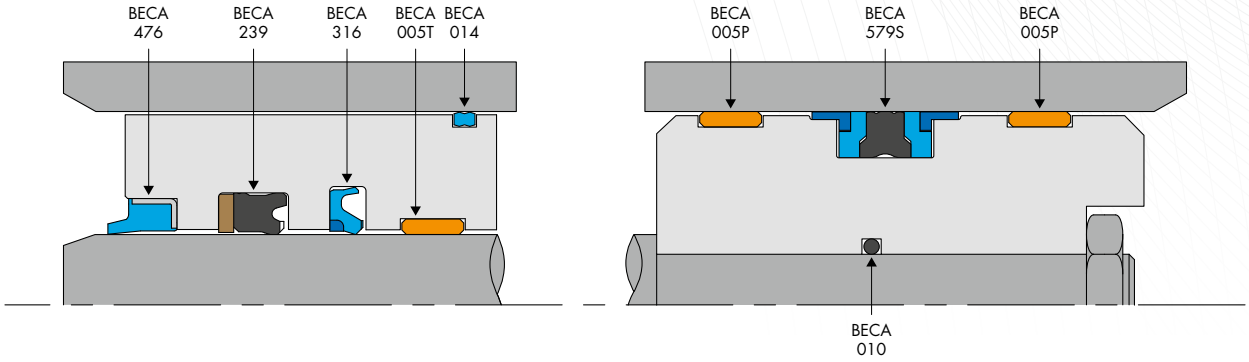
$$\Delta V = 0.003 \times p \times VO$$

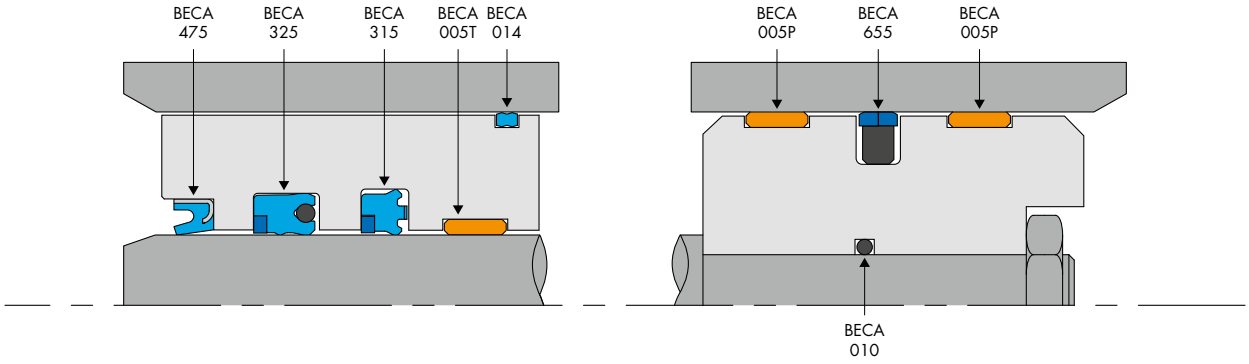
p: pressure in MPa
VO: viscosity at atmospheric pressure

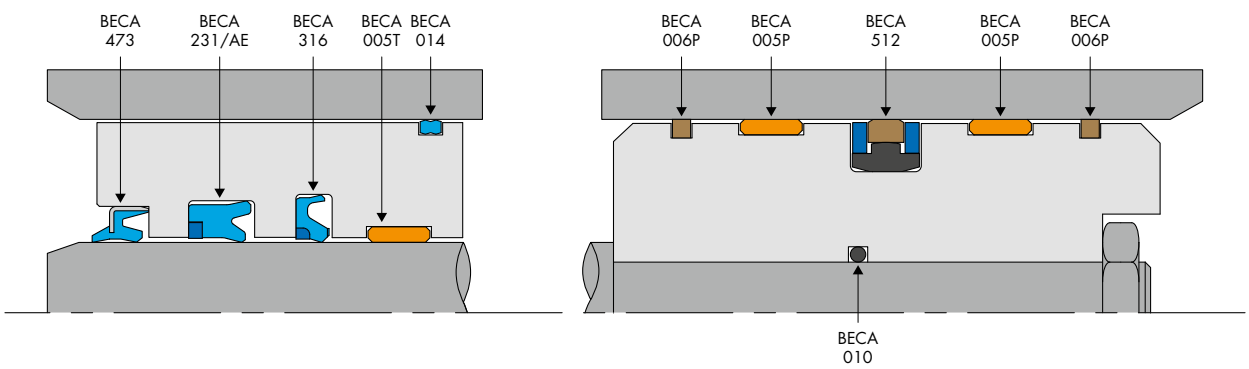
The Viscosity Index (VI) measures the viscosity fluctuation with the temperature. Oils with high viscosity indexes are less dependent on temperature.

3. Examples of applications

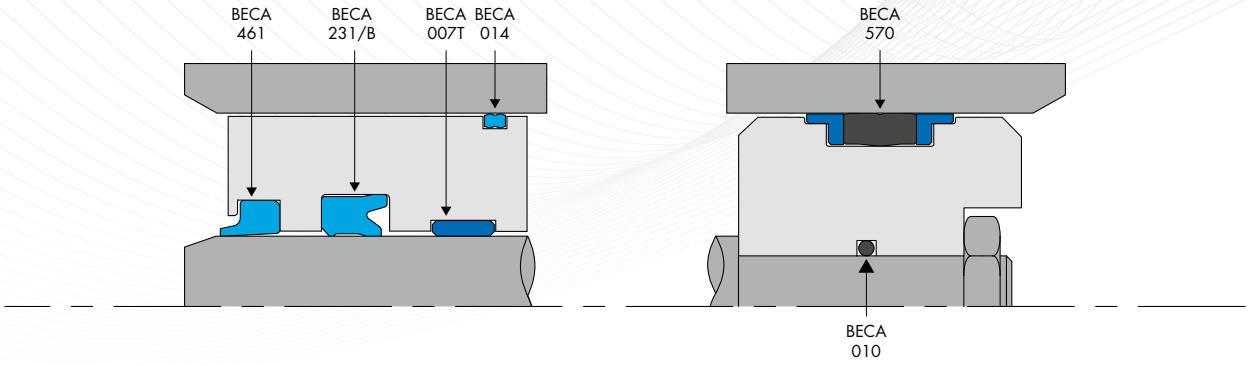
CONSTRUCTION

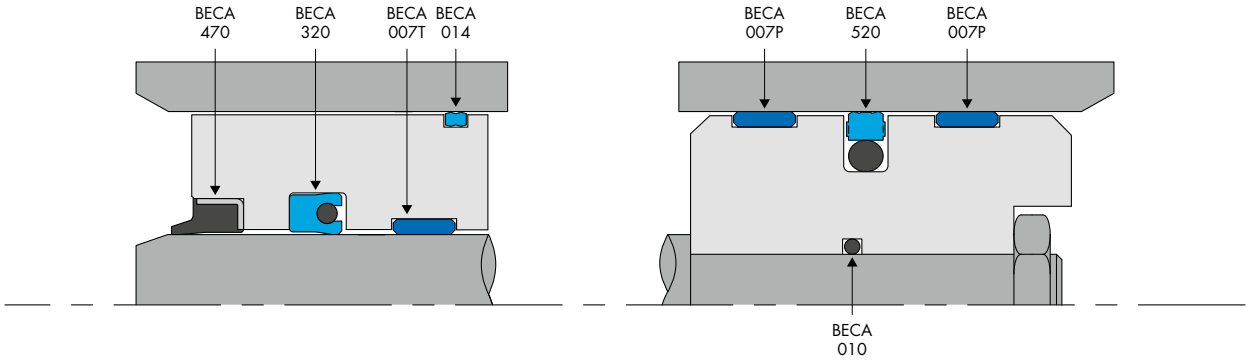


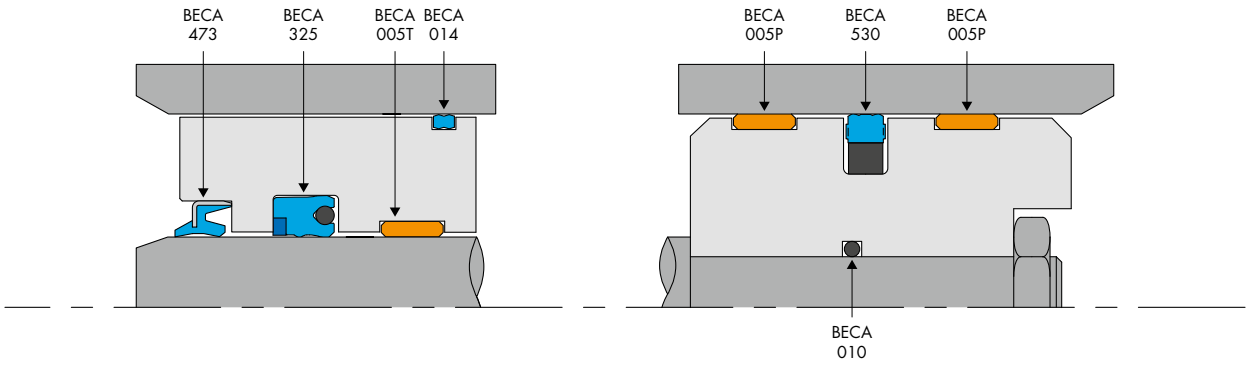




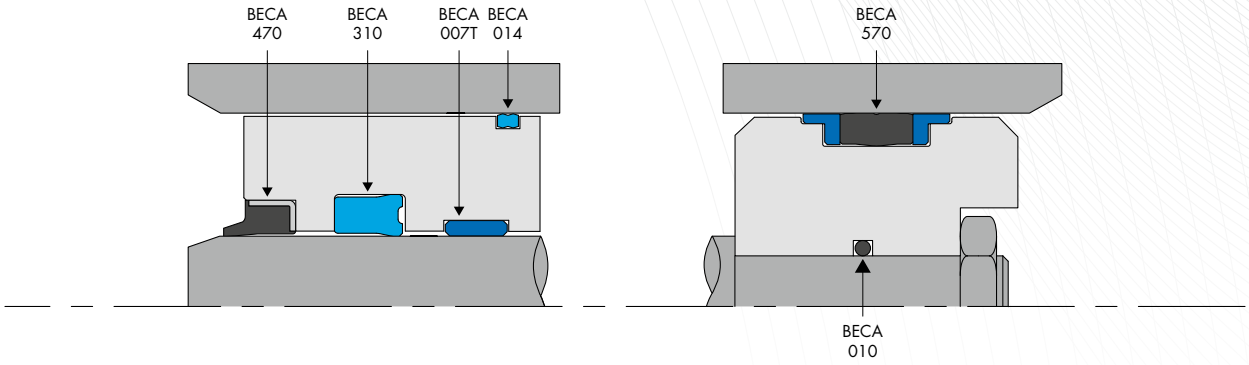
AGRICULTURE

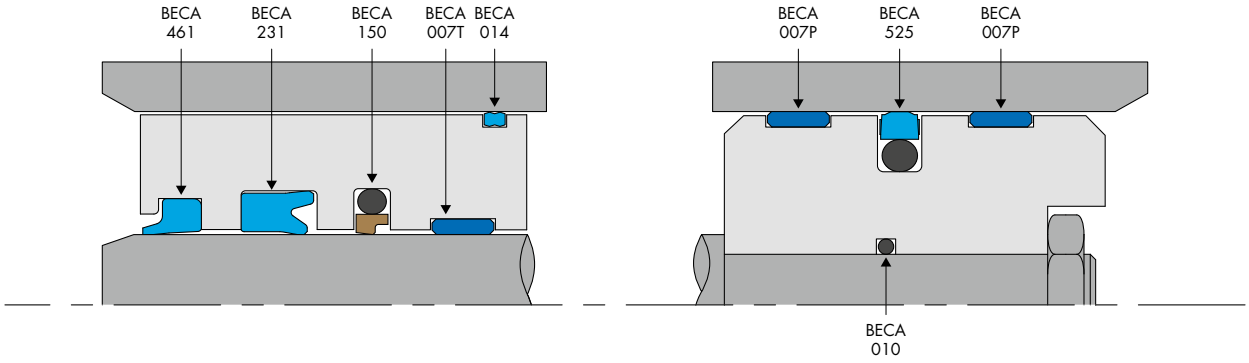


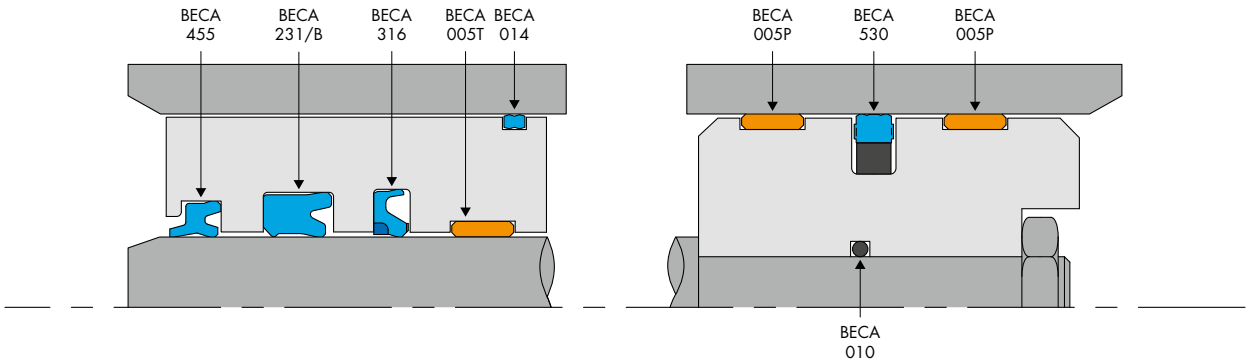




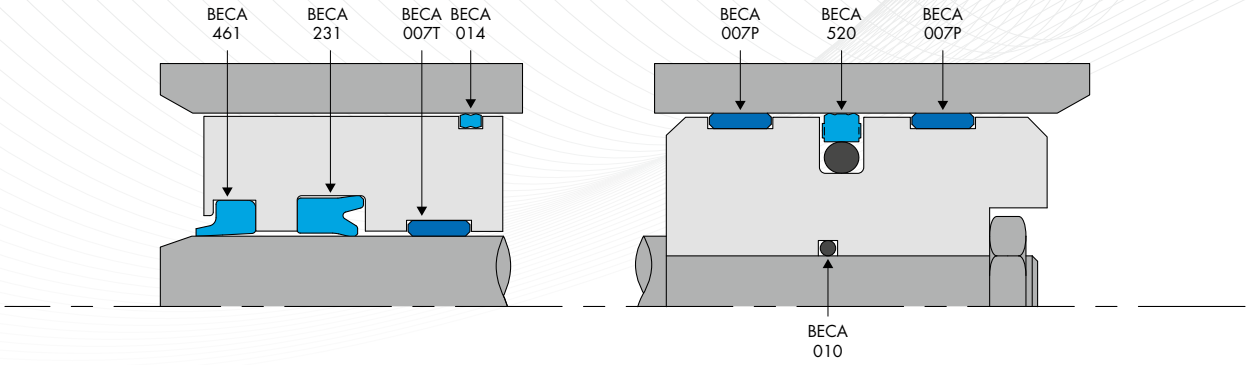
MATERIAL HANDLING







LIFTING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BECA 014
BECA 007P
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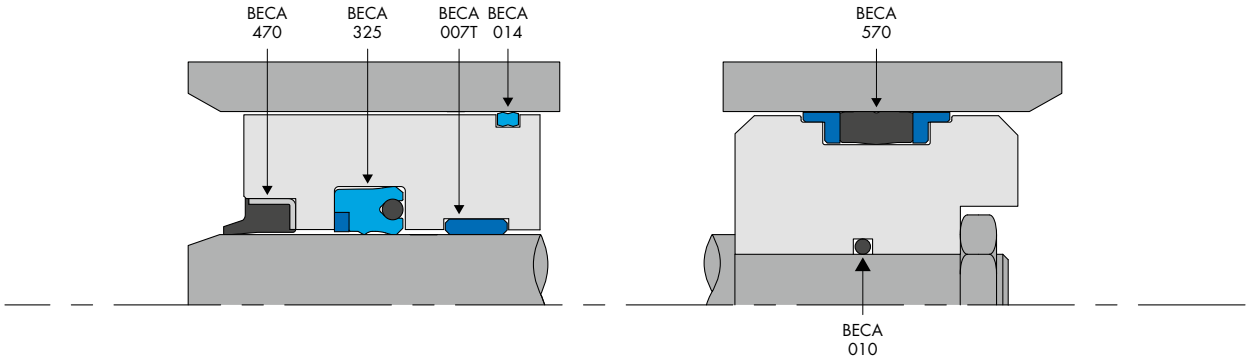
BECA 007P
BECA 010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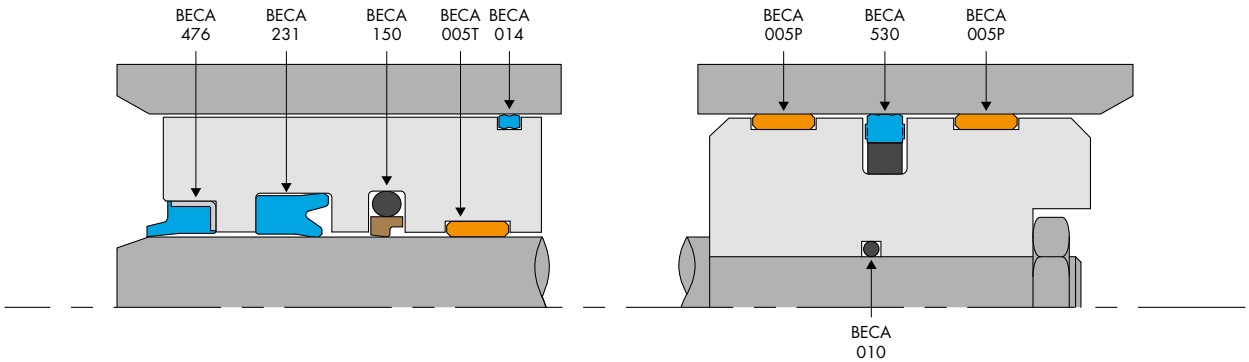
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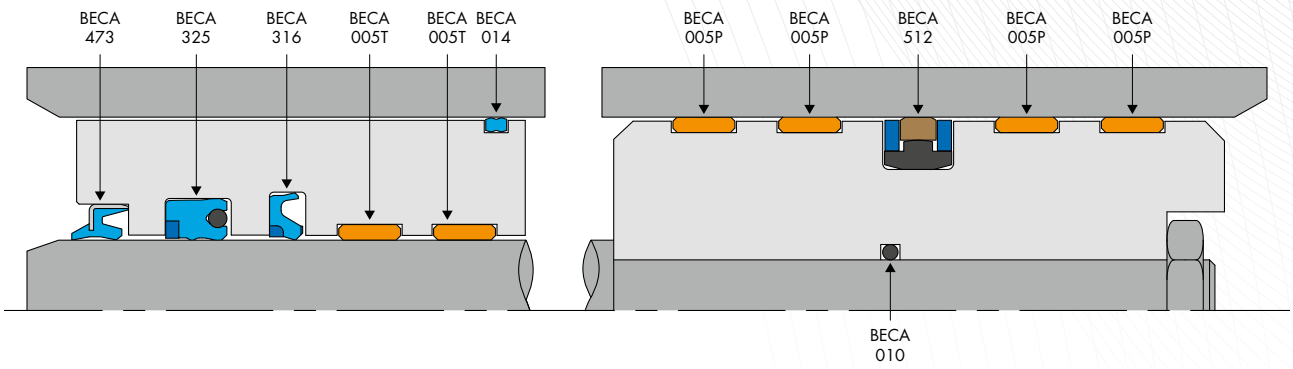
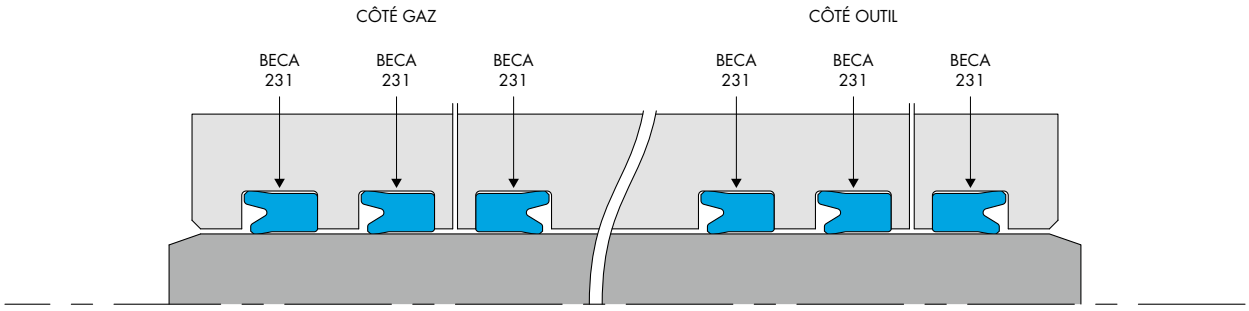
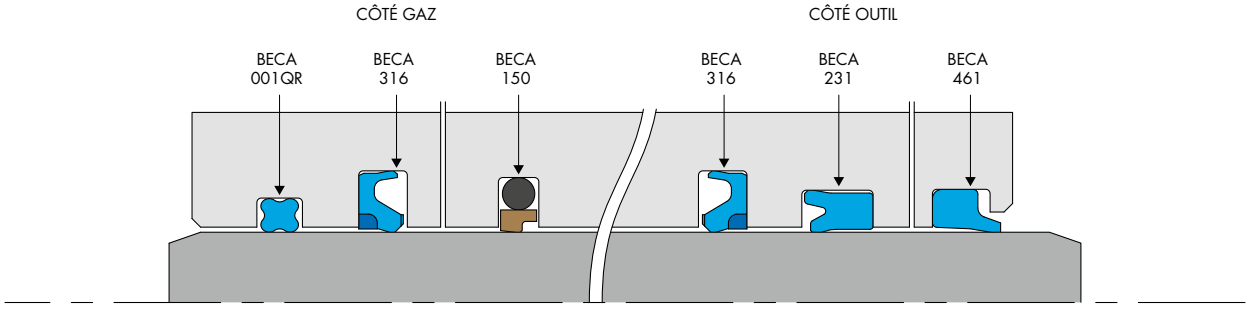
MINING

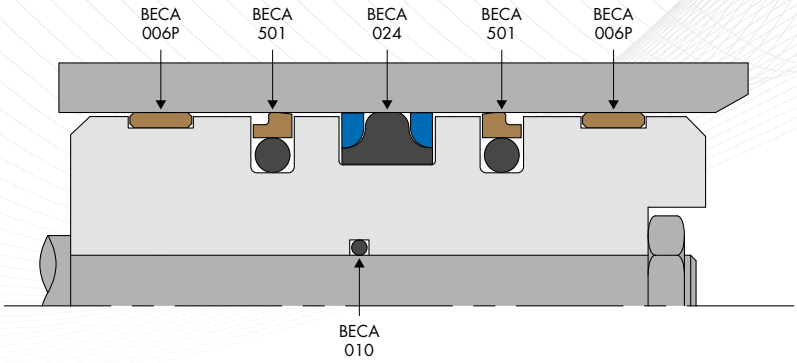


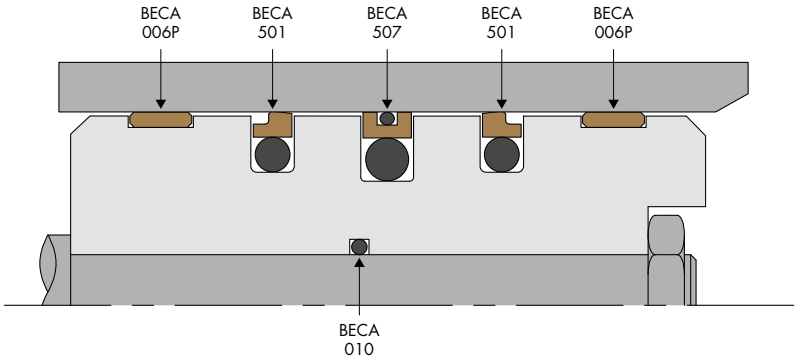
HYDRAULIC BREAKER



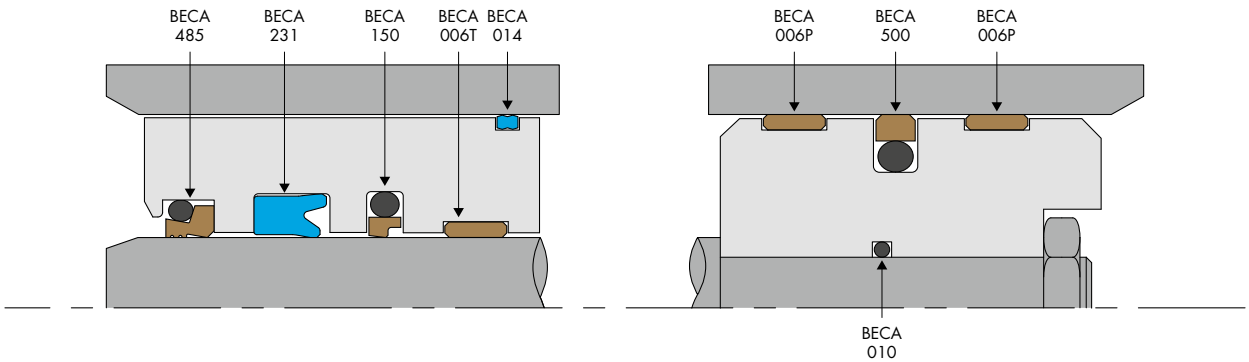


PISTON ACCUMULATORS

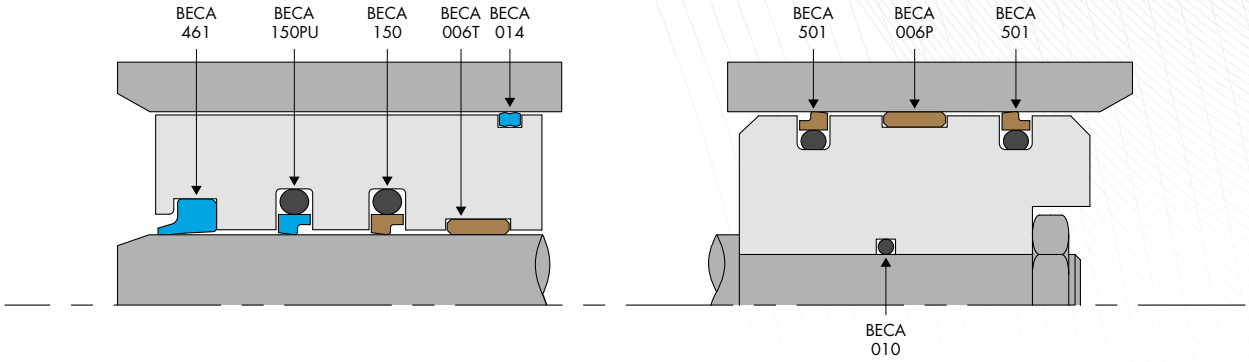


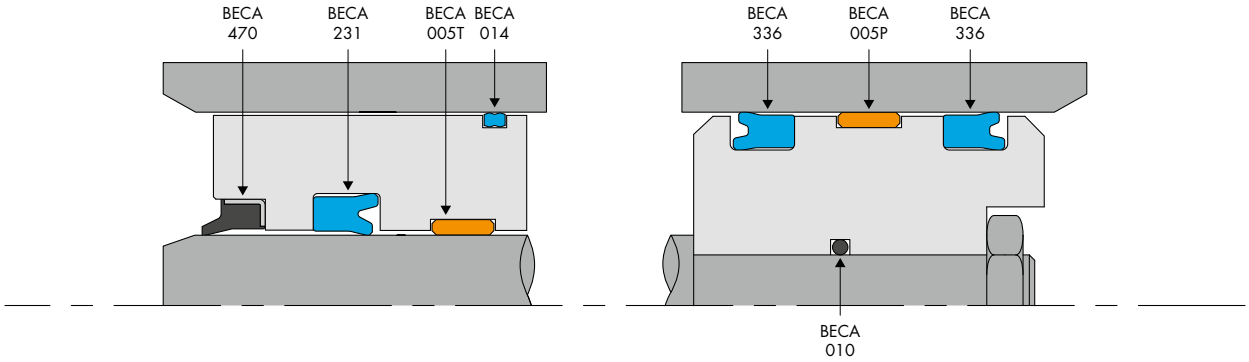


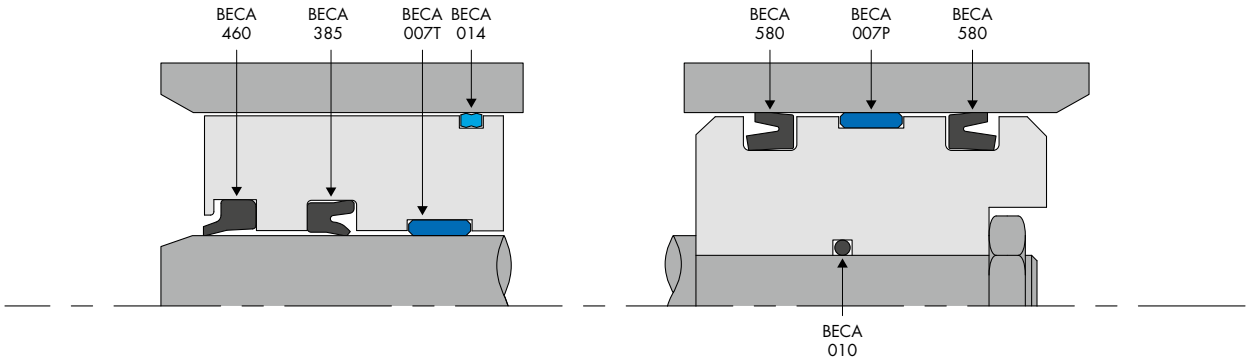
INDUSTRIAL APPLICATIONS



INDUSTRIAL APPLICATIONS (CONT.)







4. Storage recommendations and lifespan

Seals, which are regularly used as spare parts, can be stored over a long-term period. During storage, rubbers are subject to physical alterations, meaning that they can sometimes become unusable due to deformation, hardening, softening or cracking when they are exposed to oxygen and ozone, light, heat, moisture, oils and solvents.

ISO Standard 2230: 2002 "Rubber Products - Guidelines for Storage" sets out the storage recommendations and length of storage for rubbers depending on material classification, in order to ensure optimal preservation of the physical and chemical features of parts.

Temperature

The temperature in the storage area must preferably be between +5°C and +25°C. If the temperature exceeds +25°C, the rubber seals may undergo physical changes, no longer retaining their original technical features, and may break down prematurely. All heat sources (radiators, lamps, sunlight, etc.) must be controlled so that the temperature does not exceed +25°C.
On the other hand, if the temperature in the storage area is below +5°C, the seals may become more rigid, which will not necessarily alter their chemical and physical features. Returning them to +20°C is advised before putting them into operation.

Humidity

Generally speaking, the relative humidity of the storage area should not exceed 70% for rubber seals (65% for polyurethane seals). Avoid humid areas, as well as areas that are prone to condensation.

Light

Rubber seals must not come into contact with sunlight or artificial light with a high UV ray content. Using normal incandescent lighting is recommended, as is covering windows in the storage area with a protective red or orange paint. Using special anti-UV bags will ensure that seals are better protected.

Radiation

Precautions must be taken to protect stored parts from all sources of ionising radiation.

Ozone

As ozone is very damaging to rubber seals, the storage area must not contain ozone-producing equipment, such as mercury-vapour lamps, high-voltage electrical equipment, electric motors or other products likely to produce soundless electrical charges or sparks. No combustible gases or organic vapours must be present, as their photochemical processes may lead to ozone production.

Distortion

Seals must preferably be stored where they are not subjected to constraints, pressures or any other force that could cause them to become misshapen. Seals should be kept in their original packaging as far as possible.

Contact with liquids and semi-liquids

Seals must not be stored in contact with liquids (acids, disinfectants, oils, greases, etc.) or other semi-liquid materials, unless packaged in this way by the manufacturer.

Contact with metals

Certain metals, such as manganese, iron, copper, brass and other compounds are damaging to rubbers. Seals must not be stored in contact with such metals unless the rubber parts are affixed to them, in which case a rolled packaging would be preferable.

Contact with other materials

Rubber seals must not be stored in contact with PVC due to the risk of potentially transferring plasticiser or other ingredients. Rubbers with different compositions must be separated from one another.

Cleaning

If necessary, clean seals with soap and water, or denatured alcohol. Cleaning with water should particularly be avoided for seals with textile fibre, and steel-rubber (corrosion problems) or polyurethane seals. Parts must be dried at ambient temperature and not near a heat source. Seals must not come into contact with wire brushes or sharp objects.

Storage and control

Storage duration largely depends on the type of material, rubbers being particularly sensitive to storage. The table below sets out the initial storage period.

Type of materials	Initial storage period	Extension period
NR - PU	5 years	2 years
ACM - AEM - CR - HNBR - NBR	7 years	3 years
EPDM - FFKM - FKM - FVMQ - VMQ	10 years	5 years
PTFE - PA6 - POM	Unlimited	-

Quality control is carried out at the end of this period. An extension may be possible, depending on the results.

5. Guiding components

Wear rings and guide strips are used to resist deformation under radial load by guiding the piston and the rod in the system. The effects of metal on metal contact between the different components can lead to complete system deterioration; that's why FRANCE JOINT provides its expertise when developing guiding components using different types of materials.

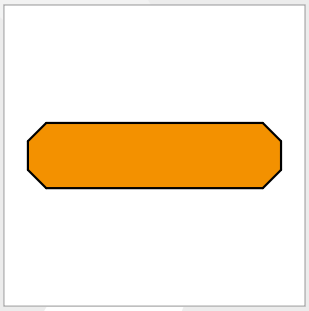
IMPORTANT

The pressures, speeds and temperatures indicate the maximum values and may not be cumulated. Moreover, they may be developed depending on the materials used.

For specific orders (temperature, pressure, speed, etc.), please contact our technical team so that they can direct you towards the appropriate choice of material and seal profile.

The dimensions shown in the catalogue are usually in stock and can be sent quickly. However, we reserve the right to modify our delivery schedule. Please contact our sales team to find out our availabilities.

Contents



WEAR RINGS

BECA 005 Piston

DESCRIPTION

The BECA 005 profile is a machined guide ring with a 30° angle cut as standard in a tubular material composed of a cotton weave with a superfine mesh, imbibed with phenolic resin with added lubricant. Other types of cuts can be made.

ADVANTAGES

Good dimensional stability
Good vibration absorption
Good friction characteristics
Good dry operation
Increased life span

APPLICATIONS

Hydraulic cylinders
Hydraulic excavators
Mobile machinery
Construction equipment
Presses

MATERIALS

Phenolic resin PF

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	-40°C / +130°C
Speed	1 m/s
Max. compression resistance	270 to 340 N/mm²
Radial loads in dynamic applications	max. 100 N/mm² at 25°C max. 50 N/mm² > at 60°C

The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

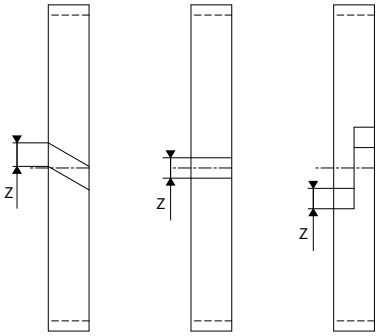
WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (ØD1 x Cr)

where:

H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
ØD1 = Bore diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



EXTRUSION GAPS

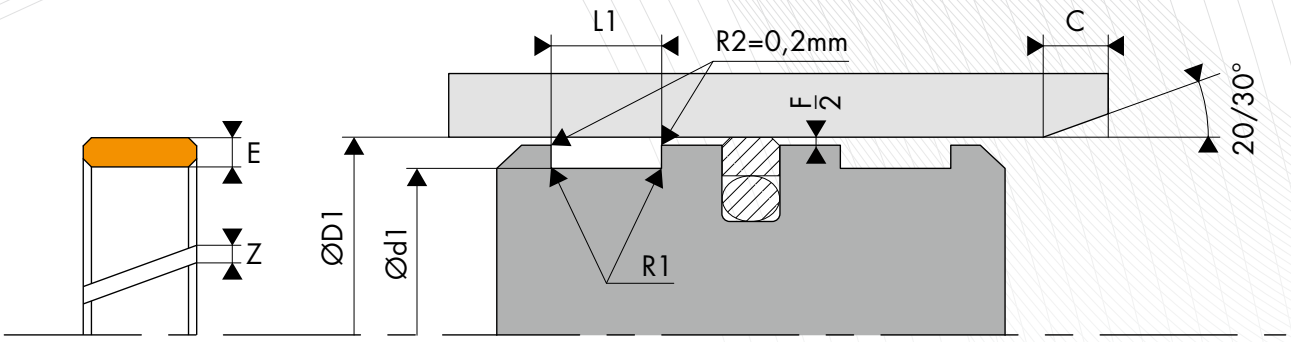
Seal thickness E	Radial gap F/2
1.55	0.50
2.50	0.90
4.00	1.50

RADIUS

Bore diameter ØD1	Radius R1
≤ 250.0	0.20
> 250.0	0.40

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 µm	≤1.6 µm	≤3.2 µm
Rz	0.63 - 2.5 µm	≤6.3 µm	≤10.0 µm
Rmax	1.0 - 4.0 µm	≤10.0 µm	≤16.0 µm



INSTALLATION DIMENSIONS

ISO 10766	Bore diameter	Groove diameter	Groove width	Seal thickness	Gap
	ØD1 H9	Ød1 h8	L1 0/+0.20	E	Z +/-0.50
*	16.0 - 50.0	D1 - 3.10	4.00	1.55	1.00
*	16.0 - 125.0	D1 - 5.00	5.60	2.50	1.25
*	25.0 - 250.0	D1 - 5.00	9.70	2.50	1.25
*	80.0 - 500.0	D1 - 5.00	15.00	2.50	1.25
*	125.0 - 999.9	D1 - 5.00	25.00	2.50	1.25
*	280.0 - 999.9	D1 - 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Phenolic resin PF
Bore diameter ____ : ØD1 = 50.00 mm
Groove diameter __ : Ød1 + 45.00 mm
Groove width _____ : L1 = 5.60 mm
Part number_____ : 005.0500455

Part number - 005. 050 045 5

Family
Bore diameter
Groove diameter
Groove width

DIMENSIONS

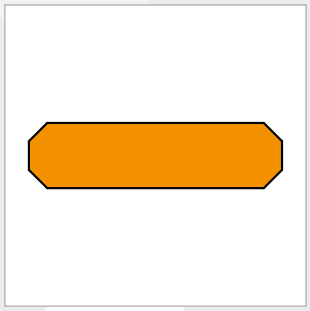
Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
005.0080494	8.00	4.90	4.00	1.55
005.0100694	10.00	6.90	4.00	1.55
005.0120894	12.00	8.90	4.00	1.55
005.0141094	14.00	10.90	4.00	1.55
005.0151194	15.00	11.90	4.00	1.55
005.0160115	**16.00**	**11.00**	**5.60**	**2.50**
005.0161294	**16.00**	**12.90**	**4.00**	**1.55**
005.0180135	18.00	13.00	5.60	2.50
005.0181494	18.00	14.90	4.00	1.55
005.0200155	**20.00**	**15.00**	**5.60**	**2.50**
005.0201694	**20.00**	**16.90**	**4.00**	**1.55**
005.0220175	22.00	17.00	5.60	2.50
005.0221894	22.00	18.90	4.00	1.55
005.0250205	**25.00**	**20.00**	**5.60**	**2.50**
005.0250209	25.00	20.00	9.70	2.50
005.0252194	**25.00**	**21.90**	**4.00**	**1.55**
005.0270225	27.00	22.00	5.60	2.50
005.0270229	27.00	22.00	9.70	2.50
005.0272394	27.00	23.90	4.00	1.55
005.0280235	28.00	23.00	5.60	2.50
005.0280239	28.00	23.00	9.70	2.50
005.0282494	28.00	24.90	4.00	1.55
005.0300255	30.00	25.00	5.60	2.50
005.0300259	30.00	25.00	9.70	2.50
005.0302694	30.00	26.90	4.00	1.55
005.0320275	**32.00**	**27.00**	**5.60**	**2.50**
005.0320279	32.00	27.00	9.70	2.50
005.0322894	**32.00**	**28.90**	**4.00**	**1.55**
005.0330285	33.00	28.00	5.60	2.50
005.0330289	33.00	28.00	9.70	2.50
005.0332994	33.00	29.90	4.00	1.55
005.0350305	35.00	30.00	5.60	2.50
005.0350309	35.00	30.00	9.70	2.50
005.0353194	35.00	31.90	4.00	1.55
005.0360315	36.00	31.00	5.60	2.50
005.0360319	36.00	31.00	9.70	2.50
005.0363294	36.00	32.90	4.00	1.55
005.0370325	37.00	32.00	5.60	2.50
005.0370329	37.00	32.00	9.70	2.50
005.0373394	37.00	33.90	4.00	1.55
005.0380335	38.00	33.00	5.60	2.50
005.0380339	38.00	33.00	9.70	2.50
005.0383494	38.00	34.90	4.00	1.55
005.0400355	**40.00**	**35.00**	**5.60**	**2.50**
005.0400359	40.00	35.00	9.70	2.50
005.0403694	**40.00**	**36.90**	**4.00**	**1.55**
005.0410365	41.00	36.00	5.60	2.50
005.0410369	41.00	36.00	9.70	2.50
005.0413794	41.00	37.90	4.00	1.55
005.0420375	42.00	37.00	5.60	2.50
005.0420379	42.00	37.00	9.70	2.50
005.0423894	42.00	38.90	4.00	1.55
005.0450405	45.00	40.00	5.60	2.50
005.0450409	45.00	40.00	9.70	2.50
005.0454194	45.00	41.90	4.00	1.55
005.0480435	48.00	43.00	5.60	2.50
005.0480439	48.00	43.00	9.70	2.50
005.0484494	48.00	44.90	4.00	1.55
005.0500455	**50.00**	**45.00**	**5.60**	**2.50**
005.0500459	50.00	45.00	9.70	2.50
005.0504694	**50.00**	**46.90**	**4.00**	**1.55**
005.0520475	52.00	47.00	5.60	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
005.0520479	52.00	47.00	9.70	2.50
005.0550505	55.00	50.00	5.60	2.50
005.0550509	55.00	50.00	9.70	2.50
005.0580535	58.00	53.00	5.60	2.50
005.0580539	58.00	53.00	9.70	2.50
005.0600555	60.00	55.00	5.60	2.50
005.0600559	60.00	55.00	9.70	2.50
005.0610565	61.00	56.00	5.60	2.50
005.0610569	61.00	56.00	9.70	2.50
005.0630585	**63.00**	**58.00**	**5.60**	**2.50**
005.0630589	**63.00**	**58.00**	**9.70**	**2.50**
005.0650605	65.00	60.00	5.60	2.50
005.0650609	65.00	60.00	9.70	2.50
005.0680635	68.00	63.00	5.60	2.50
005.0680639	68.00	63.00	9.70	2.50
005.0700655	70.00	65.00	5.60	2.50
005.0700659	70.00	65.00	9.70	2.50
005.0720675	72.00	67.00	5.60	2.50
005.0720679	72.00	67.00	9.70	2.50
005.0750705	75.00	70.00	5.60	2.50
005.0750709	75.00	70.00	9.70	2.50
005.0780735	78.00	73.00	5.60	2.50
005.0780739	78.00	73.00	9.70	2.50
005.0800755	**80.00**	**75.00**	**5.60**	**2.50**
005.0800759	**80.00**	**75.00**	**9.70**	**2.50**
005.0850805	85.00	80.00	5.60	2.50
005.0850809	85.00	80.00	9.70	2.50
005.0900855	90.00	85.00	5.60	2.50
005.0900859	90.00	85.00	9.70	2.50
005.0950905	95.00	90.00	5.60	2.50
005.0950909	95.00	90.00	9.70	2.50
005.1000955	**100.00**	**95.00**	**5.60**	**2.50**
005.1000959	**100.00**	**95.00**	**9.70**	**2.50**
005.1051005	105.00	100.00	5.60	2.50
005.1051009	105.00	100.00	9.70	2.50
005.1101055	110.00	105.00	5.60	2.50
005.1101059	110.00	105.00	9.70	2.50
005.1151105	115.00	110.00	5.60	2.50
005.1151109	115.00	110.00	9.70	2.50
005.1201155	120.00	115.00	5.60	2.50
005.1201159	120.00	115.00	9.70	2.50
005.1251205	**125.00**	**120.00**	**5.60**	**2.50**
005.1251209	**125.00**	**120.00**	**9.70**	**2.50**
005.1251202	125.00	120.00	25.00	2.50
005.1301259	130.00	125.00	9.70	2.50
005.1301252	130.00	125.00	25.00	2.50
005.1351309	135.00	130.00	9.70	2.50
005.1351302	135.00	130.00	25.00	2.50
005.1401359	**140.00**	**135.00**	**9.70**	**2.50**
005.1401352	140.00	135.00	25.00	2.50
005.1451409	145.00	140.00	9.70	2.50
005.1451402	145.00	140.00	25.00	2.50
005.1501459	150.00	145.00	9.70	2.50
005.1501452	150.00	145.00	25.00	2.50
005.1551509	155.00	150.00	9.70	2.50
005.1551502	155.00	150.00	25.00	2.50
005.1601559	**160.00**	**155.00**	**9.70**	**2.50**
005.1601552	160.00	155.00	25.00	2.50
005.1651609	165.00	160.00	9.70	2.50
005.1651602	165.00	160.00	25.00	2.50
005.1701659	170.00	165.00	9.70	2.50
005.1701652	170.00	165.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
005.1751709	175.00	170.00	9.70	2.50
005.1751702	175.00	170.00	25.00	2.50
005.1801759	**180.00**	**175.00**	**9.70**	**2.50**
005.1801751	**180.00**	**175.00**	**15.00**	**2.50**
005.1801752	180.00	175.00	25.00	2.50
005.1851809	185.00	180.00	9.70	2.50
005.1851801	185.00	180.00	15.00	2.50
005.1851802	185.00	180.00	25.00	2.50
005.1901859	190.00	185.00	9.70	2.50
005.1901851	190.00	185.00	15.00	2.50
005.1901852	190.00	185.00	25.00	2.50
005.1951909	195.00	190.00	9.70	2.50
005.1951901	195.00	190.00	15.00	2.50
005.1951902	195.00	190.00	25.00	2.50
005.2001959	**200.00**	**195.00**	**9.70**	**2.50**
005.2001951	**200.00**	**195.00**	**15.00**	**2.50**
005.2001952	200.00	195.00	25.00	2.50
005.2052009	205.00	200.00	9.70	2.50
005.2052001	205.00	200.00	15.00	2.50
005.2052002	205.00	200.00	25.00	2.50
005.2102059	210.00	205.00	9.70	2.50
005.2102051	210.00	205.00	15.00	2.50
005.2102052	210.00	205.00	25.00	2.50
005.2152109	215.00	210.00	9.70	2.50
005.2152101	215.00	210.00	15.00	2.50
005.2152102	215.00	210.00	25.00	2.50
005.2202159	**220.00**	**215.00**	**9.70**	**2.50**
005.2202151	**220.00**	**215.00**	**15.00**	**2.50**
005.2202152	220.00	215.00	25.00	2.50
005.2252209	225.00	220.00	9.70	2.50
005.2252201	225.00	220.00	15.00	2.50
005.2252202	225.00	220.00	25.00	2.50
005.2302259	230.00	225.00	9.70	2.50
005.2302251	230.00	225.00	15.00	2.50
005.2302252	230.00	225.00	25.00	2.50
005.2352309	235.00	230.00	9.70	2.50
005.2352301	235.00	230.00	15.00	2.50
005.2352302	235.00	230.00	25.00	2.50
005.2402359	240.00	235.00	9.70	2.50
005.2402351	240.00	235.00	15.00	2.50
005.2402352	240.00	235.00	25.00	2.50
005.2452409	245.00	240.00	9.70	2.50
005.2452401	245.00	240.00	15.00	2.50
005.2452402	245.00	240.00	25.00	2.50
005.2502459	**250.00**	**245.00**	**9.70**	**2.50**
005.2502451	**250.00**	**245.00**	**15.00**	**2.50**
005.2502452	250.00	245.00	25.00	2.50
005.2552501	255.00	250.00	15.00	2.50
005.2552502	255.00	250.00	25.00	2.50
005.2602551	260.00	255.00	15.00	2.50
005.2602552	260.00	255.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
005.2652601	265.00	260.00	15.00	2.50
005.2652602	265.00	260.00	25.00	2.50
005.2702651	270.00	265.00	15.00	2.50
005.2702652	270.00	265.00	25.00	2.50
005.2752701	275.00	270.00	15.00	2.50
005.2752702	275.00	270.00	25.00	2.50
005.2802751	**280.00**	**275.00**	**15.00**	**2.50**
005.2802752	**280.00**	**275.00**	**25.00**	**2.50**
005.2852801	285.00	280.00	15.00	2.50
005.2852802	285.00	280.00	25.00	2.50
005.2902851	290.00	285.00	15.00	2.50
005.2902852	290.00	285.00	25.00	2.50
005.2952901	295.00	290.00	15.00	2.50
005.2952902	295.00	290.00	25.00	2.50
005.3002951	300.00	295.00	15.00	2.50
005.3002952	300.00	295.00	25.00	2.50
005.3053001	305.00	300.00	15.00	2.50
005.3053002	305.00	300.00	25.00	2.50
005.3103051	310.00	305.00	15.00	2.50
005.3103052	310.00	305.00	25.00	2.50
005.3153101	315.00	310.00	15.00	2.50
005.3153102	315.00	310.00	25.00	2.50
005.3203151	**320.00**	**315.00**	**15.00**	**2.50**
005.3203152	**320.00**	**315.00**	**25.00**	**2.50**
005.3253201	325.00	320.00	15.00	2.50
005.3253202	325.00	320.00	25.00	2.50
005.3303251	330.00	325.00	15.00	2.50
005.3303252	330.00	325.00	25.00	2.50
005.3353301	335.00	330.00	15.00	2.50
005.3353302	335.00	330.00	25.00	2.50
005.3403351	340.00	335.00	15.00	2.50
005.3403352	340.00	335.00	25.00	2.50
005.3453401	345.00	340.00	15.00	2.50
005.3453402	345.00	340.00	25.00	2.50
005.3503451	350.00	345.00	15.00	2.50
005.3503452	350.00	345.00	25.00	2.50
005.3603551	**360.00**	**355.00**	**15.00**	**2.50**
005.3603552	**360.00**	**355.00**	**25.00**	**2.50**
005.3703651	370.00	365.00	15.00	2.50
005.3703652	370.00	365.00	25.00	2.50
005.3803751	380.00	375.00	15.00	2.50
005.3803752	380.00	375.00	25.00	2.50
005.3903851	390.00	385.00	15.00	2.50
005.3903852	390.00	385.00	25.00	2.50
005.4003951	**400.00**	**395.00**	**15.00**	**2.50**
005.4003952	**400.00**	**395.00**	**25.00**	**2.50**
005.4504451	**450.00**	**445.00**	**15.00**	**2.50**
005.4504452	**450.00**	**445.00**	**25.00**	**2.50**
005.5004951	**500.00**	**495.00**	**15.00**	**2.50**
005.5004952	**500.00**	**495.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the bore diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



WEAR RINGS

BECA 005 Rod

DESCRIPTION

The BECA 005 profile is a machined guide ring with a 30° angle cut as standard in a tubular material composed of a cotton weave with a superfine mesh, imbibed with phenolic resin with added lubricant. Other types of cuts can be made.

ADVANTAGES

Good dimensional stability
Good vibration absorption
Good friction characteristics
Good dry operation
Increased life span

APPLICATIONS

Hydraulic cylinders
Hydraulic excavators
Mobile machinery
Construction equipment
Presses

MATERIALS

Phenolic resin PF

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	-40°C / +130°C
Speed	1 m/s
Max. compression resistance	270 to 340 N/mm²
Radial loads in dynamic applications	max. 100 N/mm² at 25°C max. 50 N/mm² > at 60°C

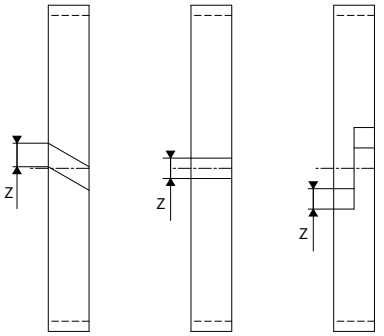
The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (Ød1 x Cr)

where:
H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
Ød1 = Rod diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



EXTRUSION GAPS

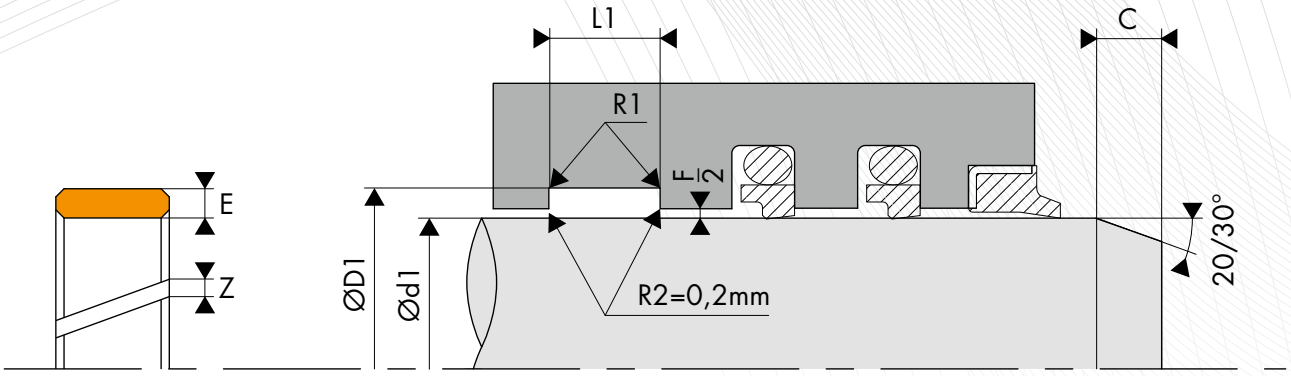
Seal thickness E	Radial gap F/2
1.55	0.50
2.50	0.90
4.00	1.50

RADIUS

Rod diameter Ød1	Radius R1
≤ 250.0	0.20
> 250.0	0.40

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 µm	≤1.6 µm	≤3.2 µm
Rz	0.63 - 2.5 µm	≤6.3 µm	≤10.0 µm
Rmax	1.0 - 4.0 µm	≤10.0 µm	≤16.0 µm



INSTALLATION DIMENSIONS

ISO 10766	Rod diameter	Groove diameter	Groove width	Seal thickness	Gap
	Ød1 f8/h9	ØD1 H8	L1 0/+0.20	E	Z +/-0.50
*	10.0 - 50.0	d1 + 3.10	4.00	1.55	1.00
*	16.0 - 120.0	d1 + 5.00	5.60	2.50	1.25
*	25.0 - 250.0	d1 + 5.00	9.70	2.50	1.25
*	75.0 - 500.0	d1 + 5.00	15.00	2.50	1.25
*	120.0 - 999.9	d1 + 5.00	25.00	2.50	1.25
*	280.0 - 999.9	d1 + 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Phenolic resin PF
Rod diameter _____ : Ød1 + 50.00 mm
Groove diameter __ : ØD1 = 55.00 mm
Groove width _____ : L1 = 5.60 mm
Part number _____ : 005.0500555

Part number - 005. 050 055 5

Family
Rod diameter
Groove diameter
Groove width

DIMENSIONS

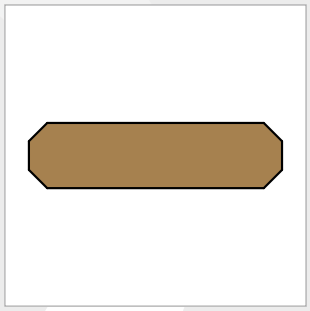
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
005.0081114	8.00	11.10	4.00	1.55
005.0101314	10.00	13.10	4.00	1.55
005.0121514	**12.00**	**15.10**	**4.00**	**1.55**
005.0141714	**14.00**	**17.10**	**4.00**	**1.55**
005.0151814	15.00	18.10	4.00	1.55
005.0161914	**16.00**	**19.10**	**4.00**	**1.55**
005.0182114	**18.00**	**21.10**	**4.00**	**1.55**
005.0202314	**20.00**	**23.10**	**4.00**	**1.55**
005.0222514	**22.00**	**25.10**	**4.00**	**1.55**
005.0252814	**25.00**	**28.10**	**4.00**	**1.55**
005.0250305	**25.00**	**30.00**	**5.60**	**2.50**
005.0273014	27.00	30.10	4.00	1.55
005.0270325	27.00	32.00	5.60	2.50
005.0283114	**28.00**	**31.10**	**4.00**	**1.55**
005.0280335	**28.00**	**33.00**	**5.60**	**2.50**
005.0303314	30.00	33.10	4.00	1.55
005.0300355	30.00	35.00	5.60	2.50
005.0300359	30.00	35.00	9.70	2.50
005.0323514	32.00	35.10	4.00	1.55
005.0320375	**32.00**	**37.00**	**5.60**	**2.50**
005.0320379	**32.00**	**37.00**	**9.70**	**2.50**
005.0333614	33.00	36.10	4.00	1.55
005.0330385	33.00	38.00	5.60	2.50
005.0330389	33.00	38.00	9.70	2.50
005.0353814	35.00	38.10	4.00	1.55
005.0350405	35.00	40.00	5.60	2.50
005.0350409	35.00	40.00	9.70	2.50
005.0363914	36.00	39.10	4.00	1.55
005.0360415	**36.00**	**41.00**	**5.60**	**2.50**
005.0360419	**36.00**	**41.00**	**9.70**	**2.50**
005.0374014	37.00	40.10	4.00	1.55
005.0370425	37.00	42.00	5.60	2.50
005.0370429	37.00	42.00	9.70	2.50
005.0384114	38.00	41.10	4.00	1.55
005.0380435	38.00	43.00	5.60	2.50
005.0380439	38.00	43.00	9.70	2.50
005.0404314	40.00	43.10	4.00	1.55
005.0400455	**40.00**	**45.00**	**5.60**	**2.50**
005.0400459	**40.00**	**45.00**	**9.70**	**2.50**
005.0414414	41.00	44.10	4.00	1.55
005.0410465	41.00	46.00	5.60	2.50
005.0410469	41.00	46.00	9.70	2.50
005.0424514	42.00	45.10	4.00	1.55
005.0420475	42.00	47.00	5.60	2.50
005.0420479	42.00	47.00	9.70	2.50
005.0454814	45.00	48.10	4.00	1.55
005.0450505	**45.00**	**50.00**	**5.60**	**2.50**
005.0450509	**45.00**	**50.00**	**9.70**	**2.50**
005.0485114	48.00	51.10	4.00	1.55
005.0480535	48.00	53.00	5.60	2.50
005.0480539	48.00	53.00	9.70	2.50
005.0505314	50.00	53.10	4.00	1.55
005.0500555	**50.00**	**55.00**	**5.60**	**2.50**
005.0500559	**50.00**	**55.00**	**9.70**	**2.50**
005.0520575	52.00	57.00	5.60	2.50
005.0520579	52.00	57.00	9.70	2.50
005.0550605	55.00	60.00	5.60	2.50
005.0550609	55.00	60.00	9.70	2.50
005.0580635	58.00	63.00	5.60	2.50
005.0580639	58.00	63.00	9.70	2.50
005.0600655	60.00	65.00	5.60	2.50
005.0600659	60.00	65.00	9.70	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
005.0610665	61.00	66.00	5.60	2.50
005.0610669	61.00	66.00	9.70	2.50
005.0630685	**63.00**	**68.00**	**5.60**	**2.50**
005.0630689	**63.00**	**68.00**	**9.70**	**2.50**
005.0650705	65.00	70.00	5.60	2.50
005.0650709	65.00	70.00	9.70	2.50
005.0680735	68.00	73.00	5.60	2.50
005.0680739	68.00	73.00	9.70	2.50
005.0700755	**70.00**	**75.00**	**5.60**	**2.50**
005.0700759	**70.00**	**75.00**	**9.70**	**2.50**
005.0720779	72.00	77.00	9.70	2.50
005.0750809	75.00	80.00	9.70	2.50
005.0780839	78.00	83.00	9.70	2.50
005.0800859	**80.00**	**85.00**	**9.70**	**2.50**
005.0800851	**80.00**	**85.00**	**15.00**	**2.50**
005.0850909	85.00	90.00	9.70	2.50
005.0850901	85.00	90.00	15.00	2.50
005.0900959	**90.00**	**95.00**	**9.70**	**2.50**
005.0900951	**90.00**	**95.00**	**15.00**	**2.50**
005.0951009	95.00	100.00	9.70	2.50
005.0951001	95.00	100.00	15.00	2.50
005.1001059	**100.00**	**105.00**	**9.70**	**2.50**
005.1001051	**100.00**	**105.00**	**15.00**	**2.50**
005.1051109	105.00	110.00	9.70	2.50
005.1051101	105.00	110.00	15.00	2.50
005.1101159	**110.00**	**115.00**	**9.70**	**2.50**
005.1101151	**110.00**	**115.00**	**15.00**	**2.50**
005.1151209	115.00	120.00	9.70	2.50
005.1151201	115.00	120.00	15.00	2.50
005.1201259	120.00	125.00	9.70	2.50
005.1201251	120.00	125.00	15.00	2.50
005.1251309	**125.00**	**130.00**	**9.70**	**2.50**
005.1251301	**125.00**	**130.00**	**15.00**	**2.50**
005.1301359	130.00	135.00	9.70	2.50
005.1301351	130.00	135.00	15.00	2.50
005.1351409	135.00	140.00	9.70	2.50
005.1351401	135.00	140.00	15.00	2.50
005.1401459	**140.00**	**145.00**	**9.70**	**2.50**
005.1401451	**140.00**	**145.00**	**15.00**	**2.50**
005.1451509	145.00	150.00	9.70	2.50
005.1451501	145.00	150.00	15.00	2.50
005.1501559	150.00	155.00	9.70	2.50
005.1501551	150.00	155.00	15.00	2.50
005.1551609	155.00	160.00	9.70	2.50
005.1551601	155.00	160.00	15.00	2.50
005.1601659	**160.00**	**165.00**	**9.70**	**2.50**
005.1601651	**160.00**	**165.00**	**15.00**	**2.50**
005.1651709	165.00	170.00	9.70	2.50
005.1651701	165.00	170.00	15.00	2.50
005.1701759	170.00	175.00	9.70	2.50
005.1701751	170.00	175.00	15.00	2.50
005.1751809	175.00	180.00	9.70	2.50
005.1751801	175.00	180.00	15.00	2.50
005.1801859	**180.00**	**185.00**	**9.70**	**2.50**
005.1801851	**180.00**	**185.00**	**15.00**	**2.50**
005.1851909	185.00	190.00	9.70	2.50
005.1851901	185.00	190.00	15.00	2.50
005.1901959	190.00	195.00	9.70	2.50
005.1901951	190.00	195.00	15.00	2.50
005.1952009	195.00	200.00	9.70	2.50
005.1952001	195.00	200.00	15.00	2.50
005.2002059	200.00	205.00	9.70	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
005.2002051	**200.00**	**205.00**	**15.00**	**2.50**
005.2002052	**200.00**	**205.00**	**25.00**	**2.50**
005.2052101	205.00	210.00	15.00	2.50
005.2052102	205.00	210.00	25.00	2.50
005.2102151	210.00	215.00	15.00	2.50
005.2102152	210.00	215.00	25.00	2.50
005.2152201	215.00	220.00	15.00	2.50
005.2152202	215.00	220.00	25.00	2.50
005.2202251	**220.00**	**225.00**	**15.00**	**2.50**
005.2202252	**220.00**	**225.00**	**25.00**	**2.50**
005.2252301	225.00	230.00	15.00	2.50
005.2252302	225.00	230.00	25.00	2.50
005.2302351	230.00	235.00	15.00	2.50
005.2302352	230.00	235.00	25.00	2.50
005.2352401	235.00	240.00	15.00	2.50
005.2352402	235.00	240.00	25.00	2.50
005.2402451	240.00	245.00	15.00	2.50
005.2402452	240.00	245.00	25.00	2.50
005.2452501	245.00	250.00	15.00	2.50
005.2452502	245.00	250.00	25.00	2.50
005.2502551	**250.00**	**255.00**	**15.00**	**2.50**
005.2502552	**250.00**	**255.00**	**25.00**	**2.50**
005.2552601	255.00	260.00	15.00	2.50
005.2552602	255.00	260.00	25.00	2.50
005.2602651	260.00	265.00	15.00	2.50
005.2602652	260.00	265.00	25.00	2.50
005.2652701	265.00	270.00	15.00	2.50
005.2652702	265.00	270.00	25.00	2.50
005.2702751	270.00	275.00	15.00	2.50
005.2702752	270.00	275.00	25.00	2.50
005.2752801	275.00	280.00	15.00	2.50
005.2752802	275.00	280.00	25.00	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
005.2802851	**280.00**	**285.00**	**15.00**	**2.50**
005.2802852	**280.00**	**285.00**	**25.00**	**2.50**
005.2852901	285.00	290.00	15.00	2.50
005.2852902	285.00	290.00	25.00	2.50
005.2902951	290.00	295.00	15.00	2.50
005.2902952	290.00	295.00	25.00	2.50
005.2953001	295.00	300.00	15.00	2.50
005.2953002	295.00	300.00	25.00	2.50
005.3003051	300.00	305.00	15.00	2.50
005.3003052	300.00	305.00	25.00	2.50
005.3053101	305.00	310.00	15.00	2.50
005.3053102	305.00	310.00	25.00	2.50
005.3103151	310.00	315.00	15.00	2.50
005.3103152	310.00	315.00	25.00	2.50
005.3153201	315.00	320.00	15.00	2.50
005.3153202	315.00	320.00	25.00	2.50
005.3203251	**320.00**	**325.00**	**15.00**	**2.50**
005.3203252	**320.00**	**325.00**	**25.00**	**2.50**
005.3253301	325.00	330.00	15.00	2.50
005.3253302	325.00	330.00	25.00	2.50
005.3303351	330.00	335.00	15.00	2.50
005.3303352	330.00	335.00	25.00	2.50
005.3353401	335.00	340.00	15.00	2.50
005.3353402	335.00	340.00	25.00	2.50
005.3403451	340.00	345.00	15.00	2.50
005.3403452	340.00	345.00	25.00	2.50
005.3453501	345.00	350.00	15.00	2.50
005.3453502	345.00	350.00	25.00	2.50
005.3503551	350.00	355.00	15.00	2.50
005.3503552	350.00	355.00	25.00	2.50
005.3603651	**360.00**	**365.00**	**15.00**	**2.50**
005.3603652	**360.00**	**365.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



WEAR RINGS

BECA 006 Piston

DESCRIPTION

The BECA 006 profile is a machined guide ring with a 30° angle cut as standard made from filled PTFE or PE-UHMW, depending on the type of application. Embossed rings are also offered. The embossing is a set of lubricant pockets, which improves the friction. Other types of cuts can be made.

ADVANTAGES

Substantial and improved lubrication conditions through the tear structures
Very good friction coefficient; no stick-slip effect
Good wear resistance; very long life
Increased absorption of foreign particles
Good vibration absorption
No water absorption for the PE-UHMW

APPLICATIONS

Agriculture
Food & Beverage
Shock absorbers
Maintenance
Dry applications
Injection presses
Pneumatics
Presses
Robotics
Standard cylinders

MATERIALS

Bronze-filled PTFE
Carbon-filled PTFE
PE-UHMW

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	PTFE: -60°C / +150°C PE-UHMW: -60°C / +80°C
Speed	PTFE: 15 m/s PE-UHMW: 2 m/s
Media	Mineral hydraulic oils Biocompatible fluids Water Air Others (contact our experts)
Max. compression resistance	30 to 35 N/mm²
Radial loads in dynamic applications	Filled PTFE: 15 N/mm² at 25°C 12 N/mm² at 80°C 8 N/mm² at 120°C PE-UHMW: 25 N/mm² at 25°C 10 N/mm² at 80°C

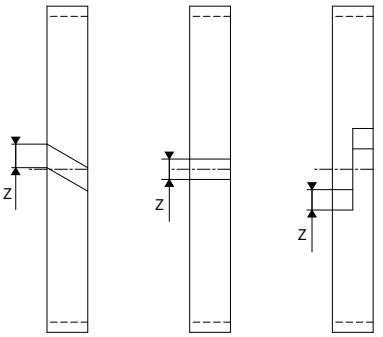
The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (ØD1 x Cr)

where:
H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
ØD1 = Bore diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



EXTRUSION GAPS

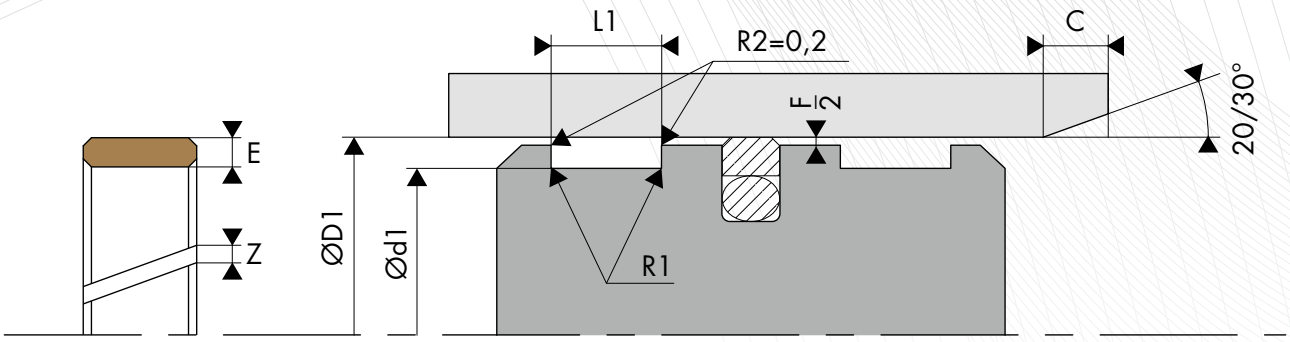
Bore diameter ØD1	Min. radial gap F/2 min	Max. radial gap F/2 max
8.0 - 20.0	0.20	0.30
21.00 - 100.0	0.25	0.40
101.0 - 250.0	0.30	0.60
251.0 - 500.0	0.40	0.80
501.0 - 1000.0	0.50	1.10
> 1000.0	0.50	1.20

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.05 - 0.2 µm	≤1.6 µm	≤3.2 µm
Rz	0.4 - 1.6 µm	≤6.3 µm	≤10.0 µm
Rmax	0.63 - 2.5 µm	≤10.0 µm	≤16.0 µm

RADIUS

Bore diameter ØD1	Radius R1
≤ 250.0	0.20
> 250.0	0.40



INSTALLATION DIMENSIONS

ISO 10766	Bore diameter	Groove diameter	Groove width	Seal thickness	Gap
	ØD1 H9	Ød1 h8	L1 0/+0.20	E	Z +/-0.50
*	8.0 - 20.0	D1 - 3.10	2.50	1.55	1.00
*	10.0 - 50.0	D1 - 3.10	4.00	1.55	1.00
*	16.0 - 140.0	D1 - 5.00	5.60	2.50	1.25
*	60.0 - 220.0	D1 - 5.00	9.70	2.50	1.25
*	130.0 - 400.0	D1 - 5.00	15.00	2.50	1.25
*	280.0 - 999.9	D1 - 5.00	25.00	2.50	1.25
*	280.0 - 999.9	D1 - 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Bronze-filled PTFE
Bore diameter ____ : ØD1 = 50.00 mm
Groove diameter __ : Ød1 + 45.00 mm
Groove width _____ : L1 = 5.60 mm
Part number_____ : 006.0500455

Part number - 006. 050 045 5

Family
Bore diameter
Groove diameter
Groove width

DIMENSIONS

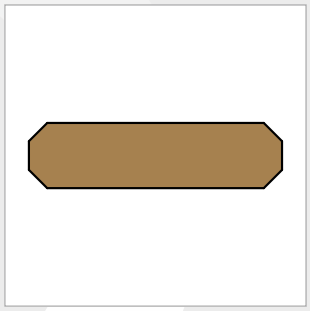
Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
006.0080494	8.00	4.90	4.00	1.55
006.0100694	10.00	6.90	4.00	1.55
006.0120894	12.00	8.90	4.00	1.55
006.0141094	14.00	10.90	4.00	1.55
006.0151194	15.00	11.90	4.00	1.55
006.0160115	**16.00**	**11.00**	**5.60**	**2.50**
006.0161294	**16.00**	**12.90**	**4.00**	**1.55**
006.0180135	18.00	13.00	5.60	2.50
006.0181494	18.00	14.90	4.00	1.55
006.0200155	**20.00**	**15.00**	**5.60**	**2.50**
006.0201694	**20.00**	**16.90**	**4.00**	**1.55**
006.0220175	22.00	17.00	5.60	2.50
006.0221894	22.00	18.90	4.00	1.55
006.0250205	**25.00**	**20.00**	**5.60**	**2.50**
006.0250209	25.00	20.00	9.70	2.50
006.0252194	**25.00**	**21.90**	**4.00**	**1.55**
006.0270225	27.00	22.00	5.60	2.50
006.0270229	27.00	22.00	9.70	2.50
006.0272394	27.00	23.90	4.00	1.55
006.0280235	28.00	23.00	5.60	2.50
006.0280239	28.00	23.00	9.70	2.50
006.0282494	28.00	24.90	4.00	1.55
006.0300255	30.00	25.00	5.60	2.50
006.0300259	30.00	25.00	9.70	2.50
006.0302694	30.00	26.90	4.00	1.55
006.0320275	**32.00**	**27.00**	**5.60**	**2.50**
006.0320279	32.00	27.00	9.70	2.50
006.0322894	**32.00**	**28.90**	**4.00**	**1.55**
006.0330285	33.00	28.00	5.60	2.50
006.0330289	33.00	28.00	9.70	2.50
006.0332994	33.00	29.90	4.00	1.55
006.0350305	35.00	30.00	5.60	2.50
006.0350309	35.00	30.00	9.70	2.50
006.0353194	35.00	31.90	4.00	1.55
006.0360315	36.00	31.00	5.60	2.50
006.0360319	36.00	31.00	9.70	2.50
006.0363294	36.00	32.90	4.00	1.55
006.0370325	37.00	32.00	5.60	2.50
006.0370329	37.00	32.00	9.70	2.50
006.0373394	37.00	33.90	4.00	1.55
006.0380335	38.00	33.00	5.60	2.50
006.0380339	38.00	33.00	9.70	2.50
006.0383494	38.00	34.90	4.00	1.55
006.0400355	**40.00**	**35.00**	**5.60**	**2.50**
006.0400359	40.00	35.00	9.70	2.50
006.0403694	**40.00**	**36.90**	**4.00**	**1.55**
006.0410365	41.00	36.00	5.60	2.50
006.0410369	41.00	36.00	9.70	2.50
006.0413794	41.00	37.90	4.00	1.55
006.0420375	42.00	37.00	5.60	2.50
006.0420379	42.00	37.00	9.70	2.50
006.0423894	42.00	38.90	4.00	1.55
006.0450405	45.00	40.00	5.60	2.50
006.0450409	45.00	40.00	9.70	2.50
006.0454194	45.00	41.90	4.00	1.55
006.0480435	48.00	43.00	5.60	2.50
006.0480439	48.00	43.00	9.70	2.50
006.0484494	48.00	44.90	4.00	1.55
006.0500455	**50.00**	**45.00**	**5.60**	**2.50**
006.0500459	50.00	45.00	9.70	2.50
006.0504694	**50.00**	**46.90**	**4.00**	**1.55**
006.0520475	52.00	47.00	5.60	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
006.0520479	52.00	47.00	9.70	2.50
006.0550505	55.00	50.00	5.60	2.50
006.0550509	55.00	50.00	9.70	2.50
006.0580535	58.00	53.00	5.60	2.50
006.0580539	58.00	53.00	9.70	2.50
006.0600555	60.00	55.00	5.60	2.50
006.0600559	60.00	55.00	9.70	2.50
006.0610565	61.00	56.00	5.60	2.50
006.0610569	61.00	56.00	9.70	2.50
006.0630585	**63.00**	**58.00**	**5.60**	**2.50**
006.0630589	**63.00**	**58.00**	**9.70**	**2.50**
006.0650605	65.00	60.00	5.60	2.50
006.0650609	65.00	60.00	9.70	2.50
006.0680635	68.00	63.00	5.60	2.50
006.0680639	68.00	63.00	9.70	2.50
006.0700655	70.00	65.00	5.60	2.50
006.0700659	70.00	65.00	9.70	2.50
006.0720675	72.00	67.00	5.60	2.50
006.0720679	72.00	67.00	9.70	2.50
006.0750705	75.00	70.00	5.60	2.50
006.0750709	75.00	70.00	9.70	2.50
006.0780735	78.00	73.00	5.60	2.50
006.0780739	78.00	73.00	9.70	2.50
006.0800755	**80.00**	**75.00**	**5.60**	**2.50**
006.0800759	**80.00**	**75.00**	**9.70**	**2.50**
006.0850805	85.00	80.00	5.60	2.50
006.0850809	85.00	80.00	9.70	2.50
006.0900855	90.00	85.00	5.60	2.50
006.0900859	90.00	85.00	9.70	2.50
006.0950905	95.00	90.00	5.60	2.50
006.0950909	95.00	90.00	9.70	2.50
006.1000955	**100.00**	**95.00**	**5.60**	**2.50**
006.1000959	**100.00**	**95.00**	**9.70**	**2.50**
006.1051005	105.00	100.00	5.60	2.50
006.1051009	105.00	100.00	9.70	2.50
006.1101055	110.00	105.00	5.60	2.50
006.1101059	110.00	105.00	9.70	2.50
006.1151105	115.00	110.00	5.60	2.50
006.1151109	115.00	110.00	9.70	2.50
006.1201155	120.00	115.00	5.60	2.50
006.1201159	120.00	115.00	9.70	2.50
006.1251205	**125.00**	**120.00**	**5.60**	**2.50**
006.1251209	**125.00**	**120.00**	**9.70**	**2.50**
006.1251202	125.00	120.00	25.00	2.50
006.1301259	130.00	125.00	9.70	2.50
006.1301252	130.00	125.00	25.00	2.50
006.1351309	135.00	130.00	9.70	2.50
006.1351302	135.00	130.00	25.00	2.50
006.1401359	**140.00**	**135.00**	**9.70**	**2.50**
006.1401352	140.00	135.00	25.00	2.50
006.1451409	145.00	140.00	9.70	2.50
006.1451402	145.00	140.00	25.00	2.50
006.1501459	150.00	145.00	9.70	2.50
006.1501452	150.00	145.00	25.00	2.50
006.1551509	155.00	150.00	9.70	2.50
006.1551502	155.00	150.00	25.00	2.50
006.1601559	**160.00**	**155.00**	**9.70**	**2.50**
006.1601552	160.00	155.00	25.00	2.50
006.1651609	165.00	160.00	9.70	2.50
006.1651602	165.00	160.00	25.00	2.50
006.1701659	170.00	165.00	9.70	2.50
006.1701652	170.00	165.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
006.1751709	175.00	170.00	9.70	2.50
006.1751702	175.00	170.00	25.00	2.50
006.1801759	**180.00**	**175.00**	**9.70**	**2.50**
006.1801751	**180.00**	**175.00**	**15.00**	**2.50**
006.1801752	180.00	175.00	25.00	2.50
006.1851809	185.00	180.00	9.70	2.50
006.1851801	185.00	180.00	15.00	2.50
006.1851802	185.00	180.00	25.00	2.50
006.1901859	190.00	185.00	9.70	2.50
006.1901851	190.00	185.00	15.00	2.50
006.1901852	190.00	185.00	25.00	2.50
006.1951909	195.00	190.00	9.70	2.50
006.1951901	195.00	190.00	15.00	2.50
006.1951902	195.00	190.00	25.00	2.50
006.2001959	**200.00**	**195.00**	**9.70**	**2.50**
006.2001951	**200.00**	**195.00**	**15.00**	**2.50**
006.2001952	200.00	195.00	25.00	2.50
006.2052009	205.00	200.00	9.70	2.50
006.2052001	205.00	200.00	15.00	2.50
006.2052002	205.00	200.00	25.00	2.50
006.2102059	210.00	205.00	9.70	2.50
006.2102051	210.00	205.00	15.00	2.50
006.2102052	210.00	205.00	25.00	2.50
006.2152109	215.00	210.00	9.70	2.50
006.2152101	215.00	210.00	15.00	2.50
006.2152102	215.00	210.00	25.00	2.50
006.2202159	**220.00**	**215.00**	**9.70**	**2.50**
006.2202151	**220.00**	**215.00**	**15.00**	**2.50**
006.2202152	220.00	215.00	25.00	2.50
006.2252209	225.00	220.00	9.70	2.50
006.2252201	225.00	220.00	15.00	2.50
006.2252202	225.00	220.00	25.00	2.50
006.2302259	230.00	225.00	9.70	2.50
006.2302251	230.00	225.00	15.00	2.50
006.2302252	230.00	225.00	25.00	2.50
006.2352309	235.00	230.00	9.70	2.50
006.2352301	235.00	230.00	15.00	2.50
006.2352302	235.00	230.00	25.00	2.50
006.2402359	240.00	235.00	9.70	2.50
006.2402351	240.00	235.00	15.00	2.50
006.2402352	240.00	235.00	25.00	2.50
006.2452409	245.00	240.00	9.70	2.50
006.2452401	245.00	240.00	15.00	2.50
006.2452402	245.00	240.00	25.00	2.50
006.2502459	**250.00**	**245.00**	**9.70**	**2.50**
006.2502451	**250.00**	**245.00**	**15.00**	**2.50**
006.2502452	250.00	245.00	25.00	2.50
006.2552501	255.00	250.00	15.00	2.50
006.2552502	255.00	250.00	25.00	2.50
006.2602551	260.00	255.00	15.00	2.50
006.2602552	260.00	255.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
006.2652601	265.00	260.00	15.00	2.50
006.2652602	265.00	260.00	25.00	2.50
006.2702651	270.00	265.00	15.00	2.50
006.2702652	270.00	265.00	25.00	2.50
006.2752701	275.00	270.00	15.00	2.50
006.2752702	275.00	270.00	25.00	2.50
006.2802751	**280.00**	**275.00**	**15.00**	**2.50**
006.2802752	**280.00**	**275.00**	**25.00**	**2.50**
006.2852801	285.00	280.00	15.00	2.50
006.2852802	285.00	280.00	25.00	2.50
006.2902851	290.00	285.00	15.00	2.50
006.2902852	290.00	285.00	25.00	2.50
006.2952901	295.00	290.00	15.00	2.50
006.2952902	295.00	290.00	25.00	2.50
006.3002951	300.00	295.00	15.00	2.50
006.3002952	300.00	295.00	25.00	2.50
006.3053001	305.00	300.00	15.00	2.50
006.3053002	305.00	300.00	25.00	2.50
006.3103051	310.00	305.00	15.00	2.50
006.3103052	310.00	305.00	25.00	2.50
006.3153101	315.00	310.00	15.00	2.50
006.3153102	315.00	310.00	25.00	2.50
006.3203151	**320.00**	**315.00**	**15.00**	**2.50**
006.3203152	**320.00**	**315.00**	**25.00**	**2.50**
006.3253201	325.00	320.00	15.00	2.50
006.3253202	325.00	320.00	25.00	2.50
006.3303251	330.00	325.00	15.00	2.50
006.3303252	330.00	325.00	25.00	2.50
006.3353301	335.00	330.00	15.00	2.50
006.3353302	335.00	330.00	25.00	2.50
006.3403351	340.00	335.00	15.00	2.50
006.3403352	340.00	335.00	25.00	2.50
006.3453401	345.00	340.00	15.00	2.50
006.3453402	345.00	340.00	25.00	2.50
006.3503451	350.00	345.00	15.00	2.50
006.3503452	350.00	345.00	25.00	2.50
006.3603551	**360.00**	**355.00**	**15.00**	**2.50**
006.3603552	**360.00**	**355.00**	**25.00**	**2.50**
006.3703651	370.00	365.00	15.00	2.50
006.3703652	370.00	365.00	25.00	2.50
006.3803751	380.00	375.00	15.00	2.50
006.3803752	380.00	375.00	25.00	2.50
006.3903851	390.00	385.00	15.00	2.50
006.3903852	390.00	385.00	25.00	2.50
006.4003951	**400.00**	**395.00**	**15.00**	**2.50**
006.4003952	**400.00**	**395.00**	**25.00**	**2.50**
006.4504451	**450.00**	**445.00**	**15.00**	**2.50**
006.4504452	**450.00**	**445.00**	**25.00**	**2.50**
006.5004951	**500.00**	**495.00**	**15.00**	**2.50**
006.5004952	**500.00**	**495.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the bore diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



WEAR RINGS

BECA 006 Rod

DESCRIPTION

The BECA 006 profile is a machined guide ring with a 30° angle cut as standard made from filled PTFE or PE-UHMW, depending on the type of application. Embossed rings are also offered. The embossing is a set of lubricant pockets, which improves the friction. Other types of cuts can be made.

ADVANTAGES

Substantial and improved lubrication conditions through the tear structures

Very good friction coefficient; no stick-slip effect

Good wear resistance; very long life

Increased absorption of foreign particles

Good vibration absorption

No water absorption for the PE-UHMW

APPLICATIONS

Agriculture
Food & Beverage
Shock absorbers
Maintenance
Dry applications
Injection presses
Pneumatics
Presses
Robotics
Standard cylinders

MATERIALS

Bronze-filled PTFE
Carbon-filled PTFE
PE-UHMW

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	PTFE: -60°C / +150°C PE-UHMW: -60°C / +80°C
Speed	PTFE: 15 m/s PE-UHMW: 2 m/s
Media	Mineral hydraulic oils Biocompatible fluids Water Air Others (contact our experts)
Max. compression resistance	30 to 35 N/mm²
Radial loads in dynamic applications	Filled PTFE: 15 N/mm² at 25°C 12 N/mm² at 80°C 8 N/mm² at 120°C PE-UHMW: 25 N/mm² at 25°C 10 N/mm² at 80°C

The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

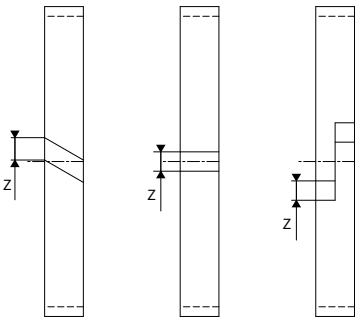
WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (Ød1 x Cr)

where:

H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
Ød1 = Rod diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



Angle cut 30° | Straight cut | Special step cut

EXTRUSION GAPS

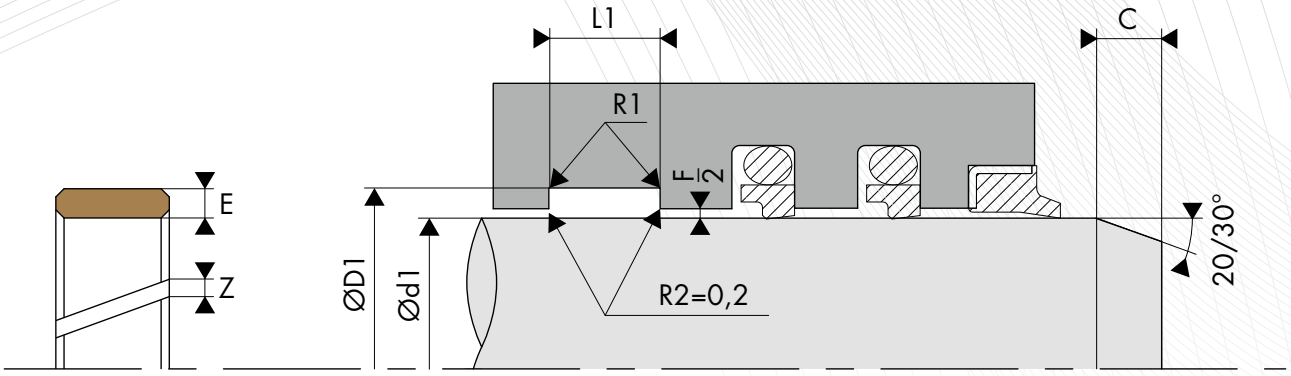
Rod diameter Ød1	Min. radial gap F/2 min	Max. radial gap F/2 min
8.0 - 20.0	0.20	0.30
21.0 - 100.0	0.25	0.40
101.0 - 250.0	0.30	0.60
251.0 - 500.0	0.40	0.80
501.0 - 1000.0	0.50	1.10
> 1000.0	0.50	1.20

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.05 - 0.2 µm	≤1.6 µm	≤3.2 µm
Rz	0.4 - 1.6 µm	≤6.3 µm	≤10.0 µm
Rmax	0.63 - 2.5 µm	≤10.0 µm	≤16.0 µm

RADIUS

Rod diameter Ød1	Radius R1
≤ 250.0	0.20
> 250.0	0.40



INSTALLATION DIMENSIONS

ISO 10766	Rod diameter	Groove diameter	Groove width	Seal thickness	Gap
	Ød1 f8/h9	ØD1 H8	L1 0/+0.20	E	Z +/-0.50
*	8.0 - 20.0	d1 + 3.10	2.50	1.55	1.00
*	10.0 - 50.0	d1 + 3.10	4.00	1.55	1.00
*	15.0 - 140.0	d1 + 5.00	5.60	2.50	1.25
*	20.0 - 220.0	d1 + 5.00	9.70	2.50	1.25
*	80.0 - 400.0	d1 + 5.00	15.00	2.50	1.25
*	200.0 - 999.9	d1 + 5.00	25.00	2.50	1.25
*	280.0 - 999.9	d1 + 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Bronze-filled PTFE
Rod diameter _____ : d1 = 50.00 mm
Groove diameter __ : D1 = 55.00 mm
Groove width _____ : L1 = 5.60 mm
Part number_____ : 006.0500555

* The codes that define the materials are set out in the materials table.

Part number - 006. 050 055 5

Family
Rod diameter
Groove diameter
Groove width

DIMENSIONS

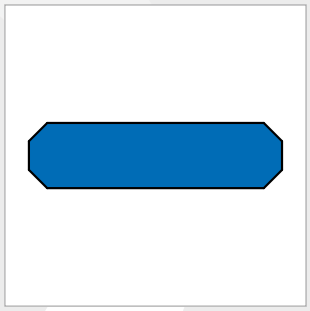
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
006.0081114	8.00	11.10	4.00	1.55
006.0101314	10.00	13.10	4.00	1.55
006.0121514	**12.00**	**15.10**	**4.00**	**1.55**
006.0141714	**14.00**	**17.10**	**4.00**	**1.55**
006.0151814	15.00	18.10	4.00	1.55
006.0161914	**16.00**	**19.10**	**4.00**	**1.55**
006.0182114	**18.00**	**21.10**	**4.00**	**1.55**
006.0202314	**20.00**	**23.10**	**4.00**	**1.55**
006.0222514	**22.00**	**25.10**	**4.00**	**1.55**
006.0252814	**25.00**	**28.10**	**4.00**	**1.55**
006.0250305	**25.00**	**30.00**	**5.60**	**2.50**
006.0273014	27.00	30.10	4.00	1.55
006.0270325	27.00	32.00	5.60	2.50
006.0283114	**28.00**	**31.10**	**4.00**	**1.55**
006.0280335	**28.00**	**33.00**	**5.60**	**2.50**
006.0303314	30.00	33.10	4.00	1.55
006.0300355	30.00	35.00	5.60	2.50
006.0300359	30.00	35.00	9.70	2.50
006.0323514	32.00	35.10	4.00	1.55
006.0320375	**32.00**	**37.00**	**5.60**	**2.50**
006.0320379	**32.00**	**37.00**	**9.70**	**2.50**
006.0333614	33.00	36.10	4.00	1.55
006.0330385	33.00	38.00	5.60	2.50
006.0330389	33.00	38.00	9.70	2.50
006.0353814	35.00	38.10	4.00	1.55
006.0350405	35.00	40.00	5.60	2.50
006.0350409	35.00	40.00	9.70	2.50
006.0363914	36.00	39.10	4.00	1.55
006.0360415	**36.00**	**41.00**	**5.60**	**2.50**
006.0360419	**36.00**	**41.00**	**9.70**	**2.50**
006.0374014	37.00	40.10	4.00	1.55
006.0370425	37.00	42.00	5.60	2.50
006.0370429	37.00	42.00	9.70	2.50
006.0384114	38.00	41.10	4.00	1.55
006.0380435	38.00	43.00	5.60	2.50
006.0380439	38.00	43.00	9.70	2.50
006.0404314	40.00	43.10	4.00	1.55
006.0400455	**40.00**	**45.00**	**5.60**	**2.50**
006.0400459	**40.00**	**45.00**	**9.70**	**2.50**
006.0414414	41.00	44.10	4.00	1.55
006.0410465	41.00	46.00	5.60	2.50
006.0410469	41.00	46.00	9.70	2.50
006.0424514	42.00	45.10	4.00	1.55
006.0420475	42.00	47.00	5.60	2.50
006.0420479	42.00	47.00	9.70	2.50
006.0454814	45.00	48.10	4.00	1.55
006.0450505	**45.00**	**50.00**	**5.60**	**2.50**
006.0450509	**45.00**	**50.00**	**9.70**	**2.50**
006.0485114	48.00	51.10	4.00	1.55
006.0480535	48.00	53.00	5.60	2.50
006.0480539	48.00	53.00	9.70	2.50
006.0505314	50.00	53.10	4.00	1.55
006.0500555	**50.00**	**55.00**	**5.60**	**2.50**
006.0500559	**50.00**	**55.00**	**9.70**	**2.50**
006.0520575	52.00	57.00	5.60	2.50
006.0520579	52.00	57.00	9.70	2.50
006.0550605	55.00	60.00	5.60	2.50
006.0550609	55.00	60.00	9.70	2.50
006.0580635	58.00	63.00	5.60	2.50
006.0580639	58.00	63.00	9.70	2.50
006.0600655	60.00	65.00	5.60	2.50
006.0600659	60.00	65.00	9.70	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
006.0610665	61.00	66.00	5.60	2.50
006.0610669	61.00	66.00	9.70	2.50
006.0630685	**63.00**	**68.00**	**5.60**	**2.50**
006.0630689	**63.00**	**68.00**	**9.70**	**2.50**
006.0650705	65.00	70.00	5.60	2.50
006.0650709	65.00	70.00	9.70	2.50
006.0680735	68.00	73.00	5.60	2.50
006.0680739	68.00	73.00	9.70	2.50
006.0700755	**70.00**	**75.00**	**5.60**	**2.50**
006.0700759	**70.00**	**75.00**	**9.70**	**2.50**
006.0720779	72.00	77.00	9.70	2.50
006.0750809	75.00	80.00	9.70	2.50
006.0780839	78.00	83.00	9.70	2.50
006.0800859	**80.00**	**85.00**	**9.70**	**2.50**
006.0800851	**80.00**	**85.00**	**15.00**	**2.50**
006.0850909	85.00	90.00	9.70	2.50
006.0850901	85.00	90.00	15.00	2.50
006.0900959	**90.00**	**95.00**	**9.70**	**2.50**
006.0900951	**90.00**	**95.00**	**15.00**	**2.50**
006.0951009	95.00	100.00	9.70	2.50
006.0951001	95.00	100.00	15.00	2.50
006.1001059	**100.00**	**105.00**	**9.70**	**2.50**
006.1001051	**100.00**	**105.00**	**15.00**	**2.50**
006.1051109	105.00	110.00	9.70	2.50
006.1051101	105.00	110.00	15.00	2.50
006.1101159	**110.00**	**115.00**	**9.70**	**2.50**
006.1101151	**110.00**	**115.00**	**15.00**	**2.50**
006.1151209	115.00	120.00	9.70	2.50
006.1151201	115.00	120.00	15.00	2.50
006.1201259	120.00	125.00	9.70	2.50
006.1201251	120.00	125.00	15.00	2.50
006.1251309	**125.00**	**130.00**	**9.70**	**2.50**
006.1251301	**125.00**	**130.00**	**15.00**	**2.50**
006.1301359	130.00	135.00	9.70	2.50
006.1301351	130.00	135.00	15.00	2.50
006.1351409	135.00	140.00	9.70	2.50
006.1351401	135.00	140.00	15.00	2.50
006.1401459	**140.00**	**145.00**	**9.70**	**2.50**
006.1401451	**140.00**	**145.00**	**15.00**	**2.50**
006.1451509	145.00	150.00	9.70	2.50
006.1451501	145.00	150.00	15.00	2.50
006.1501559	150.00	155.00	9.70	2.50
006.1501551	150.00	155.00	15.00	2.50
006.1551609	155.00	160.00	9.70	2.50
006.1551601	155.00	160.00	15.00	2.50
006.1601659	**160.00**	**165.00**	**9.70**	**2.50**
006.1601651	**160.00**	**165.00**	**15.00**	**2.50**
006.1651709	165.00	170.00	9.70	2.50
006.1651701	165.00	170.00	15.00	2.50
006.1701759	170.00	175.00	9.70	2.50
006.1701751	170.00	175.00	15.00	2.50
006.1751809	175.00	180.00	9.70	2.50
006.1751801	175.00	180.00	15.00	2.50
006.1801859	**180.00**	**185.00**	**9.70**	**2.50**
006.1801851	**180.00**	**185.00**	**15.00**	**2.50**
006.1851909	185.00	190.00	9.70	2.50
006.1851901	185.00	190.00	15.00	2.50
006.1901959	190.00	195.00	9.70	2.50
006.1901951	190.00	195.00	15.00	2.50
006.1952009	195.00	200.00	9.70	2.50
006.1952001	195.00	200.00	15.00	2.50
006.2002059	200.00	205.00	9.70	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
006.2002051	**200.00**	**205.00**	**15.00**	**2.50**
006.2002052	**200.00**	**205.00**	**25.00**	**2.50**
006.2052101	205.00	210.00	15.00	2.50
006.2052102	205.00	210.00	25.00	2.50
006.2102151	210.00	215.00	15.00	2.50
006.2102152	210.00	215.00	25.00	2.50
006.2152201	215.00	220.00	15.00	2.50
006.2152202	215.00	220.00	25.00	2.50
006.2202251	**220.00**	**225.00**	**15.00**	**2.50**
006.2202252	**220.00**	**225.00**	**25.00**	**2.50**
006.2252301	225.00	230.00	15.00	2.50
006.2252302	225.00	230.00	25.00	2.50
006.2302351	230.00	235.00	15.00	2.50
006.2302352	230.00	235.00	25.00	2.50
006.2352401	235.00	240.00	15.00	2.50
006.2352402	235.00	240.00	25.00	2.50
006.2402451	240.00	245.00	15.00	2.50
006.2402452	240.00	245.00	25.00	2.50
006.2452501	245.00	250.00	15.00	2.50
006.2452502	245.00	250.00	25.00	2.50
006.2502551	**250.00**	**255.00**	**15.00**	**2.50**
006.2502552	**250.00**	**255.00**	**25.00**	**2.50**
006.2552601	255.00	260.00	15.00	2.50
006.2552602	255.00	260.00	25.00	2.50
006.2602651	260.00	265.00	15.00	2.50
006.2602652	260.00	265.00	25.00	2.50
006.2652701	265.00	270.00	15.00	2.50
006.2652702	265.00	270.00	25.00	2.50
006.2702751	270.00	275.00	15.00	2.50
006.2702752	270.00	275.00	25.00	2.50
006.2752801	275.00	280.00	15.00	2.50
006.2752802	275.00	280.00	25.00	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
006.2802851	**280.00**	**285.00**	**15.00**	**2.50**
006.2802852	**280.00**	**285.00**	**25.00**	**2.50**
006.2852901	285.00	290.00	15.00	2.50
006.2852902	285.00	290.00	25.00	2.50
006.2902951	290.00	295.00	15.00	2.50
006.2902952	290.00	295.00	25.00	2.50
006.2953001	295.00	300.00	15.00	2.50
006.2953002	295.00	300.00	25.00	2.50
006.3003051	300.00	305.00	15.00	2.50
006.3003052	300.00	305.00	25.00	2.50
006.3053101	305.00	310.00	15.00	2.50
006.3053102	305.00	310.00	25.00	2.50
006.3103151	310.00	315.00	15.00	2.50
006.3103152	310.00	315.00	25.00	2.50
006.3153201	315.00	320.00	15.00	2.50
006.3153202	315.00	320.00	25.00	2.50
006.3203251	**320.00**	**325.00**	**15.00**	**2.50**
006.3203252	**320.00**	**325.00**	**25.00**	**2.50**
006.3253301	325.00	330.00	15.00	2.50
006.3253302	325.00	330.00	25.00	2.50
006.3303351	330.00	335.00	15.00	2.50
006.3303352	330.00	335.00	25.00	2.50
006.3353401	335.00	340.00	15.00	2.50
006.3353402	335.00	340.00	25.00	2.50
006.3403451	340.00	345.00	15.00	2.50
006.3403452	340.00	345.00	25.00	2.50
006.3453501	345.00	350.00	15.00	2.50
006.3453502	345.00	350.00	25.00	2.50
006.3503551	350.00	355.00	15.00	2.50
006.3503552	350.00	355.00	25.00	2.50
006.3603651	**360.00**	**365.00**	**15.00**	**2.50**
006.3603652	**360.00**	**365.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



WEAR RINGS

BECA 007 Piston

DESCRIPTION

The BECA 007 Piston profile is a machined guide ring with a 30° angle cut as standard, made from glass-filled PTFE. Other types of cuts can be made.

ADVANTAGES

Great compression resistance
Great wear resistance
Water absorption limited to 0.2%
Good stiffness

APPLICATIONS

Lifting trucks
Construction equipment
Agricultural machinery
Standard cylinders

MATERIALS

Polyoxymethylene - POM

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	-50°C / +115°C
Speed	1 m/s
Max. compression resistance	170 N/mm²
Radial loads in dynamic applications	40 N/mm² at 25°C 25 N/mm² > 60°C

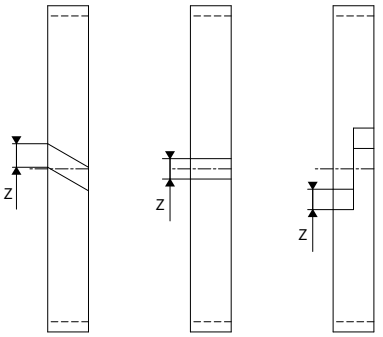
The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (ØD1 x Cr)

where:
H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
ØD1 = Bore diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



EXTRUSION GAPS

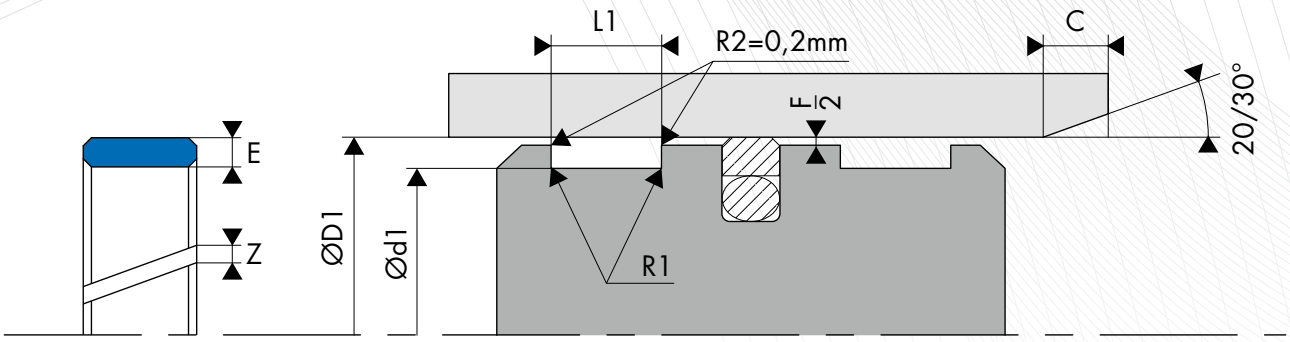
Bore diameter ØD1	Radial gap F/2	
8.0 - 20.0	0.20	0.30
21.0 - 100.0	0.25	0.40
101.0 - 250.0	0.30	0.60
251.0 - 300.0	0.40	0.80
301.0 - 500.0	0.40	0.80

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 µm	≤1.6 µm	≤3.2 µm
Rz	0.63 - 2.5 µm	≤6.3 µm	≤10.0 µm
Rmax	1.0 - 4.0 µm	≤10.0 µm	≤16.0 µm

RADIUS

Bore diameter ØD1	Radius R1
8.0 - 250.0	0.20
> 250.0	0.40



INSTALLATION DIMENSIONS

ISO 10766	Bore diameter	Groove diameter	Groove width	Seal thickness	End Gap
	ØD1 H9	Ød1 h8	L1 0/+0.20	E	Z +/-0.50
*	10.0 - 50.0	D1 - 3.10	4.00	1.55	1.00
*	16.0 - 140.0	D1 - 5.00	5.60	2.50	1.25
*	60.0 - 220.0	D1 - 5.00	9.70	2.50	1.25
*	130.0 - 500.0	D1 - 5.00	15.00	2.50	1.25
*	280.0 - 500.0	D1 - 5.00	25.00	2.50	1.25
*	280.0 - 500.0	D1 - 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Polyoxymethylene (POM)
Bore diameter ____ : D1 = 50.00 mm
Groove diameter __ : d1 = 45.00 mm
Groove width _____ : L1 = 5.60 mm
Part number_____ : 007.0500455

* The codes that define the materials are set out in the materials table.

Part number - 007. 050 045 5

Family
Bore diameter
Groove diameter
Groove width

DIMENSIONS

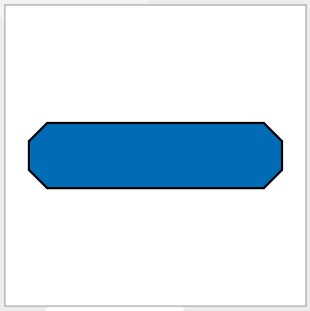
Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
007.0080494	8.00	4.90	4.00	1.55
007.0100694	10.00	6.90	4.00	1.55
007.0120894	12.00	8.90	4.00	1.55
007.0141094	14.00	10.90	4.00	1.55
007.0151194	15.00	11.90	4.00	1.55
007.0160115	**16.00**	**11.00**	**5.60**	**2.50**
007.0161294	**16.00**	**12.90**	**4.00**	**1.55**
007.0180135	18.00	13.00	5.60	2.50
007.0181494	18.00	14.90	4.00	1.55
007.0200155	**20.00**	**15.00**	**5.60**	**2.50**
007.0201694	**20.00**	**16.90**	**4.00**	**1.55**
007.0220175	22.00	17.00	5.60	2.50
007.0221894	22.00	18.90	4.00	1.55
007.0250205	**25.00**	**20.00**	**5.60**	**2.50**
007.0250209	25.00	20.00	9.70	2.50
007.0252194	**25.00**	**21.90**	**4.00**	**1.55**
007.0270225	27.00	22.00	5.60	2.50
007.0270229	27.00	22.00	9.70	2.50
007.0272394	27.00	23.90	4.00	1.55
007.0280235	28.00	23.00	5.60	2.50
007.0280239	28.00	23.00	9.70	2.50
007.0282494	28.00	24.90	4.00	1.55
007.0300255	30.00	25.00	5.60	2.50
007.0300259	30.00	25.00	9.70	2.50
007.0302694	30.00	26.90	4.00	1.55
007.0320275	**32.00**	**27.00**	**5.60**	**2.50**
007.0320279	32.00	27.00	9.70	2.50
007.0322894	**32.00**	**28.90**	**4.00**	**1.55**
007.0330285	33.00	28.00	5.60	2.50
007.0330289	33.00	28.00	9.70	2.50
007.0332994	33.00	29.90	4.00	1.55
007.0350305	35.00	30.00	5.60	2.50
007.0350309	35.00	30.00	9.70	2.50
007.0353194	35.00	31.90	4.00	1.55
007.0360315	36.00	31.00	5.60	2.50
007.0360319	36.00	31.00	9.70	2.50
007.0363294	36.00	32.90	4.00	1.55
007.0370325	37.00	32.00	5.60	2.50
007.0370329	37.00	32.00	9.70	2.50
007.0373394	37.00	33.90	4.00	1.55
007.0380335	38.00	33.00	5.60	2.50
007.0380339	38.00	33.00	9.70	2.50
007.0383494	38.00	34.90	4.00	1.55
007.0400355	**40.00**	**35.00**	**5.60**	**2.50**
007.0400359	40.00	35.00	9.70	2.50
007.0403694	**40.00**	**36.90**	**4.00**	**1.55**
007.0410365	41.00	36.00	5.60	2.50
007.0410369	41.00	36.00	9.70	2.50
007.0413794	41.00	37.90	4.00	1.55
007.0420375	42.00	37.00	5.60	2.50
007.0420379	42.00	37.00	9.70	2.50
007.0423894	42.00	38.90	4.00	1.55
007.0450405	45.00	40.00	5.60	2.50
007.0450409	45.00	40.00	9.70	2.50
007.0454194	45.00	41.90	4.00	1.55
007.0480435	48.00	43.00	5.60	2.50
007.0480439	48.00	43.00	9.70	2.50
007.0484494	48.00	44.90	4.00	1.55
007.0500455	**50.00**	**45.00**	**5.60**	**2.50**
007.0500459	50.00	45.00	9.70	2.50
007.0504694	**50.00**	**46.90**	**4.00**	**1.55**
007.0520475	52.00	47.00	5.60	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
007.0520479	52.00	47.00	9.70	2.50
007.0550505	55.00	50.00	5.60	2.50
007.0550509	55.00	50.00	9.70	2.50
007.0580535	58.00	53.00	5.60	2.50
007.0580539	58.00	53.00	9.70	2.50
007.0600555	60.00	55.00	5.60	2.50
007.0600559	60.00	55.00	9.70	2.50
007.0610565	61.00	56.00	5.60	2.50
007.0610569	61.00	56.00	9.70	2.50
007.0630585	**63.00**	**58.00**	**5.60**	**2.50**
007.0630589	**63.00**	**58.00**	**9.70**	**2.50**
007.0650605	65.00	60.00	5.60	2.50
007.0650609	65.00	60.00	9.70	2.50
007.0680635	68.00	63.00	5.60	2.50
007.0680639	68.00	63.00	9.70	2.50
007.0700655	70.00	65.00	5.60	2.50
007.0700659	70.00	65.00	9.70	2.50
007.0720675	72.00	67.00	5.60	2.50
007.0720679	72.00	67.00	9.70	2.50
007.0750705	75.00	70.00	5.60	2.50
007.0750709	75.00	70.00	9.70	2.50
007.0780735	78.00	73.00	5.60	2.50
007.0780739	78.00	73.00	9.70	2.50
007.0800755	**80.00**	**75.00**	**5.60**	**2.50**
007.0800759	**80.00**	**75.00**	**9.70**	**2.50**
007.0850805	85.00	80.00	5.60	2.50
007.0850809	85.00	80.00	9.70	2.50
007.0900855	90.00	85.00	5.60	2.50
007.0900859	90.00	85.00	9.70	2.50
007.0950905	95.00	90.00	5.60	2.50
007.0950909	95.00	90.00	9.70	2.50
007.1000955	**100.00**	**95.00**	**5.60**	**2.50**
007.1000959	**100.00**	**95.00**	**9.70**	**2.50**
007.1051005	105.00	100.00	5.60	2.50
007.1051009	105.00	100.00	9.70	2.50
007.1101055	110.00	105.00	5.60	2.50
007.1101059	110.00	105.00	9.70	2.50
007.1151105	115.00	110.00	5.60	2.50
007.1151109	115.00	110.00	9.70	2.50
007.1201155	120.00	115.00	5.60	2.50
007.1201159	120.00	115.00	9.70	2.50
007.1251205	**125.00**	**120.00**	**5.60**	**2.50**
007.1251209	**125.00**	**120.00**	**9.70**	**2.50**
007.1251202	125.00	120.00	25.00	2.50
007.1301259	130.00	125.00	9.70	2.50
007.1301252	130.00	125.00	25.00	2.50
007.1351309	135.00	130.00	9.70	2.50
007.1351302	135.00	130.00	25.00	2.50
007.1401359	**140.00**	**135.00**	**9.70**	**2.50**
007.1401352	140.00	135.00	25.00	2.50
007.1451409	145.00	140.00	9.70	2.50
007.1451402	145.00	140.00	25.00	2.50
007.1501459	150.00	145.00	9.70	2.50
007.1501452	150.00	145.00	25.00	2.50
007.1551509	155.00	150.00	9.70	2.50
007.1551502	155.00	150.00	25.00	2.50
007.1601559	**160.00**	**155.00**	**9.70**	**2.50**
007.1601552	160.00	155.00	25.00	2.50
007.1651609	165.00	160.00	9.70	2.50
007.1651602	165.00	160.00	25.00	2.50
007.1701659	170.00	165.00	9.70	2.50
007.1701652	170.00	165.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
007.1751709	175.00	170.00	9.70	2.50
007.1751702	175.00	170.00	25.00	2.50
007.1801759	**180.00**	**175.00**	**9.70**	**2.50**
007.1801751	**180.00**	**175.00**	**15.00**	**2.50**
007.1801752	180.00	175.00	25.00	2.50
007.1851809	185.00	180.00	9.70	2.50
007.1851801	185.00	180.00	15.00	2.50
007.1851802	185.00	180.00	25.00	2.50
007.1901859	190.00	185.00	9.70	2.50
007.1901851	190.00	185.00	15.00	2.50
007.1901852	190.00	185.00	25.00	2.50
007.1951909	195.00	190.00	9.70	2.50
007.1951901	195.00	190.00	15.00	2.50
007.1951902	195.00	190.00	25.00	2.50
007.2001959	**200.00**	**195.00**	**9.70**	**2.50**
007.2001951	**200.00**	**195.00**	**15.00**	**2.50**
007.2001952	200.00	195.00	25.00	2.50
007.2052009	205.00	200.00	9.70	2.50
007.2052001	205.00	200.00	15.00	2.50
007.2052002	205.00	200.00	25.00	2.50
007.2102059	210.00	205.00	9.70	2.50
007.2102051	210.00	205.00	15.00	2.50
007.2102052	210.00	205.00	25.00	2.50
007.2152109	215.00	210.00	9.70	2.50
007.2152101	215.00	210.00	15.00	2.50
007.2152102	215.00	210.00	25.00	2.50
007.2202159	**220.00**	**215.00**	**9.70**	**2.50**
007.2202151	**220.00**	**215.00**	**15.00**	**2.50**
007.2202152	220.00	215.00	25.00	2.50
007.2252209	225.00	220.00	9.70	2.50
007.2252201	225.00	220.00	15.00	2.50
007.2252202	225.00	220.00	25.00	2.50
007.2302259	230.00	225.00	9.70	2.50
007.2302251	230.00	225.00	15.00	2.50
007.2302252	230.00	225.00	25.00	2.50
007.2352309	235.00	230.00	9.70	2.50
007.2352301	235.00	230.00	15.00	2.50
007.2352302	235.00	230.00	25.00	2.50
007.2402359	240.00	235.00	9.70	2.50
007.2402351	240.00	235.00	15.00	2.50
007.2402352	240.00	235.00	25.00	2.50
007.2452409	245.00	240.00	9.70	2.50
007.2452401	245.00	240.00	15.00	2.50
007.2452402	245.00	240.00	25.00	2.50
007.2502459	**250.00**	**245.00**	**9.70**	**2.50**
007.2502451	**250.00**	**245.00**	**15.00**	**2.50**
007.2502452	250.00	245.00	25.00	2.50
007.2552501	255.00	250.00	15.00	2.50
007.2552502	255.00	250.00	25.00	2.50
007.2602551	260.00	255.00	15.00	2.50
007.2602552	260.00	255.00	25.00	2.50

Part number	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	Seal thickness E
007.2652601	265.00	260.00	15.00	2.50
007.2652602	265.00	260.00	25.00	2.50
007.2702651	270.00	265.00	15.00	2.50
007.2702652	270.00	265.00	25.00	2.50
007.2752701	275.00	270.00	15.00	2.50
007.2752702	275.00	270.00	25.00	2.50
007.2802751	**280.00**	**275.00**	**15.00**	**2.50**
007.2802752	**280.00**	**275.00**	**25.00**	**2.50**
007.2852801	285.00	280.00	15.00	2.50
007.2852802	285.00	280.00	25.00	2.50
007.2902851	290.00	285.00	15.00	2.50
007.2902852	290.00	285.00	25.00	2.50
007.2952901	295.00	290.00	15.00	2.50
007.2952902	295.00	290.00	25.00	2.50
007.3002951	300.00	295.00	15.00	2.50
007.3002952	300.00	295.00	25.00	2.50
007.3053001	305.00	300.00	15.00	2.50
007.3053002	305.00	300.00	25.00	2.50
007.3103051	310.00	305.00	15.00	2.50
007.3103052	310.00	305.00	25.00	2.50
007.3153101	315.00	310.00	15.00	2.50
007.3153102	315.00	310.00	25.00	2.50
007.3203151	**320.00**	**315.00**	**15.00**	**2.50**
007.3203152	**320.00**	**315.00**	**25.00**	**2.50**
007.3253201	325.00	320.00	15.00	2.50
007.3253202	325.00	320.00	25.00	2.50
007.3303251	330.00	325.00	15.00	2.50
007.3303252	330.00	325.00	25.00	2.50
007.3353301	335.00	330.00	15.00	2.50
007.3353302	335.00	330.00	25.00	2.50
007.3403351	340.00	335.00	15.00	2.50
007.3403352	340.00	335.00	25.00	2.50
007.3453401	345.00	340.00	15.00	2.50
007.3453402	345.00	340.00	25.00	2.50
007.3503451	350.00	345.00	15.00	2.50
007.3503452	350.00	345.00	25.00	2.50
007.3603551	**360.00**	**355.00**	**15.00**	**2.50**
007.3603552	**360.00**	**355.00**	**25.00**	**2.50**
007.3703651	370.00	365.00	15.00	2.50
007.3703652	370.00	365.00	25.00	2.50
007.3803751	380.00	375.00	15.00	2.50
007.3803752	380.00	375.00	25.00	2.50
007.3903851	390.00	385.00	15.00	2.50
007.3903852	390.00	385.00	25.00	2.50
007.4003951	**400.00**	**395.00**	**15.00**	**2.50**
007.4003952	**400.00**	**395.00**	**25.00**	**2.50**
007.4504451	**450.00**	**445.00**	**15.00**	**2.50**
007.4504452	**450.00**	**445.00**	**25.00**	**2.50**
007.5004951	**500.00**	**495.00**	**15.00**	**2.50**
007.5004952	**500.00**	**495.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the bore diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



WEAR RINGS

BECA 007 Rod

DESCRIPTION

The BECA 007 Piston profile is a machined guide ring with a 30° angle cut as standard, made from glass-filled PTFE. Other types of cuts can be made.

ADVANTAGES

Great compression resistance
Great wear resistance
Water absorption limited to 0.2%
Good stiffness

APPLICATIONS

Lifting trucks
Construction equipment
Agricultural machinery
Standard cylinders

MATERIALS

Polyoxymethylene - POM

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	-50°C / +115°C
Speed	1 m/s
Max. compression resistance	170 N/mm²
Radial loads in dynamic applications	40 N/mm² at 25°C 25 N/mm² > 60°C

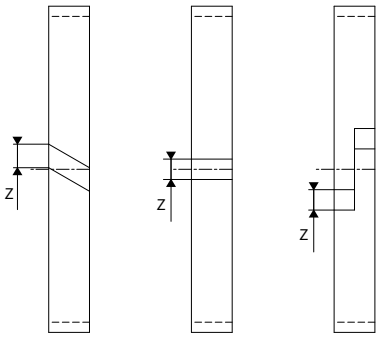
The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

WEAR RING HEIGHT DIMENSIONING

H = (F x f) / (Ød1 x Cr)

where:
H = Min. height of guide (mm)
F = Max. radial force (N)
f = Safety coefficient (we recommend 2)
Ød1 = Rod diameter (mm)
Cr = Permissible radial load in dynamic applications (N/mm²)

TYPES OF CUT



EXTRUSION GAPS

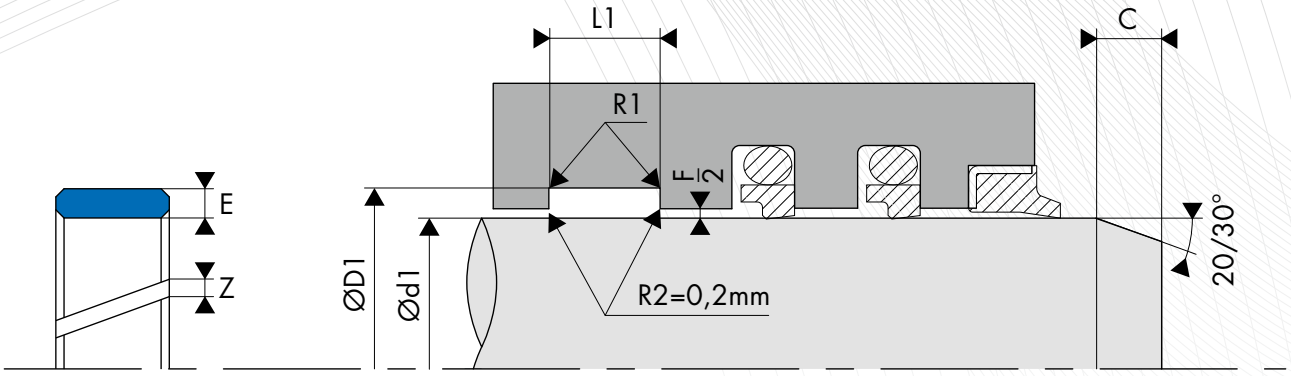
Rod diameter Ød1	Radial gap F/2	
8.0 - 20.0	0.20	0.30
21.0 - 100.0	0.25	0.40
101.0 - 250.0	0.30	0.60
251.0 - 300.0	0.40	0.80
301.0 - 500.0	0.40	0.80

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 µm	≤1.6 µm	≤3.2 µm
Rz	0.63 - 2.5 µm	≤6.3 µm	≤10.0 µm
Rmax	1.0 - 4.0 µm	≤10.0 µm	≤16.0 µm

RADIUS

Rod diameter Ød1	Radius R1
≤ 250.0	0.20
> 250.0	0.40



INSTALLATION DIMENSIONS

ISO 10766	Rod diameter	Groove diameter	Groove width	Seal thickness	End Gap
	Ød1 f8/h9	ØD1 H8	L1 0/+0.20	E	Z +/-0.50
*	10.0 - 50.0	d1 + 3.10	4.00	1.55	1.00
*	15.0 - 140.0	d1 + 5.00	5.60	2.50	1.25
*	20.0 - 220.0	d1 + 5.00	9.70	2.50	1.25
*	80.0 - 360.0	d1 + 5.00	15.00	2.50	1.25
*	200.0 - 360.0	d1 + 5.00	25.00	2.50	1.25
*	280.0 - 360.0	d1 + 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Material _____ : Polyoxymethylene (POM)
Rod diameter _____ : d1 = 50.00 mm
Groove diameter __ : D1 = 55.00 mm
Groove width _____ : L1 = 5.60 mm
Part number_____ : 007.0500555

* The codes that define the materials are set out in the materials table.

Part number - 007. 050 055 5

Family
Rod diameter
Groove diameter
Groove width

DIMENSIONS

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
007.0081114	8.00	11.10	4.00	1.55
007.0101314	10.00	13.10	4.00	1.55
007.0121514	**12.00**	**15.10**	**4.00**	**1.55**
007.0141714	**14.00**	**17.10**	**4.00**	**1.55**
007.0151814	15.00	18.10	4.00	1.55
007.0161914	**16.00**	**19.10**	**4.00**	**1.55**
007.0182114	**18.00**	**21.10**	**4.00**	**1.55**
007.0202314	**20.00**	**23.10**	**4.00**	**1.55**
007.0222514	**22.00**	**25.10**	**4.00**	**1.55**
007.0252814	**25.00**	**28.10**	**4.00**	**1.55**
007.0250305	**25.00**	**30.00**	**5.60**	**2.50**
007.0273014	27.00	30.10	4.00	1.55
007.0270325	27.00	32.00	5.60	2.50
007.0283114	**28.00**	**31.10**	**4.00**	**1.55**
007.0280335	**28.00**	**33.00**	**5.60**	**2.50**
007.0303314	30.00	33.10	4.00	1.55
007.0300355	30.00	35.00	5.60	2.50
007.0300359	30.00	35.00	9.70	2.50
007.0323514	32.00	35.10	4.00	1.55
007.0320375	**32.00**	**37.00**	**5.60**	**2.50**
007.0320379	**32.00**	**37.00**	**9.70**	**2.50**
007.0333614	33.00	36.10	4.00	1.55
007.0330385	33.00	38.00	5.60	2.50
007.0330389	33.00	38.00	9.70	2.50
007.0353814	35.00	38.10	4.00	1.55
007.0350405	35.00	40.00	5.60	2.50
007.0350409	35.00	40.00	9.70	2.50
007.0363914	36.00	39.10	4.00	1.55
007.0360415	**36.00**	**41.00**	**5.60**	**2.50**
007.0360419	**36.00**	**41.00**	**9.70**	**2.50**
007.0374014	37.00	40.10	4.00	1.55
007.0370425	37.00	42.00	5.60	2.50
007.0370429	37.00	42.00	9.70	2.50
007.0384114	38.00	41.10	4.00	1.55
007.0380435	38.00	43.00	5.60	2.50
007.0380439	38.00	43.00	9.70	2.50
007.0404314	40.00	43.10	4.00	1.55
007.0400455	**40.00**	**45.00**	**5.60**	**2.50**
007.0400459	**40.00**	**45.00**	**9.70**	**2.50**
007.0414414	41.00	44.10	4.00	1.55
007.0410465	41.00	46.00	5.60	2.50
007.0410469	41.00	46.00	9.70	2.50
007.0424514	42.00	45.10	4.00	1.55
007.0420475	42.00	47.00	5.60	2.50
007.0420479	42.00	47.00	9.70	2.50
007.0454814	45.00	48.10	4.00	1.55
007.0450505	**45.00**	**50.00**	**5.60**	**2.50**
007.0450509	**45.00**	**50.00**	**9.70**	**2.50**
007.0485114	48.00	51.10	4.00	1.55
007.0480535	48.00	53.00	5.60	2.50
007.0480539	48.00	53.00	9.70	2.50
007.0505314	50.00	53.10	4.00	1.55
007.0500555	**50.00**	**55.00**	**5.60**	**2.50**
007.0500559	**50.00**	**55.00**	**9.70**	**2.50**
007.0520575	52.00	57.00	5.60	2.50
007.0520579	52.00	57.00	9.70	2.50
007.0550605	55.00	60.00	5.60	2.50
007.0550609	55.00	60.00	9.70	2.50
007.0580635	58.00	63.00	5.60	2.50
007.0580639	58.00	63.00	9.70	2.50
007.0600655	60.00	65.00	5.60	2.50
007.0600659	60.00	65.00	9.70	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
007.0610665	61.00	66.00	5.60	2.50
007.0610669	61.00	66.00	9.70	2.50
007.0630685	**63.00**	**68.00**	**5.60**	**2.50**
007.0630689	**63.00**	**68.00**	**9.70**	**2.50**
007.0650705	65.00	70.00	5.60	2.50
007.0650709	65.00	70.00	9.70	2.50
007.0680735	68.00	73.00	5.60	2.50
007.0680739	68.00	73.00	9.70	2.50
007.0700755	**70.00**	**75.00**	**5.60**	**2.50**
007.0700759	**70.00**	**75.00**	**9.70**	**2.50**
007.0720779	72.00	77.00	9.70	2.50
007.0750809	75.00	80.00	9.70	2.50
007.0780839	78.00	83.00	9.70	2.50
007.0800859	**80.00**	**85.00**	**9.70**	**2.50**
007.0800851	**80.00**	**85.00**	**15.00**	**2.50**
007.0850909	85.00	90.00	9.70	2.50
007.0850901	85.00	90.00	15.00	2.50
007.0900959	**90.00**	**95.00**	**9.70**	**2.50**
007.0900951	**90.00**	**95.00**	**15.00**	**2.50**
007.0951009	95.00	100.00	9.70	2.50
007.0951001	95.00	100.00	15.00	2.50
007.1001059	**100.00**	**105.00**	**9.70**	**2.50**
007.1001051	**100.00**	**105.00**	**15.00**	**2.50**
007.1051109	105.00	110.00	9.70	2.50
007.1051101	105.00	110.00	15.00	2.50
007.1101159	**110.00**	**115.00**	**9.70**	**2.50**
007.1101151	**110.00**	**115.00**	**15.00**	**2.50**
007.1151209	115.00	120.00	9.70	2.50
007.1151201	115.00	120.00	15.00	2.50
007.1201259	120.00	125.00	9.70	2.50
007.1201251	120.00	125.00	15.00	2.50
007.1251309	**125.00**	**130.00**	**9.70**	**2.50**
007.1251301	**125.00**	**130.00**	**15.00**	**2.50**
007.1301359	130.00	135.00	9.70	2.50
007.1301351	130.00	135.00	15.00	2.50
007.1351409	135.00	140.00	9.70	2.50
007.1351401	135.00	140.00	15.00	2.50
007.1401459	**140.00**	**145.00**	**9.70**	**2.50**
007.1401451	**140.00**	**145.00**	**15.00**	**2.50**
007.1451509	145.00	150.00	9.70	2.50
007.1451501	145.00	150.00	15.00	2.50
007.1501559	150.00	155.00	9.70	2.50
007.1501551	150.00	155.00	15.00	2.50
007.1551609	155.00	160.00	9.70	2.50
007.1551601	155.00	160.00	15.00	2.50
007.1601659	**160.00**	**165.00**	**9.70**	**2.50**
007.1601651	**160.00**	**165.00**	**15.00**	**2.50**
007.1651709	165.00	170.00	9.70	2.50
007.1651701	165.00	170.00	15.00	2.50
007.1701759	170.00	175.00	9.70	2.50
007.1701751	170.00	175.00	15.00	2.50
007.1751809	175.00	180.00	9.70	2.50
007.1751801	175.00	180.00	15.00	2.50
007.1801859	**180.00**	**185.00**	**9.70**	**2.50**
007.1801851	**180.00**	**185.00**	**15.00**	**2.50**
007.1851909	185.00	190.00	9.70	2.50
007.1851901	185.00	190.00	15.00	2.50
007.1901959	190.00	195.00	9.70	2.50
007.1901951	190.00	195.00	15.00	2.50
007.1952009	195.00	200.00	9.70	2.50
007.1952001	195.00	200.00	15.00	2.50
007.2002059	200.00	205.00	9.70	2.50

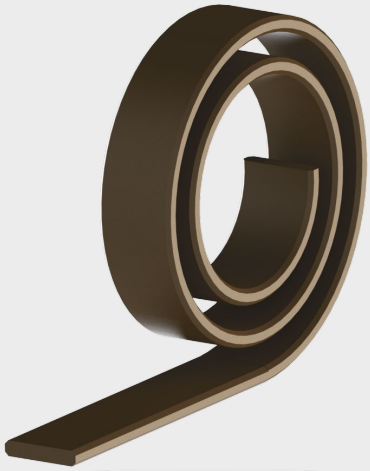
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
007.2002051	**200.00**	**205.00**	**15.00**	**2.50**
007.2002052	**200.00**	**205.00**	**25.00**	**2.50**
007.2052101	205.00	210.00	15.00	2.50
007.2052102	205.00	210.00	25.00	2.50
007.2102151	210.00	215.00	15.00	2.50
007.2102152	210.00	215.00	25.00	2.50
007.2152201	215.00	220.00	15.00	2.50
007.2152202	215.00	220.00	25.00	2.50
007.2202251	**220.00**	**225.00**	**15.00**	**2.50**
007.2202252	**220.00**	**225.00**	**25.00**	**2.50**
007.2252301	225.00	230.00	15.00	2.50
007.2252302	225.00	230.00	25.00	2.50
007.2302351	230.00	235.00	15.00	2.50
007.2302352	230.00	235.00	25.00	2.50
007.2352401	235.00	240.00	15.00	2.50
007.2352402	235.00	240.00	25.00	2.50
007.2402451	240.00	245.00	15.00	2.50
007.2402452	240.00	245.00	25.00	2.50
007.2452501	245.00	250.00	15.00	2.50
007.2452502	245.00	250.00	25.00	2.50
007.2502551	**250.00**	**255.00**	**15.00**	**2.50**
007.2502552	**250.00**	**255.00**	**25.00**	**2.50**
007.2552601	255.00	260.00	15.00	2.50
007.2552602	255.00	260.00	25.00	2.50
007.2602651	260.00	265.00	15.00	2.50
007.2602652	260.00	265.00	25.00	2.50
007.2652701	265.00	270.00	15.00	2.50
007.2652702	265.00	270.00	25.00	2.50
007.2702751	270.00	275.00	15.00	2.50
007.2702752	270.00	275.00	25.00	2.50
007.2752801	275.00	280.00	15.00	2.50
007.2752802	275.00	280.00	25.00	2.50

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	Seal thickness E
007.2802851	**280.00**	**285.00**	**15.00**	**2.50**
007.2802852	**280.00**	**285.00**	**25.00**	**2.50**
007.2852901	285.00	290.00	15.00	2.50
007.2852902	285.00	290.00	25.00	2.50
007.2902951	290.00	295.00	15.00	2.50
007.2902952	290.00	295.00	25.00	2.50
007.2953001	295.00	300.00	15.00	2.50
007.2953002	295.00	300.00	25.00	2.50
007.3003051	300.00	305.00	15.00	2.50
007.3003052	300.00	305.00	25.00	2.50
007.3053101	305.00	310.00	15.00	2.50
007.3053102	305.00	310.00	25.00	2.50
007.3103151	310.00	315.00	15.00	2.50
007.3103152	310.00	315.00	25.00	2.50
007.3153201	315.00	320.00	15.00	2.50
007.3153202	315.00	320.00	25.00	2.50
007.3203251	**320.00**	**325.00**	**15.00**	**2.50**
007.3203252	**320.00**	**325.00**	**25.00**	**2.50**
007.3253301	325.00	330.00	15.00	2.50
007.3253302	325.00	330.00	25.00	2.50
007.3303351	330.00	335.00	15.00	2.50
007.3303352	330.00	335.00	25.00	2.50
007.3353401	335.00	340.00	15.00	2.50
007.3353402	335.00	340.00	25.00	2.50
007.3403451	340.00	345.00	15.00	2.50
007.3403452	340.00	345.00	25.00	2.50
007.3453501	345.00	350.00	15.00	2.50
007.3453502	345.00	350.00	25.00	2.50
007.3503551	350.00	355.00	15.00	2.50
007.3503552	350.00	355.00	25.00	2.50
007.3603651	**360.00**	**365.00**	**15.00**	**2.50**
007.3603652	**360.00**	**365.00**	**25.00**	**2.50**

The figures highlighted in bold correspond to the dimensions for standard ISO 10766, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.

GUIDE TAPES

BECA 006/B



DESCRIPTION

The BECA 006/B profile is a roll of tape that can be cut to a specific length according to the customer's specification. Embossed strips are also offered. The embossing is a set of lubricant pockets, which improves the friction. Several types of cuts can be made.

ADVANTAGES

Substantial and improved lubrication conditions through the tear structures

Very good friction coefficient; no stick-slip effect

Good wear resistance; very long life

Increased absorption of foreign particles

Easy to fit

Good vibration absorption

APPLICATIONS

Agriculture

Food & Beverage

Shock absorbers

Maintenance

Dry applications

Injection presses

Pneumatics

Presses

Robotics

Standard cylinders

MATERIALS

Bronze-filled PTFE

Carbon graphite-filled PTFE

Other grades of materials are available. Please contact our experts.

TECHNICAL DATA

Temperature	-60°C / +150°C
Speed	15 m/s
Media	Mineral hydraulic oils Biocompatible fluids Water Air Others (contact our experts)
Max. compression resistance	30 to 35 N/mm²
Radial loads in dynamic applications	15 N/mm² at 25°C 12 N/mm² at 80°C 8 N/mm² at 120°C

The figures above indicate the maximum values and may not be cumulated. They may be developed, depending on the materials used.

EXTRUSION GAPS

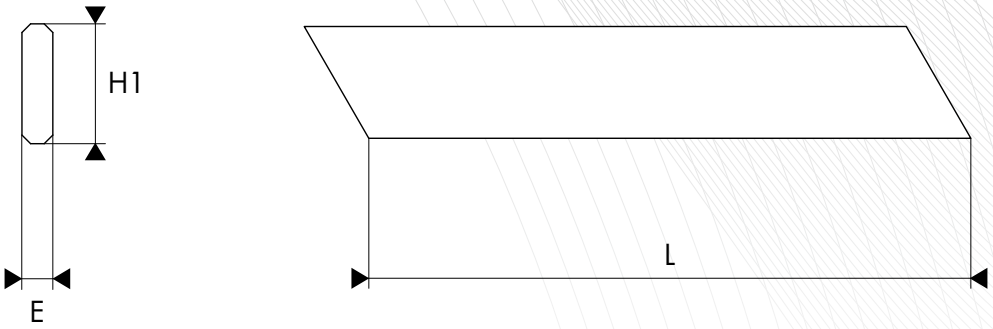
Bore diameter ØD1 Rod diameter Ød1	Min. radial gap F/2 min	Max. radial gap F/2 max
8.0 - 20.0	0.20	0.30
21.0 - 100.0	0.25	0.40
101.0 - 250.0	0.30	0.60
251.0 - 500.0	0.40	0.80
501.0 - 1000.0	0.50	1.10
> 1000.0	0.60	1.20

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.05 - 0.2 µm	≤1.6 µm	≤3.2 µm
Rz	0.4 - 1.6 µm	≤6.3 µm	≤10.0 µm
Rmax	0.63 - 2.5 µm	≤10.0 µm	≤16.0 µm

RADIUS

Bore diameter ØD1 Rod diameter Ød1	Radius R1
≤ 250.0	0.20
> 250.0	0.40



DETERMINING THE LENGTH OF THE TAPE

In the piston guide:
L (mm) = π x (ØD1 - E) - Z

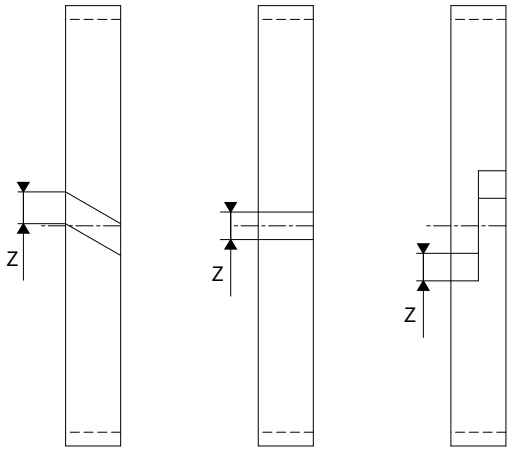
In the rod guide:
L (mm) = π x (ØD1 - E) - Z

where:
L = Length of the guide tape (mm)
ØD1 = Bore diameter (mm)
Ød1 = Rod diameter (mm)
E = Thickness of the tape (mm)
Z = Gap after fitting

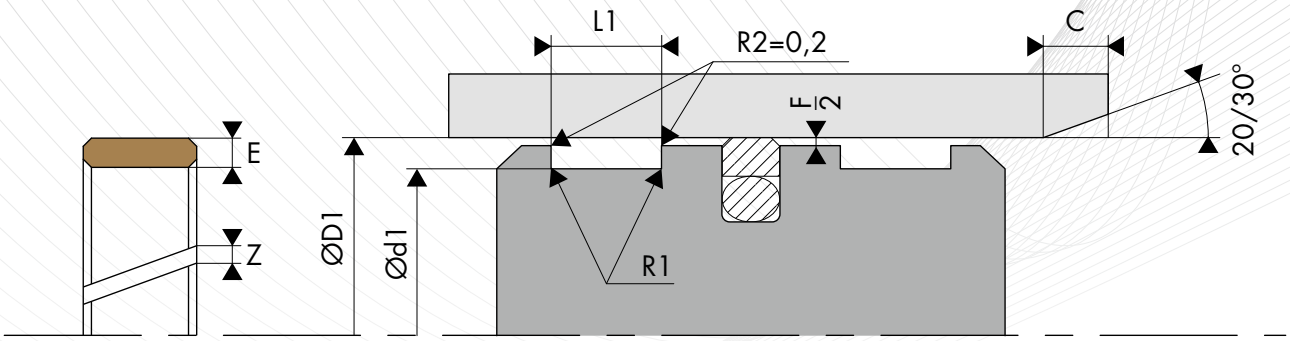
TOLERANCES OF THE TAPE LENGTH

Length of the tape L (mm)	Tolerances of L (mm)
≤ 45.00	± 0.25
> 45.00	± 0.40
> 80.00	± 0.60
> 100.00	± 0.80
> 125.00	± 1.00
> 150.00	± 1.20
> 180.00	± 1.40
> 215.00	± 1.60
> 270.00	± 1.80
> 330.00	± 2.00

TYPES OF CUT



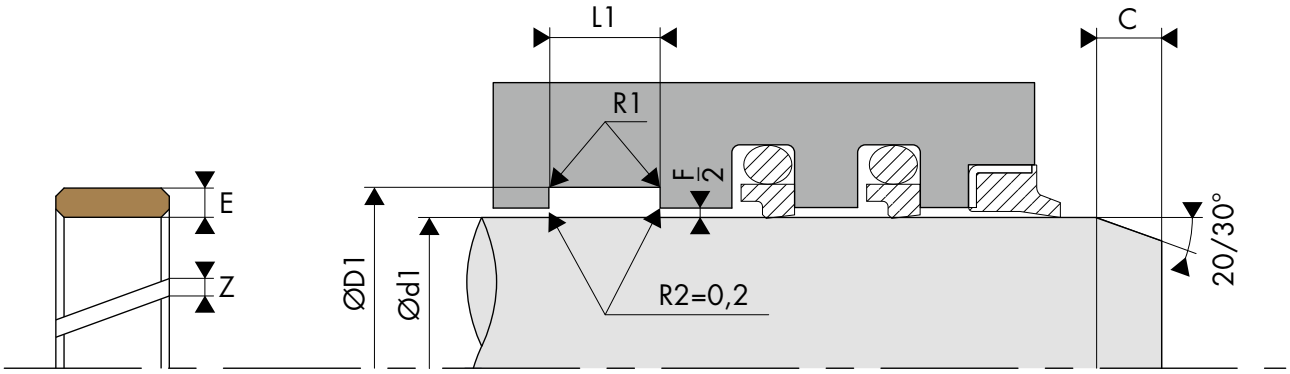
Angle cut 30° | Straight cut | Special step cut



INSTALLATION DIMENSIONS - PISTON GUIDE

Piston guide				Thickness of the tape	Gap
ISO 10766	Bore diameter ØD1 H9	Groove diameter Ød1 h8	Groove width L1 0/+0.20	E	Z +/-0.50
*	8.0 - 20.0	D1 - 3.10	2.50	1.55	1.00
*	10.0 - 50.0	D1 - 3.10	4.00	1.55	1.00
*	16.0 - 140.0	D1 - 5.00	5.60	2.50	1.25
*	60.0 - 220.0	D1 - 5.00	9.70	2.50	1.25
*	130.0 - 400.0	D1 - 5.00	15.00	2.50	1.25
*	280.0 - 999.9	D1 - 5.00	25.00	2.50	1.25
*	280.0 - 999.9	D1 - 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts.



INSTALLATION DIMENSIONS - ROD GUIDE

Rod guide				Thickness of the tape	Gap
ISO 10766	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H8	Groove width L1 0/+0.20	E	Z +/-0.50
*	8.0 - 20.0	d1 + 3.10	2.50	1.55	1.00
*	10.0 - 50.0	d1 + 3.10	4.00	1.55	1.00
*	15.0 - 140.0	d1 + 5.00	5.60	2.50	1.25
*	20.0 - 220.0	d1 + 5.00	9.70	2.50	1.25
*	80.0 - 400.0	d1 + 5.00	15.00	2.50	1.25
*	200.0 - 999.9	d1 + 5.00	25.00	2.50	1.25
*	280.0 - 999.9	d1 + 8.00	25.00	4.00	2.00

Other dimensions are possible, not taking ISO 10766 into consideration. Please contact our experts

DIMENSIONS

Part number	Groove width L1 0/+0.20	Height of the tape H1 0/-0.10	Thickness of the tape Ep +0/-0.05
006.0321.5	3.20	3.00	1.50
006.0421.5	4.20	4.00	1.50
006.0631.5	6.30	6.10	1.50
006.0811.5	8.10	7.90	1.50
006.0971.5	9.70	9.50	1.50
006.1271.5	12.70	12.50	1.50
006.0151.5	15.00	14.80	1.50
006.0161.5	16.00	15.80	1.50
006.0201.5	20.00	19.50	1.50
006.0251.5	25.00	24.50	1.50
006.0301.5	30.00	29.50	1.50
006.0322.0	3.20	3.00	2.00
006.0422.0	4.20	4.00	2.00
006.0632.0	6.30	6.10	2.00
006.0812.0	8.10	7.90	2.00
006.0972.0	9.70	9.50	2.00
006.1272.0	12.70	12.50	2.00
006.0152.0	15.00	14.80	2.00
006.0202.0	20.00	19.50	2.00
006.0252.0	25.00	24.50	2.00
006.0302.0	30.00	29.50	2.00
006.0322.5	3.20	3.00	2.50
006.0422.5	4.20	4.00	2.50
006.0632.5	6.30	6.10	2.50
006.0812.5	8.10	7.90	2.50

Part number	Groove width L1 0/+0.20	Height of the tape H1 0/-0.10	Thickness of the tape Ep +0/-0.05
006.0972.5	**9.70**	**9.50**	**2.50**
006.1272.5	12.70	12.50	2.50
006.0152.5	**15.00**	**14.80**	**2.50**
006.0202.5	20.00	19.50	2.50
006.0252.5	**25.00**	**24.50**	**2.50**
006.0302.5	30.00	29.50	2.50
006.0323.0	3.20	3.00	3.00
006.0423.0	4.20	4.00	3.00
006.0633.0	6.30	6.10	3.00
006.0813.0	8.10	7.90	3.00
006.0973.0	9.70	9.50	3.00
006.1273.0	12.70	12.50	3.00
006.0153.0	15.00	14.80	3.00
006.0203.0	20.00	19.50	3.00
006.0253.0	25.00	24.50	3.00
006.0303.0	30.00	29.50	3.00
006.3553.0	35.50	35.00	3.00
006.0634.0	6.30	6.10	4.00
006.0814.0	8.10	7.90	4.00
006.0974.0	9.70	9.50	4.00
006.1274.0	12.70	12.50	4.00
006.0154.0	15.00	14.80	4.00
006.0204.0	20.00	19.50	4.00
006.0254.0	**25.00**	**24.50**	**4.00**
006.0304.0	30.00	29.50	4.00

The figures highlighted in bold correspond to standard ISO 10766. Other intermediate sizes can be provided.

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