

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

FRANCEJOINT

SEALING SYSTEMS



ROD
SEALS





FRANCEJOINT
SEALING SYSTEMS

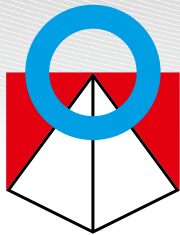
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Site N°2: Administrative Area – Research & Development – Machining – Tooling



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



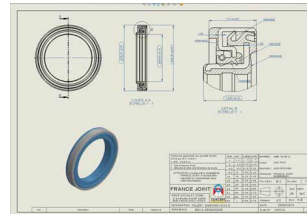
Logistics / Packaging

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...

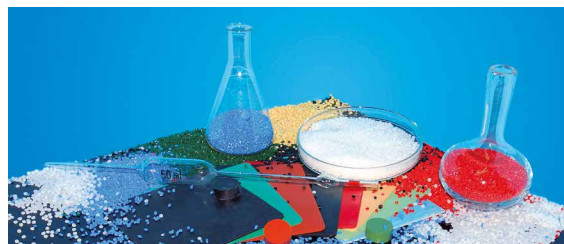


QUALITY IN OUR CONCERNS

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





○ 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.

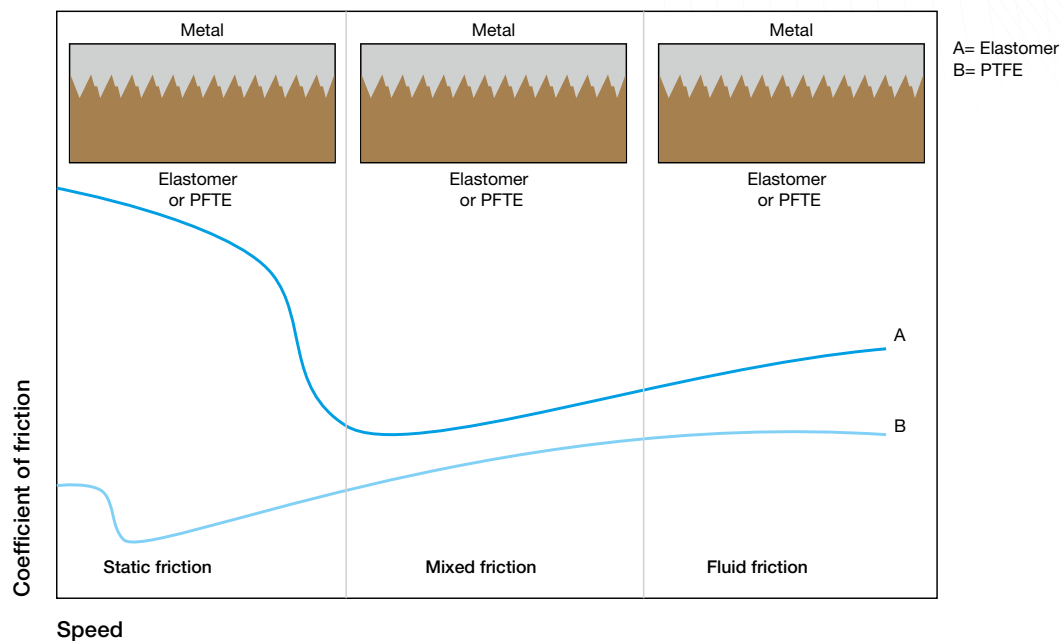


Diagram 2.1-1

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.

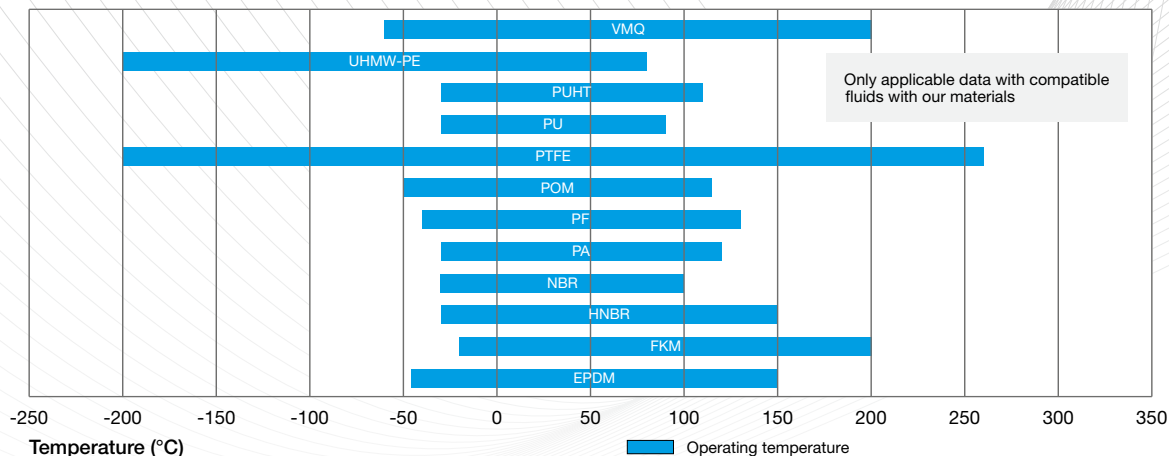


Table 2.2-1

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:**

$$\Delta P = p_1 - p = \frac{6 \times \eta \times v \times L}{Hs^2}$$

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

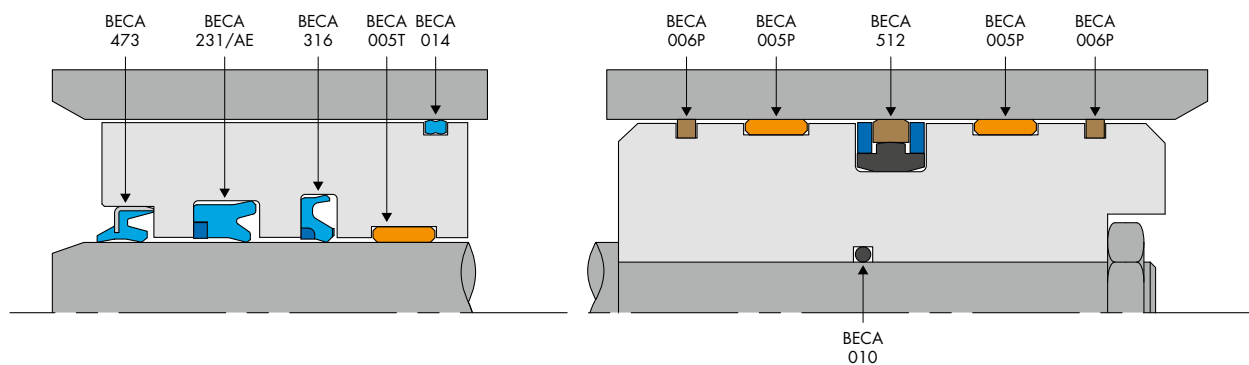
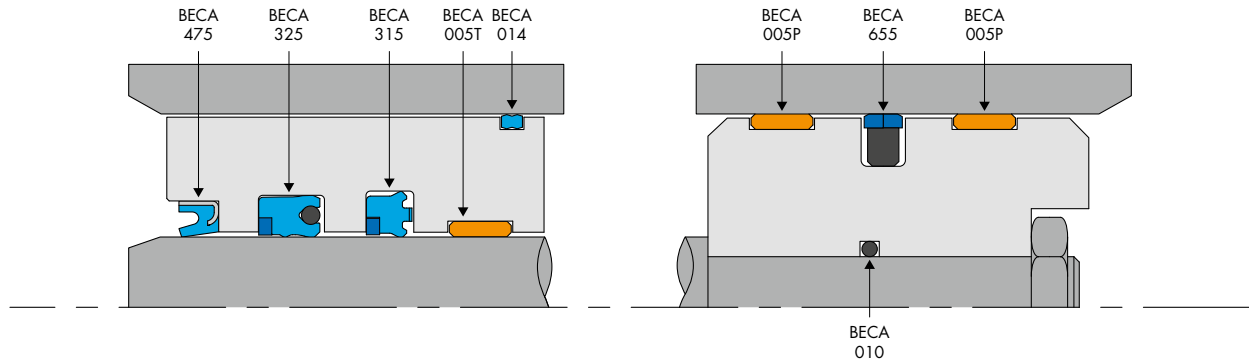
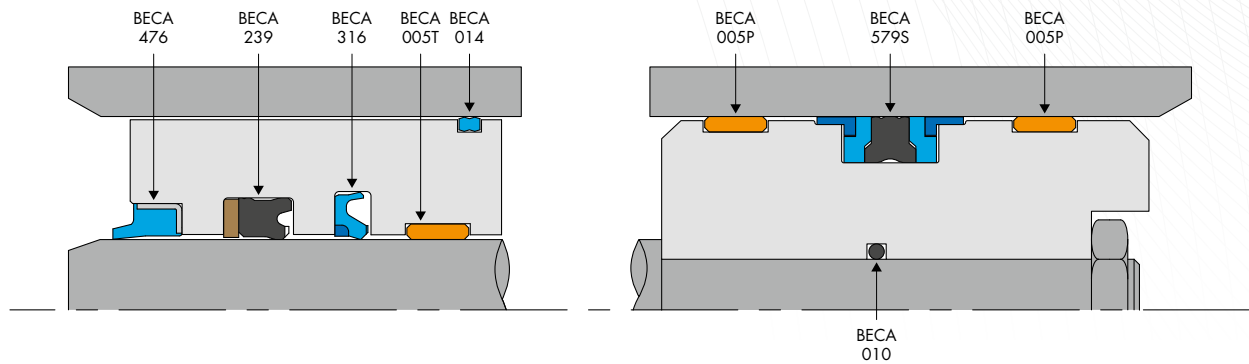
VO: viscosity at atmospheric pressure

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

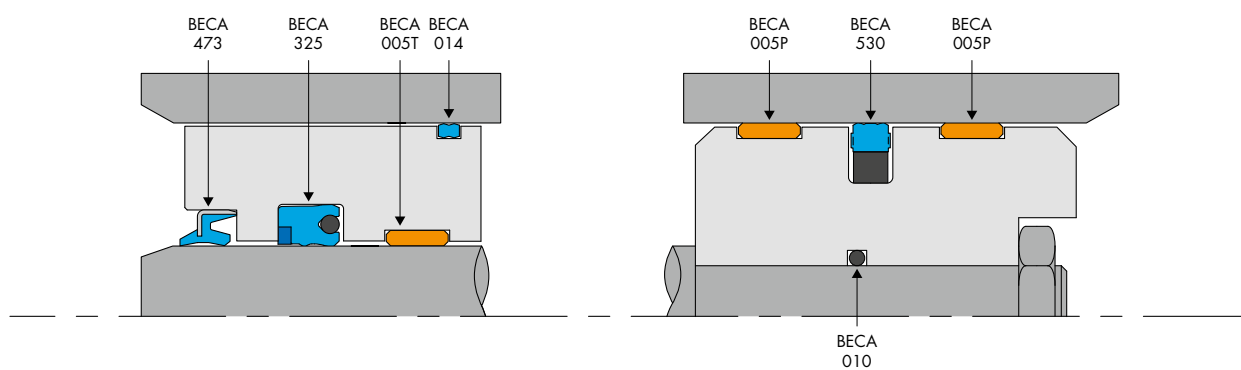
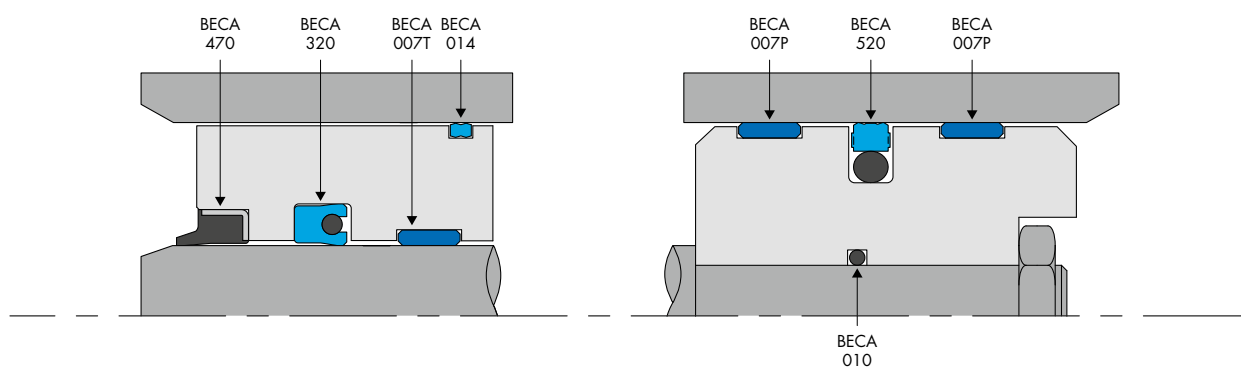
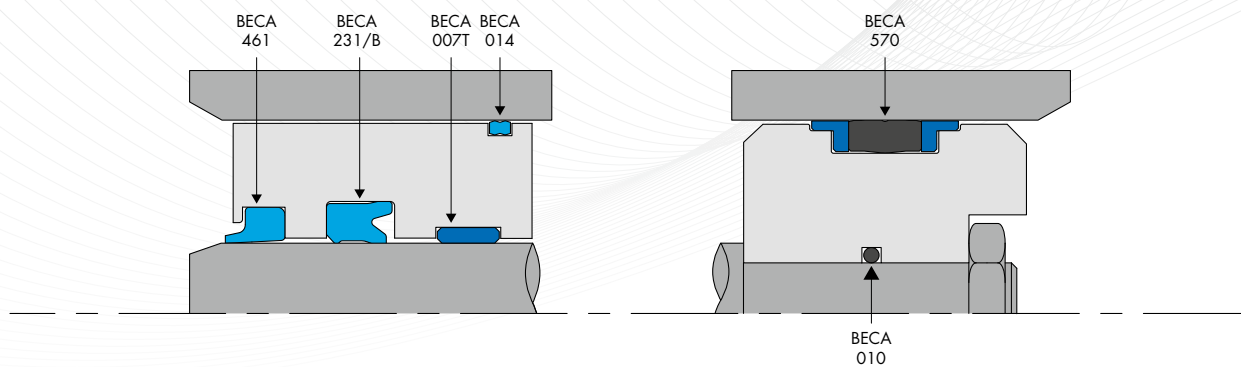


CONSTRUCTION



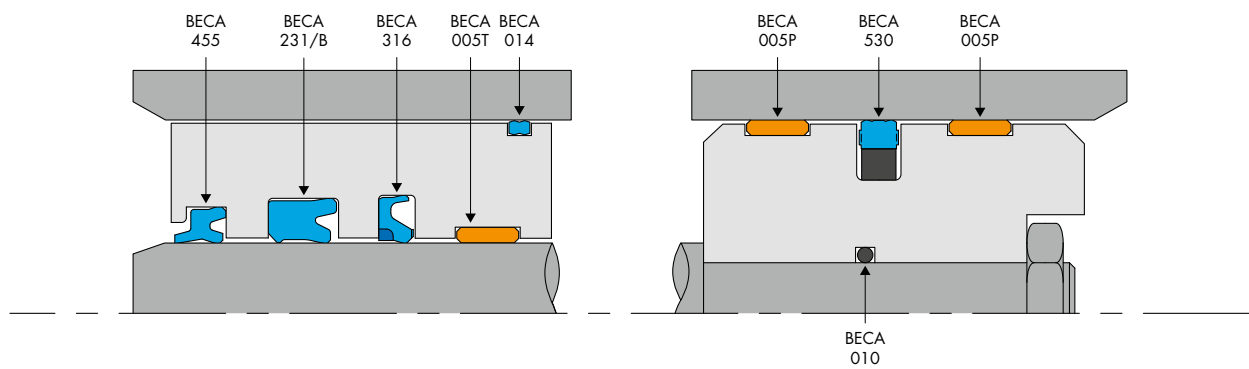
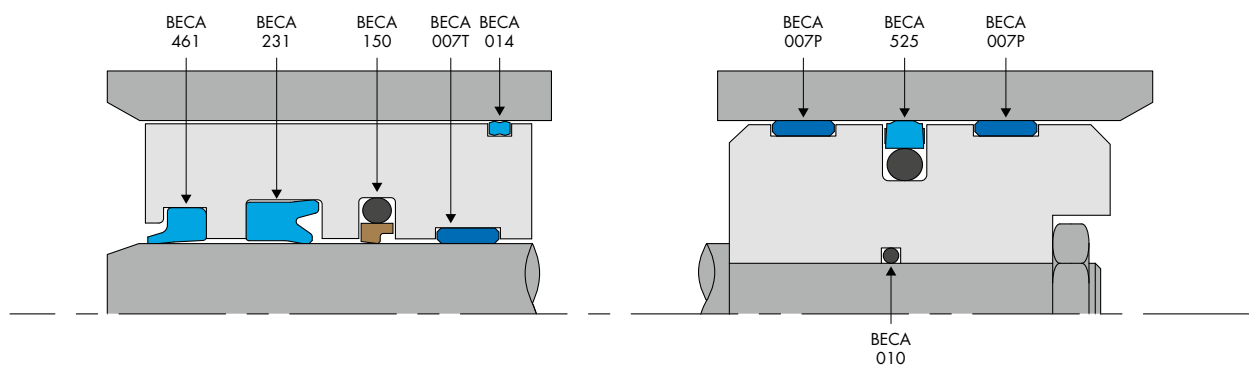
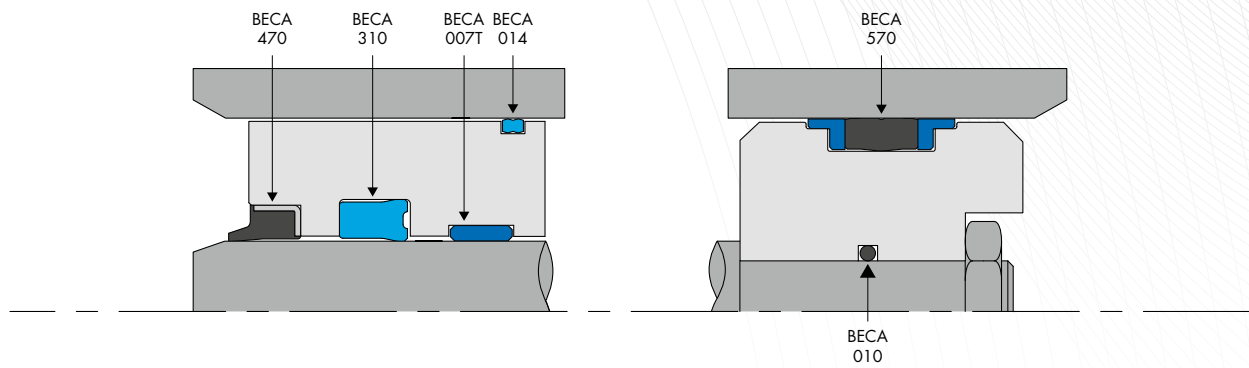


AGRICULTURE



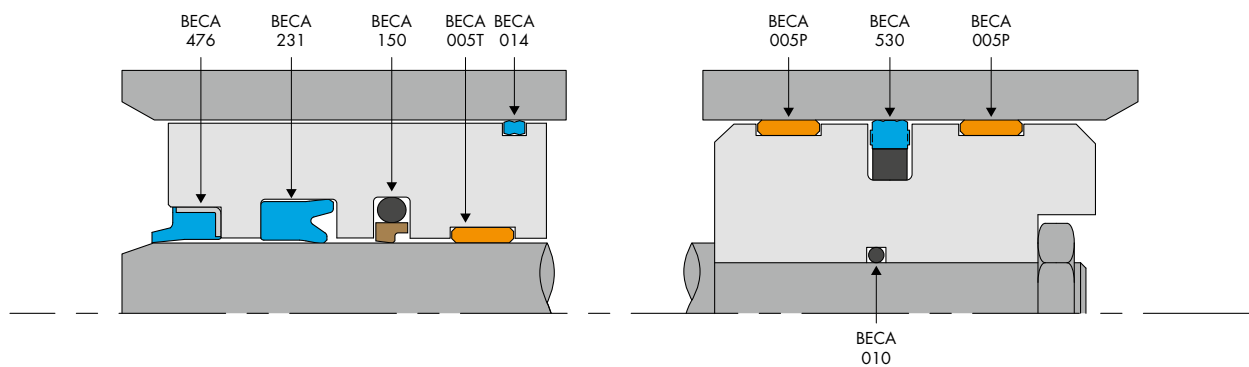
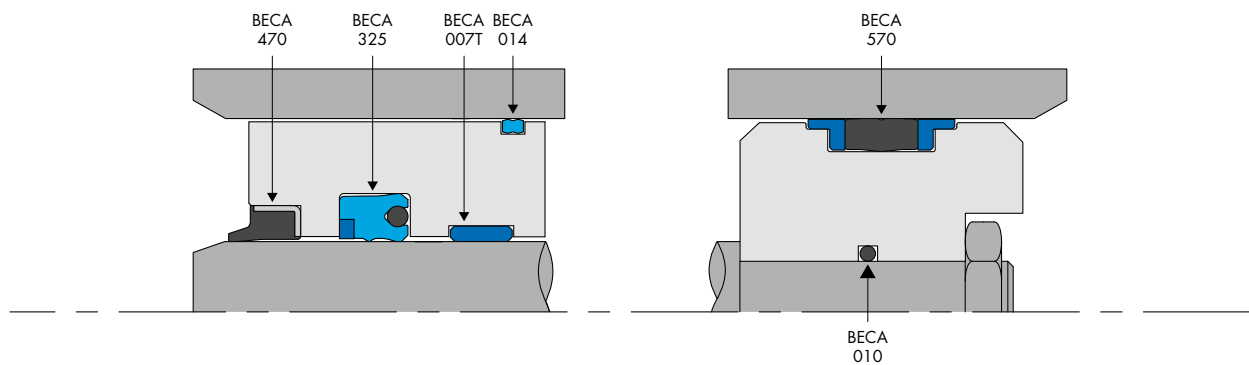
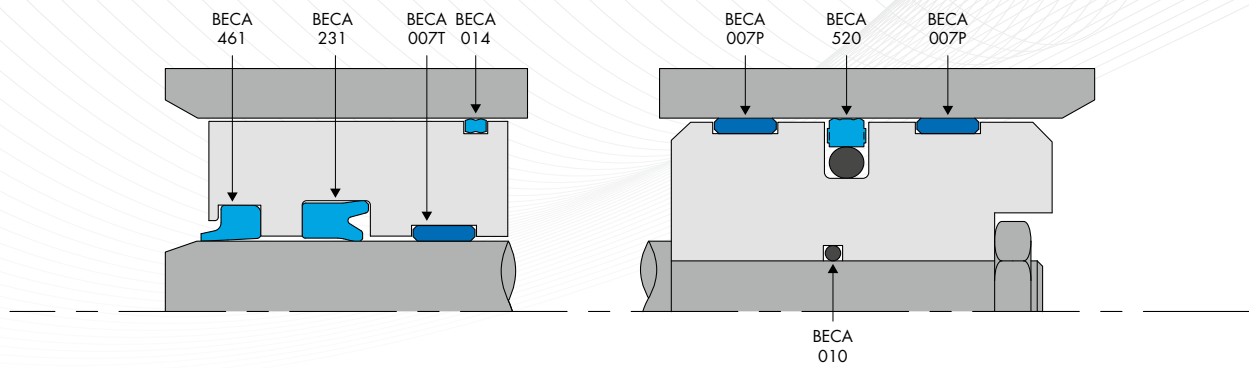


MATERIAL HANDLING



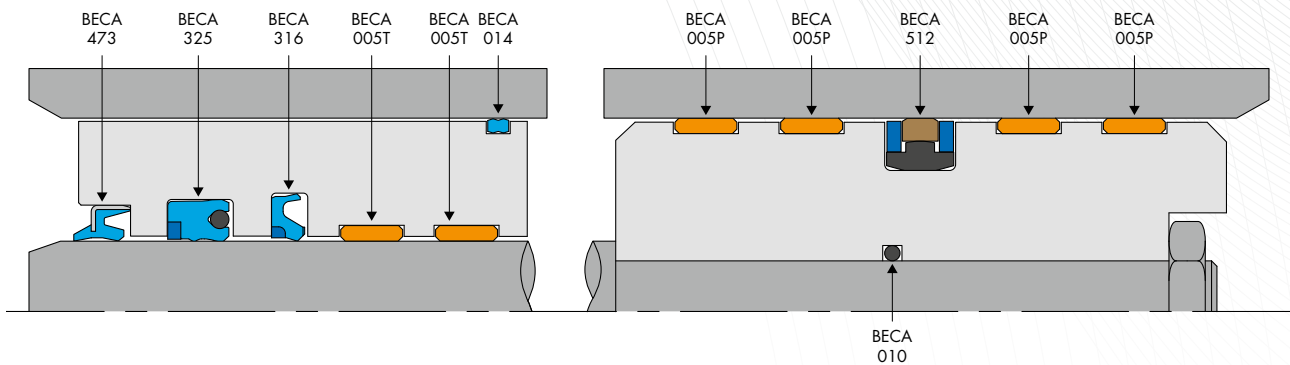


LIFTING

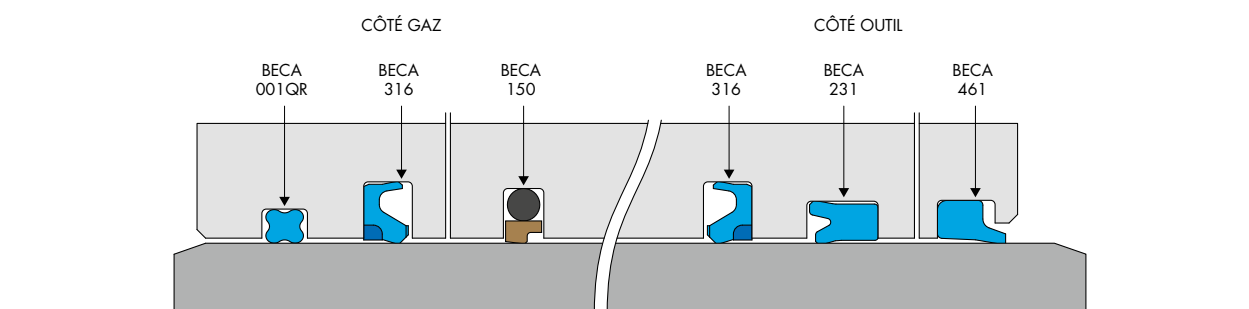
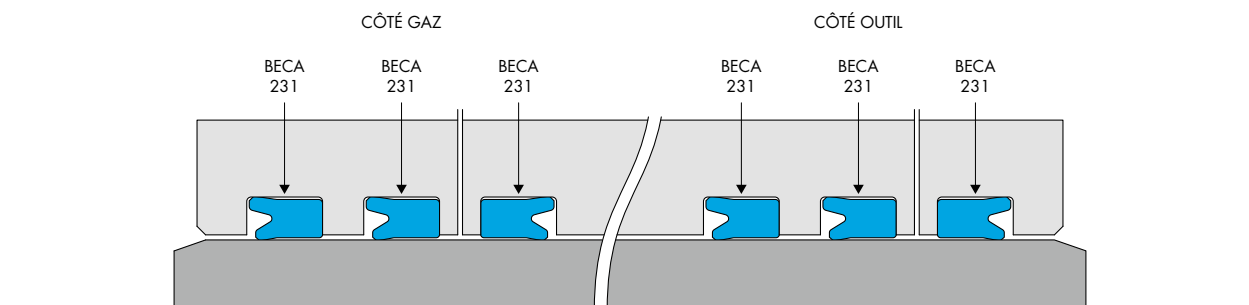




MINING

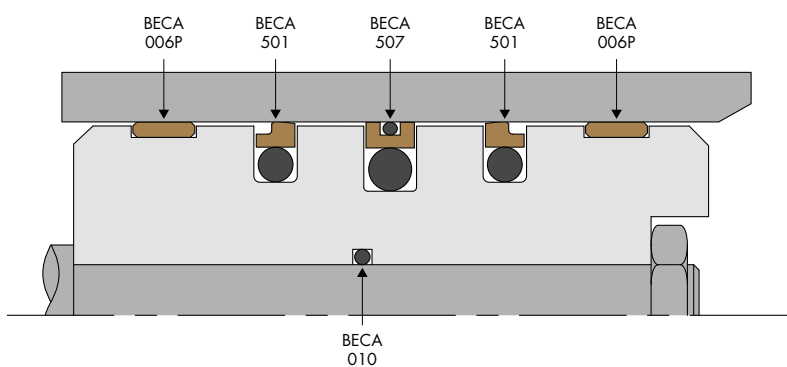
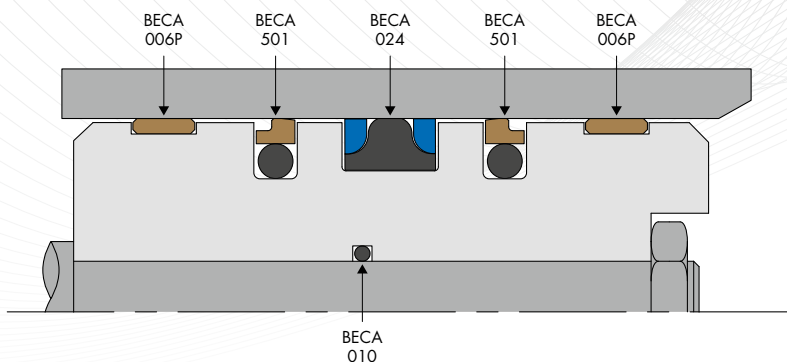


HYDRAULIC BREAKER

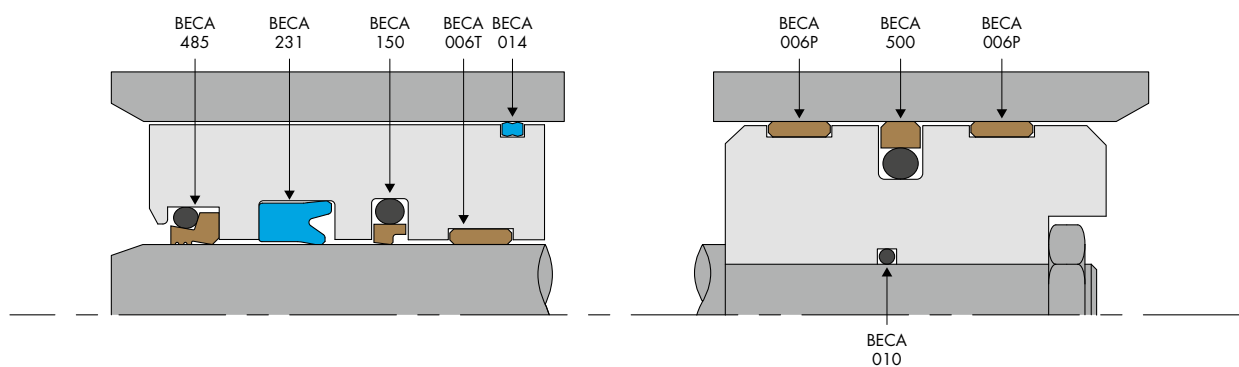




PISTON ACCUMULATORS

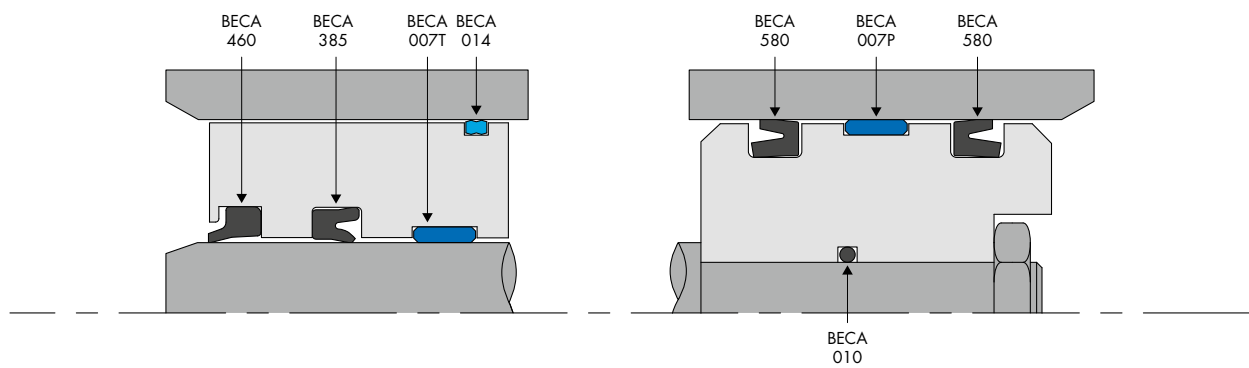
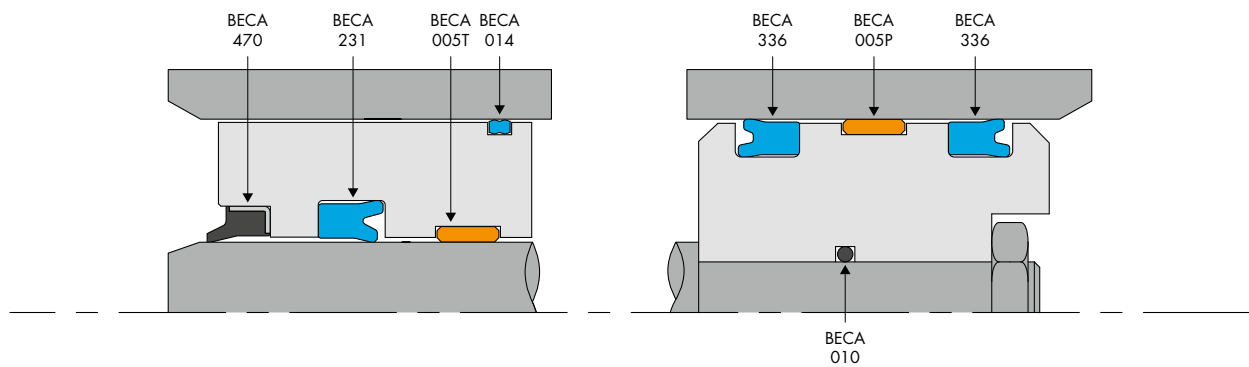
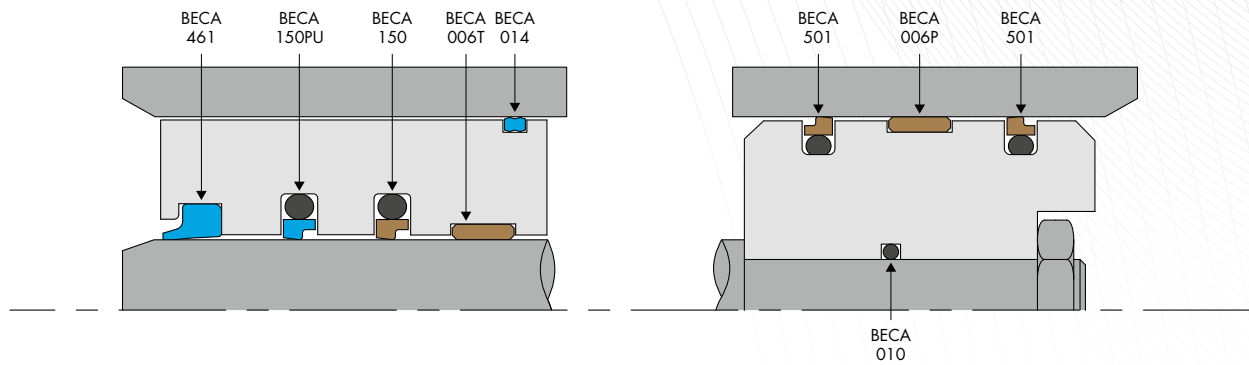


INDUSTRIAL APPLICATIONS





INDUSTRIAL APPLICATIONS (CONT.)



4. Assembly recommendations

Several essential rules must be followed before fitting the seals.

- Check that the mechanical parts (rods and bore parts) have an inlet chamfer. If not, a suitable sleeve must be used.
- Flash and chamfer or round off the sharp edges; cover the threaded parts.
- Remove the machining shavings and all impurities and other foreign bodies. Clean all mechanical parts carefully.
- Grease or oil the seal and mechanical parts to facilitate assembly. To do this, ensure beforehand that the lubricants are compatible with the seal materials. Avoid greases containing solid additives (molybdenum disulphide or zinc sulphide).
- If using installation tools, check that they are clean and do not have sharp edges.
- Soak the seal in oil heated to around +80°C / +100°C (in the water heated for the EPDM) to give the material a greater elasticity. Effective for textile fibre seals and for harder seals.
- Create assembly tools (mandrels, correction tubes, push-in tools, slide tools, plugs, etc.) using a polymer (Polyamide - PA6 or Polyoxymethylene - POM), taking into account characteristics such as sliding, and generally having excellent surface roughness so that the friction ring does not deteriorate.

Fitting methods differ depending on the type of groove (open or closed) as well as the seal's profile. The table below sets out all of the methods used to correctly fit seals from our range.

Type of seal	Rod seal	
Type of groove	Closed groove	Open groove
Composite seal	Assembly 1.A	Assembly 1.C
Lip seal	Assembly 1.B	
Compo-compact seal	Assembly 1.B	

4.1 ASSEMBLY 1.A - ROD COMPOSITE SEAL - CLOSED GROOVE

Applicable for the following product families: BECA 150-152-154, BECA 151-153-155, BECA 157-158, BECA 161-163-165, BECA 170-179, BECA 640.

Using assembly tools:

- Insert the O'Ring into the groove.
- Prepare a push-in rod and a plug adapted to your application's dimensions.
- Clip one side of the friction ring into the groove and push it into place using the push-in tool (see diagram 4.1-1 opposite).
- Prevent any of the sealing components from twisting.

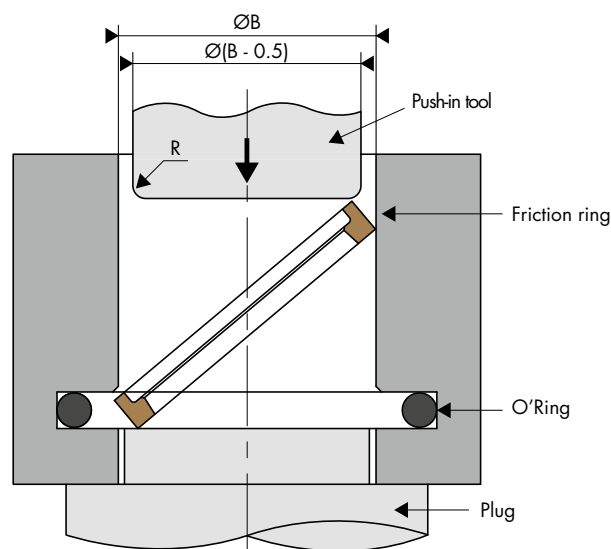
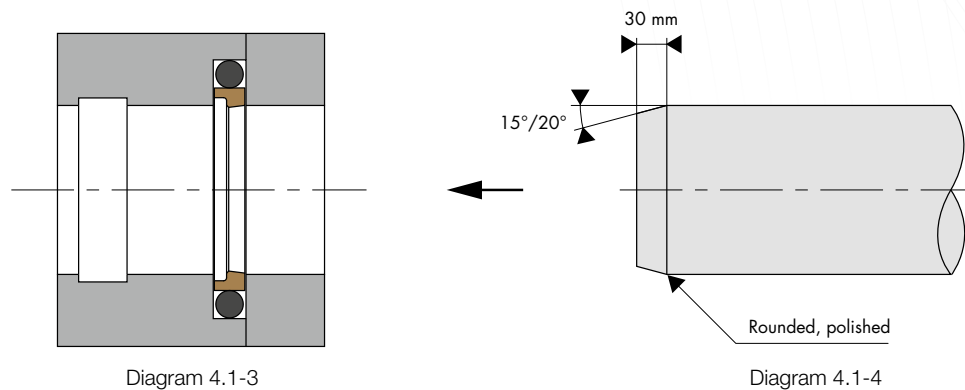
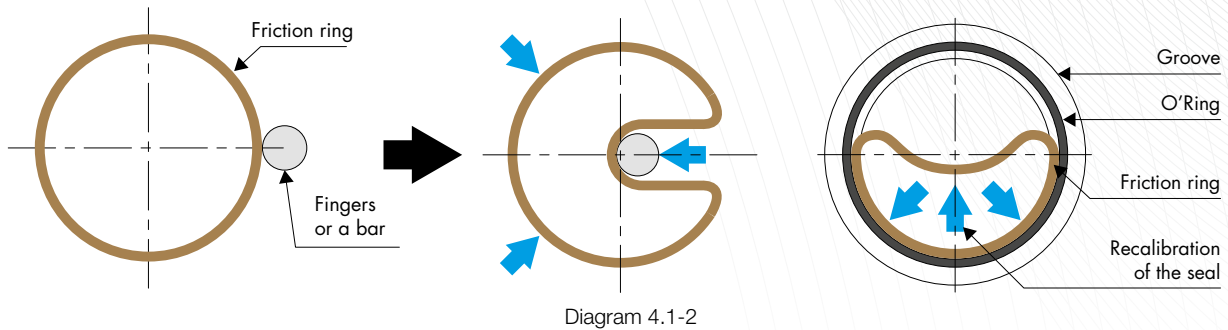


Diagram 4.1-1

If assembly tools fail:

- Fit the O'Ring into the groove.
- Distort the friction ring by shaping it like a bean without creating a sharp angle (see diagram 4.1-2).
- Position the friction ring in the groove and restore its shape by pushing it against the O'Ring.
- Calibrate the friction ring using a mandrel chamfered between 15° and 20° along a length of 30.00 mm.



4.2 ASSEMBLY 1.B - LIP SEAL, ROD COMPO-COMPACT SEAL - CLOSED GROOVE

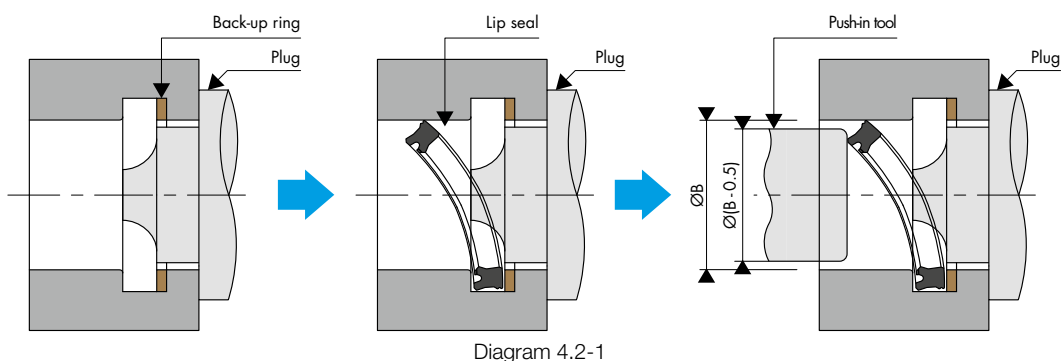
Applicable for the following product families: BECA 230, BECA 231, BECA 301, BECA 301/AE, BECA 320, BECA 322, BECA 325.

Using assembly tools:

- Prepare a push-in tool and a plug adapted to your application's dimensions.
- Clip one side of the lip seal into the groove and push the other part of the seal into place using the push-in tool (see diagram 4.2-1 opposite).
- Perform the entire operation without interruption to prevent the seal from becoming permanently warped.

If assembly tools fail:

- For seals with a back-up ring, first fit the seal in the groove followed by the back-up ring.
- Distort the lip seal by shaping it like a bean without creating a sharp angle (see diagram 4.1-2).
- Fit the lip seal into the groove.
- Calibrate the lip seal using a mandrel (see diagram 4.1-4).



4.3 ASSEMBLY 1.C – ROD SEALS - OPEN GROOVE

Applicable to all rod seals.

- The open groove assembly is simple and does not require any specific tools.
- For composite seals, prevent the seal's parts from becoming twisted and, for the final assembly (passing the rod through the seal), use the rod to calibrate the friction ring, provided the inlet chamfer is long enough. A calibration mandrel can also be used (see diagram 4.1-4).
- For lip seals, compo-compact and compact seals, use a push-in plug to push the seal onto its groove diameter. If the chamfer does not work at the bore, a bushing for assembly, chamfered 15° - 20° along a length of 30 mm, can be used positioned against the bore. (see diagram 4.3-1).

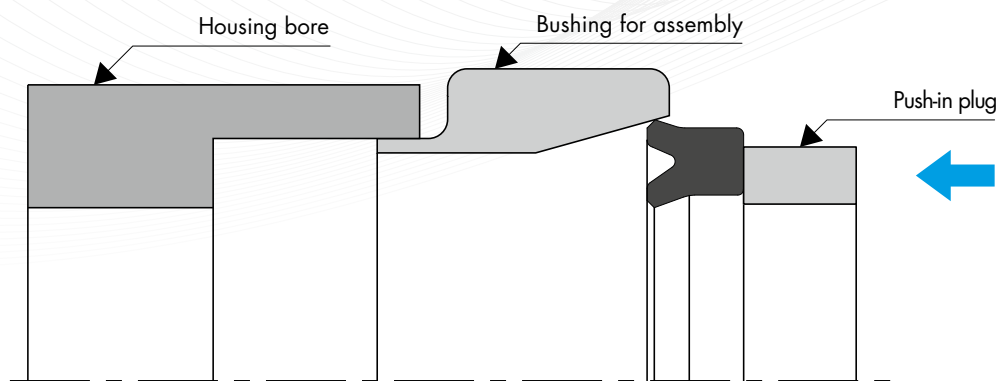


Diagram 4.3-1

5. 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.



6. Rod seals

The rod seals, mainly used in hydraulic cylinders, must ensure the sealing of fluids while meeting the conditions for extreme use. Whatever their form, whether it be a composite seal, a compact seal or a lip seal (also called a U-seal), we will assist you in selecting a seal whilst considering the different variables such as pressure, temperature, type of media, speed, frequency, surface roughness and other specific parameters.

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.

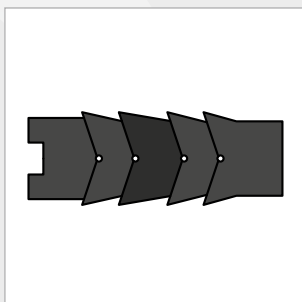
For specific orders (temperature, pressure, speed, etc.), please contact our technical team so that they can direct you towards the appropriate choice of material and seal profile.

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

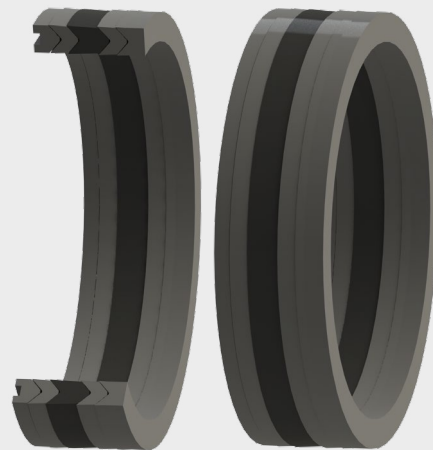
	BECA 002 Materials: NBR + fabric NBR + TPE Temperature: -30°C / +110°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 24
	BECA 150 - 152 - 154 Materials: PTFE + Rubber Temperature: -30°C / +200°C Pressure: 50 MPa Speed: 5 m/s	P. 30
	BECA 151 - 153 - 155 Materials: PTFE + Rubber Temperature: -30°C / +200°C Pressure: 50 MPa Speed: 5 m/s	P. 36
	BECA 157 - 158 Materials: PTFE + Rubber Temperature: -30°C / +200°C Pressure: 50 MPa Speed: 2 m/s	P. 42
	BECA 161 - 163 - 165 Materials: PU + Rubber Temperature: -30°C / +100°C Pressure: 25 MPa Speed: 0.5 m/sec	P. 46
	BECA 170 - 179 Materials: PTFE + Rubber Temperature: -30°C / +200°C Pressure: 35 MPa Speed: 5 m/s	P. 52
	BECA 190 Materials: NBR + POM Temperature: -30°C / +200°C Pressure: 50 MPa Speed: 0.5 m/sec	P. 56
	BECA 200 Materials: NBR + POM Temperature: -30°C / +100°C Pressure: 70 MPa Speed: 0.5 m/sec	P. 58
	BECA 201 Materials: Rubber + POM/PTFE Temperature: -30°C / +200°C Pressure: 70 MPa Speed: 0.5 m/sec	P. 60
	BECA 202 Materials: NBR + POM + TPE Temperature: -30°C / +110°C Pressure: 70 MPa Speed: 0.5 m/sec	P. 62
	BECA 230 Materials: Rubber Temperature: -30°C / +200°C Pressure: 15 MPa Speed: 0.5 m/sec	P. 64
	BECA 230/AE Materials: Rubber + POM/PTFE Temperature: -30°C / +200°C Pressure: 25 MPa Speed: 0.5 m/sec	P. 103
	BECA 230/B Materials: Rubber Temperature: -30°C / +200°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 66
	BECA 231 Materials: PU Temperature: -30°C / +110°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 68
	BECA 231/B Materials: PU Temperature: -30°C / +110°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 70

	BECA 231/AE Materials: PU + POM Temperature: -30°C / +110°C Pressure: 45 MPa Speed: 0.5 m/sec	P. 72
	BECA 235T/AE Materials: Rubber + POM/PTFE Temperature: -30°C / +200°C Pressure: 25 MPa Speed: 0.5 m/sec	P. 104
	BECA 239 Materials: Rubber + PTFE Temperature: -30°C / +200°C Pressure: 25 MPa Speed: 0.5 m/sec	P. 74
	BECA 300 Materials: Rubber + POM/PTFE Temperature: -30°C / +200°C Pressure: 27.5 MPa Speed: 0.5 m/sec	P. 76
	BECA 301/AE Materials: Fabric NBR + POM Temperature: -30°C / +110°C Pressure: 35 MPa Speed: 0.5 m/sec	P. 78
	BECA 302/AE Materials: FKM + PTFE Temperature: -20°C / +200°C Pressure: 35 MPa Speed: 0.5 m/sec	P. 80
	BECA 310/B Materials: PU Temperature: -30°C / +110°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 105
	BECA 312 Materials: PU + POM Temperature: -30°C / +110°C Pressure: 50 MPa Speed: 0.5 m/sec	P. 82
	BECA 315 Materials: PU + POM Temperature: -30°C / +110°C Pressure: 40 MPa (peak at 60 MPa) Speed: 0.5 m/sec	P. 84
	BECA 316 Materials: PU + POM Temperature: -30°C / +110°C Pressure: 40 MPa (peak at 60 MPa) Speed: 1 m/s	P. 86
	BECA 322 Materials: PU + NBR + POM Temperature: -30°C / +100°C Pressure: 45 MPa Speed: 0.5 m/sec	P. 88
	BECA 325 Materials: PU + NBR + POM Temperature: -30°C / +100°C Pressure: 45 MPa Speed: 0.5 m/sec	P. 90
	BECA 335T/AE Materials: PU + POM Temperature: -30°C / +110°C Pressure: 45 MPa Speed: 0.5 m/sec	P. 106
	BECA 340 - 349 Materials: PTFE + Stainless steel Temperature: -200°C / +260°C Pressure: 40 MPa Speed: 15 m/s	P. 92
	BECA 385 Materials: Rubber Temperature: -30°C / +200°C Pressure: 8 MPa Speed: 0.5 m/sec	P. 96
	BECA 640 Materials: PA6 + NBR Temperature: -30°C / +100°C Pressure: 40 MPa Speed: 0.5 m/sec	P. 98



ROD SEALS

BECA 002/5



DESCRIPTION

The BECA 002/5 profile is a 5-part chevron seal. This sealing system is composed of 2 textile-reinforced rubber shaft seals and 1 rubber ring. Its geometry means that it is encapsulated between a head nut and a locking ring.

ADVANTAGES

Strong sealing, tolerant to surface roughness defects (impacts on the rod, carbon deposits, etc.)

The tightness can be adjusted depending on the application

Excellent resistance to pressure

APPLICATIONS

Cylinders for extreme demands

Presses

Steel industry

Mining machines

Installations in corrosive and abrasive environments

MATERIALS

POM + NBR + fabric NBR + TPE

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa
Speed	0.5 m/s
Media	Mineral oils

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

EXTRUSION GAPS

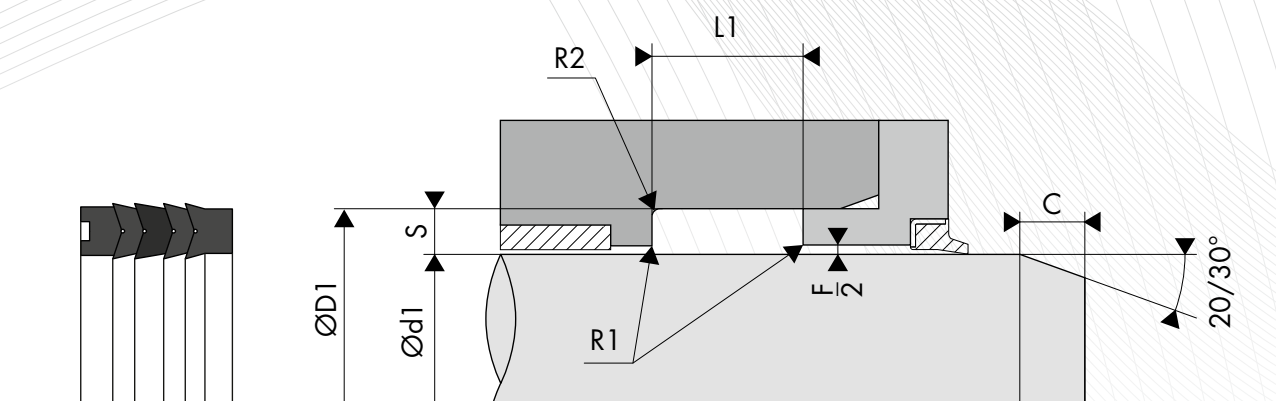
Radial section S	Radial gap F/2			
	16 MPa	26 MPa	32 MPa	40 MPa
≤ 5.00	0.50	0.40	0.35	-
≤ 7.50	0.55	0.45	0.40	0.35
≤ 12.50	0.60	0.50	0.45	0.40
≤ 15.00	0.65	0.55	0.45	0.40

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

CHAMFERS AND RADIUS

Inside diameter Ød1	Radius R1	Radius R2	Chamfer C
≤ 50.00	0.30	0.40	2.50
> 50.00	0.30	0.80	4.00

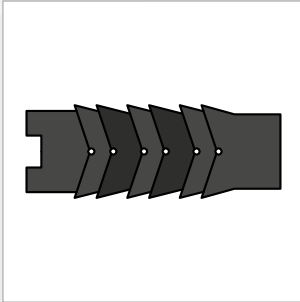


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.25
002.502011	10.00	20.00	11.00
002.502514	12.00	25.00	14.35
002.502914	16.00	29.00	14.35
002.503114	18.00	31.00	14.32
002.503222	18.00	32.00	22.50
002.503021	20.00	30.00	21.50
002.531517	20.00	31.50	17.50
002.503217	20.00	32.00	17.50
002.503314	20.00	33.00	14.35
002.503624	20.00	36.00	24.00
002.503218	22.00	32.00	18.15
002.503826	22.00	38.00	26.00
002.503517	25.00	35.00	17.30
002.504019	25.00	40.00	19.85
002.504225	25.00	42.00	25.40
002.504525	25.00	45.00	25.40
002.504529	26.00	45.00	29.40
002.504017	28.00	40.00	17.00
002.504417	28.00	44.00	17.65
002.504021	30.00	40.00	21.80
002.504220	30.00	42.00	20.00
002.504522	30.00	45.00	22.20
002.505029	30.00	50.00	29.37
002.504217	32.00	42.00	17.30
002.504521	35.00	45.00	21.78
002.504717	35.00	47.00	17.50
002.505022	35.00	50.00	22.50
002.505217	36.00	52.00	17.60
002.505528	38.00	55.00	28.00
002.505525	39.00	55.00	25.40
002.505017	40.00	50.00	17.30
002.505522	40.00	55.00	22.60
002.505617	40.00	56.00	17.63
002.506030	40.00	60.00	30.00
002.506535	40.00	65.00	35.75
002.505517	45.00	55.00	17.50
002.506022	45.00	60.00	22.20
002.506129	45.00	61.00	29.00
002.506528	45.00	65.00	28.00
002.506025	48.00	60.00	25.00
002.506222	48.00	62.00	22.22
002.506524	50.00	65.00	24.60
002.507021	50.00	70.00	21.95
002.507030	50.00	70.00	30.00
002.506928	51.00	69.00	28.00
002.507617	51.00	76.00	17.50
002.507238	52.00	72.00	38.50
002.506725	55.00	67.00	25.00
002.507026	55.00	70.00	26.50
002.507538	55.00	75.00	38.50
002.507621	56.00	76.00	21.94
002.507519	60.00	75.00	19.00
002.507629	60.00	76.00	29.00
002.507727	60.00	77.00	27.00
002.508022	60.00	80.00	22.00
002.508032	60.00	80.00	32.15
002.508321	63.00	83.00	21.94
002.508532	63.00	85.00	32.00
002.508028	63.50	80.00	28.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.25
002.508025	64.00	80.00	25.80
002.507721	65.00	77.00	21.00
002.508026	65.00	80.00	26.00
002.508529	65.00	85.00	29.00
002.508528	70.00	85.00	28.00
002.509022	70.00	90.00	22.00
002.509030	70.00	90.00	30.00
002.509530	75.00	95.00	30.00
002.510037	75.00	100.00	37.50
002.509517	80.00	95.00	17.50
002.510030	80.00	100.00	30.00
002.510527	80.00	105.00	27.40
002.510530	85.00	105.00	30.00
002.511540	85.00	115.00	40.00
002.510531	90.00	105.00	31.75
002.511025	90.00	110.00	25.00
002.511026	90.00	110.00	26.90
002.511030	90.00	110.00	30.00
002.511527	90.00	115.00	27.41
002.512042	90.00	120.00	42.00
002.511024	95.00	110.00	24.00
002.511532	95.00	115.00	32.15
002.512540	95.00	125.00	40.00
002.511525	100.00	115.00	25.30
002.512028	100.00	120.00	28.00
002.512527	100.00	125.00	27.40
002.512536	100.00	125.00	36.90
002.513037	104.00	130.00	37.00
002.512025	105.00	120.00	25.00
002.512529	105.00	125.00	29.76
002.513030	110.00	130.00	30.00
002.513236	110.00	132.00	36.50
002.513541	110.00	135.00	41.50
002.513025	114.00	130.00	25.80
002.514037	115.00	140.00	37.12
002.514030	120.00	140.00	30.00
002.514539	120.00	145.00	39.50
002.515044	120.00	150.00	44.00
002.513317	125.00	133.00	17.50
002.514529	125.00	145.00	29.60
002.515027	125.00	150.00	27.40
002.515541	125.00	155.00	41.00
002.514530	130.00	145.00	30.00
002.515029	130.00	150.00	29.76
002.515540	130.00	155.00	40.00
002.516041	130.00	160.00	41.50
002.515530	135.00	155.00	30.55
002.516028	140.00	160.00	28.50
002.516541	140.00	165.00	41.95
002.517039	140.00	170.00	39.00
002.517038	145.00	170.00	38.10
002.517030	150.00	170.00	30.55
002.518040	150.00	180.00	40.00
002.518045	152.30	180.00	45.00
002.518535	153.00	185.00	35.50
002.517529	154.00	175.00	29.44
002.517530	155.00	175.00	30.00
002.518547	155.00	185.00	47.00
002.518060	156.00	180.00	60.00
002.518230	157.00	182.00	30.25
002.517325	158.00	173.00	25.00
002.517526	160.00	175.00	26.00
002.518030	160.00	180.00	30.00
002.518540	160.00	185.00	40.00
002.519033	160.00	190.00	33.00
002.517322	165.00	173.00	22.50
002.518035	165.00	180.00	35.00
002.519034	165.00	190.00	34.00
002.519540	165.00	195.00	40.46
002.519537	170.00	195.00	37.50
002.520042	175.00	200.00	42.00
002.520030	180.00	200.00	30.00
002.521033	180.00	210.00	33.00
002.520528	185.00	205.00	28.00
002.521024	185.00	210.00	24.00
002.521542	185.00	215.00	42.50
002.520021	187.13	200.00	21.74
002.521536	190.00	215.00	36.00
002.520323	193.00	203.00	23.00
002.522549	195.00	225.00	49.00
002.522030	200.00	220.00	30.00
002.523032	200.00	230.00	32.97
002.524060	200.00	240.00	60.00
002.523457	203.20	234.95	57.20
002.522519	205.00	225.00	19.50
002.524042	210.00	240.00	42.10

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.25
002.524545	215.00	245.00	45.00
002.525550	215.00	255.00	50.00
002.524030	220.00	240.00	30.00
002.525052	220.00	250.00	52.00
002.526060	220.00	260.00	60.00
002.525432	224.00	254.00	32.97
002.525545	225.00	255.00	45.00
002.525438	228.60	254.00	38.10
002.526045	230.00	260.00	45.00
002.527060	230.00	270.00	60.00
002.527045	240.00	270.00	45.00
002.528060	240.00	280.00	60.00
002.527546	245.00	275.00	46.00
002.527027	250.00	270.00	27.00
002.528033	250.00	280.00	33.00
002.528043	250.00	280.00	43.00
002.529060	250.00	290.00	60.00
002.527530	255.00	275.00	30.00
002.528544	255.00	285.00	44.00
002.528040	260.00	280.00	40.00
002.529040	260.00	290.00	40.50
002.530054	260.00	300.00	54.00
002.528529	265.00	285.00	29.00
002.529037	265.00	290.00	37.50
002.529540	265.00	295.00	40.00
002.530046	270.00	300.00	46.00
002.531060	270.00	310.00	60.00
002.530546	275.00	305.00	46.00
002.531050	280.00	310.00	50.50
002.531538	280.00	315.00	38.45
002.532057	280.00	320.00	57.00
002.531540	285.00	315.00	40.00
002.532560	285.00	325.00	60.00
002.530728	288.92	307.97	28.57
002.532050	290.00	320.00	50.80
002.533054	290.00	330.00	54.00
002.532546	295.00	325.00	46.00
002.532032	300.00	320.00	32.00
002.533044	300.00	330.00	44.00
002.534054	300.00	340.00	54.00
002.533030	310.00	330.00	30.00
002.534046	310.00	340.00	46.00
002.535060	310.00	350.00	60.00
002.535046	313.00	350.00	46.00
002.534552	315.00	345.00	52.00
002.535038	315.00	350.00	38.45
002.535550	315.00	355.00	50.00
002.535050	320.00	350.00	50.80
002.536054	320.00	360.00	54.00
002.536555	320.00	365.00	55.00
002.535546	325.00	355.00	46.00
002.536556	325.00	365.00	56.00
002.537060	330.00	370.00	60.00
002.537046	340.00	370.00	46.00
002.538060	340.00	380.00	60.00
002.538046	350.00	380.00	46.00
002.539060	350.00	390.00	60.00
002.538142	355.00	381.00	42.00
002.539050	360.00	390.00	50.80
002.540060	360.00	400.00	60.00
002.540045	369.00	400.00	45.00
002.540546	375.00	405.00	46.00
002.542060	380.00	420.00	60.00
002.544085	380.00	440.00	85.00
002.542051	384.00	420.00	51.00
002.542050	390.00	420.00	50.00
002.543060	390.00	430.00	60.00
002.543048	400.00	430.00	48.00
002.544054	400.00	440.00	54.00
002.545075	400.00	450.00	75.00
002.545060	410.00	450.00	60.00
002.545050	416.00	450.00	50.00
002.545046	420.00	450.00	46.00
002.546052	420.00	460.00	52.00
002.546560	425.00	465.00	60.00
002.546449	430.00	464.00	49.00
002.548059	440.00	480.00	59.00
002.547546	445.00	475.00	46.00
002.548550	446.00	485.00	50.00
002.549060	450.00	490.00	60.00
002.550075	450.00	500.00	75.00
002.549250	460.00	492.00	50.00
002.550060	460.00	500.00	60.00
002.550055	463.00	500.00	55.00
002.550046	470.00	500.00	46.00



ROD SEALS

BECA 002/7



DESCRIPTION

The BECA 002/7 profile is a 7-part chevron ring and is composed of 3 textile-reinforced rubber shaft seals and 2 rubber rings. Its geometry means that it is encapsulated between a head nut and a locking ring.

ADVANTAGES

Strong sealing, tolerant to surface roughness defects (impacts on the rod, carbon deposits, etc.)

The tightness can be adjusted depending on the application

Excellent resistance to pressure

APPLICATIONS

Cylinders for extreme demands

Presses

Steel industry

Mining machines

Installations in corrosive and abrasive environments

MATERIALS

POM + NBR + fabric NBR + TPE

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa
Speed	0.5 m/s
Media	Mineral oils

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

EXTRUSION GAPS

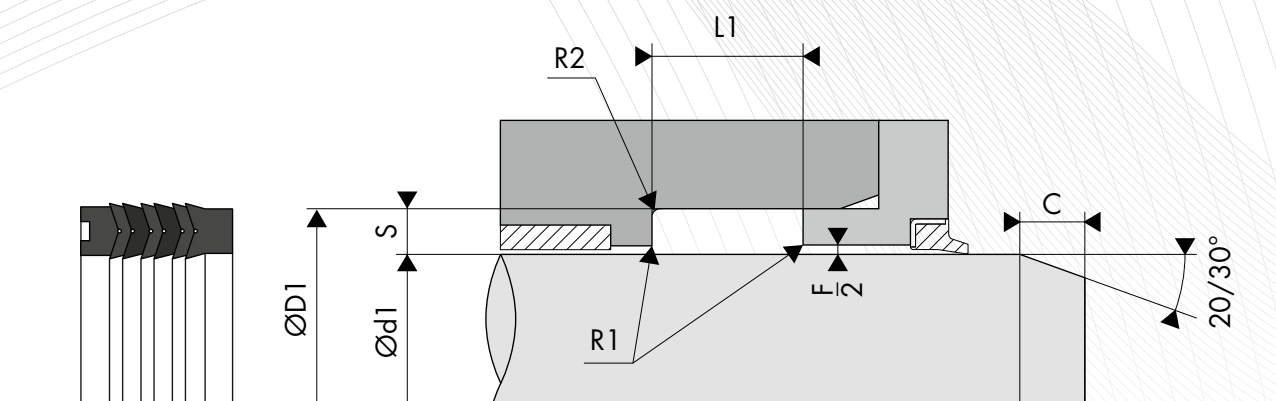
Radial section S	Radial gap F/2			
	16 MPa	26 MPa	32 MPa	40 MPa
≤ 5.00	0.50	0.40	0.35	-
≤ 7.50	0.55	0.45	0.40	0.35
≤ 12.50	0.60	0.50	0.45	0.40
≤ 15.00	0.65	0.55	0.45	0.40

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

CHAMFERS AND RADIUS

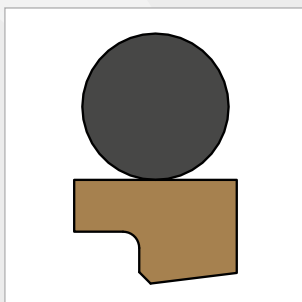
Inside diameter Ød1	Radius R1	Radius R2	Chamfer C
≤ 50.00	0.30	0.40	2.50
> 50.00	0.30	0.80	4.00



DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.25
002.701818	8.00	18.00	18.50
002.702018	10.00	20.00	18.50
002.702218	12.00	22.00	18.50
002.702418	14.00	24.00	18.50
002.702518	14.00	25.00	18.50
002.702618	16.00	26.00	18.50
002.702818	18.00	28.00	18.50
002.703018	20.00	30.00	18.50
002.703222	20.00	32.00	22.50
002.703218	22.00	32.00	18.50
002.703422	22.00	34.00	22.50
002.703722	25.00	37.00	22.50
002.704022	25.00	40.00	22.50
002.704322	28.00	43.00	22.50
002.704222	30.00	42.00	22.50
002.704522	30.00	45.00	22.50
002.704422	32.00	44.00	22.50
002.704722	32.00	47.00	22.50
002.704822	36.00	48.00	22.50
002.705122	36.00	51.00	22.50
002.705222	40.00	52.00	22.50
002.705522	40.00	55.00	22.50
002.705422	42.00	54.00	22.50
002.705722	42.00	57.00	22.50
002.706022	45.00	60.00	22.50
002.706527	45.00	65.00	27.50
002.706522	50.00	65.00	22.50
002.706529	50.00	65.00	29.00
002.707030	50.00	70.00	30.00
002.707022	55.00	70.00	22.50
002.707530	55.00	75.00	30.00
002.707122	56.00	71.00	22.50
002.707637	56.00	76.00	37.00
002.707522	60.00	75.00	22.50
002.708037	60.00	80.00	37.00
002.707822	63.00	78.00	22.50
002.708337	63.00	83.00	37.00
002.707722	65.00	77.00	22.50
002.708022	65.00	80.00	22.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.25
002.708029	65.00	80.00	29.00
002.708541	65.00	85.00	41.00
002.708522	70.00	85.00	22.50
002.709041	70.00	90.00	41.00
002.709022	75.00	90.00	22.50
002.709541	75.00	95.00	41.00
002.709522	80.00	95.00	22.50
002.710041	80.00	100.00	41.00
002.710022	85.00	100.00	22.50
002.710541	85.00	105.00	41.00
002.710522	90.00	105.00	22.50
002.711041	90.00	110.00	41.00
002.711036	95.00	110.00	36.50
002.711530	100.00	115.00	30.00
002.712041	100.00	120.00	41.00
002.712530	110.00	125.00	30.00
002.713041	110.00	130.00	41.00
002.713030	115.00	130.00	30.00
002.714046	115.00	140.00	46.00
002.714034	125.00	140.00	34.00
002.715046	125.00	150.00	46.00
002.715534	140.00	155.00	34.00
002.716546	140.00	165.00	46.00
002.717041	150.00	170.00	41.00
002.718060	150.00	180.00	60.00
002.718040	160.00	180.00	40.00
002.719060	160.00	190.00	60.00
002.720060	170.00	200.00	60.00
002.720041	180.00	200.00	41.00
002.721060	180.00	210.00	60.00
002.722060	190.00	220.00	60.00
002.722041	200.00	220.00	41.00
002.723060	200.00	230.00	60.00
002.725060	220.00	250.00	60.00
002.726060	230.00	260.00	60.00
002.726565	235.00	265.00	65.00
002.727064	240.00	270.00	64.00
002.728060	250.00	280.00	60.00
002.731060	280.00	310.00	60.00



ROD SEALS

BECA

150-152-154



DESCRIPTION

The BECA 150 - 152 - 154 profiles are single acting composite rod seals composed of a filled PTFE friction ring and pre-tightened rubber O'Ring. They can be assembled in grooves according to standard ISO 7425/2. Option of connecting the seal to a back-up ring.

ADVANTAGES

Optimal sealing in static and dynamic applications

Low friction coefficient;
no stick-slip effect

Excellent abrasion and
extrusion resistance

Wide temperature range and excellent
chemical resistance, depending on
the material selected for the O'Ring

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Standard cylinders

MATERIALS

Friction ring

Bronze-filled PTFE

Carbon-filled PTFE

Blue GL PTFE

O'Ring

NBR 70 Shore A

FKM 70 Shore A

Other grades of materials are
available. Please refer to the
materials table on the next page.

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	50 MPa
Speed	5 m/s
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

Radial section S	Radial gap F/2		
	10 MPa	20 MPa	40 MPa
2.45	0.30	0.20	0.15
3.65	0.40	0.25	0.15
5.35	0.50	0.30	0.20
7.55	0.70	0.40	0.25
10.25	0.80	0.60	0.35
12.00	0.90	0.70	0.40
13.65	1.00	0.80	0.50
19.00	1.20	0.90	0.60

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

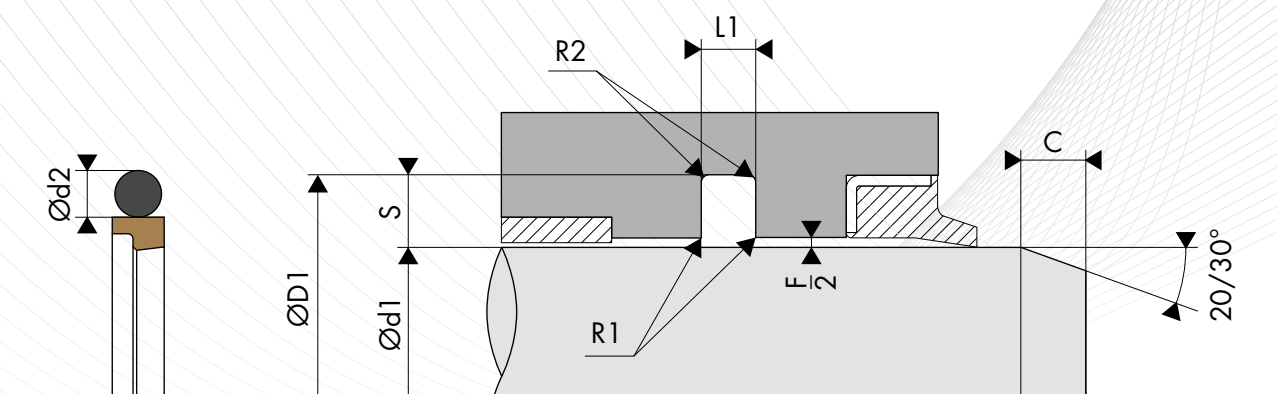
CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
2.45	0.30	0.40	3.00
3.65	0.30	0.60	3.00
5.35	0.30	1.00	3.00
7.55	0.30	1.30	5.00
10.25	0.30	1.80	6.00
12.00	0.30	1.80	8.00
13.65	0.30	2.50	10.00
19.00	0.30	3.00	12.00

TABLE MATERIALS

Friction ring					O'Ring			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
					F6	VMQ 70 Shore A	-60°C/+200°C	
DC	C	PTFE + 25% Carbon	Grey	Improvements • Wear properties • Compression set Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
CG	C	PTFE + 23% Carbon + 2% Graphite	Black		C6	EPDM 70 Shore A	-45°C/+150°C	
					K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DV	V	PTFE + 25 % Glass	Blue	Improvements • Wear properties • Mechanical strength Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue	Resistance to compression Resistance to wear Excellent chemical stability Good thermal conductivity	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DG	G	PTFE + 15% Graphite	Black	Improvements • Wear properties Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K1	K	PTFE + 10% Ekonol	Light brown	Improvements • Better abrasion resistance • Better dimensional stability at high temperatures Use up to +300°C Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
K2	K	PTFE + 20% Ekonol	Light brown		C6	EPDM 70 Shore A	-45°C/+150°C	
					K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DB	B	PTFE + 60% Bronze	Dark brown	Improvements • Wear properties • Warping resistance and creep strength • Compression resistance Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
B4	B	PTFE + 40% Bronze	Dark brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	K6	NBR 70 Shore A	-30°C/+80°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
PU	U	Polyurethane	Blue	Strong mechanical resistance Good resistance to wear and abrasion High elasticity modulus Good flexibility	K6	NBR 70 Shore A	-30°C/+90°C	
PUHT	U	High-temperature polyurethane	White or off-white	Very good resistance to ozone and oxidation	K6	NBR 70 Shore A	-30°C/+100°C	

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

Rod diameter Ød1 f8/h9			Groove diameter	Groove width	Radial section	O'Ring cross-section
BECA 150 Standard range	BECA 152 Light range	BECA 154 Heavy-duty range	ØD1 H9	L1 0/+0.20	S	Ød2
3.0 - 7.9	8.0 - 18.9	---	d1 + 4.90	2.20	2.45	1.78
8.0 - 18.9	19.0 - 37.9	---	d1 + 7.30	3.20	3.65	2.62
19.0 - 37.9	38.0 - 199.9	8.0 - 18.9	d1 + 10.70	4.20	5.35	3.53
38.0 - 199.9	200.0 - 255.9	19.0 - 37.9	d1 + 15.10	6.30	7.55	5.33
200.0 - 255.9	256.0 - 649.9	38.0 - 199.9	d1 + 20.50	8.10	10.25	6.99
256.0 - 649.9	650.0 - 999.9	200.0 - 255.9	d1 + 24.00	8.10	12.00	6.99
650.0 - 999.9	1000.0 - 1200.0	256.0 - 649.9	d1 + 27.30	9.50	13.65	8.40
1000.0 - **	---	650.0 - 999.9	d1 + 38.00	13.80	19.00	12.00

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Friction ring, PTFE + 60% Bronze - Code DB
 _____ : NBR 70 Shore A O'Ring - Code K6
Rod diameter _____ : Ød1 = 50.00 mm
Groove diameter _____ : ØD1 = 65.10 mm
Part number _____ : 150. 050DBK6

Part number -

	150.	050	DB	K6
Family				
Rod diameter				
Friction ring material*				
O'Ring material*				

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

DIMENSIONS

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
150.003	3.00	7.90	2.20
150.004	4.00	8.90	2.20
150.005	5.00	9.90	2.20
150.006	6.00	10.90	2.20
150.007	7.00	11.90	2.20
152.008	8.00	12.90	2.20
150.008	8.00	15.30	3.20
154.008	8.00	18.70	4.20
152.009	9.00	13.90	2.20
150.009	9.00	16.30	3.20
154.009	9.00	19.70	4.20
152.010	10.00	14.90	2.20
150.010	10.00	17.30	3.20
154.010	10.00	20.70	4.20
152.011	11.00	15.90	2.20
150.011	11.00	18.30	3.20
154.011	11.00	21.70	4.20
152.012	12.00	16.90	2.20
150.012	12.00	19.30	3.20
154.012	12.00	22.70	4.20
152.013	13.00	17.90	2.20
150.013	13.00	20.30	3.20
154.013	13.00	23.70	4.20
152.014	14.00	18.90	2.20
150.014	14.00	21.30	3.20
154.014	14.00	24.70	4.20
152.015	15.00	19.90	2.20
150.015	15.00	22.30	3.20
154.015	15.00	25.70	4.20
152.016	16.00	20.90	2.20
150.016	16.00	23.30	3.20
154.016	16.00	26.70	4.20
152.017	17.00	21.90	2.20
150.017	17.00	24.30	3.20
154.017	17.00	27.70	4.20
152.018	18.00	22.90	2.20
150.018	18.00	25.30	3.20
154.018	18.00	28.70	4.20
152.019	19.00	26.30	3.20
150.019	19.00	29.70	4.20
154.019	19.00	34.10	6.30
152.020	20.00	27.30	3.20
150.020	20.00	30.70	4.20
154.020	20.00	35.10	6.30
152.021	21.00	28.30	3.20
150.021	21.00	31.70	4.20
154.021	21.00	36.10	6.30
152.022	22.00	29.30	3.20
150.022	22.00	32.70	4.20
154.022	22.00	37.10	6.30
152.024	24.00	31.30	3.20
150.024	24.00	34.70	4.20
154.024	24.00	39.10	6.30
152.025	25.00	32.30	3.20
150.025	25.00	35.70	4.20
154.025	25.00	40.10	6.30
152.026	26.00	33.30	3.20
150.026	26.00	36.70	4.20
154.026	26.00	41.10	6.30
152.027	27.00	34.30	3.20
150.027	27.00	37.70	4.20
154.027	27.00	42.10	6.30
152.028	28.00	35.30	3.20
150.028	28.00	38.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
154.028	28.00	43.10	6.30
152.029	29.00	36.30	3.20
150.029	29.00	39.70	4.20
154.029	29.00	44.10	6.30
152.030	30.00	37.30	3.20
150.030	30.00	40.70	4.20
154.030	30.00	45.10	6.30
152.032	32.00	39.30	3.20
150.032	32.00	42.70	4.20
154.032	32.00	47.10	6.30
152.034	34.00	41.30	3.20
150.034	34.00	44.70	4.20
154.034	34.00	49.10	6.30
152.035	35.00	42.30	3.20
150.035	35.00	45.70	4.20
154.035	35.00	50.10	6.30
152.036	36.00	43.30	3.20
150.036	36.00	46.70	4.20
154.036	36.00	51.10	6.30
152.038	38.00	48.70	4.20
150.038	38.00	53.10	6.30
154.038	38.00	58.50	8.10
152.039	39.00	49.70	4.20
150.039	39.00	54.10	6.30
154.039	39.00	59.50	8.10
152.040	40.00	50.70	4.20
150.040	40.00	55.10	6.30
154.040	40.00	60.50	8.10
152.041	41.00	51.70	4.20
150.041	41.00	56.10	6.30
154.041	41.00	61.50	8.10
152.042	42.00	52.70	4.20
150.042	42.00	57.10	6.30
154.042	42.00	62.50	8.10
152.044	44.00	54.70	4.20
150.044	44.00	59.10	6.30
154.044	44.00	64.50	8.10
152.045	45.00	55.70	4.20
150.045	45.00	60.10	6.30
154.045	45.00	65.50	8.10
152.046	46.00	56.70	4.20
150.046	46.00	61.10	6.30
154.046	46.00	66.50	8.10
152.047	47.00	57.70	4.20
150.047	47.00	62.10	6.30
154.047	47.00	67.50	8.10
152.048	48.00	58.70	4.20
150.048	48.00	63.10	6.30
154.048	48.00	68.50	8.10
152.050	50.00	60.70	4.20
150.050	50.00	65.10	6.30
154.050	50.00	70.50	8.10
152.051	51.00	61.70	4.20
150.051	51.00	66.10	6.30
154.051	51.00	71.50	8.10
152.052	52.00	62.70	4.20
150.052	52.00	67.10	6.30
154.052	52.00	72.50	8.10
152.055	55.00	65.70	4.20
150.055	55.00	70.10	6.30
154.055	55.00	75.50	8.10
152.056	56.00	66.70	4.20
150.056	56.00	71.10	6.30
154.056	56.00	76.50	8.10

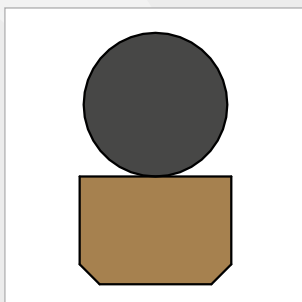
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
152.058	58.00	68.70	4.20
150.058	58.00	73.10	6.30
154.058	58.00	78.50	8.10
152.060	60.00	70.70	4.20
150.060	60.00	75.10	6.30
154.060	60.00	80.50	8.10
152.061	61.00	71.70	4.20
150.061	61.00	76.10	6.30
154.061	61.00	81.50	8.10
152.062	62.00	72.70	4.20
150.062	62.00	77.10	6.30
154.062	62.00	82.50	8.10
152.063	63.00	73.70	4.20
150.063	63.00	78.10	6.30
154.063	63.00	83.50	8.10
152.065	65.00	75.70	4.20
150.065	65.00	80.10	6.30
154.065	65.00	85.50	8.10
152.067	67.00	77.70	4.20
150.067	67.00	82.10	6.30
154.067	67.00	87.50	8.10
152.068	68.00	78.70	4.20
150.068	68.00	83.10	6.30
154.068	68.00	88.50	8.10
152.070	70.00	80.70	4.20
150.070	70.00	85.10	6.30
154.070	70.00	90.50	8.10
152.072	72.00	82.70	4.20
150.072	72.00	87.10	6.30
154.072	72.00	92.50	8.10
152.075	75.00	85.70	4.20
150.075	75.00	90.10	6.30
154.075	75.00	95.50	8.10
152.078	78.00	88.70	4.20
150.078	78.00	93.10	6.30
154.078	78.00	98.50	8.10
152.079	79.00	89.70	4.20
150.079	79.00	94.10	6.30
154.079	79.00	99.50	8.10
152.080	80.00	90.70	4.20
150.080	80.00	95.10	6.30
154.080	80.00	100.50	8.10
152.081	81.00	91.70	4.20
150.081	81.00	96.10	6.30
154.081	81.00	101.50	8.10
152.082	82.00	92.70	4.20
150.082	82.00	97.10	6.30
154.082	82.00	102.50	8.10
152.083	83.00	93.70	4.20
150.083	83.00	98.10	6.30
154.083	83.00	103.50	8.10
152.084	84.00	94.70	4.20
150.084	84.00	99.10	6.30
154.084	84.00	104.50	8.10
152.085	85.00	95.70	4.20
150.085	85.00	100.10	6.30
154.085	85.00	105.50	8.10
152.086	86.00	96.70	4.20
150.086	86.00	101.10	6.30
154.086	86.00	106.50	8.10
152.088	88.00	98.70	4.20
150.088	88.00	103.10	6.30
154.088	88.00	108.50	8.10
152.090	90.00	100.70	4.20
150.090	90.00	105.10	6.30

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
154.090	90.00	110.50	8.10
152.092	92.00	102.70	4.20
150.092	92.00	107.10	6.30
154.092	92.00	112.50	8.10
152.095	95.00	105.70	4.20
150.095	95.00	110.10	6.30
154.095	95.00	115.50	8.10
152.098	98.00	108.70	4.20
150.098	98.00	113.10	6.30
154.098	98.00	118.50	8.10
152.100	100.00	110.70	4.20
150.100	100.00	115.10	6.30
154.100	100.00	120.50	8.10
152.105	105.00	115.70	4.20
150.105	105.00	120.10	6.30
154.105	105.00	125.50	8.10
152.108	108.00	118.70	4.20
150.108	108.00	123.10	6.30
154.108	108.00	128.50	8.10
152.110	110.00	120.70	4.20
150.110	110.00	125.10	6.30
154.110	110.00	130.50	8.10
152.115	115.00	125.70	4.20
150.115	115.00	130.10	6.30
154.115	115.00	135.50	8.10
152.120	120.00	130.70	4.20
150.120	120.00	135.10	6.30
154.120	120.00	140.50	8.10
152.125	125.00	135.70	4.20
150.125	125.00	140.10	6.30
154.125	125.00	145.50	8.10
152.127	127.00	137.70	4.20
150.127	127.00	142.10	6.30
154.127	127.00	147.50	8.10
152.130	130.00	140.70	4.20
150.130	130.00	145.10	6.30
154.130	130.00	150.50	8.10
152.135	135.00	145.70	4.20
150.135	135.00	150.10	6.30
154.135	135.00	155.50	8.10
152.138	138.00	148.70	4.20
150.138	138.00	153.10	6.30
154.138	138.00	158.50	8.10
152.140	140.00	150.70	4.20
150.140	140.00	155.10	6.30
154.140	140.00	160.50	8.10
152.145	145.00	155.70	4.20
150.145	145.00	160.10	6.30
154.145	145.00	165.50	8.10
152.150	150.00	160.70	4.20
150.150	150.00	165.10	6.30
154.150	150.00	170.50	8.10
152.155	155.00	165.70	4.20
150.155	155.00	170.10	6.30
154.155	155.00	175.50	8.10
152.160	160.00	170.70	4.20
150.160	160.00	175.10	6.30
154.160	160.00	180.50	8.10
152.165	165.00	175.70	4.20
150.165	165.00	180.10	6.30
154.165	165.00	185.50	8.10
152.170	170.00	180.70	4.20
150.170	170.00	185.10	6.30
154.170	170.00	190.50	8.10
152.175	175.00	185.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
150.175	175.00	190.10	6.30
154.175	175.00	195.50	8.10
152.180	180.00	190.70	4.20
150.180	180.00	195.10	6.30
154.180	180.00	200.50	8.10
152.185	185.00	195.70	4.20
150.185	185.00	200.10	6.30
154.185	185.00	205.50	8.10
152.190	190.00	200.70	4.20
150.190	190.00	205.10	6.30
154.190	190.00	210.50	8.10
152.195	195.00	205.70	4.20
150.195	195.00	210.10	6.30
154.195	195.00	215.50	8.10
152.200	200.00	215.10	6.30
150.200	200.00	220.50	8.10
154.200	200.00	224.00	8.10
152.210	210.00	225.10	6.30
150.210	210.00	230.50	8.10
154.210	210.00	234.00	8.10
152.215	215.00	230.10	6.30
150.215	215.00	235.50	8.10
154.215	215.00	239.00	8.10
152.220	220.00	235.10	6.30
150.220	220.00	240.50	8.10
154.220	220.00	244.00	8.10
152.230	230.00	245.10	6.30
150.230	230.00	250.50	8.10
154.230	230.00	254.00	8.10
152.240	240.00	255.10	6.30
150.240	240.00	260.50	8.10
154.240	240.00	264.00	8.10
152.250	250.00	265.10	6.30
150.250	250.00	270.50	8.10
154.250	250.00	274.00	8.10
152.260	260.00	280.50	8.10
150.260	260.00	284.00	8.10
154.260	260.00	287.30	9.50
152.270	270.00	290.50	8.10
150.270	270.00	294.00	8.10
154.270	270.00	297.30	9.50
152.275	275.00	295.50	8.10
150.275	275.00	299.00	8.10
154.275	275.00	302.30	9.50
152.280	280.00	300.50	8.10
150.280	280.00	304.00	8.10
154.280	280.00	307.30	9.50
152.285	285.00	305.50	8.10
150.285	285.00	309.00	8.10
154.285	285.00	312.30	9.50
152.290	290.00	310.50	8.10
150.290	290.00	314.00	8.10
154.290	290.00	317.30	9.50
152.295	295.00	315.50	8.10
150.295	295.00	319.00	8.10
154.295	295.00	322.30	9.50
152.300	300.00	320.50	8.10
150.300	300.00	324.00	8.10
154.300	300.00	327.30	9.50
152.305	305.00	325.50	8.10
150.305	305.00	329.00	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
154.305	305.00	332.30	9.50
152.310	310.00	330.50	8.10
150.310	310.00	334.00	8.10
154.310	310.00	337.30	9.50
152.320	320.00	340.50	8.10
150.320	320.00	344.00	8.10
154.320	320.00	347.30	9.50
152.330	330.00	350.50	8.10
150.330	330.00	354.00	8.10
154.330	330.00	357.30	9.50
152.340	340.00	360.50	8.10
150.340	340.00	364.00	8.10
154.340	340.00	367.30	9.50
152.350	350.00	370.50	8.10
150.350	350.00	374.00	8.10
154.350	350.00	377.30	9.50
152.360	360.00	380.50	8.10
150.360	360.00	384.00	8.10
154.360	360.00	387.30	9.50
152.370	370.00	390.50	8.10
150.370	370.00	394.00	8.10
154.370	370.00	397.30	9.50
152.380	380.00	400.50	8.10
150.380	380.00	404.00	8.10
154.380	380.00	407.30	9.50
152.390	390.00	410.50	8.10
150.390	390.00	414.00	8.10
154.390	390.00	417.30	9.50
152.400	400.00	420.50	8.10
150.400	400.00	424.00	8.10
154.400	400.00	427.30	9.50
152.410	410.00	430.50	8.10
150.410	410.00	434.00	8.10
154.410	410.00	437.30	9.50
152.420	420.00	440.50	8.10
150.420	420.00	444.00	8.10
154.420	420.00	447.30	9.50
152.430	430.00	450.50	8.10
150.430	430.00	454.00	8.10
154.430	430.00	457.30	9.50
152.440	440.00	460.50	8.10
150.440	440.00	464.00	8.10
154.440	440.00	467.30	9.50
152.450	450.00	470.50	8.10
150.450	450.00	474.00	8.10
154.450	450.00	477.30	9.50
152.460	460.00	480.50	8.10
150.460	460.00	484.00	8.10
154.460	460.00	487.30	9.50
152.470	470.00	490.50	8.10
150.470	470.00	494.00	8.10
154.470	470.00	497.30	9.50
152.480	480.00	500.50	8.10
150.480	480.00	504.00	8.10
154.480	480.00	507.30	9.50
152.490	490.00	510.50	8.10
150.490	490.00	514.00	8.10
154.490	490.00	517.30	9.50
152.500	500.00	520.50	8.10
150.500	500.00	524.00	8.10
154.500	500.00	527.30	9.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA

151-153-155



DESCRIPTION

The BECA 151 - 153 - 155 profiles are double acting composite rod seals composed of a filled PTFE friction ring and pre-tightened rubber O'Ring. They can be assembled in grooves according to standard ISO 7425/2. Option of connecting the seal to 1 or 2 back-up rings.

ADVANTAGES

Optimal sealing in static and dynamic applications

Low friction coefficient;
no stick-slip effect

Excellent abrasion and extrusion resistance

Wide temperature range and excellent chemical resistance, depending on the material selected for the O'Ring

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Standard cylinders

MATERIALS

Friction ring

Bronze-filled PTFE

Carbon-filled PTFE

Blue GL PTFE

O'Ring

NBR 70 Shore A

FKM 70 Shore A

Other grades of materials are available. Please refer to the materials table on the next page.

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	50 MPa
Speed	5 m/s
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

Radial section S	Radial gap F/2		
	10 MPa	20 MPa	40 MPa
2.45	0.30	0.20	0.15
3.65	0.40	0.25	0.15
5.35	0.40	0.25	0.20
7.55	0.50	0.30	0.20
10.25	0.60	0.35	0.25
12.00	0.60	0.35	0.25
13.65	0.70	0.50	0.30
19.00	1.00	0.70	0.60

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

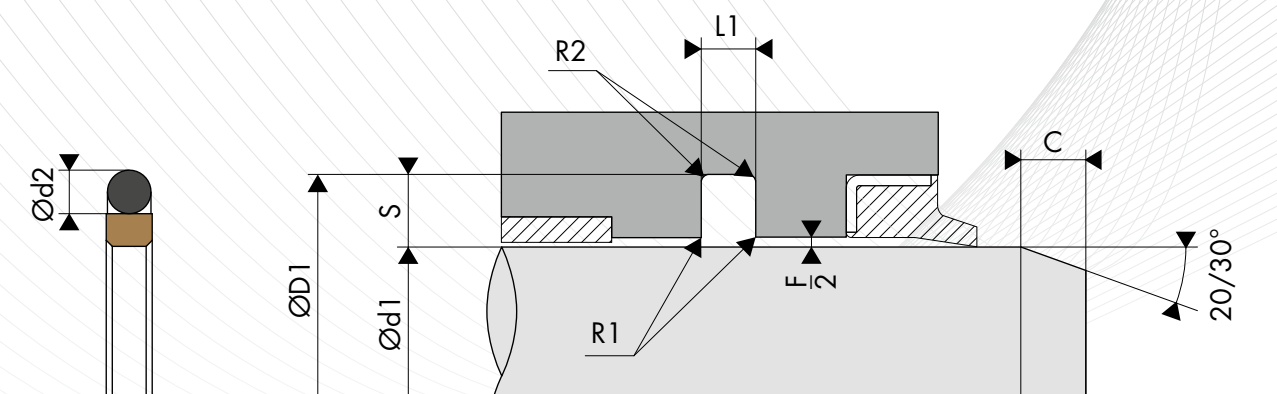
CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
2.45	0.30	0.40	3.00
3.65	0.30	0.60	3.00
5.35	0.30	1.00	3.00
7.55	0.30	1.30	5.00
10.25	0.30	1.80	6.00
12.00	0.30	1.80	8.00
13.65	0.30	2.50	10.00
19.00	0.30	3.00	12.00

TABLE MATERIALS

Friction ring					O'Ring			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
					F6	VMQ 70 Shore A	-60°C/+200°C	
DC	C	PTFE + 25% Carbon	Grey	Improvements • Wear properties • Compression set Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
CG	C	PTFE + 23% Carbon + 2% Graphite	Black		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DV	V	PTFE + 25 % Glass	Blue	Improvements • Wear properties • Mechanical strength Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DG	G	PTFE + 15% Graphite	Black	Improvements • Wear properties Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K1	K	PTFE + 10% Ekonol	Light brown	Improvements • Better abrasion resistance • Better dimensional stability at high temperatures Use up to +300°C Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K2	K	PTFE + 20% Ekonol	Light brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DB	B	PTFE + 60% Bronze	Dark brown	Improvements • Wear properties • Warping resistance and creep strength • Compression resistance Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
B4	B	PTFE + 40% Bronze	Dark brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	K6	NBR 70 Shore A	-30°C/+80°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
PU	U	Polyurethane	Blue	Strong mechanical resistance Good resistance to wear and abrasion High elasticity modulus Good flexibility	K6	NBR 70 Shore A	-30°C/+90°C	
PUHT	U	High-temperature polyurethane	White or off-white	Very good resistance to ozone and oxidation	K6	NBR 70 Shore A	-30°C/+100°C	

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

Rod diameter Ød1 f8/h9			Groove diameter	Groove width	Radial section	O'Ring cross-section
BECA 151 Standard range	BECA 153 Light range	BECA 155 Heavy-duty range	ØD1 H9	L1 0/+0.20	S	Ød2
3.0 - 7.9	8.0 - 18.9	---	d1 + 4.90	2.20	2.45	1.78
8.0 - 18.9	19.0 - 37.9	---	d1 + 7.30	3.20	3.65	2.62
19.0 - 37.9	38.0 - 199.9	8.0 - 18.9	d1 + 10.70	4.20	5.35	3.53
38.0 - 199.9	200.0 - 255.9	19.0 - 37.9	d1 + 15.10	6.30	7.55	5.33
200.0 - 255.9	256.0 - 649.9	38.0 - 199.9	d1 + 20.50	8.10	10.25	6.99
256.0 - 649.9	650.0 - 999.9	200.0 - 255.9	d1 + 24.00	8.10	12.00	6.99
650.0 - 999.9	1000.0 - 1200.0	256.0 - 649.9	d1 + 27.30	9.50	13.65	8.40
1000.0 - **	---	650.0 - 999.9	d1 + 38.00	13.80	19.00	12.00

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Friction ring, PTFE + 60% Bronze - Code DB
 _____ : NBR 70 Shore A O'Ring - Code K6
Rod diameter _____ : Ød1 = 50.00 mm
Groove diameter _____ : ØD1 = 65.10 mm
Part number _____ : 151. 050DBK6

Part number -

	151.	050	DB	K6
Family				
Rod diameter				
Friction ring material*				
O'Ring material*				

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

DIMENSIONS

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
151.003	3.00	7.90	2.20
151.004	4.00	8.90	2.20
151.005	5.00	9.90	2.20
151.006	6.00	10.90	2.20
151.007	7.00	11.90	2.20
153.008	8.00	12.90	2.20
151.008	8.00	15.30	3.20
155.008	8.00	18.70	4.20
153.009	9.00	13.90	2.20
151.009	9.00	16.30	3.20
155.009	9.00	19.70	4.20
153.010	10.00	14.90	2.20
151.010	10.00	17.30	3.20
155.010	10.00	20.70	4.20
153.011	11.00	15.90	2.20
151.011	11.00	18.30	3.20
155.011	11.00	21.70	4.20
153.012	12.00	16.90	2.20
151.012	12.00	19.30	3.20
155.012	12.00	22.70	4.20
153.013	13.00	17.90	2.20
151.013	13.00	20.30	3.20
155.013	13.00	23.70	4.20
153.014	14.00	18.90	2.20
151.014	14.00	21.30	3.20
155.014	14.00	24.70	4.20
153.015	15.00	19.90	2.20
151.015	15.00	22.30	3.20
155.015	15.00	25.70	4.20
153.016	16.00	20.90	2.20
151.016	16.00	23.30	3.20
155.016	16.00	26.70	4.20
153.017	17.00	21.90	2.20
151.017	17.00	24.30	3.20
155.017	17.00	27.70	4.20
153.018	18.00	22.90	2.20
151.018	18.00	25.30	3.20
155.018	18.00	28.70	4.20
153.019	19.00	26.30	3.20
151.019	19.00	29.70	4.20
155.019	19.00	34.10	6.30
153.020	20.00	27.30	3.20
151.020	20.00	30.70	4.20
155.020	20.00	35.10	6.30
153.021	21.00	28.30	3.20
151.021	21.00	31.70	4.20
155.021	21.00	36.10	6.30
153.022	22.00	29.30	3.20
151.022	22.00	32.70	4.20
155.022	22.00	37.10	6.30
153.024	24.00	31.30	3.20
151.024	24.00	34.70	4.20
155.024	24.00	39.10	6.30
153.025	25.00	32.30	3.20
151.025	25.00	35.70	4.20
155.025	25.00	40.10	6.30
153.026	26.00	33.30	3.20
151.026	26.00	36.70	4.20
155.026	26.00	41.10	6.30
153.027	27.00	34.30	3.20
151.027	27.00	37.70	4.20
155.027	27.00	42.10	6.30
153.028	28.00	35.30	3.20
151.028	28.00	38.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
155.028	28.00	43.10	6.30
153.029	29.00	36.30	3.20
151.029	29.00	39.70	4.20
155.029	29.00	44.10	6.30
153.030	30.00	37.30	3.20
151.030	30.00	40.70	4.20
155.030	30.00	45.10	6.30
153.032	32.00	39.30	3.20
151.032	32.00	42.70	4.20
155.032	32.00	47.10	6.30
153.034	34.00	41.30	3.20
151.034	34.00	44.70	4.20
155.034	34.00	49.10	6.30
153.035	35.00	42.30	3.20
151.035	35.00	45.70	4.20
155.035	35.00	50.10	6.30
153.036	36.00	43.30	3.20
151.036	36.00	46.70	4.20
155.036	36.00	51.10	6.30
153.038	38.00	48.70	4.20
151.038	38.00	53.10	6.30
155.038	38.00	58.50	8.10
153.039	39.00	49.70	4.20
151.039	39.00	54.10	6.30
155.039	39.00	59.50	8.10
153.040	40.00	50.70	4.20
151.040	40.00	55.10	6.30
155.040	40.00	60.50	8.10
153.041	41.00	51.70	4.20
151.041	41.00	56.10	6.30
155.041	41.00	61.50	8.10
153.042	42.00	52.70	4.20
151.042	42.00	57.10	6.30
155.042	42.00	62.50	8.10
153.044	44.00	54.70	4.20
151.044	44.00	59.10	6.30
155.044	44.00	64.50	8.10
153.045	45.00	55.70	4.20
151.045	45.00	60.10	6.30
155.045	45.00	65.50	8.10
153.046	46.00	56.70	4.20
151.046	46.00	61.10	6.30
155.046	46.00	66.50	8.10
153.047	47.00	57.70	4.20
151.047	47.00	62.10	6.30
155.047	47.00	67.50	8.10
153.048	48.00	58.70	4.20
151.048	48.00	63.10	6.30
155.048	48.00	68.50	8.10
153.050	50.00	60.70	4.20
151.050	50.00	65.10	6.30
155.050	50.00	70.50	8.10
153.051	51.00	61.70	4.20
151.051	51.00	66.10	6.30
155.051	51.00	71.50	8.10
153.052	52.00	62.70	4.20
151.052	52.00	67.10	6.30
155.052	52.00	72.50	8.10
153.055	55.00	65.70	4.20
151.055	55.00	70.10	6.30
155.055	55.00	75.50	8.10
153.056	56.00	66.70	4.20
151.056	56.00	71.10	6.30
155.056	56.00	76.50	8.10

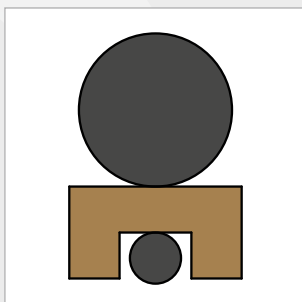
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
153.058	58.00	68.70	4.20
151.058	58.00	73.10	6.30
155.058	58.00	78.50	8.10
153.060	60.00	70.70	4.20
151.060	60.00	75.10	6.30
155.060	60.00	80.50	8.10
153.061	61.00	71.70	4.20
151.061	61.00	76.10	6.30
155.061	61.00	81.50	8.10
153.062	62.00	72.70	4.20
151.062	62.00	77.10	6.30
155.062	62.00	82.50	8.10
153.063	63.00	73.70	4.20
151.063	63.00	78.10	6.30
155.063	63.00	83.50	8.10
153.065	65.00	75.70	4.20
151.065	65.00	80.10	6.30
155.065	65.00	85.50	8.10
153.067	67.00	77.70	4.20
151.067	67.00	82.10	6.30
155.067	67.00	87.50	8.10
153.068	68.00	78.70	4.20
151.068	68.00	83.10	6.30
155.068	68.00	88.50	8.10
153.070	70.00	80.70	4.20
151.070	70.00	85.10	6.30
155.070	70.00	90.50	8.10
153.072	72.00	82.70	4.20
151.072	72.00	87.10	6.30
155.072	72.00	92.50	8.10
153.075	75.00	85.70	4.20
151.075	75.00	90.10	6.30
155.075	75.00	95.50	8.10
153.078	78.00	88.70	4.20
151.078	78.00	93.10	6.30
155.078	78.00	98.50	8.10
153.079	79.00	89.70	4.20
151.079	79.00	94.10	6.30
155.079	79.00	99.50	8.10
153.080	80.00	90.70	4.20
151.080	80.00	95.10	6.30
155.080	80.00	100.50	8.10
153.081	81.00	91.70	4.20
151.081	81.00	96.10	6.30
155.081	81.00	101.50	8.10
153.082	82.00	92.70	4.20
151.082	82.00	97.10	6.30
155.082	82.00	102.50	8.10
153.083	83.00	93.70	4.20
151.083	83.00	98.10	6.30
155.083	83.00	103.50	8.10
153.084	84.00	94.70	4.20
151.084	84.00	99.10	6.30
155.084	84.00	104.50	8.10
153.085	85.00	95.70	4.20
151.085	85.00	100.10	6.30
155.085	85.00	105.50	8.10
153.086	86.00	96.70	4.20
151.086	86.00	101.10	6.30
155.086	86.00	106.50	8.10
153.088	88.00	98.70	4.20
151.088	88.00	103.10	6.30
155.088	88.00	108.50	8.10
153.090	90.00	100.70	4.20
151.090	90.00	105.10	6.30

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
155.090	90.00	110.50	8.10
153.092	92.00	102.70	4.20
151.092	92.00	107.10	6.30
155.092	92.00	112.50	8.10
153.095	95.00	105.70	4.20
151.095	95.00	110.10	6.30
155.095	95.00	115.50	8.10
153.098	98.00	108.70	4.20
151.098	98.00	113.10	6.30
155.098	98.00	118.50	8.10
153.100	100.00	110.70	4.20
151.100	100.00	115.10	6.30
155.100	100.00	120.50	8.10
153.105	105.00	115.70	4.20
151.105	105.00	120.10	6.30
155.105	105.00	125.50	8.10
153.108	108.00	118.70	4.20
151.108	108.00	123.10	6.30
155.108	108.00	128.50	8.10
153.110	110.00	120.70	4.20
151.110	110.00	125.10	6.30
155.110	110.00	130.50	8.10
153.115	115.00	125.70	4.20
151.115	115.00	130.10	6.30
155.115	115.00	135.50	8.10
153.120	120.00	130.70	4.20
151.120	120.00	135.10	6.30
155.120	120.00	140.50	8.10
153.125	125.00	135.70	4.20
151.125	125.00	140.10	6.30
155.125	125.00	145.50	8.10
153.127	127.00	137.70	4.20
151.127	127.00	142.10	6.30
155.127	127.00	147.50	8.10
153.130	130.00	140.70	4.20
151.130	130.00	145.10	6.30
155.130	130.00	150.50	8.10
153.135	135.00	145.70	4.20
151.135	135.00	150.10	6.30
155.135	135.00	155.50	8.10
153.138	138.00	148.70	4.20
151.138	138.00	153.10	6.30
155.138	138.00	158.50	8.10
153.140	140.00	150.70	4.20
151.140	140.00	155.10	6.30
155.140	140.00	160.50	8.10
153.145	145.00	155.70	4.20
151.145	145.00	160.10	6.30
155.145	145.00	165.50	8.10
153.150	150.00	160.70	4.20
151.150	150.00	165.10	6.30
155.150	150.00	170.50	8.10
153.155	155.00	165.70	4.20
151.155	155.00	170.10	6.30
155.155	155.00	175.50	8.10
153.160	160.00	170.70	4.20
151.160	160.00	175.10	6.30
155.160	160.00	180.50	8.10
153.165	165.00	175.70	4.20
151.165	165.00	180.10	6.30
155.165	165.00	185.50	8.10
153.170	170.00	180.70	4.20
151.170	170.00	185.10	6.30
155.170	170.00	190.50	8.10
153.175	175.00	185.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
151.175	175.00	190.10	6.30
155.175	175.00	195.50	8.10
153.180	180.00	190.70	4.20
151.180	180.00	195.10	6.30
155.180	180.00	200.50	8.10
153.185	185.00	195.70	4.20
151.185	185.00	200.10	6.30
155.185	185.00	205.50	8.10
153.190	190.00	200.70	4.20
151.190	190.00	205.10	6.30
155.190	190.00	210.50	8.10
153.195	195.00	205.70	4.20
151.195	195.00	210.10	6.30
155.195	195.00	215.50	8.10
153.200	200.00	215.10	6.30
151.200	200.00	220.50	8.10
155.200	200.00	224.00	8.10
153.210	210.00	225.10	6.30
151.210	210.00	230.50	8.10
155.210	210.00	234.00	8.10
153.215	215.00	230.10	6.30
151.215	215.00	235.50	8.10
155.215	215.00	239.00	8.10
153.220	220.00	235.10	6.30
151.220	220.00	240.50	8.10
155.220	220.00	244.00	8.10
153.230	230.00	245.10	6.30
151.230	230.00	250.50	8.10
155.230	230.00	254.00	8.10
153.240	240.00	255.10	6.30
151.240	240.00	260.50	8.10
155.240	240.00	264.00	8.10
153.250	250.00	265.10	6.30
151.250	250.00	270.50	8.10
155.250	250.00	274.00	8.10
153.260	260.00	280.50	8.10
151.260	260.00	284.00	8.10
155.260	260.00	287.30	9.50
153.270	270.00	290.50	8.10
151.270	270.00	294.00	8.10
155.270	270.00	297.30	9.50
153.275	275.00	295.50	8.10
151.275	275.00	299.00	8.10
155.275	275.00	302.30	9.50
153.280	280.00	300.50	8.10
151.280	280.00	304.00	8.10
155.280	280.00	307.30	9.50
153.285	285.00	305.50	8.10
151.285	285.00	309.00	8.10
155.285	285.00	312.30	9.50
153.290	290.00	310.50	8.10
151.290	290.00	314.00	8.10
155.290	290.00	317.30	9.50
153.295	295.00	315.50	8.10
151.295	295.00	319.00	8.10
155.295	295.00	322.30	9.50
153.300	300.00	320.50	8.10
151.300	300.00	324.00	8.10
155.300	300.00	327.30	9.50
153.305	305.00	325.50	8.10
151.305	305.00	329.00	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
155.305	305.00	332.30	9.50
153.310	310.00	330.50	8.10
151.310	310.00	334.00	8.10
155.310	310.00	337.30	9.50
153.320	320.00	340.50	8.10
151.320	320.00	344.00	8.10
155.320	320.00	347.30	9.50
153.330	330.00	350.50	8.10
151.330	330.00	354.00	8.10
155.330	330.00	357.30	9.50
153.340	340.00	360.50	8.10
151.340	340.00	364.00	8.10
155.340	340.00	367.30	9.50
153.350	350.00	370.50	8.10
151.350	350.00	374.00	8.10
155.350	350.00	377.30	9.50
153.360	360.00	380.50	8.10
151.360	360.00	384.00	8.10
155.360	360.00	387.30	9.50
153.370	370.00	390.50	8.10
151.370	370.00	394.00	8.10
155.370	370.00	397.30	9.50
153.380	380.00	400.50	8.10
151.380	380.00	404.00	8.10
155.380	380.00	407.30	9.50
153.390	390.00	410.50	8.10
151.390	390.00	414.00	8.10
155.390	390.00	417.30	9.50
153.400	400.00	420.50	8.10
151.400	400.00	424.00	8.10
155.400	400.00	427.30	9.50
153.410	410.00	430.50	8.10
151.410	410.00	434.00	8.10
155.410	410.00	437.30	9.50
153.420	420.00	440.50	8.10
151.420	420.00	444.00	8.10
155.420	420.00	447.30	9.50
153.430	430.00	450.50	8.10
151.430	430.00	454.00	8.10
155.430	430.00	457.30	9.50
153.440	440.00	460.50	8.10
151.440	440.00	464.00	8.10
155.440	440.00	467.30	9.50
153.450	450.00	470.50	8.10
151.450	450.00	474.00	8.10
155.450	450.00	477.30	9.50
153.460	460.00	480.50	8.10
151.460	460.00	484.00	8.10
155.460	460.00	487.30	9.50
153.470	470.00	490.50	8.10
151.470	470.00	494.00	8.10
155.470	470.00	497.30	9.50
153.480	480.00	500.50	8.10
151.480	480.00	504.00	8.10
155.480	480.00	507.30	9.50
153.490	490.00	510.50	8.10
151.490	490.00	514.00	8.10
155.490	490.00	517.30	9.50
153.500	500.00	520.50	8.10
151.500	500.00	524.00	8.10
155.500	500.00	527.30	9.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA

157-158



DESCRIPTION

The BECA 157 - 158 profile is a double acting rod composite seal composed of a filled PTFE friction ring and two pre-tightened rubber O'Rings. It can be assembled in a groove according to standard ISO 7425/2. Option of connecting the seal to 1 or 2 back-up rings.

ADVANTAGES

Optimal sealing for separating two fluids
Low friction coefficient;
no stick-slip effect
Excellent abrasion resistance
Wide temperature range and excellent chemical resistance, depending on the material selected for the O'Ring

APPLICATIONS

Mobile hydraulics
Machine tools
Presses
Hydro-pneumatic suspension systems

MATERIALS

Friction ring

Bronze-filled PTFE

O'Rings

NBR 70 Shore A

Other grades of materials are available. Please refer to the materials table on the next page.

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	50 MPa
Speed	2 m/s
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Gas Others (contact our experts)

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

EXTRUSION GAPS

Radial section S	Radial gap F/2		
	10 MPa	20 MPa	40 MPa
5.50	0.25	0.15	0.10
7.75	0.30	0.20	0.15
10.50	0.30	0.20	0.15
12.25	0.30	0.20	0.15
14.00	0.45	0.30	0.25
19.00	0.55	0.40	0.35

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

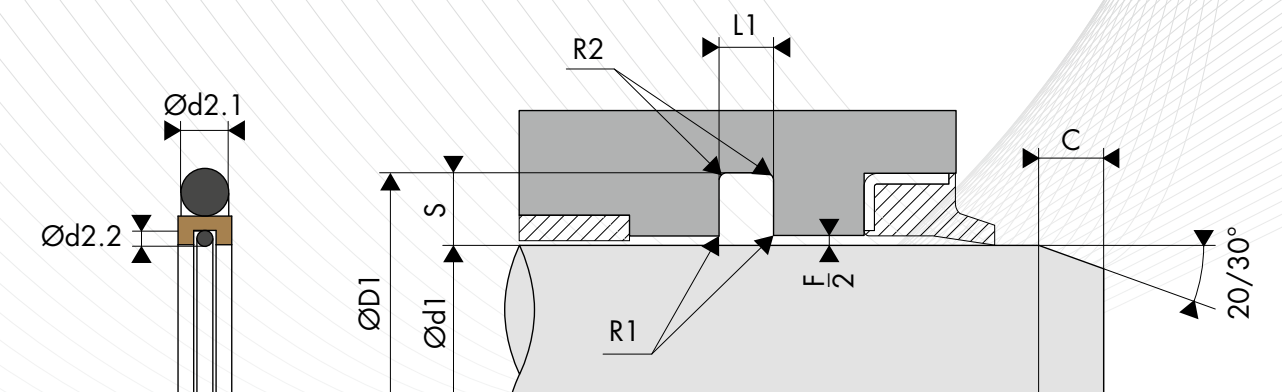
CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
5.50	0.30	1.00	3.00
7.75	0.30	1.30	3.00
10.50	0.30	1.80	5.00
12.25	0.30	1.80	6.00
14.00	0.30	2.50	8.00
19.00	0.30	3.00	10.00

TABLE MATERIALS

Friction ring					O'Rings			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
					F6	VMQ 70 Shore A	-60°C/+200°C	
DC	C	PTFE + 25% Carbon	Grey	Improvements • Wear properties • Compression set Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
CG	C	PTFE + 23% Carbon + 2% Graphite	Black	Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DV	V	PTFE + 25 % Glass	Blue	Improvements • Wear properties • Mechanical strength Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue	Resistance to compression Resistance to wear Excellent chemical stability Good thermal conductivity	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
DG	G	PTFE + 15% Graphite	Black	Improvements • Wear properties Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K1	K	PTFE + 10% Ekonol	Light brown	Improvements • Better abrasion resistance • Better dimensional stability at high temperatures Use up to +300°C Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K2	K	PTFE + 20% Ekonol	Light brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DB	B	PTFE + 60% Bronze	Dark brown	Improvements • Wear properties • Warping resistance and creep strength • Compression resistance Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
B4	B	PTFE + 40% Bronze	Dark brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

Rod diameter Ød1 f8/h9		Groove diameter	Groove width	Radial section	O'Ring cross-section	O'Ring / X'Ring cross-section
BECA 157 Standard range	BECA 158 Extended range	ØD1 H9	L1 0/+0.20	S	Ød2.1	Ød2.2
19.0 - 37.9	18.0 - 450.0	d1 + 11.00	4.20	5.50	3.53	1.78
38.0 - 199.9	30.0 - 650.0	d1 + 15.50	6.30	7.75	5.33	1.78
200.0 - 255.9	105.0 - 999.9	d1 + 21.00	8.10	10.50	6.99	2.62
256.0 - 649.9	120.0 - 999.9	d1 + 24.50	8.10	12.25	6.99	2.62
650.0 - 999.9	285.0 - 999.9	d1 + 28.00	9.50	14.00	8.40	3.53
---	650.0 - 999.9	d1 + 38.00	13.80	19.00	12.00	5.33

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Friction ring, PTFE + 60% Bronze - Code DB

_____ : NBR 70 Shore A O'Rings - Code K6

Rod diameter _____ : Ød1 = 50.00 mm

Groove diameter _____ : ØD1 = 65.50 mm

Part number _____ : 157. 050DBK6

Part number -

	157.	050	DB	K6
Family				
Rod diameter				
Friction ring material*				
O'Ring materials*				

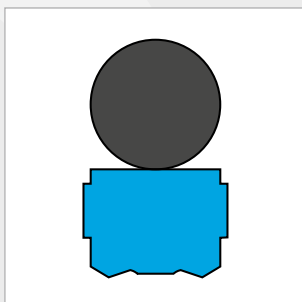
* The codes that define the materials are set out in the materials table on the previous page.

DIMENSIONS

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
157.018	18.00	29.00	4.20
157.020	20.00	31.00	4.20
157.022	22.00	33.00	4.20
157.025	25.00	36.00	4.20
157.028	28.00	39.00	4.20
157.030	30.00	41.00	4.20
157.032	32.00	43.00	4.20
157.035	35.00	46.00	4.20
157.036	36.00	47.00	4.20
157.038	38.00	53.50	6.30
157.040	40.00	55.50	6.30
157.042	42.00	57.50	6.30
157.045	45.00	60.50	6.30
157.048	48.00	63.50	6.30
157.050	50.00	65.50	6.30
157.052	52.00	67.50	6.30
157.055	55.00	70.50	6.30
157.056	56.00	71.50	6.30
157.058	58.00	73.50	6.30
157.060	60.00	75.50	6.30
157.062	62.00	77.50	6.30
157.063	63.00	78.50	6.30
157.065	65.00	80.50	6.30
157.068	68.00	83.50	6.30
157.070	70.00	85.50	6.30
157.075	75.00	90.50	6.30
157.080	80.00	95.50	6.30
157.085	85.00	100.50	6.30
157.090	90.00	105.50	6.30
157.095	95.00	110.50	6.30
157.100	100.00	115.50	6.30
157.105	105.00	120.50	6.30
157.110	110.00	125.50	6.30
157.115	115.00	130.50	6.30
157.120	120.00	135.50	6.30
157.125	125.00	140.50	6.30
157.130	130.00	145.50	6.30
157.135	135.00	150.50	6.30

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
157.140	140.00	155.50	6.30
157.145	145.00	160.50	6.30
157.150	150.00	165.50	6.30
157.155	155.00	170.50	6.30
157.160	160.00	175.50	6.30
157.165	165.00	180.50	6.30
157.170	170.00	185.50	6.30
157.175	175.00	190.50	6.30
157.180	180.00	195.50	6.30
157.185	185.00	200.50	6.30
157.190	190.00	205.50	6.30
157.195	195.00	210.50	6.30
157.200	200.00	221.00	8.10
157.205	205.00	226.00	8.10
157.210	210.00	231.00	8.10
157.215	215.00	236.00	8.10
157.220	220.00	241.00	8.10
157.230	230.00	251.00	8.10
157.240	240.00	261.00	8.10
157.250	250.00	271.00	8.10
157.260	260.00	284.50	8.10
157.270	270.00	294.50	8.10
157.280	280.00	304.50	8.10
157.290	290.00	314.50	8.10
157.300	300.00	324.50	8.10
157.310	310.00	334.50	8.10
157.320	320.00	344.50	8.10
157.330	330.00	354.50	8.10
157.340	340.00	364.50	8.10
157.350	350.00	374.50	8.10
157.360	360.00	384.50	8.10
157.370	370.00	394.50	8.10
157.380	380.00	404.50	8.10
157.390	390.00	414.50	8.10
157.400	400.00	424.50	8.10
157.450	450.00	474.50	8.10
157.500	500.00	524.50	8.10

The figures highlighted in bold correspond to the dimensions for standard ISO 7425/2, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA

161-163-165



DESCRIPTION

The BECA 161-163-165 profiles are double acting composite rod seals composed of a pre-tightened rubber O'Ring and a custom-made polyurethane friction ring.

ADVANTAGES

Optimal sealing in static and dynamic applications

Excellent abrasion and wear resistance

APPLICATIONS

Agriculture

Light and medium-sized industry

Machine tools

Material handling/Lifting

MATERIALS

Friction ring

PU 93 Shore A - Blue

PU 96 Shore A - Blue

High temp. PU 96 Shore A - Beige

O'Ring

NBR 70 Shore A

Other grades of materials are available. Please refer to the materials table on the next page.

TECHNICAL DATA

Temperature	-30°C / +100°C
Pressure	25 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

Radial section S	Radial gap F/2
2.45	0.20
3.65	0.25
5.35	0.25
7.55	0.30
10.25	0.30
12.00	0.35
13.65	0.35
19.00	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

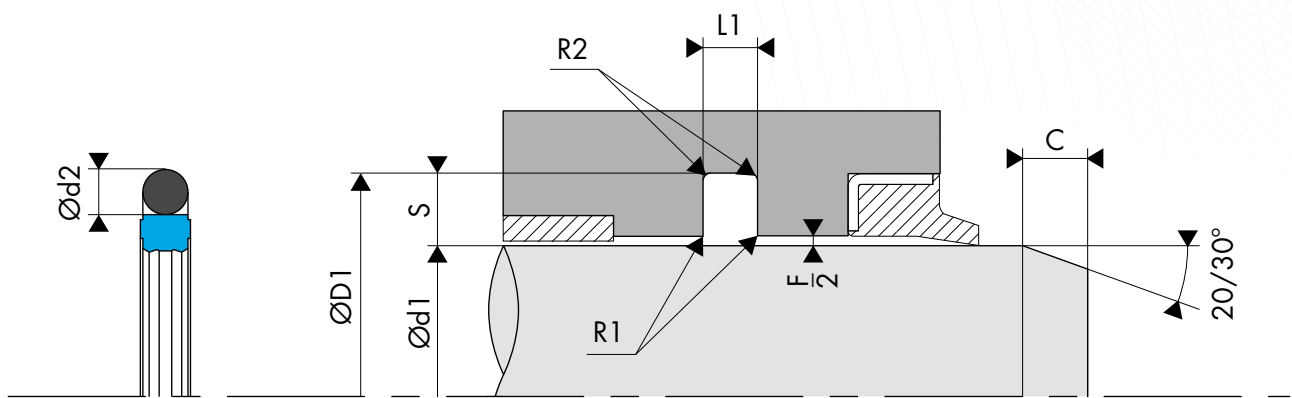
CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
2.45	0.30	0.40	0.55
3.65	0.30	0.60	0.70
5.35	0.30	1.00	0.95
7.55	0.30	1.30	1.35
10.25	0.30	1.80	1.75
12.00	0.30	1.80	1.75
13.65	0.30	2.50	10.00
19.00	0.30	3.00	12.00

TABLE MATERIALS

Friction ring					O'Ring			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	K6	NBR 70 Shore A	-30°C/+80°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
PU	U	Polyurethane	Blue	Strong mechanical resistance Good resistance to wear and abrasion High elasticity modulus	K6	NBR 70 Shore A	-30°C/+90°C	
PUHT	U	High-temperature polyurethane	White or off-white	Good flexibility Very good resistance to ozone and oxidation	K6	NBR 70 Shore A	-30°C/+100°C	

Other grades of materials are available depending on your specificities.



INSTALLATION DIMENSIONS

Rod diameter Ød1 f8/h9			Groove diameter	Groove width	Radial section	O'Ring cross-section
BECA 161 Standard range	BECA 163 Light range	BECA 165 Heavy-duty range	ØD1 H9	L1 0/+0.20	S	Ød2
3.0 - 7.9	8.0 - 18.9	---	d1 + 4.90	2.20	2.45	1.78
8.0 - 18.9	19.0 - 37.9	---	d1 + 7.30	3.20	3.65	2.62
19.0 - 37.9	38.0 - 199.9	8.0 - 18.9	d1 + 10.70	4.20	5.35	3.53
38.0 - 199.9	200.0 - 255.9	19.0 - 37.9	d1 + 15.10	6.30	7.55	5.33
200.0 - 255.9	256.0 - 649.9	38.0 - 199.9	d1 + 20.50	8.10	10.25	6.99
256.0 - 649.9	650.0 - 999.9	200.0 - 255.9	d1 + 24.00	8.10	12.00	6.99
650.0 - 999.9	1000.0 - 1200.0	256.0 - 649.9	d1 + 27.30	9.50	13.65	8.40
1000.0 - 1200.0	---	650.0 - 999.9	d1 + 38.00	13.80	19.00	12.00

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Polyurethane friction ring - Code PU
 _____ : NBR 70 Shore A O'Ring - Code K6
Rod diameter _____ : Ød1 = 50.00 mm
Groove diameter _____ : ØD1 = 65.10 mm
Part number _____ : 161. 050PUK6

Part number -

	161.	050	PU	K6
Family				
Rod diameter				
Friction ring material*				
O'Ring material*				

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

DIMENSIONS

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
161.003	3.00	7.90	2.20
161.004	4.00	8.90	2.20
161.005	5.00	9.90	2.20
161.006	6.00	10.90	2.20
161.007	7.00	11.90	2.20
163.008	8.00	12.90	2.20
161.008	8.00	15.30	3.20
165.008	8.00	18.70	4.20
163.009	9.00	13.90	2.20
161.009	9.00	16.30	3.20
165.009	9.00	19.70	4.20
163.010	10.00	14.90	2.20
161.010	10.00	17.30	3.20
165.010	10.00	20.70	4.20
163.011	11.00	15.90	2.20
161.011	11.00	18.30	3.20
165.011	11.00	21.70	4.20
163.012	12.00	16.90	2.20
161.012	12.00	19.30	3.20
165.012	12.00	22.70	4.20
163.013	13.00	17.90	2.20
161.013	13.00	20.30	3.20
165.013	13.00	23.70	4.20
163.014	14.00	18.90	2.20
161.014	14.00	21.30	3.20
165.014	14.00	24.70	4.20
163.015	15.00	19.90	2.20
161.015	15.00	22.30	3.20
165.015	15.00	25.70	4.20
163.016	16.00	20.90	2.20
161.016	16.00	23.30	3.20
165.016	16.00	26.70	4.20
163.017	17.00	21.90	2.20
161.017	17.00	24.30	3.20
165.017	17.00	27.70	4.20
163.018	18.00	22.90	2.20
161.018	18.00	25.30	3.20
165.018	18.00	28.70	4.20
163.019	19.00	26.30	3.20
161.019	19.00	29.70	4.20
165.019	19.00	34.10	6.30
163.020	20.00	27.30	3.20
161.020	20.00	30.70	4.20
165.020	20.00	35.10	6.30
163.021	21.00	28.30	3.20
161.021	21.00	31.70	4.20
165.021	21.00	36.10	6.30
163.022	22.00	29.30	3.20
161.022	22.00	32.70	4.20
165.022	22.00	37.10	6.30
163.024	24.00	31.30	3.20
161.024	24.00	34.70	4.20
165.024	24.00	39.10	6.30
163.025	25.00	32.30	3.20
161.025	25.00	35.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
165.025	25.00	40.10	6.30
163.026	26.00	33.30	3.20
161.026	26.00	36.70	4.20
165.026	26.00	41.10	6.30
163.027	27.00	34.30	3.20
161.027	27.00	37.70	4.20
165.027	27.00	42.10	6.30
163.028	28.00	35.30	3.20
161.028	28.00	38.70	4.20
165.028	28.00	43.10	6.30
163.029	29.00	36.30	3.20
161.029	29.00	39.70	4.20
165.029	29.00	44.10	6.30
163.030	30.00	37.30	3.20
161.030	30.00	40.70	4.20
165.030	30.00	45.10	6.30
163.032	32.00	39.30	3.20
161.032	32.00	42.70	4.20
165.032	32.00	47.10	6.30
163.034	34.00	41.30	3.20
161.034	34.00	44.70	4.20
165.034	34.00	49.10	6.30
163.035	35.00	42.30	3.20
161.035	35.00	45.70	4.20
165.035	35.00	50.10	6.30
163.036	36.00	43.30	3.20
161.036	36.00	46.70	4.20
165.036	36.00	51.10	6.30
163.038	38.00	48.70	4.20
161.038	38.00	53.10	6.30
165.038	38.00	58.50	8.10
163.039	39.00	49.70	4.20
161.039	39.00	54.10	6.30
165.039	39.00	59.50	8.10
163.040	40.00	50.70	4.20
161.040	40.00	55.10	6.30
165.040	40.00	60.50	8.10
163.041	41.00	51.70	4.20
161.041	41.00	56.10	6.30
165.041	41.00	61.50	8.10
163.042	42.00	52.70	4.20
161.042	42.00	57.10	6.30
165.042	42.00	62.50	8.10
163.044	44.00	54.70	4.20
161.044	44.00	59.10	6.30
165.044	44.00	64.50	8.10
163.045	45.00	55.70	4.20
161.045	45.00	60.10	6.30
165.045	45.00	65.50	8.10
163.046	46.00	56.70	4.20
161.046	46.00	61.10	6.30
165.046	46.00	66.50	8.10
163.047	47.00	57.70	4.20
161.047	47.00	62.10	6.30
165.047	47.00	67.50	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
163.048	48.00	58.70	4.20
161.048	48.00	63.10	6.30
165.048	48.00	68.50	8.10
163.050	50.00	60.70	4.20
161.050	50.00	65.10	6.30
165.050	50.00	70.50	8.10
163.051	51.00	61.70	4.20
161.051	51.00	66.10	6.30
165.051	51.00	71.50	8.10
163.052	52.00	62.70	4.20
161.052	52.00	67.10	6.30
165.052	52.00	72.50	8.10
163.055	55.00	65.70	4.20
161.055	55.00	70.10	6.30
165.055	55.00	75.50	8.10
163.056	56.00	66.70	4.20
161.056	56.00	71.10	6.30
165.056	56.00	76.50	8.10
163.058	58.00	68.70	4.20
161.058	58.00	73.10	6.30
165.058	58.00	78.50	8.10
163.060	60.00	70.70	4.20
161.060	60.00	75.10	6.30
165.060	60.00	80.50	8.10
163.061	61.00	71.70	4.20
161.061	61.00	76.10	6.30
165.061	61.00	81.50	8.10
163.062	62.00	72.70	4.20
161.062	62.00	77.10	6.30
165.062	62.00	82.50	8.10
163.063	63.00	73.70	4.20
161.063	63.00	78.10	6.30
165.063	63.00	83.50	8.10
163.065	65.00	75.70	4.20
161.065	65.00	80.10	6.30
165.065	65.00	85.50	8.10
163.067	67.00	77.70	4.20
161.067	67.00	82.10	6.30
165.067	67.00	87.50	8.10
163.068	68.00	78.70	4.20
161.068	68.00	83.10	6.30
165.068	68.00	88.50	8.10
163.070	70.00	80.70	4.20
161.070	70.00	85.10	6.30
165.070	70.00	90.50	8.10
163.072	72.00	82.70	4.20
161.072	72.00	87.10	6.30
165.072	72.00	92.50	8.10
163.075	75.00	85.70	4.20
161.075	75.00	90.10	6.30
165.075	75.00	95.50	8.10
163.078	78.00	88.70	4.20
161.078	78.00	93.10	6.30
165.078	78.00	98.50	8.10
163.079	79.00	89.70	4.20

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
161.079	79.00	94.10	6.30
165.079	79.00	99.50	8.10
163.080	80.00	90.70	4.20
161.080	80.00	95.10	6.30
165.080	80.00	100.50	8.10
163.081	81.00	91.70	4.20
161.081	81.00	96.10	6.30
165.081	81.00	101.50	8.10
163.082	82.00	92.70	4.20
161.082	82.00	97.10	6.30
165.082	82.00	102.50	8.10
163.083	83.00	93.70	4.20
161.083	83.00	98.10	6.30
165.083	83.00	103.50	8.10
163.084	84.00	94.70	4.20
161.084	84.00	99.10	6.30
165.084	84.00	104.50	8.10
163.085	85.00	95.70	4.20
161.085	85.00	100.10	6.30
165.085	85.00	105.50	8.10
163.086	86.00	96.70	4.20
161.086	86.00	101.10	6.30
165.086	86.00	106.50	8.10
163.088	88.00	98.70	4.20
161.088	88.00	103.10	6.30
165.088	88.00	108.50	8.10
163.090	90.00	100.70	4.20
161.090	90.00	105.10	6.30
165.090	90.00	110.50	8.10
163.092	92.00	102.70	4.20
161.092	92.00	107.10	6.30
165.092	92.00	112.50	8.10
163.095	95.00	105.70	4.20
161.095	95.00	110.10	6.30
165.095	95.00	115.50	8.10
163.098	98.00	108.70	4.20
161.098	98.00	113.10	6.30
165.098	98.00	118.50	8.10
163.100	100.00	110.70	4.20
161.100	100.00	115.10	6.30
165.100	100.00	120.50	8.10
163.105	105.00	115.70	4.20
161.105	105.00	120.10	6.30
165.105	105.00	125.50	8.10
163.108	108.00	118.70	4.20
161.108	108.00	123.10	6.30
165.108	108.00	128.50	8.10
163.110	110.00	120.70	4.20
161.110	110.00	125.10	6.30
165.110	110.00	130.50	8.10
163.115	115.00	125.70	4.20
161.115	115.00	130.10	6.30
165.115	115.00	135.50	8.10
163.120	120.00	130.70	4.20
161.120	120.00	135.10	6.30

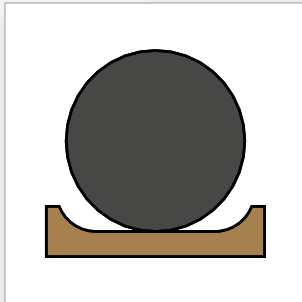
Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
165.120	120.00	140.50	8.10
163.125	125.00	135.70	4.20
161.125	125.00	140.10	6.30
165.125	125.00	145.50	8.10
163.127	127.00	137.70	4.20
161.127	127.00	142.10	6.30
165.127	127.00	147.50	8.10
163.130	130.00	140.70	4.20
161.130	130.00	145.10	6.30
165.130	130.00	150.50	8.10
163.135	135.00	145.70	4.20
161.135	135.00	150.10	6.30
165.135	135.00	155.50	8.10
163.138	138.00	148.70	4.20
161.138	138.00	153.10	6.30
165.138	138.00	158.50	8.10
163.140	140.00	150.70	4.20
161.140	140.00	155.10	6.30
165.140	140.00	160.50	8.10
163.145	145.00	155.70	4.20
161.145	145.00	160.10	6.30
165.145	145.00	165.50	8.10
163.150	150.00	160.70	4.20
161.150	150.00	165.10	6.30
165.150	150.00	170.50	8.10
163.155	155.00	165.70	4.20
161.155	155.00	170.10	6.30
165.155	155.00	175.50	8.10
163.160	160.00	170.70	4.20
161.160	160.00	175.10	6.30
165.160	160.00	180.50	8.10
163.165	165.00	175.70	4.20
161.165	165.00	180.10	6.30
165.165	165.00	185.50	8.10
163.170	170.00	180.70	4.20
161.170	170.00	185.10	6.30
165.170	170.00	190.50	8.10
163.175	175.00	185.70	4.20
161.175	175.00	190.10	6.30
165.175	175.00	195.50	8.10
163.180	180.00	190.70	4.20
161.180	180.00	195.10	6.30
165.180	180.00	200.50	8.10
163.185	185.00	195.70	4.20
161.185	185.00	200.10	6.30
165.185	185.00	205.50	8.10
163.190	190.00	200.70	4.20
161.190	190.00	205.10	6.30
165.190	190.00	210.50	8.10
163.195	195.00	205.70	4.20
161.195	195.00	210.10	6.30
165.195	195.00	215.50	8.10
163.200	200.00	215.10	6.30
161.200	200.00	220.50	8.10
165.200	200.00	224.00	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
163.210	210.00	225.10	6.30
161.210	210.00	230.50	8.10
165.210	210.00	234.00	8.10
163.215	215.00	230.10	6.30
161.215	215.00	235.50	8.10
165.215	215.00	239.00	8.10
163.220	220.00	235.10	6.30
161.220	220.00	240.50	8.10
165.220	220.00	244.00	8.10
163.230	230.00	245.10	6.30
161.230	230.00	250.50	8.10
165.230	230.00	254.00	8.10
163.240	240.00	255.10	6.30
161.240	240.00	260.50	8.10
165.240	240.00	264.00	8.10
163.250	250.00	265.10	6.30
161.250	250.00	270.50	8.10
165.250	250.00	274.00	8.10
163.260	260.00	280.50	8.10
161.260	260.00	284.00	8.10
165.260	260.00	287.30	9.50
163.270	270.00	290.50	8.10
161.270	270.00	294.00	8.10
165.270	270.00	297.30	9.50
163.275	275.00	295.50	8.10
161.275	275.00	299.00	8.10
165.275	275.00	302.30	9.50
163.280	280.00	300.50	8.10
161.280	280.00	304.00	8.10
165.280	280.00	307.30	9.50
163.285	285.00	305.50	8.10
161.285	285.00	309.00	8.10
165.285	285.00	312.30	9.50
163.290	290.00	310.50	8.10
161.290	290.00	314.00	8.10
165.290	290.00	317.30	9.50
163.295	295.00	315.50	8.10
161.295	295.00	319.00	8.10
165.295	295.00	322.30	9.50
163.300	300.00	320.50	8.10
161.300	300.00	324.00	8.10
165.300	300.00	327.30	9.50
163.305	305.00	325.50	8.10
161.305	305.00	329.00	8.10
165.305	305.00	332.30	9.50
163.310	310.00	330.50	8.10
161.310	310.00	334.00	8.10
165.310	310.00	337.30	9.50
163.320	320.00	340.50	8.10
161.320	320.00	344.00	8.10
165.320	320.00	347.30	9.50
163.330	330.00	350.50	8.10
161.330	330.00	354.00	8.10
165.330	330.00	357.30	9.50
163.340	340.00	360.50	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
161.340	340.00	364.00	8.10
165.340	340.00	367.30	9.50
163.350	350.00	370.50	8.10
161.350	350.00	374.00	8.10
165.350	350.00	377.30	9.50
163.360	360.00	380.50	8.10
161.360	360.00	384.00	8.10
165.360	360.00	387.30	9.50
163.370	370.00	390.50	8.10
161.370	370.00	394.00	8.10
165.370	370.00	397.30	9.50
163.380	380.00	400.50	8.10
161.380	380.00	404.00	8.10
165.380	380.00	407.30	9.50
163.390	390.00	410.50	8.10
161.390	390.00	414.00	8.10
165.390	390.00	417.30	9.50
163.400	400.00	420.50	8.10
161.400	400.00	424.00	8.10
165.400	400.00	427.30	9.50
163.410	410.00	430.50	8.10
161.410	410.00	434.00	8.10
165.410	410.00	437.30	9.50
163.420	420.00	440.50	8.10
161.420	420.00	444.00	8.10

Part number	Rod diameter Ød1 f8/h9	Groove diameter ØD1 H9	Groove width L1 0/+0.20
165.420	420.00	447.30	9.50
163.430	430.00	450.50	8.10
161.430	430.00	454.00	8.10
165.430	430.00	457.30	9.50
163.440	440.00	460.50	8.10
161.440	440.00	464.00	8.10
165.440	440.00	467.30	9.50
163.450	450.00	470.50	8.10
161.450	450.00	474.00	8.10
165.450	450.00	477.30	9.50
163.460	460.00	480.50	8.10
161.460	460.00	484.00	8.10
165.460	460.00	487.30	9.50
163.470	470.00	490.50	8.10
161.470	470.00	494.00	8.10
165.470	470.00	497.30	9.50
163.480	480.00	500.50	8.10
161.480	480.00	504.00	8.10
165.480	480.00	507.30	9.50
163.490	490.00	510.50	8.10
161.490	490.00	514.00	8.10
165.490	490.00	517.30	9.50
163.500	500.00	520.50	8.10
161.500	500.00	524.00	8.10
165.500	500.00	527.30	9.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA

170-179



DESCRIPTION

The BECA 170 - 179 profiles are double acting composite rod seals composed of a filled PTFE friction ring and pre-tightened rubber O'Ring. They can be mounted in the grooves of the O'Rings. Option of connecting the seal to 1 or 2 back-up rings.

ADVANTAGES

Suitable for a reduced size

Low friction coefficient;
no stick-slip effect

Excellent extrusion and wear resistance

Wide temperature range and excellent chemical resistance, depending on the material selected for the O'Ring

APPLICATIONS

Machine tools

Lifting systems

Valves

MATERIALS

Friction ring

Bronze-filled PTFE

Carbon-filled PTFE

Virgin PTFE

O'Ring

NBR 70 Shore A

FKM 70 Shore A

VMQ 70 Shore A

Other grades of materials are available. Please refer to the materials table on the next page.

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	35 MPa
Speed	5 m/s
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Others (contact our experts)

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

EXTRUSION GAPS

Radial section S	Radial gap F/2			
	2 MPa	10 MPa	20 MPa	35 MPa
1.45	0.10	0.10	0.08	0.05
2.25	0.15	0.15	0.10	0.07
3.10	0.25	0.20	0.15	0.08
4.70	0.35	0.25	0.20	0.10
6.10	0.50	0.30	0.25	0.15
7.50	0.60	0.40	0.30	0.20

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

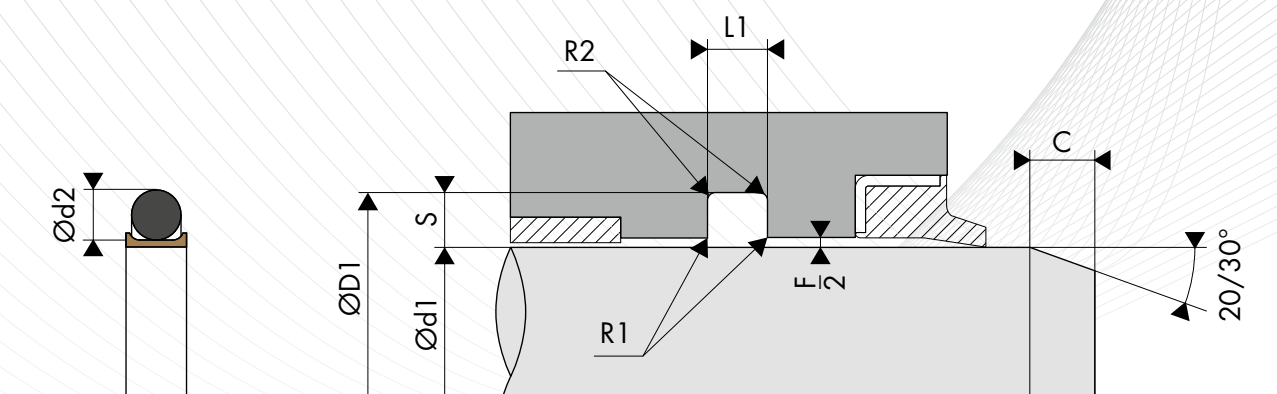
CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
1.45	0.30	0.40	3.00
2.25	0.30	0.40	3.00
3.10	0.30	0.60	3.00
4.70	0.30	0.80	3.00
6.10	0.30	0.80	5.00
7.50	0.30	1.00	6.00

TABLE MATERIALS

Friction ring					O'Ring			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
					F6	VMQ 70 Shore A	-60°C/+200°C	
DC	C	PTFE + 25% Carbon	Grey	Improvements • Wear properties • Compression set Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
CG	C	PTFE + 23% Carbon + 2% Graphite	Black		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
DV	V	PTFE + 25 % Glass	Blue	Improvements • Wear properties • Mechanical strength Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue	Resistance to compression Resistance to wear Excellent chemical stability Good thermal conductivity	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DG	G	PTFE + 15% Graphite	Black	Improvements • Wear properties Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	K6	NBR 70 Shore A	-30°C/+100°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
					G6	FKM 70 Shore A	-20°C/+200°C	
					C6	EPDM 70 Shore A	-45°C/+150°C	
K1	K	PTFE + 10% Ekonol	Light brown	Improvements • Better abrasion resistance • Better dimensional stability at high temperatures Use up to +300°C Good friction coefficient and low permeability	K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
K2	K	PTFE + 20% Ekonol	Light brown		C6	EPDM 70 Shore A	-45°C/+150°C	
					K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
DB	B	PTFE + 60% Bronze	Dark brown	Improvements • Wear properties • Warping resistance and creep strength • Compression resistance Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	K6	NBR 70 Shore A	-30°C/+100°C	Steel Chrome steel Cast iron
					G6	FKM 70 Shore A	-20°C/+200°C	
B4	B	PTFE + 40% Bronze	Dark brown		K6	NBR 70 Shore A	-30°C/+100°C	
					G6	FKM 70 Shore A	-20°C/+200°C	
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	K6	NBR 70 Shore A	-30°C/+80°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

Rod diameter Ød1 f8/h9		Groove diameter	Groove width	Radial section	O'Ring cross-section
BECA 170 Standard range	BECA 179 Extended range	ØD1 H9	L1 0/+0.20	S	Ød2
4.0 - 9.9	2.0 - 129.9	d1 + 2.90	2.40	1.45	1.78
10.0 - 19.9	5.0 - 249.9	d1 + 4.50	3.60	2.25	2.62
20.0 - 39.9	5.0 - 449.9	d1 + 6.20	4.80	3.10	3.53
40.0 - 119.9	12.0 - 649.9	d1 + 9.40	7.10	4.70	5.33
120.0 - 649.9	60.0 - 999.9	d1 + 12.20	9.50	6.10	6.99
650.0 - 999.9	110.0 - 999.9	d1 + 15.00	10.00	7.50	8.40

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Friction ring, PTFE + 60% Bronze - Code DB
 _____ : NBR 70 Shore A O'Ring - Code K6

Rod diameter _____ : Ød1 = 50.00 mm

Groove diameter _____ : ØD1 = 59.40 mm

Part number _____ : 170. 050DBK6

Part number -

	170.	050	DB	K6
Family				
Rod diameter				
Friction ring material*				
O'Ring material*				

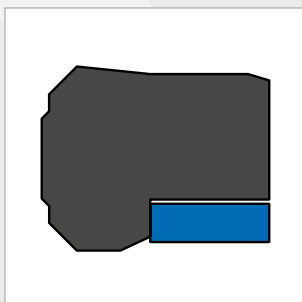
* The codes that define the materials are set out in the materials table on the previous page.

DIMENSIONS

Part number	Diameter of the rod Ød1 f8/h9	Diameter of the groove ØD1 H9	Width of the groove L1 0/+0.20
170.003	3.00	5.90	2.40
170.004	4.00	6.90	2.40
170.005	5.00	7.90	2.40
170.006	6.00	8.90	2.40
170.007	7.00	9.90	2.40
170.008	8.00	10.90	2.40
170.009	9.00	11.90	2.40
170.010	10.00	14.50	3.60
170.012	12.00	16.50	3.60
170.014	14.00	18.50	3.60
170.015	15.00	19.50	3.60
170.016	16.00	20.50	3.60
170.018	18.00	22.50	3.60
170.020	20.00	26.20	4.80
170.022	22.00	28.20	4.80
170.025	25.00	31.20	4.80
170.028	28.00	34.20	4.80
170.030	30.00	36.20	4.80
170.032	32.00	38.20	4.80
170.035	35.00	41.20	4.80
170.036	36.00	42.20	4.80
170.038	38.00	44.20	4.80
170.040	40.00	49.40	7.10
170.042	42.00	51.40	7.10
170.045	45.00	54.40	7.10
170.048	48.00	57.40	7.10
170.050	50.00	59.40	7.10
170.052	52.00	61.40	7.10
170.055	55.00	64.40	7.10
170.056	56.00	65.40	7.10
170.058	58.00	67.40	7.10
170.060	60.00	69.40	7.10
170.062	62.00	71.40	7.10
170.063	63.00	72.40	7.10
170.065	65.00	74.40	7.10
170.068	68.00	77.40	7.10
170.070	70.00	79.40	7.10
170.075	75.00	84.40	7.10
170.080	80.00	89.40	7.10
170.085	85.00	94.40	7.10
170.090	90.00	99.40	7.10
170.095	95.00	104.40	7.10
170.100	100.00	109.40	7.10
170.105	105.00	114.40	7.10

Part number	Diameter of the rod Ød1 f8/h9	Diameter of the groove ØD1 H9	Width of the groove L1 0/+0.20
170.110	110.00	119.40	7.10
170.115	115.00	124.40	7.10
170.120	120.00	132.20	9.50
170.125	125.00	137.20	9.50
170.130	130.00	142.20	9.50
170.135	135.00	147.20	9.50
170.140	140.00	152.20	9.50
170.145	145.00	157.20	9.50
170.150	150.00	162.20	9.50
170.155	155.00	167.20	9.50
170.160	160.00	172.20	9.50
170.165	165.00	177.20	9.50
170.170	170.00	182.20	9.50
170.175	175.00	187.20	9.50
170.180	180.00	192.20	9.50
170.185	185.00	197.20	9.50
170.190	190.00	202.20	9.50
170.195	195.00	207.20	9.50
170.200	200.00	212.20	9.50
170.205	205.00	217.20	9.50
170.210	210.00	222.20	9.50
170.215	215.00	227.20	9.50
170.220	220.00	232.20	9.50
170.230	230.00	242.20	9.50
170.240	240.00	252.20	9.50
170.250	250.00	262.20	9.50
170.260	260.00	272.20	9.50
170.270	270.00	282.20	9.50
170.280	280.00	292.20	9.50
170.290	290.00	302.20	9.50
170.300	300.00	312.20	9.50
170.310	310.00	322.20	9.50
170.320	320.00	332.20	9.50
170.330	330.00	342.20	9.50
170.340	340.00	352.20	9.50
170.350	350.00	362.20	9.50
170.360	360.00	372.20	9.50
170.370	370.00	382.20	9.50
170.380	380.00	392.20	9.50
170.390	390.00	402.20	9.50
170.400	400.00	412.20	9.50
170.450	450.00	462.20	9.50
170.500	500.00	512.20	9.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 190



DESCRIPTION

The BECA 190 profile is a compo-compact rod seal composed of a profiled rubber ring and a POM back-up ring on the back as standard. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Excellent wear resistance
Good chemical resistance
Can be assembled in a closed groove for $\varnothing d1 \geq 30.00$ mm

APPLICATIONS

Mobile hydraulics
Presses
Aftermarket
Standard cylinders

MATERIALS

Profiled seal

NBR 80 Shore A
FKM 80 Shore A

Back-up ring

Polyoxymethylene - POM
Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	50 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

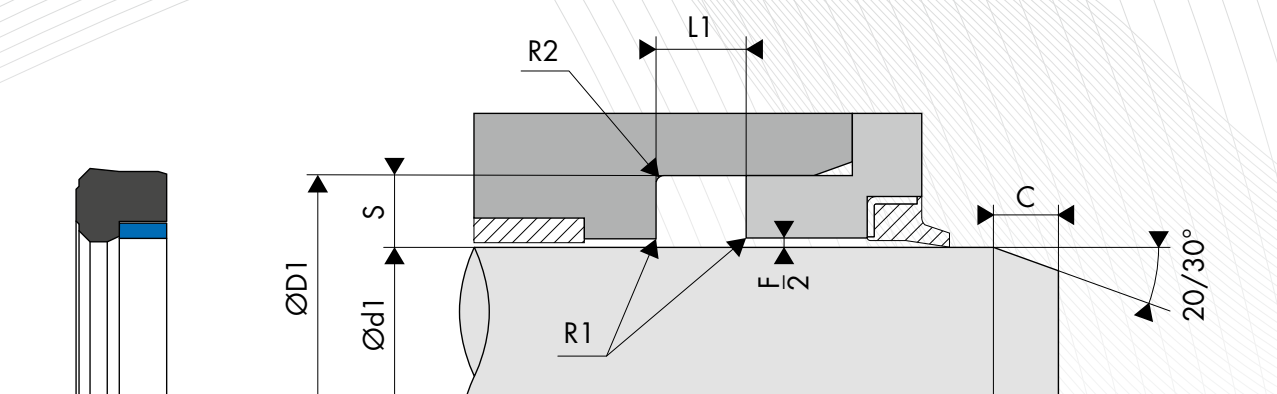
Pressure MPa	Radial gap F/2
10 MPa	0.65
20 MPa	0.55
35 MPa	0.45
50 MPa	0.35

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 μm	$\leq 1.6 \mu\text{m}$	$\leq 3.2 \mu\text{m}$
Rz	0.63 - 2.5 μm	$\leq 6.3 \mu\text{m}$	$\leq 10.0 \mu\text{m}$
Rmax	1.0 - 4.0 μm	$\leq 10.0 \mu\text{m}$	$\leq 16.0 \mu\text{m}$

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00
12.50	1.00	1.20	6.50

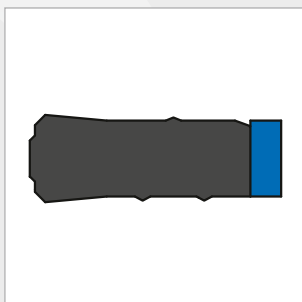


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H11	Groove width L1 0/+0.20
190.0006014	6.00	14.00	6.30
190.0008016	8.00	16.00	6.30
190.0010018	10.00	18.00	6.30
190.0010020	10.00	20.00	8.00
190.0012020	12.00	20.00	6.30
190.0012022	12.00	22.00	8.00
190.0014022	14.00	22.00	6.30
190.0014024	14.00	24.00	8.00
190.0016024	16.00	24.00	6.30
190.0016026	16.00	26.00	8.00
190.0018026	18.00	26.00	6.30
190.0018028	18.00	28.00	8.00
190.0020028	20.00	28.00	6.30
190.0020030	20.00	30.00	8.00
190.0022030	22.00	30.00	6.30
190.0022032	22.00	32.00	8.00
190.0025033	25.00	33.00	6.30
190.0025035	25.00	35.00	8.00
190.0028038	28.00	38.00	8.00
190.0028043	28.00	43.00	12.50
190.1030040	30.00	40.00	8.00
190.0032042	32.00	42.00	8.00
190.0032047	32.00	47.00	12.50
190.2033045	33.00	45.00	10.00
190.0035045	35.00	45.00	8.00
190.0036046	36.00	46.00	8.00
190.0036051	36.00	51.00	12.50
190.0040050	40.00	50.00	8.00
190.0040055	40.00	55.00	12.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H11	Groove width L1 0/+0.20
190.0045055	45.00	55.00	8.00
190.0045060	45.00	60.00	12.50
190.0050060	50.00	60.00	8.00
190.0050065	50.00	65.00	12.50
190.0055070	55.00	70.00	12.50
190.0056071	56.00	71.00	12.50
190.0056076	56.00	76.00	16.00
190.0060075	60.00	75.00	12.50
190.0063078	63.00	78.00	12.50
190.0063083	63.00	83.00	16.00
190.0065080	65.00	80.00	12.50
190.0070085	70.00	85.00	12.50
190.0070090	70.00	90.00	16.00
190.0080095	80.00	95.00	12.50
190.0080100	80.00	100.00	16.00
190.0090105	90.00	105.00	12.50
190.0090110	90.00	110.00	16.00
190.0100120	100.00	120.00	16.00
190.0100125	100.00	125.00	20.00
190.0110130	110.00	130.00	16.00
190.0110135	110.00	135.00	20.00
190.0125145	125.00	145.00	16.00
190.0125150	125.00	150.00	20.00
190.2140160	140.00	160.00	12.00
190.0140160	140.00	160.00	16.00
190.0140165	140.00	165.00	20.00
190.0160185	160.00	185.00	20.00
190.0180205	180.00	205.00	20.00
190.0200225	200.00	225.00	20.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 200



DESCRIPTION

The BECA 200 profile is a compo-compact rod seal composed of a fabric part, a rubber part and a POM back-up ring as standard. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Excellent wear resistance
Excellent resistance to high pressures
Good chemical resistance
Can be assembled in a closed groove for $\varnothing d1 \geq 35.00$ mm

APPLICATIONS

Mobile hydraulics
Presses
Aftermarket
Standard cylinders

MATERIALS

Profiled seal

NBR 80 Shore A
FKM 80 Shore A

Back-up ring

Polyoxymethylene - POM
Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	70 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

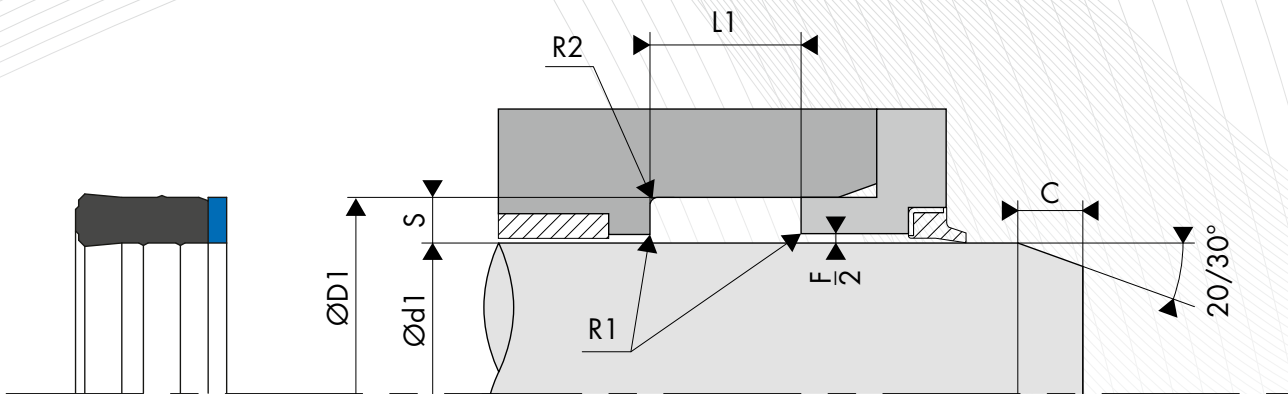
Pressure MPa	Radial gap F/2
25 MPa	0.80
30 MPa	0.70
50 MPa	0.50
70 MPa	0.35

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 μm	$\leq 1.6 \mu\text{m}$	$\leq 3.2 \mu\text{m}$
Rz	0.63 - 2.5 μm	$\leq 6.3 \mu\text{m}$	$\leq 10.0 \mu\text{m}$
Rmax	1.0 - 4.0 μm	$\leq 10.0 \mu\text{m}$	$\leq 16.0 \mu\text{m}$

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00
12.50	1.00	1.20	6.50

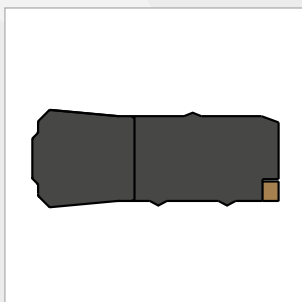


DIMENSIONS

Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H11	Width of the groove L1 0/+0.20
200.0028038	28.00	38.00	16.00
200.0030040	30.00	40.00	16.00
200.0032042	32.00	42.00	16.00
200.0035045	35.00	45.00	16.00
200.0036046	36.00	46.00	16.00
200.0040050	40.00	50.00	16.00
200.0045055	45.00	55.00	16.00
200.0045060	45.00	60.00	22.50
200.0046061	46.00	61.00	22.50
200.0050060	50.00	60.00	16.00
200.0051071	51.00	71.00	30.00
200.0055070	55.00	70.00	25.00
200.0056071	56.00	71.00	25.00
200.0060080	60.00	80.00	30.00
200.0061081	61.00	81.00	30.00

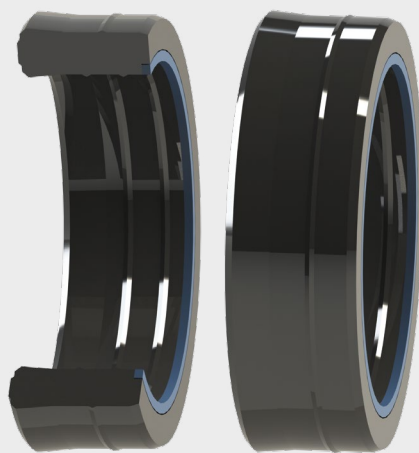
Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H11	Width of the groove L1 0/+0.20
200.0063078	63.00	78.00	25.00
200.0065080	65.00	80.00	25.00
200.0070085	70.00	85.00	25.00
200.0070090	70.00	90.00	30.00
200.0071091	71.00	91.00	30.00
200.0080095	80.00	95.00	25.00
200.0080100	80.00	100.00	30.00
200.0081101	81.00	101.00	30.00
200.0090105	90.00	105.00	25.00
200.0090110	90.00	110.00	30.00
200.0091111	91.00	111.00	30.00
200.0100120	100.00	120.00	32.00
200.0110130	110.00	130.00	32.00
200.0125145	125.00	145.00	32.00
200.0140160	140.00	160.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 201



DESCRIPTION

The BECA 201 profile is a compo-compact rod seal composed of a rubber part and a POM or bronze-filled PTFE back-up ring as standard. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Excellent wear resistance
Excellent resistance to high pressures
Good chemical resistance
Can be assembled in a closed groove for $\varnothing d1 \geq 35.00$ mm

APPLICATIONS

Mobile hydraulics
Presses
Aftermarket
Standard cylinders

MATERIALS

Profiled seal

NBR 80 Shore A
FKM 80 Shore A

Back-up ring

Polyoxymethylene - POM
Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	70 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

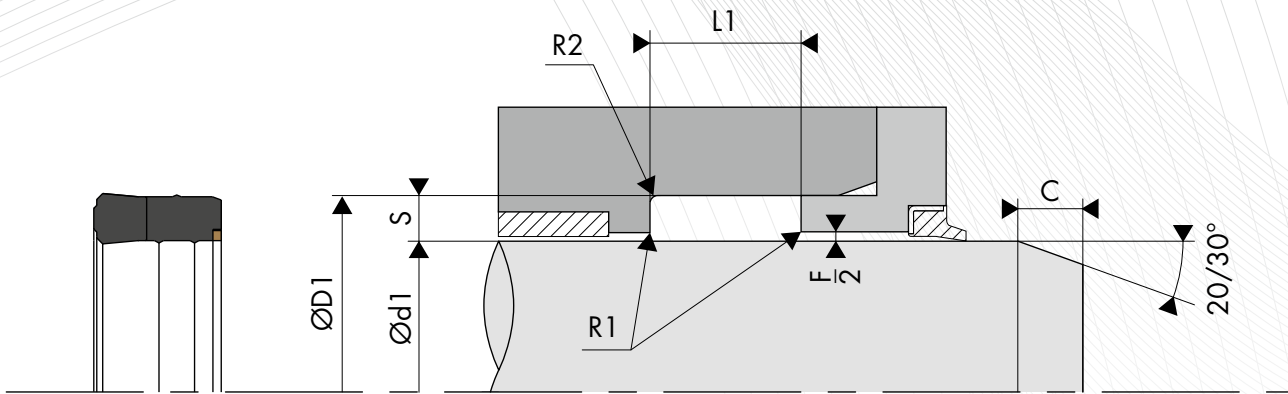
Pressure MPa	Radial gap F/2
25 MPa	0.80
30 MPa	0.70
50 MPa	0.50
70 MPa	0.35

SURFACE ROUGHNESS

Roughness	Dynamic surface area	Static surface area	Groove flanks
Ra	0.1 - 0.4 μm	$\leq 1.6 \mu\text{m}$	$\leq 3.2 \mu\text{m}$
Rz	0.63 - 2.5 μm	$\leq 6.3 \mu\text{m}$	$\leq 10.0 \mu\text{m}$
Rmax	1.0 - 4.0 μm	$\leq 10.0 \mu\text{m}$	$\leq 16.0 \mu\text{m}$

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00
12.50	1.00	1.20	6.50

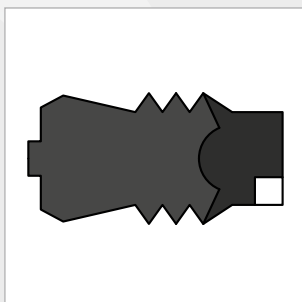


DIMENSIONS

Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H11	Width of the groove L1 0/+0.20
201.0028038	28.00	38.00	16.00
201.0030040	30.00	40.00	16.00
201.0032042	32.00	42.00	16.00
201.0035045	35.00	45.00	16.00
201.0036046	36.00	46.00	16.00
201.0040050	40.00	50.00	16.00
201.0045055	45.00	55.00	16.00
201.0045060	45.00	60.00	22.50
201.0046061	46.00	61.00	22.50
201.0050060	50.00	60.00	16.00
201.0051071	51.00	71.00	30.00
201.0055070	55.00	70.00	25.00
201.0056071	56.00	71.00	25.00
201.0060080	60.00	80.00	30.00
201.0061081	61.00	81.00	30.00

Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H11	Width of the groove L1 0/+0.20
201.0063078	63.00	78.00	25.00
201.0065080	65.00	80.00	25.00
201.0070085	70.00	85.00	25.00
201.0070090	70.00	90.00	30.00
201.0071091	71.00	91.00	30.00
201.0080095	80.00	95.00	25.00
201.0080100	80.00	100.00	30.00
201.0081101	81.00	101.00	30.00
201.0090105	90.00	105.00	25.00
201.0090110	90.00	110.00	30.00
201.0091111	91.00	111.00	30.00
201.0100120	100.00	120.00	32.00
201.0110130	110.00	130.00	32.00
201.0125145	125.00	145.00	32.00
201.0140160	140.00	160.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 202



DESCRIPTION

The BECA 202 is a compo-compact rod seal composed of a flexible NBR ring, a fabric NBR support on the back and a polyoxymethylene back-up ring.

ADVANTAGES

Excellent sealing under high pressure
Good extrusion resistance
Good sealing in difficult environments

APPLICATIONS

Hydraulic cylinders
Earth-moving machinery
Mining machinery

MATERIALS

NBR 90 Shore A + POM + TPE

TECHNICAL DATA

Temperature	-30°C / +100°C
Pressure	70 MPa
Speed	0.5 m/sec
Media	Mineral oils HFA, HFB and HFC hydraulic fluids

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

EXTRUSION GAPS

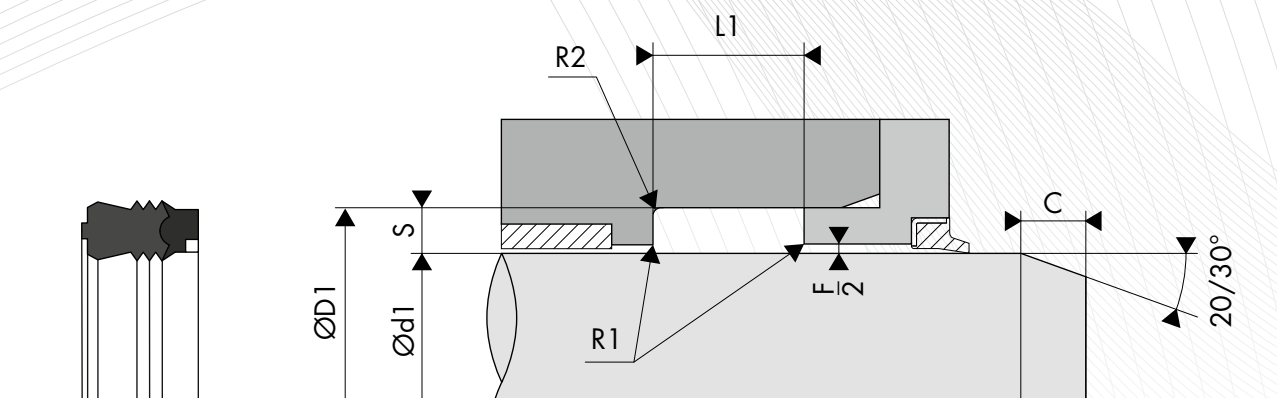
Radial section S	Radial gap F/2			
	16 MPa	26 MPa	32 MPa	40 MPa
≤ 5.00	0.50	0.40	0.35	-
≤ 7.50	0.55	0.45	0.40	0.35
≤ 12.50	0.60	0.50	0.45	0.40
≤ 15.00	0.65	0.55	0.45	0.40

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

CHAMFERS AND RADIUS

Inside diameter d1	Radius R1	Radius R2	Chamfer C
≤ 50.00	0.30	0.40	2.50
≤ 100.00	0.30	0.80	4.00
≤ 150.00	0.30	0.80	5.00
> 150.00	0.30	1.00	6.50

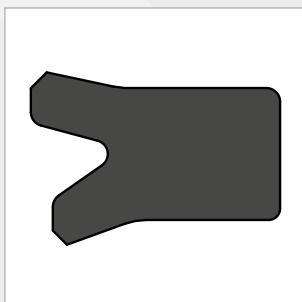


DIMENSIONS

Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H9	Width of the groove L1 0/+0.25
202.015020	15.00	27.00	20.00
202.020020	20.00	33.00	20.00
202.022020	22.00	35.00	20.00
202.025020	25.00	38.00	20.00
202.028020	28.00	41.00	20.00
202.030020	30.00	43.00	20.00
202.032022	32.00	47.00	22.50
202.035025	35.00	45.00	25.59
202.035022	35.00	47.00	22.50
202.035225	35.00	50.00	22.50
202.036022	36.00	51.00	22.50
202.040017	40.00	50.00	17.50
202.040022	40.00	52.00	22.50
202.040226	40.00	55.00	22.62
202.040030	40.00	60.00	30.00
202.045022	45.00	60.00	22.50
202.045028	45.00	65.00	28.00
202.050020	50.00	63.00	20.00
202.050022	50.00	65.00	22.50
202.050024	50.00	65.00	24.50
202.050030	50.00	70.00	30.00
202.050031	50.00	70.00	31.90
202.055022	55.00	70.00	22.50
202.055025	55.00	70.00	25.00
202.055030	55.00	75.00	30.00
202.055032	55.00	75.00	32.00
202.056022	56.00	71.00	22.50
202.056025	56.00	71.00	25.00
202.056028	56.00	76.00	28.00
202.060022	60.00	75.00	22.50
202.060025	60.00	75.00	25.00
202.060027	60.00	80.00	27.00
202.060030	60.00	80.00	30.00
202.060032	60.00	80.00	32.00
202.060034	60.00	80.00	34.90
202.063027	63.00	83.00	27.00
202.063029	63.00	83.00	29.00
202.063030	63.00	83.00	30.00
202.065029	65.00	85.00	29.00
202.070022	70.00	85.00	22.50
202.070025	70.00	85.00	25.00
202.070030	70.00	90.00	30.00
202.070031	70.00	90.00	31.90
202.075028	75.00	95.00	28.00
202.075030	75.00	95.00	30.00
202.765032	76.50	96.50	32.50
202.080030	80.00	100.00	30.00
202.085022	85.00	105.00	22.00

Part number	Diameter of the rod Ød1 f8	Diameter of the groove ØD1 H9	Width of the groove L1 0/+0.25
202.085030	85.00	105.00	30.00
202.090022	90.00	105.00	22.50
202.090025	90.00	105.00	25.00
202.090033	90.00	105.00	33.53
202.090030	90.00	110.00	30.00
202.090032	90.00	110.00	32.50
202.095028	95.00	115.00	28.00
202.100024	100.00	114.30	24.21
202.100030	100.00	120.00	30.00
202.105025	105.00	118.00	25.00
202.105034	105.00	120.00	34.00
202.105030	105.00	125.00	30.00
202.110032	110.00	130.00	32.50
202.110036	110.00	132.00	36.50
202.115030	115.00	130.00	30.00
202.120030	120.00	140.00	30.00
202.125029	125.00	145.00	29.62
202.130028	130.00	150.00	28.00
202.135028	135.00	155.00	28.00
202.140019	140.00	160.00	19.00
202.140028	140.00	160.00	28.00
202.140030	140.00	160.00	30.00
202.150028	150.00	170.00	28.00
202.155028	155.00	175.00	28.00
202.160028	160.00	180.00	28.00
202.165030	165.00	185.00	30.00
202.170035	170.00	195.00	35.00
202.175035	175.00	200.00	35.00
202.180035	180.00	205.00	35.00
202.185035	185.00	210.00	35.00
202.190035	190.00	215.00	35.00
202.195035	195.00	220.00	35.00
202.200035	200.00	225.00	35.00
202.210030	210.00	235.00	30.00
202.215035	215.00	240.00	35.00
202.220035	220.00	245.00	35.00
202.225035	225.00	250.00	35.00
202.230035	230.00	255.00	35.00
202.240035	240.00	265.00	35.00
202.250035	250.00	275.00	35.00
202.260030	260.00	280.00	30.00
202.265035	265.00	290.00	35.00
202.275035	275.00	300.00	35.00
202.280035	280.00	305.00	35.00
202.300035	300.00	325.00	35.00
202.335035	335.00	360.00	35.00

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 230



DESCRIPTION

The BECA 230 profile is a U-ring type single acting rod seal with offset rubber lips.

ADVANTAGES

Optimised sealing effect
Excellent resistance to high temperatures depending on the type of material chosen
Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics
Machine tools
Presses
Standard cylinders

MATERIALS

NBR 70 Shore A
NBR 85 Shore A
FKM 85 Shore A

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	15 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

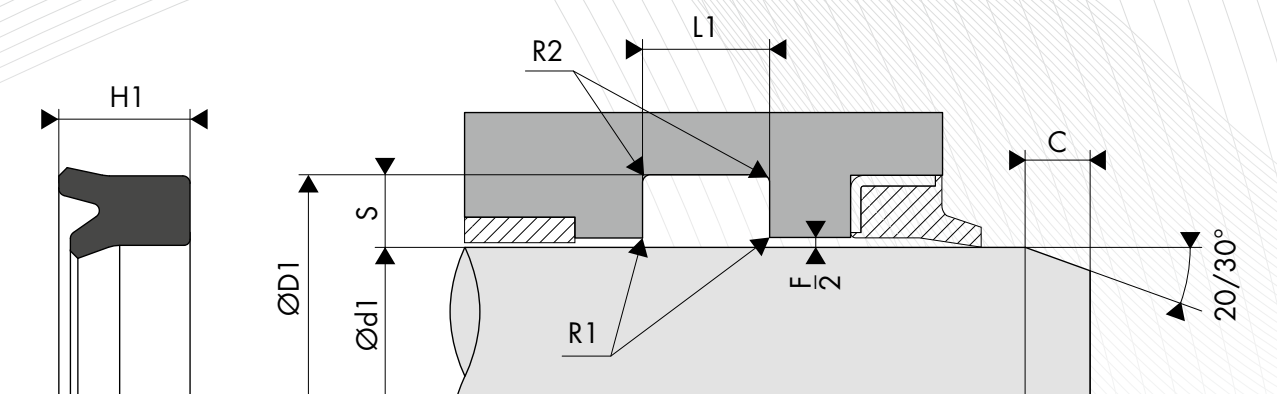
Pressure MPa	Radial gap F/2
2.5 MPa	0.45
5.0 MPa	0.35
7.5 MPa	0.30
10.0 MPa	0.25
15.0 MPa	0.20

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00

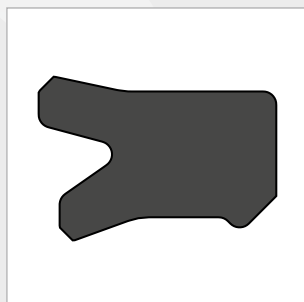


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Groove width L1 -0.50/+1.00
230.1006014	6.00	14.00	5.70	6.30
230.0651254	6.50	12.50	3.90	4.00
230.0701304	7.00	13.00	3.90	4.00
230.0081284	8.00	12.80	4.00	5.00
230.1008014	8.00	14.00	3.90	4.00
230.0008016	8.00	16.00	5.70	6.30
230.1008016	8.00	16.00	6.00	6.70
230.1013623	10.00	13.60	2.30	2.70
230.1010018	10.00	18.00	5.70	6.30
230.1010020	10.00	20.00	7.30	8.00
230.1012020	12.00	20.00	5.70	6.30
230.0012022	12.00	22.00	7.30	8.00
230.1012022	12.00	22.00	8.00	9.00
230.0132326	13.00	23.20	5.20	5.80
230.1014022	14.00	22.00	5.70	6.30
230.1014024	14.00	24.00	7.30	8.00
230.1016024	16.00	24.00	5.70	6.30
230.1016026	16.00	26.00	7.30	8.00
230.1018025	18.00	25.00	5.00	5.60
230.1018026	18.00	26.00	5.70	6.30
230.1018028	18.00	28.00	7.30	8.00
230.0190255	19.00	25.00	4.70	5.30
230.0020654	20.00	26.50	3.70	4.00
230.1020027	20.00	27.00	6.00	6.50
230.1020028	20.00	28.00	5.70	6.30
230.1020030	20.00	30.00	7.30	8.00
230.2022030	22.00	30.00	5.70	6.30
230.1022032	22.00	32.00	7.30	8.00
230.1025032	25.00	32.00	5.00	5.60
230.1025033	25.00	33.00	5.70	6.30
230.5025035	25.00	35.00	5.50	6.00
230.7025035	25.00	35.00	7.30	8.00
230.1025035	25.00	35.00	8.00	9.00
230.0289454	28.00	34.50	3.70	4.00
230.1028038	28.00	38.00	7.30	8.00
230.1028043	28.00	43.00	11.50	12.50
230.1030040	30.00	40.00	10.00	11.00
230.1031041	31.00	41.00	10.00	11.00
230.1032040	32.00	40.00	5.70	6.30
230.1032042	32.00	42.00	7.30	8.00
230.1032047	32.00	47.00	11.50	12.50
230.2035045	35.00	45.00	9.00	10.00
230.1035045	35.00	45.00	10.00	11.00
230.1035055	35.00	55.00	11.00	12.00
230.1036046	36.00	46.00	7.30	8.00
230.1036051	36.00	51.00	11.50	12.50
230.2040050	40.00	50.00	9.00	10.00
230.1040050	40.00	50.00	10.00	11.00
230.1040055	40.00	55.00	11.50	12.50
230.1042050	42.00	50.00	5.70	6.30
230.7045055	45.00	55.00	7.00	7.50
230.2045055	45.00	55.00	7.30	8.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Groove width L1 -0.50/+1.00
230.1045055	45.00	55.00	10.00	11.00
230.1045060	45.00	60.00	11.50	12.50
230.7050060	50.00	60.00	7.00	8.00
230.2050060	50.00	60.00	7.30	8.00
230.1050060	50.00	60.00	10.00	11.00
230.1050065	50.00	65.00	11.50	12.50
230.1054064	54.00	64.00	7.00	8.00
230.1055063	55.00	63.00	5.70	6.30
230.1055065	55.00	65.00	10.00	11.00
230.1056071	56.00	71.00	11.50	12.50
230.1056076	56.00	76.00	15.00	16.00
230.1060070	60.00	70.00	10.00	11.00
230.2060070	60.00	70.00	12.00	13.00
230.1063078	63.00	78.00	11.50	12.50
230.1063083	63.00	83.00	15.00	16.00
230.0065075	65.00	75.00	12.00	13.00
230.1067077	67.00	77.00	10.00	11.00
230.2070080	70.00	80.00	6.50	7.50
230.1070080	70.00	80.00	12.00	13.00
230.1070085	70.00	85.00	11.50	12.50
230.1070090	70.00	90.00	15.00	16.00
230.2080090	80.00	90.00	10.00	11.00
230.1080090	80.00	90.00	12.00	13.00
230.1080095	80.00	95.00	11.50	12.50
230.1080100	80.00	100.00	15.00	16.00
230.2090100	90.00	100.00	6.50	7.50
230.1090100	90.00	100.00	12.00	13.00
230.1090105	90.00	105.00	11.50	12.50
230.1090110	90.00	110.00	15.00	16.00
230.1100120	100.00	120.00	15.00	16.00
230.1100125	100.00	125.00	19.00	20.00
230.1110125	110.00	125.00	9.60	10.60
230.1110130	110.00	130.00	15.00	16.00
230.1110135	110.00	135.00	19.00	20.00
230.1125145	125.00	145.00	15.00	16.00
230.1125150	125.00	150.00	19.00	20.00
230.1140160	140.00	160.00	15.00	16.00
230.1140165	140.00	165.00	19.00	20.00
230.1145160	145.00	160.00	9.60	10.60
230.1160185	160.00	185.00	19.00	20.00
230.1160190	160.00	190.00	24.00	25.00
230.1180205	180.00	205.00	19.00	20.00
230.1180210	180.00	210.00	24.00	25.00
230.1185200	185.00	200.00	9.60	10.60
230.1200225	200.00	225.00	19.00	20.00
230.1200230	200.00	230.00	24.00	25.00
230.1220250	220.00	250.00	24.00	25.00
230.1250280	250.00	280.00	24.00	25.00
230.1280310	280.00	310.00	24.00	25.00
230.1320360	320.00	360.00	31.00	32.00
230.1360400	360.00	400.00	31.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 230/B



DESCRIPTION

The BECA 230/B profile is a rubber single acting rod seal with symmetrical lips and a second sealing lip. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect at both high and low pressures

Excellent abrasion and wear resistance

Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Hydraulic cylinders

MATERIALS

PU 93 Shore A - Blue

PU 96 Shore A - Blue

High temp. PU 96 Shore A - Beige

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	15 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

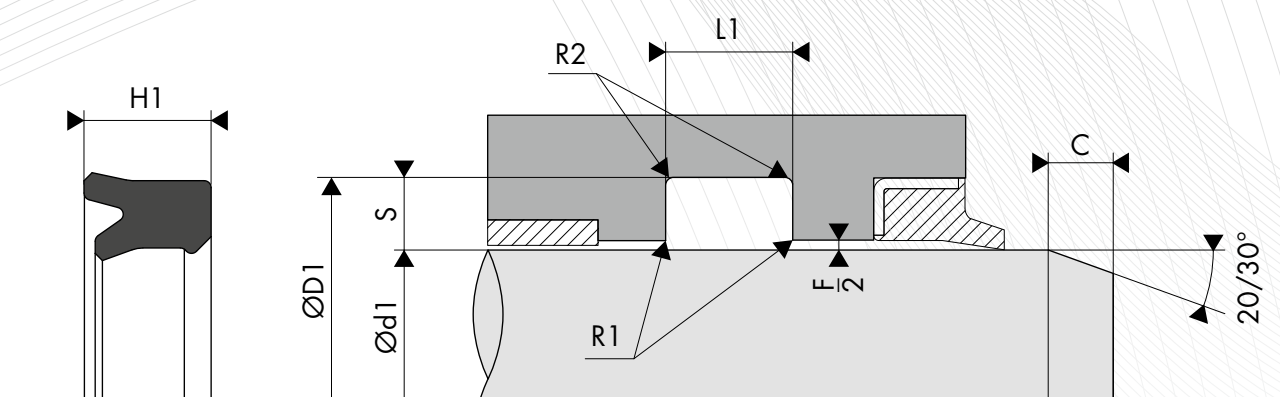
Pressure MPa	Radial gap F/2
2.5 MPa	0.45
5.0 MPa	0.35
7.5 MPa	0.30
10.0 MPa	0.25
15.0 MPa	0.20

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00

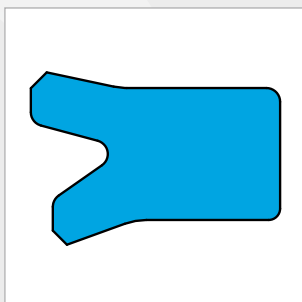


○ DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
230.0121673	12.00	16.70	2.70	3.00
230.121673S	12.00	16.70	2.70	3.00
230.0141873	14.00	18.70	2.70	3.00
230.141873S	14.00	18.70	2.70	3.00
230.0151973	15.00	19.70	2.70	3.00
230.0162073	16.00	20.70	2.70	3.00
230.16203K8	16.00	20.70	2.70	3.00
230.162073S	16.00	20.70	2.70	3.00
230.0160226	16.00	22.00	5.50	6.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
230.0202654	20.00	26.50	3.70	4.00
230.202654S	20.00	26.50	3.70	4.00
230.0232954	23.00	29.50	3.70	4.00
230.0283454	28.00	34.50	3.70	4.00
230.0300406	30.00	40.00	6.00	6.50
230.6030040	30.00	40.00	6.00	7.00
230.7030040	30.00	40.00	7.00	8.00
230.0450557	45.00	55.00	7.00	7.50
230.0891029	89.00	102.00	8.56	9.56

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 231



DESCRIPTION

The BECA 231 profile is a U-ring type single acting rod seal with offset polyurethane lips. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect at both high and low pressures

Excellent abrasion and extrusion resistance

Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Hydraulic cylinders

MATERIALS

PU 93 Shore A - Blue

PU 96 Shore A - Blue

High temp. PU 96 Shore A - Beige

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

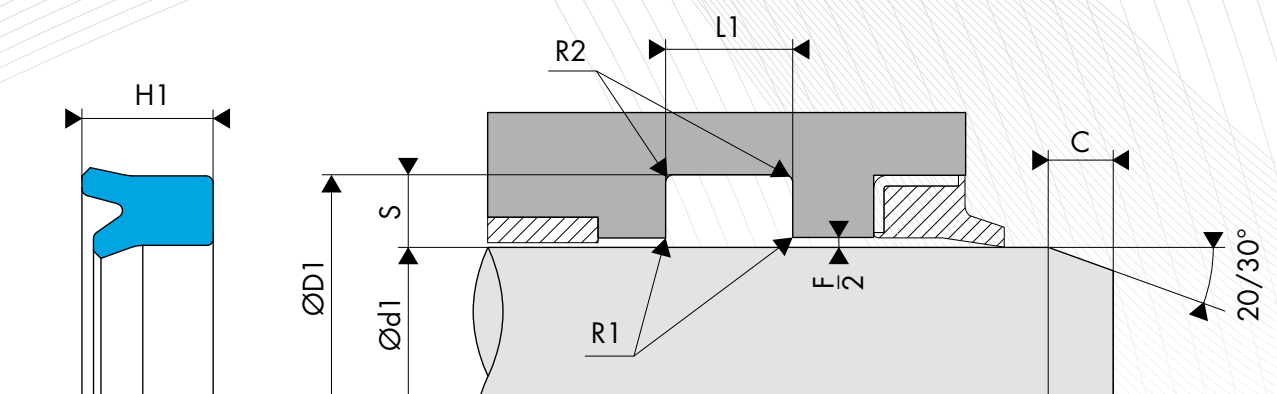
Diameter of the rod Ød1	Radial gap F/2				
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10
> 60 mm	0.50	0.40	0.30	0.20	0.15

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
4.00	0.20	0.60	2.50
5.00	0.20	1.00	2.50
7.50	0.20	1.00	4.00
12.50	0.20	1.30	6.00
20.00	0.20	1.80	8.00

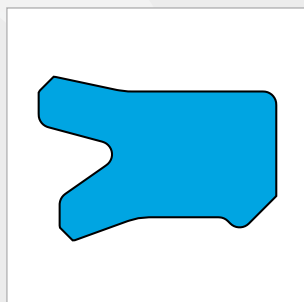


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
231.0060146	6.00	14.00	5.70	6.30
231.0080166	8.00	16.00	5.70	6.30
231.0100186	10.00	18.00	5.70	6.30
231.0100208	10.00	20.00	7.30	8.00
231.0120206	12.00	20.00	5.70	6.30
231.0120228	12.00	22.00	7.30	8.00
231.0140226	14.00	22.00	5.70	6.30
231.0140248	14.00	24.00	7.30	8.00
231.0160268	16.00	26.00	7.30	8.00
231.0200307	20.00	30.00	7.30	8.00
231.0200308	20.00	30.00	8.00	9.00
231.0220285	22.00	28.00	4.50	5.00
231.0220307	22.00	30.00	7.00	8.00
231.0220326	22.00	32.00	5.70	6.30
231.0220328	22.00	32.00	7.30	8.00
231.0250338	25.00	33.00	8.00	9.00
231.0250358	25.00	35.00	7.30	8.00
231.0280431	28.00	43.00	11.50	12.50
231.0300451	30.00	45.00	10.00	11.00
231.0350437	35.00	43.00	6.30	7.00
231.0350457	35.00	45.00	7.00	8.00
231.0360512	36.00	51.00	11.50	12.50
231.0400551	40.00	55.00	11.50	12.50
231.0420506	42.00	50.00	5.70	6.30
231.0450556	45.00	55.00	6.00	7.00
231.0450601	45.00	60.00	11.50	12.50
231.0500606	50.00	60.00	6.00	7.00
231.0500631	50.00	63.00	10.00	11.00
231.0500650	50.00	65.00	10.00	11.00
231.0500651	50.00	65.00	11.50	12.50
231.0550636	55.00	63.00	5.70	6.30
231.0560711	56.00	71.00	11.50	12.50
231.0560761	56.00	76.00	15.00	16.00
231.0630781	63.00	78.00	11.50	12.50
231.0630831	63.00	83.00	15.00	16.00
231.0650781	65.00	78.00	10.00	11.00
231.0650801	65.00	80.00	12.00	13.00
231.0700831	70.00	83.00	10.00	11.00
231.0700851	70.00	85.00	11.50	12.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
231.0700901	70.00	90.00	15.00	16.00
231.0750881	75.00	88.00	10.00	11.00
231.0750900	75.00	90.00	10.00	11.00
231.0750901	75.00	90.00	11.50	12.50
231.0800951	80.00	95.00	11.50	12.50
231.0801005	80.00	100.00	15.00	16.00
231.0851009	85.00	100.00	9.00	10.00
231.0901007	90.00	100.00	6.50	7.50
231.0901051	90.00	105.00	11.50	12.50
231.0901101	90.00	110.00	15.00	16.00
231.0951109	95.00	110.00	9.00	10.00
231.0961061	96.00	106.00	12.00	13.00
231.1001081	100.00	108.00	11.50	12.50
231.1001151	100.00	115.00	10.00	11.00
231.1001201	100.00	120.00	15.00	16.00
231.1001251	100.00	125.00	19.00	20.00
231.1101251	110.00	125.00	9.60	10.60
231.1101301	110.00	130.00	15.00	16.00
231.1101351	110.00	135.00	19.00	20.00
231.1251451	125.00	145.00	15.00	16.00
231.1251501	125.00	150.00	19.00	20.00
231.1301501	130.00	150.00	13.00	14.00
231.1401601	140.00	160.00	15.00	16.00
231.1401651	140.00	165.00	19.00	20.00
231.1451601	145.00	160.00	9.60	10.60
231.1601851	160.00	185.00	19.00	20.00
231.1601902	160.00	190.00	24.00	25.00
231.1701901	170.00	190.00	16.00	17.00
231.1802051	180.00	205.00	19.00	20.00
231.1802102	180.00	210.00	24.00	25.00
231.1852001	185.00	200.00	9.60	10.60
231.2002256	200.00	225.00	16.00	17.00
231.2002259	200.00	225.00	19.00	20.00
231.2002302	200.00	230.00	24.00	25.00
231.2202502	220.00	250.00	24.00	25.00
231.2502802	250.00	280.00	24.00	25.00
231.2803102	280.00	310.00	24.00	25.00
231.3203603	320.00	360.00	31.00	32.00
231.3604003	360.00	400.00	31.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 231/B



DESCRIPTION

The BECA 231/B profile is a polyurethane U-ring type single acting rod seal with offset lips, symmetrical lips and a second sealing lip. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect at both high and low pressures

Excellent abrasion and wear resistance

Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Hydraulic cylinders

MATERIALS

PU 93 Shore A - Blue

PU 96 Shore A - Blue

High temp. PU 96 Shore A - Beige

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

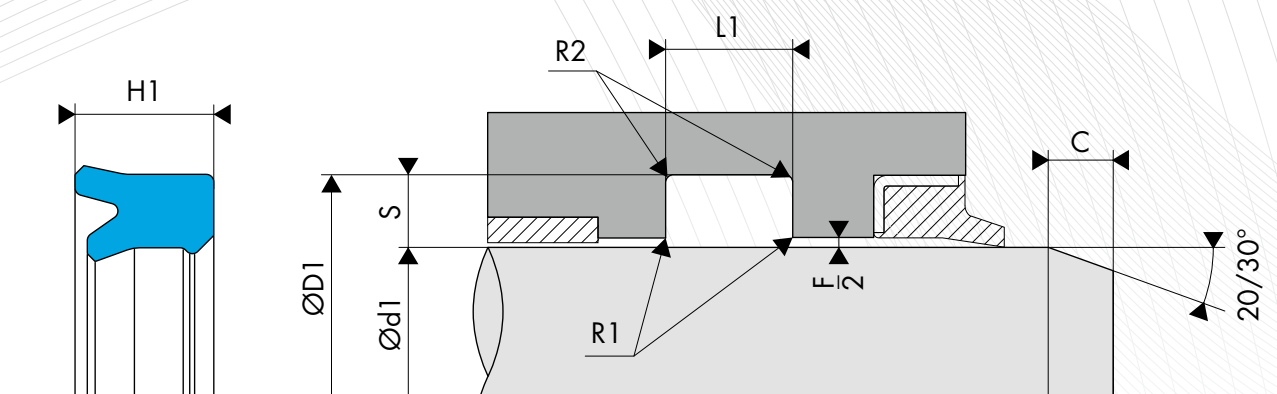
Diameter of the rod Ød1	Radial gap F/2				
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10
> 60 mm	0.50	0.40	0.30	0.20	0.15

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
4.00	0.20	0.60	2.50
5.00	0.20	1.00	2.50
7.50	0.20	1.00	4.00
12.50	0.20	1.30	6.00
20.00	0.20	1.80	8.00

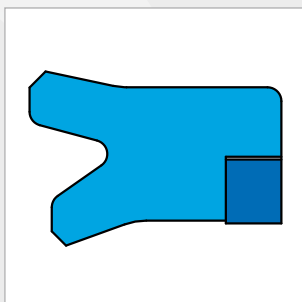


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
231.0120184	12.00	18.00	4.00	4.50
231.0120185	12.00	18.00	5.00	6.00
231.0150215	15.00	21.00	4.50	5.00
231.0160226	16.00	22.00	5.00	6.00
231.0160235	16.00	23.00	5.00	5.60
231.0160246	16.00	24.00	5.70	6.30
231.0180255	18.00	25.00	5.00	5.60
231.0180266	18.00	26.00	5.70	6.30
231.0180288	18.00	28.00	8.00	9.00
231.0200265	20.00	26.00	5.00	5.50
231.0200275	20.00	27.00	5.00	5.60
231.0200286	20.00	28.00	5.70	6.30
231.0220295	22.00	29.00	5.00	5.60
231.0220306	22.00	30.00	5.70	6.30
231.0220309	22.00	30.00	8.00	9.00
231.0240305	24.00	30.00	4.50	5.00
231.0250321	25.00	32.00	10.00	11.00
231.0250325	25.00	32.00	5.00	5.60
231.0250336	25.00	33.00	5.70	6.30
231.0250339	25.00	33.00	8.00	9.00
231.0260361	26.00	36.00	10.00	11.00
231.0280366	28.00	36.00	5.70	6.30
231.0280388	28.00	38.00	7.00	8.00
231.0300367	30.00	36.00	6.30	7.00
231.0300386	30.00	38.00	5.70	6.30
231.0300387	30.00	38.00	6.30	7.00
231.0300407	30.00	40.00	7.00	8.00
231.0300431	30.00	43.00	10.00	11.00
231.0300461	30.00	46.00	9.00	10.00
231.0320406	32.00	40.00	5.70	6.30
231.0320428	32.00	42.00	7.00	8.00
231.0320471	32.00	47.00	10.00	11.00
231.0320481	32.00	48.00	10.00	11.00
231.0350436	35.00	43.00	5.70	6.30
231.0350519	35.00	51.00	9.00	10.00
231.0360446	36.00	44.00	5.70	6.30
231.0360461	36.00	46.00	10.00	11.00
231.0360468	36.00	46.00	7.00	8.00
231.0370471	37.00	47.00	10.00	11.00
231.0370478	37.00	47.00	8.00	9.00
231.0380482	38.00	48.00	12.00	13.00
231.0380487	38.00	48.00	6.60	7.20
231.0400486	40.00	48.00	5.70	6.30
231.0400489	40.00	48.00	8.00	9.00
231.0400506	40.00	50.00	6.00	7.00
231.0400508	40.00	50.00	7.00	8.00
231.0400528	40.00	52.00	8.00	9.00
231.0400550	40.00	55.00	10.00	11.00
231.0445571	44.45	57.15	8.00	9.00
231.0450536	45.00	53.00	5.70	6.30
231.0450539	45.00	53.00	8.00	9.00
231.0450558	45.00	55.00	7.00	8.00
231.0450612	45.00	61.00	12.00	13.00
231.0470561	47.00	56.30	9.00	10.00
231.0470569	47.00	56.30	8.00	9.00
231.0500582	50.00	58.00	10.90	12.00
231.0500586	50.00	58.00	5.70	6.30
231.0500608	50.00	60.00	7.00	8.00
231.0520621	52.00	62.00	10.00	11.00
231.0550638	55.00	63.00	7.30	8.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.5
231.0550639	55.00	63.00	8.00	9.00
231.0550652	55.00	65.00	12.00	13.00
231.0550656	55.00	65.00	6.00	7.00
231.0550701	55.00	70.00	10.00	11.00
231.0550709	55.00	70.00	9.00	10.00
231.0550752	55.00	75.00	12.00	13.00
231.0560667	56.00	66.00	6.80	7.50
231.0560712	56.00	71.00	11.50	12.50
231.0570669	57.16	66.70	9.50	10.50
231.0600719	60.00	71.00	8.00	9.00
231.0600751	60.00	75.00	11.50	12.50
231.0600752	60.00	75.00	12.00	13.00
231.0630737	63.00	73.00	6.80	7.50
231.0650802	65.00	80.00	12.00	13.00
231.0700781	70.00	78.00	10.90	12.00
231.0700807	70.00	80.00	6.80	7.50
231.0700852	70.00	85.00	11.50	12.50
231.0770872	77.00	87.00	12.00	13.00
231.0800907	80.00	90.00	6.80	7.50
231.0800952	80.00	95.00	11.50	12.50
231.0850944	85.00	94.00	14.00	15.00
231.0900981	90.00	98.00	10.90	12.00
231.0961062	96.00	106.00	12.00	13.00
231.1001082	100.00	108.00	11.50	12.50
231.1030040	30.00	40.00	10.00	11.00
231.1030045	30.00	45.00	10.00	11.00
231.1035045	35.00	45.00	10.00	11.00
231.1040050	40.00	50.00	10.00	11.00
231.1040055	40.00	55.00	11.50	12.50
231.1045053	45.00	53.00	10.00	11.00
231.1050057	50.00	57.00	10.00	11.00
231.1050060	50.00	60.00	10.00	11.00
231.1050065	50.00	65.00	10.00	11.00
231.1055065	55.00	65.00	10.00	11.00
231.1058068	58.00	68.00	10.00	11.00
231.1060070	60.00	70.00	10.00	11.00
231.1060075	60.00	75.00	10.00	11.00
231.1080090	80.00	90.00	10.00	11.00
231.1151231	115.00	123.00	10.90	12.00
231.1601805	160.00	180.00	15.00	16.00
231.2055063	55.00	63.00	12.00	13.00
231.2060070	60.00	70.00	12.00	13.00
231.2063073	63.00	73.00	12.00	13.00
231.2063078	63.00	78.00	11.50	12.50
231.2070080	70.00	80.00	12.00	13.00
231.2075085	75.00	85.00	12.00	13.00
231.2080090	80.00	90.00	12.00	13.00
231.2090105	90.00	105.00	11.50	12.50
231.2203257	22.00	32.00	5.70	6.30
231.4513020	13.00	20.00	4.00	4.50
231.7035043	35.00	43.00	6.30	7.00
231.7035045	35.00	45.00	7.00	8.00
231.7509011	75.00	90.00	11.50	12.50
231.8020030	20.00	30.00	8.00	9.00
231.8022032	22.00	32.00	8.00	9.00
231.8025035	25.00	35.00	8.00	9.00
231.8028038	28.00	38.00	8.00	9.00
231.8030040	30.00	40.00	8.00	9.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 231/AE



DESCRIPTION

The BECA 231/AE profile is a polyurethane U-ring type single acting rod seal with offset lips, with a POM back-up ring integrated into the back. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect at both high and low pressures

Excellent abrasion and wear resistance

Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics

Injection presses

Machine tools

Presses

Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue

PU 96 Shore A - Blue

High temp. PU 96 Shore A - Beige

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	45 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

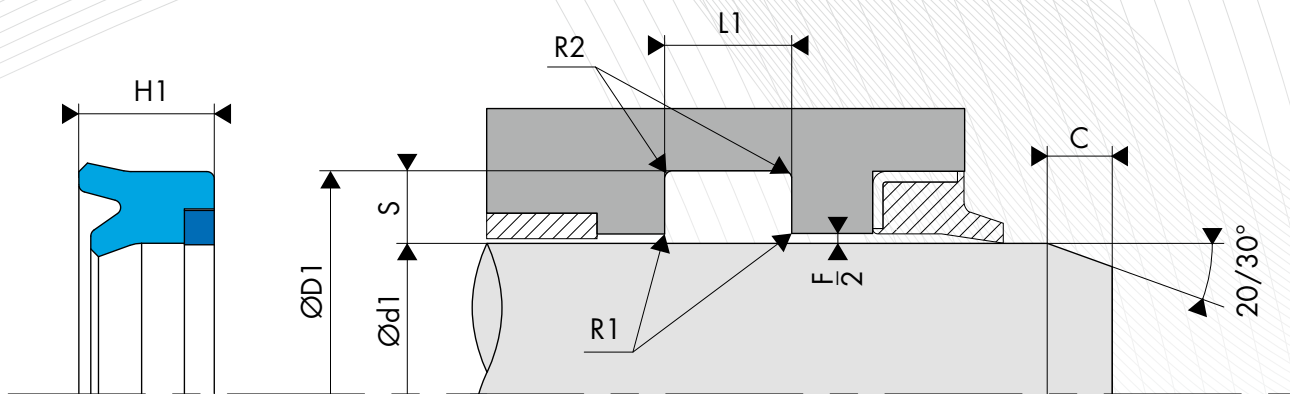
Rod diameter Ød1	Radial gap F/2					
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa	≤ 45 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10	0.07
> 60 mm	0.50	0.40	0.30	0.20	0.15	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
4.00	0.20	0.60	2.50
5.00	0.20	1.00	2.50
7.50	0.20	1.00	4.00
12.50	0.20	1.30	6.00
20.00	0.20	1.80	8.00

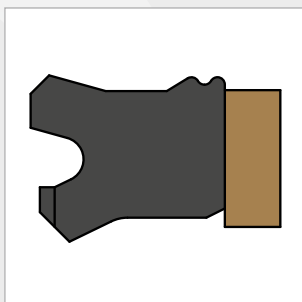


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.5
231.1828AEG	18.00	28.00	8.00	9.00
231.R103004	30.00	40.00	10.00	11.00
231.350456E	35.00	45.00	6.50	7.50
231.R703504	35.00	45.00	6.50	7.50
231.035045E	35.00	45.00	10.00	11.00
231.R035045	35.00	45.00	10.00	11.00
231.04555AE	45.00	55.00	7.00	8.00
231.04658AE	46.00	58.00	12.00	13.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.5
231.2055065	55.00	65.00	12.00	13.00
231.E070083	70.00	83.00	13.00	14.00
231.1001154	100.00	115.00	13.00	14.00
231.0105BAE	105.00	125.00	12.00	13.00
231.105125E	105.00	125.00	15.00	16.00
231.E130150	130.00	150.00	16.00	17.00
231.200225E	200.00	225.00	15.00	16.00
231.E200225	200.00	225.00	20.00	21.00

Other intermediate sizes can be provided.



ROD SEALS

BECA 239



DESCRIPTION

The BECA 239 profile is a U-ring type single acting rod seal with offset lips composed of a profiled rubber seal and a bronze-filled PTFE back-up ring on the back.

ADVANTAGES

Optimised sealing effect at average and higher pressures
Good extrusion resistance

APPLICATIONS

Mobile hydraulics
Material handling - Lifting
Hydraulic cylinders

MATERIALS

Profiled seal

NBR 85 Shore A

Back-up ring

Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	25 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

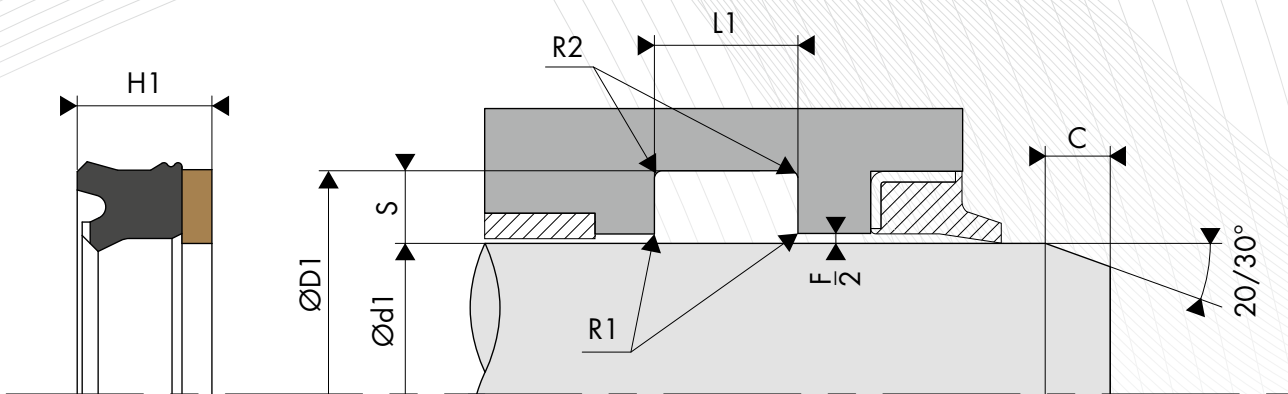
Pressure MPa	Radial gap F/2
10 MPa	0.25
15 MPa	0.20
20 MPa	0.15
25 MPa	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
4.00	0.20	0.40	2.00
5.00	0.40	0.70	2.50
6.00	0.70	1.10	3.00
7.50	0.80	1.10	4.00
10.00	1.00	1.10	5.00

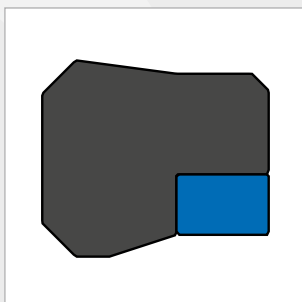


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.20
239.0300401	30.00	40.00	10.00	11.00
239.0350605	35.00	60.00	15.50	17.00
239.0400501	40.00	50.00	10.00	11.00
239.0450551	45.00	55.00	10.00	11.00
239.0450705	45.00	70.00	15.50	17.00
239.0500634	50.00	63.00	13.00	14.00
239.0550684	55.00	68.00	13.00	14.00
239.0600734	60.00	73.00	13.00	14.00
239.0650784	65.00	78.00	13.00	14.00
239.0650902	65.00	90.00	18.00	20.00
239.0700831	70.00	83.00	13.00	14.00

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Height of the seal H1	Width of the groove L1 0/+0.20
239.0750883	75.00	88.00	13.00	14.00
239.0800933	80.00	93.00	13.00	14.00
239.0851004	85.00	100.00	13.00	14.00
239.0901054	90.00	105.00	13.00	14.00
239.0951103	95.00	110.00	13.50	14.50
239.1001153	100.00	115.00	13.00	14.00
239.1101303	110.00	130.00	13.00	14.00
239.1201403	120.00	140.00	13.00	14.00
239.1301506	130.00	150.00	16.00	17.00
239.1401607	140.00	160.00	16.00	17.00
239.1601806	160.00	180.00	16.00	17.00

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 300



DESCRIPTION

The BECA 300 profile is a single acting compo-compact rod seal composed of a profiled rubber seal and a filled PTFE or POM back-up ring on the back depending on the type of application.

ADVANTAGES

Optimised sealing effect
Good chemical compatibility, depending on the material chosen
Excellent wear resistance
Excellent extrusion resistance

APPLICATIONS

Mobile hydraulics
Material handling - Lifting
Presses
Hydraulic cylinders

MATERIALS

Profiled seal

NBR 80 Shore A
FKM 80 Shore A

Back-up ring

Polyoxymethylene - POM
Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	27.5 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

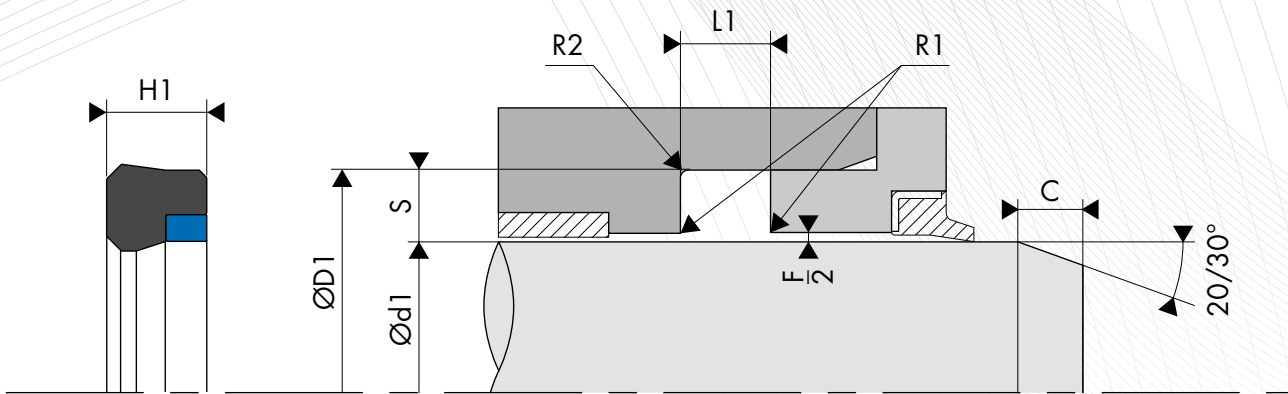
Pressure MPa	Radial gap F/2
15 MPa	0.30
20 MPa	0.25
25 MPa	0.20
27.5 MPa	0.15

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
4.00	0.30	0.50	2.00
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00

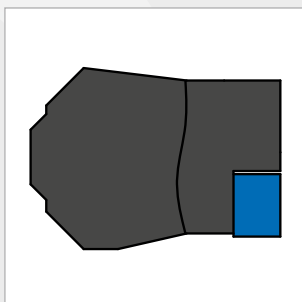


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
300.0012019	12.00	19.00	5.00	5.60
300.0014021	14.00	21.00	5.00	5.60
300.0016023	16.00	23.00	5.00	5.60
300.0018025	18.00	25.00	5.00	5.60
300.0020027	20.00	27.00	5.00	5.60
300.0022029	22.00	29.00	5.00	5.60
300.0028036	28.00	36.00	5.70	6.30
300.0032040	32.00	40.00	5.70	6.30
300.0035043	35.00	43.00	5.70	6.30
300.0036044	36.00	44.00	5.70	6.30
300.0038046	38.00	46.00	5.70	6.30
300.0040048	40.00	48.00	5.70	6.30

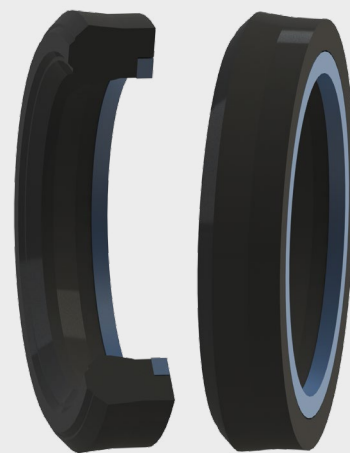
Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
300.0045053	45.00	53.00	5.70	6.30
300.0055065	55.00	65.00	6.75	7.50
300.0056066	56.00	66.00	6.75	7.50
300.0063073	63.00	73.00	6.75	7.50
300.0070080	70.00	80.00	6.75	7.50
300.0080090	80.00	90.00	6.75	7.50
300.0090100	90.00	100.00	6.75	7.50
300.0100115	100.00	115.00	9.50	10.50
300.0110125	110.00	125.00	9.50	10.50
300.0125140	125.00	140.00	9.50	10.50
300.0130155	130.00	155.00	9.50	10.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 301/AE



DESCRIPTION

The BECA 301/AE profile is a single acting compact rod seal composed of a profiled fabric NBR seal and a POM back-up ring on the back. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect
Good chemical compatibility, depending on the material chosen
Excellent wear resistance
Excellent extrusion resistance

APPLICATIONS

Mobile hydraulics
Material handling - Lifting
Presses
Hydraulic cylinders

MATERIALS

Profiled seal

Fabric NBR

Back-up ring

Polyoxymethylene - POM

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	35 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

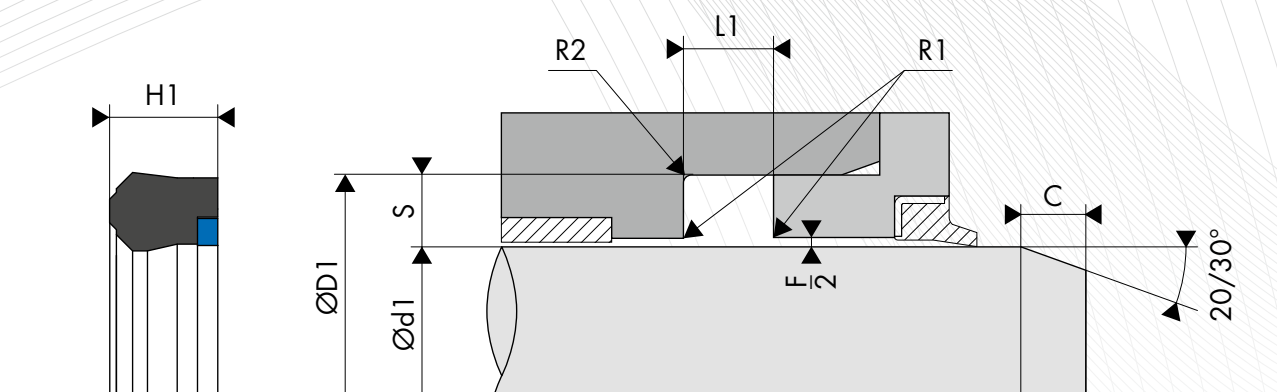
Pressure MPa	Radial gap F/2
15 MPa	0.20
25 MPa	0.10
35 MPa	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
4.00	0.20	0.40	2.00
5.00	0.40	0.70	2.50
6.00	0.70	1.10	3.00
7.50	0.70	1.10	4.00
10.00	1.00	1.10	5.00

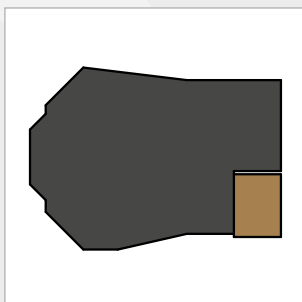


DIMENSIONS

Part number	Rod diameter Ød1 f9	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
301.012019E	12.00	19.00	6.30	7.00
301.016028E	16.00	28.00	7.20	7.50
301.318028E	18.00	28.00	7.20	8.00
301.320028E	20.00	28.00	5.70	6.30
301.020030E	20.00	30.00	8.00	9.00
301.322030E	22.00	30.00	5.70	6.30
301.022035E	22.00	35.00	9.50	10.00
301.325033E	25.00	33.00	5.70	6.30
301.328036E	28.00	36.00	5.70	6.30
301.028040E	28.00	40.00	8.00	9.00
301.332040E	32.00	40.00	5.70	6.30
301.032045E	32.00	45.00	10.00	11.00
301.032047E	32.00	47.00	10.00	11.00
301.035043E	35.00	43.00	5.70	6.30
301.035045E	35.00	45.00	11.00	12.00
301.336044E	36.00	44.00	5.70	6.30
301.036046E	36.00	46.00	8.00	8.50
301.340048E	40.00	48.00	5.70	6.30
301.340050E	40.00	50.00	7.20	8.00
301.040050E	40.00	50.00	10.00	11.00
301.S40050E	40.00	50.00	10.00	11.00
301.040055E	40.00	55.00	10.00	11.00
301.345053E	45.00	53.00	5.70	6.30
301.345055E	45.00	55.00	7.20	8.00
301.045057E	45.00	57.00	10.00	11.00
301.350060E	50.00	60.00	7.20	8.00
301.950060E	50.00	60.00	9.30	10.00
301.050060E	50.00	60.00	10.00	11.00
301.050065E	50.00	65.00	10.00	11.00
301.055065E	55.00	65.00	7.20	8.00
301.356066E	56.00	66.00	6.80	7.50
301.060072E	60.00	72.00	9.00	10.00
301.060075E	60.00	75.00	12.00	13.00
301.363073E	63.00	73.00	6.80	7.50

Part number	Rod diameter Ød1 f9	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
301.063075E	63.00	75.00	10.50	11.50
301.070082E	70.00	82.00	10.00	11.00
301.070084E	70.00	84.00	11.50	12.50
301.370085E	70.00	85.00	11.50	12.50
301.070090E	70.00	90.00	15.00	16.00
301.075085E	75.00	85.00	10.50	11.50
301.075090E	75.00	90.00	11.00	12.00
301.075095E	75.00	95.00	13.50	14.50
301.080901E	80.00	90.00	10.00	11.00
301.080911E	80.00	91.00	9.50	10.50
301.380095E	80.00	95.00	11.50	12.50
301.080096E	80.00	96.00	9.50	10.50
301.080100E	80.00	100.00	13.50	14.50
301.085100E	85.00	100.00	13.00	14.00
301.090100E	90.00	100.00	10.50	11.50
301.390105E	90.00	105.00	11.50	12.50
301.090105E	90.00	105.00	12.50	13.50
301.090110E	90.00	110.00	11.50	12.50
301.110113E	100.00	113.00	12.50	13.00
301.100120E	100.00	120.00	13.50	14.50
301.105125E	105.00	125.00	12.50	13.50
301.110125E	110.00	125.00	11.00	12.00
301.110130E	110.00	130.00	12.00	13.00
301.100133E	120.00	132.70	10.00	11.00
301.120133E	120.00	132.70	10.00	11.00
301.135120I	120.00	135.00	12.50	13.50
301.120140E	120.00	140.00	11.50	12.50
301.130145E	130.00	145.00	13.00	14.00
301.130150E	130.00	150.00	13.50	14.50
301.140160E	140.00	160.00	12.00	13.00
301.160175E	160.00	175.00	15.00	16.00
301.160185E	160.00	185.00	15.00	16.00
301.175200E	175.00	200.00	22.00	23.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 302/AE



DESCRIPTION

The BECA 302/AE profile is a single acting compact rod seal composed of a profiled FKM seal and a bronze-filled PTFE back-up ring on the back. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Optimised sealing effect

Good chemical compatibility and wide temperature range, depending on the material chosen

Excellent wear resistance

Excellent extrusion resistance

APPLICATIONS

Mobile hydraulics

Material handling - Lifting

Presses

Hydraulic cylinders

MATERIALS

Profiled seal

FKM 80 Shore A

Back-up ring

Bronze-filled PTFE

TECHNICAL DATA

Temperature	-20°C / +200°C
Pressure	35 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

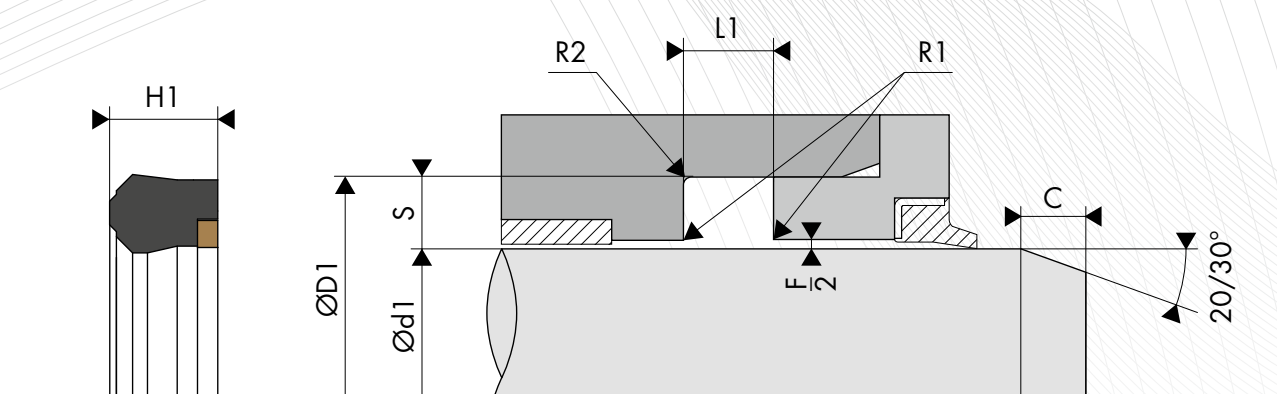
Pressure MPa	Radial gap F/2
15 MPa	0.20
25 MPa	0.10
35 MPa	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
4.00	0.20	0.40	2.00
5.00	0.40	0.70	2.50
6.00	0.70	1.10	3.00
7.50	0.70	1.10	4.00
10.00	1.00	1.10	5.00

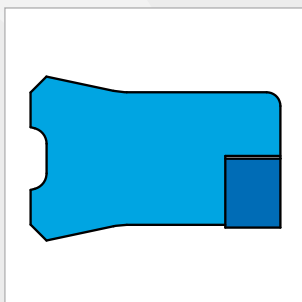


DIMENSIONS

Part number	Rod diameter Ød1 f9	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
302.016AG6E	16.00	26.00	8.00	9.00
302.018025E	18.00	25.00	5.60	6.30
302.018AG6E	18.00	26.00	5.70	6.30
302.022029E	22.00	29.00	5.00	5.60
302.022BG6E	22.00	30.00	5.70	6.30
302.022AG6E	22.00	32.00	8.00	9.00
302.025BG6E	25.00	33.00	6.40	7.00
302.028BG6E	28.00	36.00	5.70	6.30
302.028CG6E	28.00	38.00	7.20	8.00
302.028AG6E	28.00	40.00	8.00	9.00
302.036BG6E	36.00	46.00	7.20	8.00

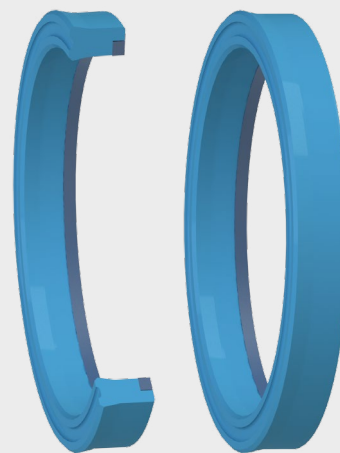
Part number	Rod diameter Ød1 f9	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
302.036AG6E	36.00	48.00	8.00	9.00
302.040050E	40.00	50.00	10.00	11.00
302.045053E	45.00	53.00	5.70	6.30
302.045055E	45.00	55.00	7.20	8.00
302.045BG6E	45.00	55.00	7.20	8.00
302.045AG6E	45.00	60.00	12.50	13.50
302.350060E	50.00	60.00	7.20	8.00
302.356066E	56.00	66.00	6.80	7.50
302.056AG6E	56.00	71.00	12.50	13.50
302.070AG6E	70.00	85.00	12.50	13.50
302.390105E	90.00	105.00	11.50	12.50

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 312



DESCRIPTION

The BECA 312 profile is a U-ring type single acting compact rod seal with matching lips and made of a very dense polyurethane body and a POM back-up ring on the back.

ADVANTAGES

Good sealing at both high and low pressures
Excellent abrasion resistance
Excellent extrusion resistance

APPLICATIONS

Mobile hydraulics
Material handling - Lifting
Presses
Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	50 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

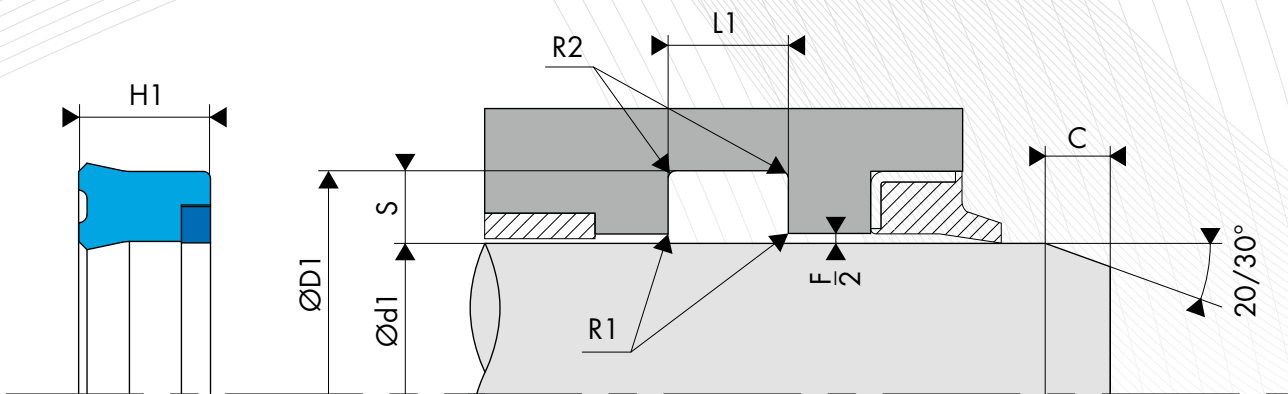
Rod diameter Ød1	Radial gap F/2					
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa	≤ 50 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10	0.07
> 60 mm	0.50	0.40	0.30	0.20	0.15	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.40	0.60	2.50
4.00	0.40	0.60	2.50
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00

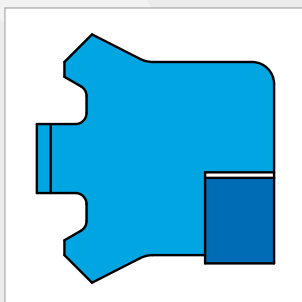


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
312.0200286	20.00	28.00	6.00	7.00
312.0250336	25.00	33.00	6.00	7.00
312.0300386	30.00	38.00	6.00	7.00
312.0360436	36.00	43.00	5.50	6.50
312.0400486	40.00	48.00	6.00	7.00
312.0400501	40.00	50.00	10.00	11.00
312.0450551	45.00	55.00	10.00	11.00
312.0450558	45.00	55.00	7.00	8.00

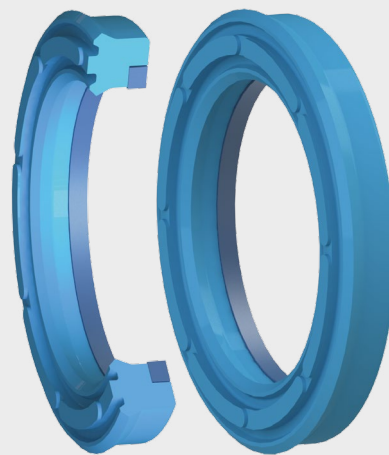
Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
312.0500601	50.00	60.00	10.00	11.00
312.0500609	50.00	60.00	9.00	10.00
312.0550651	55.00	65.00	10.00	11.00
312.0600702	60.00	70.00	12.00	13.00
312.1045055	45.00	55.00	10.00	11.00
312.1521622	152.00	162.00	12.20	13.00
312.1882032	188.00	203.00	12.20	13.00
312.1982082	198.00	208.00	12.00	13.00

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 315



DESCRIPTION

The BECA 315 profile is a single acting buffer rod seal composed of a profiled polyurethane triple lip seal and a POM back-up ring on the back.

ADVANTAGES

Primary seal
Low friction coefficient
Excellent abrasion resistance
Excellent extrusion resistance

APPLICATIONS

Agriculture
Mobile machinery
Injection presses
Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa (peak at 60 MPa)
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

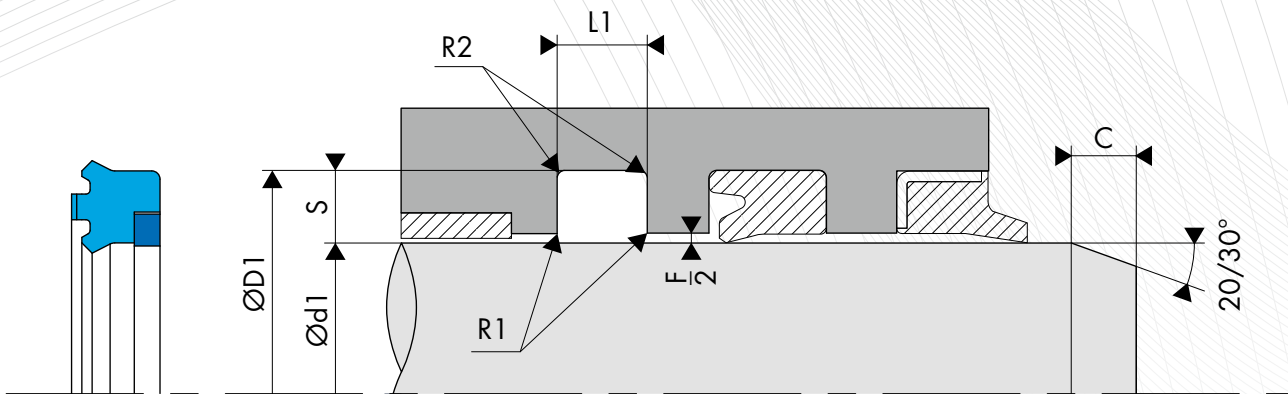
Radial section S	Radial gap F/2			
	15 MPa	25 MPa	30 MPa	40 MPa
≤ 7.75	0.60	0.50	0.40	0.35
≤ 10.00	0.70	0.60	0.50	0.40

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
7.50 - 7.75	0.80	1.00	4.00
10.00	0.80	1.00	5.00

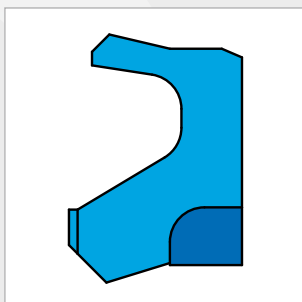


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
315.0560719	56.00	71.00	8.50	9.50
315.0650806	65.00	80.50	6.00	6.30
315.0700852	70.00	85.00	12.50	13.50
315.0700859	70.00	85.00	8.50	9.50
315.0750906	75.00	90.50	6.00	6.30
315.0750909	75.00	90.00	9.50	10.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
315.0800953	80.00	95.00	12.50	13.50
315.0800956	80.00	95.00	6.00	6.30
315.0800959	80.00	95.00	8.50	9.50
315.0901059	90.00	105.00	8.50	9.50
315.0951107	95.00	110.00	6.00	7.00
315.1001201	100.00	120.00	11.50	12.50

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 316



DESCRIPTION

The BECA 316 profile is a single acting buffer rod seal with offset lips composed of a profiled polyurethane seal and a POM back-up ring on the back.

ADVANTAGES

- Primary seal
- Low friction coefficient
- Excellent abrasion resistance
- Excellent extrusion resistance

APPLICATIONS

- Agriculture
- Mobile machinery
- Injection presses
- Hydraulic cylinders

MATERIALS

Profiled seal

PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa (peak at 60 MPa)
Speed	1 m/s
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

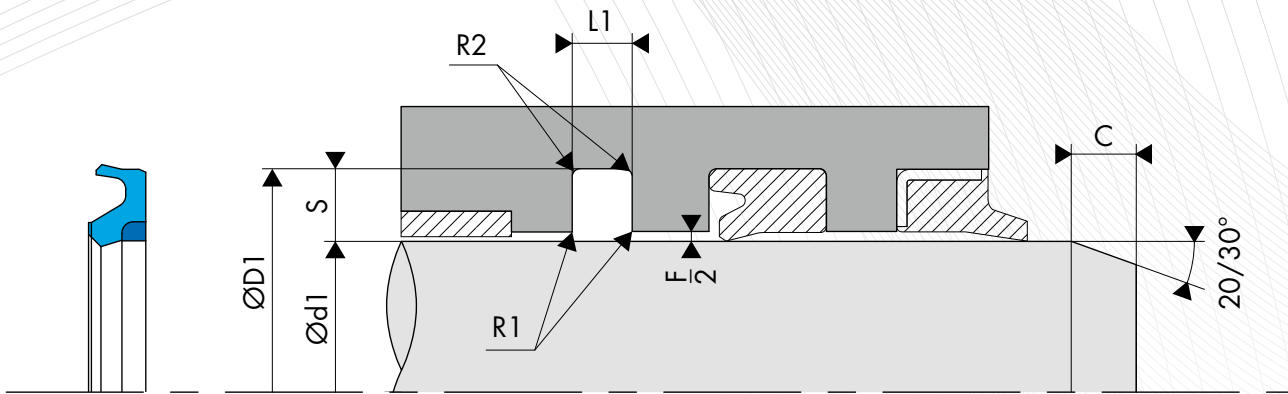
Radial section S	Radial gap F/2			
	15 MPa	25 MPa	30 MPa	40 MPa
≤ 7.75	0.60	0.50	0.40	0.35
≤ 10.50	0.70	0.60	0.50	0.40

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
7.75	0.20	0.40	4.00
10.50	0.20	0.50	5.00

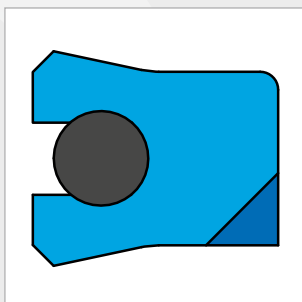


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Seal height H1	Groove width L1 0/+0.25
316.5570HPU	55.00	70.50	6.00	6.30
316.5671HPU	56.00	71.10	6.00	6.30
316.0650806	65.00	80.50	6.00	6.30
316.0700856	70.00	85.50	6.00	6.30
316.0750906	75.00	90.50	6.00	6.30
316.0800956	80.00	95.50	6.00	6.30
316.0851006	85.00	100.50	6.00	6.30
316.0901056	90.00	105.50	6.00	6.30
316.0951106	95.00	110.50	6.00	6.30
316.1001156	100.00	115.50	6.00	6.30
316.1051206	105.00	120.50	6.00	6.30
316.1101256	110.00	125.50	6.00	6.30
316.1151306	115.00	130.50	6.00	6.30

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Seal height H1	Groove width L1 0/+0.25
316.1201356	120.00	135.50	6.00	6.30
316.1251406	125.00	140.50	6.00	6.30
316.1301456	130.00	145.50	6.00	6.30
316.1231476	132.00	147.50	6.00	6.30
316.1351506	135.00	150.50	6.00	6.30
316.1401556	140.00	155.50	6.00	6.30
316.1501656	150.00	165.50	6.00	6.30
316.1601756	160.00	175.50	6.00	6.30
316.1701856	170.00	185.50	6.00	6.30
316.1801956	180.00	195.50	6.00	6.30
316.1902056	190.00	205.50	6.00	6.30
316.2002217	200.00	221.00	7.70	8.00
316.2102317	210.00	231.00	7.70	8.00

The figures highlighted in bold correspond to the dimensions for standard ISO 7425/2, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 322



DESCRIPTION

The BECA 322 profile is a U-ring type single acting rod seal with matching lips, composed of a profiled polyurethane seal, a NBR O'Ring to preserve its elastic memory and a triangular POM back-up ring on the back. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Very good sealing at low pressures
Elastic memory preserved using the O'Ring
Excellent abrasion resistance
Very good extrusion resistance

APPLICATIONS

Agriculture
Mobile machinery
Lifting systems
Injection presses
Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

O'Ring

NBR 70 Shore A

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +100°C
Pressure	45 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

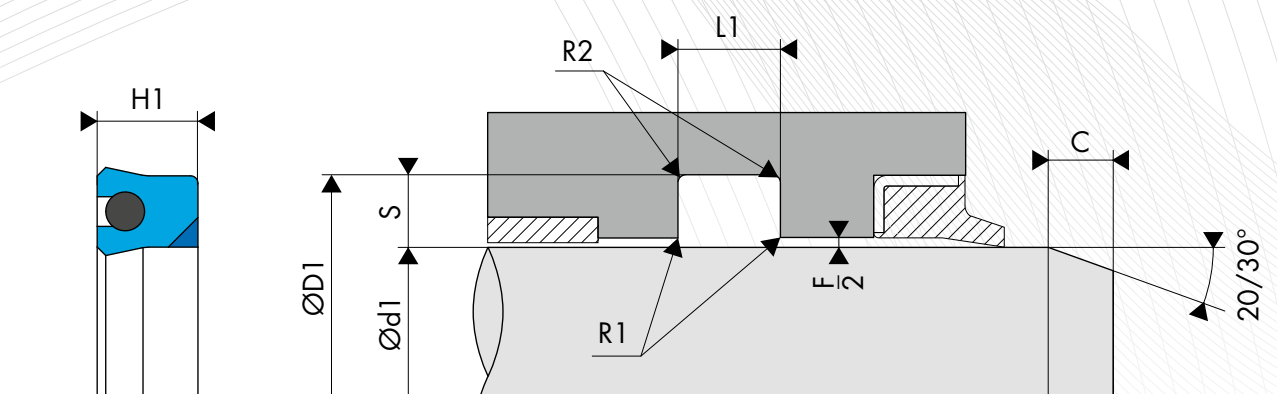
Pressure MPa	Radial gap F/2
20 MPa	0.30
25 MPa	0.25
35 MPa	0.15
40 MPa	0.10
45 MPa	0.07

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.20	0.40	2.00
4.00	0.40	0.60	2.50
5.00	0.80	1.00	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00

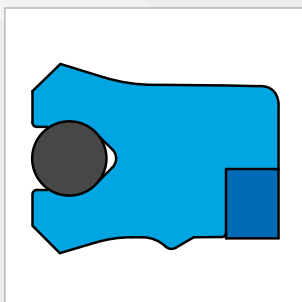


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
322.0060146	6.00	14.00	5.70	6.30
322.0080166	8.00	16.00	5.70	6.30
322.0100186	10.00	18.00	5.70	6.30
322.0100208	10.00	20.00	7.30	8.00
322.0120206	12.00	20.00	5.70	6.30
322.0120228	12.00	22.00	7.30	8.00
322.0140226	14.00	22.00	5.70	6.30
322.0140248	14.00	24.00	7.30	8.00
322.0160246	16.00	24.00	5.70	6.30
322.0160268	16.00	26.00	7.30	8.00
322.0180255	18.00	25.00	5.00	5.60
322.0180266	18.00	26.00	5.70	6.30
322.0180288	18.00	28.00	7.30	8.00
322.0200275	20.00	27.00	5.20	5.60
322.0200281	20.00	28.00	5.70	6.30
322.0200308	20.00	30.00	7.30	8.00
322.0220301	22.00	30.00	5.70	6.30
322.0220328	22.00	32.00	7.30	8.00
322.0250325	25.00	32.00	5.00	5.60
322.0250331	25.00	33.00	5.70	6.30
322.0250358	25.00	35.00	7.30	8.00
322.0280361	28.00	36.00	5.70	6.30
322.0280381	28.00	38.00	7.20	8.00
322.0280388	28.00	38.00	7.30	8.00
322.0280432	28.00	43.00	11.50	12.50
322.0300386	30.00	38.00	5.70	6.30
322.0320401	32.00	40.00	5.70	6.30
322.0320421	32.00	42.00	7.20	8.00
322.0320428	32.00	42.00	7.30	8.00
322.0320472	32.00	47.00	11.50	12.50
322.0350436	35.00	43.00	5.70	6.30
322.0360441	36.00	44.00	5.70	6.30
322.0360461	36.00	46.00	7.20	8.00
322.0360468	36.00	46.00	7.30	8.00
322.0360481	36.00	48.00	9.00	10.00
322.0360512	36.00	51.00	11.50	12.50
322.0400501	40.00	50.00	7.20	8.00
322.0400508	40.00	50.00	7.30	8.00
322.0400552	40.00	55.00	11.50	12.50
322.0420506	42.00	50.00	5.70	6.30
322.0450551	45.00	55.00	7.20	8.00
322.0450558	45.00	55.00	7.30	8.00
322.0450601	45.00	60.00	10.00	11.00
322.0450602	45.00	60.00	11.50	12.50
322.0500601	50.00	60.00	7.20	8.00
322.0500608	50.00	60.00	7.30	8.00
322.0500609	50.00	60.00	8.00	9.00
322.0500621	50.00	62.00	9.00	10.00
322.0500652	50.00	65.00	11.50	12.50
322.0550636	55.00	63.00	5.70	6.30
322.0560719	56.00	71.00	9.50	10.50
322.0560711	56.00	71.00	10.00	11.00
322.0560711	56.00	71.00	11.50	12.50
322.0560766	56.00	76.00	15.00	16.00
322.0600703	60.00	70.00	12.00	13.00
322.0600750	60.00	75.00	10.00	11.00
322.0600753	60.00	75.00	11.50	12.50
322.0630788	63.00	78.00	7.50	8.00
322.0630781	63.00	78.00	11.50	12.50
322.0630836	63.00	83.00	15.00	16.00

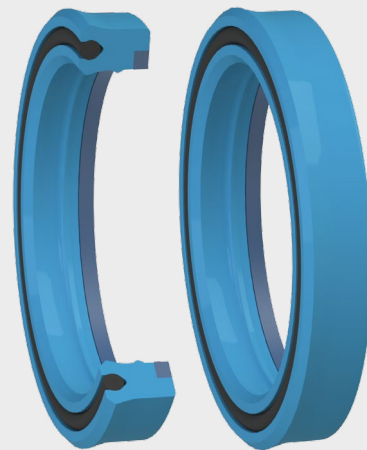
Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
322.8650802	65.00	80.00	8.00	9.00
322.0650802	65.00	80.00	11.50	12.50
322.0700807	70.00	80.00	6.50	7.50
322.0700851	70.00	85.00	10.00	11.00
322.0700902	70.00	90.00	12.00	13.00
322.0700903	70.00	90.00	13.50	14.50
322.0700906	70.00	90.00	15.00	16.00
322.0750952	75.00	95.00	12.00	13.00
322.0750953	75.00	95.00	13.50	14.50
322.0800951	80.00	95.00	10.50	11.50
322.0800952	80.00	95.00	11.00	12.00
322.0800951	80.00	95.00	11.50	12.50
322.0801002	80.00	100.00	11.50	12.50
322.0801003	80.00	100.00	13.50	14.50
322.0801006	80.00	100.00	15.00	16.00
322.0851002	85.00	100.00	12.00	
322.0901007	90.00	100.00	6.50	7.50
322.0901051	90.00	105.00	11.50	12.50
322.0901052	90.00	105.00	12.50	13.50
322.0901109	90.00	110.00	9.50	10.00
322.0901102	90.00	110.00	11.40	12.50
322.0901101	90.00	110.00	11.50	12.50
322.0901106	90.00	110.00	15.00	16.00
322.0951153	95.00	115.00	13.50	14.50
322.0961042	96.00	104.00	11.10	12.00
322.1001203	100.00	120.00	13.50	14.50
322.1001201	100.00	120.00	15.00	16.00
322.1001250	100.00	125.00	19.00	20.00
322.1101250	110.00	125.00	9.60	10.60
322.1101302	110.00	130.00	12.00	13.00
322.1101303	110.00	130.00	13.50	14.50
322.1101301	110.00	130.00	15.00	16.00
322.1101350	110.00	135.00	19.00	20.00
322.1201402	120.00	140.00	11.50	12.50
322.1241322	124.00	132.00	11.10	12.00
322.1251456	125.00	145.00	15.00	16.00
322.1251500	125.00	150.00	19.00	20.00
322.1301504	130.00	150.00	13.50	14.50
322.1401606	140.00	160.00	15.00	16.00
322.1401650	140.00	165.00	19.00	20.00
322.1451600	145.00	160.00	9.60	10.60
322.1581662	158.00	166.00	11.10	12.00
322.1601850	160.00	185.00	19.00	20.00
322.1601905	160.00	190.00	24.00	25.00
322.1802050	180.00	205.00	19.00	20.00
322.1802105	180.00	210.00	24.00	25.00
322.1852000	185.00	200.00	9.60	10.60
322.1982062	198.00	206.00	11.10	12.00
322.1982082	198.00	208.00	11.20	12.00
322.2002250	200.00	225.00	19.00	20.00
322.2002305	200.00	230.00	24.00	25.00
322.2182304	218.00	230.00	13.00	14.00
322.2202505	220.00	250.00	24.00	25.00
322.2502805	250.00	280.00	24.00	25.00
322.2803105	280.00	310.00	24.00	25.00
322.3203602	320.00	360.00	31.00	32.00
322.3604002	360.00	400.00	31.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 325



DESCRIPTION

The BECA 325 profile is a U-ring type single acting rod seal with matching lips, composed of a profiled polyurethane seal, a NBR O'Ring to preserve its elastic memory and a POM back-up ring on the back. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Very good sealing at low pressures
Elastic memory preserved using the O'Ring
Excellent abrasion resistance
Very good extrusion resistance

APPLICATIONS

Agriculture
Mobile machinery
Lifting systems
Injection presses
Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

O'Ring

NBR 70 Shore A

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +100°C
Pressure	45 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

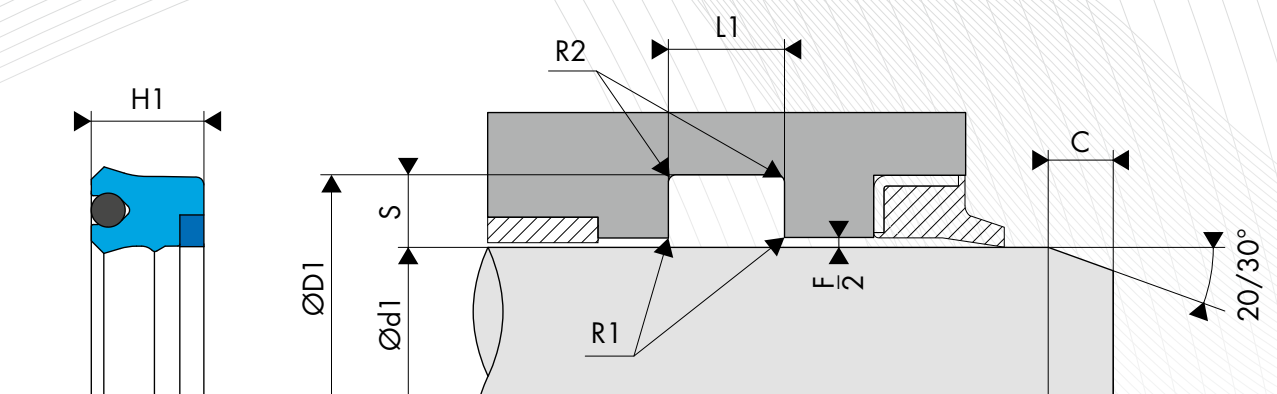
Pressure MPa	Radial gap F/2
25 MPa	0.35
35 MPa	0.30
40 MPa	0.25
45 MPa	0.20

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.20	0.40	2.00
4.00	0.40	0.60	2.50
5.00	0.80	1.00	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00

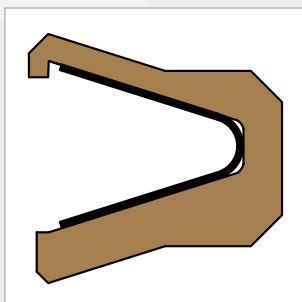


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
325.006014I	6.00	14.00	5.70	6.30
325.008016I	8.00	16.00	5.70	6.30
325.010018I	10.00	18.00	5.70	6.30
325.010020I	10.00	20.00	7.30	8.00
325.012020I	12.00	20.00	5.70	6.30
325.012022I	12.00	22.00	7.30	8.00
325.014022I	14.00	22.00	5.70	6.30
325.014024I	14.00	24.00	7.30	8.00
325.016024I	16.00	24.00	5.70	6.30
325.016026I	16.00	26.00	7.30	8.00
325.018025I	18.00	25.00	5.00	5.60
325.018026I	18.00	26.00	5.70	6.30
325.018028I	18.00	28.00	7.30	8.00
325.020028I	20.00	28.00	5.70	6.30
325.020030I	20.00	30.00	7.30	8.00
325.022030I	22.00	30.00	5.70	6.30
325.022032I	22.00	32.00	7.30	8.00
325.025032I	25.00	32.00	5.00	5.60
325.025033I	25.00	33.00	5.70	6.30
325.025035I	25.00	35.00	7.30	8.00
325.028038I	28.00	38.00	7.30	8.00
325.028043I	28.00	43.00	11.50	12.50
325.032040I	32.00	40.00	5.70	6.30
325.032042I	32.00	42.00	7.30	8.00
325.032047I	32.00	47.00	11.50	12.50
325.036046I	36.00	46.00	7.30	8.00
325.036051I	36.00	51.00	11.50	12.50
325.040050I	40.00	50.00	7.30	8.00
325.040055I	40.00	55.00	11.50	12.50
325.042050I	42.00	50.00	5.70	6.30
325.045055I	45.00	55.00	7.30	8.00
325.045060I	45.00	60.00	11.50	12.50
325.050060I	50.00	60.00	7.30	8.00
325.050065I	50.00	65.00	11.50	12.50
325.055063I	55.00	63.00	5.70	6.30
325.056071I	56.00	71.00	11.50	12.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H10	Seal height H1	Groove width L1 0/+0.25
325.056076I	56.00	76.00	15.00	16.00
325.063078I	63.00	78.00	11.50	12.50
325.063083I	63.00	83.00	15.00	16.00
325.070080I	70.00	80.00	6.50	7.50
325.070085I	70.00	85.00	11.50	12.50
325.070085I	70.00	85.00	11.70	12.50
325.070090I	70.00	90.00	15.00	16.00
325.080095I	80.00	95.00	11.50	12.50
325.080095I	80.00	95.00	11.70	12.50
325.080100I	80.00	100.00	15.00	16.00
325.090100I	90.00	100.00	6.50	7.50
325.090105I	90.00	105.00	11.50	12.50
325.090105I	90.00	105.00	11.70	12.50
325.090110I	90.00	110.00	15.00	16.00
325.100120I	100.00	120.00	14.50	16.00
325.100120S	100.00	120.00	15.00	16.00
325.100125I	100.00	125.00	19.00	20.00
325.110130I	110.00	130.00	15.00	16.00
325.110135I	110.00	135.00	19.00	20.00
325.125145I	125.00	145.00	15.00	16.00
325.125150I	125.00	150.00	19.00	20.00
325.140160I	140.00	160.00	15.00	16.00
325.140165I	140.00	165.00	19.00	20.00
325.145160I	145.00	160.00	9.60	10.60
325.160185I	160.00	185.00	19.00	20.00
325.160190I	160.00	190.00	24.00	25.00
325.180205I	180.00	205.00	19.00	20.00
325.180210I	180.00	210.00	24.00	25.00
325.200225I	200.00	225.00	19.00	20.00
325.200230I	200.00	230.00	24.00	25.00
325.220250I	220.00	250.00	24.00	25.00
325.250280I	250.00	280.00	24.00	25.00
325.280310I	280.00	310.00	24.00	25.00
325.320360I	320.00	360.00	31.00	32.00
325.360400I	360.00	400.00	31.00	32.00

The figures highlighted in bold correspond to the dimensions for standard ISO 5597, with the rod diameters in line with standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA

340-349



DESCRIPTION

The BECA 340 profile is a single acting rod seal composed of a profiled, filled PTFE U-ring type seal and a V-spring that is resistant to corrosion.

The BECA 349 profile is specially designed for applications where the seal is in contact with food products. It is characterised by a silicone overmoulding on the inside of the seal, which completely hides the V-spring, thus preventing impurities from accumulating in this hard-to-clean area.

ADVANTAGES

Wide temperature range and excellent chemical resistance

Low friction coefficient; no stick-slip effect

Excellent abrasion resistance

Good dimensional stability

Non-toxic material

APPLICATIONS

Food & Beverage

Medical

Pharmaceutical

Static hydraulics

MATERIALS

Profiled seal

Carbon-filled PTFE

Blue GL PTFE

PE-UHMW

V-Shaped spring

Stainless steel

Other grades of materials are available. Please refer to the materials table on the next page.

TECHNICAL DATA

Temperature	-200°C / +260°C
Pressure	40 MPa
Speed	15 m/s
Media	Practically all types of fluids, and chemical and gas products

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

EXTRUSION GAPS

Radial section S	Radial gap F/2			
	2 MPa	10 MPa	20 MPa	40 MPa
1.45	0.20	0.10	0.08	0.05
2.25	0.25	0.15	0.10	0.07
3.10	0.35	0.20	0.15	0.08
4.70	0.50	0.25	0.20	0.10
6.10	0.60	0.30	0.25	0.12
9.50	0.90	0.50	0.40	0.20

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

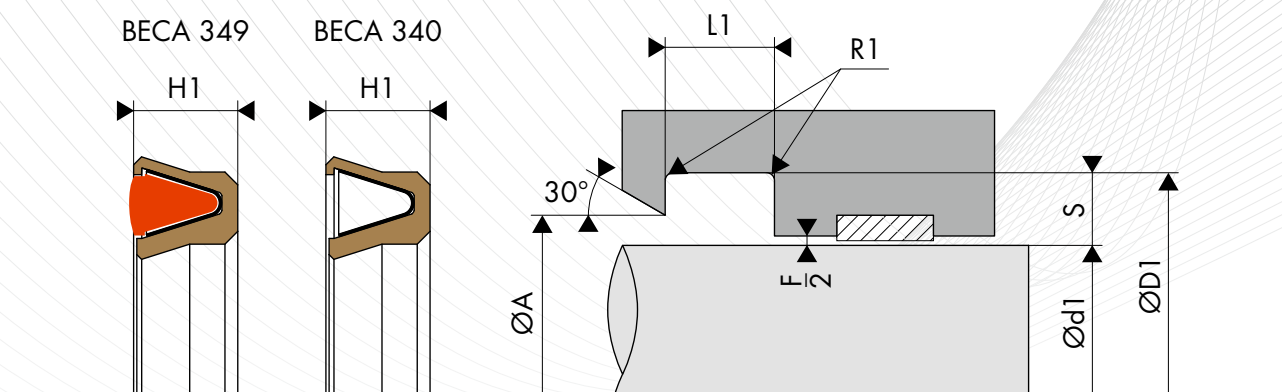
CHAMFERS AND RADIUS

Radial section S	Radius R1	Chamfer C
1.45	0.40	3.00
2.25	0.40	3.00
3.10	0.60	3.00
4.70	0.80	3.00
6.10	0.80	3.50
9.50	0.80	6.50

TABLE MATERIALS

Profiled seal					V-spring			Mating surface material
Standard code	ISO code	Material	Colour	Characteristics	Code	Type of material	Service temperature	
DP	P	Virgin PTFE	White	Resistance to chemical products Impermeability Dielectric Non-stick Low friction coefficient Food industry	I	X10 Cr Ni 18-8	-200°C/+260°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
DC	C	PTFE + 25% Carbon	Grey	Improvements • Wear properties • Compression set Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	I	X10 Cr Ni 18-8	-200°C/+260°C	
CG	C	PTFE + 23% Carbon + 2% Graphite	Black	Good resistance to chemical products Thermal and electrical conductivity Anti-static High-performing in compression-based dynamic applications	I	X10 Cr Ni 18-8	-200°C/+260°C	
DV	V	PTFE + 25 % Glass	Blue	Improvements • Wear properties • Mechanical strength Slightly more abrasive, however, this is corrected by adding MOS2 Maintains its chemical and dielectric properties Well-suited to applications with rotational and simultaneous alternating movements	I	X10 Cr Ni 18-8	-200°C/+260°C	Steel Chrome steel Cast iron
VM	M	PTFE + 15 % Glass + 5% MOS2	Grey	Resistance to compression Resistance to wear Excellent chemical stability Good thermal conductivity	I	X10 Cr Ni 18-8	-200°C/+260°C	
DX	X	PTFE GL Blue + Glass + Metal oxides	Turquoise blue	Improvements • Wear properties Reduced wear on metal parts Self-lubricating Thermal and electrical conductivity Low permeability Good friction coefficient Anti-static High performing in dynamic self-lubricating applications	I	X10 Cr Ni 18-8	-200°C/+260°C	
DG	G	PTFE + 15% Graphite	Black	Improvements • Better abrasion resistance • Better dimensional stability at high temperatures Use up to +300°C Good friction coefficient and low permeability	I	X10 Cr Ni 18-8	-200°C/+260°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
K1	K	PTFE + 10% Ekonol	Light brown	Improvements • Wear properties • Warping resistance and creep strength • Compression resistance Self-lubricating Electrical and thermal conductivity Does not alter the metal parts Reduced hold with certain chemical products Used for high-compression dynamic seals and has a low level of wear	I	X10 Cr Ni 18-8	-200°C/+260°C	
K2	K	PTFE + 20% Ekonol	Light brown		I	X10 Cr Ni 18-8	-200°C/+260°C	Steel Chrome steel Cast iron
DB	B	PTFE + 60% Bronze	Dark brown		I	X10 Cr Ni 18-8	-200°C/+260°C	
B4	B	PTFE + 40% Bronze	Dark brown		I	X10 Cr Ni 18-8	-200°C/+260°C	Steel Stainless steel Chrome steel Aluminium Bronze Cast iron Treated surface
HG	HG	PE-UHMW	White or off-white	Excellent wear resistance on contact with water and air	I	X10 Cr Ni 18-8	-70°C/+80°C	

Other grades of materials are available depending on your specificities.



○ INSTALLATION DIMENSIONS

Series	Rod diameter Ød1 h9		Groove diameter	Groove width	Radial section	Step height
	Standard range	Extended range	ØD1 H9	L1 0/+0.20	S	ØD1 - A
340.0*	3.0 - 9.9	3.0 - 40.0	d1 + 2.90	2.40	1.45	0.4
340.1	10.0 - 19.9	6.0 - 200.0	d1 + 4.50	3.60	2.25	0.6
340.2	20.0 - 39.9	10.0 - 400.0	d1 + 6.20	4.80	3.10	0.7
340.3	40.0 - 119.9	20.0 - 700.0	d1 + 9.40	7.10	4.70	0.8
340.4	120.0 - 629.9	35.0 - 999.9	d1 + 12.20	9.50	6.10	0.9
340.5	630.0 - 999.9	80.0 - 999.9	d1 + 19.00	15.00	9.50	0.9

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

*Only BECA 340.0 profiles are fitted with an O'Ring instead of a V-spring.

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : 60% Bronze-filled PTFE profiled seal- Code DB
 _____ : Stainless steel V-Shaped spring - Code I
Rod diameter _____ : Ød1 = 50.00 mm
Groove diameter _____ : ØD1 = 59.40 mm
Part number _____ : 340. 3050DBI

Part number -

	340.3.	050	DB	I
Family				
Rod diameter				
Profiled seal material*				
V-Shaped spring material*				

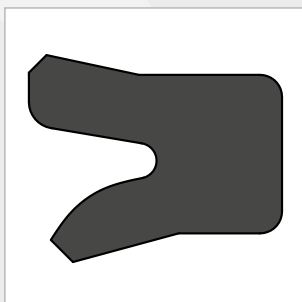
* The codes that define the materials are set out in the materials table on the previous page.

DIMENSIONS

Part number	Rod diameter Ød1 h9	Groove diameter ØD1 H9	Seal height H1	Groove width L1 0/+0.20
340.0004	4.00	6.90	2.10	2.40
340.0005	5.00	7.90	2.10	2.40
340.0006	6.00	8.90	2.10	2.40
340.0007	7.00	9.90	2.10	2.40
340.0008	8.00	10.90	2.10	2.40
340.1010	10.00	14.50	3.30	3.60
340.1011	11.00	15.50	3.30	3.60
340.1012	12.00	16.50	3.30	3.60
340.1014	14.00	18.50	3.30	3.60
340.1015	15.00	19.50	3.30	3.60
340.1016	16.00	20.50	3.30	3.60
340.1018	18.00	22.50	3.30	3.60
340.2020	20.00	26.20	4.40	4.80
340.2022	22.00	28.20	4.40	4.80
340.2025	25.00	31.20	4.40	4.80
340.2028	28.00	34.20	4.40	4.80
340.2030	30.00	36.20	4.40	4.80
340.2032	32.00	38.20	4.40	4.80
340.2033	33.00	39.20	4.40	4.80
340.2035	35.00	41.20	4.40	4.80
340.2036	36.00	42.20	4.40	4.80
340.2038	38.00	44.20	4.40	4.80
340.3040	40.00	49.40	6.50	7.10
340.3042	42.00	51.40	6.50	7.10
340.3045	45.00	54.40	6.50	7.10
340.3048	48.00	57.40	6.50	7.10
340.3050	50.00	59.40	6.50	7.10
340.3052	52.00	61.40	6.50	7.10
340.3055	55.00	64.40	6.50	7.10
340.3056	56.00	65.40	6.50	7.10
340.3060	60.00	69.40	6.50	7.10
340.3063	63.00	72.40	6.50	7.10
340.3065	65.00	74.40	6.50	7.10
340.3070	70.00	79.40	6.50	7.10
340.3072	72.00	81.40	6.50	7.10

Part number	Rod diameter Ød1 h9	Groove diameter ØD1 H9	Seal height H1	Groove width L1 0/+0.20
340.3075	75.00	84.40	6.50	7.10
340.3080	80.00	89.40	6.50	7.10
340.3085	85.00	94.40	6.50	7.10
340.3090	90.00	99.40	6.50	7.10
340.3095	95.00	104.40	6.50	7.10
340.3100	100.00	109.40	6.50	7.10
340.3105	105.00	114.40	6.50	7.10
340.3110	110.00	119.40	6.50	7.10
340.3115	115.00	124.40	6.50	7.10
340.3116	116.00	125.40	6.50	7.10
340.4120	120.00	132.20	8.80	9.50
340.4125	125.00	137.20	8.80	9.50
340.4130	130.00	142.20	8.80	9.50
340.4135	135.00	147.20	8.80	9.50
340.4140	140.00	152.20	8.80	9.50
340.4150	150.00	162.20	8.80	9.50
340.4160	160.00	172.20	8.80	9.50
340.4165	165.00	177.20	8.80	9.50
340.4170	170.00	182.20	8.80	9.50
340.4180	180.00	192.20	8.80	9.50
340.4190	190.00	202.20	8.80	9.50
340.4200	200.00	212.20	8.80	9.50
340.4210	210.00	222.20	8.80	9.50
340.4220	220.00	232.20	8.80	9.50
340.4230	230.00	242.20	8.80	9.50
340.4238	238.00	250.20	8.80	9.50
340.4240	240.00	252.20	8.80	9.50
340.4250	250.00	262.20	8.80	9.50
340.4280	280.00	292.20	8.80	9.50
340.4300	300.00	312.20	8.80	9.50
340.4315	315.00	327.20	8.80	9.50
340.4320	320.00	332.20	8.80	9.50
340.4350	350.00	362.20	8.80	9.50
340.4360	360.00	372.20	8.80	9.50
340.4400	400.00	412.20	8.80	9.50

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 385



DESCRIPTION

The BECA 385 profile is a U-ring type single acting rod seal with asymmetrical rubber lips for low-pressure applications.

ADVANTAGES

Very good sealing at low pressures
Excellent wear resistance
Reduced size

APPLICATIONS

Material handling - Lifting
Presses
Hydraulic cylinders

MATERIALS

NBR 80 Shore A
FKM 80 Shore A

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	8 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

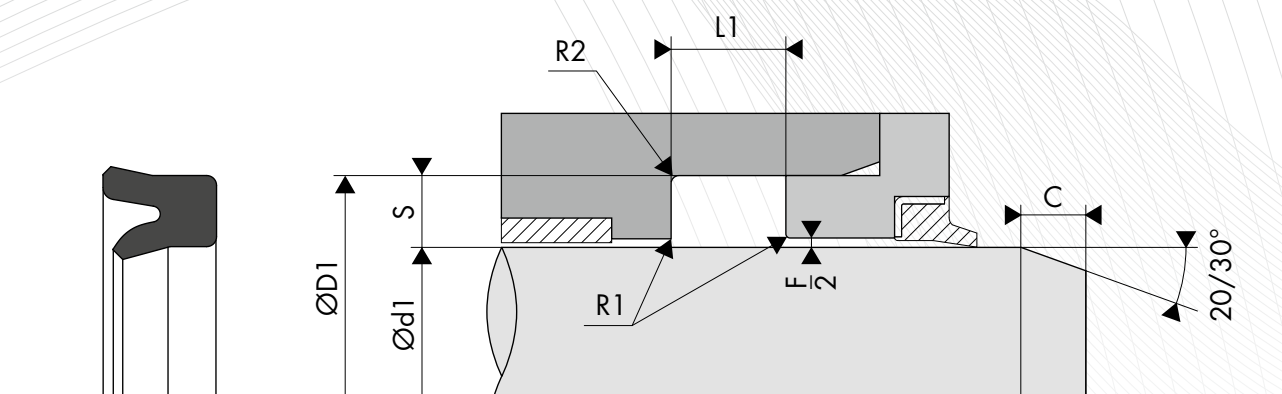
Pressure MPa	Radial gap F/2
1.0 MPa	0.25
1.2 MPa	0.20
6.5 MPa	0.10
8.0 MPa	0.05

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.30	0.50	2.00
4.00	0.30	0.50	2.00
5.00	0.40	0.60	2.50
6.00	0.50	0.70	3.00
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00

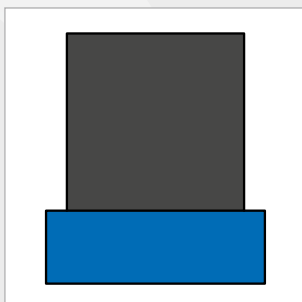


DIMENSIONS

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H8	Seal height H1	Groove width L1 0/+0.25
385.1003008	3.17	8.75	3.96	5.50
385.1004011	4.76	11.11	3.96	5.50
385.1006012	6.00	12.00	4.00	5.50
385.2006012	6.35	12.70	3.96	5.50
385.1007014	7.93	14.28	3.96	5.50
385.008014E	8.00	14.00	4.00	4.80
385.08014F6	8.00	14.00	4.00	5.50
385.1008014	8.00	14.00	4.00	5.50
385.1008016	8.00	16.00	5.50	7.00
385.1009016	9.52	16.50	3.96	5.50
385.0100184	10.00	18.00	4.00	5.00
385.1010018	10.00	18.00	5.50	7.00
385.1011019	11.11	19.05	3.96	5.50
385.1012020	12.00	20.00	5.50	7.00
385.1012021	12.70	21.00	5.10	7.00
385.14018K6	14.00	18.00	2.90	3.00
385.1014022	14.00	22.00	5.50	7.00
385.1014020	14.28	20.63	4.76	6.00
385.1015022	15.87	22.22	4.76	6.00
385.15224C0	15.87	22.22	4.76	6.00
385.1016024	16.00	24.00	5.50	7.00
385.1017023	17.46	23.81	4.60	6.00
385.1018025	18.00	25.00	4.50	6.00
385.1825SP9	18.00	25.00	4.50	6.00
385.1018026	18.00	26.00	5.50	6.00
385.0180305	18.00	30.00	5.50	6.00
385.1019025	19.08	25.40	4.76	6.00
385.1020028	20.00	28.00	5.50	7.00
385.2020028	20.63	28.58	4.76	6.00
385.1022030	22.00	30.00	5.50	6.00
385.1022-22	22.22	31.75	4.76	6.00
385.1023036	23.81	36.51	6.35	8.00
385.1025035	25.00	35.00	7.00	8.50
385.1025038	25.40	38.10	6.35	8.00
385.1026036	26.99	36.51	6.35	8.00
385.1028036	28.00	36.00	5.50	7.00
385.1028038	28.00	38.00	7.00	7.50
385.1028041	28.58	41.28	7.93	9.50
385.1030038	30.16	38.10	6.35	8.00
385.1031044	31.75	44.45	6.35	8.00
385.32040CA	32.00	40.00	5.00	6.00
385.1032042	32.00	42.00	7.00	8.50
385.1032045	32.00	45.00	10.00	11.00
385.0330416	33.00	40.87	4.50	6.00
385.1033040	33.34	40.63	4.60	6.00
385.1034050	34.93	50.80	7.93	9.50
385.1036046	36.00	46.00	7.00	7.50
385.1036050	36.51	50.80	7.93	9.50
385.1038050	38.10	50.80	9.52	11.00
385.1039055	39.69	55.96	9.52	11.00
385.1040046	40.00	46.00	3.60	4.40
385.1040050	40.00	50.00	7.00	8.50
385.041050G	41.28	50.80	5.55	7.00
385.1041050	41.28	50.80	5.55	7.00
385.1042050	42.00	50.00	5.50	7.00
385.1042053	42.86	53.98	9.52	11.00
385.1044057	44.45	57.15	7.93	9.50
385.1045055	45.00	55.00	7.00	7.50

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H8	Seal height H1	Groove width L1 0/+0.25
385.1046060	46.04	60.33	9.52	11.00
385.1047063	47.63	63.50	9.52	11.00
385.1049066	49.21	66.68	9.52	11.00
385.1050060	50.00	60.00	7.00	7.50
385.1050073	50.80	73.03	11.11	12.50
385.1053069	53.98	69.85	9.52	11.00
385.1056068	56.00	68.00	7.00	7.50
385.2056068	56.00	68.00	8.50	10.00
385.1057069	57.15	69.85	7.93	9.50
385.1060072	60.00	72.00	8.50	10.00
385.1060076	60.33	76.20	7.93	9.50
385.1063075	63.00	75.00	8.50	10.00
385.1063076	63.50	76.20	7.93	9.50
385.1065077	65.00	77.00	8.50	10.00
385.1066079	66.68	79.38	9.52	11.00
385.1069090	69.85	90.90	9.52	11.00
385.1070082	70.00	82.00	8.50	9.50
385.1073082	73.03	82.55	9.52	11.00
385.1076088	76.20	88.90	9.52	11.00
385.1079098	79.38	98.43	9.52	11.00
385.1080092	80.00	92.00	8.50	10.00
385.1082095	82.55	95.25	7.93	9.50
385.1085098	85.73	98.43	9.52	11.00
385.1088101	88.90	101.60	9.52	11.00
385.1090102	90.00	102.00	8.50	9.50
385.1092106	92.08	106.40	7.93	9.50
385.1095111	95.25	111.10	9.52	11.00
385.1098107	98.43	107.95	9.52	11.00
385.1100112	100.00	112.00	8.50	10.00
385.1100115	100.00	115.00	10.00	11.50
385.1101111	101.60	111.10	5.75	7.00
385.1061177	106.30	117.20	7.20	7.60
385.1107127	107.95	127.00	9.52	11.00
385.1110130	110.00	130.00	14.00	15.50
385.1114146	114.30	146.05	12.70	14.00
385.1120136	120.65	136.50	7.14	8.50
385.1125145	125.00	145.00	14.00	15.50
385.1127146	127.00	146.05	12.70	14.00
385.1133152	133.35	152.40	12.70	14.00
385.1139157	139.70	157.52	7.14	8.50
385.1140160	140.00	160.00	14.00	15.50
385.1146165	146.05	165.10	12.70	14.00
385.1152171	152.40	171.45	9.52	11.00
385.1158177	158.80	177.80	12.70	14.00
385.1160180	160.00	180.00	14.00	17.00
385.1165184	165.10	184.15	12.70	14.00
385.1171190	171.45	190.50	12.70	14.00
385.1177190	177.80	190.50	7.14	8.50
385.1180200	180.00	200.00	14.00	17.00
385.1184203	184.15	203.20	9.52	11.00
385.1190209	190.55	209.55	12.70	14.00
385.1196215	196.90	215.90	12.70	14.00
385.1203222	203.20	222.30	12.70	14.00
385.1209228	209.55	228.60	12.70	14.00
385.1215235	215.90	235.00	12.70	14.00
385.1222241	222.30	241.30	9.52	11.00
385.1228247	228.60	247.70	12.70	14.00

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



ROD SEALS

BECA 640



DESCRIPTION

The BECA 640 profile is a double acting composite rod seal composed of a rubber O'Ring or square ring and a polyamide friction ring.

ADVANTAGES

The square ring does not twist
Low friction coefficient
Excellent extrusion resistance
Compatible with hydraulic oils

APPLICATIONS

Agriculture
Mobile machinery
Hydraulic cylinders

MATERIALS

Friction ring

Polyamide PA6

O'Ring or square ring

NBR 70 Shore A

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

TECHNICAL DATA

Temperature	-30°C / +100°C
Pressure	40 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

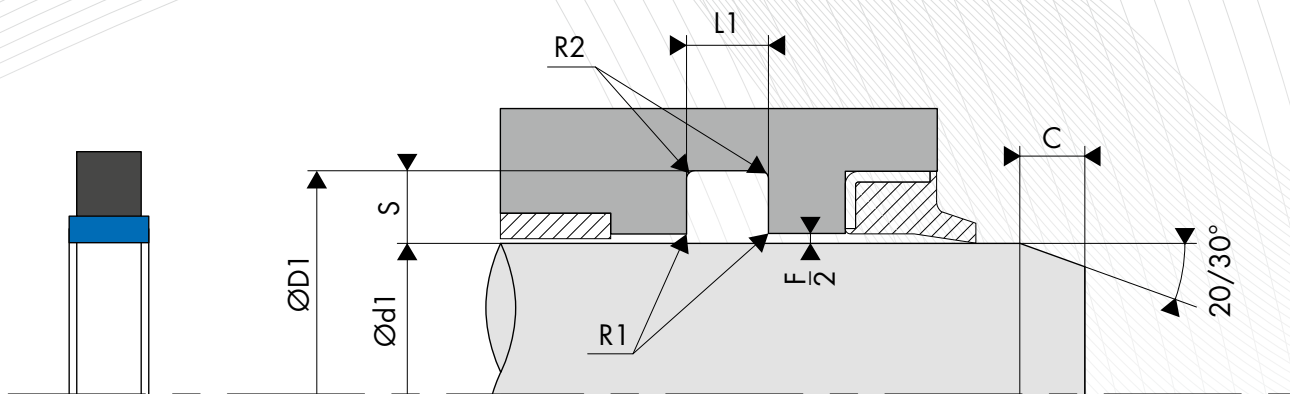
Pressure MPa	Radial gap F/2
20 MPa	0.25
35 MPa	0.20
40 MPa	0.15

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
1.30	0.30	0.10	2.00
2.00	0.30	0.20	2.00
2.60	0.30	0.20	2.00
3.25	0.30	0.20	3.00
3.90	0.30	0.20	3.00
4.55	0.30	0.20	4.00
5.20	0.30	0.30	4.50
5.85	0.30	0.30	5.00
6.50	0.30	0.40	5.50
7.80	0.30	0.40	6.00
10.40	0.30	0.60	8.00
13.00	0.30	0.80	10.00



○ INSTALLATION DIMENSIONS

Rod diameter	Groove diameter	Groove width	Radial section	Cross-section
Ød1 f8	ØD1 H9	L1 0/+0.20	S	Ød2
3.0 - 11.9	d1 + 2.60	1.35	1.30	1.00
12.0 - 23.9	d1 + 4.00	2.00	2.00	1.78
24.0 - 33.9	d1 + 5.20	2.60	2.60	2.00
34.0 - 45.9	d1 + 6.50	3.20	3.25	2.62
46.0 - 58.9	d1 + 7.80	3.85	3.90	3.00
59.0 - 80.9	d1 + 9.10	4.50	4.55	3.53
81.0 - 129.9	d1 + 10.20	5.10	5.20	4.00
130.0 - 199.9	d1 + 11.70	5.70	5.85	5.00
200.0 - 299.9	d1 + 13.00	6.35	6.50	5.33
300.0 - 399.9	d1 + 15.60	7.60	7.80	6.99
400.0 - 599.9	d1 + 20.80	10.10	10.40	8.40
600.0 - **	d1 + 26.00	12.60	13.00	12.00

For special applications > 40 MPa, we recommend using an H8/f8 tolerance (groove/rod) or selecting other, more suitable materials. Please contact our experts.

○ EXAMPLE OF CODIFICATION

STANDARD CODIFICATION

Materials _____ : Polyamide friction ring - D6
 _____ : NBR 70 Shore A O'Ring / square ring - Code K6
Rod diameter _____ : Ød1 = 50.00 mm
Groove diameter _____ : ØD1 = 57.80 mm
Part number _____ : 640. 050D6K6

Part number -

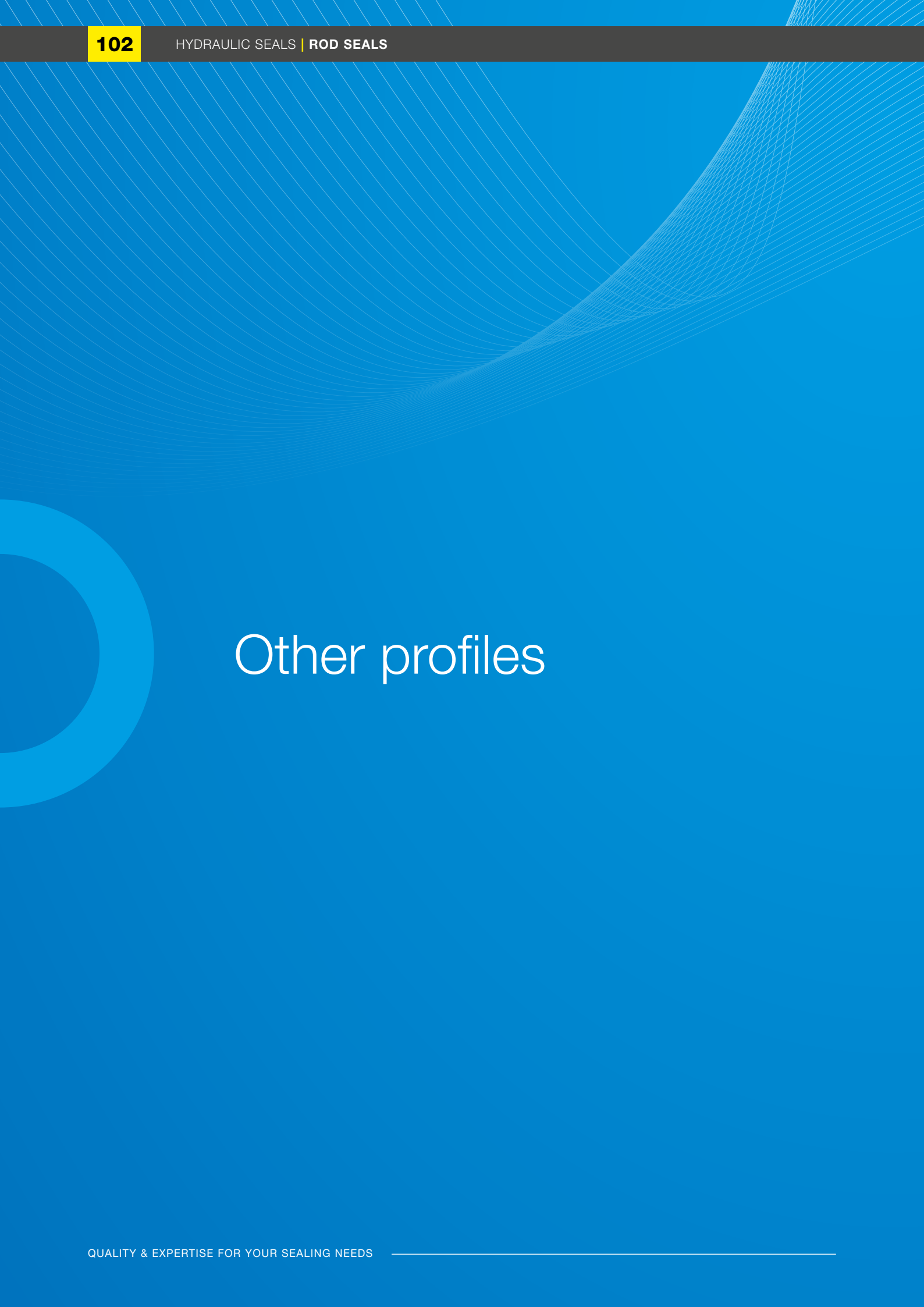
	640.	050	D6	K6
Family				
Rod diameter				
Friction ring material				
O'Ring / square ring material				

DIMENSIONS

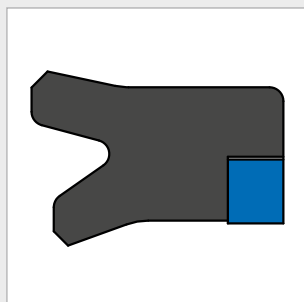
Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.10
640.003	3.00	5.60	1.35
640.004	4.00	6.60	1.35
640.005	5.00	7.60	1.35
640.006	6.00	8.60	1.35
640.007	7.00	9.60	1.35
640.008	8.00	10.60	1.35
640.009	9.00	11.60	1.35
640.010	10.00	12.60	1.35
640.011	11.00	13.60	1.35
640.012	12.00	16.00	2.00
640.013	13.00	17.00	2.00
640.014	14.00	18.00	2.00
640.015	15.00	19.00	2.00
640.016	16.00	20.00	2.00
640.017	17.00	21.00	2.00
640.018	18.00	22.00	2.00
640.019	19.00	23.00	2.00
640.020	20.00	24.00	2.00
640.021	21.00	25.00	2.00
640.022	22.00	26.00	2.00
640.024	24.00	29.20	2.60
640.025	25.00	30.20	2.60
640.026	26.00	31.20	2.60
640.027	27.00	32.20	2.60
640.028	28.00	33.20	2.60
640.029	29.00	34.20	2.60
640.030	30.00	35.20	2.60
640.032	32.00	37.20	2.60
640.034	34.00	40.50	3.20
640.035	35.00	41.50	3.20
640.036	36.00	42.50	3.20
640.038	38.00	44.50	3.20
640.039	39.00	45.50	3.20
640.040	40.00	46.50	3.20
640.041	41.00	47.50	3.20
640.042	42.00	48.50	3.20
640.044	44.00	50.50	3.20
640.045	45.00	51.50	3.20
640.046	46.00	53.80	3.85
640.047	47.00	54.80	3.85
640.048	48.00	55.80	3.85
640.050	50.00	57.80	3.85
640.051	51.00	58.80	3.85
640.052	52.00	59.80	3.85
640.055	55.00	62.80	3.85
640.056	56.00	63.80	3.85
640.058	58.00	65.80	3.85
640.060	60.00	69.10	4.50
640.061	61.00	70.10	4.50
640.062	62.00	71.10	4.50
640.063	63.00	72.10	4.50
640.065	65.00	74.10	4.50
640.067	67.00	76.10	4.50
640.068	68.00	77.10	4.50
640.070	70.00	79.10	4.50
640.072	72.00	81.10	4.50
640.075	75.00	84.10	4.50
640.078	78.00	87.10	4.50
640.079	79.00	88.10	4.50
640.080	80.00	89.10	4.50
640.081	81.00	91.40	5.10
640.082	82.00	92.40	5.10
640.083	83.00	93.40	5.10
640.084	84.00	94.40	5.10
640.085	85.00	95.40	5.10
640.086	86.00	96.40	5.10
640.088	88.00	98.40	5.10
640.090	90.00	100.40	5.10

Part number	Rod diameter Ød1 f8	Groove diameter ØD1 H9	Groove width L1 0/+0.10
640.092	92.00	102.40	5.10
640.095	95.00	105.40	5.10
640.098	98.00	108.40	5.10
640.100	100.00	110.40	5.10
640.105	105.00	115.40	5.10
640.108	108.00	118.40	5.10
640.110	110.00	120.40	5.10
640.115	115.00	125.40	5.10
640.120	120.00	130.40	5.10
640.125	125.00	135.40	5.10
640.127	127.00	137.40	5.10
640.130	130.00	141.70	5.70
640.135	135.00	146.70	5.70
640.138	138.00	149.70	5.70
640.140	140.00	151.70	5.70
640.145	145.00	156.70	5.70
640.150	150.00	161.70	5.70
640.155	155.00	166.70	5.70
640.160	160.00	171.70	5.70
640.165	165.00	176.70	5.70
640.170	170.00	181.70	5.70
640.175	175.00	186.70	5.70
640.180	180.00	191.70	5.70
640.185	185.00	196.70	5.70
640.190	190.00	201.70	5.70
640.195	195.00	206.70	5.70
640.200	200.00	213.00	6.35
640.210	210.00	223.00	6.35
640.215	215.00	228.00	6.35
640.220	220.00	233.00	6.35
640.230	230.00	243.00	6.35
640.240	240.00	253.00	6.35
640.250	250.00	263.00	6.35
640.260	260.00	273.00	6.35
640.270	270.00	283.00	6.35
640.275	275.00	288.00	6.35
640.280	280.00	293.00	6.35
640.285	285.00	298.00	6.35
640.290	290.00	303.00	6.35
640.295	295.00	308.00	6.35
640.300	300.00	315.60	7.60
640.305	305.00	320.60	7.60
640.310	310.00	325.60	7.60
640.320	320.00	335.60	7.60
640.330	330.00	345.60	7.60
640.340	340.00	355.60	7.60
640.350	350.00	365.60	7.60
640.360	360.00	375.60	7.60
640.370	370.00	385.60	7.60
640.380	380.00	395.60	7.60
640.390	390.00	405.60	7.60
640.400	400.00	420.80	10.10
640.410	410.00	430.80	10.10
640.420	420.00	440.80	10.10
640.430	430.00	450.80	10.10
640.440	440.00	460.80	10.10
640.450	450.00	470.80	10.10
640.460	460.00	480.80	10.10
640.470	470.00	490.80	10.10
640.480	480.00	500.80	10.10
640.490	490.00	510.80	10.10
640.500	500.00	520.80	10.10

The figures highlighted in bold correspond to the rod diameters that are recommended by standard ISO 3320. Other intermediate sizes can be provided.



Other profiles



ROD SEALS

BECA 230/AE



DESCRIPTIONS

The BECA 230/AE profile is a rubber U-ring type single acting rod seal with offset lips, with a filled PTFE or POM back-up ring.

ADVANTAGES

Optimised sealing effect
Excellent resistance to high temperatures depending on the type of material chosen
Good extrusion resistance
Assembly by deformation in closed groove

APPLICATIONS

Mobile hydraulics
Machine tools
Presses
Standard cylinders

MATERIALS

Profiled seal

NBR 70 Shore A
NBR 85 Shore A
FKM 85 Shore A

Back-up ring

Polyoxymethylene - POM
Bronze-filled PTFE

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	25 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

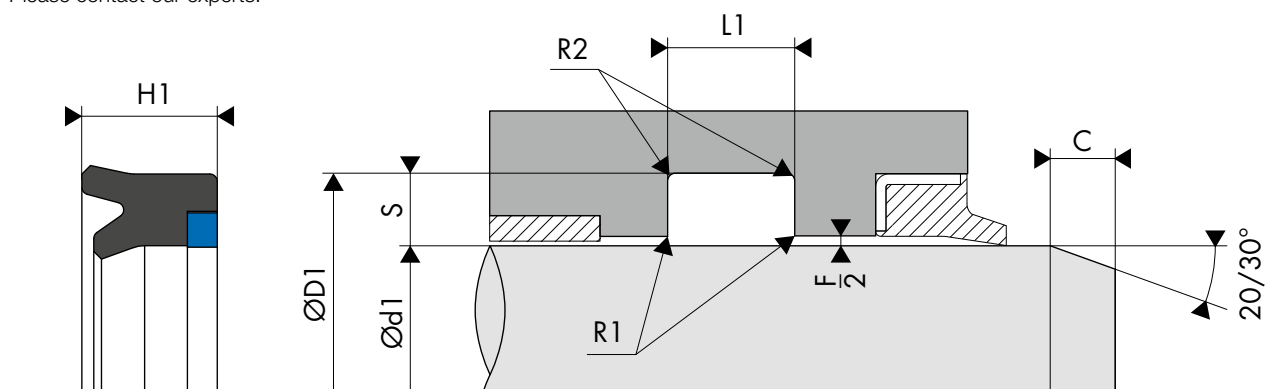
Pressure MPa	Radial gap F/2
2.5 MPa	0.45
5.0 MPa	0.35
7.5 MPa	0.30
10.0 MPa	0.25
15.0 MPa	0.20
25.0 MPa	0.10

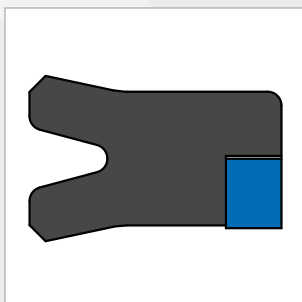
SURFACE ROUGHNESS

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00





ROD SEALS

BECA 235T/AE



DESCRIPTIONS

The BECA 235T/AE profile is a rubber U-ring type single acting rod seal with matching lips and a POM back-up ring.

ADVANTAGES

Optimised sealing effect
Excellent resistance to high temperatures depending on the type of material chosen
Good extrusion resistance

APPLICATIONS

Mobile hydraulics
Machine tools
Presses
Standard cylinders

MATERIALS

Profiled seal

NBR 70 Shore A
NBR 85 Shore A
FKM 85 Shore A

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +200°C
Pressure	25 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils Fire-resistant liquids Biocompatible fluids Water Others (contact our experts)

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

EXTRUSION GAPS

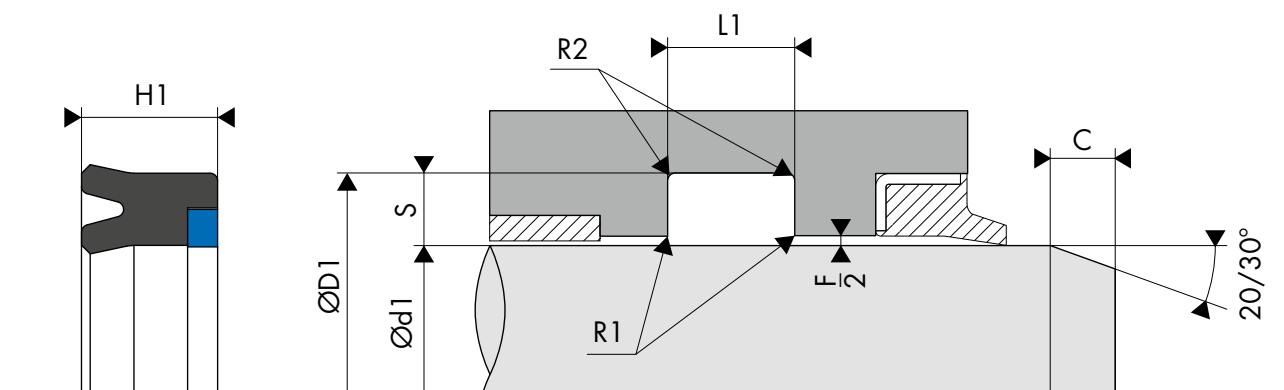
Pressure MPa	Radial gap F/2
2.5 MPa	0.45
5.0 MPa	0.35
7.5 MPa	0.30
10.0 MPa	0.25
15.0 MPa	0.20
25.0 MPa	0.10

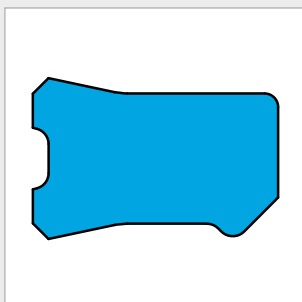
SURFACE ROUGHNESS

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.50	0.20	0.40	2.00
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00





ROD SEALS

BECA 310/B



DESCRIPTIONS

The BECA 310/B profile is a U-ring type single acting compact rod seal with matching lips, symmetrical lips and a second sealing lip, and is composed of a very dense polyurethane body. It can be assembled in a groove according to standard ISO 5597.

ADVANTAGES

Good sealing at both high and low pressures
Excellent abrasion resistance

APPLICATIONS

Mobile hydraulics
Material handling - Lifting
Presses
Hydraulic cylinders

MATERIALS

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	40 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

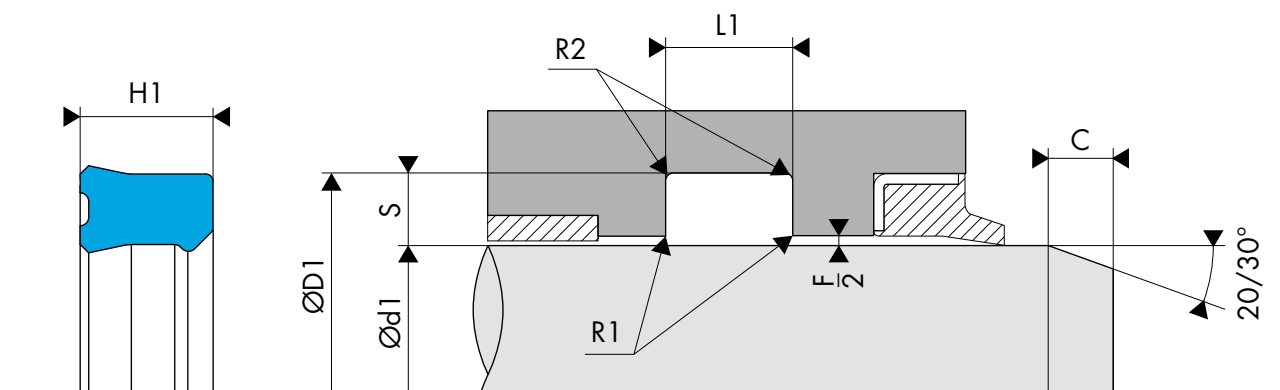
Rod diameter Ød1	Radial gap F/2				
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10
> 60 mm	0.50	0.40	0.30	0.20	0.15

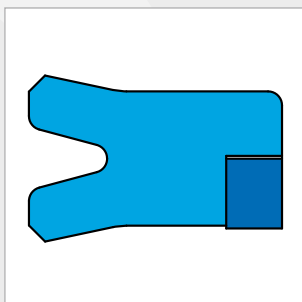
SURFACE ROUGHNESS

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

CHAMFERS AND RADIUS

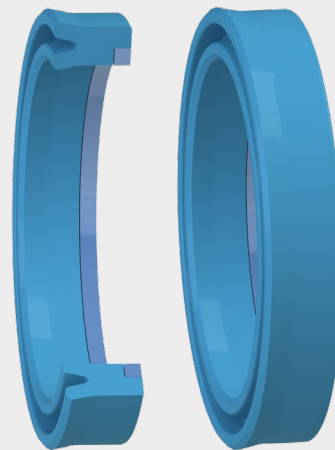
Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.40	0.60	2.50
4.00	0.40	0.60	2.50
5.00	0.40	0.60	2.50
7.50	0.80	1.00	4.00





ROD SEALS

BECA 335T/AE



DESCRIPTIONS

The BECA 335T/AE profile is a polyurethane U-ring type single acting rod seal with matching lips and a POM back-up ring.

ADVANTAGES

Optimised sealing effect
Excellent abrasion resistance
Very good extrusion resistance
Very good wear resistance

APPLICATIONS

Agriculture
Mobile machinery
Lifting systems
Injection presses
Hydraulic cylinders

MATERIALS

Profiled seal

PU 93 Shore A - Blue
PU 96 Shore A - Blue
High temp. PU 96 Shore A - Beige

Back-up ring

Polyoxymethylene - POM

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

TECHNICAL DATA

Temperature	-30°C / +110°C
Pressure	45 MPa
Speed	0.5 m/sec
Media	Mineral hydraulic oils

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

EXTRUSION GAPS

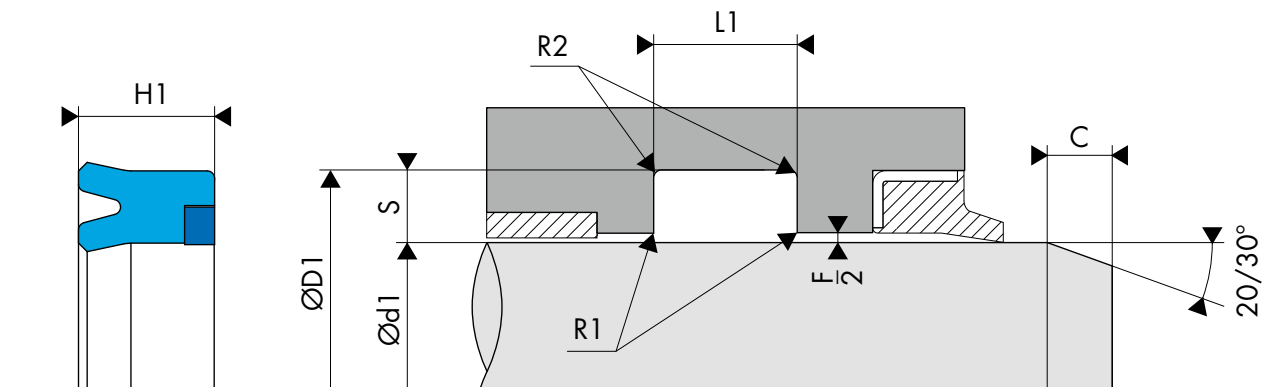
Rod diameter Ød1	Radial gap F/2					
	≤ 5 MPa	≤ 10 MPa	≤ 20 MPa	≤ 30 MPa	≤ 40 MPa	≤ 45 MPa
≤ 60 mm	0.40	0.30	0.20	0.15	0.10	0.07
> 60 mm	0.50	0.40	0.30	0.20	0.15	0.10

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

CHAMFERS AND RADIUS

Radial section S	Radius R1	Radius R2	Chamfer C
3.00	0.20	0.40	2.00
4.00	0.20	0.40	2.50
5.00	0.40	0.60	3.00
7.50	0.80	1.00	4.00
10.00	0.80	1.00	5.00



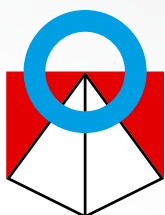


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