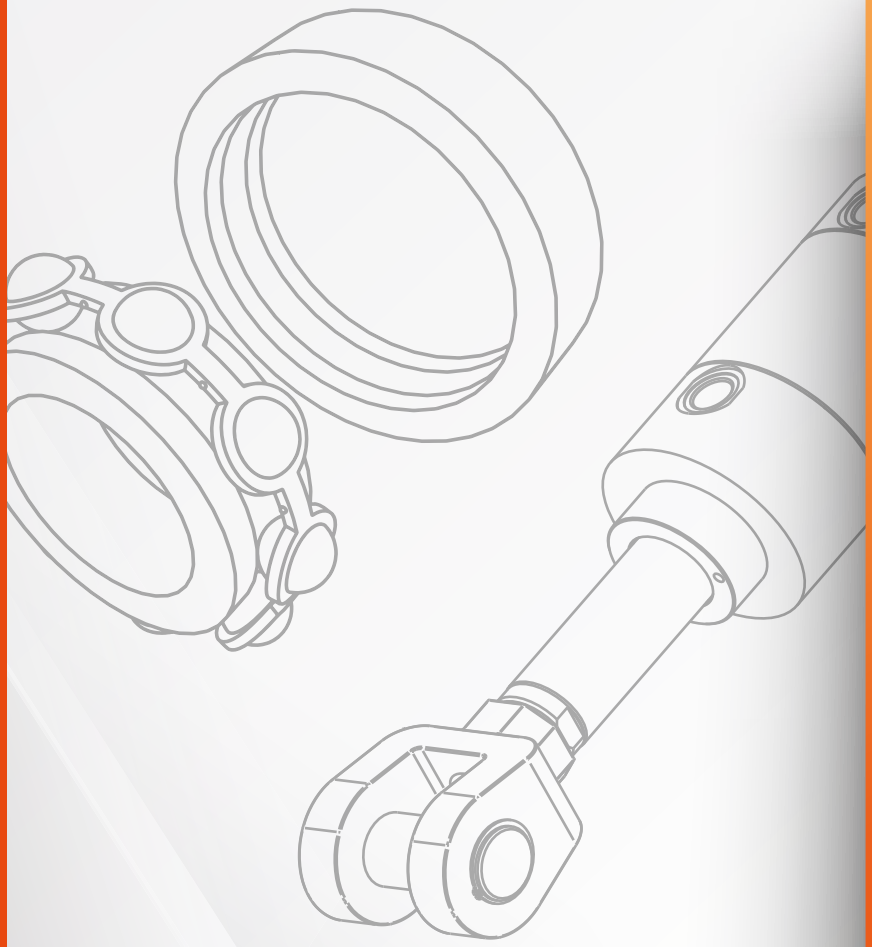
CARCO® PRP®

PRECISION RUBBER PRODUCTS

THERMOPLASTIC COMPOSITE SEALS & GUIDING SYSTEMS

LINEAR AND ROTARY MOVEMENT



www.carcoprp.com

MORE THAN A CENTURY OF EXPERIENCE

From leather seals for the first hydropower plants to modern sealing solutions.
This is the evolution of CARCO – PRP in more than a century, manufacturing rotary shaft seals and hydraulic seals for all diameters, in fabric reinforced elastomers and in thermoplastic polymers.
We keep greatest attention to quality since we dedicate to challenging and critical applications, with no room for mistakes.

CARCO - PRP

Today CARCO – PRP is part of a group of companies specialized in the design and manufacture of seals with production sites in Italy, the USA and Canada.
We offer our products through a global network of CARCO – PRP sales offices and authorised distributors

FAST

Short delivery time is part of our image, even when we deliver large diameter seals for metal forging presses or for giant wind mills or for ceramic presses.

EXPERTISE

We are specialized in a large variety of applications: to satisfy the customer's requirements we need to know deeply the machinery in which our seal is fitted.
Our technical department specifies the suitable seal profile and material to offer the longest seal life and prevent costly machine shutdown.
Our technical support includes the definition of metalwork finishing, lubrication system and future maintenance.

PRODUCTION

We dispose of one the largest hydraulic press in the world for the vulcanization of seals in fabric reinforced elastomers (3 mt.); a long serie of presses cover the complete size range. The department of termoplastics machining disposes of several CNC lathe machines up to 3 meter diameter. Our technology of hot and cold bonding enables the production of giant seals.

RESEARCH AND DEVELOPMENT

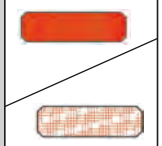
CARCO – PRP engineers can design customized seals based on working conditions provided by the machine manufacturers. With finite element analysis we predict the behaviour of the seal, with our test rigs we explore new projects and with our laboratory we develop new materials and verify the quality of the raw materials.

Identification		Designation	Working conditions			Page
			Press. MPa (bar)	Temp. °C	Speed m/s	
Static seal						
O-ring		Double effect seal for static and dynamic applications. It can be supplied in different materials such as: Nitrite (NBR) Hydrogenated Nitrile (HNBR) Fluorocarbon (FKM) Ethylene Propylene (EPDM) Chloroprene (CR) Silicone (VMQ) etc. Dimensions according to international and metric standards ISO 3601.		-60 +325		02.01
Q-ring		Double-acting seal for static, dynamic and rotating applications. Available in different materials.		-60 +260		02.04
OSR1 / OSR2		Seal for static applications. High stability and resistance to twisting in case of pulsating pressure. This seal can replace o-ring with backup.	50 (500)	-50 +110		02.05
71 / 72		Anti-extrusion Back-Up ring for O-RING and Q-RING. Available in PTFE and other materials.	45 (450)	-60 +200		02.07
73 / 74		Anti-extrusion Back-Up ring for O-RING. Available in PTFE and other materials.	45 (450)	-60 +200		02.08
S concave back-up		Anti-extrusion Back-Up ring for O-RING. Moulded product, made of hard rubber, suitable to prevent extrusion phenomena also in case of pulsating pressure.	35 (350)	-30 +100		02.09
68A		Frontal static seal, for internal pressure. Energized by a metallic helicoil spring. Excellent seal performance with low density and/or low temperature gases.	40 (400)	-200 +260	0,5	02.12
64A		Frontal static seal, for internal pressure. Energized by a metallic cantilever spring. Lower load and higher lip flexibility compared to type 68A.	40 (400)	-90 +260	0,5	02.12
69A		Frontal static seal for external pressure. Energized by a metallic helicoil spring. Excellent seal performance with low density and/or low temperature gases.	40 (400)	-200 +260	0,5	02.13
63A		Frontal static seal, for external pressure. Energized by a metallic cantilever spring. Lower load and higher lip flexibility compared to type 69A.	40 (400)	-90 +260	0,5	02.13

Identification		Designation	Working conditions			Page
			Press. MPa (bar)	Temp. °C	Speed m/s	
Rod seal						
01A / 01B		Double-acting rod seal, energised by an O-RING. In dynamic applications it generates low friction without stick-slip phenomena; it allows a very long operating life of the system thanks to its high wear resistance.	80 (800)	-60 +200	15	03.01
01C		Double-acting rod seal energised by an O-RING. This seal is designed for a rod with dimensional changes, to avoid damage or deformation while sliding along different diameters. An accessible groove is necessary.	80 (800)	-60 +200	15	03.03
01D		Symmetric single and double-acting rod seal energised by an O-RING. This seal is designed for applications with short stroke and high frequency. The middle groove is acting as an oil reservoir.	30 (300)	-60 +200	15	03.04
01T		Double-acting rod seal, energised by an O-RING. This seal offers high extrusion resistance, high wear resistance and low friction without stick-slip.	80 (800)	-60 +200	15	03.05
01Z		Double-acting rod seal, energised by an O-RING. This seal offers high extrusion resistance, high wear resistance and low friction without stick-slip. The contained o-ring wil improve the seal reactivity during the stroke inversion.	80 (800)	-60 +200	15	03.06
11A		Single-acting rod seal, energised by an O-RING. In dynamic applications it generates low friction without stick-slip phenomena; it allows a very long operating life of the system thanks to its high wear resistance. Exceptional efficiency of seal is obtained with a combination in tandem together with a scraper of series PRP-21B.	60 (600)	-60 +200	15	03.07
11S		Single-acting rod seal energised by an elastomeric component. The special shape of the energiser makes this seal very stable even under high loads. Recommended for heavy duty applications and dirty environments, for example in steel mills.	60 (600)	-35 +200	5	03.09
31A		Double-acting rod seal energized by an O-ring, as type 01. Its performance is improved by the additional Q-ring, to obtain an absolutely leak-free system. The Q-ring extrusion is avoided by the seat inside the PTFE ring.	40 (400)	-60 +200	3	03.10
41A		Double-acting rod seal. Its dimensions allow fitting in housings suitable for O-RING according to AS568A / BS1806 / MIL-P-5514. Ideal solution for large friction reduction, absence of stick-slip and significant wear resistance, keeping a housing of reduced size.	35 (350)	-60 +200	15	03.11
61A		Single-acting radial dynamic seal, energised by a cantilever metallic spring; the characteristics of low friction, absence of stick-slip and wear resistance are enhanced. Recommended in case of chemical attack of the fluid.	40 (400)	-90 +260	15	03.12
67A		Single-acting static or semi-dynamic seal energised by a helicoil metallic spring. Excellent seal performance also with low density and/or low temperature gases.	40 (400)	-200 +260	0,5	03.12
R01		Single-acting Polyurethane or Rubber U-Cup rod seal, with asymmetrical profile and trimmed sealing lips. Low break-away force compared to V-packs. Used as primary or secondary seal.	40 (400)	-50 +200	0,5	03.13
R03		Single-acting Polyurethane or Rubber U-Cup rod seal energised by an O-RING. This seal offers superior performances with and without pressure activation. Commonly used as secondary seal together with Type 11A.	40 (400)	-50 +200	0,5	03.13
R08		Single-acting Polyurethane or Rubber U-Cup rod seal with symmetrical profile and trimmed sealing lips. Very compact design providing superior sealing preformance even with low pressure.	40 (400)	-50 +200	0,5	03.13

Identification		Designation	Working conditions			Page
			Press. MPa (bar)	Temp. °C	Speed m/s	
Piston seal						
02A / 02B		Double-acting piston seal, energised by an O-RING. In dynamic applications it generates low friction without stick-slip phenomena; it allows a very long operating life of the system thanks to its high wear resistance.	80 (800)	-60 +200	15	04.01
02C		Double-acting piston seal energised by an O-RING. This seal is designed for a piston with dimensional changes, to avoid damage or deformation while sliding along different diameters. An accessible groove is necessary.	80 (800)	-60 +200	15	04.03
02D		Symmetric single and double-acting piston seal energised by an O-RING. This seal is designed for applications with short stroke and high frequency. The middle groove is acting as an oil reservoir.	30 (300)	-60 +200	15	04.04
02F		Double-acting piston seal energised by an elastomeric ring. 2 back-up rings provide long seal life even with large clearance and extremly severe working conditions.	60 (600)	-35 +110	1,5	04.05
02S		Double-acting piston seal, energized by an elastomeric component. The special shape of the energizer makes this seal very stable even under high loads. Recommended for heavy duty applications and dirty environments, for example in steel mills.	80 (800)	-35 +200	5	04.06
02T		Double-acting piston seal, energised by an O-RING. This seal offers high extrusion resistance, high wear resistance and low friction without stick-slip.	80 (800)	-60 +200	15	04.07
02Z		Double-acting piston seal, energised by an O-RING. This seal offers high extrusion resistance, high wear resistance and low friction without stick-slip. The contained o-ring wil improve the seal reactivity during the stroke inversion.	80 (800)	-60 +200	15	04.08
12A		Single-acting piston seal, energised by an O-RING. In dynamic applications it generates low friction without stick-slip phenomena; it allows a very long operating life of the system thanks to its high wear resistance. Exceptional efficiency of seal is obtained with a combination of 2 seals in tandem.	60 (600)	-60 +200	15	04.09
12S		Single-acting piston seal energized by an elastomeric component. The special shape of the energizer makes this seal very stable even under high loads. Recommended for heavy duty applications and dirty environments, for example in steel mills.	60 (600)	-35 +200	5	04.11
32A		Double-acting piston seal energized by an O-ring, as type 02. Its performance is improved by the additional Q-ring, to obtain an absolutely leak-free system. The Q-ring extrusion is avoided by the seat inside the PTFE ring.	40 (400)	-60 +200	3	04.12
42A		Double-acting piston seal. Its dimensions allow fitting in housings suitable for O-RING according to AS568A / BS1806 / MIL-P-5514. Ideal solution for large friction reduction, absence of stick-slip and significant wear resistance, keeping a housing of reduced size.	35 (350)	-60 +200	15	04.13
62A		Single-acting radial dynamic seal, energised by a cantilever metallic spring; the characteristics of low friction, absence of stick-slip and wear resistance are enhanced. Recommended in case of chemical attack of the fluid.	40 (400)	-90 +260	15	04.14

Identification		Designation	Working conditions			Page
			Press. MPa (bar)	Temp. °C	Speed m/s	
66A		Single-acting static or semi-dynamic seal energised by a helicoil metallic spring. Excellent seal performance also with low density and/or low temperature gases.	40 (400)	-200 +260	0,5	04.14
P01		Single-acting Polyurethane or Rubber U-Cup piston seal, with asymmetrical profile and trimmed sealing lips. Low break-away force compared to V-packs.	40 (400)	-50 +200	0,5	04.15
P01C		Single-acting Polyurethane or Rubber U-Cup piston seal, with asymmetrical profile and trimmed sealing lips. Low break-away force compared to V-packs.	40 (400)	-50 +200	0,5	04.15
P02A		Single-acting Polyurethane or Rubber U-Cup piston seal, with asymmetrical profile with back up ring to improve extrusion resistance. Low break-away force compared to V-packs.	70 (700)	-50 +200	0,5	04.15
Wiper Ring						
21A		Single-acting wiper ring of great efficiency thanks to the energizing O-RING. It enhances the service life of the seal system even in presence of ice and mud.		-60 +200	15	05.01
21B		Double-acting wiper ring energised by an O-RING. Its double action enhances the effect of the seal system. Its high efficiency prevents pollution from entering in the seal area.		-60 +200	15	05.01
21C		Robust design double-acting wiper ring energised by an O-RING. Its double action enhances the seal system. Its high efficiency prevents pollution from entering in the seal area. Robust design.		-60 +200	15	05.02
21D		Double-acting wiper ring in NBR, Used only in combination with seals preventing overpressure between seal and scraper during the return stroke of the rod.		-30 +100	1	05.03
21E		Double-acting wiper energized by double O-RING. Its double action enhances the performance of the seal. Being very efficient, it is recommended for dirty and contaminating enviroments. We also recommend to have a drain between seal and scraper.		-60 +200	15	05.04
21F		Double-acting wiper energized by double O-RING. Its double action enhances the performance of the seal. Being very efficient, it is recommended for dirty and contaminating enviroments. We also recommend to have a drain between seal and scraper.		-60 +200	15	05.05
W02		Single-acting wiper for rod made of elastomers or polyurethanes. Very good wiping action with a reliable static tightness feature.		-50 +200	1	05.06
W11		Double-acting wiper for rod made of elastomers or polyuretanes. Very good wiping action with sealing effect against residual film of oil on the extending rod.		-50 +200	1	05.07
W12		Double-acting wiper for rod made of elastomers or polyuretanes. Very good wiping action with sealing effect against residual film of oil on the extending rod.		-50 +200	1	05.08

Identification		Designation	Working conditions			Page
			Press. MPa (bar)	Temp. °C	Speed m/s	
Rotary seal						
51		Seal enegised by an O-RING typically used for rotating joints. Produced in rod version (preferable to the PRP-52 version), it requires careful examination of the application design.	20 (200)	-60 +200	1	06.01
52		Seal enegised by an O-RING typically used for rotating joints. Produced in cylinder version, it requires careful examination of the application design.	20 (200)	-60 +200	1	06.02
65A		Single-acting dynamic shaft seal energized by a cantilever metallic spring. Seal rotation is prevented by an axial clamping. Compatible with most fluids and chemical products. Withstanding up to 25 MPa static (no rotation).	15 (150)	-75 +200	5	06.03
65B		Single-acting dynamic bore seal energized by a cantilever metallic spring. Seal rotation is prevented by an axial clamping. Compatible with most fluids and chemical products. Withstanding up to 25 MPa static (no rotation).	15 (150)	-75 +200	5	06.05
Guiding system						
81A / 82A		Thermoplastic guide rings for rod and piston made from strips. They are meant to avoid metal-to-metal contact, absorbing any radial stress. Guide rings prevent risk of seizure and stick- slip phenomena, enhancing service life of the system.	14 N/mm²	-60 +200	15	07.01 07.02
81D / 82D		Preformed guide rings made of thermoplastic material or composite material (K-Tex). Those rings are obtained by machining, for easy fitting and special dimensions.	According to the choice of material			07.03 07.04
81T / 82T		K-Tex guide rings suitable for high radial loads made from strips. They are made of polyester fabric and polyester resin with lubricating additives.	100 N/mm²	-70 +120	1	07.05 07.06
83A		PTFE-based material used as linear glide guides, for example: for mills or lathe machines. Fitted by gluing, used to reduce significantly stick-slip phenomena.	7 N/mm²	-40 +80	1	07.08
Technical specifications and accessories						
XT		Thermoplastic material supplied in round bars in order to machine mechanical parts and bearings for medium and heavy duty applications with poor lubrication.		-40 +70	0,5	08.06
K-Tex ALL GRADES		Semi- and finished products made of thermosetting composite material, supplied as tube/bar or plate to machine mechanical parts for heavy-duty applications with poor or no lubrication.	100 N/mm²	-70 +120	1	08.06

CODE	COLOUR	BASIC COMPOSITION	DESCRIPTION	COMPLIANCE AVAILABLE ON REQUEST (1)
100		PTFE pure	Good wear and extrusion resitance. General applications with low coefficient of friction.	FDA / MOCA / WRAS / M710 / USP VI
110		Modified PTFE (also known as TFM)	PTFE with better physical characteristics, lower deformation, low gas permeability and great abrasion resistance.	FDA / MOCA / WRAS / ANNEX F / M710
120		PTFE Aromatic Polyester	PTFE reinforced with aromatic polymers. High wear and extrusion resistance.	FDA / MOCA / ANNEX F / M710
131		PTFE Premium	High grade PTFE, very good mechanical properties, excellent physical characteristic and dimensional stability.	AMS / FDA / MOCA / WRAS / ANNEX F / M710
140		PTFE Mineral	PTFE reinforced with mineral filler, very good combination of mechanical and glide characteristics, mild on the sliding surfaces. Suitable for linear and rotary movement.	FDA / MOCA / M710
150		PEEK	High performance engineering plastic, excellent mechanical strength and rigidity. Suitable for guiding and anti extrusion elements.	FDA / MOCA / ANNEX F / M710
190		PTFE oxide	PTFE reinforced in order to obtain better wear and extrusion resistance compared to PRP 100.	FDA / MOCA
220		PTFE Mineral MoS2	PTFE reinforced with mineral filler and MoS2, excellent combination of mechanical and glide characteristics, mild on the sliding surfaces. Suitable for linear and rotary movement.	
240		PTFE Bronze	PTFE reinforced with bronze. Typical for Hydraulic application, very good extrusion resistance.	
260		PTFE Bronze	PTFE reinforced with bronze. Higher percentage of bronze (heavy duty application).	
270		PTFE Bronze	PTFE reinforced with bronze. Excellent extrusion and wear resistance.	
278		PTFE Bronze	PTFE reinforced with bronze. Surface treated for high frequency and short stroke.	
290		PTFE Bronze	Excellent wear resistant PTFE reinforced with bronze. Excellent wear resistance dedicated to guide rings.	
320		PTFE Carbon Graphite	PTFE reinforced with carbon and graphite. Excellent wear resistance in application with water and steam.	FDA / MOCA / WRAS / ANNEX F / M710
340		PTFE Graphite	PTFE reinforced with graphite. Excellent chemical stability and thermal resistance, lower coefficient of friction.	FDA / MOCA / ANNEX F / M710
410		PTFE Carbon Fibers	PTFE reinforced with carbon fiber, excellent glide characteristic in case of high frequency movement. Suitable for rotation on ceramic coating.	FDA / MOCA / M710
550		PTFE Glass MoS2	PTFE reinforced with glass and MoS2, very good dielectric and mechanical resistance, high inertness towards wide chemical substances. Suitable for linear and rotary movement.	M710
770		NBR-BLACK 75 ShA	Excellent material for sealing, in light duty application, or as energizer in a composite seal. Good combination of physical-mechanical properties.	
600		NBR-BLACK 85 ShA	Excelent material for sealing, in standard duty hydraulic application. Good cobination of physical-mechanical properties.	

CODE	COLOUR	BASIC COMPOSITION	DESCRIPTION	COMPLIANCE AVAILABLE ON REQUEST (1)
610		NBR-BLACK 95 ShA	Good material for sealing, in standard duty hydraulic seal applications. Very good choice as wiper or static seal with high extrusion resistance.	
680		HNBR-BLACK 73 ShA	Excellent material for sealing, in light duty seal applications or energizer in composite seals. Improved chemical and thermal resistance in comparison to NBR.	
620		HNBR-BLACK 85 ShA	Excellent material for sealing in standard duty seal hydraulic applications. Improved chemical and thermal resistance in comparison to NBR.	
630		EPDM-BLACK 85 ShA	Excellent material for sealing in standard standard duty seal applications, often used in base, acid and alcoholic fluid. EPDM is not resistant to mineral, vegetable and animal oils.	
644		EPDM-WHITE 85 ShA	This material is often used food applications, used also in hot water and steam applications. EPDM materials are also used in base, acid and alcoholic fluid.	FDA / MOCA
760		FKM-BLACK 75 ShA	Excellent material for sealing, in light duty seal applications; very high resistance to chemicals and high temperature.	
720		FKM-BLACK 85 ShA	Excellent material for sealing, in standard duty seal applications; very high resistance to chemicals and high temperature.	
800		PU 57 ShD	Very good mechanical resistance, suitable for back-up rings or composite seals energized by O-ring.	
840		PU 70 ShD	Very good mechanical resistance, excellent wear resistance. Suitable for back-up rings, scrapers or composite seals energized by O-ring.	
850		PU 95 ShA	Good combination of mecahnical properties. General purpose for hydraulic and pneumatic application.	FDA / MOCA
860		PU 95 ShA	Very good resistance at low temperature -55°C. Good combination of mechanical properties. General purpose for hydraulic and pneumatic application.	FDA / MOCA
870		PU 95A ShA MoS2	High abrasion resistance & low CoF. Good combination of mechanical properties. General purpose for hydraulic and pneumatic application.	
910		UHMW-PE	Excellent abrasion resistance in poor lub condition. Suitable against ceramic coating. Suitable for energized seal.	FDA / MOCA
010		PA6	High mechanical resistance suitable for anti-extrusion ring, support ring and spacers.	FDA / MOCA
030		POM	Very good wear and abrasion properties, with low moisture absorption. Suitable for anti extrusion ring, support ring and spacers.	FDA
K11		Composite Synthetic, Graphite	Excellent wear and abrasion properties and high compressive load. Suitable for bushing and pad and customized product.	
K18		Composite Synthetic, PTFE	Excellent wear and abrasion properties and high compressive load. Suitable for guide ring.	
K21		Composite Synthetic, Graphite	Excellent wear and abrasion properties and high compressive load. Improved service temperature. Suitable for bushing and pad and customized product.	
K28		Composite Synthetic, PTFE	Excellent wear and abrasion properties and high compressive load. Improved service temperature. Suitable for bushing and pad.	
K31		Composite of aramidic fiber	Excellent wear and abrasion properties and high compressive load. Extremely high service temperature. Suitable for guide ring and customized product.	

NOTE: (1) Material compliant with a regulation/standard shall be expressly request in the purchase order or in the request for quote.

MATERIAL SELECTION FOR SEALS AND GUIDES

FLUID	CONTACT SURFACE	MATERIALS		
		SEAL	O-RING	GUIDE
Hydraulic oil	Steel, Chrorned steel, Cast iron	190, 240, 550, 800	Nitrile NBR Code A...	190, 290, K18
	Bronze, Aluminium, Stainless steel, soft metals	140, 220, 320		190, 320
Water / Glycol	Steel, Chromed steel, Cast iron, Bronze, Aluminium, Stainless steel, soft metals	220, 320, 910	Nitrile NBR Code A...	320, K18
Hot water Steam	Steel, Cast iron	320, 550	Ethylene propylene EPDM Code H...	150, 320, K28
	Bronze, Aluminium, Stainless steel, soft metals	140, 220, 320		
Dry / lubricated air	Steel Chromed steel, Cast iron	190, 240, 320	Nitrile NBR Code A...	190, 290, K18
	Bronze, Aluminium, Stainless steel, soft metals	140, 320, 910		190, 320
Synthetic fluids with high flash point	Steel, Cast iron	190, 240, 550	Fluorocarbon FKM Code E...	150, 190, 290, K28
Synthetic fluids e.g. Skydrol 500, 7000, Cellulube A60 Pydraul 60	Steel, Cast iron	190, 240, 550		190, 290, K18
	Bronze, Aluminium, Stainless steel, soft metals	320		320

NOTE: O-ring choice also depends on both working temperature and fluids.

JACKET MATERIALS FOR LIPRING

FLUID	MATERIALS		
	SEMI-DYNAMIC/STATIC	LINEAR	ROTATION
Air / Gas	190, 910	120, 910	120, 910
Steam Oil Water / Oil Crude oil Petro-chemicals Chemicals		320, 340, 410	410
Food	100, 910	120, 910	120, 910
Vacuum		100, 110	100, 110

ELASTOMER MATERIALS

ELASTOMERIC BASE	CODE	TECHNICAL CHARACTERISTICS			USE AND COMPATIBILITY
		Application	Shore Hardness A (±-5)	Temperature range °C *	
Acrylonitrile-Butadiene NBR (code A..)	AOO	Industrial/General	7O	-30 +110	Standard material for hydraulic and pneumatic use. For hydraulic mineral fluids, animal and vegetable oils and fats. Flameretardant fluids (HFA, HFB, HFC), aliphatic hydrocarbons (propane, butane), oils and greases of silicone, water with temperature MAX 80°C, biodegradable oils based on synthetic esters and vegetable oils. For hydraulic mineral oils at low.
	A9O	Industrial/General	9O	-25 +110	
	A45	Low Temperature	7O	-45 +100	
	A60	Food & Beverage	7O	-30 +100	
	G00	Military / Aerospace	7O	-53 +115	Material according to Military standard MS28775
Ethylene-Propylene-Diene EPDM (code H...)	H00	Industrial/General	7O	-45 +150	Hot water, steam, brake fluid, detergents. Alcohols, ketones, anti-freeze liquids, flame retardant fluids based on phosphates, organic and non-organic acids and bases. **NOT SUITABLE FOR MINERAL OILS**
Siliconic VMQ (code S...)	S00	Industrial/General	7O	-60 +200	Hot air, oxygen, insert gases at high temperatures, ozone, UV radiation, aliphatic oils for transmissions, animal and vegetable oils and fats, brake fluid. **LOW RESISTANCE TO MINERAL OILS** For static applications only.
	S60	Food & Beverage	7O	-60 +200	
Fluoroelastomer FKM (code E...)	E00	Industrial/General	7O	-20 +200	Mineral oils and greases, aliphatic, aromatic hydrocarbons, and chlorines, crude oil, diesel oil, flame retardant fluids based on phosphates. Oil and greases based on silicone, acids alkaline solutions. Suitable for applications under high vacuum.
	E60	Food & Beverage	7O	-20 +200	
	E90	OIL & GAS	9O	-20 +200	Excellent chemical and thermal properties. Designed for Rapid Gas Decompression resistance.
Acrylonitrile-Hydrogeneted butadiene HNBR (code B...)	B00	Industrial/General	7O	-20 +150	Mineral-based hydraulic fluids, animal and vegetable fats, aliphatic hydrocarbons, diesel oils, ozone, slightly acid gases, diluted acids and bases.
	B10	Low Temperature	7O	-65 +130	
Perfluoroelastomer FFKM (code K...)	K16	Chemical industies	7O	-37 +325	It has highly resistance to aggressive chemicals and environments. Suitable for crude refining, analysis apparatus and aerospace sector, semi-conductors industrial, also with to organic acids such as acetic, benzoic and formic acids. Very suitable for hot water, steam and hot amines.

(*)The a.m. temperatures are the limits to which the elastomer is subjected too. Therefore consider that, based on the working conditions, the temperatures around the seal will be higher than the temperature of the media.

SPRING MATERIALS FOR LIPRING

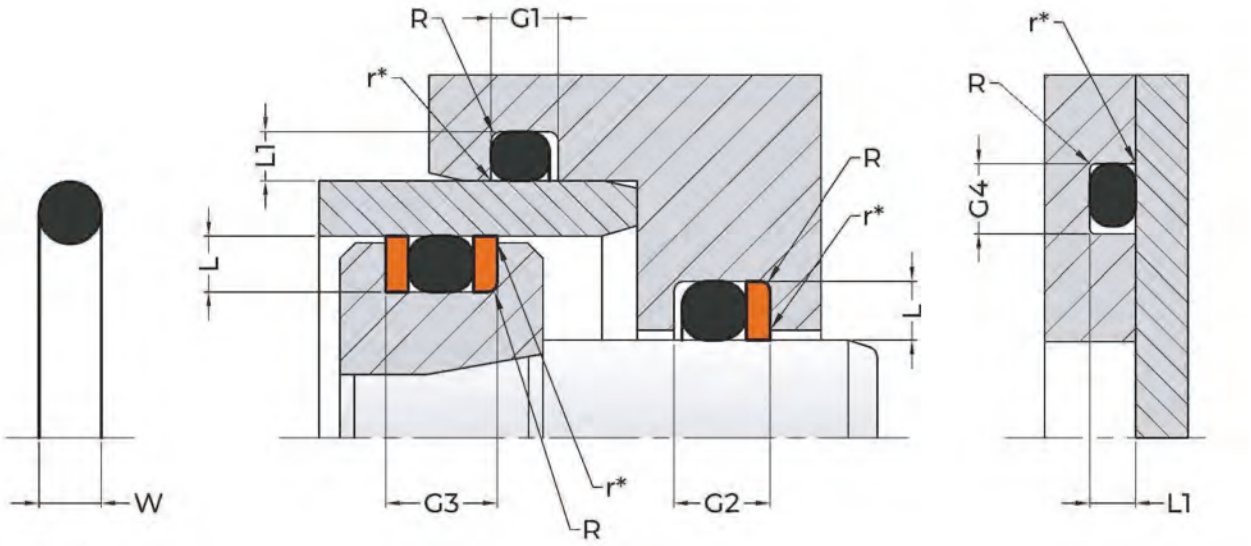
FLUID	MATERIAL	CODE
Air/Gas Water/Steam/Food Oil/Grease	Stainless steel DIN mat. N. 1.4310 (x12 Cr Ni 177)AISI 301 or 17-7 PH	S00
Caustic Soda Acids Sea water	Hastelloy Ni-Cr-Mo alloy DIN mat. N. 2.4819 UNS N10276	H00
Petroleum products Chemicals Solvents	Elgiloy Co-Ni alloy UNS R30003	E00

FLUID	RUBBER & PU Seals ≤ 95 ShA		PTFE & Thermoplastic Seals		
	APPLICATION		APPLICATION		
	STATIC	DYNAMIC	STATIC	LINEAR	ROTATION
Gas/Low temperature Hydrogen Helium	Ra = 0,3 µm Rz = 2,5 µm Rt = 3,2 µm	Ra = 0,1 µm Rz = 0,63 µm Rt = 1,0 µm	Ra = 0,3 µm Rz = 2,5 µm Rt = 3,2 µm	Ra = 0,05 µm Rz = 0,4 µm Rt = 0,63 µm	Ra = 0,05 µm Rz = 0,4 µm Rt = 0,63 µm
Freon Oxygen Liquid nitrogen	Ra = 0,4 µm Rz = 3,2 µm Rt = 4,0 µm	Ra = 0,2 µm Rz = 1,6 µm Rt = 2,5 µm	Ra = 0,3 µm Rz = 2,5 µm Rt = 3,2 µm	Ra = 0,1 µm Rz = 0,63 µm Rt = 1,0 µm	Ra = 0,1 µm Rz = 0,63 µm Rt = 1,0 µm
Low viscosity gases/liquids Air Alcohol Gaseous Nitrogen Natural gas	Ra = 0,8 µm Rz = 5,0 µm Rt = 6,5 µm	Ra = 0,3 µm Rz = 2,5 µm Rt = 3,2 µm	Ra = 0,6 µm Rz = 3,5 µm Rt = 5,0 µm	Ra = 0,2 µm Rz = 1,6 µm Rt = 2,5 µm	Ra = 0,1 µm Rz = 0,63 µm Rt = 1,0 µm
Medium and High viscosity fluids Water Oil Grease Skydrol Liquid adhesives	Ra = 1,6 µm Rz = 6,3 µm Rt = 8,0 µm	Ra = 0,6 µm Rz = 3,5 µm Rt = 5,0 µm	Ra = 0,8 µm Rz = 5,0 µm Rt = 6,5 µm	Ra = 0,4 µm Rz = 3,2 µm Rt = 4,0 µm	Ra = 0,3 µm Rz = 2,5 µm Rt = 3,2 µm

The reliability and efficiency of the seals is closely linked to the quality of the sliding surfaces, so scores, pores, scratches, machining paths, are not permitted. In addition to the features mentioned above, another essential parameter to define, is the Rmr (material contact area).
This should be approx: 50-70% for poliurethane & rubber seal or 60-90% for PTFE & thermoplastic seals >95 ShA. The value of Rmr is determinated at a cut depth c= 0.25 x Rz, relative to a referece line C_{ref} of 5%.

In case of ceramic coating surface texture, characteristics are even more important. The peaks, sharp edge and the porosity, might have influence in premature wear of seal. Please contact our technical office for information on roughness parameters.

GROOVE GEOMETRY & DIMENSIONS



r* = rounded and free of burrs r=0,2 max

W Cross section	Radial Fitting					Axial Fitting		R
	L Dynamic +0,05 -0,0	L1 Static +0,05 -0,0	G1 +0,2 -0,0	G2 +0,2 -0,0	G3 +0,2 -0,0	L1 +0,05 -0,0	G4 +0,2 -0,0	max
1,78	1,45	1,3	2,4	3,8	5,2	1,3	2,6	0,2
2,62	2,25	2,0	3,6	4,7	6,2	2,0	3,8	0,3
3,53	3,1	2,7	4,8	6,0	7,7	2,7	5,0	0,4
5,33	4,7	4,3	7,1	8,7	10,8	4,3	7,3	04
6,99	6,1	5,8	9,5	12,0	14,7	5,8	9,7	0,6

DENOMINATION EXAMPLE

O-ring	324 = 34,29 x 5,33
Q-ring	4324 = 34,29 x 5,33

The material listed in the following tables, is referring to ISO3601-1 class B, grade N
For material choice see page 01.09

Cord Diameter w=1,78 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
001	0,74x1,0	010	6,07	019	20,35	028	34,65	037	63,22	046	107,67
002	2,00	011	7,65	020	21,95	029	37,82	038	66,40	047	114,02
003	1,07x1,27	012	9,25	021	23,52	030	41,00	039	69,57	048	120,37
004	1,42x1,52	013	10,82	022	25,12	031	44,17	040	72,75	049	126,72
005	1,78	014	12,42	023	26,70	032	47,35	041	75,92	050	133,07
006	2,57	015	14,00	024	28,30	033	50,52	042	82,27		
007	2,90	016	15,60	025	29,87	034	53,70	043	88,62		
008	3,68	017	17,17	026	31,47	035	56,87	044	94,97		
009	4,47	018	18,77	027	33,05	036	60,05	045	101,32		

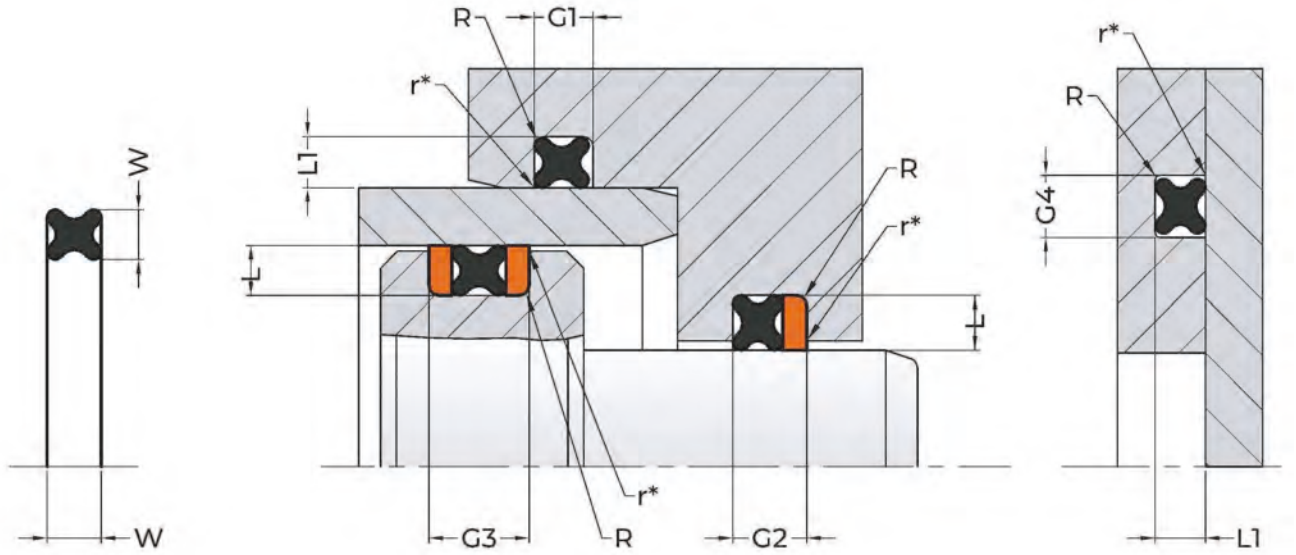
Cord Diameter w=2,62 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
102	1,24	115	17,12	128	37,77	141	58,42	154	94,92	167	177,47
103	2,06	116	18,72	129	39,34	142	59,99	155	101,27	168	183,82
104	2,84	117	20,29	130	40,94	143	61,60	156	107,62	169	190,17
105	3,63	118	21,89	131	42,52	144	63,17	157	113,97	170	196,52
106	4,42	119	23,47	132	44,12	145	64,77	158	120,32	171	202,87
107	5,23	120	25,07	133	45,69	146	66,34	159	126,67	172	209,22
108	6,02	121	26,64	134	47,29	147	67,95	160	133,02	173	215,57
109	7,59	122	28,24	135	48,90	148	69,52	161	139,37	174	221,92
110	9,19	123	29,82	136	50,47	149	71,12	162	145,72	175	228,27
111	10,77	124	31,42	137	52,07	150	72,69	163	152,07	176	234,62
112	12,37	125	32,99	138	53,64	151	75,87	164	158,42	177	240,97
113	13,94	126	34,59	139	55,25	152	82,22	165	164,77	178	247,32
114	15,54	127	36,17	140	56,82	153	88,57	166	171,12		

Cord Diameter w=3,53 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
201	4,34	215	26,57	229	59,92	243	104,37	257	148,82	271	234,54
202	5,94	216	28,17	230	63,09	244	107,54	258	151,99	272	240,89
203	7,52	217	29,74	231	66,27	245	110,72	259	158,34	273	247,24
204	9,12	218	31,34	232	69,44	246	113,89	260	164,69	274	253,59
205	10,69	219	32,92	233	72,62	247	117,07	261	171,04	275	266,29
206	12,29	220	34,52	234	75,79	248	120,24	262	177,39	276	278,99
207	13,87	221	36,09	235	78,97	249	123,42	263	183,74	277	291,69
208	15,47	222	37,69	236	82,14	250	126,59	264	190,09	278	304,39
209	17,04	223	40,87	237	85,32	251	129,77	265	196,44	279	329,79
210	18,64	224	44,04	238	88,49	252	132,94	266	202,79	280	355,19
211	20,22	225	47,22	239	91,67	253	136,12	267	209,14	281	380,59
212	21,82	226	50,39	240	94,84	254	139,29	268	215,49	282	405,26
213	23,39	227	53,57	241	98,02	255	142,47	269	221,84	283	430,66
214	24,99	228	56,74	242	101,19	256	145,64	270	228,19	284	456,06

Cord Diameter w=5,33 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
309	10,46	324	34,29	339	81,92	354	129,54	369	202,57	384	380,37
310	12,07	325	37,47	340	85,09	355	132,72	370	208,92	385	405,29
311	13,64	326	40,64	341	88,27	356	135,89	371	215,27	386	430,66
312	15,24	327	43,82	342	91,44	357	139,07	372	221,62	387	456,06
313	16,81	328	49,99	343	94,62	358	142,24	373	227,97	388	481,41
314	18,42	329	50,17	344	97,79	359	145,42	374	234,32	389	506,81
315	19,99	330	53,34	345	100,97	360	148,59	375	240,67	390	532,21
316	21,59	331	56,52	346	104,14	361	151,77	376	247,02	391	557,61
317	23,16	332	59,69	347	107,32	362	158,12	377	253,37	392	582,68
318	24,77	333	62,87	348	110,49	363	164,47	378	266,07	393	608,08
319	26,34	334	66,04	349	113,67	364	170,82	379	278,77	394	633,48
320	27,94	335	69,22	350	116,84	365	177,17	380	291,47	395	658,88
321	29,51	336	72,39	351	120,02	366	183,52	381	304,17		
322	31,12	337	75,57	352	123,19	367	189,87	382	329,57		
323	32,69	338	78,74	353	126,37	368	196,22	383	354,97		

Cord Diameter w=6,99 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
425	113,67	434	142,24	443	189,80	452	291,47	461	405,26	470	532,26
426	116,84	435	145,42	444	196,22	453	304,17	462	417,96	471	557,66
427	120,02	436	148,59	445	202,57	454	316,87	463	430,66	472	582,68
428	123,19	437	151,77	446	215,27	455	329,57	464	443,36	473	608,08
429	126,37	438	158,12	447	227,97	456	342,27	465	456,06	474	633,48
430	129,54	439	164,47	448	240,67	457	354,97	466	468,76	475	658,88
431	132,72	440	170,82	449	253,37	458	367,67	467	481,46		
432	135,89	441	177,17	450	266,07	459	380,37	468	494,16		
433	139,07	442	183,52	451	278,77	460	393,07	469	506,86		

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	W Cross section	Radial Fitting					Axial Fitting		R max
		L Dynamic +0,05 -0,0	L1 Static +0,05 -0,0	G1 +0,2 -0,0	G2 +0,2 -0,0	G3 +0,2 -0,0	L1 +0,05 -0,0	G4 +0,2 -0,0	
Q4004 Q4050	1,78	1,5	1,4	2,0	3,4	4,8	1,4	2,0	0,2
Q4102 Q4178	2,62	2,3	2,25	3,0	4,4	5,8	2,25	3,0	0,3
Q4201 Q4284	3,53	3,2	3,1	4,0	5,4	6,8	3,1	4,0	0,4
Q4309 Q4395	5,33	4,9	4,75	6,0	7,7	9,4	4,75	6,0	0,4
Q4425 Q4475	6,99	6,4	6,2	8,0	10,5	13	6,2	8,8	0,6

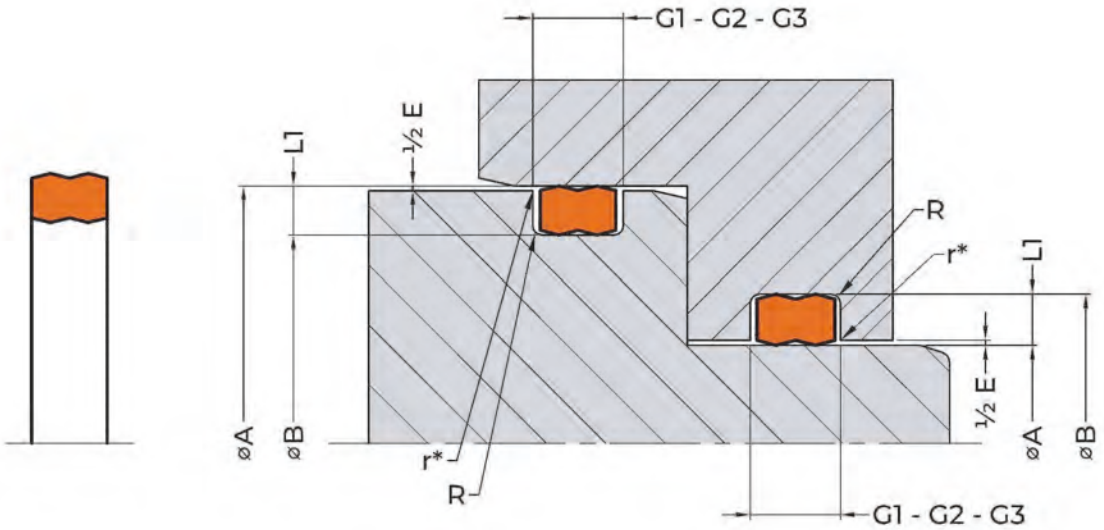
See page 01.06 E 01.07 for material selection

O-ring and Q-ring have the same dimensions, for denomination add "4" before serie number. See example below.
See page 02.01/02.02/02.03 for series numbers.

DENOMINATION EXAMPLE

O-ring 324 = 34,29 x 5,33
Q-ring 4324 = 34,29 x 5,33

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Suggested cross section

Serie		Section	Groove Width		Groove Length			*E	R
OSR1	OSR2	L1	ØB	ØB	G1	G2	G3	max	max
		Static	Static	Static					
Rod	Piston	+0,05 -0,0	h9 Piston	H9 Rod	+0,2 -0,0	+0,2 -0,0	+0,2 -0,0		
000		1,3	A - 2,6	A + 2,6	2,4	3,8	5,2	0,20	0,2
100		2,0	A - 4,0	A + 4,0	3,6	4,7	6,2	0,20	0,3
200		2,7	A - 5,4	A + 5,4	4,8	6,0	7,7	0,25	0,4
300		4,3	A - 8,6	A + 8,6	7,1	8,7	10,8	0,28	04
400		5,8	A - 11,6	A + 11,6	9,5	12,0	14,7	0,40	0,6

*** Max diametral gap**
The values above mantion for mat. 610, 850 and 870, for operating temperature of 60°C.
For high pressure or temperature, please contact our Technical Department.
For material selection please check pages 01.06 / 01.07

DENOMINATION EXAMPLE

Type : OSR1
Application : Rod
Diameter A : Ø 50,0 mm
Fluid : Hydraulic oil

OSR1 870 50X55,4X6

Type
Seal material code
Diameter ØA
Diameter ØB
Groove height

DENOMINATION EXAMPLE

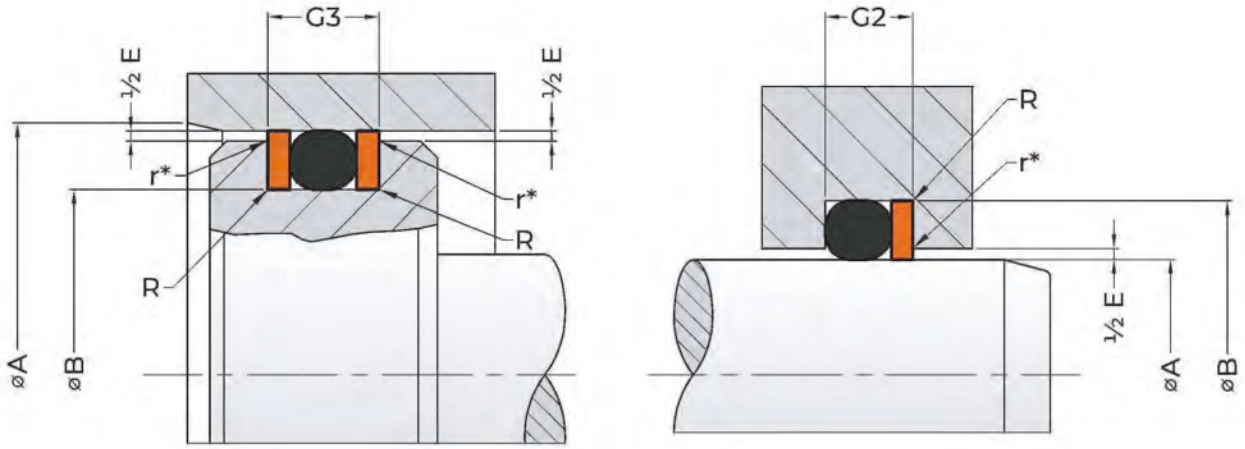
Type : OSR2
Application : Piston
Diameter A : Ø 60,0 mm
Fluid : Hydraulic oil

OSR2 870 60X53,8X6

Type
Seal material code
Diameter ØA
Diameter ØB
Groove height

O-Ring Section	O-Ring Hardness	E Diametral Gap						
		4 MPa	7 MPa	10 MPa	14 MPa	18 MPa	21 MPa	35 MPa
1,78	70 Shore A	0,15	0,10	0,05	-	-	-	-
2,62		0,18	0,13	0,08	-	-	-	-
3,53		0,20	0,15	0,10	-	-	-	-
5,33		0,25	0,18	0,13	-	-	-	-
6,99		0,30	0,20	0,15	-	-	-	-
1,78	80 Shore A	0,20	0,15	0,10	0,05	0,03	-	-
2,62		0,25	0,18	0,13	0,08	0,04	-	-
3,53		0,30	0,20	0,15	0,10	0,05	-	-
5,33		0,35	0,25	0,18	0,13	0,06	-	-
6,99		0,40	0,30	0,20	0,15	0,07	-	-
1,78	90 Shore A	0,25	0,20	0,13	0,10	0,08	0,05	0,03
2,62		0,30	0,25	0,18	0,13	0,10	0,08	0,04
3,53		0,40	0,30	0,20	0,15	0,13	0,10	0.05
5,33		0,45	0,35	0,25	0,18	0,15	0,13	0,06
6,99		0,50	0,40	0,30	0,20	0,18	0,15	0,07

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Back up rings can be supplied for any diameter.

Serie Piston	Serie Rod	Section O-Ring W	Section Back-up Ring S	Section Back-up Ring T	Groove Width Piston ØB h9	Groove Width Rod ØB H9	Groove Length G2 +0,2 -0,0	Groove Length G3 +0,2 -0,0	E** max	R max
72*00	**71*00**	1,78	1,45	1,4	A-2,9	A+2,9	3,8	5,2	0,13	0,2
72*01	**71*01**	2,62	2,25	1,4	A-4,5	A+4,5	4,7	6,2	0,13	0,3
72*02	**71*02**	3,53	3,1	1,4	A-6,2	A+6,2	6,0	7,7	0,15	0,4
72*03	**71*03**	5,33	4,7	1,7	A-9,4	A+9,4	8,7	10,8	0,17	0,4
72*04	**71*04**	6,99	6,1	2,5	A-12,2	A+12,2	12,0	14,7	0,25	0,6

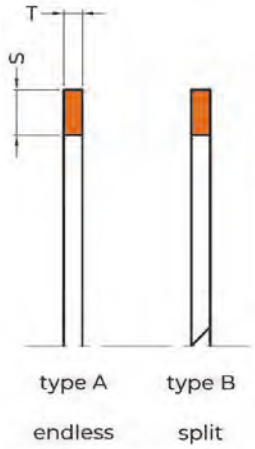
*** To choose between type A or B refer to the image below**
**** Max . diametral gap for pressure up to 45 MPa**
For higher pressure please contact our Technical Department

DENOMINATION EXAMPLE

Rod : Ø 90,0 mm
Serie : 02
Type : A (endless)

71A 02 - 00900 - 550
Type
Serie
Ref. (Ø rod x 10)
Seal material code

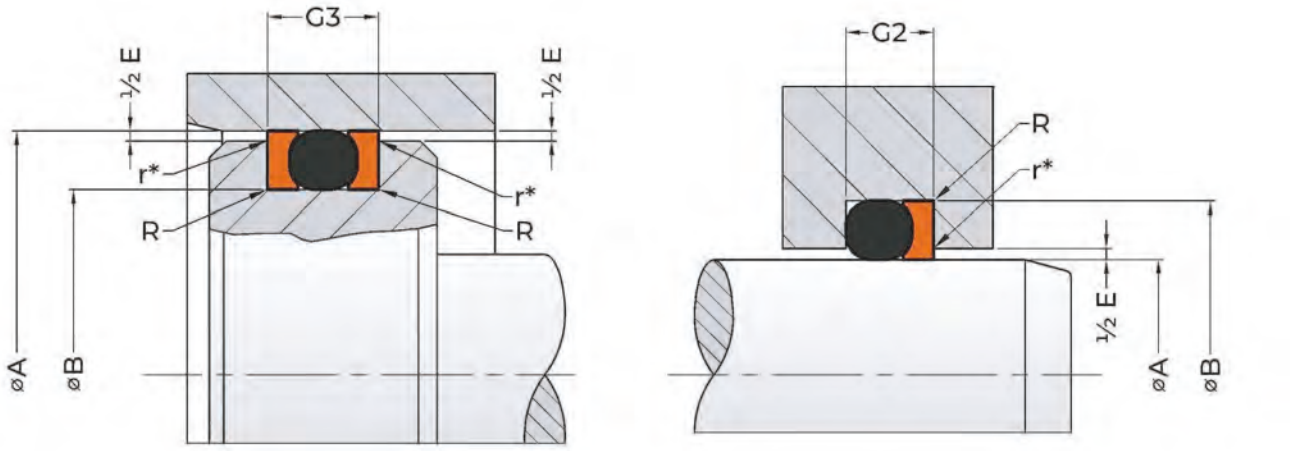
Cutting types



In case of groove dimensions not included in the table, identify the product as: 71A9 or 72A9

71A9 550 80X86,5X1,4
Type
Seal material code
Diameter ØA
Diameter ØB
Thickness T

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Back up rings can be supplied for any diameter.

Serie Piston	Serie Rod	Section O-Ring W	Section Back-up Ring S	Section Back-up Ring T	Groove Width Piston ØB h9	Groove Width Rod ØB H9	Groove Length G2 +0,2 -0,0	Groove Length G3 +0,2 -0,0	E** max	R max
74*00	**73*00**	1,78	1,45	1,4	A-2,9	A+2,9	3,8	5,2	0,13	0,2
74*01	**73*01**	2,62	2,25	1,4	A-4,5	A+4,5	4,7	6,2	0,13	0,3
74*02	**73*02**	3,53	3,1	1,4	A-6,2	A+6,2	6,0	7,7	0,15	0,4
74*03	**73*03**	5,33	4,7	1,7	A-9,4	A+9,4	8,7	10,8	0,17	0,4
74*04	**73*04**	6,99	6,1	2,5	A-12,2	A+12,2	12,0	14,7	0,25	0,6

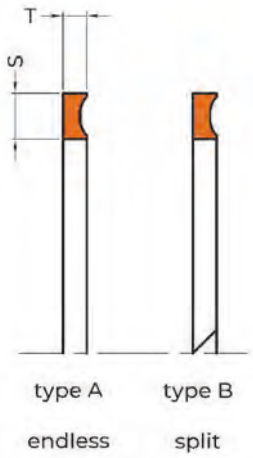
*** To choose between type A or B refer to the image below**
**** Max . diametral gap for pressure up to 45 MPa**
For higher pressure please contact our Technical Department

DENOMINATION EXAMPLE

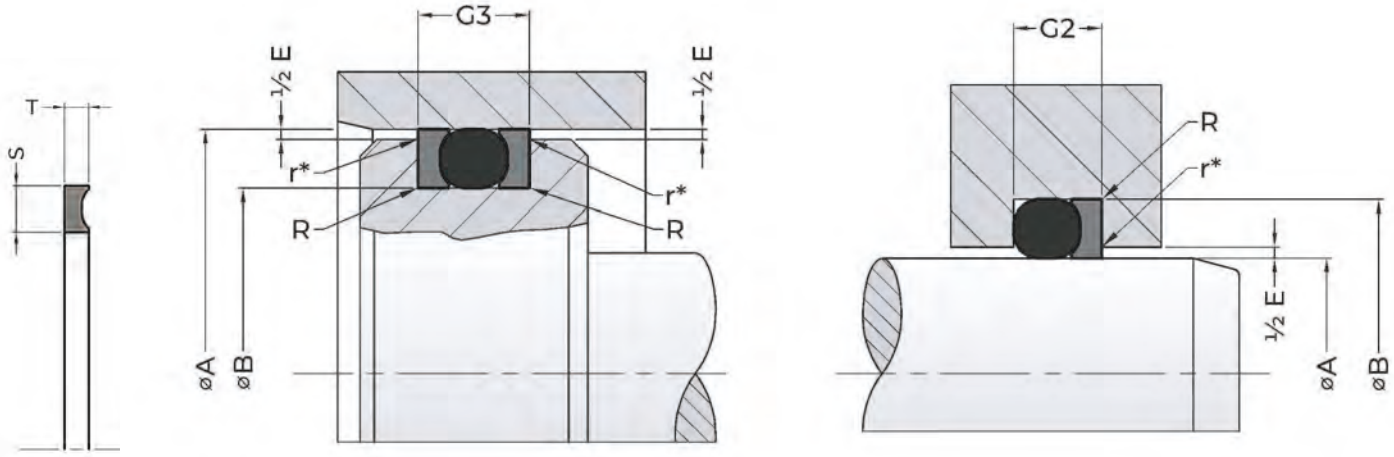
Rod : Ø 90,0 mm
Serie : 02
Type : A (endless)

73A 02 - 00900 - 550
Type
Serie
Ref. (Ø rod x 10)
Seal material code

Cutting types



GROOVE GEOMETRY & DIMENSION

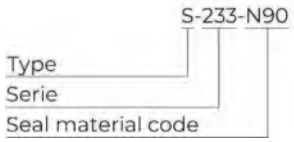


r* = rounded and free of burrs r=0,2 max

W O-Ring	S Back-up Ring	Groove Width ØB Piston h9	Groove Width ØB Rod H9	Groove Length G2 +0,2 -0,0	Groove Length G3 +0,2 -0,0	R max
1,78	**1,35**	A - 2,9	A + 2,9	3,8	5,2	0,2
2,62	**2,18**	A - 4,5	A + 4,5	4,7	6,2	0,3
3,53	**3,0**	A - 6,2	A + 6,2	6,0	7,7	0,4
5,33	**4,65**	A - 9,4	A + 9,4	8,7	10,8	0,4
6,99	**5,99**	A - 12,2	A + 12,2	12	14,7	0,6

DENOMINATION EXAMPLE

Type :	Concave back-up
Serie :	3,00 mm
Rod :	Øi 73,18 mm



S 1,35 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
-	-	010	6,73	019	21,08	028	35,38	037	63,96	046	108,41
-	-	011	8,31	020	22,68	029	38,56	038	67,13	047	114,76
-	-	012	9,91	021	24,26	030	41,73	039	70,31	048	121,11
004	2,44	013	11,56	022	25,86	031	44,91	040	73,48	049	127,46
005	3,23	014	13,16	023	27,43	032	48,08	041	76,66	050	133,81
006	3,56	015	14,73	024	29,03	033	51,26	042	83,01	-	-
007	4,34	016	16,33	025	30,61	034	54,43	043	89,36	-	-
008	5,13	017	17,91	026	32,21	035	57,61	044	95,71	-	-
009	5,94	018	19,51	027	33,78	036	60,78	045	102,06	-	-

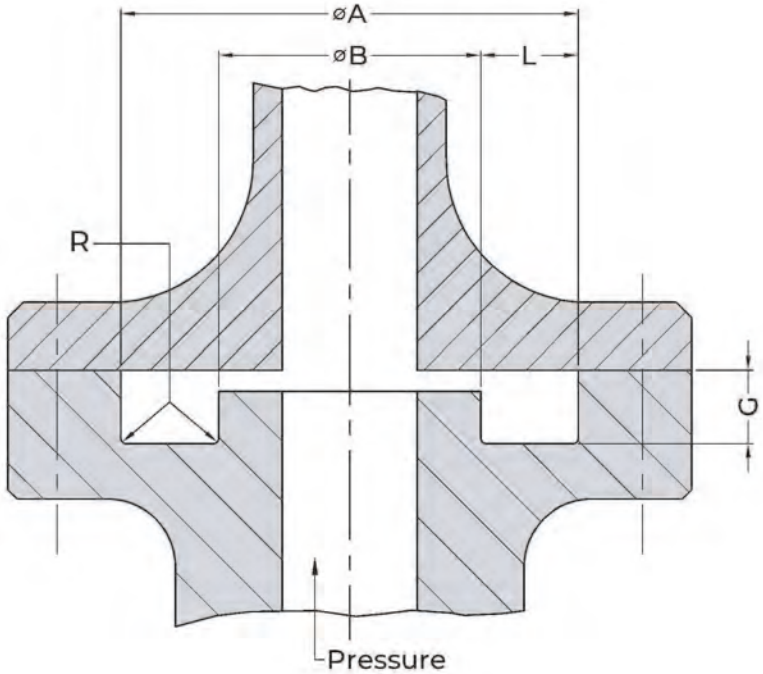
S 2,18 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
102	1,96	115	17,83	128	38,56	141	59,21	154	95,71	167	178,26
103	2,77	116	19,43	129	40,16	142	60,78	155	102,06	168	184,61
104	3,56	117	21,11	130	41,73	143	62,38	156	108,41	169	190,96
105	4,34	118	22,68	131	43,33	144	63,96	157	114,76	170	197,31
106	5,13	119	24,28	132	44,91	145	65,56	158	121,11	171	203,86
107	5,94	120	25,86	133	46,51	146	67,13	159	127,46	172	210,01
108	6,73	121	27,46	134	48,08	147	68,73	160	133,81	173	216,36
109	8,31	122	29,03	135	49,68	148	70,31	161	140,16	174	222,71
110	9,91	123	30,63	136	51,26	149	71,91	162	146,51	175	229,06
111	11,48	124	32,21	137	52,86	150	73,48	163	152,86	176	235,41
112	13,08	125	33,81	138	54,43	151	76,66	164	159,21	177	241,76
113	14,66	126	35,38	139	56,03	152	83,01	165	165,56	178	248,11
114	16,26	127	36,98	140	57,61	153	89,36	166	171,91		

S 3,00 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
201	5,13	215	27,38	229	60,88	243	104,93	257	149,68	271	235,41
202	6,73	216	28,98	230	64,06	244	108,10	258	152,86	272	241,76
203	8,30	217	30,56	231	66,83	245	111,28	259	159,21	273	248,11
204	9,90	218	32,16	232	70,00	246	114,45	260	165,56	274	254,46
205	11,56	219	33,88	233	73,18	247	117,63	261	171,91	275	267,16
206	13,16	220	35,48	234	76,35	248	121,11	262	178,26	276	279,86
207	14,73	221	37,06	235	79,50	249	124,28	263	184,61	277	292,56
208	16,33	222	38,66	236	82,70	250	127,46	264	190,96	278	305,26
209	17,90	223	41,83	237	85,88	251	130,63	265	197,31	279	330,66
210	19,46	224	45,01	238	89,05	252	133,81	266	203,66	280	365,05
211	21,03	225	48,18	239	92,23	253	136,98	267	210,01	281	381,46
212	22,63	226	51,36	240	95,40	254	140,16	268	216,36	282	406,12
213	24,21	227	54,53	241	95,58	255	143,33	269	222,71	283	431,52
214	25,81	228	57,71	242	101,75	256	146,51	270	229,06	284	456,92

S 4,65 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
309	11,43	324	35,26	339	83,13	354	130,89	369	203,91	384	381,71
310	13,03	325	38,43	340	86,31	355	134,09	370	210,26	385	406,60
311	14,60	326	41,61	341	89,48	356	137,24	371	216,61	386	432,00
312	16,20	327	44,78	342	92,66	357	140,41	372	222,96	387	457,40
313	17,78	328	47,96	343	95,83	358	143,59	373	229,31	388	482,75
314	19,38	329	51,13	344	99,01	359	146,76	374	235,66	389	508,15
315	20,96	330	54,31	345	102,31	360	149,94	375	242,01	390	533,55
316	22,56	331	57,61	346	105,49	361	153,11	376	248,36	391	558,95
317	24,13	332	60,78	347	108,66	362	159,46	377	254,71	392	584,02
318	25,73	333	63,96	348	111,84	363	165,81	378	267,41	393	609,42
319	27,31	334	67,13	349	115,01	364	172,16	379	280,11	394	634,82
320	28,91	335	70,31	350	118,19	365	178,51	380	292,81	395	660,22
321	30,42	336	73,48	351	121,36	366	184,86	381	305,51		
322	32,08	337	76,66	352	124,54	367	191,21	382	330,91		
323	33,43	338	79,83	353	127,71	368	197,56	383	356,31		

S 5,99 mm											
Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm	Serie	Internal diameter mm
425	115,60	434	144,17	443	191,11	452	292,71	461	406,50	470	533,50
426	118,77	435	147,35	444	197,46	453	305,41	462	419,2	471	558,90
427	121,95	436	150,52	445	203,81	454	318,11	463	431,90	472	584,30
428	125,20	437	153,70	446	216,51	455	330,81	464	444,60	473	609,70
429	128,30	438	159,36	447	229,21	456	343,51	465	457,30	474	635,10
430	131,47	439	165,71	448	241,91	457	356,21	466	470,00	475	660,50
431	134,65	440	172,06	449	254,61	458	368,91	467	482,70		
432	137,82	441	178,41	450	267,31	459	381,61	468	495,40		
433	141,00	442	184,76	451	280,01	460	394,31	469	508,11		

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	Serie	C/S	ØA Available H11	ØA Suggested H11	ØB	G	L +0,2 -0,0	R max
68A00 **68A10**	000	**64A00** **64A10**	000	10,0 ÷ 40,0 10,0 ÷ 40,0	10,0 ÷ 13,9 10,0 ÷ 13,9	A - 4,8 A - 7,6	1,45 + 0,03 1,45 + 0,03	2,4 3,8	0,4 0,4
68A01 **68A11**	100	**64A01** **64A11**	100	13,0 ÷ 200,0 13,0 ÷ 200,0	14,0 ÷ 24,9 14,0 ÷ 24,9	A - 7,2 A - 9,3	2,25 + 0,05 2,25 + 0,05	3,6 4,65	0,4 0,4
68A02 **68A12**	200	**64A02** **64A12**	200	18,0 ÷ 400,0 18,0 ÷ 400,0	25,0 ÷ 45,9 25,0 ÷ 45,9	A - 9,6 A - 11,4	3,1 + 0,08 3,1 + 0,08	4,8 5,7	0,6 0,6
68A03 **68A13**	300	**64A03** **64A13**	300	28,0 ÷ 700,0 28,0 ÷ 700,0	46,0 ÷ 124,9 46,0 ÷ 124,9	A - 14,2 A - 17,0	4,7 + 0,1 4,7 + 0,1	7,1 8,5	0,8 0,8
68A04 **68A14**	400	**64A04** **64A14**	400	45,0 ÷ 1000,0 45,0 ÷ 1000,0	125,0 ÷ 999,9 125,0 ÷ 999,9	A - 19,0 A - 22,4	6,1 + 0,15 6,1 + 0,15	9,5 11,2	0,8 0,8
68A05 **68A15**	500	**64A05** **64A15**	500	120,0 ÷ 2500,0 120,0 ÷ 2500,0	1000 ÷ 2500 1000 ÷ 2500	A - 30,0 A - 31,6	9,5 + 0,2 9,5 + 0,2	15,0 15,8	0,8 0,8

For seal material selection please refer to pages 01.08 and 01.09

DENOMINATION EXAMPLE

Diameter A : Ø 45,0 mm
Cross section : 200
Fluid : Hydraulic oil

68A 02 - 00450 - 190 - S00

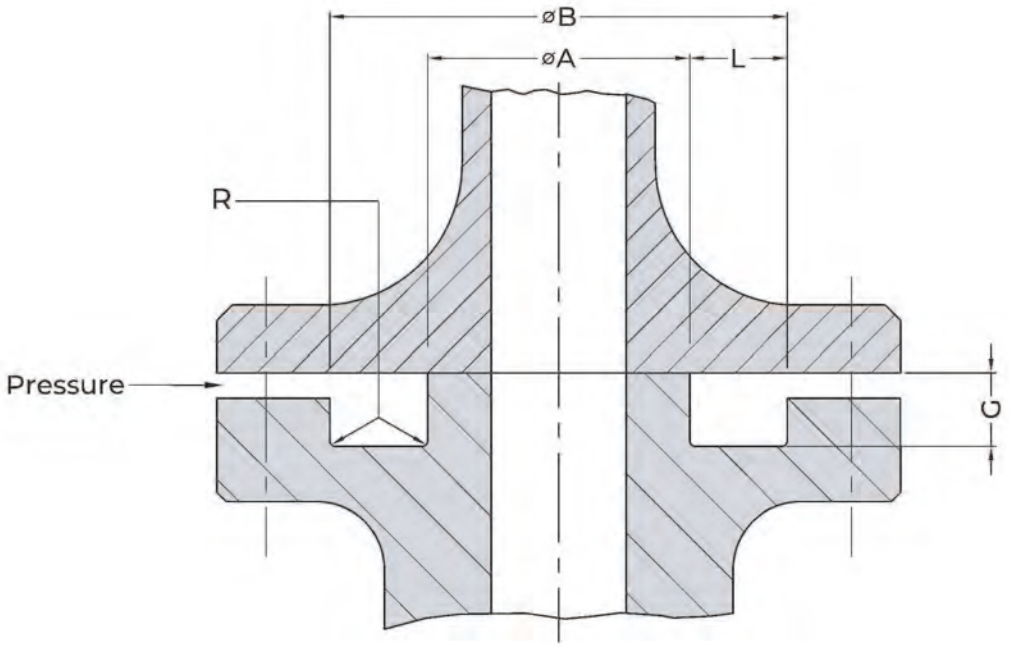
- Type
- Serie
- Ref. (Ø A x 10)
- Seal material code
- Spring material code

In case of groove dimensions not included in the table, identify the product as: 68A9 or 64A9

68A9 190-S00 45X35,4X3,4

- Type
- Seal material code
- Spring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	Serie	C/S	ØA Available h11	ØA Suggested h11	ØB	G	L +0,2 -0,0	R max
69A00 **69A10**	000	**63A00** **63A10**	000	3,0 ÷ 40,0 3,0 ÷ 40,0	3,0 ÷ 9,9 3,0 ÷ 9,9	A + 4,8 A + 7,6	1,45 + 0,03 1,45 + 0,03	2,4 3,8	0,4 0,4
69A01 **69A11**	100	**63A01** **63A11**	100	8,0 ÷ 200,0 8,0 ÷ 200,0	10,0 ÷ 19,9 10,0 ÷ 19,9	A + 7,2 A + 9,3	2,25 + 0,05 2,25 + 0,05	3,6 4,65	0,4 0,4
69A02 **69A12**	200	**63A02** **63A12**	200	12,0 ÷ 400,0 12,0 ÷ 400,0	20,0 ÷ 39,9 20,0 ÷ 39,9	A + 9,6 A + 11,4	3,1 + 0,08 3,1 + 0,08	4,8 5,7	0,6 0,6
69A03 **69A13**	300	**63A03** **63A13**	300	20,0 ÷ 700,0 20,0 ÷ 700,0	40,0 ÷ 119,9 40,0 ÷ 119,9	A + 14,2 A + 17,0	4,7 + 0,1 4,7 + 0,1	7,1 8,5	0,8 0,8
69A04 **69A14**	400	**63A04** **63A14**	400	35,0 ÷ 1000,0 35,0 ÷ 1000,0	120,0 ÷ 999,9 120,0 ÷ 999,9	A + 19,0 A + 22,4	6,1 + 0,15 6,1 + 0,15	9,5 11,2	0,8 0,8
69A05 **69A15**	500	**63A05** **63A15**	500	100,0 ÷ 2500,0 100,0 ÷ 2500,0	1000 ÷ 2500 1000 ÷ 2500	A + 30,0 A + 31,6	9,5 + 0,2 9,5 + 0,2	15,0 15,8	0,8 0,8

For seal material selection please refer to pages 01.08 and 01.09

DENOMINATION EXAMPLE

Diameter A : Ø 50,0 mm
Cross section : 300
Fluid : Hydraulic oil

69A 03 - 00500 - 190 - S00

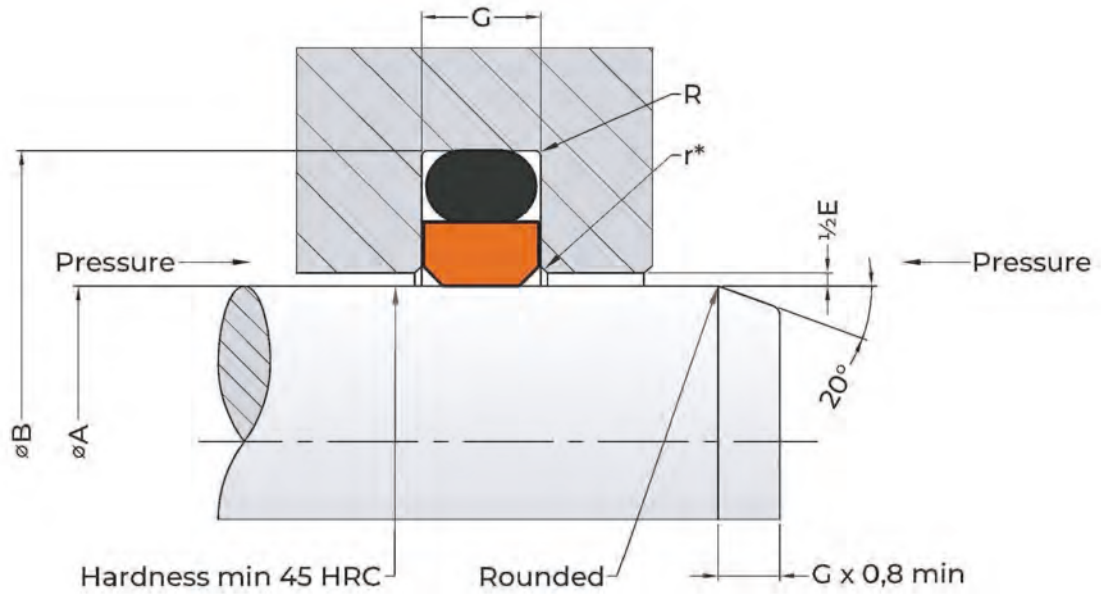
Type
Serie
Ref. (Ø A x 10)
Seal material code
Spring material code

In case of groove dimensions not included in the table, identify the product as: 68A9 or 64A9

69A9 190-S00 50X64,2X5

Type
Seal material code
Spring material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

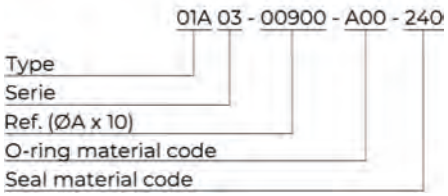
Serie		ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to			O-Ring
		Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
01A00	01B00	3 ÷ 7,9	8 ÷ 18,9	-	A + 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
01A01	01B01	8 ÷ 18,9	19 ÷ 37,9	-	A + 7,3	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
01A02	01B02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 10,7	4,2	0,8 ÷ 1,2	0,8	0,5	0,4	3,53
01A03	01B03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 15,1	6,3	1,2 ÷ 1,5	1,0	0,6	0,4	5,33
01A04	01B04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 20,5	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
01A05	01B05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 24,0	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
01A06	01B06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 27,3	9,5	2,0 ÷ 3,0	1,4	1,0	0,6	8,40
01A07	01B07	≥1000	-	650 ÷ 999,9	A + 38,0	13,8	2,5 ÷ 3,5	2,0	1,4	1,2	12,00

*** Tolerances for higher pressures (up to 80 MPa): H7 / f7.**

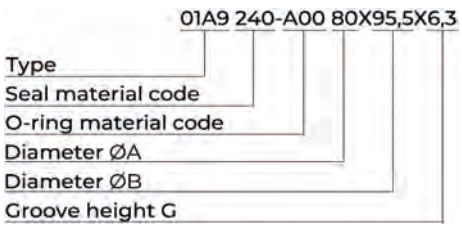
Minimum diameter for fitting in closed groove	
Serie	Diameter
01*00	12 mm
01*01	16 mm
01*02	19 mm
01*03	38 mm
01*04	70 mm
01*05	200 mm
01*06	256 mm
01*07	400 mm

DENOMINATION EXAMPLE

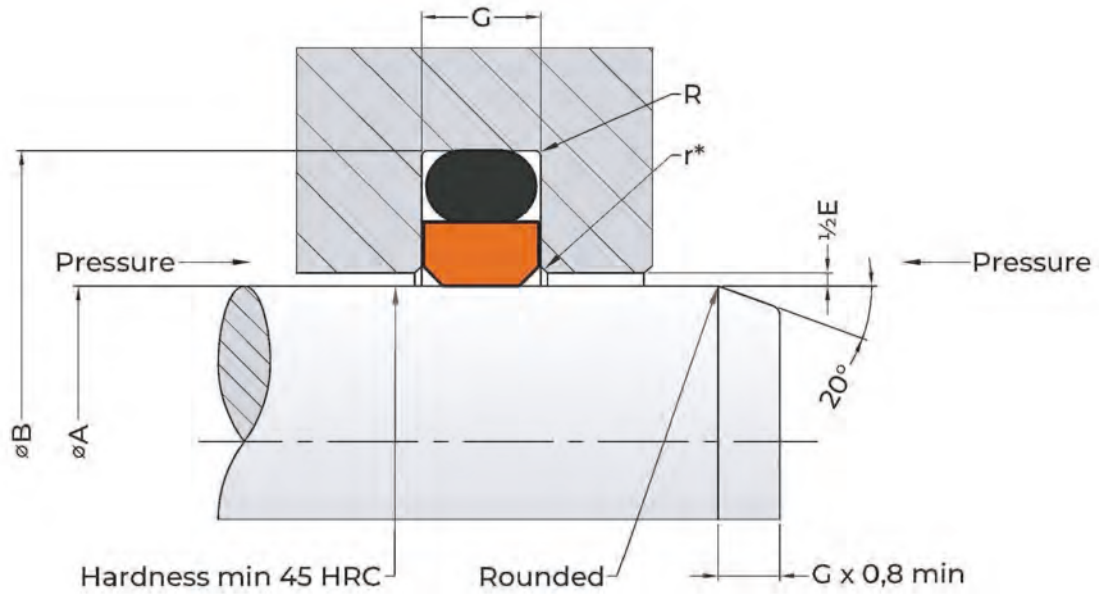
Rod : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 01A9 or 01B9



Installation groove specially designed for low friction pneumatic applications, using PRP 01A / 01B



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

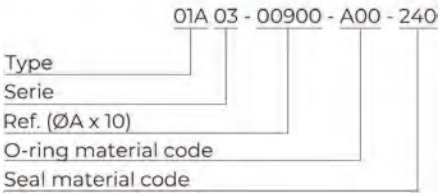
Serie		ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to 5 MPa	O-Ring
		Standard	Light duty	Heavy duty					
01A00	01B00	3 ÷ 7,9	8 ÷ 18,9	-	A + 5,0	2,2	0,3 ÷ 0,5	0,4	1,78
01A01	01B01	8 ÷ 18,9	19 ÷ 37,9	-	A + 8,0	3,2	0,5 ÷ 0,8	0,5	2,62
01A02	01B02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 11,5	4,2	0,8 ÷ 1,2	0,5	3,53
01A03	01B03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 16,5	6,3	1,2 ÷ 1,5	0,6	5,33
01A04	01B04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 22,3	8,1	1,5 ÷ 2,0	0,7	6,99
01A05	01B05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 26,3	8,1	1,5 ÷ 2,0	0,7	6,99
01A06	01B06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 30,0	9,5	2,0 ÷ 3,0	1,0	8,40
01A07	01B07	≥1000	-	650 ÷ 999,9	A + 40,0	13,8	2,5 ÷ 3,5	1,4	12,00

***Operating pressure 1,6 MPa (max 5 MPa)**

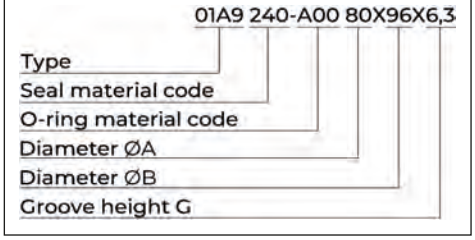
Minimum diameter for fitting in closed groove	
Serie	Diameter
01*00	12 mm
01*01	16 mm
01*02	19 mm
01*03	38 mm
01*04	70 mm
01*05	200 mm
01*06	256 mm
01*07	400 mm

DENOMINATION EXAMPLE

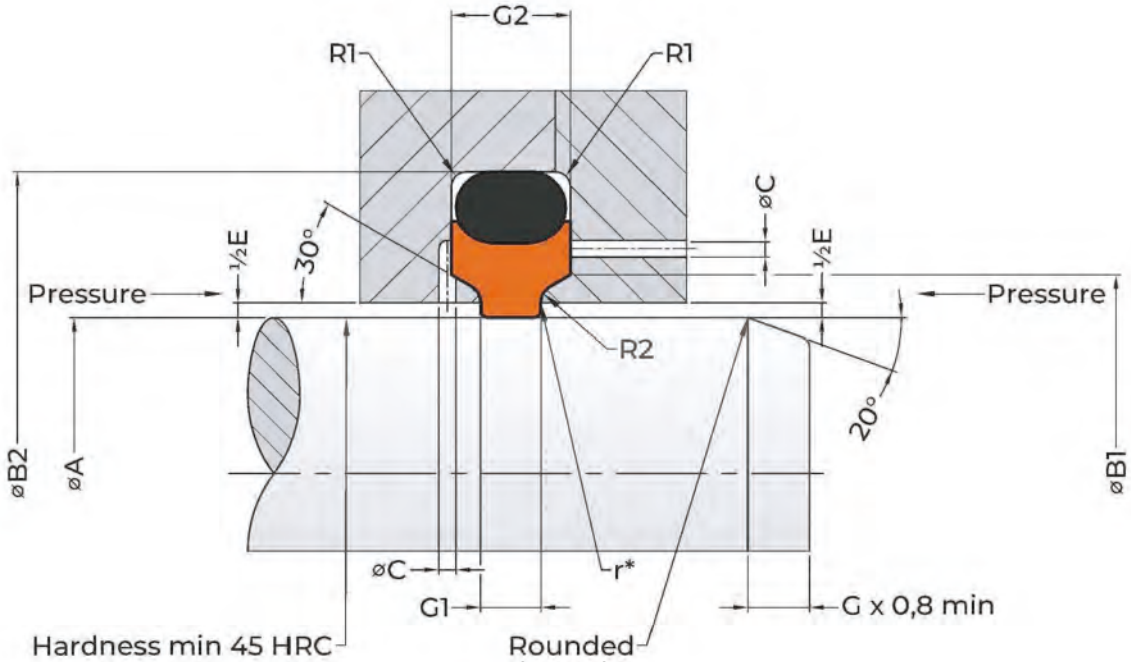
Rod : Ø 90,0 mm
Fluid : air
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 01A9 or 01B9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Rod		ØB1 Groove	ØB2 Groove	G1	G2	R1	R2	ØC **	O-Ring
	Available h9	Suggested h9	+0,0 -0,1	H9	+0,2 -0,0	+0,2 -0,0	max	±0,05	max	
01C01	6 ÷ 250	6 ÷ 59,9	A + 1,6	A + 8,0	1,8	3,2	0,5	0,3	0,5	2,62
01C02	10 ÷ 455	60 ÷ 132,9	A + 2,4	A + 11,0	2,2	4,2	0,7	0,5	0,6	3,53
01C03	30 ÷ 660	133 ÷ 329,9	A + 3,8	A + 15,5	3,2	6,3	0,8	1,0	1,0	5,33
01C04	110 ÷ 660	330 ÷ 654,9	A + 5,2	A + 21,0	4,2	8,1	0,8	1,2	1,1	6,99
01C05	650 ÷ 999,9	650 ÷ 999,9	A + 6,8	A + 28,0	6,3	9,5	0,8	1,2	2,0	8,40
01C06	750 ÷ 2600	1000 ÷ 2600	A + 9,2	A + 38,0	9,2	13,8	1,2	1,8	2,0	12,00

*** Tolerances for higher pressures (up to 80 MPa): H7 / f7**
****Hole required in applications where the seal is exposed to rapid pressure variations. Two pieces housing only.**

Serie	* E max		
	up to 10 MPa	up to 20 MPa	up to 40 MPa
01C01	0,7	0,4	0,3
01C02	0,8	0,5	0,4
01C03	1,0	0,6	0,4
01C04	1,2	0,7	0,5
01C05	1,4	0,9	0,6
01C06	2,0	1,4	1,1

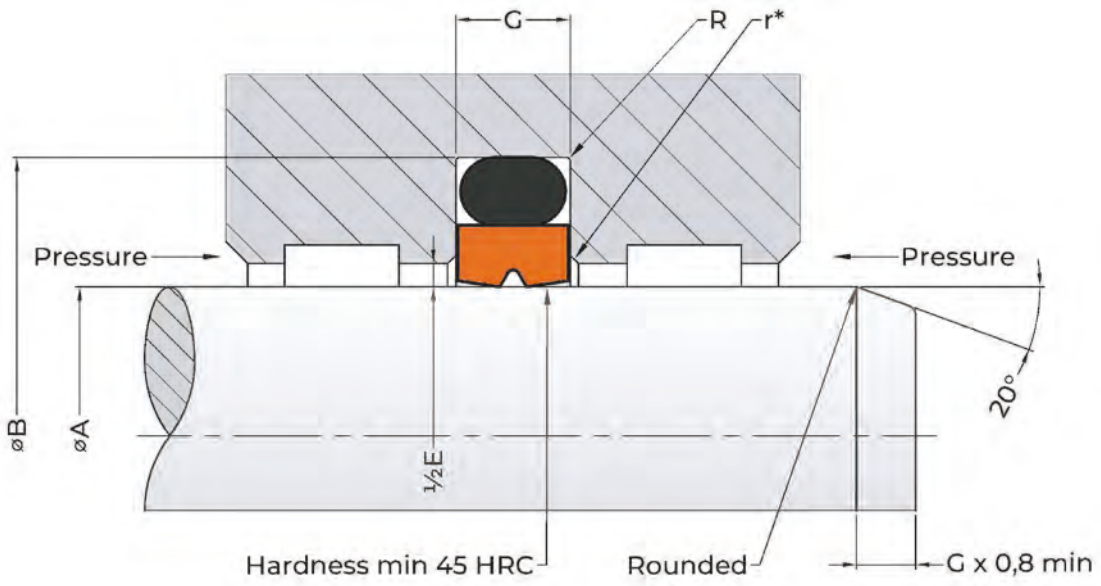
DENOMINATION EXAMPLE

Rod : Ø 50,0 mm
Fluid : hydraulic oil
Contact material : steel

01C 01 - 00500 - A00 - 240

- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

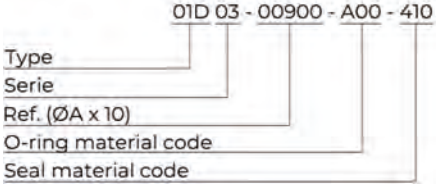
Serie	ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	30 MPa	
01D00	3 ÷ 7,9	8 ÷ 18,9	-	A + 5,0	2,2	0,4	0,5	0,4	0,3	1,78
01D01	8 ÷ 18,9	19 ÷ 37,9	-	A + 7,5	3,2	0,6	0,8	0,5	0,3	2,62
01D02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 11,0	4,2	1,0	0,9	0,5	0,4	3,53
01D03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 15,5	6,3	1,3	1,1	0,6	0,4	5,33
01D04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 21,0	8,1	1,8	1,2	0,7	0,5	6,99
01D05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 24,5	8,1	1,8	1,2	0,7	0,5	6,99
01D06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 27,3	9,5	2,5	1,3	1,0	0,6	8,40

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**
Recommended for stroke ≤ 3 x G (Groove width) and reciprocating movement above 5 Hz.

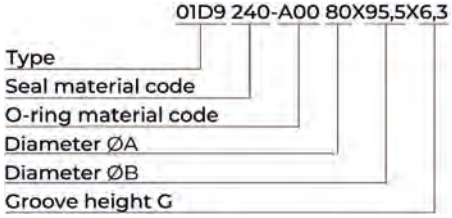
Minimum diameter for fitting in closed groove	
Serie	Diameter
01D00	12 mm
01D01	16 mm
01D02	19 mm
01D03	38 mm
01D04	70 mm
01D05	200 mm
01D06	256 mm

DENOMINATION EXAMPLE

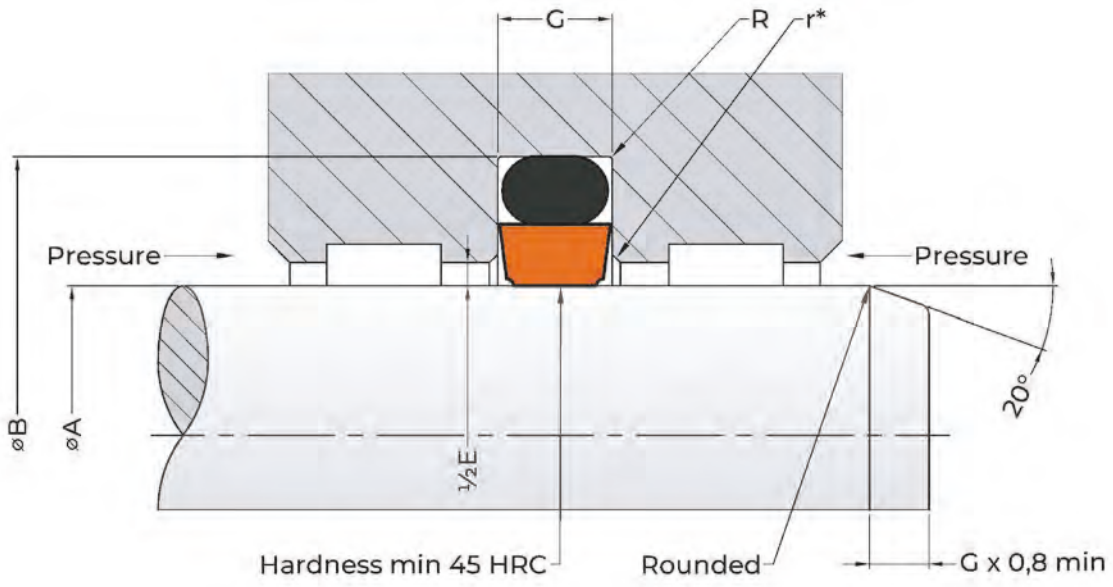
Rod : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 01D9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

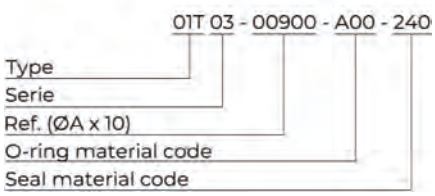
Serie	ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
01T00	3 ÷ 7,9	8 ÷ 18,9	-	A + 4,9	2,2	0,3 ÷ 0,5	0,8	0,6	0,4	1,78
01T01	8 ÷ 18,9	19 ÷ 37,9	-	A + 7,3	3,2	0,5 ÷ 0,8	1,2	1,0	0,6	2,62
01T02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 10,7	4,2	0,8 ÷ 1,2	1,4	1,0	0,6	3,53
01T03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 15,1	6,3	1,2 ÷ 1,5	1,6	1,2	0,8	5,33
01T04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 20,5	8,1	1,5 ÷ 2,0	1,6	1,2	0,8	6,99
01T05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 24,0	8,1	1,5 ÷ 2,0	1,8	1,4	1,0	6,99
01T06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 27,3	9,5	2,0 ÷ 3,0	2,0	1,6	1,2	8,40
01T07	≥1000	-	650 ÷ 999,9	A + 38,0	13,8	2,5 ÷ 3,5	2,4	1,8	1,4	12,00

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

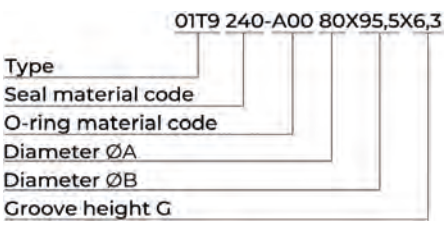
Minimum diameter for fitting in closed groove	
Serie	Diameter
01T00	12 mm
01T01	16 mm
01T02	19 mm
01T03	38 mm
01T04	70 mm
01T05	200 mm
01T06	256 mm
01T07	400 mm

DENOMINATION EXAMPLE

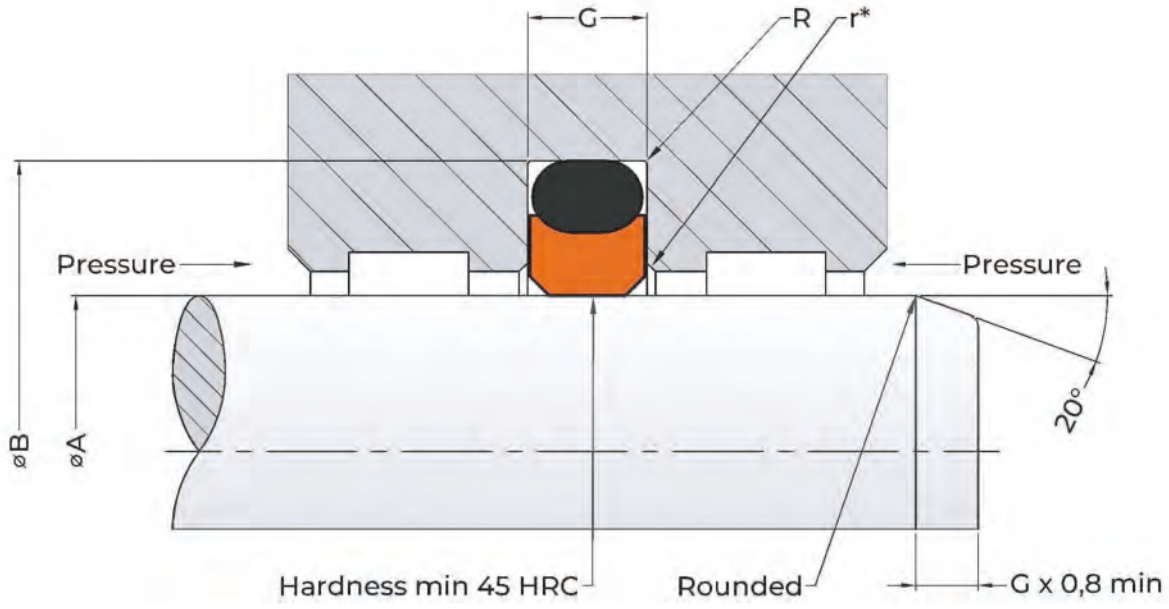
Rod : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 01T9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

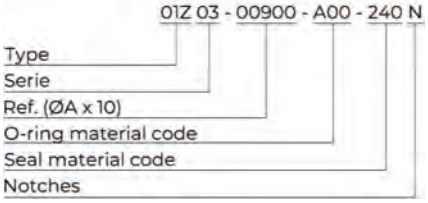
Serie	ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
01Z00	3 ÷ 7,9	8 ÷ 18,9	-	A + 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
01Z01	8 ÷ 18,9	19 ÷ 37,9	-	A + 7,3	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
01Z02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 10,7	4,2	0,8 ÷ 1,2	0,8	0,5	0,4	3,53
01Z03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 15,1	6,3	1,2 ÷ 1,5	1,0	0,6	0,4	5,33
01Z04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 20,5	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
01Z05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 24,0	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
01Z06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 27,3	9,5	2,0 ÷ 3,0	1,4	1,0	0,6	8,40
01Z07	≥1000	-	650 ÷ 999,9	A + 38,0	13,8	2,5 ÷ 3,5	2,0	1,4	1,2	12,00

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

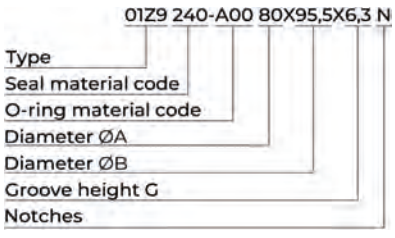
Minimum diameter for fitting in closed groove	
Serie	Diameter
01Z00	12 mm
01Z01	16 mm
01Z02	19 mm
01Z03	38 mm
01Z04	70 mm
01Z05	200 mm
01Z06	256 mm
01Z07	400 mm

DENOMINATION EXAMPLE

Rod : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel

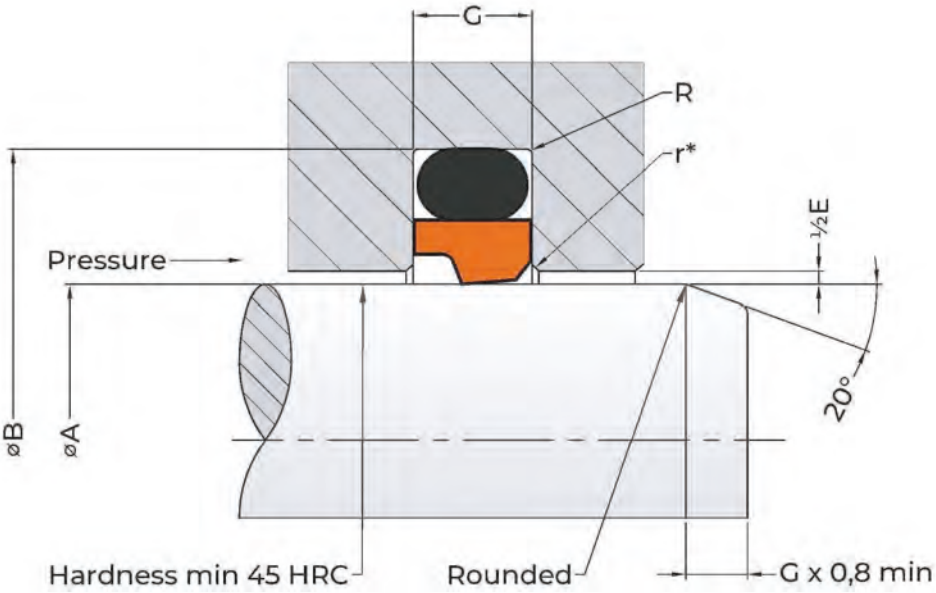


In case of groove dimensions not included in the table, identify the product as: 01Z9



Lateral notches assure fast seal reaction in case of pressure direction changes
Notches are standardized for seal with a diameter larger than 20 mm
In case of groove dimensions not included in the table, identify the product as: 01Z9

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
11A00	3 ÷ 7,9	8 ÷ 18,9	-	A + 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
11A01	8 ÷ 18,9	19 ÷ 37,9	-	A + 7,3	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
11A02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 10,7	4,2	0,8 ÷ 1,2	1,0	0,6	0,4	3,53
11A03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 15,1	6,3	1,2 ÷ 1,5	1,4	0,8	0,5	5,33
11A04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 20,5	8,1	1,5 ÷ 2,0	1,6	1,2	0,7	6,99
11A05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 24,0	8,1	1,5 ÷ 2,0	1,8	1,4	0,8	6,99
11A06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 27,3	9,5	2,0 ÷ 3,0	2,0	1,6	1,0	8,40
11A07	≥1000	-	650 ÷ 999,9	A + 38,0	13,8	2,5 ÷ 3,5	2,4	1,8	1,2	12,00

*** Tolerances for higher pressures (up to 60 Mpa): H7 / f7.**

Minimum diameter for fitting in closed groove	
Serie	Diameter
11A00	12 mm
11A01	16 mm
11A02	19 mm
11A03	38 mm
11A04	70 mm
11A05	200 mm
11A06	256 mm
11A07	400 mm

DENOMINATION EXAMPLE

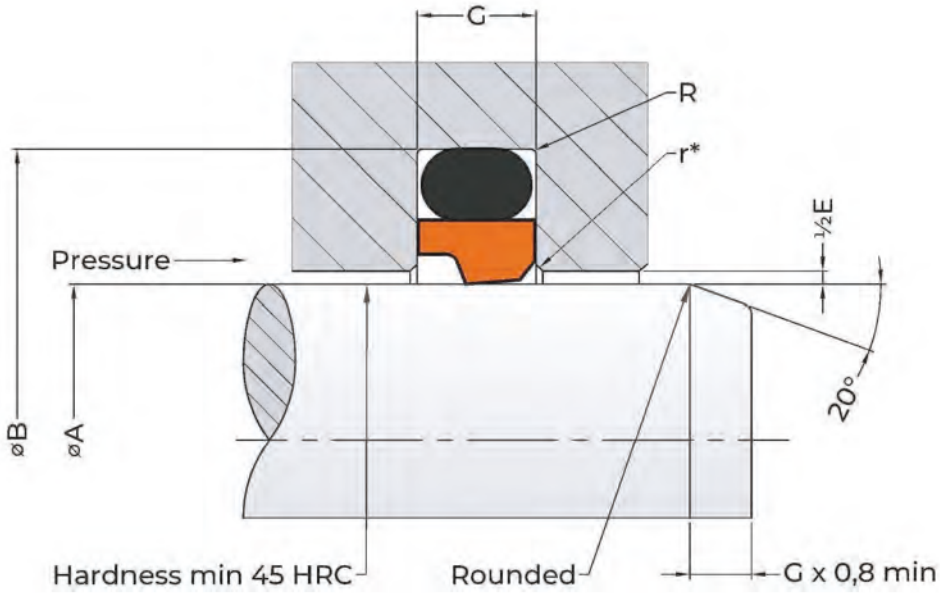
Rod : Ø 60,3 mm
Fluid : hydraulic oil
Contact material : steel

11A 03 - 00603 - A00 - 240
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

In case of groove dimensions not included in the table, identify the product as: 11A9

11A9 240-A00 80X95,5X6,3
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

Installation groove specially designed for low friction pneumatic applications, using PRP 11A



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

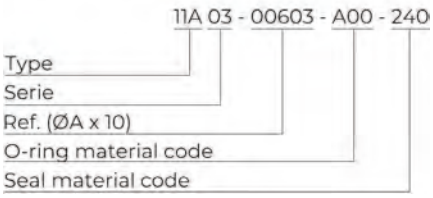
Serie	ØA Rod h9			ØB Groove H9	G +0,15 -0,0	R	E* Max. Diametral gap up to 5 MPa	O-Ring
	Standard	Light duty	Heavy duty					
11A00	3 ÷ 7,9	8 ÷ 18,9	-	A + 5,0	2,2	0,3 ÷ 0,5	0,6	1,78
11A01	8 ÷ 18,9	19 ÷ 37,9	-	A + 8,0	3,2	0,5 ÷ 0,8	0,8	2,62
11A02	19 ÷ 37,9	38 ÷ 199,9	8 ÷ 18,9	A + 11,5	4,2	0,8 ÷ 1,2	1,0	3,53
11A03	38 ÷ 199,9	200 ÷ 255,9	19 ÷ 37,9	A + 16,5	6,3	1,2 ÷ 1,5	1,4	5,33
11A04	200 ÷ 255,9	256 ÷ 649,9	38 ÷ 199,9	A + 22,3	8,1	1,5 ÷ 2,0	1,6	6,99
11A05	256 ÷ 649,9	650 ÷ 999,9	200 ÷ 255,9	A + 25,8	8,1	1,5 ÷ 2,0	1,8	6,99
11A06	650 ÷ 999,9	≥1000	256 ÷ 649,9	A + 30,0	9,5	2,0 ÷ 3,0	2,0	8,40
11A07	≥1000	-	650 ÷ 999,9	A + 40,0	13,8	2,5 ÷ 3,5	2,4	12,00

***Operating pressure 1,6 MPa (max 5 MPa)**

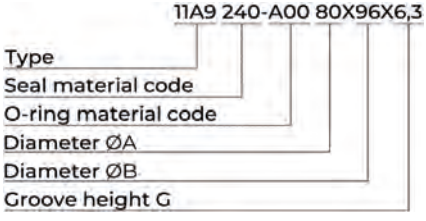
Minimum diameter for fitting in closed groove	
Serie	Diameter
11A00	12 mm
11A01	16 mm
11A02	19 mm
11A03	38 mm
11A04	70 mm
11A05	200 mm
11A06	256 mm
11A07	400 mm

DENOMINATION EXAMPLE

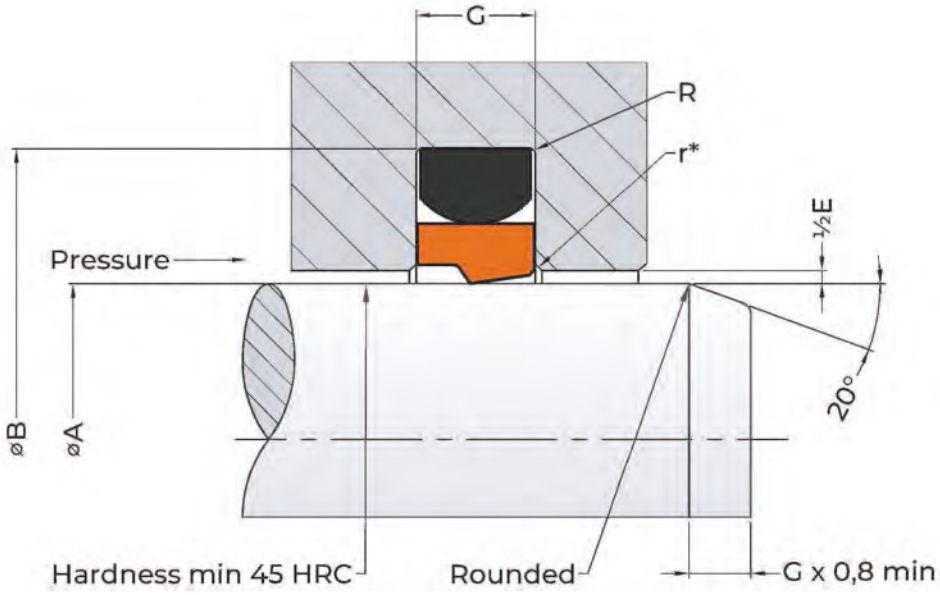
Rod : Ø 60,3 mm
Fluid : air
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 11A9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Rod h8	ØB Groove H8	G +0,2 -0,0	R	E* Max. Diametral gap up to		
					15 MPa	25 MPa	40 MPa
11S00	20 ÷ 39,9	A + 10,0	5,0	0,4	1,5	1,0	0,8
11S01	40 ÷ 74,9	A + 15,0	7,5	0,4	1,5	1,0	0,8
11S02	75 ÷ 209,9	A + 20,0	10,0	0,4	1,5	1,0	0,8
11S03	210 ÷ 309,9	A + 25,0	12,5	0,4	1,5	1,3	1,0
11S04	310 ÷539,9	A + 30,0	15,0	1,8	1,5	1,3	1,0
11S05	510 ÷ 699,9	A + 35,0	17,5	1,2	1,5	1,3	1,0
11S06	700 ÷ 1150	A + 40,0	20,0	1,2	1,6	1,4	1,1

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**
Please ask our Technical Department for minimum fitting diameter of seal into closed housing

DENOMINATION EXAMPLE

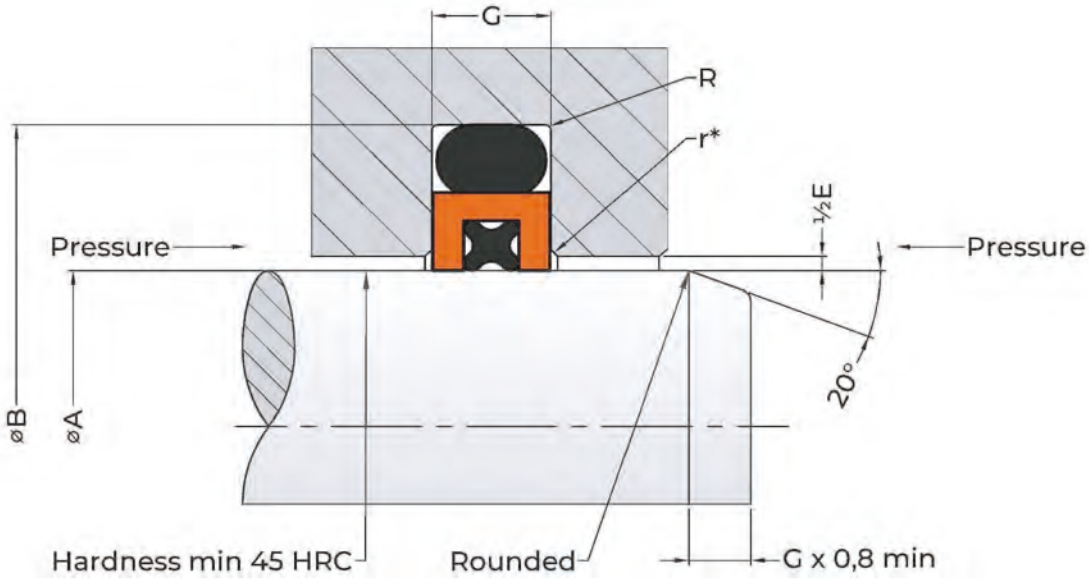
Rod : Ø 200,0 mm
Fluid : hydraulic oil
Contact material : steel

11S 02 - 02000 - A00 - 240
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

In case of groove dimensions not included in the table, identify the product as: 11S9

11S9 240-A00 80X102X10
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Rod h9	ØB Groove H9	G +0,2 -0,0	R	E* Max. Diametral gap up to 10 MPa	E* Max. Diametral gap up to 20 MPa	E* Max. Diametral gap up to 40 MPa	O-ring	Q-ring
31A02	19,0 ÷ 37,9	A + 11,0	4,2	0,2 ÷ 0,4	0,5	0,3	0,2	3,53	1,78
31A03	38,0 ÷ 132,9	A + 15,5	6,3	0,3 ÷ 0,6	0,6	0,4	0,3	5,33	1,78
31A04	133,0 ÷ 249,9	A + 21,0	8,1	0,4 ÷ 0,8	0,6	0,4	0,3	6,99	2,62
31A05	250,0 ÷ 447,9	A + 28,0	9,5	0,5 ÷ 1,0	0,9	0,6	0,5	8,40	3,53
31A06	448,0 ÷ 655,0	A + 35,0	11,5	0,5 ÷ 1,0	1,1	0,8	0,7	10,00	5,33

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Minimum diameter for fitting in closed groove	
Serie	Diameter
31A02	30 mm
31A03	38 mm
31A04	133 mm
31A05	250 mm
31A06	448 mm

DENOMINATION EXAMPLE

Rod : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel

31A 03 - 00900 - A00 - 240 N

- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code
- Notches

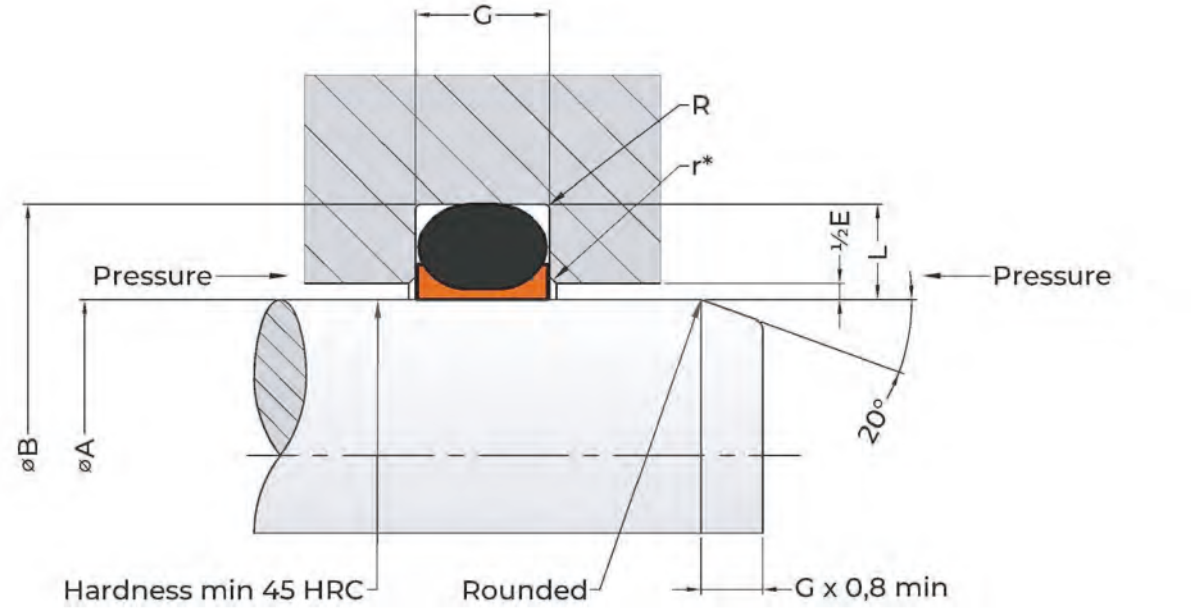
In case of groove dimensions not included in the table, identify the product as: 31A9

31A9 240-A00 80X95,5X6,3 N

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G
- Notches

Lateral notches assure fast seal reaction in case of pressure direction changes
Notches are standardized for seal with a diameter larger than 20 mm

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Rod		ØB Groove	L	G	R	E* Max. Diametral gap up to	O-Ring
	Available h9	Suggested h9	H9		+0,2 -0,0	max	35 MPa	
41A00	2÷125	4÷9,9	A + 2,9	1,45	2,4	0,2	0,13	1,78
41A10	2÷125	4÷9,9	A + 2,9	1,45	3,8	0,2	0,13	1,78
41A20	2÷125	4÷9,9	A + 2,9	1,45	5,2	0,2	0,13	1,78
41A01	2÷240	10÷19,9	A + 4,5	2,25	3,6	0,3	0,13	2,62
41A11	2÷240	10÷19,9	A + 4,5	2,25	4,7	0,3	0,13	2,62
41A21	2÷240	10÷19,9	A + 4,5	2,25	6,2	0,3	0,13	2,62
41A02	4÷450	20÷39,9	A + 6,2	3,1	4,8	0,4	0,15	3,53
41A12	4÷450	20÷39,9	A + 6,2	3,1	6,0	0,4	0,15	3,53
41A22	4÷450	20÷39,9	A + 6,2	3,1	7,7	0,4	0,15	3,53
41A03	10÷650	40÷119,9	A + 9,4	4,7	7,1	0,4	0,17	5,33
41A13	10÷650	40÷119,9	A + 9,4	4,7	8,7	0,4	0,17	5,33
41A23	10÷650	40÷119,9	A + 9,4	4,7	10,8	0,4	0,17	5,33
41A04	115÷650	120÷400,9	A + 12,2	6,1	9,5	0,6	0,25	6,99
41A14	115÷650	120÷400,9	A + 12,2	6,1	12,0	0,6	0,25	6,99
41A24	115÷650	120÷400,9	A + 12,2	6,1	14,7	0,6	0,25	6,99

DENOMINATION EXAMPLE

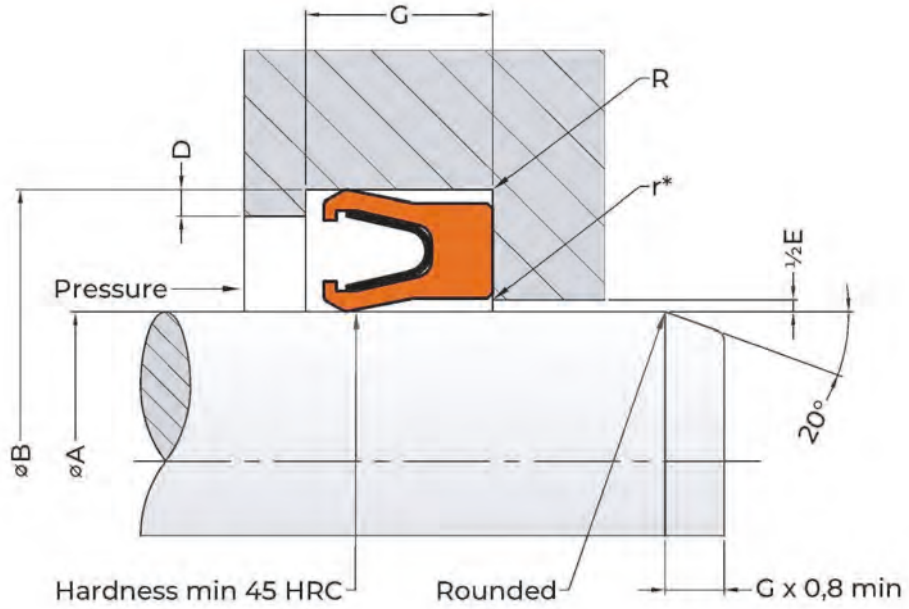
Rod : Ø 30,0 mm
Fluid : hydraulic oil
Contact material : steel

41A 02 - 00300 - A00 - 190
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

In case of groove dimensions not included in the table, identify the product as: 41A9

41A9 190-A00 80X86,5X4,8
- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	Serie	C/S	ØA Rod Available h9	ØA Rod Suggested h9	ØB Groove H9	G +0,2 -0,0	R max	D min
61A00 61A10	000	**67A00 67A10**	000	3,0 ÷ 9,9	3,0 ÷ 40	A + 2,9	2,4 3,8	0,4	0,4
61A01 61A11	100	**67A01 67A11**	100	10,0 ÷ 19,9	6,0 ÷ 200,0	A + 4,5	3,6 4,65	0,4	0,6
61A02 61A12	200	**67A02 67A12**	200	20,0 ÷ 39,9	10,0 ÷ 400,0	A + 6,2	4,8 5,7	0,6	0,7
61A03 61A13	300	**67A03 67A13**	300	40,0 ÷ 119,9	20,0 ÷ 700,0	A + 9,4	7,1 8,5	0,8	0,8
61A04 61A14	400	**67A04 67A14**	400	120,0 ÷ 999,9	35,0 ÷ 999,9	A + 12,2	9,5 11,2	0,8	0,9
61A05 61A15	500	**67A05 67A15**	500	400,0 ÷ 1400,0	150,0 ÷ 1400,0	A + 18,75	13,4 15,8	0,8	1,5

*** "E" values depend on working temperature and seal material.**
*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Fitting into closed housing pag. 08.03/ 08.04

C/S	* E max up to 2 MPa	up to 10 MPa	up to 20 MPa	up to 40 MPa
000	0,40	0,20	0,16	0,10
100	0,50	0,30	0,20	0,14
200	0,70	0,40	0,30	0,16
300	1,00	0,50	0,40	0,20
400	1,20	0,60	0,50	0,24
500	1,80	1,00	0,80	0,40

DENOMINATION EXAMPLE

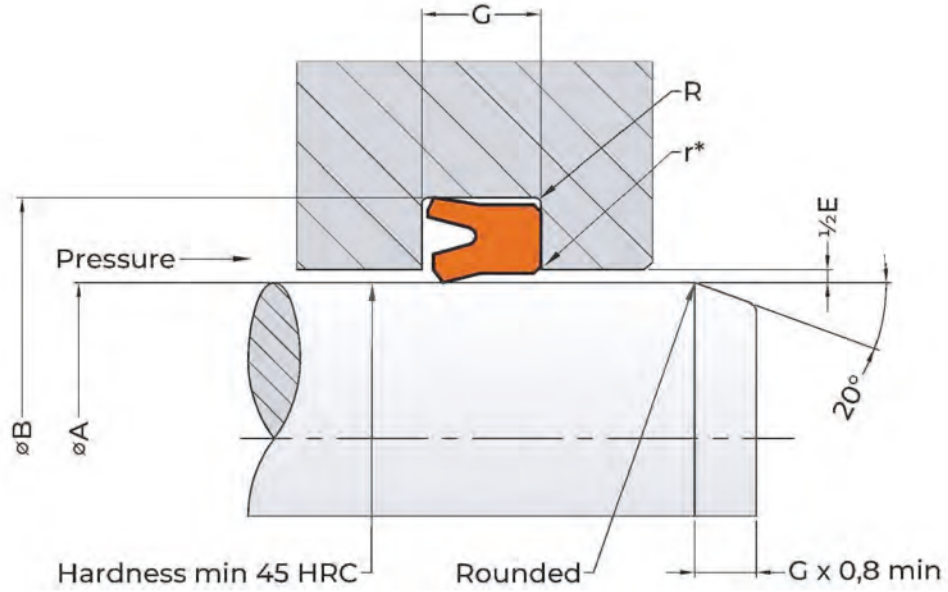
Rod : Ø 35,0 mm
Cross section : 200
Fluid : Hydraulic oil
Contact material : steel
Movement : Dynamic

61A 02 - 00350 - 190 - S00
Type
Serie
Ref. (ØA x 10)
Seal material code
Spring material code

In case of groove dimensions not included in the table, identify the product as: 61A9 or 67A9

61A9 190-S00 30X36,5X4,8
Type
Seal material code
Spring material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

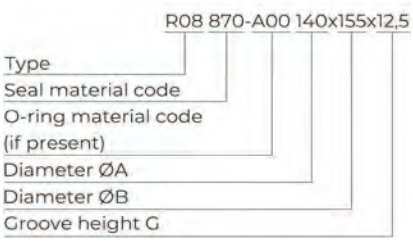
Type C/S R01	R03	R08	ØA Rod Suggested h9 from ÷ to	ØB Groove H9	G +0,2 -0,0	R max
4,0			10 ÷ 24	A + 8,0	6,3	0,4
5,0			14 ÷ 50	A + 10,0	8,0	0,4
7,5			28 ÷ 140	A + 15,0	12,5	0,6
10,0			56 ÷ 200	A + 20,0	16,0	0,8
12,5			100 ÷ 280	A + 25,0	20,0	0,8
15,0			160 ÷ 360	A + 30,0	25,0	0,8

With shaft diameter smaller than 30 mm, open groove with flange is recommended for seal fitting.
***"E" values depend on working temperature and seal material. In this page are written values designed for mat. 850 and 870, for operating temperature of 60°C. For high pressure or temperature, please contact our Technical Department.**

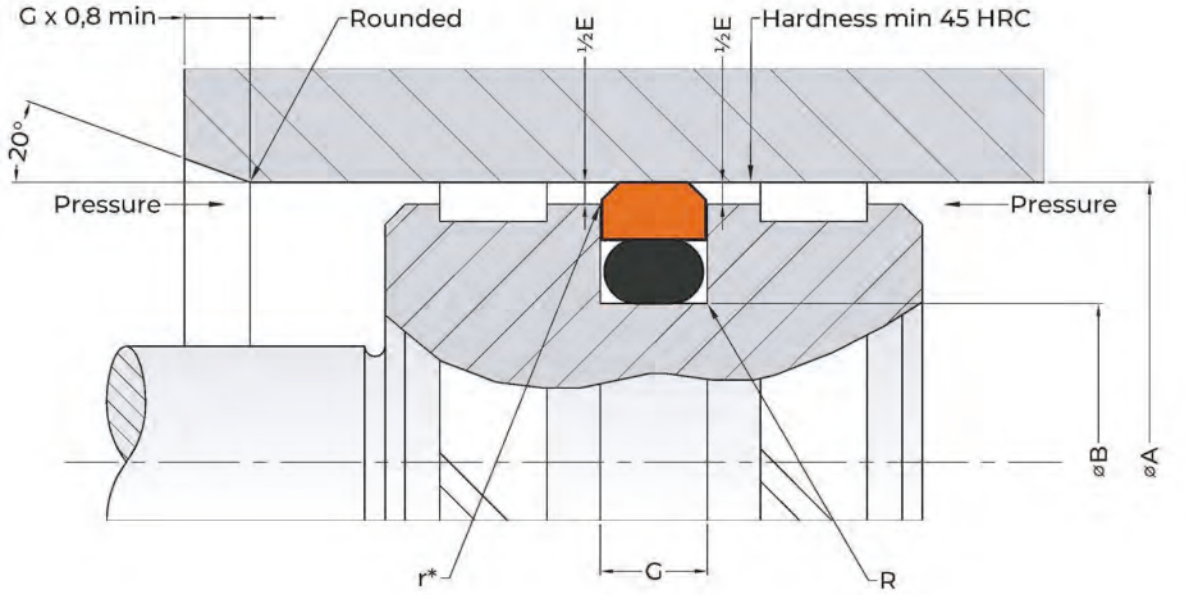
C/S	* E max up to 2 MPa	up to 10 MPa	up to 20 MPa	up to 40 MPa
4 ÷ 6	0,60	0,50	0,30	-
6,1 ÷ 8,5	0,70	0,55	0,40	0,20
8,6 ÷ 13,3	0,80	0,60	0,45	0,25
13,4 ÷ 18,2	0,90	0,70	0,50	0,30
18,3 ÷ 22	1,10	0,90	0,60	0,40

DENOMINATION EXAMPLE

Cylinder : Ø 140,0 mm
Fluid : hydraulic oil
Contact material : steel



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie		ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-Ring
		Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
02A00	02B00	8 ÷ 14,9	15 ÷ 39,9	-	A - 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
02A01	02B01	15 ÷ 39,9	40 ÷ 79,9	-	A - 7,5	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
02A02	02B02	40 ÷ 79,9	80 ÷ 132,9	15 ÷ 39,9	A - 11,0	4,2	0,8 ÷ 1,2	0,8	0,5	0,4	3,53
02A03	02B03	80 ÷ 132,9	133 ÷ 329,9	40 ÷ 79,9	A - 15,5	6,3	1,2 ÷ 1,5	1,0	0,6	0,4	5,33
02A04	02B04	133 ÷ 329,9	330 ÷ 669,9	80 ÷ 132,9	A - 21,0	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
02A05	02B05	330 ÷ 669,9	670 ÷ 999,9	133 ÷ 329,9	A - 24,5	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
02A06	02B06	670 ÷ 999,9	≥1000	330 ÷ 669,9	A - 28,0	9,5	2,0 ÷ 3,0	1,4	1,0	0,6	8,40
02A07	02B07	≥1000	-	-	A - 38,0	13,8	2,0 ÷ 3,0	2,0	1,4	1,2	12,00

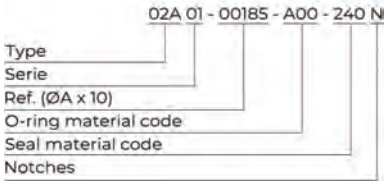
*** Tolerances for higher pressures (up to 80 MPa): H7 / f7.**

Lateral notches assure fast seal reaction in case of pressure direction changes
Nothces are standardized for seal with a diameter larger than 20 mm

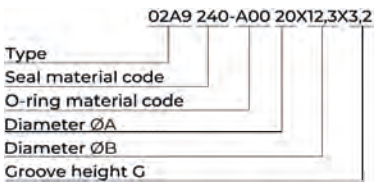
Minimum diameter for fitting in closed groove			
Serie	Material 190-550-240	Material 320	Material 910-840
02*00	8	15	20
02*01	15	20	35
02*02	20	30	50
02*03	40	50	70
02*04	80	80	95
02*05	133	133	133
02*06	330	330	330
02*07	500	500	500

DENOMINATION EXAMPLE

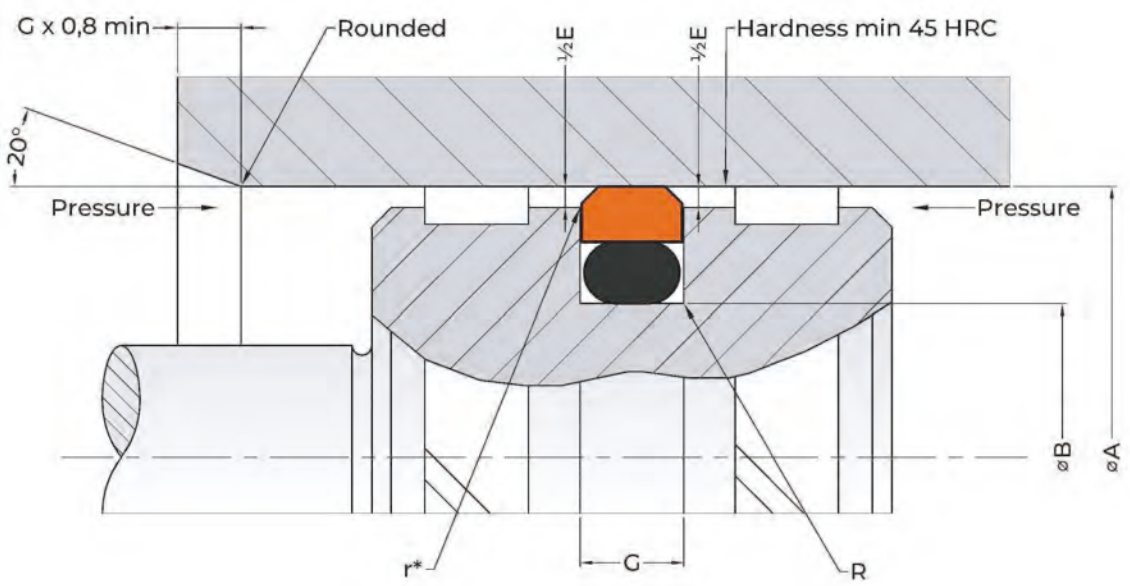
Cylinder : Ø 18,5 mm
Fluid : hydraulic oil
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 02A9 or 02B9



Installation groove specially designed for low friction pneumatic applications, using PRP 02A / 02B



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie		ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to 5 MPa	O-Ring
		Standard	Light duty	Heavy duty					
02A00	02B00	8 ÷ 14,9	15 ÷ 39,9	-	A - 5,0	2,2	0,3 ÷ 0,5	0,6	1,78
02A01	02B01	15 ÷ 39,9	40 ÷ 79,9	-	A - 8,0	3,2	0,5 ÷ 0,8	0,8	2,62
02A02	02B02	40 ÷ 79,9	80 ÷ 132,9	15 ÷ 39,9	A - 11,5	4,2	0,8 ÷ 1,2	0,8	3,53
02A03	02B03	80 ÷ 132,9	133 ÷ 329,9	40 ÷ 79,9	A - 16,5	6,3	1,2 ÷ 1,5	1,0	5,33
02A04	02B04	133 ÷ 329,9	330 ÷ 669,9	80 ÷ 132,9	A - 22,3	8,1	1,5 ÷ 2,0	1,2	6,99
02A05	02B05	330 ÷ 669,9	670 ÷ 999,9	133 ÷ 329,9	A - 26,3	8,1	1,5 ÷ 2,0	1,2	6,99
02A06	02B06	670 ÷ 999,9	≥1000	330 ÷ 669,9	A - 30,0	9,5	2,0 ÷ 3,0	1,4	8,40
02A07	02B07	≥1000	-	-	A - 40,0	13,8	2,0 ÷ 3,0	2,0	12,00

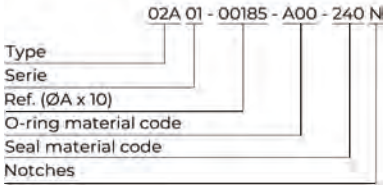
*** Tolerances for higher pressures (up to 80 MPa): H7 / f7.**

Lateral notches assure fast seal reaction in case of pressure direction changes
Nothces are standardized for seal with a diameter larger than 20 mm

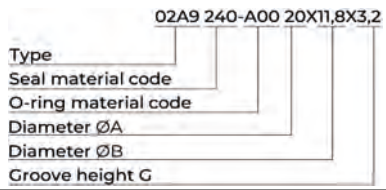
Minimum diameter for fitting in closed groove			
Serie	Material 190-550-240	Material 320	Material 910-840
02A00	8	15	20
02A01	15	20	35
02A02	20	30	50
02A03	40	50	70
02A04	80	80	95
02A05	133	133	133
02A06	330	330	330
02A07	500	500	500

DENOMINATION EXAMPLE

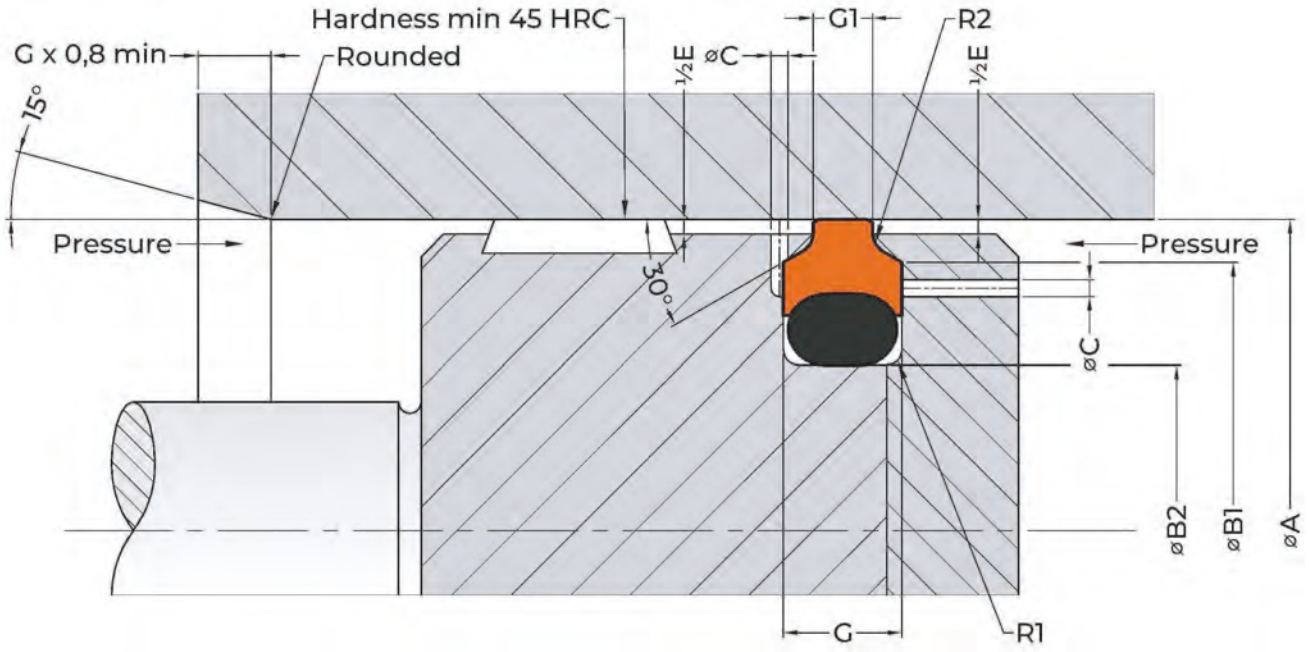
Cylinder : Ø 18,5 mm
Fluid : air
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 02A9 or 02B9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder		ØB1 Groove	ØB2 Groove	G1	G2	R1	R2	ØC **	O-Ring
	Suggested H9	Available H9	+0,0 -0,1	h9	+0,2 -0,0	+0,2 -0,0	max	±0,05	max	
02C01	6 ÷ 59,9	6 ÷ 250	A - 1,6	A - 8,0	1,8	3,2	0,5	0,3	0,5	2,62
02C02	60 ÷ 132,9	10 ÷ 455	A - 2,4	A - 11,0	2,2	4,2	0,7	0,5	0,6	3,53
02C03	133 ÷ 329,9	30 ÷ 660	A - 3,8	A - 15,5	3,2	6,3	0,8	1,0	1,0	5,33
02C04	330 ÷ 649,9	110 ÷ 660	A - 5,2	A - 21,0	4,2	8,1	0,8	1,2	1,1	6,99
02C05	650 ÷ 999,9	650 ÷ 999,9	A - 6,8	A - 28,0	6,8	10	0,8	1,2	2,0	8,40
02C06	1000 ÷ 2600	750 ÷ 2600	A - 9,2	A - 38,0	9,2	13,8	1,2	1,8	2,8	12,00

*** Tolerances for higher pressures (up to 80 MPa): H7 / f7**
****Hole required in applications where the gasket is exposed to rapid pressure variations.**

E* Max. Diametral gap up to		
10 MPa	20 MPa	40 MPa
0,7	0,4	0,3
0,8	0,5	0,4
1,0	0,6	0,4
1,2	0,7	0,5
1,4	0,9	0,6
2,0	1,4	1,1

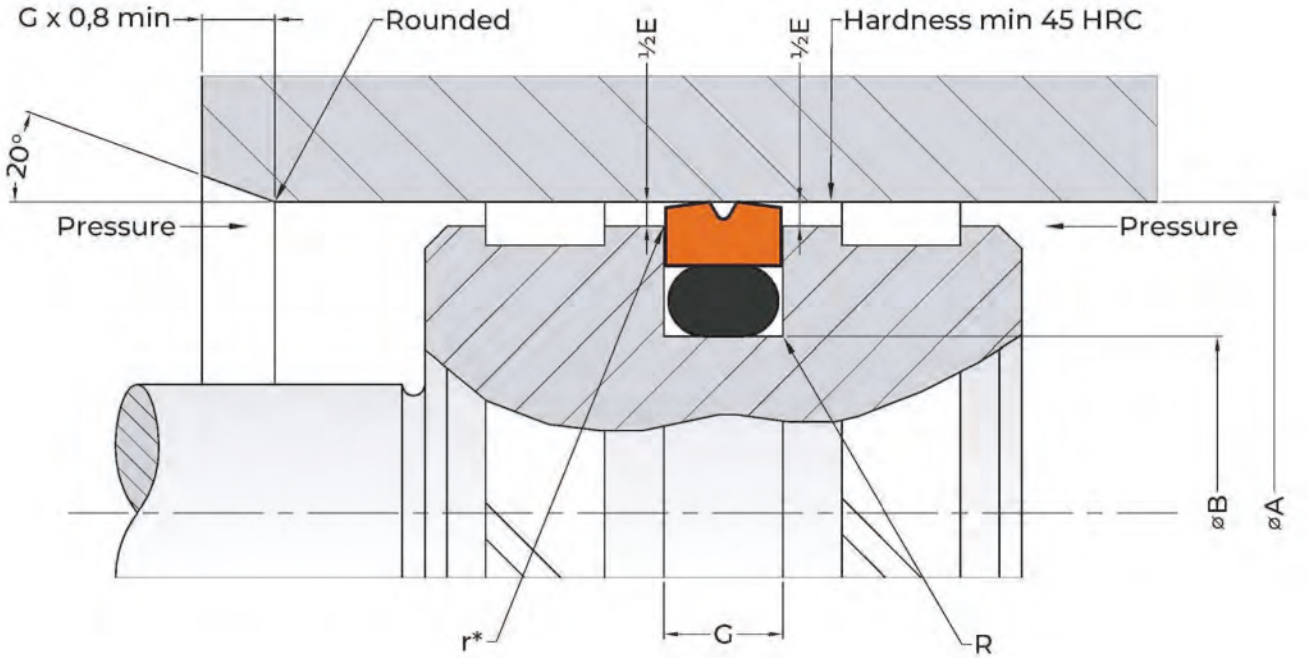
DENOMINATION EXAMPLE

Cylinder : Ø 50,0 mm
Fluid : hydraulic oil
Contact material : steel

02C 01 - 00500 - A00 - 240

Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	30 MPa	
02D00	8 ÷ 14,9	15 ÷ 39,9	-	A - 5,0	2,2	0,4	0,5	0,4	0,3	1,78
02D01	15 ÷ 39,9	40 ÷ 79,9	-	A - 7,5	3,2	0,6	0,8	0,5	0,3	2,62
02D02	40 ÷ 79,9	80 ÷ 132,9	15 ÷ 39,9	A - 11,0	4,2	1,0	0,9	0,5	0,4	3,53
02D03	80 ÷ 132,9	133 ÷ 329,9	40 ÷ 79,9	A - 15,5	6,3	1,3	1,1	0,6	0,4	5,33
02D04	133 ÷ 329,9	330 ÷ 669,9	80 ÷ 132,9	A - 21,0	8,1	1,8	1,2	0,7	0,5	6,99
02D05	330 ÷ 669,9	670 ÷ 999,9	133 ÷ 329,9	A - 24,5	8,1	1,8	1,2	0,7	0,5	6,99
02D06	670 ÷ 999,9	≥ 1000	330 ÷ 669,9	A - 27,3	9,5	2,5	1,3	1,0	0,6	8,40

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Minimum diameter for fitting in closed groove	
Serie	Diameter
02D00	12 mm
02D01	16 mm
02D02	19 mm
02D03	38 mm
02D04	70 mm
02D05	200 mm
02D06	256 mm

DENOMINATION EXAMPLE

Cylinder : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel

02D 03 - 00900 - A00 - 410

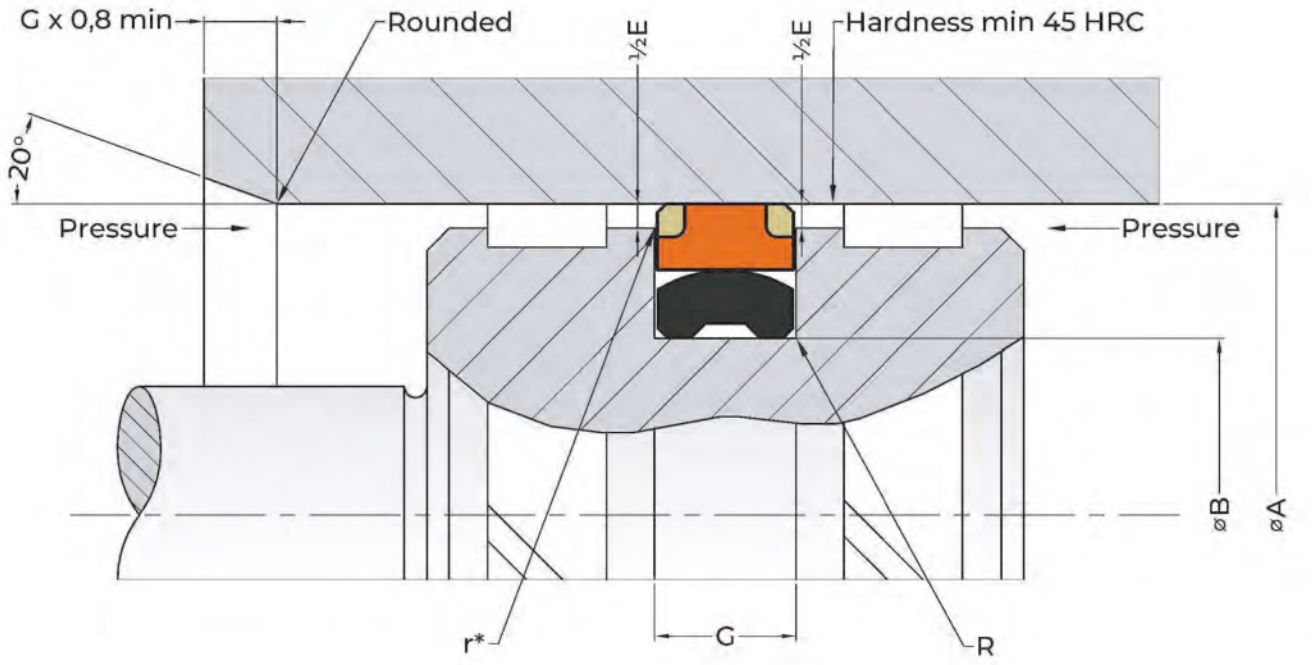
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

In case of groove dimensions not included in the table, identify the product as: 02D9

02D9 240-A00 90X74,3X6,3

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie 	**ØA** Cylinder H9	**ØB** Groove h9	**G** +0,2 -0,0	**R**	**E*** Max. Diametral gap up to	
					30 MPa	60 MPa
02F00	50 ÷ 62,9	A - 14,0	9,0	0,2 ÷ 0,4	0,8	0,5
02F01	63 ÷ 94,9	A - 15,0	11,0	0,4 ÷ 0,6	0,8	0,5
02F02	95 ÷ 124,9	A - 15,0	12,5	0,4 ÷ 0,6	0,8	0,5
02F03	125 ÷ 249,9	A -23,0	16,0	0,6 ÷ 0,8	0,8	0,5
02F04	≥ 250	A - 28,0	17,5	0,8 ÷ 1,0	0,8	0,5

DENOMINATION EXAMPLE

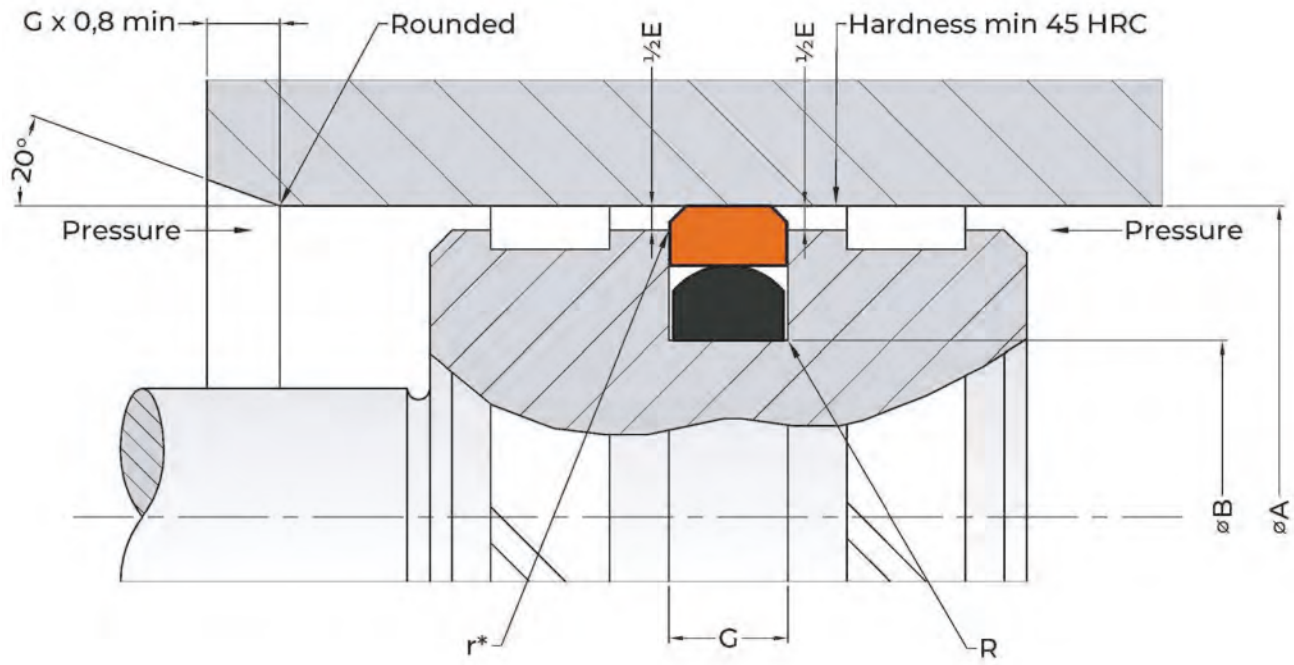
Cylinder : Ø 120,0 mm
Fluid : hydraulic oil
Contact material : steel

02F 02 - 01200 - A00 - 240 - 030
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code
Back-up material code

In case of groove dimensions not included in the table, identify the product as: 02F9

02F9 240-A00-030 90X74,5X12,5
Type
Seal material code
O-ring material code
Back-up material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie 	**ØA** Cylinder H8	**ØB** Groove h8	**G** +0,2 -0,0	**R**	**E*** Max. Diametral gap up to		
					15 MPa	25 MPa	40 MPa
02S00	55,0 ÷ 79,9	A - 15,0	7,5	0,4	1,2	1,0	0,8
02S01	80,0 ÷ 149,9	A - 20,0	10,0	0,4	1,2	1,0	0,8
02S02	150,0 ÷ 244,9	A - 25,0	12,5	0,4	1,5	1,3	1,0
02S03	245,0 ÷ 519,9	A - 30,0	15,0	0,8	1,5	1,3	1,0
02S04	410,0 ÷ 769,9	A - 35,0	17,5	1,2	1,5	1,3	1,0
02S05	770,0 ÷ 1450,0	A - 40,0	20,0	1,2	1,6	1,4	1,1

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**
Please ask our Technical Department for minimum fitting diameter of seal into closed housing

DENOMINATION EXAMPLE

Cylinder : Ø 300,0 mm
Fluid : hydraulic oil
Contact material : steel

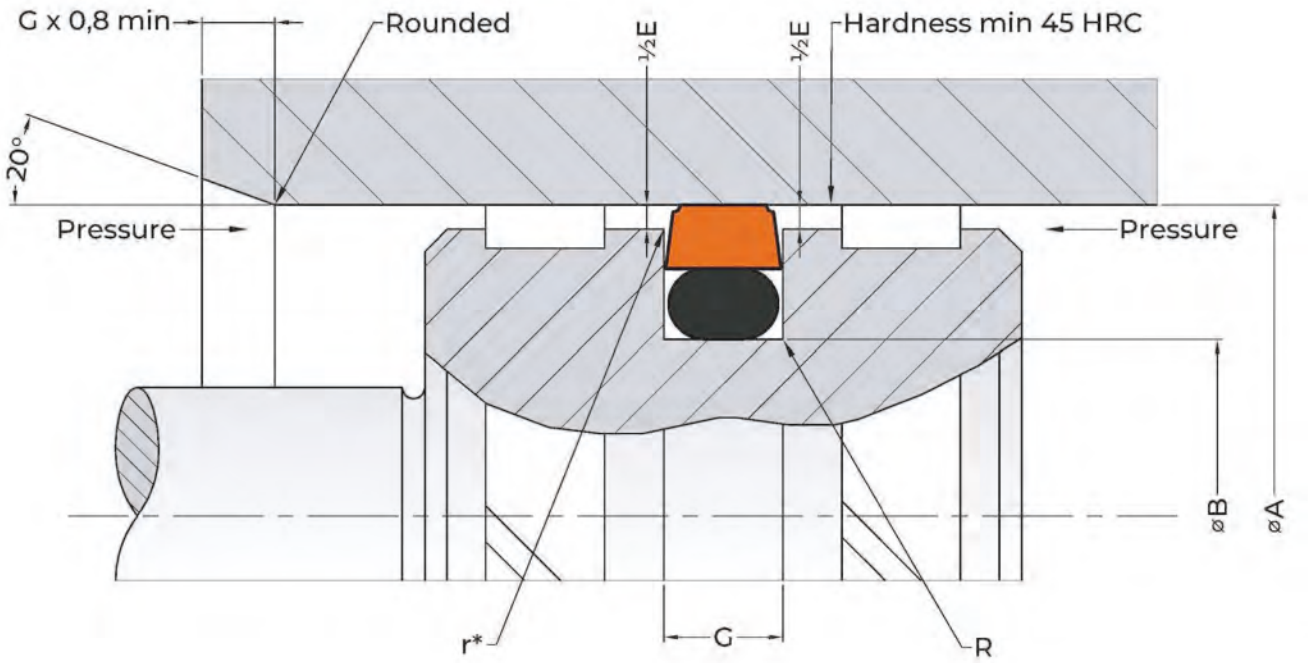
02S 03 - 03000 - A00 - 240 N
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code
- Back-up material code

In case of groove dimensions not included in the table, identify the product as: 02S9

02S9 240-A00 3000X265X15 N
- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G
- Notches

Lateral notches assure fast seal reaction in case of pressure direction changes

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

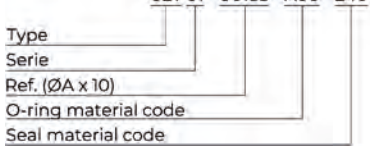
Serie	ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
02T00	8 ÷ 14,9	15 ÷ 39,9	-	A - 4,9	2,2	0,3 ÷ 0,5	0,8	0,6	0,4	1,78
02T01	15 ÷ 39,9	40 ÷ 79,9	-	A - 7,5	3,2	0,5 ÷ 0,8	1,2	1,0	0,6	2,62
02T02	40 ÷ 79,9	80 ÷ 132,9	15 ÷ 39,9	A - 11,0	4,2	0,8 ÷ 1,2	1,4	1,0	0,6	3,53
02T03	80 ÷ 132,9	133 ÷ 329,9	40 ÷ 79,9	A - 15,5	6,3	1,2 ÷ 1,5	1,6	1,2	0,8	5,33
02T04	133 ÷ 329,9	330 ÷ 669,9	80 ÷ 132,9	A - 21,0	8,1	1,5 ÷ 2,0	1,6	1,2	0,8	6,99
02T05	330 ÷ 669,9	670 ÷ 999,9	133 ÷ 329,9	A - 24,5	8,1	1,5 ÷ 2,0	1,8	1,4	1,0	6,99
02T06	670 ÷ 999,9	≥1000	330 ÷ 669,9	A - 28,0	9,5	2,0 ÷ 3,0	2,0	1,6	1,2	8,40
02T07	≥1000	-	-	A - 38,0	13,8	2,0 ÷ 3,0	2,4	1,8	1,4	12,00

*** Tolerances for higher pressures (up to 80 MPa): H7 / f7.**

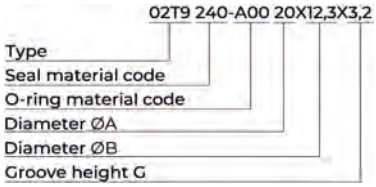
Minimum diameter for fitting in closed groove			
Serie	Material 190-550-24	Material 320	Material 910-840
02T00	0	15	20
02T01	8	20	35
02T02	15	30	50
02T03	20	50	70
02T04	40	80	95
02T05	80	133	133
02T06	133	330	330
02T07	500	500	500

DENOMINATION EXAMPLE

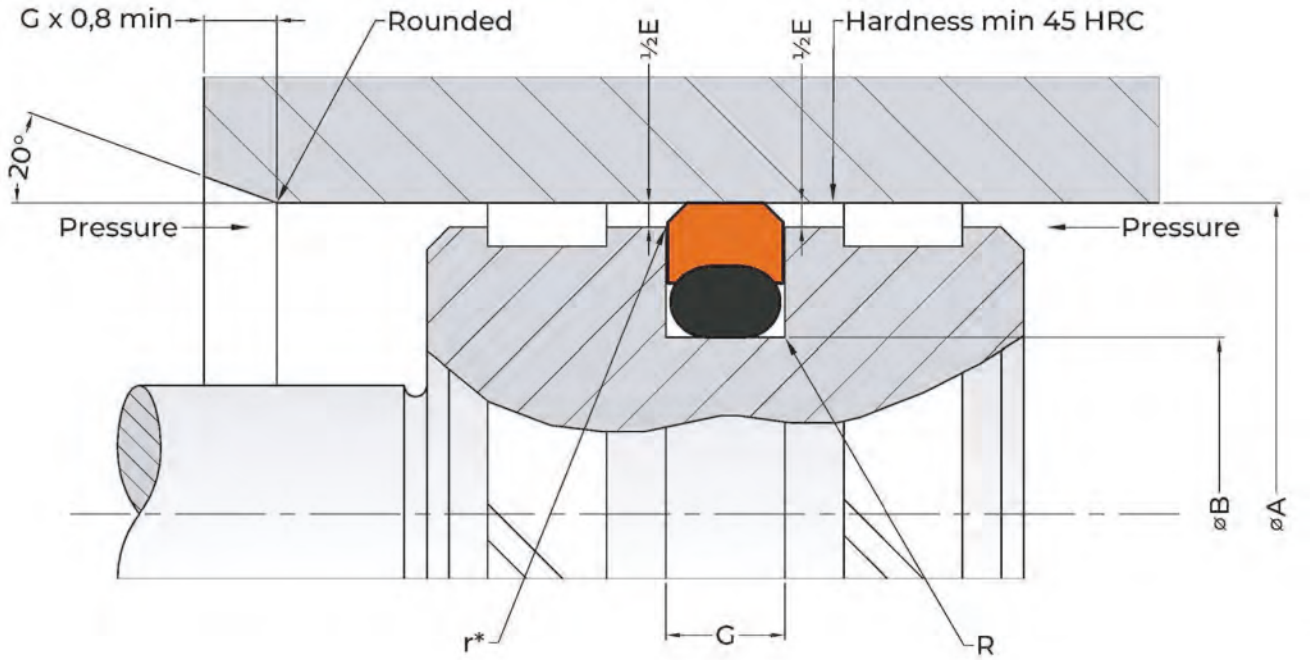
Clinder : Ø 18,5 mm
Fluid : hydraulic oil
Contact material : steel



In case of groove dimensions not included in the table, identify the product as: 02T9



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

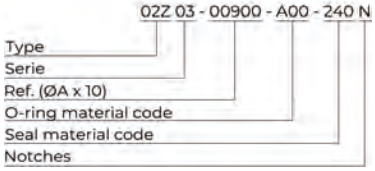
Serie	ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
02Z00	8 ÷ 14,9	15 ÷ 39,9	-	A - 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
02Z01	15 ÷ 39,9	40 ÷ 79,9	-	A - 7,5	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
02Z02	40 ÷ 79,9	80 ÷ 132,9	15 ÷ 39,9	A - 11,0	4,2	0,8 ÷ 1,2	0,8	0,5	0,4	3,53
02Z03	80 ÷ 132,9	133 ÷ 329,9	40 ÷ 79,9	A - 15,5	6,3	1,2 ÷ 1,5	1,0	0,6	0,4	5,33
02Z04	133 ÷ 329,9	330 ÷ 669,9	80 ÷ 132,9	A - 21,0	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
02Z05	330 ÷ 669,9	670 ÷ 999,9	133 ÷ 329,9	A - 24,5	8,1	1,5 ÷ 2,0	1,2	0,7	0,5	6,99
02Z06	670 ÷ 999,9	≥1000	330 ÷ 669,9	A - 28,0	9,5	2,0 ÷ 3,0	1,4	1,0	0,6	8,40
02Z07	≥1000	-	-	A - 38,0	13,8	2,0 ÷ 3,0	2,0	1,4	1,2	12,00

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

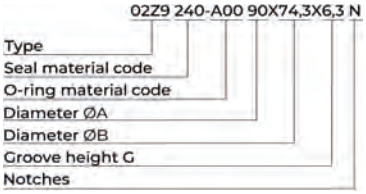
Minimum diameter for fitting in closed groove			
Serie	Material 190-550-24	Material 320	Material 910-840
02Z00	0	15	20
02Z01	8	20	35
02Z02	15	30	50
02Z03	20	50	70
02Z04	40	80	95
02Z05	80	133	133
02Z06	133	330	330
02Z07	500	500	500

DENOMINATION EXAMPLE

Cylinder : Ø 90,0 mm
Fluid : hydraulic oil
Contact material : steel

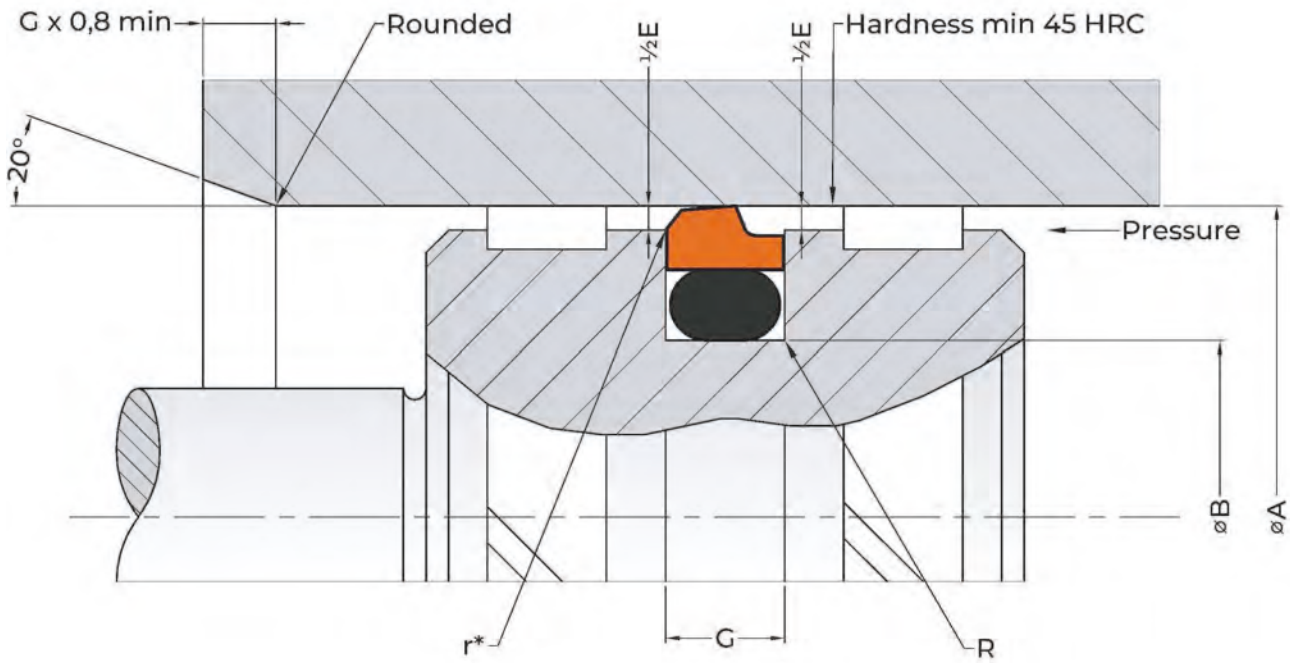


In case of groove dimensions not included in the table, identify the product as: 02Z9



Lateral notches assure fast seal reaction in case of pressure direction changes
Nothces are standardized for seal with a diameter larger than 20 mm

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder H9			ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-Ring
	Standard	Light duty	Heavy duty				10 MPa	20 MPa	40 MPa	
12A00	8 ÷ 16,9	17 ÷ 26,9	-	A - 4,9	2,2	0,3 ÷ 0,5	0,6	0,4	0,3	1,78
12A01	17 ÷ 26,9	27 ÷ 59,9	-	A - 7,3	3,2	0,5 ÷ 0,8	0,8	0,5	0,3	2,62
12A02	27 ÷ 59,9	60 ÷ 199,9	20 ÷ 26,9	A - 10,7	4,2	0,8 ÷ 1,2	1,0	0,6	0,4	3,53
12A03	60 ÷ 199,9	200 ÷ 255,9	27 ÷ 59,9	A - 15,1	6,3	1,2 ÷ 1,5	1,4	0,8	0,5	5,33
12A04	200 ÷ 255,9	256 ÷ 669,9	60 ÷ 199,9	A - 20,5	8,1	1,5 ÷ 2,0	1,6	1,2	0,7	6,99
12A05	256 ÷ 669,9	670 ÷ 999,9	200 ÷ 255,9	A - 24,0	8,1	1,5 ÷ 2,0	1,8	1,4	0,8	6,99
12A06	670 ÷ 999,9	≥1000	256 ÷ 669,9	A - 27,3	9,5	2,0 ÷ 3,0	2,0	1,6	1,0	8,40
12A07	≥1000	-	-	A - 38,0	13,8	2,5 ÷ 3,5	2,4	1,8	1,2	12,00

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Minimum diameter for fitting in closed groove			
Serie	Material 190-550-24	Material 320	Material 910-840
12A00	0	15	20
12A01	8	20	35
12A02	15	30	50
12A03	20	50	70
12A04	40	80	95
12A05	80	133	133
12A06	133	330	330
12A07	500	500	500

DENOMINATION EXAMPLE

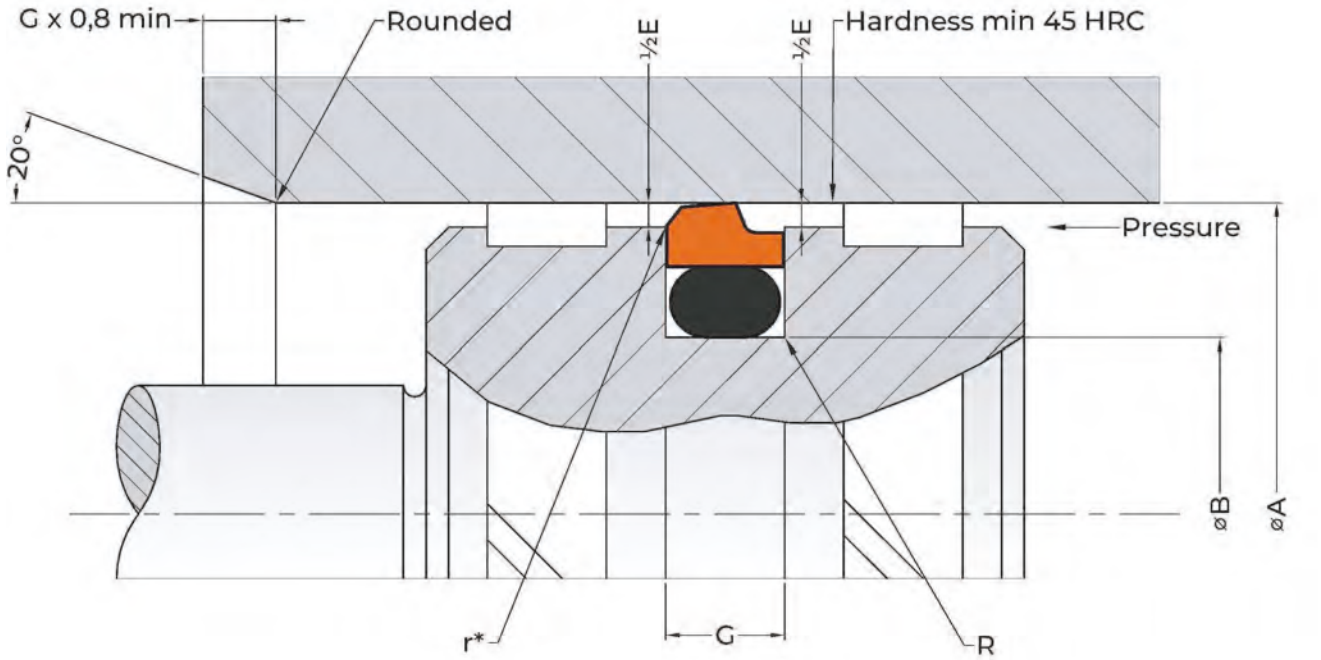
Cylinder : Ø 18,5 mm
Fluid : hydraulic oil
Contact material : steel

12A 01 - 00185 - A00 - 240
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

In case of groove dimensions not included in the table, identify the product as: 12A9

12A9 240-A00 20X12,5X3,2
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

Installation groove specially designed for low friction pneumatic applications, using PRP 12A



r* = rounded and free of burrs r=0,2 max

Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder H9			ØB Groove h9	G +0,15 -0,0	R	E* Max. Diametral gap up to	O-Ring
	Standard	Light duty	Heavy duty				5 MPa	
12A00	8 ÷ 16,9	17 ÷ 26,9	-	A - 5,0	2,2	0,3 ÷ 0,5	0,6	1,78
12A01	17 ÷ 26,9	27 ÷ 59,9	-	A - 8,0	3,2	0,5 ÷ 0,8	0,8	2,62
12A02	27 ÷ 59,9	60 ÷ 199,9	20 ÷ 26,9	A - 11,5	4,2	0,8 ÷ 1,2	0,8	3,53
12A03	60 ÷ 199,9	200 ÷ 255,9	27 ÷ 59,9	A - 16,5	6,3	1,2 ÷ 1,5	1,0	5,33
12A04	200 ÷ 255,9	256 ÷ 669,9	60 ÷ 199,9	A - 22,3	8,1	1,5 ÷ 2,0	1,2	6,99
12A05	256 ÷ 669,9	670 ÷ 999,9	200 ÷ 255,9	A - 25,8	8,1	1,5 ÷ 2,0	1,2	6,99
12A06	670 ÷ 999,9	≥1000	256 ÷ 669,9	A - 30,0	9,5	2,0 ÷ 3,0	1,4	8,40
12A07	≥1000	-	-	A - 40,0	13,8	2,5 ÷ 3,5	2,0	12,00

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Minimum diameter for fitting in closed groove			
Serie	Material 190-550-24	Material 320	Material 910-840
12A00	0	15	20
12A01	8	20	35
12A02	15	30	50
12A03	20	50	70
12A04	40	80	95
12A05	80	133	133
12A06	133	330	330
12A07	500	500	500

DENOMINATION EXAMPLE

Cylinder : Ø 18,5 mm
Fluid : hydraulic oil
Contact material : steel

12A 01 - 00185 - A00 - 240

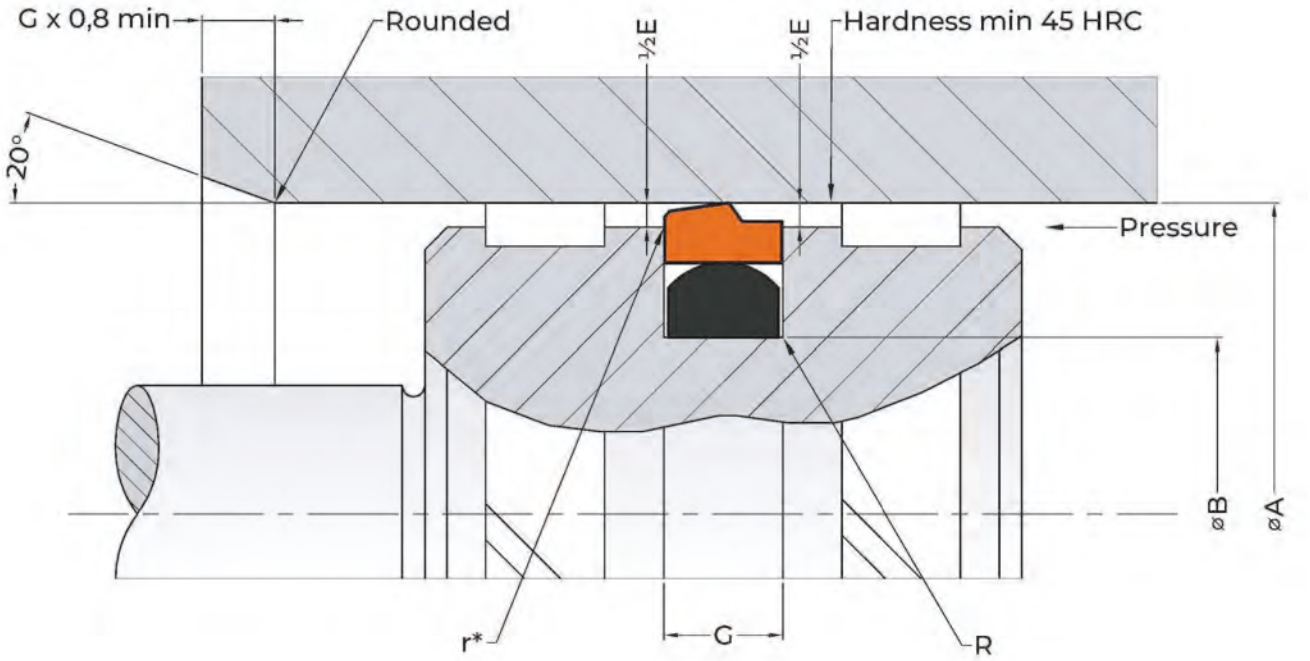
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

In case of groove dimensions not included in the table, identify the product as: 12A9

12A9 240-A00 20X11,8X3,2

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder H8	ØB Groove h8	G +0,2 -0,0	R	E* Max. Diametral gap up to		
					15 MPa	25 MPa	40 MPa
12S00	55 ÷ 79,9	A - 15,0	7,5	0,4	1,2	1,0	0,8
12S01	80 ÷ 149,9	A - 20,0	10,0	0,4	1,2	1,0	0,8
12S02	150 ÷ 244,9	A - 25,0	12,5	0,4	1,5	1,3	1,0
12S03	245 ÷ 519,9	A - 30,0	15,0	0,8	1,5	1,3	1,0
12S04	410 ÷ 769,9	A - 35,0	17,5	1,2	1,5	1,3	1,0
12S05	770 ÷ 1450	A - 40,0	20,0	1,2	1,6	1,4	1,1

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**
Please ask our Technical Department for minimum fitting diameter of seal into closed housing

DENOMINATION EXAMPLE

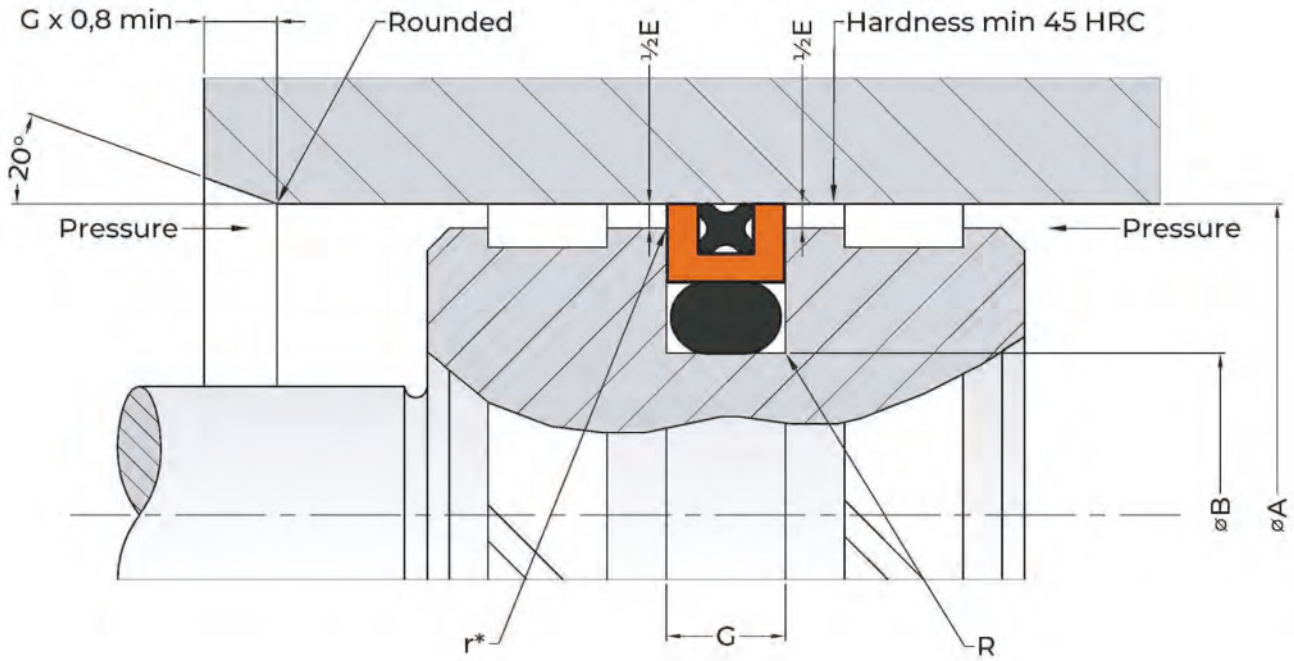
Cylinder : Ø 250,0 mm
Fluid : hydraulic oil
Contact material : steel

12S 03 - 02500 - A00 - 240
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

In case of groove dimensions not included in the table, identify the product as: 12S9

12S9 240-A00 250X215X15
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	ØA Cylinder H9	ØB Groove h9	G +0,2 -0,0	R	E* Max. Diametral gap up to			O-ring	Q-ring
					10 MPa	20 MPa	40 MPa		
32A02	15,0 ÷ 79,9	A - 11,0	4,2	0,2 ÷ 0,4	0,5	0,3	0,2	3,53	1,78
32A03	40,0 ÷ 132,9	A - 15,5	6,3	0,3 ÷ 0,6	0,6	0,4	0,3	5,33	1,78
32A04	80,0 ÷ 259,9	A - 21,0	8,1	0,4 ÷ 0,8	0,6	0,4	0,3	6,99	2,62
32A05	133,0 ÷ 259,9	A - 24,5	8,1	0,4 ÷ 0,8	0,6	0,4	0,3	6,99	2,62
32A06	260,0 ÷ 469,9	A - 28,0	9,5	0,5 ÷ 1,0	0,9	0,6	0,5	8,40	3,53
32A07	470,0 ÷ 700,0	A - 35,0	11,5	0,5 ÷ 1,0	1,1	0,8	0,7	10,00	5,33

*** Tolerances for higher pressures (up to 60 MPa): H7 / f7.**

Minimum diameter for fitting in closed groove	
Serie	Diameter
32A02	30 mm
32A03	50 mm
32A04	80 mm
32A05	133 mm
32A06	330 mm
32A07	470 mm

DENOMINATION EXAMPLE

Cylinder : Ø 40,0 mm
Fluid : hydraulic oil
Contact material : steel

32A 02 - 00400 - A00 - 240 N

- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code
- Notches

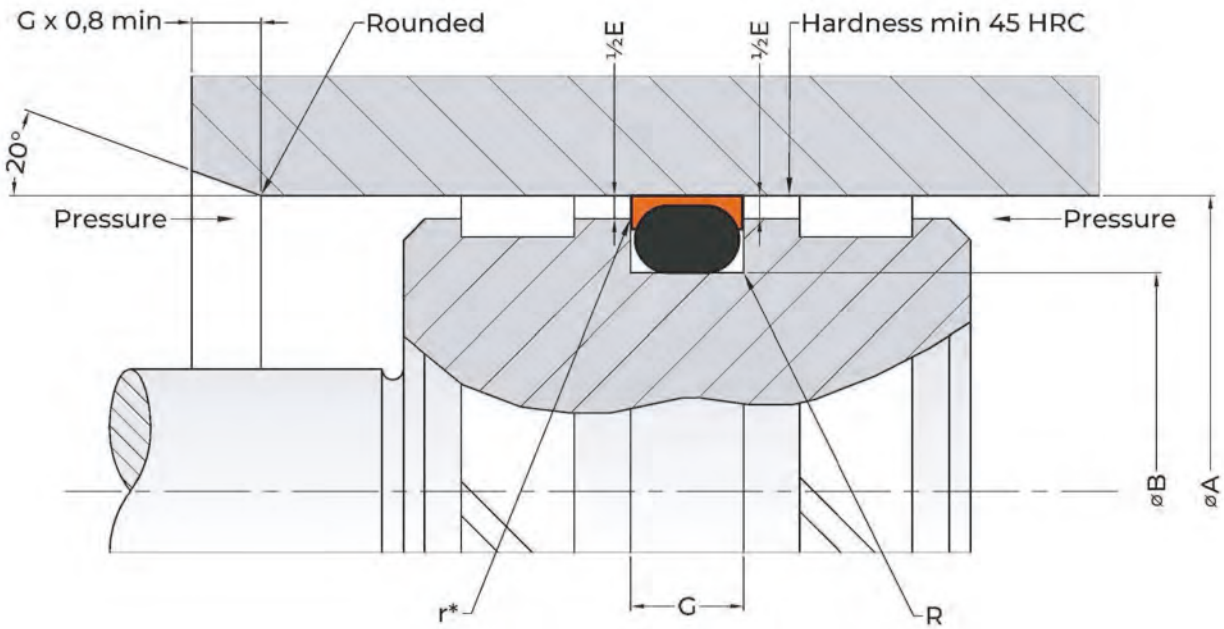
In case of groove dimensions not included in the table, identify the product as: 32A9

32A9 240-A00 50X38X4,2 N

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G
- Notches

Lateral notches assure fast seal reaction in case of pressure direction changes
Nothces are standardized for seal with a diameter larger than 20 mm

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	ØA Rod		ØB Groove	L	G	R	E* Max diametral gap up to	O-Ring
	Suggested H9	Available H9	h11		+0,2 -0,0	max	35 MPa	
42A00	4,8 ÷ 137	8 ÷ 13,9	A - 2,9	1,45	2,4	0,2	0,13	1,78
42A10	4,8 ÷ 137	8 ÷ 13,9	A - 2,9	1,45	3,8	0,2	0,13	1,78
42A20	4,8 ÷ 137	8 ÷ 13,9	A - 2,9	1,45	5,2	0,2	0,13	1,78
42A01	6 ÷ 260	14 ÷ 24,9	A - 4,5	2,25	3,6	0,3	0,13	2,62
42A11	6 ÷ 260	14 ÷ 24,9	A - 4,5	2,25	4,7	0,3	0,13	2,62
42A21	6 ÷ 260	14 ÷ 24,9	A - 4,5	2,25	6,2	0,3	0,13	2,62
42A02	11 ÷ 480	25 ÷ 45,9	A - 6,2	3,1	4,8	0,4	0,15	3,53
42A12	11 ÷ 480	25 ÷ 45,9	A - 6,2	3,1	6,0	0,4	0,15	3,53
42A22	11 ÷ 480	25 ÷ 45,9	A - 6,2	3,1	7,7	0,4	0,15	3,53
42A03	20 ÷ 690	46 ÷ 124,9	A - 9,4	4,7	7,1	0,4	0,17	5,33
42A13	20 ÷ 690	46 ÷ 124,9	A - 9,4	4,7	8,7	0,4	0,17	5,33
42A23	20 ÷ 690	46 ÷ 124,9	A - 9,4	4,7	10,8	0,4	0,17	5,33
42A04	128 ÷ 700	128 ÷ 400,9	A - 12,2	6,1	9,5	0,6	0,25	6,99
42A14	128 ÷ 700	128 ÷ 400,9	A - 12,2	6,1	12,0	0,6	0,25	6,99
42A24	128 ÷ 700	128 ÷ 400,9	A - 12,2	6,1	14,7	0,6	0,25	6,99

DENOMINATION EXAMPLE

Cylinder : Ø 40,0 mm
Fluid : hydraulic oil
Contact material : steel

42A 02 - 00400 - A00 - 190

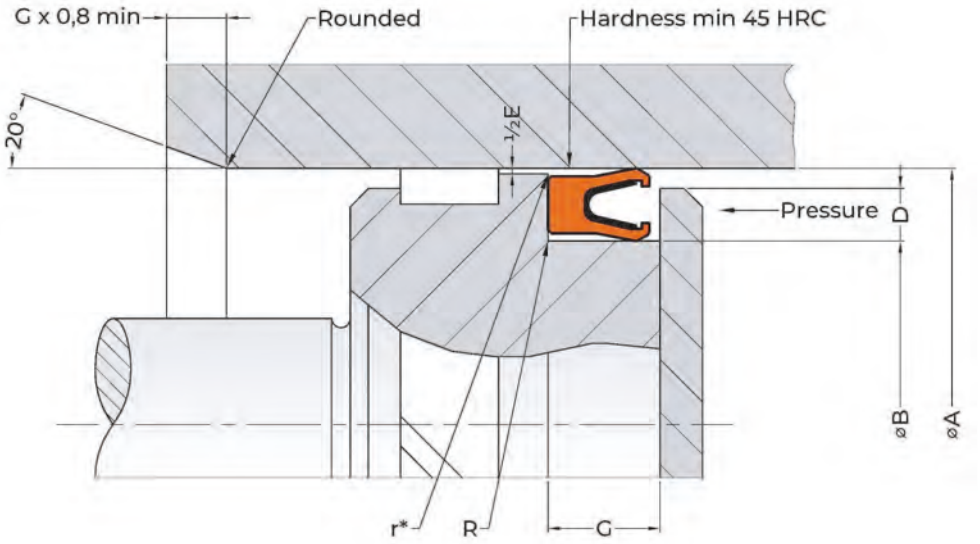
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

In case of groove dimensions not included in the table, identify the product as: 42A9

42A9 190-A00 40X33X4,8

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	Serie	C/S	ØA Rod Suggested H9	ØA Rod Available H9	ØB Groove h9	G +0,2 -0,0	R max	D min
62A00 62A10	000	66A00 66A10	000	6 ÷ 13,9	6 ÷ 40	A - 2,9	2,4 3,8	0,4	0,4
62A01 62A11	100	66A01 66A11	100	14 ÷ 24,9	10 ÷ 200	A - 4,5	3,6 4,65	0,4	0,6
62A02 62A12	200	66A02 66A12	200	25 ÷ 45,9	16 ÷ 400	A - 6,2	4,8 5,7	0,6	0,7
62A03 62A13	300	66A03 66A13	300	46 ÷ 24,9	28 ÷ 700	A - 9,4	7,1 8,5	0,8	0,8
62A04 62A14	400	66A04 66A14	400	125 ÷ 999,9	45 ÷ 999,9	A - 12,2	9,5 11,2	0,8	0,9
62A05 62A15	500	66A05 66A15	500	400 ÷ 1400	150 ÷ 1400	A - 18,75	13,4 15,8	0,8	1,5

*** "E" values depend on working temperature and seal material.**
*** Tolerances for higher pressures (up to 60 MPa): H7 / f7**

Fitting into closed housing pag. 08.03 / 08.04

C/S	* E max up to 2 MPa	up to 10 MPa	up to 20 MPa	up to 40 MPa
000	0,40	0,20	0,16	0,10
100	0,50	0,30	0,20	0,14
200	0,70	0,40	0,30	0,16
300	1,00	0,50	0,40	0,20
400	1,20	0,60	0,50	0,24
500	1,80	1,00	0,80	0,40

DENOMINATION EXAMPLE

Cylinder :	Ø 80,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Dynamic

62A 03 - 00800 - 190 - S00

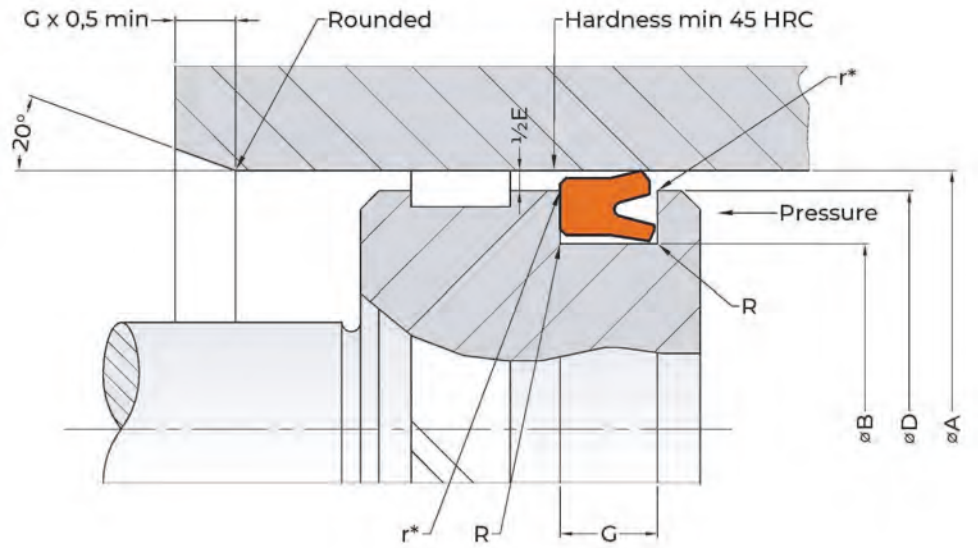
- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code

In case of groove dimensions not included in the table, identify the product as: 62A9 or 66A9

62A9 190-S00 90X80,4X7,1

- Type
- Seal material code
- Spring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

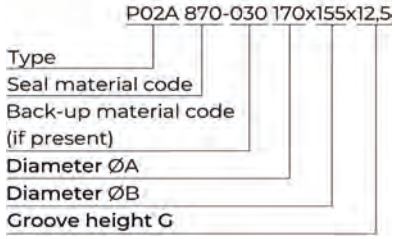
Type C/S P01	P01C	P02A	ØA Rod Suggested H9 from ÷ to	ØB Groove h9	ØD Groove min	G +0,2 -0,0	R max
4,0			16 ÷ 40	A - 8,0	B + 4,0	6,3	0,4
5,0			25 ÷ 63	A - 10,0	B + 5,0	8,0	0,4
7,5			50 ÷ 180	A - 15,0	B + 6,0	12,5	0,4
10,0			80 ÷ 250	A - 20,0	B + 8,0	16,0	0,6
12,5			125 ÷ 300	A - 25,0	B + 10,0	20,0	0,8
15,0			200 ÷ 450	A - 30,0	B + 12,0	25,0	0,8
20,0			400 ÷ 650	A - 40,0	B + 15,0	32,0	0,8

With bore diameter smaller than 20 mm, open groove with flange is reccomended for seal fitting.
***"E" values depend on working temperature and seal material.**
In this page are written values designed for mat. 850 and 870, for operating temperature of 60°C.
For high pressure or temperature, please contact our Technical Department.
For material selection please check pages 01.06 and 01.07

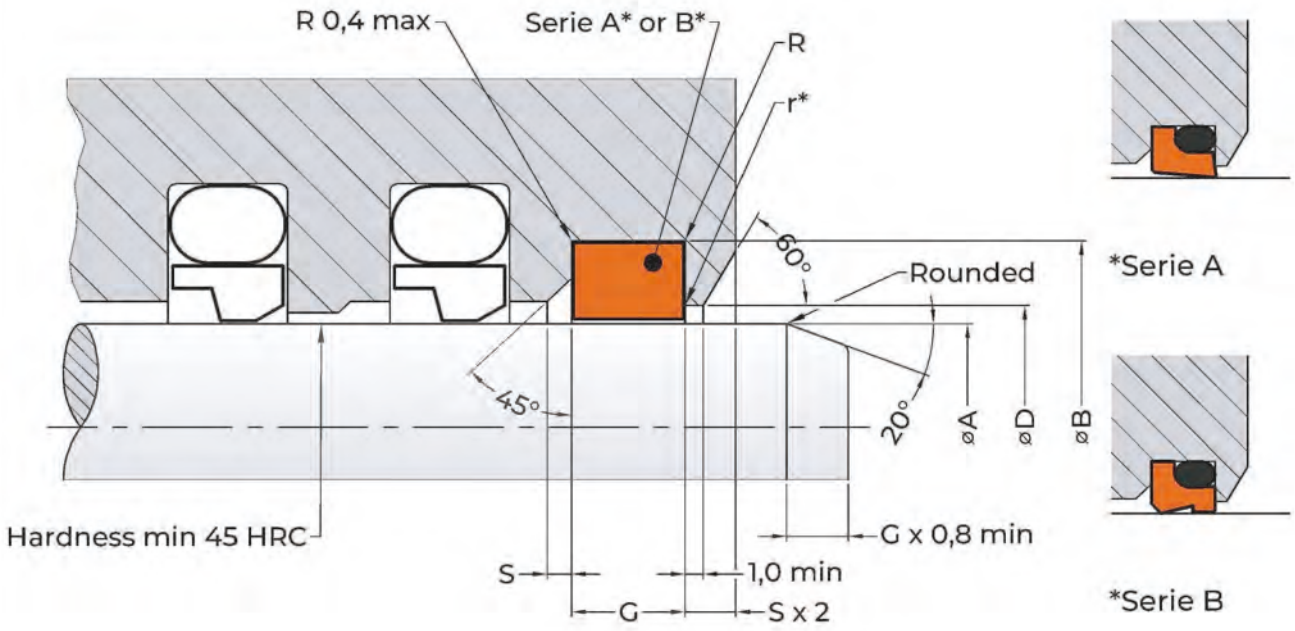
C/S	* E max up to 5 MPa	up to 10 MPa	up to 20 MPa	up to 40 MPa
4 ÷ 6	0,60	0,50	0,30	-
6,1 ÷ 8,5	0,70	0,55	0,40	0,20
8,6 ÷ 13,3	0,80	0,60	0,45	0,25
13,4 ÷ 18,2	0,90	0,70	0,50	0,30
18,3 ÷ 22	1,10	0,90	0,60	0,40

DENOMINATION EXAMPLE

Cylinder : Ø 170,0 mm
Fluid : hydraulic oil
Contact material : steel



GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Wipers can be supplied for any diameter as per the following table

Serie		ØA Rod		ØB	ØD	S	G	R	O-Ring
		Suggested h9	Available h9	Groove H9	+0,25 -0,00		+0,15 -0,00	max	
21A00	**21B00**	6 ÷ 11,9	6 ÷ 130	A + 4,8	A + 1,5	0,6	3,7	0,4	1,78
21A01	**21B01**	12 ÷ 64,9	6 ÷ 245	A + 6,8	A + 1,5	1,0	5,0	0,7	2,62
21A02	**21B02**	65 ÷ 250,9	6 ÷ 455	A + 8,8	A + 1,5	1,4	6,0	1,0	3,53
21A03	**21B03**	251 ÷ 420,9	40 ÷ 655	A + 12,2	A + 2,0	1,8	8,4	1,2	5,33
21A04	**21B04**	421 ÷ 650,9	110 ÷ 655	A + 16,0	A + 2,0	2,0	11,0	1,5	6,99
21A05	**21B05**	651 ÷ 999,9	140 ÷ 999,9	A + 20,0	A + 2,5	2,5	14,0	2,0	8,40

Open groove with flange is preferred for wiper with a diameter smaller than 30 mm.
PRP - 21B in case of risk of interpressure between seal and wiper we recommend to have a drain for pressure release to prevent the wiper from being pushed out from its housing.
Please contact our Technical Department.

DENOMINATION EXAMPLE

Rod : Ø 80,5 mm
Contact material : steel

21B 02 - 00805 - A00 - 240

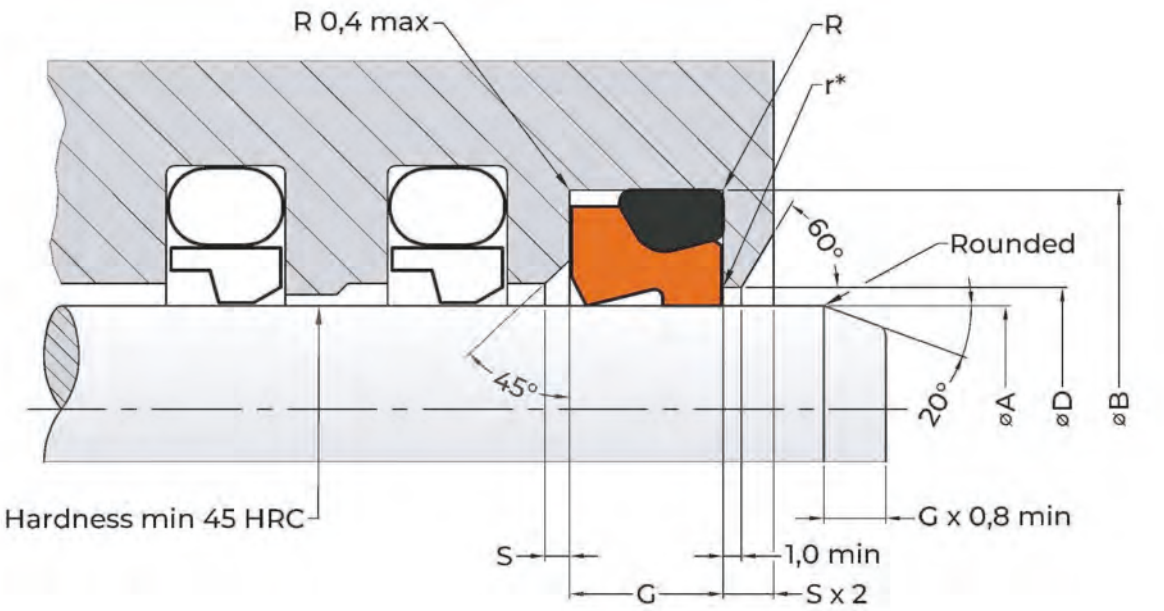
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

In case of groove dimensions not included in the table, identify the product as: 21A9 or 21B9

21B9 240-A00 90X99X6

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Wipers can be supplied for any diameter as per the following table

Serie	ØA Rod Suggested h9	ØA Rod Available h9	ØB Groove H9	ØD +0,25 -0,00	S	G +0,15 -0,00	R max	O-Ring
21C00	19 ÷ 39,9	19 ÷ 100	A + 7,6	A + 1,5	1,5	4,2	0,7	2,62
21C01	40 ÷ 69,9	30 ÷ 200	A + 8,8	A + 1,5	1,5	6,3	0,7	2,62
21C02	70 ÷ 139,9	70 ÷ 360	A + 12,2	A + 2,0	2,0	8,1	1,0	3,53
21C03	140 ÷ 399,9	100 ÷ 650	A + 16,0	A + 2,5	2,5	9,5	1,2	5,33
21C04	400 ÷ 649,9	200 ÷ 650	A + 24,0	A + 2,5	4,0	14,0	1,5	6,99
21C05	≥ 650	≥ 400	A + 27,3	A + 2,5	5,0	16,0	2,0	8,40

Open groove with flange is preferred for wiper with a diameter smaller than 30 mm.
In case of risk of interpressure between seal and wiper, we recommend to have a drain for pressure release to prevent the wiper from being pushed out from its housing.
Please contact our Technical Department.

Minimum diameter for fitting in closed groove	
Serie	Diameter
21C00	30 mm
21C01	40 mm
21C02	70 mm
21C03	100 mm
21C04	140 mm
21C05	180 mm

DENOMINATION EXAMPLE

Rod : Ø 80,5 mm
Contact material : steel

21C 02 - 00805 - A00 - 240

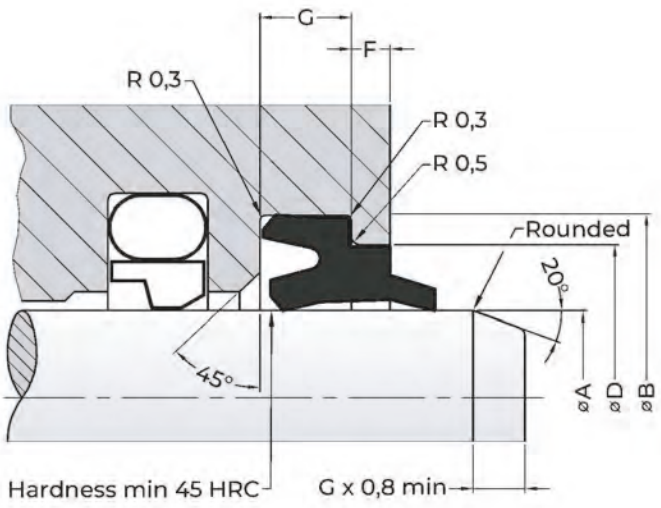
- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code

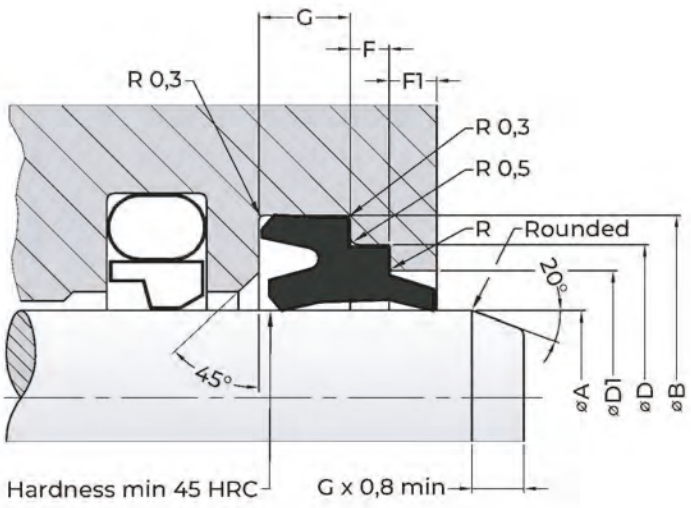
In case of groove dimensions not included in the table, identify the product as: 21C9

21C9 240-A00 90X102,5X8,1

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

GROOVE GEOMETRY & DIMENSION



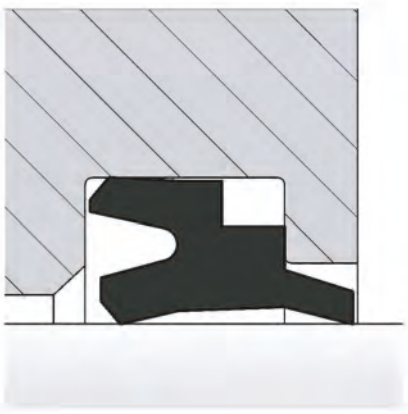


Serie	ØA Rod h9	ØB Groove H9	ØD Groove ±0,1	ØD1 Groove ±0,1	G +0,2 -0,0	F min	F1 min	R max
21D02	10 ÷ 100	A + 8,0	A + 6,0	A + 3,5	4,0	2,0	2,0	0,5
21D03	105 ÷ 200	A + 12,0	A + 9,0	A + 5,0	5,5	2,7	3,0	1,0
21D04	205 ÷ 440	A + 15,0	A + 12,0	A + 7,0	6,5	3,0	3,0	1,5

Wipers can be supplied for any diameter as per the following table

ØA Available diameters									
10	12	14	15	16	18	20	22	24	25
28	30	32	35	36	37	38	40	42	45
46	48	50	52	55	56	60	63	65	68
70	75	80	85	90	95	100	105	110	115
120	125	130	135	140	145	150	160	165	170
180	185	190	195	200	210	220	225	240	250
260	280	300	320	360	400	-	-	-	-

In case of risk of interpressure between seal and wiper, we recommend to have a drain for pressure release to prevent the wiper from being pushed out from its housing. Please contact our Technical Department.



Compatible with mounting on W11 wiper housing

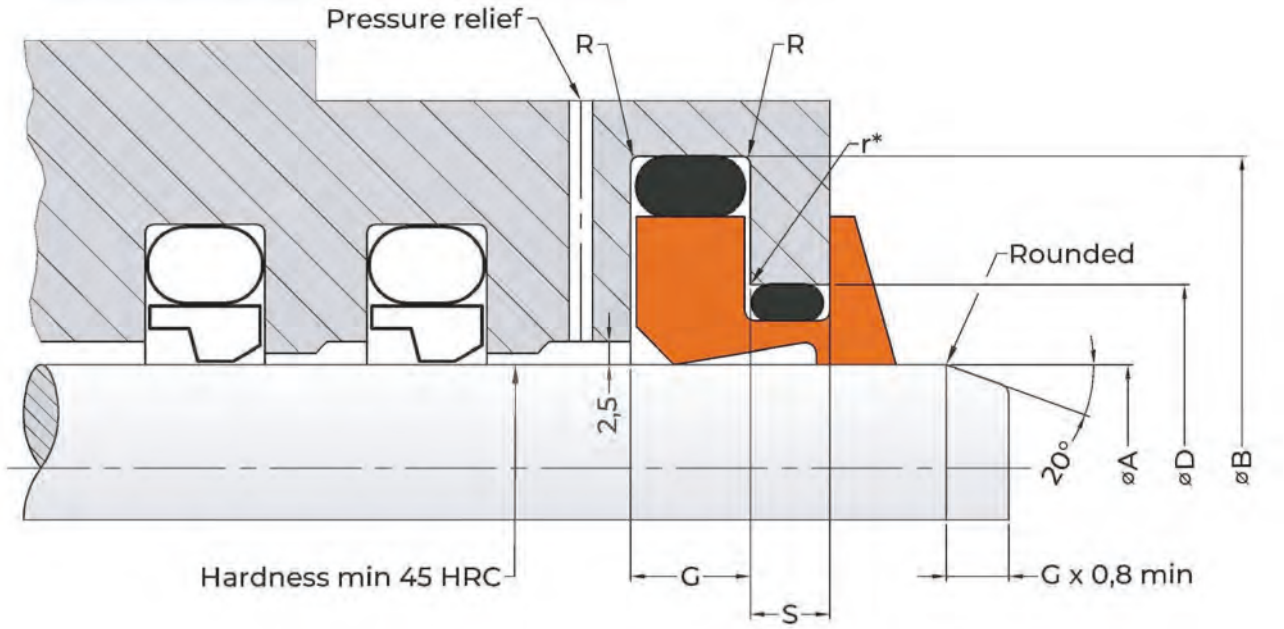
DENOMINATION EXAMPLE

Rod : Ø 80,0 mm
Contact material : steel

21D 02 - 00800 - N90

Type
Serie
Ref. (ØA x 10)
Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Wipers can be supplied for any diameter as per the following table

Serie	ØA Rod Suggested h9	ØA Rod Available h9	ØB Groove H9	ØD +0,25 -0,00	G +0,15 -0,00	S +0,0 -0,1	R max	O-Ring d1	O-Ring d2
21E01	140 ÷ 229,9	100 ÷ 450	A + 22,2	A + 10,7	6,3	4,2	1,2	5,33	3,53
21E02	230 ÷ 299,9	220 ÷ 450	A + 24,2	A + 10,7	6,3	4,2	1,2	5,33	3,53
21E03	300 ÷ 629,9	250 ÷ 650	A + 33,0	A + 15,1	8,1	6,3	1,2	6,99	5,33
21E04	630 ÷ 999,9	500 ÷ 999,9	A + 36,5	A + 15,1	9,5	6,3	2,0	8,40	5,33

Open groove with flange is preferred for wiper with a diameter smaller than 140 mm.
In case of risk of interpressure between seal and wiper, we recommend to have a drain for pressure release to prevent the wiper from being pushed out from its housing.
Please contact our Technical Department.

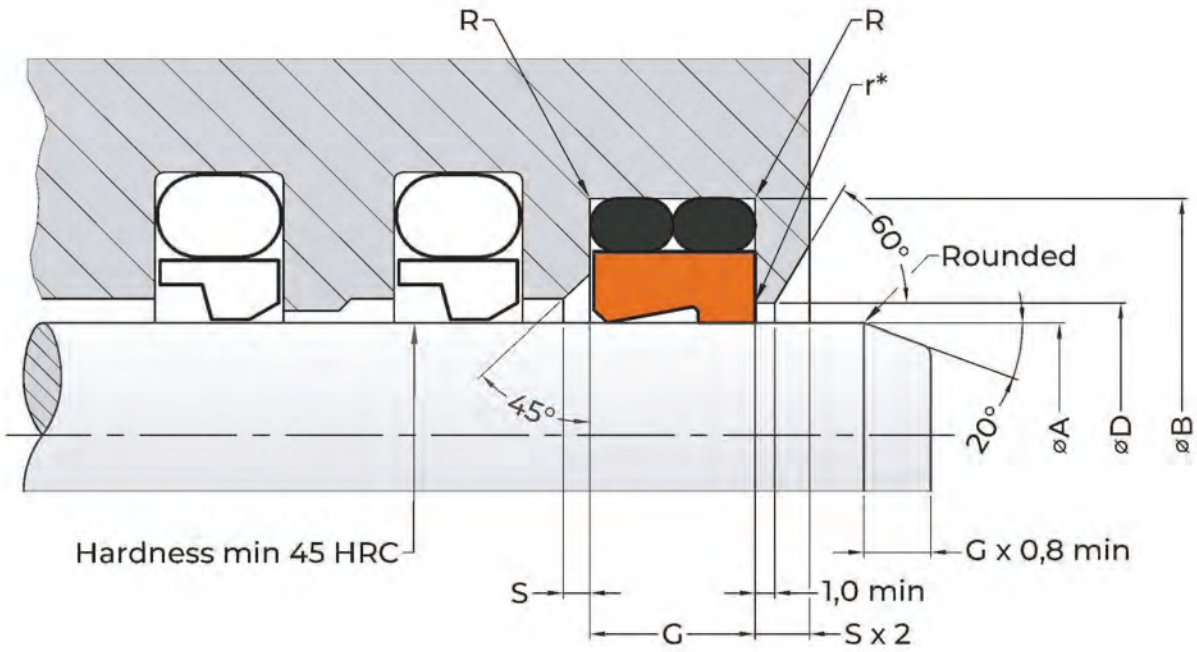
DENOMINATION EXAMPLE

Rod : Ø 200,0 mm
Contact material : steel

21E 01 - 02000 - A00 - 240

Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod h9	ØB Groove H9	ØD Groove +0,25 -0,00	S	G +0,15 -0,00	R max	O-Ring
21F00	6 ÷ 39,9	A + 7,6	A + 1,0	1,5	4,2	0,4	1,78
21F01	40 ÷ 69,9	A + 8,8	A + 1,5	1,5	6,3	1,2	2,62
21F02	70 ÷ 139,9	A + 12,2	A + 2,0	2,0	8,1	1,5	3,53
21F03	140 ÷ 400	A + 16,0	A + 2,0	2,5	11,5	2,0	5,33
21F04	400,1 ÷ 649,9	A + 24,0	A + 2,5	4,0	15,5	2,5	6,99
21F05	650 ÷ 999,9	A + 27,3	A + 2,5	5,0	18,0	2,5	8,40

**Open groove with flange is preferred for wiper with a diameter smaller than 30 mm.
In case of risk of interpressure between seal and wiper, we recommend to have a drain for pressure release to prevent the wiper from being pushed out from its housing.
Please contact our Technical Department.**

DENOMINATION EXAMPLE

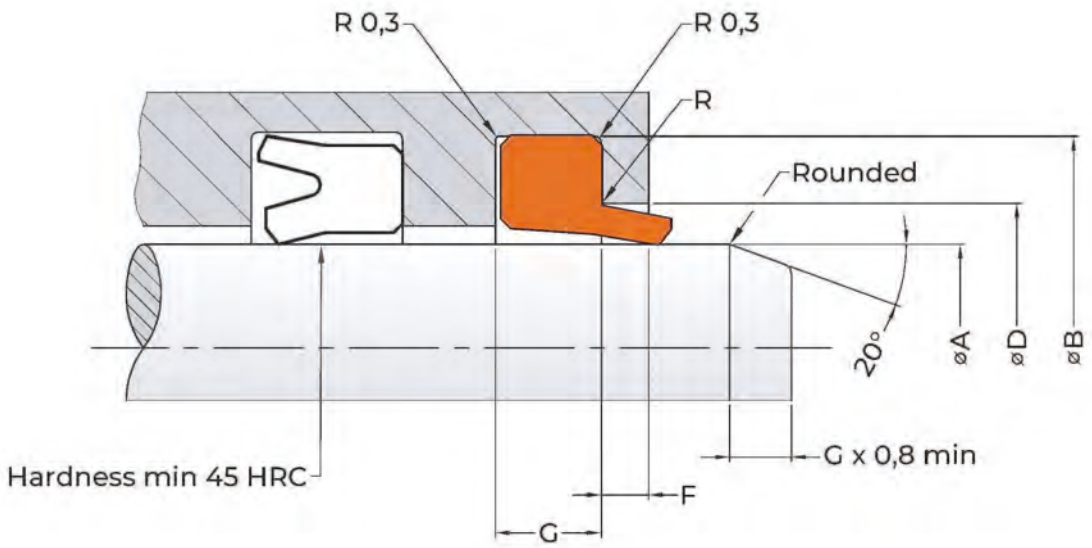
Rod : Ø 90,0 mm
Contact material : steel

21F 02 - 00900 - A00 - 240
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code

In case of groove dimension not included in the table, identify the product as: 21F9

21F9 240-A00 90X102,5X8,1
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



Wipers can be supplied for any diameter as per the following table
Other dimensions are avalable, please contact our Technical Department.

Type C/S  W02	ØA Rod Suggested from ÷ to h9	ØB Groove H10	ØD ± 0,1	G +0,2 -0,0	F min	R max
4,3	20 ÷ 80	A + 8,6	A + 3,0	5,3	1,7	1,0
5,3	45 ÷ 80	A + 10,6	A + 3,0	5,3	1,7	1,0
6,1	75 ÷ 150	A + 12,2	A + 6,0	7,2	4,8	1,0
7,5	140 ÷ 290	A + 15,0	A + 7,6	10,2	5,8	1,5
10,0	180 ÷ 500	A + 20,0	A + 10,0	10,2	7,8	3,0
12,5	320 ÷ 900	A + 25,0	A + 12,6	12,7	7,3	3,0
15,0	380 ÷ 2450	A + 30,0	A + 15,0	15,2	9,8	3,0

With shaft diameter smaller than 30 mm, open groove with flange is reccomended for seal fitting.

In this page are written values designed for mat. 610, 850 and 870, for operating temperature of 60°C. For high pressure or temperature, please contact our Technical Department.
For material selection please check pages 01.06/01.07

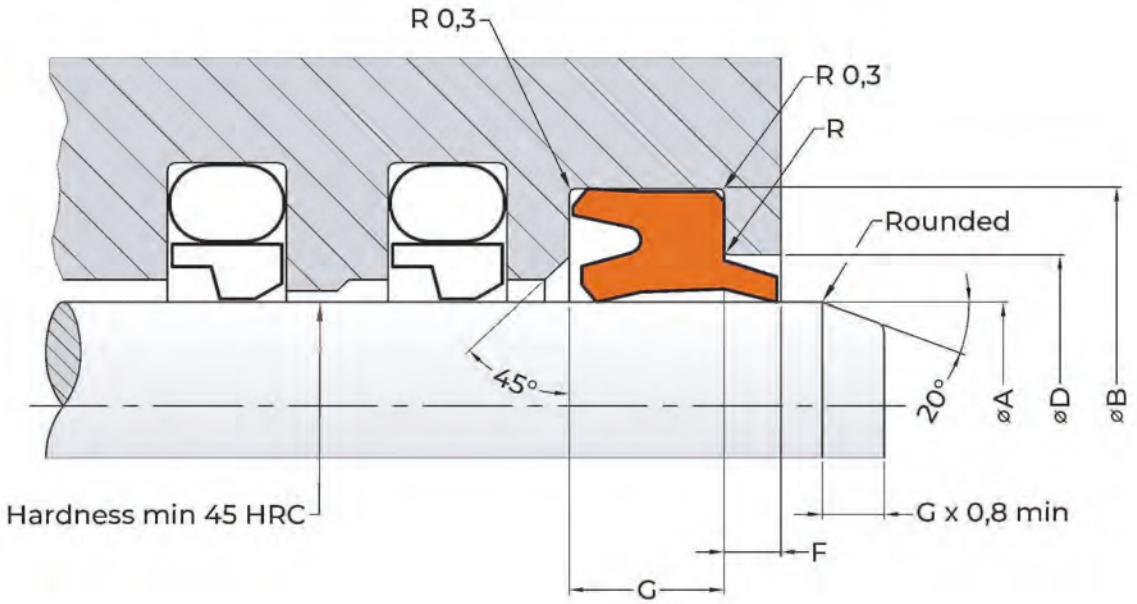
DENOMINATION EXAMPLE

Rod : Ø 265,0 mm
Contact material : steel

W02 870 265x280x10,2

Type
Seal material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



Wipers can be supplied for any diameter as per the following table
Other dimensions are avalable, please contact our Technical Department.

Type C/S  W11	ØA Rod Suggested from ÷ to h9	ØB Groove H10	ØD ± 0,1	G +0,2 -0,0	F min	R max
4,0	10 ÷ 100	A + 8,0	A + 3,5	6,0	2,0	0,5
6,0	100 ÷200	A + 12,0	A + 5,0	8,2	2,7	1,0
7,5	200 ÷ 1000	A + 15,0	A + 7,0	9,5	3,0	1,5
10,0	200 ÷ 1350	A + 20,0	A + 10,0	10,2	7,8	1,5
12,5	200 ÷ 1700	A + 25,0	A + 12,6	16,0	6,5	2,0
15,0	310 ÷ 2450	A + 30,0	A + 15,0	18,0	9,0	3,0

With shaft diameter smaller than 30 mm, open groove with flange is reccomended for seal fitting.

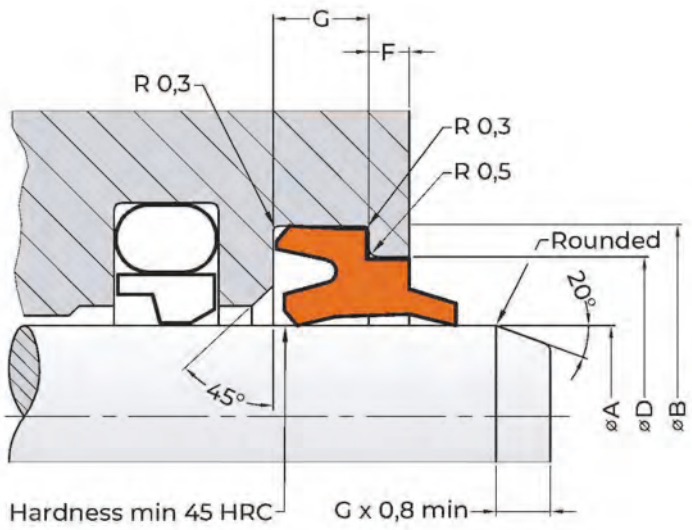
In this page are written values designed for mat. 610, 850 and 870, for operating temperature of 60°C. For high pressure or temperature, please contact our Technical Department.
For material selection please check pages 01.06/01.07

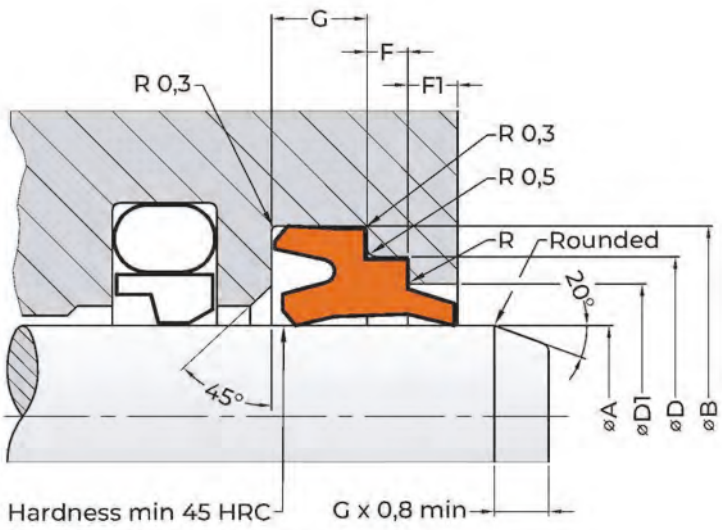
DENOMINATION EXAMPLE

Rod : Ø 240,0 mm
Contact material : steel

W11 870 240x260x10,2
Type
Seal material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



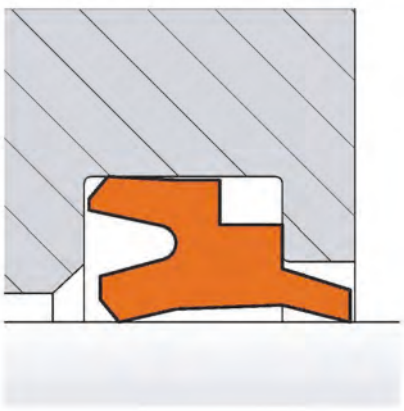


Wipers can be supplied for any diameter as per the following table

Type Serie C/S W12	ØA Rod h9	ØB Groove H9	ØD Groove ±0,1	ØD1 Groove ±0,1	G +0,2 -0,0	F min	F1 min	R max
4,0	200 ÷ 240	A + 8,0	A + 6,0	A + 3,5	4,0	2,0	2,0	0,5
6,0	250 ÷ 300	A + 12,0	A + 9,0	A + 5,0	5,5	2,7	3,0	1,0
7,5	310 ÷ 2450	A + 15,0	A + 12,0	A + 7,0	6,5	3,0	3,0	1,5

With shaft diameter smaller than 30 mm, open groove with flange is reccomended for seal fitting.

In this page are written values designed for mat. 610, 850 and 870, for operating temperature of 60°C.
For high pressure or temperature, please contact our Technical Department.
For material selection please check pages 01.06/01.07



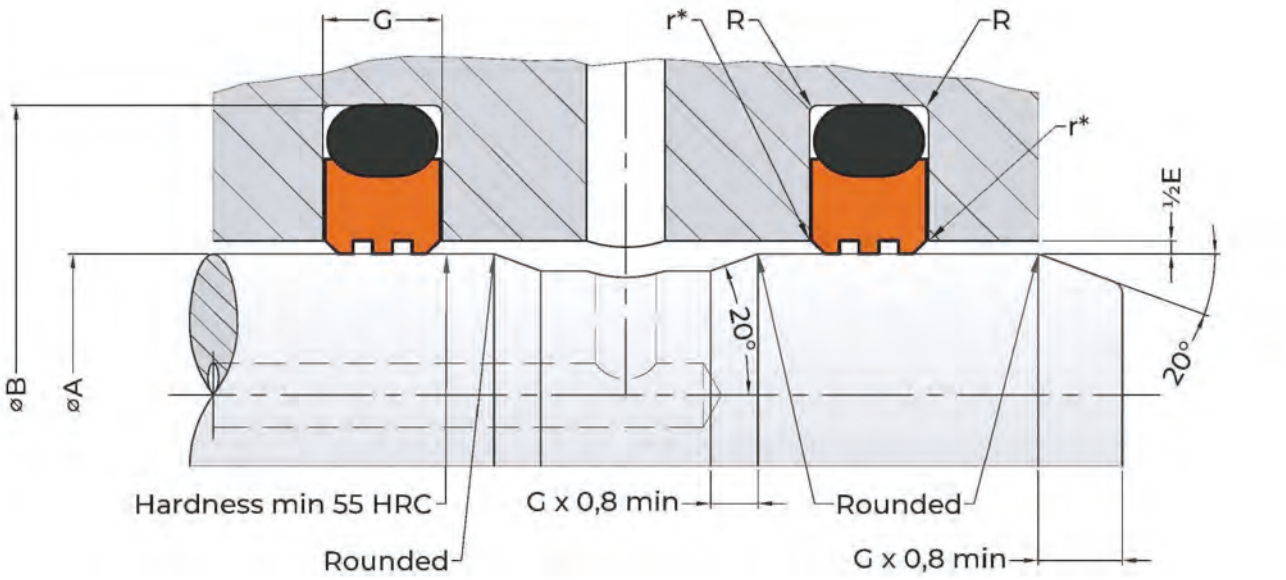
Compatible with mounting on W11 wiper housing

DENOMINATION EXAMPLE

Rod : Ø 240,0 mm
Contact material : steel

W12 870 240x248x4
Type
Seal material code
Diameter ØA
Diameter ØB
Groove height G

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie	ØA Shaft Suggested h9	ØA Shaft Available h9	ØB Groove H9	G +0,2 -0,0	R max	Number of grooves in the sealing surface	E* Max. Diametral gap up to 1 MPa	E* Max. Diametral gap up to 10 MPa	E* Max. Diametral gap up to 20 MPa	O-Ring
51C00	6 ÷ 24,9	6 ÷ 130	A + 4,9	2,2	0,3	C = 0	0,6	0,3	0,2	1,78
51B01	25 ÷ 59,9	10 ÷ 245	A + 7,5	3,2	0,5	B = 1	0,7	0,4	0,3	2,62
51B02	60 ÷ 132,9	19 ÷ 455	A + 11,0	4,2	0,7	B = 1	0,8	0,5	0,4	3,53
51A03	133 ÷ 329,9	38 ÷ 655	A + 15,5	6,3	1,2	A = 2	0,9	0,6	0,5	5,33
51A04	330 ÷ 654,9	120 ÷ 655	A + 21,0	8,1	1,5	A = 2	1,0	0,6	0,5	6,99
51A05	655 ÷ 999,9	650 ÷ 999,9	A + 28,0	9,5	2,0	A = 2	1,2	0,9	0,6	8,40

This seal is recommended for rotary application depending on the design constraints
*** Extrusion gap for higher pressures (up to 30 MPa): H8 / f8. Max PV = 2,5 MPa x m/s.**
Seals cannot be used as bearings. Use the appropriate support to guide the components.

Minimum diameter for fitting in closed groove	
Serie	Diameter
51C00	12 mm
51B01	18 mm
51B02	33 mm
51A03	60 mm

DENOMINATION EXAMPLE

Shaft : Ø 100,0 mm
Cross section : 200
Fluid : hydraulic oil
Contact material : steel
Movement : Rotation

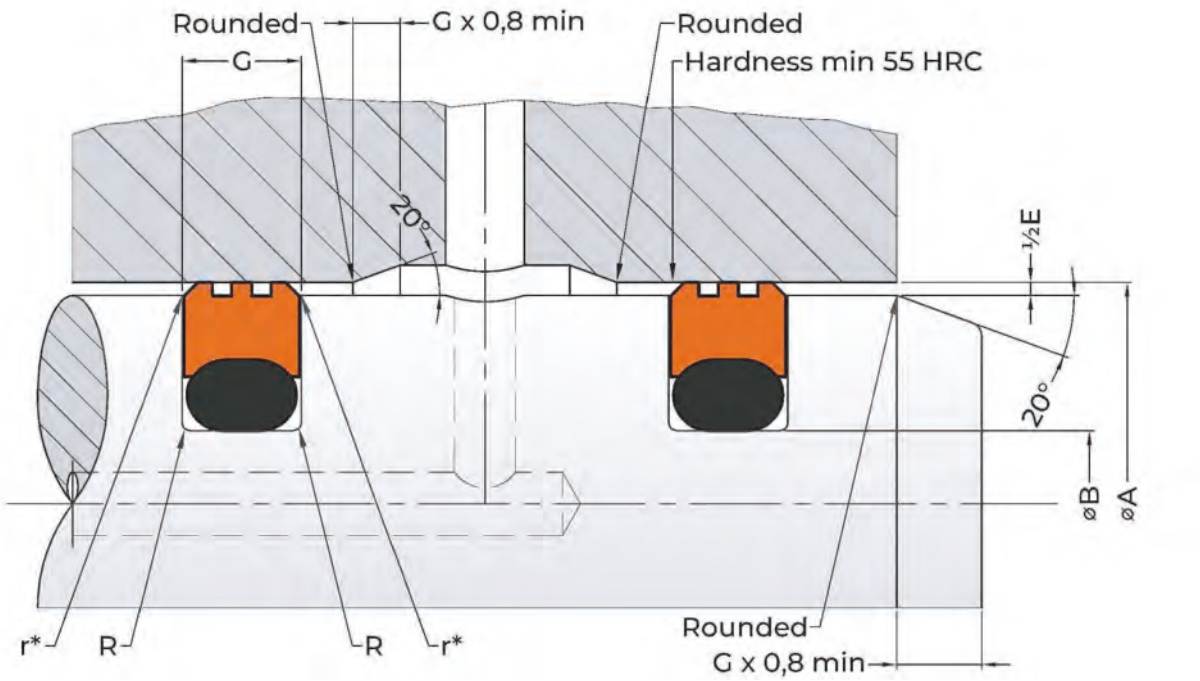
51B 02 - 01000 - A00 - 410 N
Type
Serie
Ref. (ØA x 10)
O-ring material code
Seal material code
Notches

In case of groove dimensions not included in the table, identify the product as: 51A9

51B9 410-A00 90X101,5X4,2
Type
Seal material code
O-ring material code
Diameter ØA
Diameter ØB
Groove height G

Lateral notches assure fast seal reaction in case of pressure direction changes.
Notches are standardized for seal with a diameter larger than 20 mm.

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max
Seals can be supplied for any diameter as per the following table

Serie	ØA Shaft Suggested H9	ØA Shaft Available H9	ØB Groove h9	G +0,2 -0,0	R max	Number of grooves in the sealing surface	E* Max. Diametral gap up to 1 MPa	E* Max. Diametral gap up to 10 MPa	E* Max. Diametral gap up to 20 MPa	O-Ring
52C00	8 ÷ 29,9	8 ÷ 135	A – 4,9	2,2	0,3	C = 0	0,6	0,3	0,2	1,78
52B01	30 ÷ 69,9	14 ÷ 250	A – 7,5	3,2	0,5	B = 1	0,7	0,4	0,3	2,62
52B02	70 ÷ 132,9	22 ÷ 460	A – 11,0	4,2	0,7	B = 1	0,8	0,5	0,4	3,53
52A03	133 ÷ 329,9	40 ÷ 675	A – 15,5	6,3	1,2	A = 2	0,9	0,6	0,5	5,33
52A04	330 ÷ 689,9	133 ÷ 690	A – 21,0	8,1	1,5	A = 2	1,0	0,6	0,5	6,99
52A05	690 ÷ 999,9	690 ÷ 999,9	A – 28,0	9,5	2,0	A = 2	1,2	0,9	0,6	8,40

This seal is recommended for rotary application depending on the design constraints
*** Extrusion gap for higher pressures (up to 30 MPa): H8 / f8. Max PV = 2,5 MPa x m/s.**
Seals cannot be used as bearings. Use the appropriate support to guide the components.

Minimum diameter for fitting in closed groove	
Serie	Diameter
52C00	15 mm
52B01	25 mm
52B02	32 mm
52A03	50 mm

DENOMINATION EXAMPLE

Bore : Ø 50,0 mm
Cross section : 100
Fluid : hydraulic oil
Contact material : steel
Movement : Rotation

52B 01 - 00500 - A00 - 410 N

- Type
- Serie
- Ref. (ØA x 10)
- O-ring material code
- Seal material code
- Notches

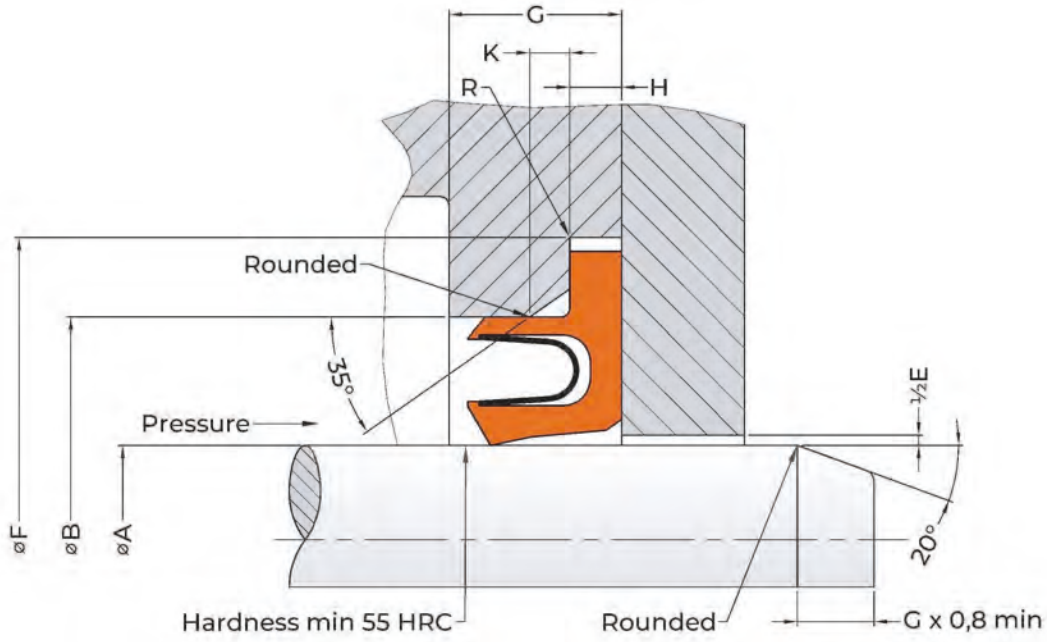
In case of groove dimensions not included in the table, identify the product as: 52A9

52B9 410-A00 60X52X3,2

- Type
- Seal material code
- O-ring material code
- Diameter ØA
- Diameter ØB
- Groove height G

Lateral notches assure fast seal reaction in case of pressure direction changes.
Notches are standardized for seal with a diameter larger than 20 mm.

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	ØA Rod Suggested h9	ØA Rod Available h9	ØB Groove H9	ØF Flange H10	G min	H	K	R max
65A01	100	5 ÷ 19,9	5 ÷ 200	A + 5,0	A + 10,0	3,6	0,85 +0,0/-0,1	0,8	0,3
65A02	200	20 ÷ 39,9	10 ÷ 400	A + 7,0	A + 13,5	4,8	1,35 +0,0/-0,15	1,1	0,4
65A03	300	40 ÷ 400,9	20 ÷ 700	A + 10,5	A + 18,5	7,1	1,80 +0,0/-0,2	1,4	0,5
65A04	400	401 ÷ 999,9	35 ÷ 999,9	A + 14,0	A + 23,0	9,5	2,80 +0,0/-0,2	1,6	0,5

*** "E" values depend on working temperature and seal material.**
For high pressure please contact our Technical Department. Max PV = 8 MP-a x m/s.
Seals cannot be used as bearings. Use the appropriate support to guide the components.
For material selection please check pages 01.08 and 01.09

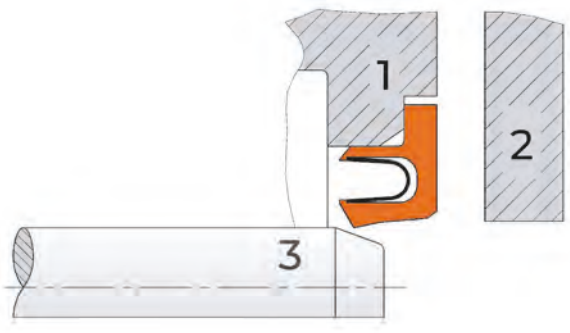
Serie	* E max Diametral gap up to 2 MPa	up to 10 MPa	up to 20 MPa
100	0,50	0,30	0,20
200	0,70	0,40	0,30
300	1,00	0,50	0,40
400	1,20	0,60	0,50

DENOMINATION EXAMPLE

Shaft :	Ø 30,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Rotation

65A 02 - 00300 - 410 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code



Installation should be performed in the following steps in order to ensure a concentric and strain-free fit:

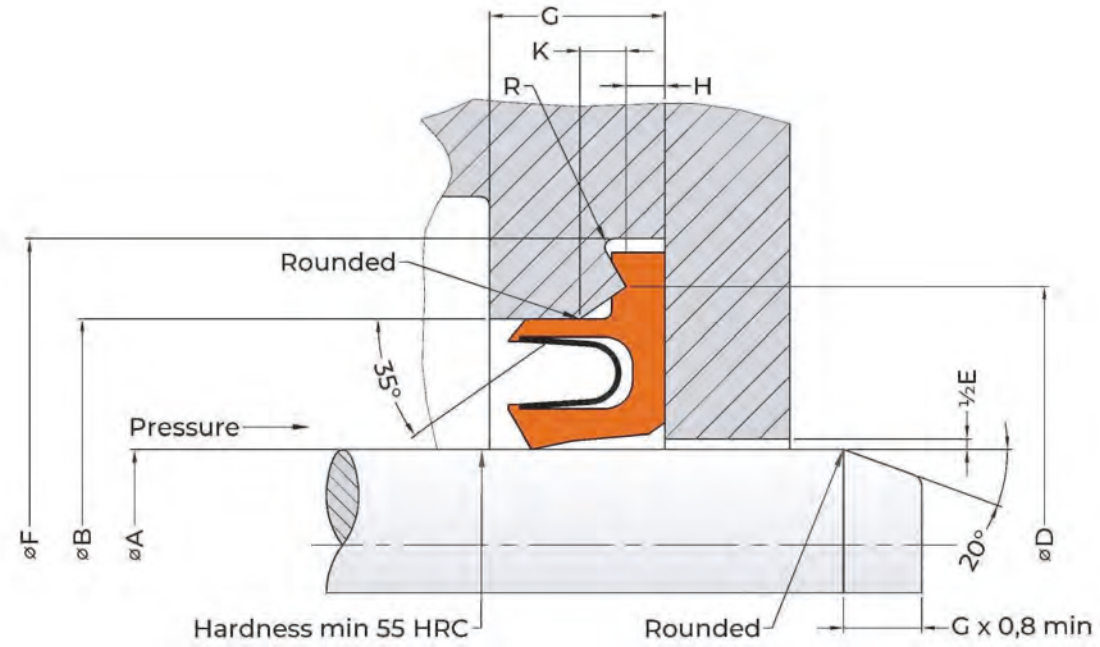
a) Place the seal ring into the open groove (1) ;

b) Fit the cover (2) loosely onto the housing;

c) Insert the shaft (3);

d) Tighten the cover (2).

Installation groove specially designed for heavy duty applications, using PRP 65A



Seals can be supplied for any diameter as per the following table

Serie	C/S	ØA Rod Suggested h9	ØA Rod Available h9	ØB Groove H9	ØF Flange H10	ØD Cusp +0,25 -0,00	G min	H	K	R max
65A01	100	5 ÷ 19,9	5 ÷ 200	A + 5,0	A + 10,0	A + 6,0	3,6	0,75 +0,0/-0,1	0,8	0,3
65A02	200	20 ÷ 39,9	10 ÷ 400	A + 7,0	A + 13,5	A + 8,3	4,8	1,10 +0,0/-0,15	1,1	0,4
65A03	300	40 ÷ 400,9	20 ÷ 700	A + 10,5	A + 18,5	A + 12,2	7,1	1,50 +0,0/-0,2	1,4	0,5
65A04	400	401 ÷ 999,9	35 ÷ 999,9	A + 14,0	A + 23,0	A + 15,9	9,5	2,30 +0,0/-0,2	1,6	0,5

*** "E" values depend on working temperature and seal material.**
For high pressure please contact our Technical Department. Max PV = 8 MPa x m/s.
Seals cannot be used as bearings. Use the appropriate support to guide the components.
For material selection please check pages 01.08 and 01.09

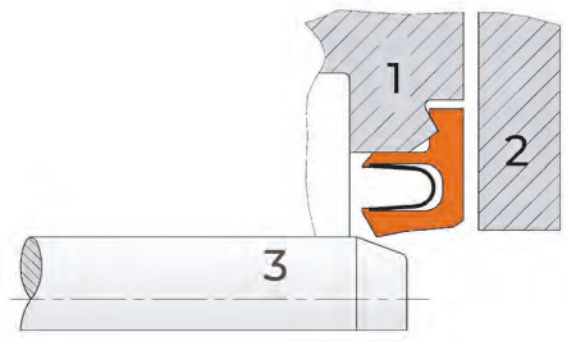
Serie	* E max Diametral gap up to 2 MPa	up to 10 MPa	up to 20 MPa
100	0,50	0,30	0,20
200	0,70	0,40	0,30
300	1,00	0,50	0,40
400	1,20	0,60	0,50

DENOMINATION EXAMPLE

Shaft :	Ø 30,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Rotation

65A 02 - 00300 - 410 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code



Installation should be performed in the following steps in order to ensure a concentric and strain-free fit:

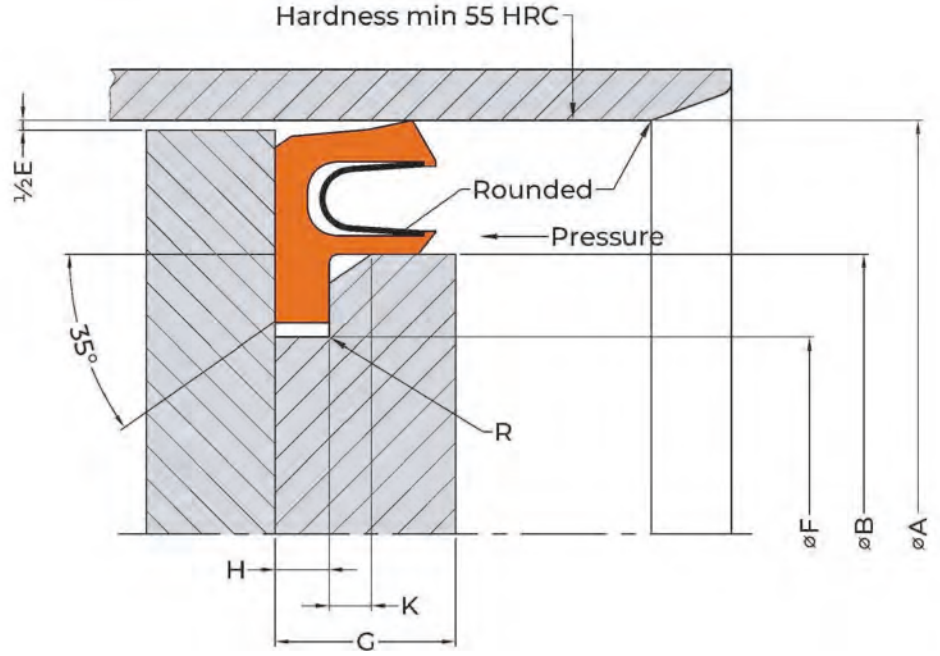
a) Place the seal ring into the open groove (1) ;

b) Fit the cover (2) loosely onto the housing;

c) Insert the shaft (3);

d) Tighten the cover (2).

GROOVE GEOMETRY & DIMENSION



Seals can be supplied for any diameter as per the following table

Serie	C/S	ØA Rod Suggested H9	ØA Rod Available H9	ØB Groove h9	ØF Flange h10	G min	H	K	R max
65B01	100	14 ÷ 24,9	14 ÷ 200	A - 5,0	A - 10,0	3,6	0,85 +0,0/-0,1	0,8	0,3
65B02	200	25 ÷ 45,9	18 ÷ 400	A - 7,0	A - 13,5	4,8	1,35 +0,0/-0,15	1,1	0,4
65B03	300	46 ÷ 124,9	28 ÷ 700	A - 10,5	A - 18,5	7,1	1,80 +0,0/-0,2	1,4	0,5
65B04	400	125 ÷ 999,9	45 ÷ 999,9	A - 14,0	A - 23,0	9,5	2,80 +0,0/-0,2	1,6	0,5

*** "E" values depend on working temperature and seal material.**
For high pressure please contact our Technical Department. Max PV = 8 MPa x m/s.
Seals cannot be used as bearings. Use the appropriate support to guide the components.
For material selection please check pages 01.08 and 01.09

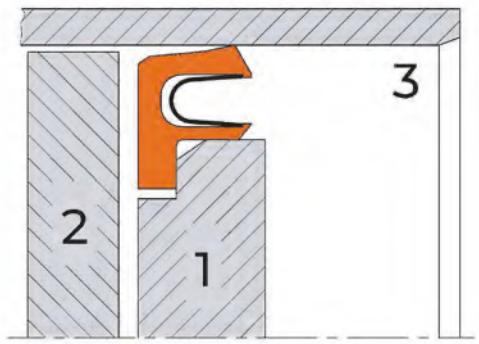
Serie	* E max Diametral gap up to 2 MPa	up to 10 MPa	up to 20 MPa
100	0,50	0,30	0,20
200	0,70	0,40	0,30
300	1,00	0,50	0,40
400	1,20	0,60	0,50

DENOMINATION EXAMPLE

Bore :	Ø 30,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Rotation

65B 02 - 00300 - 410 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code



Installation should be performed in the following steps in order to ensure a concentric and strain-free fit:

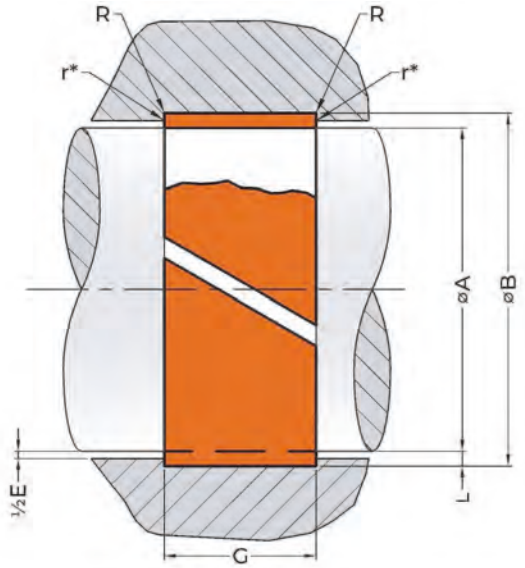
a) Place the seal ring into the open groove (1) ;

b) Fit the cover (2) loosely onto the housing;

c) Insert the seal seat (1+2) in the bore (3) ;

d) Tighten the cover (2).

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested h9	ØB Groove H9	L	G +0,2 -0,0	R max	E* Diametral gap
81A15032	8 ÷ 20	ØA + 3	1,5	3,2	0,3	0,4 ÷ 1,0
81A20042	8 ÷ 140	ØA + 4	2,0	4,2	0,3	0,5 ÷ 1,5
81A20063	15 ÷ 220	ØA + 4	2,0	6,3	0,3	0,5 ÷ 1,5
81A20081	15 ÷ 220	ØA + 4	2,0	8,1	0,3	0,5 ÷ 1,5
81A20097	20 ÷ 220	ØA + 4	2,0	9,7	0,3	0,5 ÷ 1,5
81A20150	80 ÷ 400	ØA + 4	2,0	15,0	0,3	0,5 ÷ 1,5
81A20200	80 ÷ 700	ØA + 4	2,0	20,0	0,3	0,5 ÷ 1,5
81A20250	200 ÷ 999,9	ØA + 4	2,0	25,0	0,3	0,5 ÷ 1,5
81A25042	8 ÷ 140	ØA + 5	2,5	4,2	0,3	0,5 ÷ 2,0
81A25056	15 ÷ 140	ØA + 5	2,5	5,6	0,3	0,5 ÷ 2,0
81A25063	15 ÷ 220	ØA + 5	2,5	6,3	0,3	0,5 ÷ 2,0
81A25081	15 ÷ 220	ØA + 5	2,5	8,1	0,3	0,5 ÷ 2,0
81A25097	20 ÷ 220	ØA + 5	2,5	9,7	0,3	0,5 ÷ 2,0
81A25150	80 ÷ 400	ØA + 5	2,5	15,0	0,3	0,5 ÷ 2,0
81A25200	80 ÷ 700	ØA + 5	2,5	20,0	0,3	0,5 ÷ 2,0
81A25250	200 ÷ 999,9	ØA + 5	2,5	25,0	0,3	0,5 ÷ 2,0
81A25300	200 ÷ 999,9	ØA + 5	2,5	30,0	0,3	0,5 ÷ 2,0
81A30300	280 ÷ 999,9	ØA + 6	3,0	30,0	0,3	0,5 ÷ 3,0
81A40500	280 ÷ 999,9	ØA + 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

Rod :	Ø 101,6 mm
Guide thickness :	2,5 mm
Groove width :	9,7 mm
Contact material :	steel

81A 25 097 - 01016 - 290 - A

- Type
- Thickness
- Groove width
- Ref. (ØA x 10)
- Seal material code
- Cut type

Type 81A, thermoplastic material guide rings are made from thermoplastic strip.
For other cross sections please contact our Technical Department.

Guiding tape available in meter length with code PRP 85 intestead of PRP 81

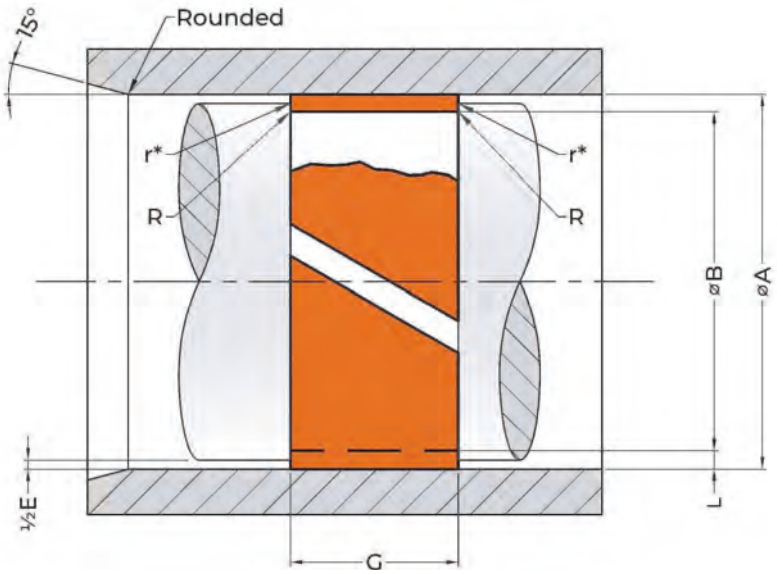
DENOMINATION EXAMPLE

Guide thickness :	2,5 mm
Groove width :	9,7 mm
Material :	PTFE + Bronze

85A 25 097 - 290

- Type
- Thickness
- Groove width
- Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested H9	ØB Groove h9	L	G +0,2 -0,0	R max	E* Diametral gap
82A15032	8 ÷ 20	ØA - 3	1,5	3,2	0,3	0,4 ÷ 1,0
82A20042	8 ÷ 140	ØA - 4	2,0	4,2	0,3	0,5 ÷ 1,5
82A20063	15 ÷ 220	ØA - 4	2,0	6,3	0,3	0,5 ÷ 1,5
82A20082	15 ÷ 220	ØA - 4	2,0	8,1	0,3	0,5 ÷ 1,5
82A20097	60 ÷ 220	ØA - 4	2,0	9,7	0,3	0,5 ÷ 1,5
82A20150	130 ÷ 400	ØA - 4	2,0	15,0	0,3	0,5 ÷ 1,5
82A20200	160 ÷ 700	ØA - 4	2,0	20,0	0,3	0,5 ÷ 1,5
82A20250	280 ÷ 999,9	ØA - 4	2,0	25,0	0,3	0,5 ÷ 1,5
82A25042	8 ÷ 140	ØA - 5	2,5	4,2	0,3	0,5 ÷ 2,0
82A25056	15 ÷ 140	ØA - 5	2,5	5,6	0,3	0,5 ÷ 2,0
82A25063	15 ÷ 220	ØA - 5	2,5	6,3	0,3	0,5 ÷ 2,0
82A25082	15 ÷ 220	ØA - 5	2,5	8,1	0,3	0,5 ÷ 2,0
82A25097	60 ÷ 220	ØA - 5	2,5	9,7	0,3	0,5 ÷ 2,0
82A25150	130 ÷ 400	ØA - 5	2,5	15,0	0,3	0,5 ÷ 2,0
82A25200	160 ÷ 700	ØA - 5	2,5	20,0	0,3	0,5 ÷ 2,0
82A25250	280 ÷ 999,9	ØA - 5	2,5	25,0	0,3	0,5 ÷ 2,0
82A25300	280 ÷ 999,9	ØA - 5	2,5	30,0	0,3	0,5 ÷ 2,0
82A30300	280 ÷ 999,9	ØA - 6	3,0	30,0	0,3	0,5 ÷ 3,0
82A40500	280 ÷ 999,9	ØA - 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

Cylinder : Ø 60,0 mm
Guide thickness : 2,0 mm
Groove width : 6,3 mm
Contact material : steel

82A 20 063 - 00600 - 320 - A
Type
Thickness
Groove width
Ref. (ØA x 10)
Seal material code
Cut type

Type 82A, thermoplastic material guide rings are made from thermoplastic strip.
For other cross sections please contact our Technical Department.

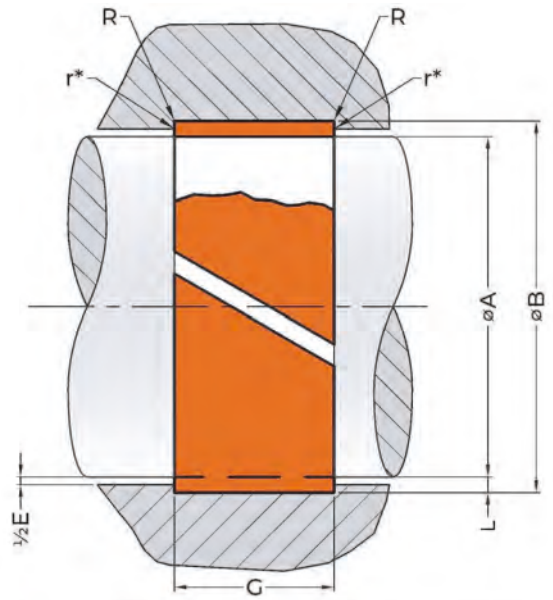
Guiding tape available in meter length with code PRP 85 intestead of PRP 82

DENOMINATION EXAMPLE

Guide thickness : 2,5 mm
Groove width : 9,7 mm
Material : PTFE + Bronze

85A 25 097 - 290
Type
Thickness
Groove width
Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested h9	ØB Groove H9	L	G +0,2 -0,0	R max	E* Diametral gap
81D15032	8 ÷ 20	ØA + 3	1,5	3,2	0,3	0,4 ÷ 1,0
81D20042	8 ÷ 140	ØA + 4	2,0	4,2	0,3	0,5 ÷ 1,5
81D20063	15 ÷ 220	ØA + 4	2,0	6,3	0,3	0,5 ÷ 1,5
81D20081	15 ÷ 220	ØA + 4	2,0	8,1	0,3	0,5 ÷ 1,5
81D20097	20 ÷ 220	ØA + 4	2,0	9,7	0,3	0,5 ÷ 1,5
81D20150	80 ÷ 400	ØA + 4	2,0	15,0	0,3	0,5 ÷ 1,5
81D20200	80 ÷ 700	ØA + 4	2,0	20,0	0,3	0,5 ÷ 1,5
81D20250	200 ÷ 999,9	ØA + 4	2,0	25,0	0,3	0,5 ÷ 1,5
81D25042	8 ÷ 140	ØA + 5	2,5	4,2	0,3	0,5 ÷ 2,0
81D25056	15 ÷ 140	ØA + 5	2,5	5,6	0,3	0,5 ÷ 2,0
81D25063	15 ÷ 220	ØA + 5	2,5	6,3	0,3	0,5 ÷ 2,0
81D25081	15 ÷ 220	ØA + 5	2,5	8,1	0,3	0,5 ÷ 2,0
81D25097	20 ÷ 220	ØA + 5	2,5	9,7	0,3	0,5 ÷ 2,0
81D25150	80 ÷ 400	ØA + 5	2,5	15,0	0,3	0,5 ÷ 2,0
81D25200	80 ÷ 700	ØA + 5	2,5	20,0	0,3	0,5 ÷ 2,0
81D25250	200 ÷ 999,9	ØA + 5	2,5	25,0	0,3	0,5 ÷ 2,0
81D25300	200 ÷ 999,9	ØA + 5	2,5	30,0	0,3	0,5 ÷ 2,0
81D30300	280 ÷ 999,9	ØA + 6	3,0	30,0	0,3	0,5 ÷ 3,0
81D40500	280 ÷ 999,9	ØA + 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

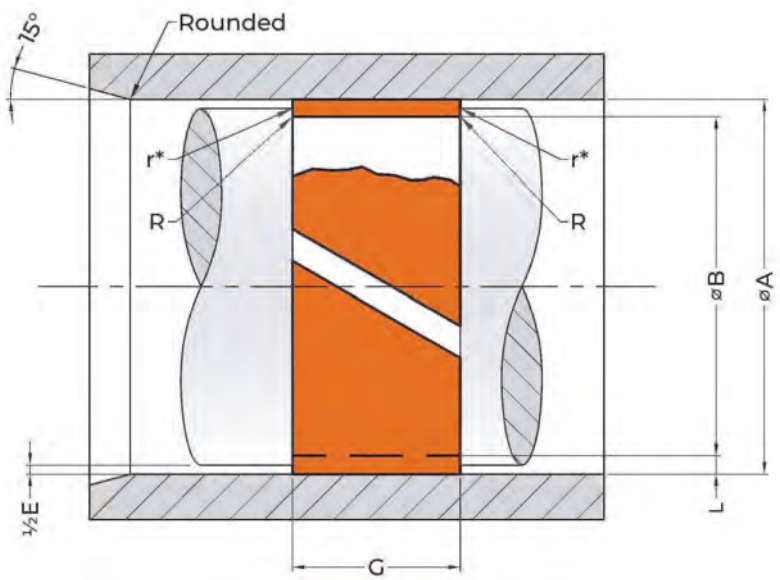
Rod : Ø 95,0 mm
Guide thickness : 2,5 mm
Groove width : 9,7 mm
Contact material : steel

81D 25 097 - 00950 - K18 - A

Type
Thickness
Groove width
Ref. (ØA x 10)
Seal material code
Cut type

Type 81D, preformed guide rings made of thermoplastic and thermosetting material, manufactured by machining tubes.
Suggested for easy fitting or special dimensions.
For other cross sections please contact our Technical Department.

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested H9	ØB Groove h9	L	G +0,2 -0,0	R max	E* Diametral gap
82D15032	8 ÷ 20	ØA - 3	1,5	3,2	0,3	0,4 ÷ 1,0
82D20042	8 ÷ 140	ØA - 4	2,0	4,2	0,3	0,5 ÷ 1,5
82D20063	15 ÷ 220	ØA - 4	2,0	6,3	0,3	0,5 ÷ 1,5
82D20082	15 ÷ 220	ØA - 4	2,0	8,1	0,3	0,5 ÷ 1,5
82D20097	60 ÷ 220	ØA - 4	2,0	9,7	0,3	0,5 ÷ 1,5
82D20150	130 ÷ 400	ØA - 4	2,0	15,0	0,3	0,5 ÷ 1,5
82D20200	160 ÷ 700	ØA - 4	2,0	20,0	0,3	0,5 ÷ 1,5
82D20250	280 ÷ 999,9	ØA - 4	2,0	25,0	0,3	0,5 ÷ 1,5
82D25042	8 ÷ 140	ØA - 5	2,5	4,2	0,3	0,5 ÷ 2,0
82D25056	15 ÷ 140	ØA - 5	2,5	5,6	0,3	0,5 ÷ 2,0
82D25063	15 ÷ 220	ØA - 5	2,5	6,3	0,3	0,5 ÷ 2,0
82D25082	15 ÷ 220	ØA - 5	2,5	8,1	0,3	0,5 ÷ 2,0
82D25097	60 ÷ 220	ØA - 5	2,5	9,7	0,3	0,5 ÷ 2,0
82D25150	130 ÷ 400	ØA - 5	2,5	15,0	0,3	0,5 ÷ 2,0
82D25200	160 ÷ 700	ØA - 5	2,5	20,0	0,3	0,5 ÷ 2,0
82D25250	280 ÷ 999,9	ØA - 5	2,5	25,0	0,3	0,5 ÷ 2,0
82D25300	280 ÷ 999,9	ØA - 5	2,5	30,0	0,3	0,5 ÷ 2,0
82D30300	280 ÷ 999,9	ØA - 6	3,0	30,0	0,3	0,5 ÷ 3,0
82D40500	280 ÷ 999,9	ØA - 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

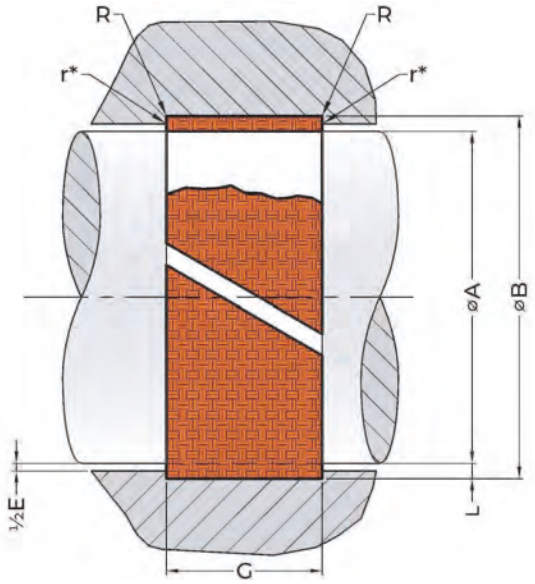
Cylinder : Ø 100,0 mm
Guide thickness : 2,5 mm
Groove width : 9,7 mm
Contact material : steel

82D 25 097 - 01000 - K18 - A

- Type
- Thickness
- Groove width
- Ref. (ØA x 10)
- Seal material code
- Cut type

Type 82D, preformed guide rings made of thermoplastic and thermosetting material, manufactured by machining tubes.
Suggested for easy fitting or special dimensions.
For other cross sections please contact our Technical Department.

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested h9	ØB Groove H9	L	G +0,2 -0,0	R max	E* Diametral gap
81T15032	8 ÷ 20	ØA + 3	1,5	3,2	0,3	0,4 ÷ 1,0
81T20042	8 ÷ 140	ØA + 4	2,0	4,2	0,3	0,5 ÷ 1,5
81T20063	15 ÷ 220	ØA + 4	2,0	6,3	0,3	0,5 ÷ 1,5
81T20081	15 ÷ 220	ØA + 4	2,0	8,1	0,3	0,5 ÷ 1,5
81T20097	20 ÷ 220	ØA + 4	2,0	9,7	0,3	0,5 ÷ 1,5
81T20150	80 ÷ 400	ØA + 4	2,0	15,0	0,3	0,5 ÷ 1,5
81T20200	80 ÷ 700	ØA + 4	2,0	20,0	0,3	0,5 ÷ 1,5
81T20250	200 ÷ 999,9	ØA + 4	2,0	25,0	0,3	0,5 ÷ 1,5
81T25042	8 ÷ 140	ØA + 5	2,5	4,2	0,3	0,5 ÷ 2,0
81T25056	15 ÷ 140	ØA + 5	2,5	5,6	0,3	0,5 ÷ 2,0
81T25063	15 ÷ 220	ØA + 5	2,5	6,3	0,3	0,5 ÷ 2,0
81T25081	15 ÷ 220	ØA + 5	2,5	8,1	0,3	0,5 ÷ 2,0
81T25097	20 ÷ 220	ØA + 5	2,5	9,7	0,3	0,5 ÷ 2,0
81T25150	80 ÷ 400	ØA + 5	2,5	15,0	0,3	0,5 ÷ 2,0
81T25200	80 ÷ 700	ØA + 5	2,5	20,0	0,3	0,5 ÷ 2,0
81T25250	200 ÷ 999,9	ØA + 5	2,5	25,0	0,3	0,5 ÷ 2,0
81T25300	200 ÷ 999,9	ØA + 5	2,5	30,0	0,3	0,5 ÷ 2,0
81T30300	280 ÷ 999,9	ØA + 6	3,0	30,0	0,3	0,5 ÷ 3,0
81T40500	280 ÷ 999,9	ØA + 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

Rod :	Ø 90,0 mm
Guide thickness :	2,5 mm
Groove width :	9,7 mm
Contact material :	steel

81T 25 097 - 00900 - K18 - A

- Type
- Thickness
- Groove width
- Ref. (ØA x 10)
- Seal material code
- Cut type

Type 81T, K-Tex guide rings are made from strip.
For other cross sections please contact our Technical Department.

Guiding tape available in meter length with code PRP 85 intestead of PRP 81

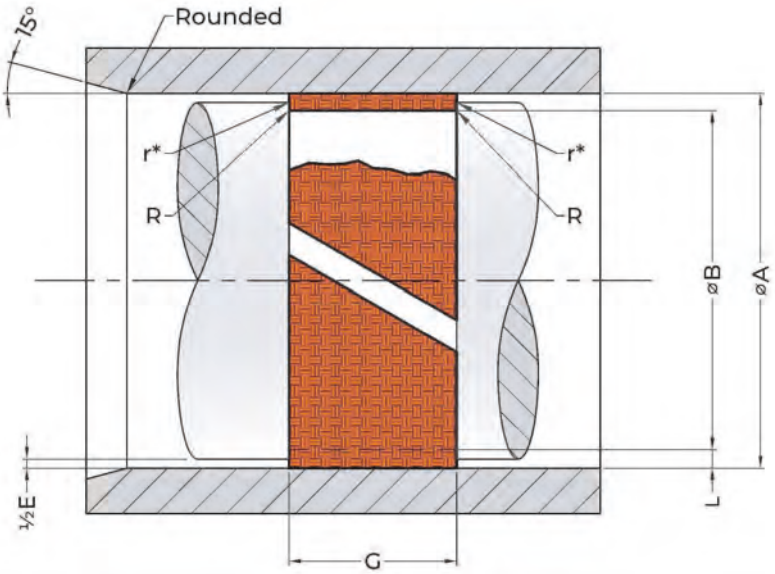
DENOMINATION EXAMPLE

Guide thickness :	2,5 mm
Groove width :	9,7 mm
Material :	K18

85T 25 097 - K18

- Type
- Thickness
- Groove width
- Seal material code

GROOVE GEOMETRY & DIMENSION



r* = rounded and free of burrs r=0,2 max

Serie	ØA Rod Suggested H9	ØB Groove h9	L	G +0,2 -0,0	R max	E* Diametral gap
82T15032	8 ÷ 20	ØA - 3	1,5	3,2	0,3	0,4 ÷ 1,0
82T20042	8 ÷ 140	ØA - 4	2,0	4,2	0,3	0,5 ÷ 1,5
82T20063	15 ÷ 220	ØA - 4	2,0	6,3	0,3	0,5 ÷ 1,5
82T20082	15 ÷ 220	ØA - 4	2,0	8,1	0,3	0,5 ÷ 1,5
82T20097	60 ÷ 220	ØA - 4	2,0	9,7	0,3	0,5 ÷ 1,5
82T20150	130 ÷ 400	ØA - 4	2,0	15,0	0,3	0,5 ÷ 1,5
82T20200	160 ÷ 700	ØA - 4	2,0	20,0	0,3	0,5 ÷ 1,5
82T20250	280 ÷ 999,9	ØA - 4	2,0	25,0	0,3	0,5 ÷ 1,5
82T25042	8 ÷ 140	ØA - 5	2,5	4,2	0,3	0,5 ÷ 2,0
82T25056	15 ÷ 140	ØA - 5	2,5	5,6	0,3	0,5 ÷ 2,0
82T25063	15 ÷ 220	ØA - 5	2,5	6,3	0,3	0,5 ÷ 2,0
82T25082	15 ÷ 220	ØA - 5	2,5	8,1	0,3	0,5 ÷ 2,0
82T25097	60 ÷ 220	ØA - 5	2,5	9,7	0,3	0,5 ÷ 2,0
82T25150	130 ÷ 400	ØA - 5	2,5	15,0	0,3	0,5 ÷ 2,0
82T25200	160 ÷ 700	ØA - 5	2,5	20,0	0,3	0,5 ÷ 2,0
82T25250	280 ÷ 999,9	ØA - 5	2,5	25,0	0,3	0,5 ÷ 2,0
82T25300	280 ÷ 999,9	ØA - 5	2,5	30,0	0,3	0,5 ÷ 2,0
82T30300	280 ÷ 999,9	ØA - 6	3,0	30,0	0,3	0,5 ÷ 3,0
82T40500	280 ÷ 999,9	ØA - 8	4,0	50,0	0,3	0,5 ÷ 4,0

DENOMINATION EXAMPLE

Cylinder : Ø 120,0 mm
Guide thickness : 2,5 mm
Groove width : 6,3 mm
Contact material : steel

82T 25 063 - 01200 - K18 - A
Type
Thickness
Groove width
Ref. (ØA x 10)
Seal material code
Cut type

Type 82T, K-Tex guide rings are made from strip.
For other cross sections please contact our Technical Department.

Guiding tape available in meter length with code PRP 85 intestead of PRP 82

DENOMINATION EXAMPLE

Guide thickness : 2,5 mm
Groove width : 9,7 mm
Material : K18

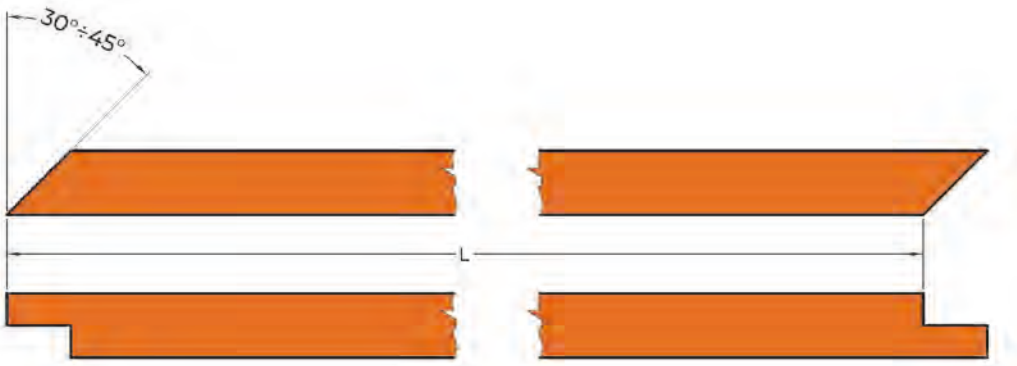
85T 25 097 - K18
Type
Thickness
Groove width
Seal material code

TYPE "A"
ANGLE CUT
For reciprocating movement

TYPE "B"
STRAIGHT CUT
For rotary movement

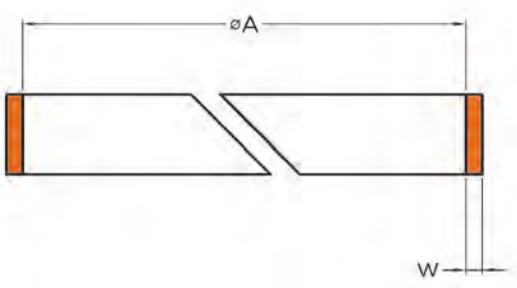
TYPE "C"
STEP CUT
for special application

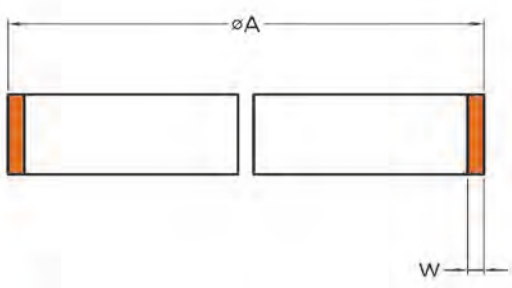
CALCULATION OF THE STRETCHED LENGHT



PRP 81	guide ring for rod
L =	3,11 (ØA + W) - 1,0
L =	Stretched lenght
A =	Rod diameter
W =	Guide thickness

PRP 82	guide ring for piston
L =	3,11 (ØA - W) - 1,0
L =	Stretched lenght
A =	Piston diameter
W =	Guide thickness





Characteristics and application

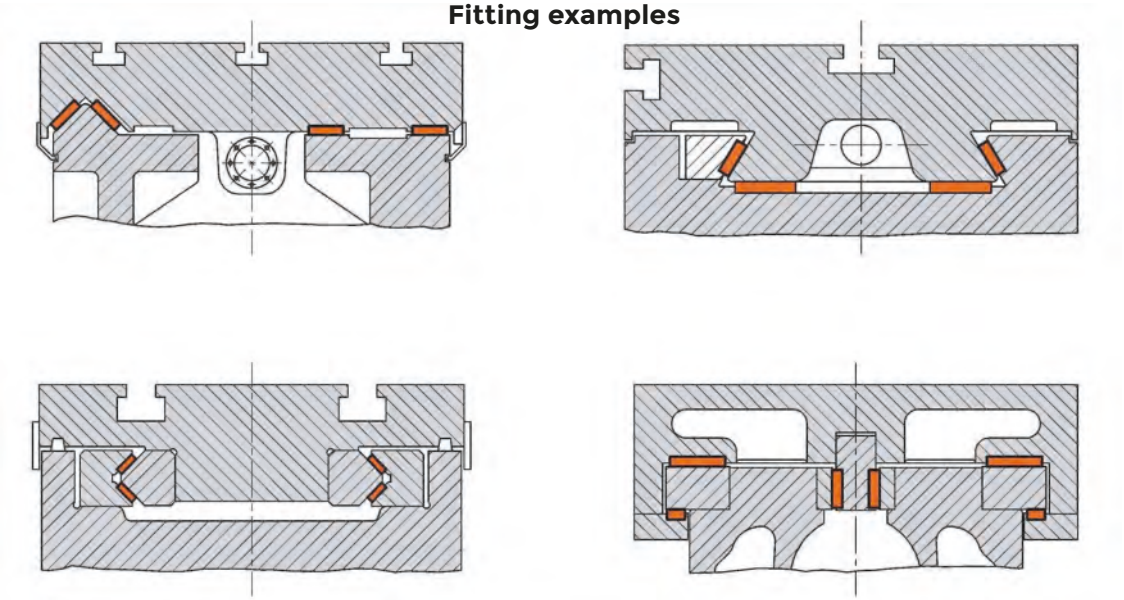
PRP 83A is a guiding material placed between sliding metal parts, when low friction values are required even with high loads. It is used as the linear guide for tool machine with low speed movement and risk of stick-slip.

PRP 83A is highly recommended for refurbishment of old tool machines which had originally guide rings.

Advantages

- No stick-slip effect
- Low friction coefficient
- Self-lubricating properties
- High wear resistance
- Long working life
- Dust resistant
- Vibration reduction properties
- Low cost

Fitting examples

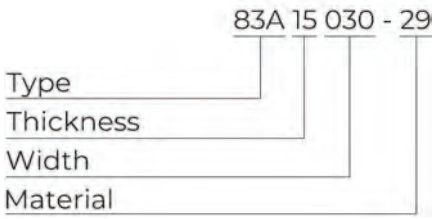


Dimensions

PRP Serie	Thickness mm	Tolerances mm mm + 0,3	Width mm	Tolerances	+ 0,0 / -0,1												
83A	1,5	- 0,0	20	25	30	35	40	45	50	60	70	80	90	100	125	150	175

DENOMINATION EXAMPLE

Guide thickness : 1,5 mm
Groove width : 30 mm
Material : 29



Following adhesives are recommended

Adhesive	Weight ratio	Time of use	Polymerization time
Araldite AWG 06 Hardening HV953U	100 80	2 hours a 25 °C	15 hours a 20 °C
Araldite AW138M Hardening HV998 40	100	30 min a 23 °C	12 hours a 20 °C

LIPRING SEALED VERSION
Add "D" suffix to the end of product denomination

STATIC/DYNAMIC, FOR ROD

DENOMINATION EXAMPLE

Rod :	Ø 35,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Dynamic

61A 02 - 00350 - 190 - S00 D

- 61A — Type
- 02 — Serie
- 00350 — Ref. (ØA x 10)
- 190 — Seal material code
- S00 — Spring material code
- D — Silicone filling

STATIC/DYNAMIC, FOR CYLINDER

DENOMINATION EXAMPLE

Cylinder :	Ø 80,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Dynamic

62A 03 - 00800 - 190 - S00 D

- 62A — Type
- 03 — Serie
- 00800 — Ref. (ØA x 10)
- 190 — Seal material code
- S00 — Spring material code
- D — Silicone filling

ROTATION, FOR SHAFT

DENOMINATION EXAMPLE

Shaft :	Ø 30,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Rotation

65A 02 - 00300 - 410 - S00 D

- 65A — Type
- 02 — Serie
- 00300 — Ref. (ØA x 10)
- 410 — Seal material code
- S00 — Spring material code
- D — Silicone filling

STATIC/DYNAMIC, FOR ROD

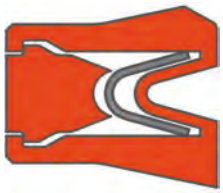
DENOMINATION EXAMPLE

Rod :	Ø 35,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Dynamic

611 02 - 00350 - 120 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code

STATIC/DYNAMIC, FOR CYLINDER



DENOMINATION EXAMPLE

Cylinder :	Ø 80,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Dynamic

621 03 - 00800 - 120 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code

ROTATION, FOR SHAFT

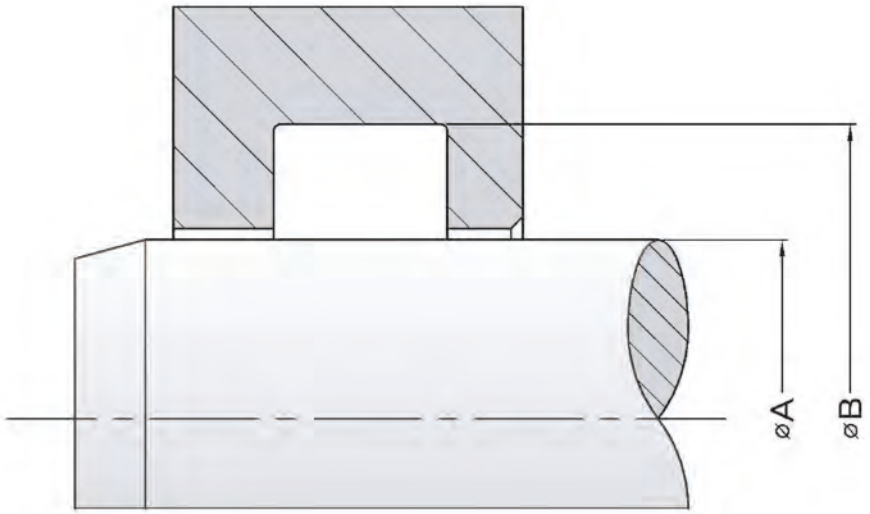
DENOMINATION EXAMPLE

Shaft :	Ø 30,0 mm
Cross section :	200
Fluid :	Hydraulic oil
Contact material :	steel
Movement :	Rotation

651 02 - 00300 - 120 - S00

- Type
- Serie
- Ref. (ØA x 10)
- Seal material code
- Spring material code

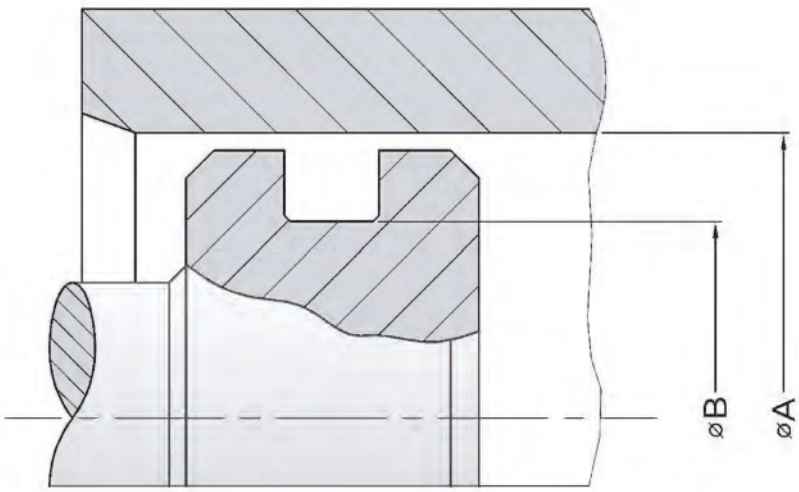
MINIMUM ROD DIAMETER FOR SEAL FITTING INTO CLOSED HOUSING



Serie 	ØA min
000	30,0
100	70,0
200	110,0
300	300,0
400	500,0
500	800,0

Serie 	ØA min
000	30,0
100	70,0
200	110,0
300	230,0
400	400,0
500	600,0

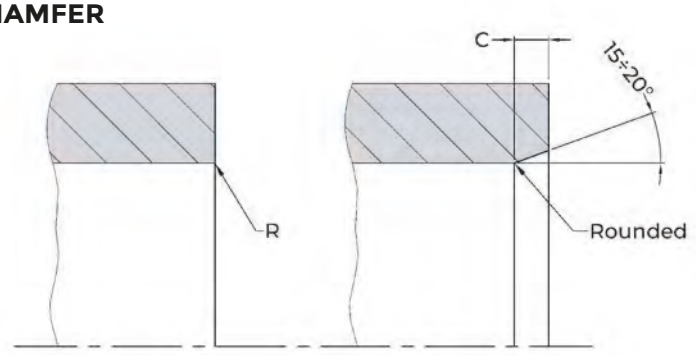
MINIMUM CYLINDER DIAMETER FOR SEAL FITTING INTO CLOSED HOUSING



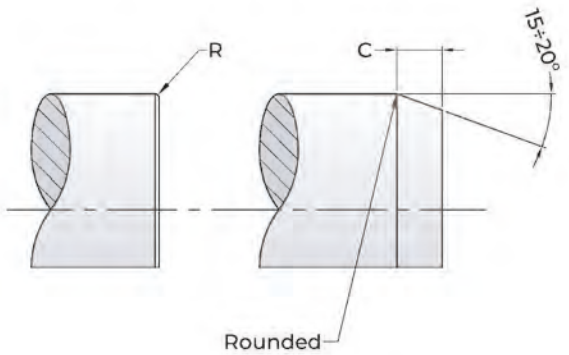
Serie 	ØA min
000	35,0
100	50,0
200	70,0
300	105,0
400	140,0
500	200,0

Serie 	ØA min
000	20,0
100	35,0
200	48,0
300	75,0
400	95,0
500	120,0

CHAMFER

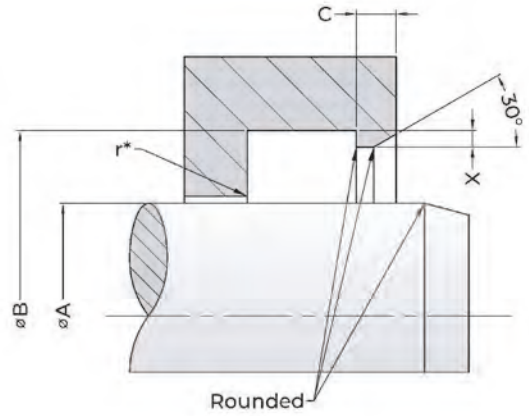


Serie	R min	C min
000	1,0	4,2
100	1,0	4,7
200	1,0	5,2
300	1,0	8,2
400	1,0	11,9
500	1,0	12,0

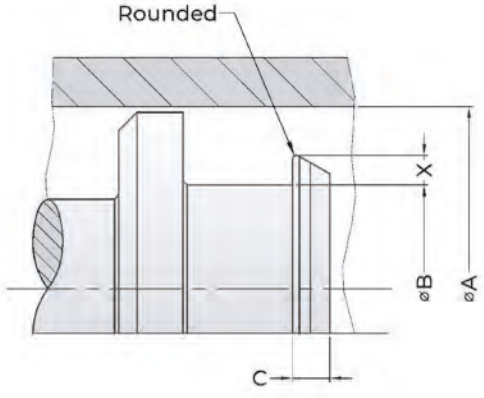


Serie	R min	C min
000	1,0	4,2
100	1,0	4,7
200	1,0	5,2
300	1,0	8,2
400	1,0	11,9
500	1,0	12,0

SEAL FITTING FOR ROD AND PISTON WITH RETAINER

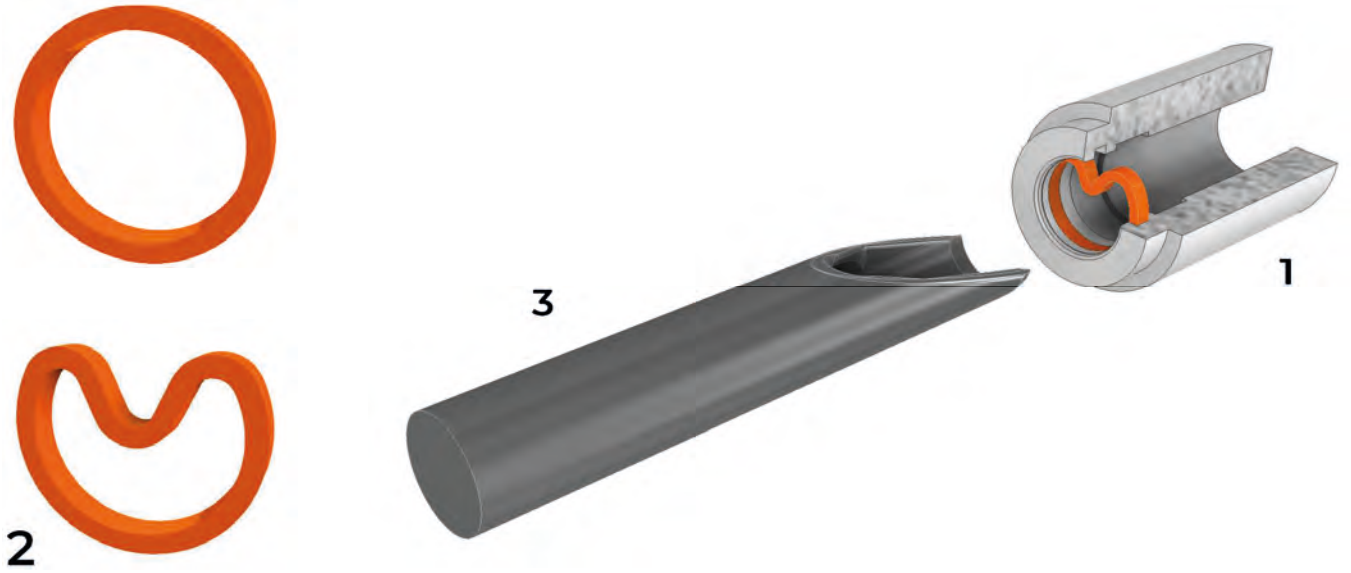


Serie	X	ØA min	C min
000	0,4	12,0	2,5
100	0,6	20,0	3,5
200	0,7	30,0	3,5
300	0,8	40,0	4,5
400	0,9	55,0	7,5
500	1,5	80,0	7,5

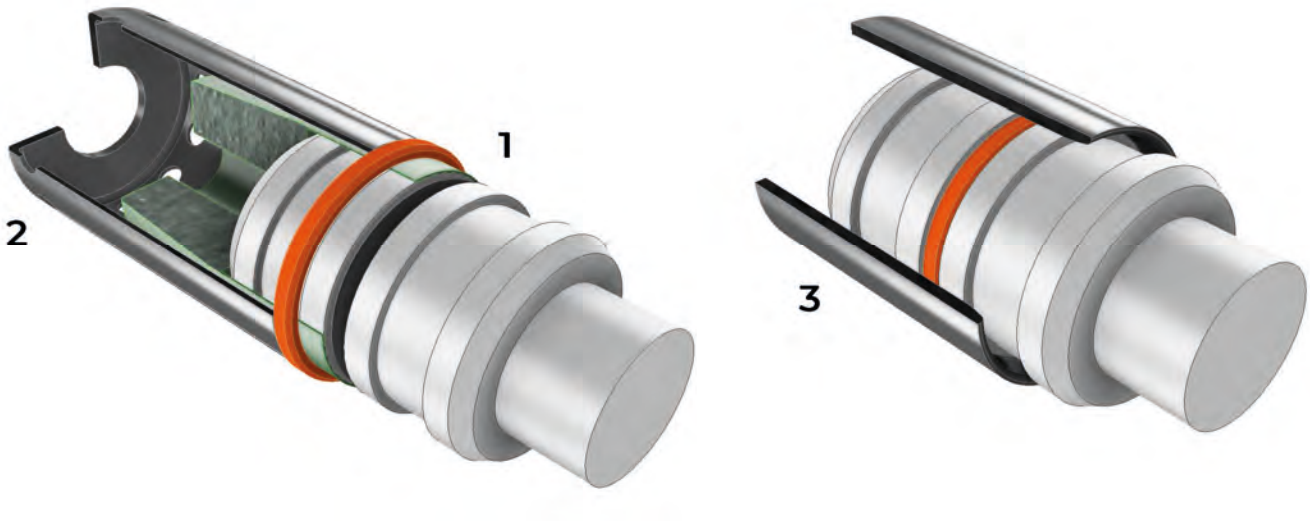


Serie	X	ØA min	C min
000	0,4	15,0	2,5
100	0,6	21,0	3,5
200	0,7	25,0	3,5
300	0,8	30,0	4,5
400	0,9	45,0	7,5
500	1,5	70,0	7,5

FITTING IN FEMALE GROOVE
a) Fit the O-RING into the groove (1) and check the right positioning.
b) Bend the seal as showed in picture 1 (kidney shape (2)).
c) Fit the seal into the groove and reshape it by using the fitting tool (3).



FITTING IN MALE GROOVE
a) Fit the O-RING into the groove and check the right positioning.
b) Use the fitting tool (2), quickly slide the seal on the conical tool (1).
c) Use the tool to reshape (3) the seal before fitting the piston into the cylinder bore.



In both cases use a lubricant for easy fitting.
Our Technical Department is available for any further information about fitting tools.

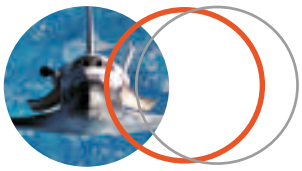
CARCO - PRP can supply machined pieces of different technopolymers or composite materials for a variety of applications.
Semi-finished materials are also available as tubes, bars or plates to machine mechanical parts.

Typical applications are:
- Marine
- Hydraulic cylinders
- Industrial machines
- Food / Pharmaceutical Industry
- Spherical bearings
- Dielectric applications

CARCO-PRP is a leading supplier of sealing solutions in the following industries

Hydraulic Presses

Aviation & Aerospace



Hydraulic Cylinders

Windpower

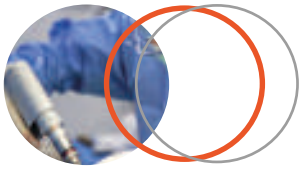
Food & Beverage

Hydropower

Steel and Aluminium Industry

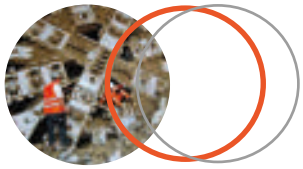
Shipbuilding

Medical



Oil & Gas

Tunnel Boring Machines



The data and tables shown in this catalog are based upon information from material suppliers and careful examination of available publications and are believed to be accurate and reliable; however, it is the user's responsibility to determine suitability for use.

You should thoroughly test any proposed use of our seals and indipendently conclude satisfactory performance in your application.

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