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quality sealing and engineering plastics solutions




ECONOMOS[®]

Large diameter
seals



Content

Content

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- A close-up photograph of a man's face in profile, looking intently at a large, curved orange seal. The seal is held in his hand and curves across the frame. The background is dark, making the orange seal and the man's features stand out.
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General

Economos designates seals in excess of 600mm diameter as 'large diameter' seals. These seals are subject to different principles and conditions than seals of smaller diameters.

Generally speaking large diameter seals are mostly used in large and heavy machinery applications. Most of these machines are special purpose and are produced in small volumes and it follows that the seals fitted are not necessarily standard, either in size, section or profile.

For the original equipment manufacturer (OEM) designer Economos offers the possibility of specifying the optimum seals and associated ancillary items without compromise due to the cost, delivery and range limitations of conventional moulding processes.

For the maintenance repair and overhaul (MRO) of large equipment Economos offers major advantages. Such machinery is often reworked due the expense and difficulty of manufacturing new components, it is far cheaper for instance to recut housings, strip and replat rods than make anew.

This is where Economos has gained its worldwide reputation in sealing technology. We have a production process available that meets these demands exactly in the **seal-jet** concept. Using this process we can machine, via our in-house developed CNC equipment, virtually any profile of seal and ancillary item to suit the application and metalwork. Since no moulding tools are required, there are no costs, no waiting for processing, and no requirement to use a so-called standard size or profile.

We are able to supply large diameter seals and components made from our class leading polyurethane with a diameter of up to 4,000 mm within a few days.

If required for installation reasons we can supply seals in a cut, glued or welded format.

The Economos quality assurance system allows us to produce a test certificate for every component, both for the material used and the profile and dimensions manufactured. Acceptance inspection by the customer or representative is also available if required.

This brochure outlines the Economos standard offerings for large diameter seals and components, if there is a special requirement then contact your local Economos subsidiary who will be pleased to provide a complete engineered sealing solution.



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Main applications of large diameter seals

Main applications

HYDROPOWER

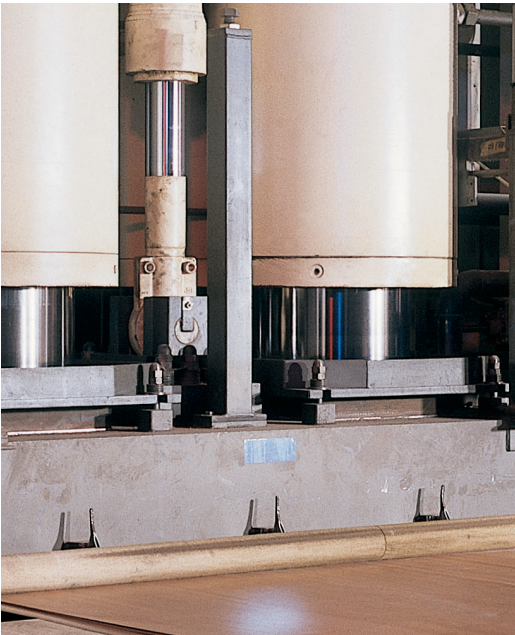
Seals for Guide blades of Kaplan and Francis turbines
Moving blades of Kaplan turbines
Nozzle control of Pelton turbines
Servo-motors and slides

HEAVY HYDRAULICS

Seals for Oil and water hydraulics in press construction
Shears
Shredders
Manipulators
Body presses
Plate chuck press

STEEL WORKS

Seals for Ladle tilting and plugging cylinders
Various roller cylinders
Stripper cranes
Shears
Manipulators
Forging presses and forging hammers



SHIPBUILDING

Seals for Rudder spindles
Ship stabilisers
Ship hydraulics
Steering gear
Fuel supply

Material data for large diameter seals

The most vital development work in sealing technology is done in optimising the geometry and improving the characteristics of the materials. ECONOMOS offers an extraordinarily wide variety of materials for large diameter seals, in order to meet any operating demands. Only the standard materials are listed in this brochure. All other material solutions will be provided by ECONOMOS upon request:

- G-ECOPUR** a polyurethane elastomer (CPU) developed by ECONOMOS, with extraordinarily high pressure resistance and abrasion resistance, hydrolysis-resistant;
- G-ECOPUR-54D** a special hard grade polyurethane elastomer (CPU) developed by ECONOMOS, with extraordinarily high pressure resistance and abrasion resistance, hydrolysis-resistant;
- ECORUBBER 1** NBR material for seals and pre-load elements;
- ECORUBBER-H** H-NBR material for high thermal and chemical stress, good mechanical properties and suitable for a wider temperature range than ECORUBBER 1;
- ECORUBBER 2** FPM (FKM, viton) material with very high chemical and thermal resistance; outstanding ozone, weathering and ageing resistance;
- ECORUBBER 3** EPDM material for mineral oil-free, aqueous media or steam applications;
- ECOFLAS** TFE/P (Aflas) material with high thermal and chemical resistance, even in aqueous and amine-containing hydraulic fluids and hot steam;
- ECOMID** PA6G material for guide and back-up elements
- ECOWEAR 1000** UHMW-PE material for guide and back-up elements; very good gliding properties in water; low moisture absorption.
- ECOFLO 1** PTFE-pure material for static support elements and subordinated guide parts; only partly useable for seals; practically resistant to chemical attacks. Very low coefficient of friction; *
- ECOFLO 2** PTFE with 15% glass-fibre + 5% molybdenum disulphide (MoS₂); for back-up and guide elements; for gliding components of compound seals for spring energized or O-ring activated seal profiles; *
- ECOFLO 3** PTFE with 40% bronze; for back-up and guide elements; for gliding components of compound seals for spring energized or O-ring activated seal profiles; *
- ECOFLO 4** PTFE with 25% carbon; for dry and lubricated working conditions; in steam applications; especially for rotary and static sealing elements; *
- ECOTEX** Fabric composite material on polyester resin basis; its specific surface structure ensures very good gliding and emergency running properties; suitable for guide rings and bearing bushes;

* Further PTFE filler combinations upon request;

All Profiles

Standard materials, working conditions and applications

standard materials		working conditions				applications		
		hardness	temperature [°C]	pressure	sliding speed [m/sec]	oil- hydraulic	oil-/H ₂ O hydraulic	pneumatic
1	G-Ecopur	95 ShoreA	-30 up to + 110	400	0,5	+	up to 70° C	+
2	G-Ecopur-54D	95 ShoreA	-30 up to + 110	400	up to 5,0	+	up to 70° C	+
3	Ecorubber 1	85 ShoreA	-30 up to + 110	160	0,5	+	+	+
4	Ecorubber-H	85 ShoreA	-25 up to + 150	160	0,5	+	+	+
4	Ecorubber 2	85 ShoreA	-20 up to + 200	160	0,5	+	+	+
5	Ecorubber 3	85 ShoreA	-50 up to + 150	160	0,5	not mineral-oil resistant		
6	Ecoflas	85 ShoreA	-20 up to + 200	160	0,5	+	+	+
7	Ecoflon 1	57 ShoreD	-200 up to + 260	160	4	+	+	+
8	Ecoflon 2	60 ShoreD	-200 up to + 260	400	4	+	+	+
9	Ecoflon 3	60 ShoreD	-200 up to + 260	400	4	+	+	+
10	Ecoflon 4	60 ShoreD	-200 up to + 260				rotating applications	
11	Ecomid	77 ShoreD	-40 up to + 100		1	+	+	+
11	Ecowear 1000	67 ShoreD	-200 up to + 80		1	+	+	+
12	Ecotex		-40 up to + 140		1	+	+	+

The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your local ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable

Availability of materials depending on diameter

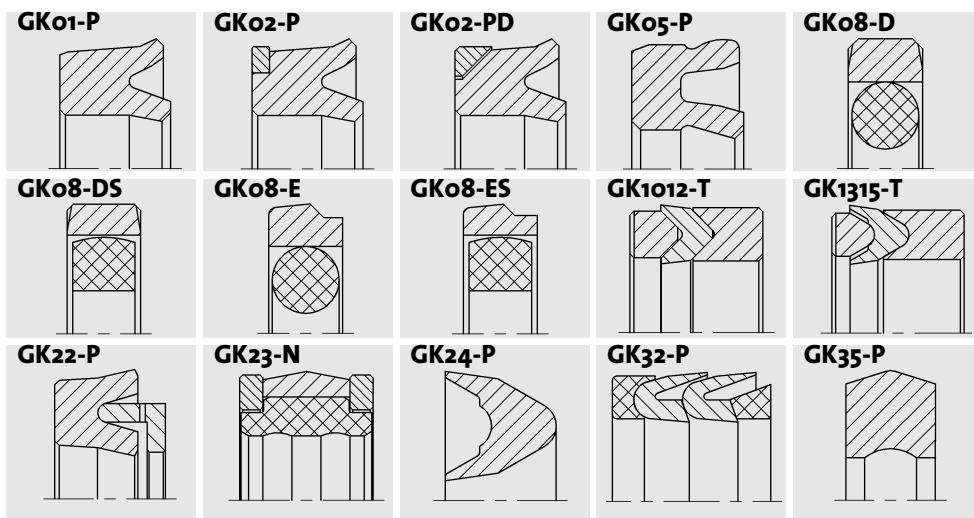
standard materials	maximum diameter currently [mm]
1 G-Ecopur	4.000
2 G-Ecopur-54D	2.000
3 Ecorubber 1	1.500
3 Ecorubber-H	1.500
4 Ecorubber 2	1.500
5 Ecorubber 3	1.500
6 Ecoflas	1.500
7 Ecoflon 1	1.500
8 Ecoflon 2	1.500
9 Ecoflon 3	1.500
10 Ecoflon 4	1.500
11 Ecomid	2.000
11 Ecowear 1000	990
12 Ecotex	3.000

Selection of standard profiles

Piston profiles

Piston seals

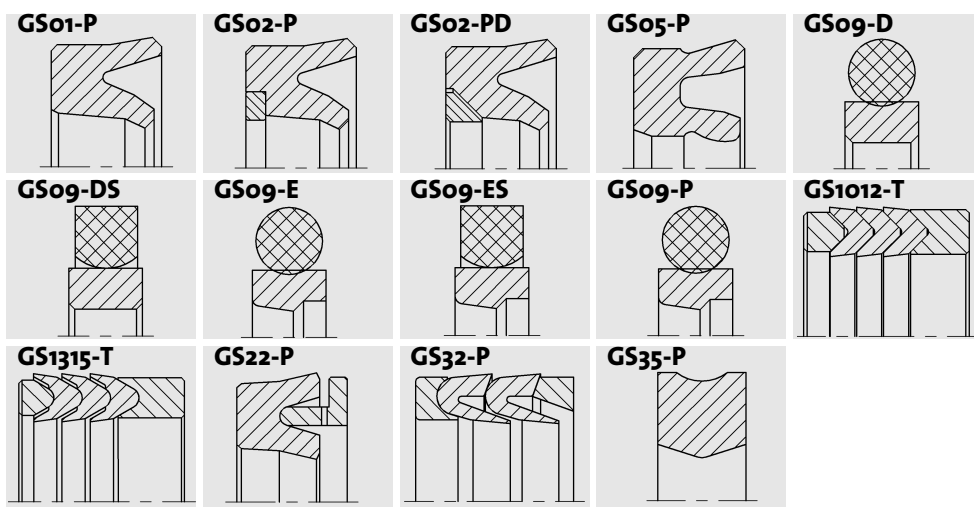
	Recommended Materials
GK01	1 3 4 5 6
GK02	1+11 3+11 3+8 3+9 4+8 4+9 6+8 6+9
GK05	1 3 4 5 6
GK08	2+3 9+3 8+3 9+4 8+4 8+6 10+6
GK1012	1+2 1+11 2+3 3+11 4+8 4+9 6+8 6+9
GK1315	1+2 1+11 2+3 3+11 4+8 4+9 6+8 6+9
GK22	1+11 3+11 4+8 4+9 6+8 6+9
GK23	1+3+11
GK24	1 3 4 5 6
GK32	1+2 1+11 2+3 3+11 4+8 4+9
GK35	1 3 4 5 6



A.m. material code is referring to the table on page 9

Rod seals

	Recommended Materials
GS01	1 3 4 5 6
GS02	1+11 3+11 3+8 3+9 4+8 4+9 6+8 6+9
GS05	1 3 4 5 6
GS09	2+3 9+3 8+3 9+4 8+4 8+6 10+6
GS1012	1+2 1+11 2+3 3+11 4+8 4+9 6+8 6+9
GS1315	1+2 1+11 2+3 3+11 4+8 4+9 6+8 6+9
GS22	1+11 3+11 4+8 4+9 6+8 6+9
GS32	1+2 1+11 2+3 3+11 4+8 4+9
GS35	1 3 4 5 6

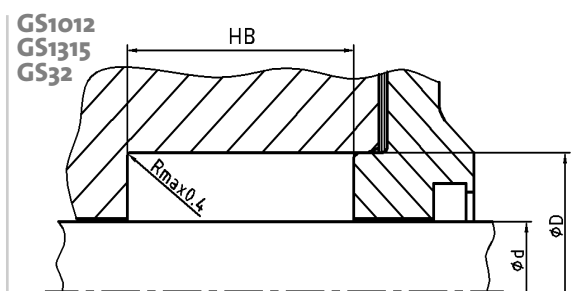
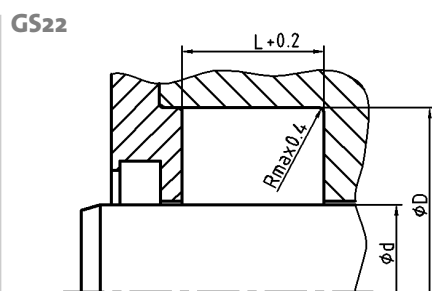
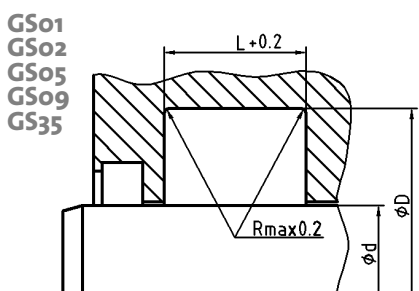
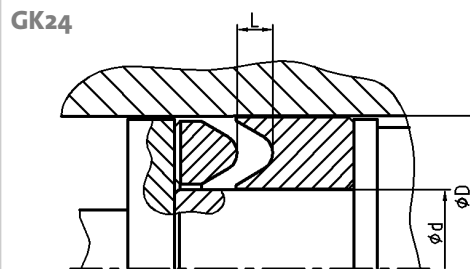
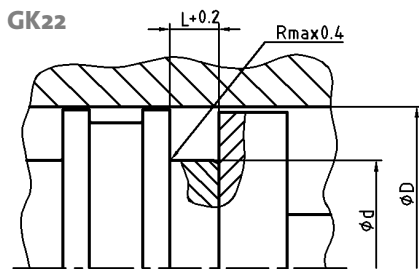
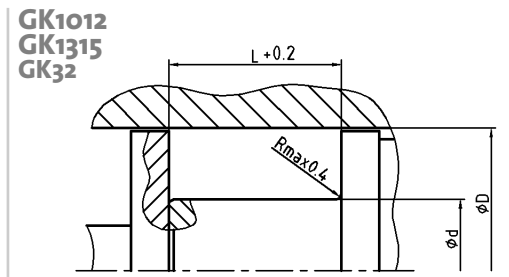
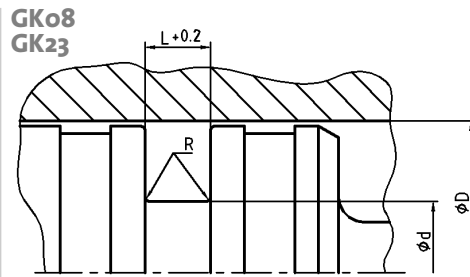
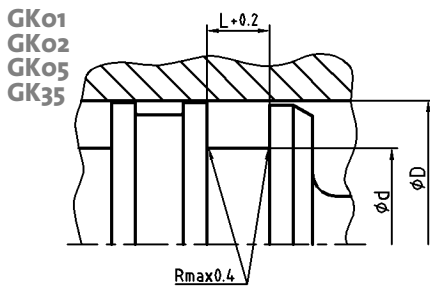


A.m. material code is referring to the table on page 9

Additional profiles upon request

Housing detail

Standard materials, working conditions and applications



Indicated dimensions are required to process an order

ϕD outside diameter

ϕd inside diameter

L groove length

HB clamp length

Selection of standard profiles

Windproof files

Wipers

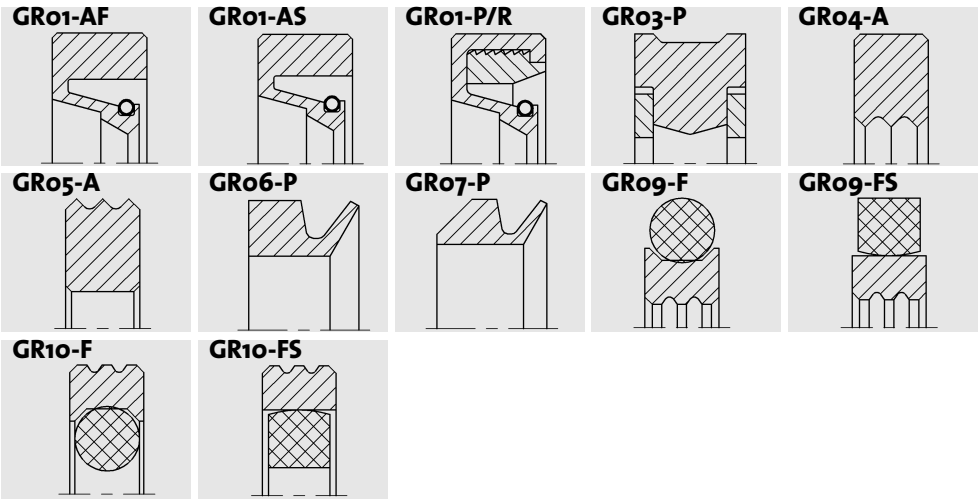
	Recommended Materials					
GA01	1	2	3	4	5	6
GA02	1	2	3	4	5	6
GA11	1	3	4	5	6	



A.m. material code is referring to the table on page 9

Rotary seals

	Recommended Materials					
GR01-AF/AS	1+Spring	3+Spring	4+Spring	5+Spring	6+Spring	
GR01-P/R	1+11+Spring	3+11+Spring	4+11+ Spring	1+Metal+Spring	3+Metal+ Spring	4+Metal+ Spring
GR03	1+11	1+8	1+9	3+11	3+8	3+9
	4+8	4+9	6+8	6+9		
GR04	1	3	4	5	6	
GR05	1	3	4	5	6	
GR06	1	3	4	5	6	
GR07	1	3	4	5	6	
GR09	10+3	10+4	10+6			
GR10	10+3	10+4	10+6			

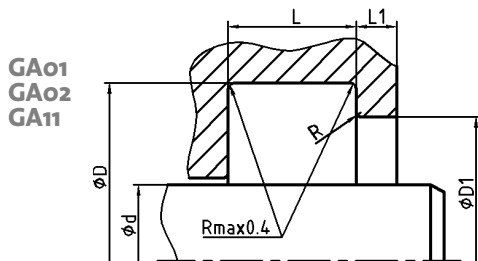


A.m. material code is referring to the table on page 9

Additional profiles upon request

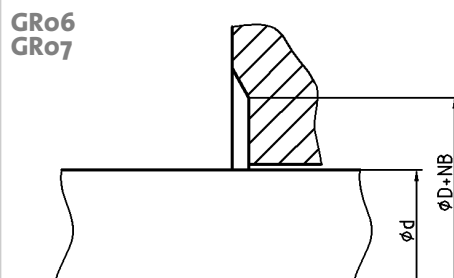
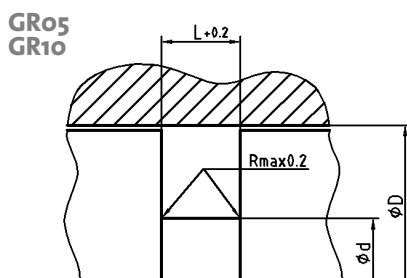
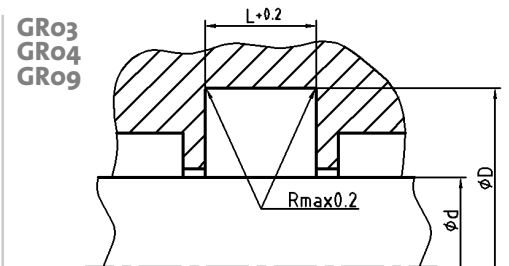
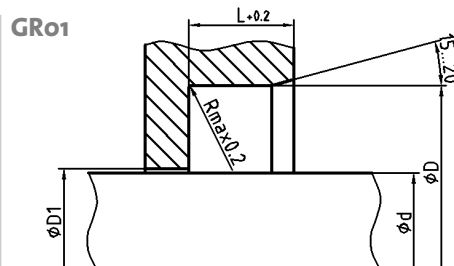
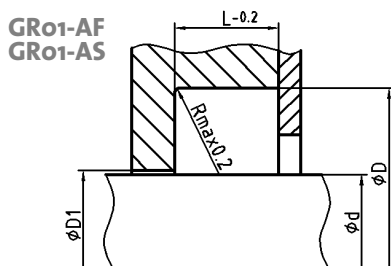
Housing detail

Standard materials, working conditions and applications



Indicated dimensions are required to process an order

ϕD outside diameter
 ϕd inside diameter
 L housing length
 H total wiper length
 HB clamp length

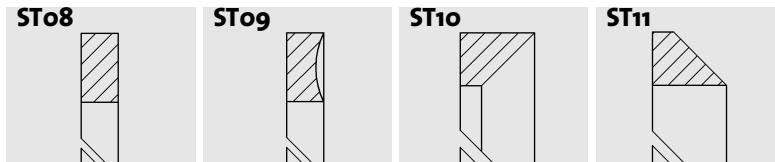


Indicated dimensions are required to process an order

ϕD outside diameter
 ϕd inside diameter
 L housing length
 $L1$ clamp length

Selection of standard profiles

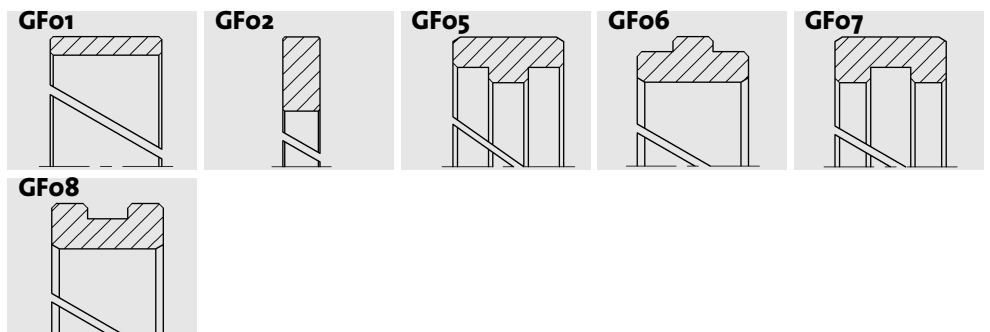
Back-up rings



	Recommended Materials
ST08	11 2 7 8 9
ST09	11 2 7 8 9
ST10	11 2 7 8 9
ST11	11 2 7 8 9

A.m. material code is referring to the table on page 9

Guide rings



	Recommended Materials
Gf01	11 8 9 12
Gf02	11 6 8 9 12
Gf05	11 8 9 12
Gf06	11 8 9 12
Gf07	11 8 9 12
Gf08	11 8 9 12

standard materials	working conditions			applications		
	temperature [°C]	admissible specific load [N/mm ²]*	sliding speed [m/sec]	oil hydraulic	oil/H ₂ O hydraulic	pneumatic
7 Ecoflon 1	200	4,5	4	+	+	+
8 Ecoflon 2	200	7,5	4	+	+	+
9 Ecoflon 3	200	6,0	5	+	+	+
10 Ecoflon 4	200	6,0	5	+	+	+
11 Ecotal	100	20	4	+	+	+
11 Ecomid	100	26	4	+		+
11 Ecowear 1000	80	5,0	1	+	+	+
12 Ecotex	140	90	1	+	+	+

The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your local ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable

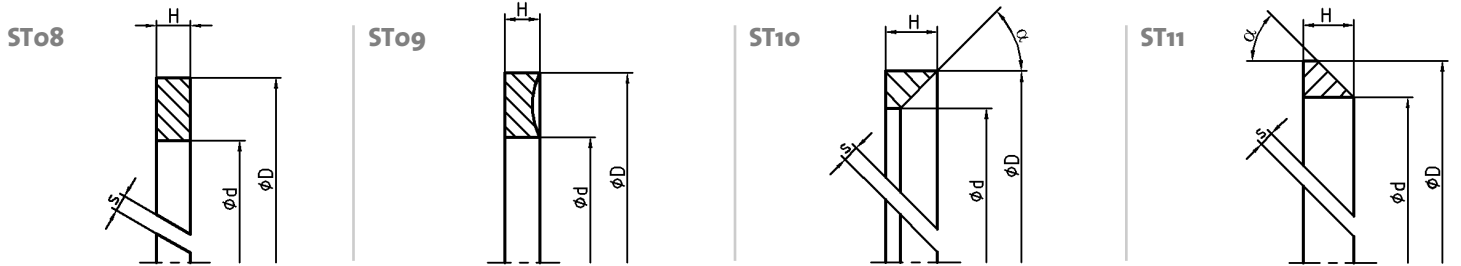
* = At 2% compression strain and room temperature.

For other temperatures please contact our application department!

Additional profiles upon request

Housing detail

Standard materials, working conditions and applications



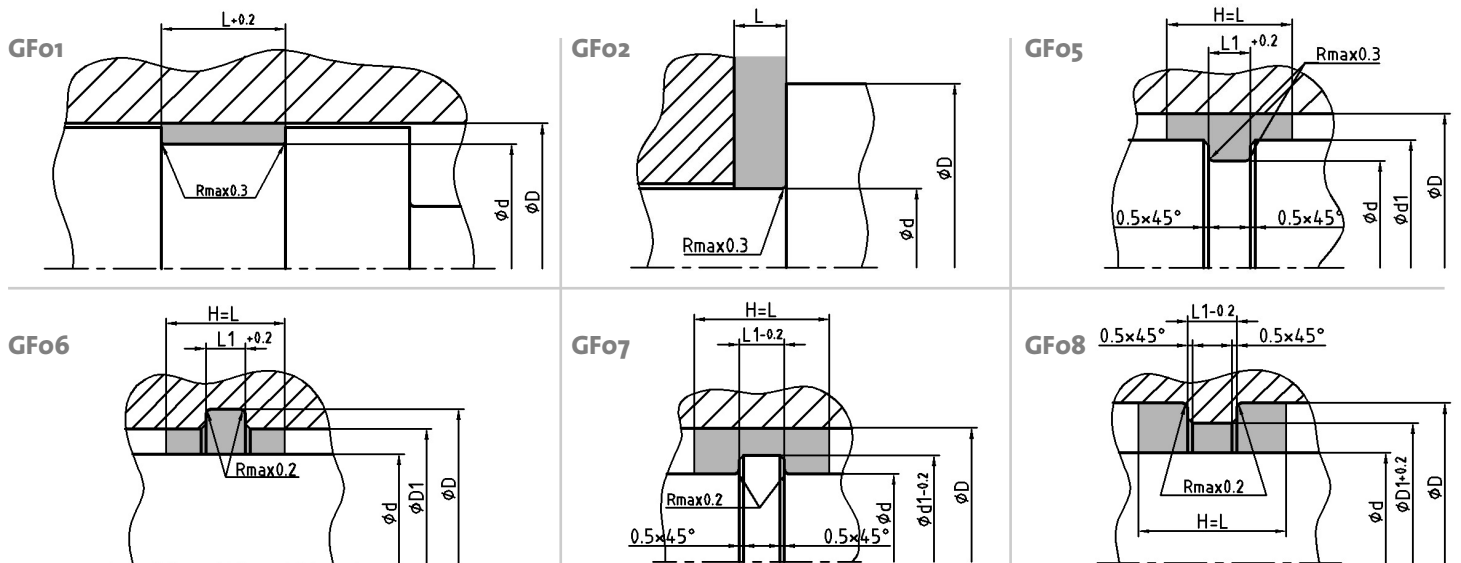
Indicated dimensions are required to process an order

ϕD outside diameter

ϕd inside diameter

H final height

S cutting gap



Indicated dimensions are required to process an order

ϕD outside diameter

$\phi D1$ contact line diameter

ϕd inside diameter

$\phi d1$ contact line diameter

L housing length

L1 retaining ring length

cutting gap width

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quality sealing solutions