

deutschland australia canada  
osterreich usa schweiz  
united kingdom

The New Generation of  
Seal Geometry's

ECONOMOS®

quality sealing solutions



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## Housing detail O-ring

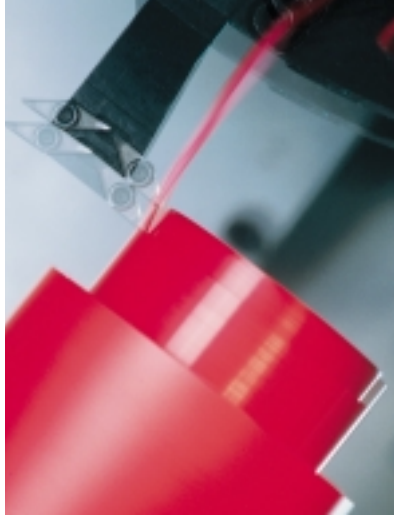
- 31 O-ring housings



ECO

R1

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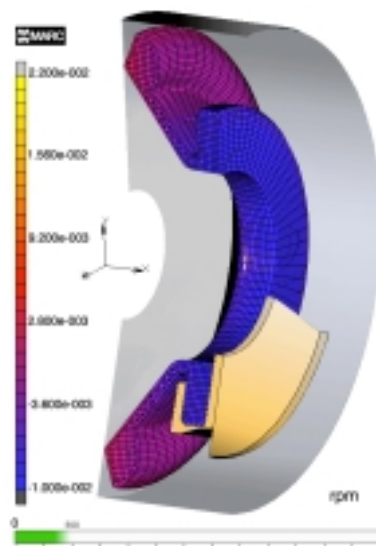
## General Trend

The industry in general endeavors to standardize seal profiles and dimensions in order to reduce inventory. But the great number of different parameters acting upon a seal in a huge variety of applications make it impossible to design one profile or sealing system that works everywhere.

In general, a satisfying solution can only be achieved by “tailoring” a profile or sealing system that meets the required specification.

It is this fact that has led to our reputation in the market. We offer the necessary flexibility in Material Engineering, Seal Design and Production Capability. We offer 17 standard materials, and can engineer special materials to meet customer requirements in house. Our special developed manufacturing process allows us to produce standards as well as special profiles up to 4000 mm in diameter.

ECONOMOS use the latest in Finite Element Analysis (FEA) for Elastomers and Thermoplastics. We offer this tool to customers who have special applications. It allows us simulate performance and limitations of profile and material design. The new line of profiles was partly developed using this system.



Finite Element Analysis (FEA)  
of a special seal

Driven by our commitment to offer the best profile/material combination for every application, we created a wide variety of profiles. This brochure should demonstrate the progress ECONOMOS made with its new line of profiles and should confirm our industrial leadership.



**Product category**

**Dynamic Seals**

**RECIPROCATING**

Piston seal, Rod seal, Vee packing, Wipers, Guide rings, Back-up rings, Bushings,...

**ROTARY**

Radial and axial seals, Rotary seals, ...

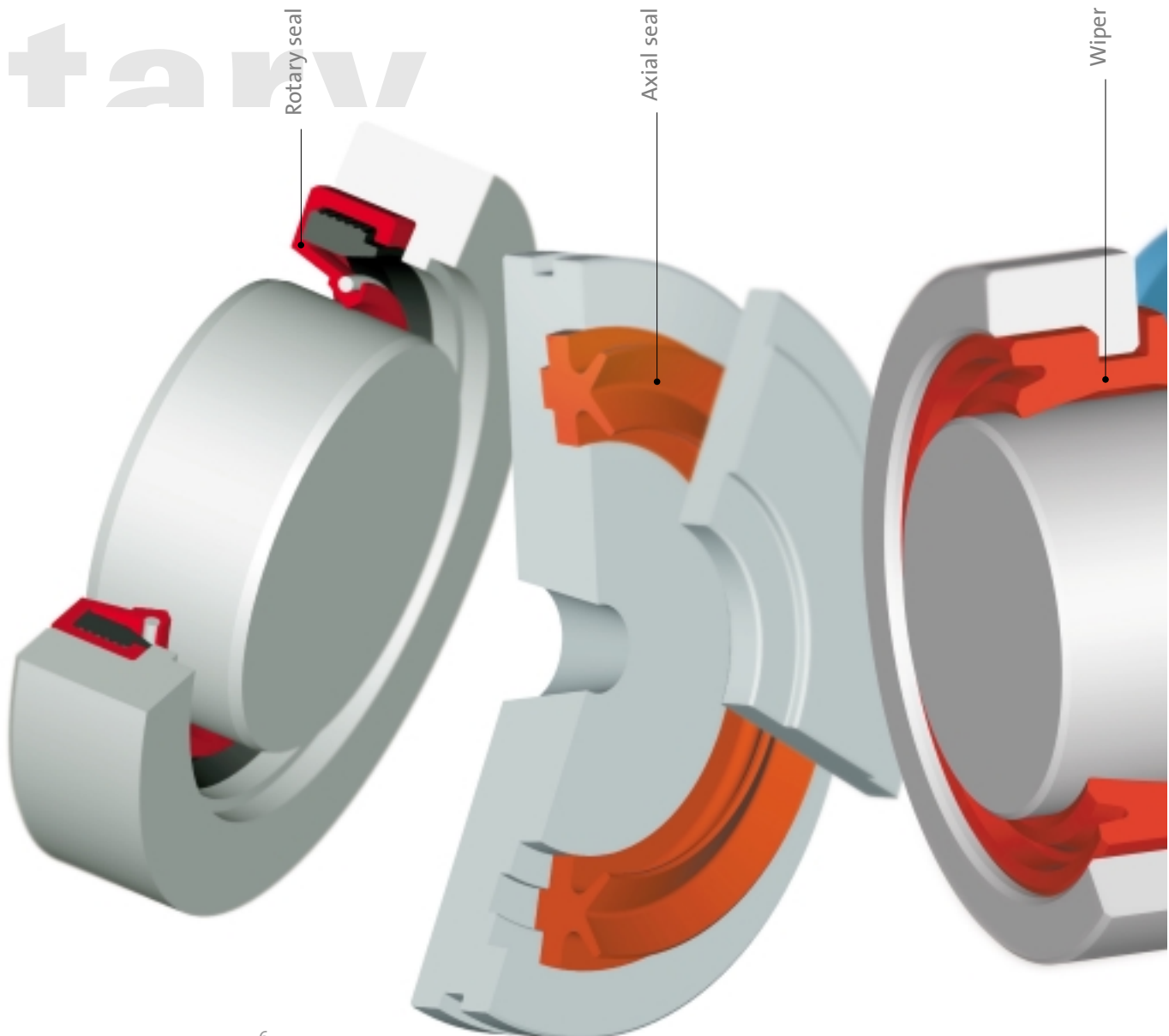
**Static Seals**

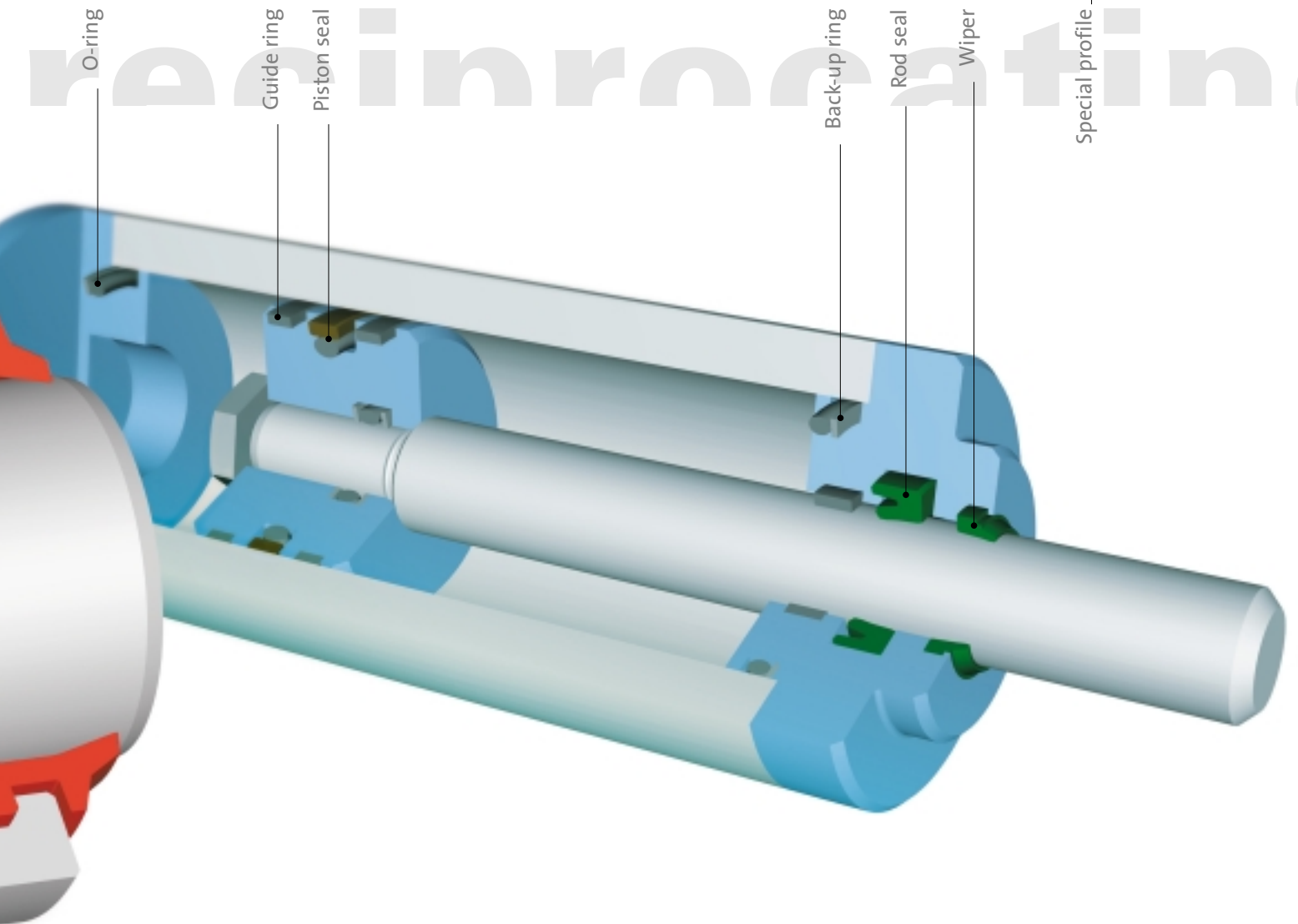
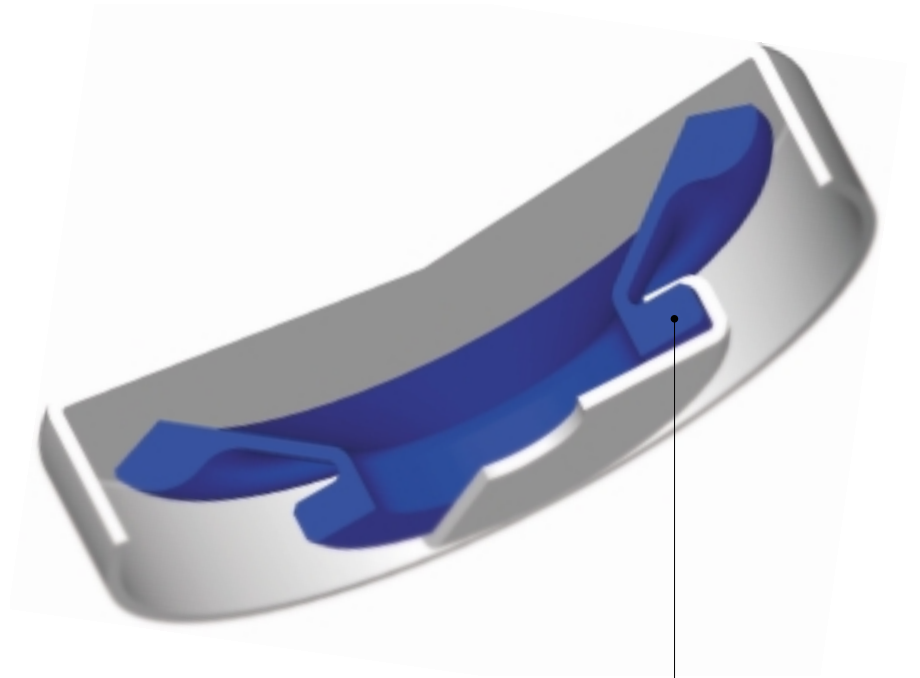
Gaskets, Profile seals, ...

**Special Profiles**

**Machined Parts**

rotary

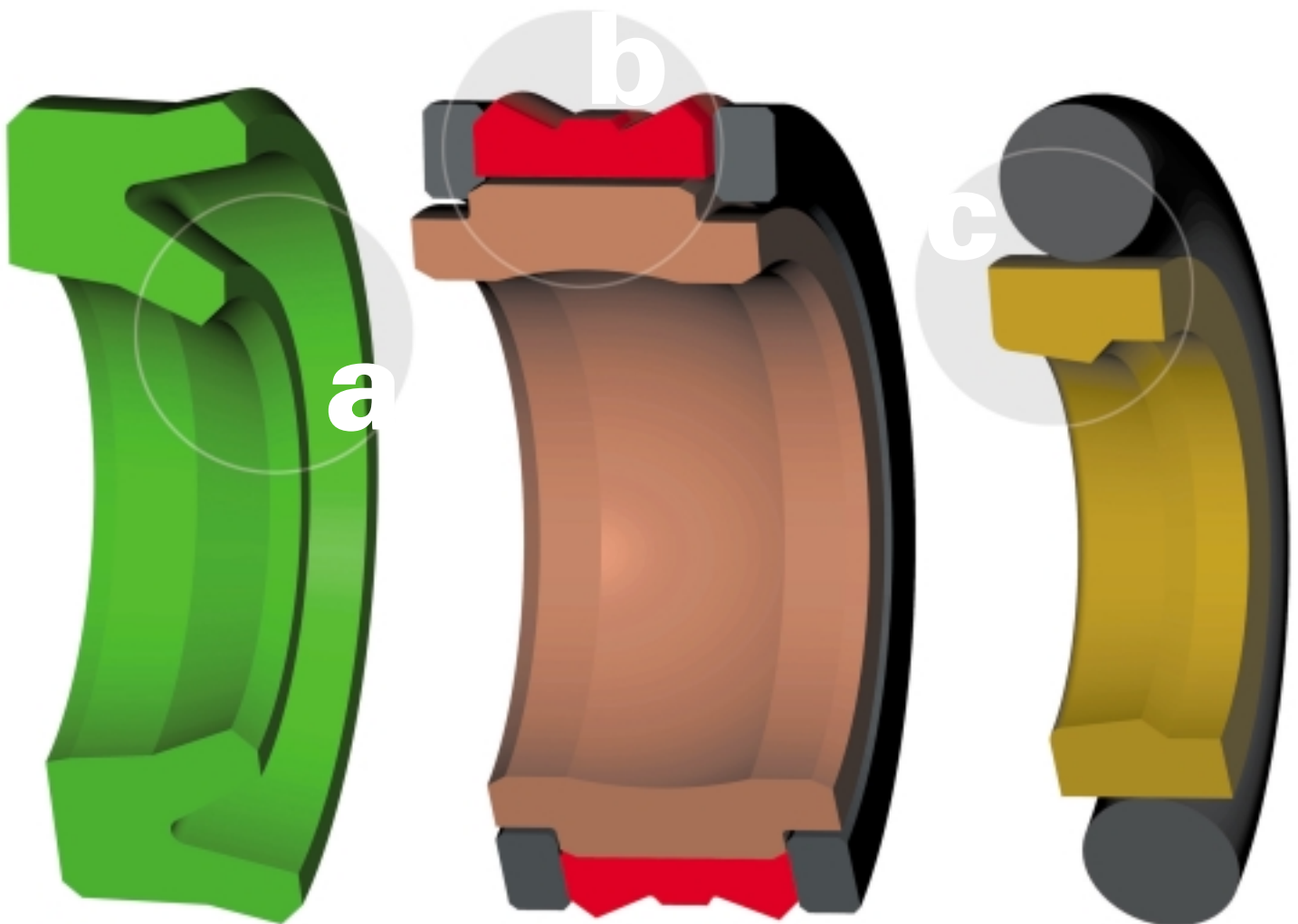




## The influence of Seal geometry

The correct choice of seal profile is other than the correct choice of material the most important criteria for designing a sealing system to meet both, optimum performance and long life.

The right selection of profile and material is always a technical – economical compromise, taking factors like leakage, friction and wear into consideration.



S01

K23

S09

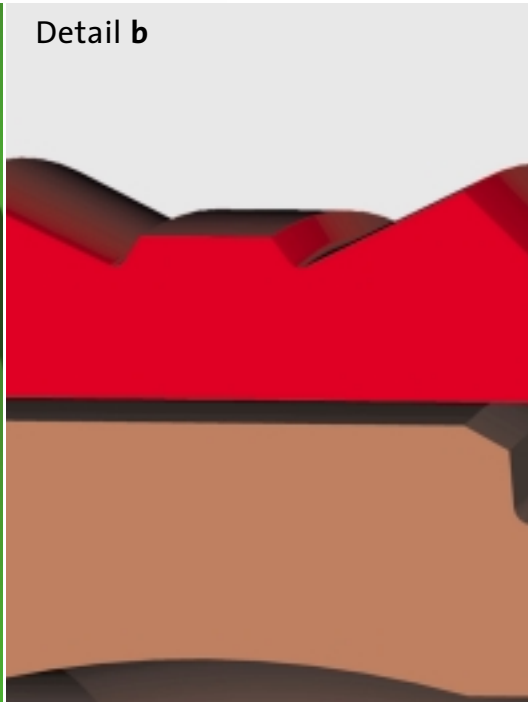




Detail a

**S01:** U-cup for standard application

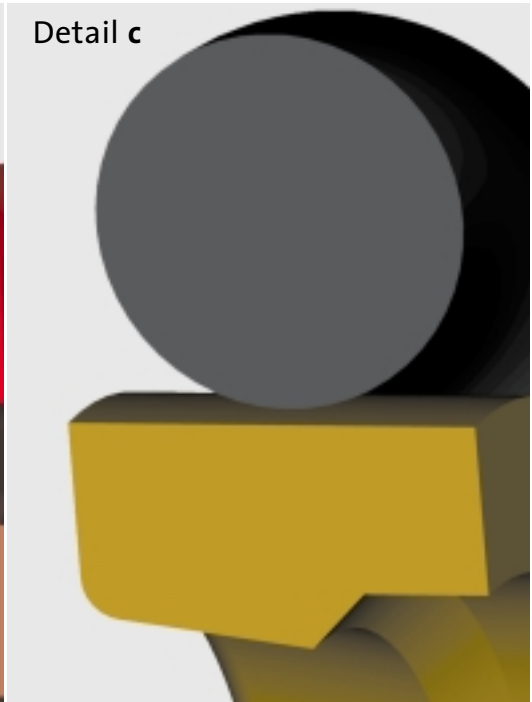
The special design of the sealing lip results in high sealability with a small trade in friction.



Detail b

**K23:** Multiple compact Piston seal for heavy duty conditions.

Very high sealability. Commonly used in heavy-duty support cylinders e.g. mining industry.



Detail c

**S09:** Slide ring seal with extremely low friction characteristics.

Specially designed geometry sets itself apart in applications where high pressure and pressure peaks occur. Due to its slightly higher leakage, usually used in combination with other profiles.

Above-mentioned profiles present only a small section of the large selection of seals. We offer seals for almost every application, which are designed to meet the required specification.

In many cases, the selection of one seal alone cannot lead to the desired result. It is the whole system that needs to be considered, including wipers and guiding elements. Often only a harmonic correlation of all sealing elements leads to ideal sealing performance.

ECONOMOS offers 20 years of field proven experience in the seal industry. We can assist you in your projects for new equipment or re-built. Our unique capability allows us to design your metal work for our seals, or engineer the best seal to fit your existing housing.

## Material data

# Material Material

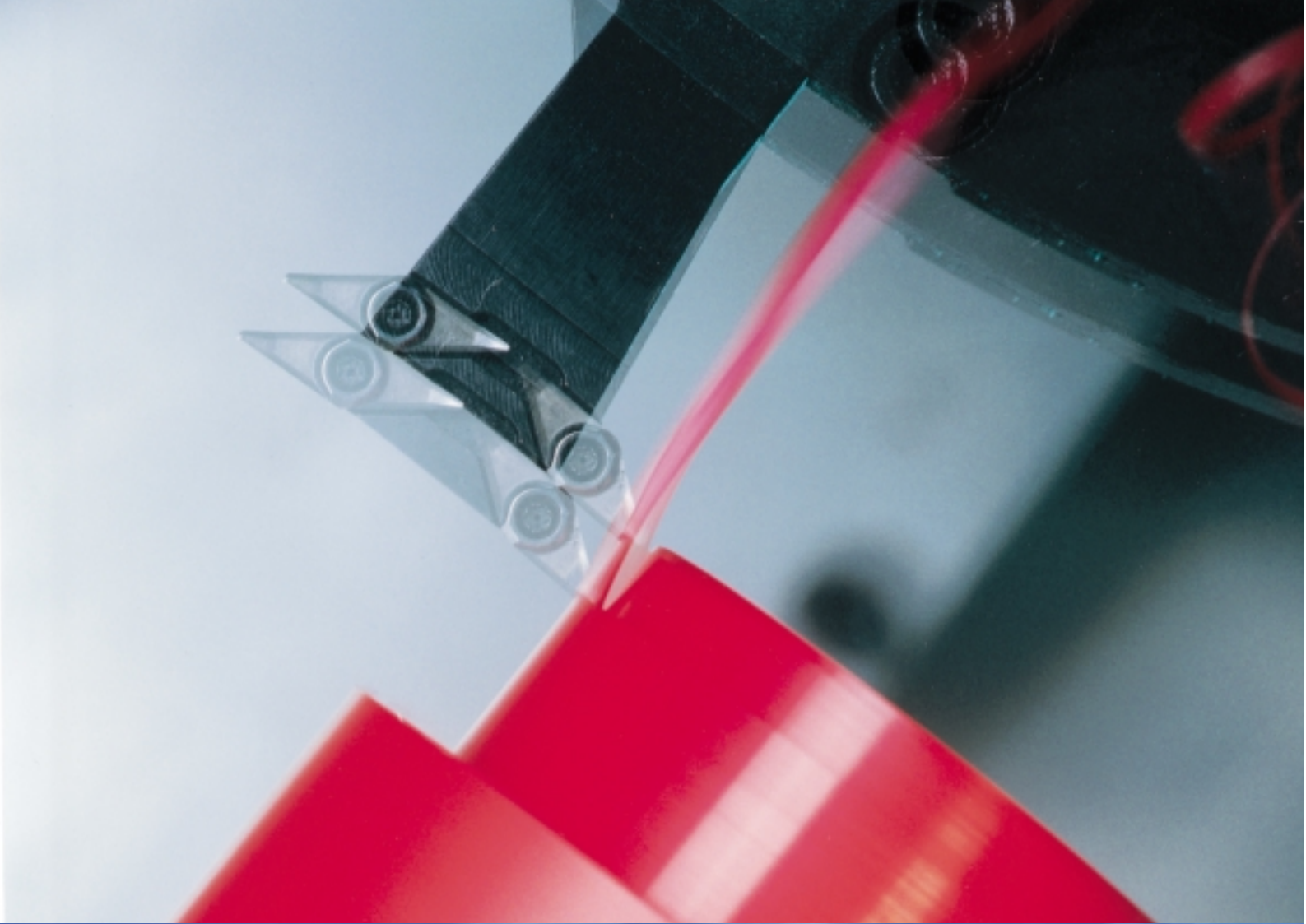
		Polyurethanes					
properties	DIN-standard	unit	Ecopur TPU	H-Ecopur TPU	G-Ecopur CPU	T-Ecopur TPU	S-Ecopur TPU
colour			green	red	red	blue	grey-black
hardness	53505	Shore A	95±2	95±2	95±2	95±2	95±2
hardness	53505	Shore D	48±3	48±3	47±3	48±3	48±3
density	53479	g/cm <sup>3</sup>	1,20	1,20	1,20	1,17	1,24
100% modulus	53504	N/mm <sup>2</sup>	≥12	≥13	≥11	≥12	17
tensile strength / yield stress	53504 / 53455	N/mm <sup>2</sup>	≥40	≥50	≥45	≥50	50
elongation at break	53504 / 53455	%	≥430	≥330	≥280	≥450	380
modulus of elasticity – tensile test	53457	N/mm <sup>2</sup>					
compression set 70°C/24h 20%Def.		%	≤30	≤27	≤30	≤27	25
100°C/24h 20%Def.		%	≤35	≤33	≤40	≤33	30
100°C /22h	53517	%					
175°C /24h	53517	%					
rebound resilience	52512	%	42	29	43	50	
tear strength	53515	N/mm	≥100	≥100	≥40	≥80	120
abrasion	53516	mm <sup>3</sup>	18	17	25	15	17
minimum service temperature		°C	-30	-20	-30	-50	-20
maximum service temperature		°C	+110	+110	+110	+110	+110

# Uralita

## data

Rubber Elastomers					Thermoplastics				
Ecorubber 1 NBR	Ecorubber-H H-NBR	Ecorubber 2 FPM, FKM	Ecorubber 3 EPDM	Ecosil MVQ	Ecotal POM	Ecoflon 1 PTFE virgin	Ecoflon 2 PTFE +15%GF +5%MoS <sub>2</sub>	Ecomid PA	Ecopaek PEEK
black	black	brown	black	reddisch brown	black	white	grey	black	cream
85±5	85±5	83±5	85±5	85±5					
					82	57	60	77	86
1,31	1,22	2,30	1,22	1,52	1,41	2,17	2,25	1,15	1,32
≥11	≥10	≥5	≥9	≥5					
≥16	≥18	≥8	≥12	≥7	62	27	18	65	97
≥130	≥180	≥200	≥110	≥130	40	300	200	120	≥50
					2600			1800	3600
≤15	≤22	≤20	≤15	≤15					
28	29	7	38	44					
20	30	21	15	8					
90	90	150	120						
-30	-25	-20	-50	-60	-50	-200	-200	-40	
+100	+150	+200	+150	+200	+100	+260	+260	+100	260







## The new line of profiles Additions and improvements at one glance

# NG 40 profiles

### 1. MATERIAL DEPENDENT PROFILE DESIGNS

Separate database of material dependent profile parameters like pre-load, sealing lip line force, relief angles for Rubber and Polyurethane. Profiles, which are recommended for these materials only, are indicated with R for Rubber, P for Polyurethane and F for PTFE.

### 2. SEAL STYLE SELECTION

Standard ECONOMOS profiles are now available in different variations to better suit different applications and housing requirements.

### 3. PROFILE GEOMETRY

Modification in the design of the sealing lip angle and chamfers lead to improvements in active leakage control and hydrodynamic back flow of oil into the housing.

### 4. BACK-UP RING GEOMETRY

New geometry of Back-up rings for Piston and Rod seals adds more seal stability.

### 5. NEW GEOMETRY FOR PNEUMATIC SEALS

New design for pneumatic seals and wipers to better utilize the initial lubrication, therefore extending life and reducing friction.

### 6. PTFE SEALS

Extended line of PTFE seals and wipers to meet increased demand of low friction sealing elements.

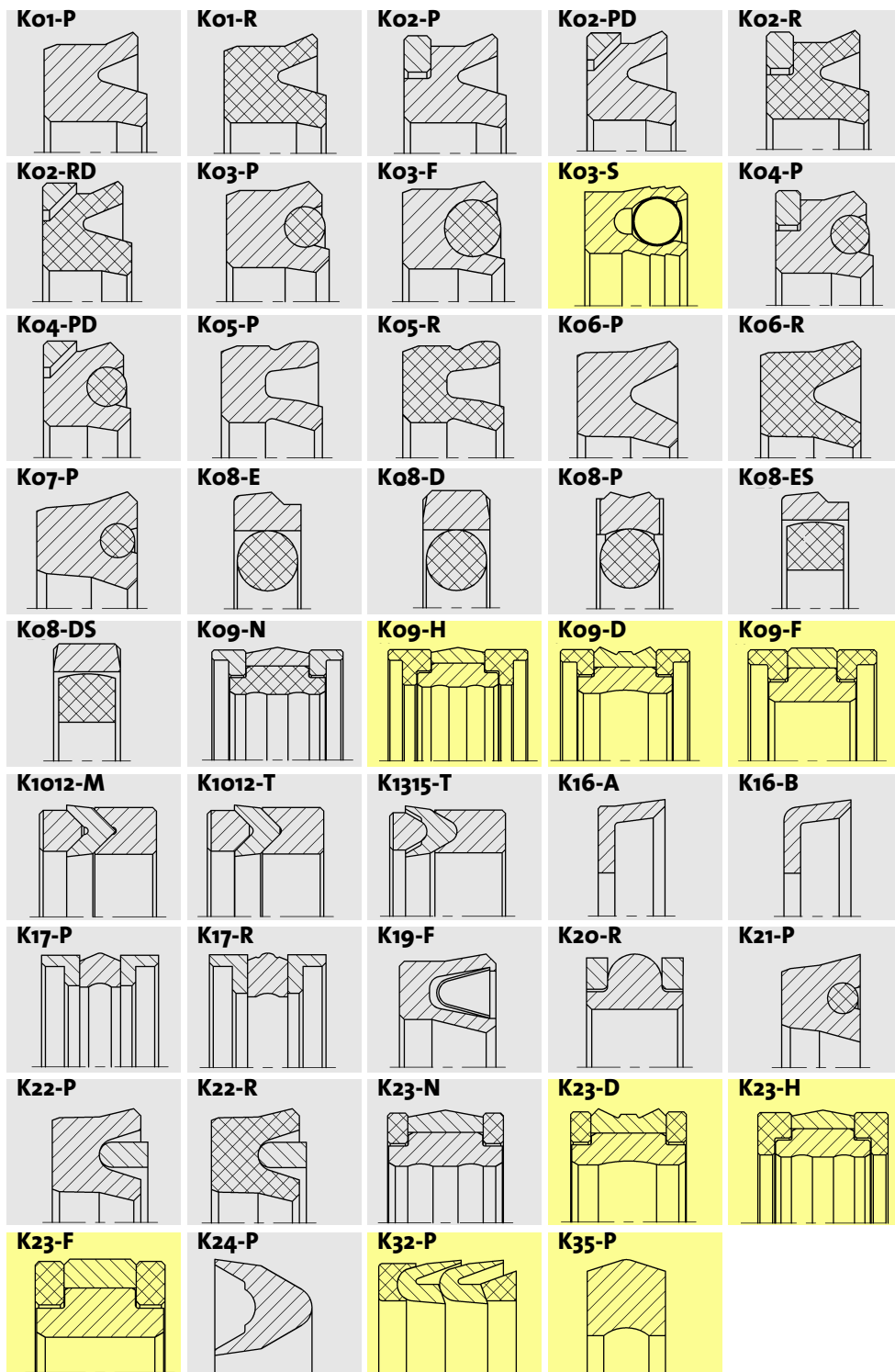
### 7. SURFACE FINISH

Even further advanced seal surface finish due to new cutting tool geometry's and modified machining parameters in our new machining software NG 40.

## New Line of Profiles

# Piston Rings

### Piston Seals



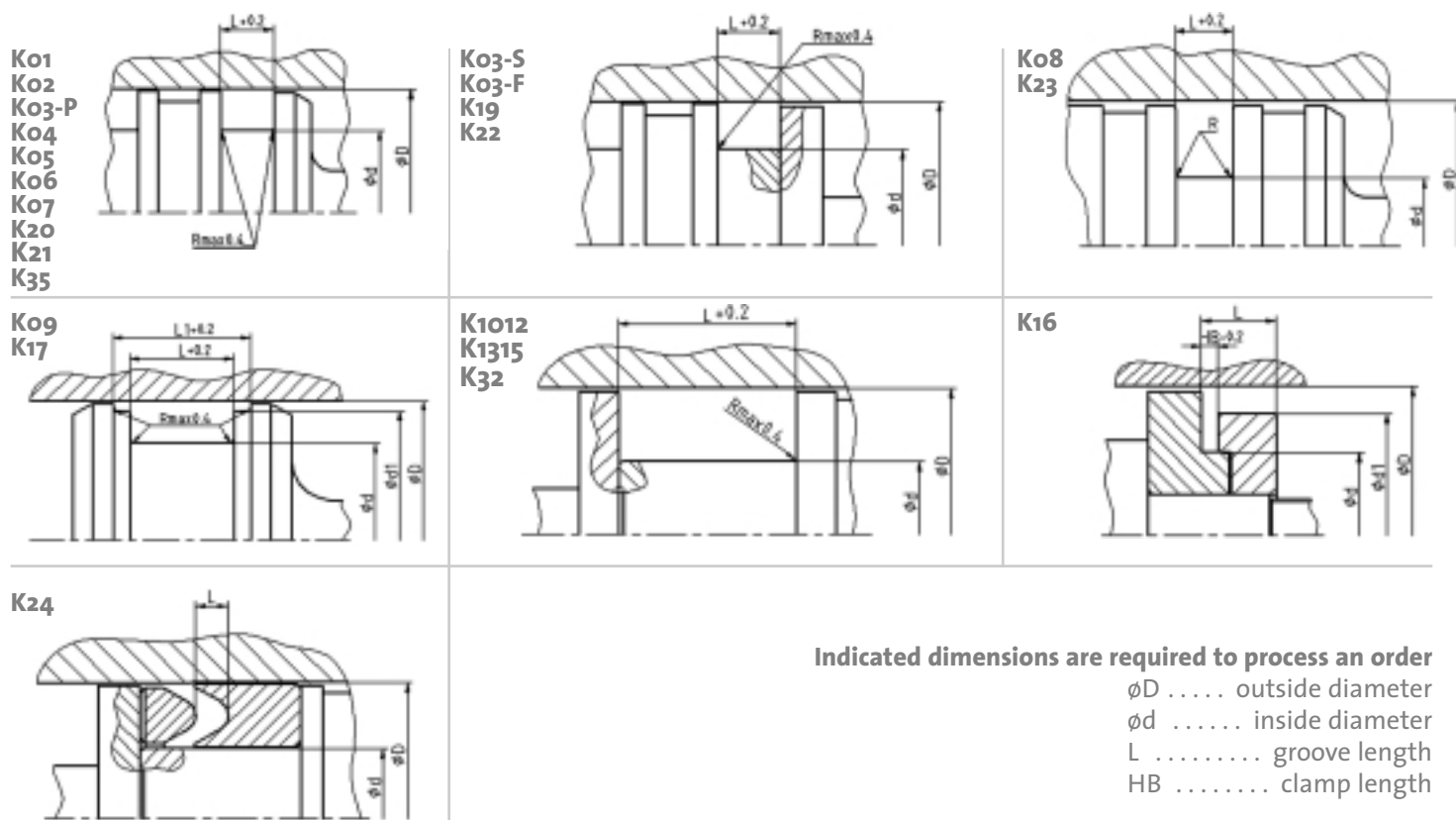
	Recommended Materials
K01	1 2 3 4
K02	1+8 2+8 4+8 3+7
K03	1+2 6+3 7+3
K03-S	6+Spring 7+Spring
K04	1+8+2
K05	1 2 3
K06	1 2 3 4
K07	1+2 6+3 7+3
K08	6+2 7+2 6+3 7+3 6+4 7+4 1+2
K09	1+2+8
K09-F	7+2+8 7+3+8
K1012	1+8 2+8 3+7 4+8
K1315	1+8 2+8 3+7 4+8
K16	1 2 3 4
K17	1+8 2+8 3+7
K19	6+Metal 7+Metal
K20	2+8 3+6 3+7
K21	1+2
K22	1+8 2+8 3+7 4+8
K23	1+2+8
K23-F	7+2+8 7+3+8
K24	1 2 3 4
K32	1+8 2+8 3+7
K35	1

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



## 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

standard materials	working conditions			applications		
	temperature [°C]	pressure	sliding speed [m/sec]	oil-hydraulic	oil/H <sub>2</sub> O hydraulic	pneumatic
1 Ecopur	-30 up to + 110	400	0,5	+	up to 40° C	+
1 H-Ecopur	-20 up to + 110	400	0,5	+	up to 90° C	+
1 T-Ecopur	-50 up to + 110	400	0,5	+	up to 40° C	+
1 S-Ecopur	-20 up to + 110	400	0,7	+	up to 90° C	+
2 Ecorubber 1	-30 up to + 100	160	0,5	+	+	+
2 Ecorubber-H	-25 up to + 150	160	0,5	+	+	+
3 Ecorubber 2	-20 up to + 200	160	0,5	+	+	+
4 Ecorubber 3	-50 up to + 150	160	0,5	not mineral-oil resistant		
5 Ecosil	-60 up to + 200	160	-	+		
6 Ecoflon 1	-200 up to + 260	160	4	+	+	+
7 Ecoflon 2	-200 up to + 260	400	4	+	+	+
8 Ecotal	-50 up to + 100		1	+	+	+
8 Ecomid	-40 up to + 100		1	+	+	+

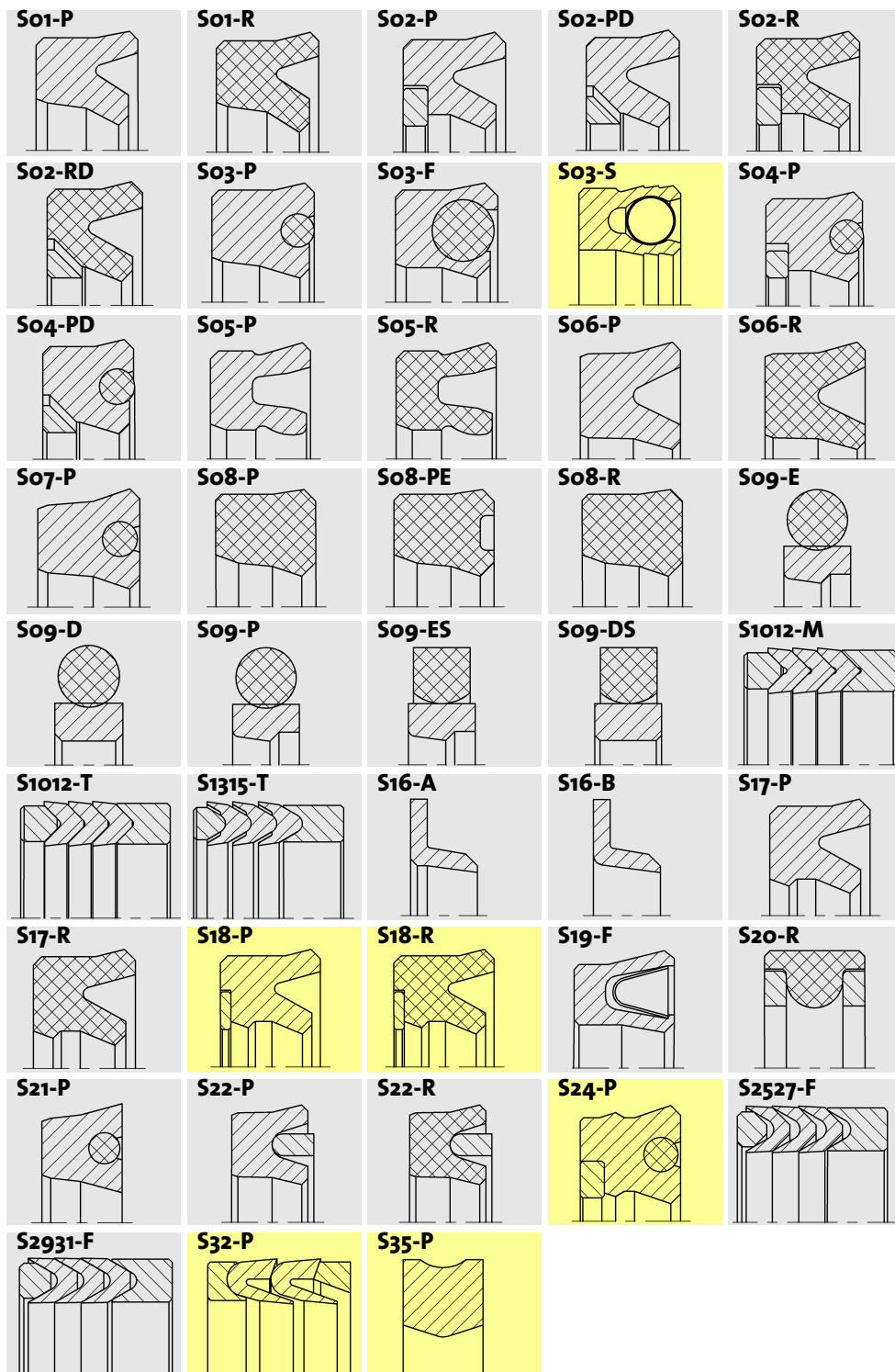
The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your next ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable

## New Line of Profiles

# Rod Seal New Line

### Rod seals

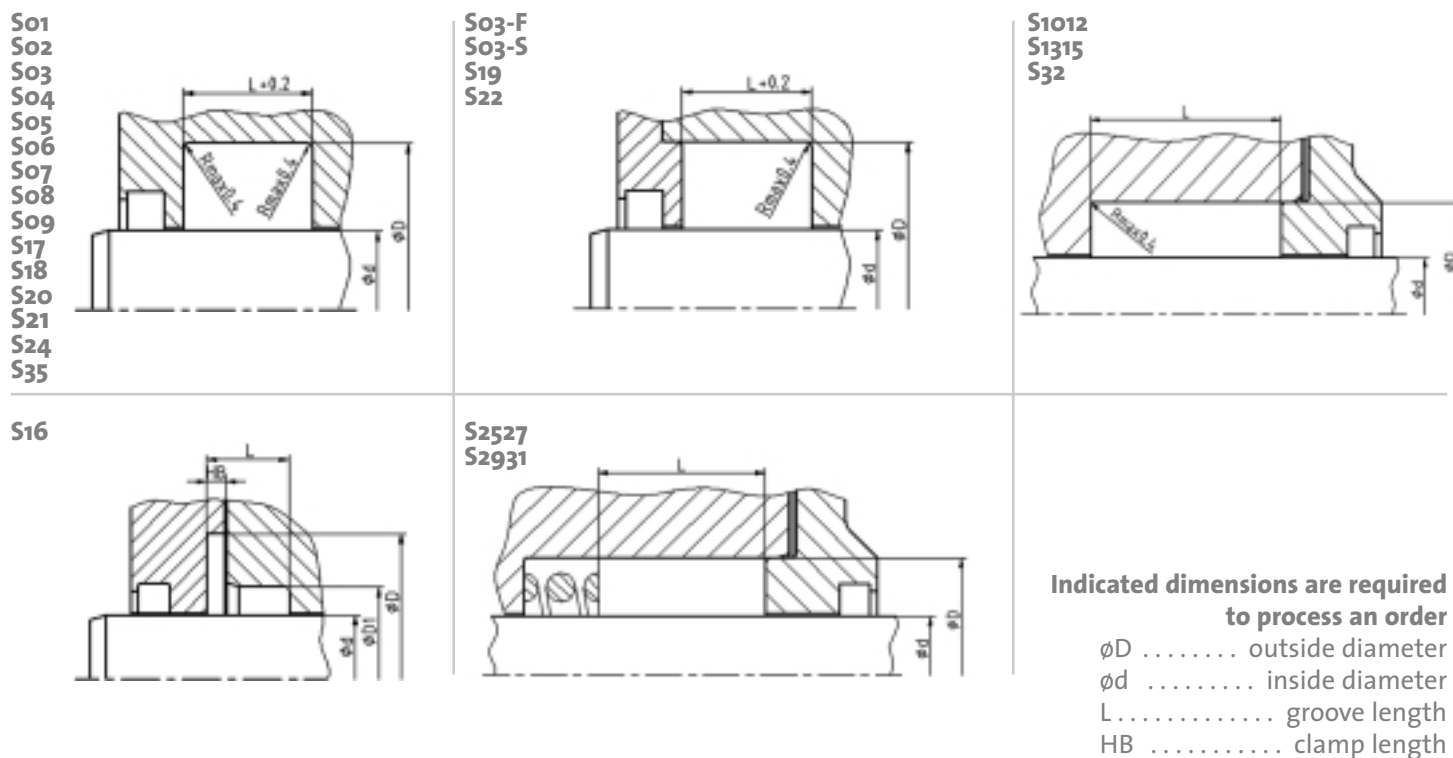


	Recommended Materials				
S01	1	2	3	4	5
S02	1+8	2+8	3+7	4+8	5+7
S03	1+2	6+3	7+3		
S03-S	6+Spring	7+Spring			
S04	1+8+2				
S05	1	2	3	4	
S06	1	2	3	4	
S07	1+2	6+3	7+3		
S08	1	2	3	4	
S09	6+2	7+2	6+3	7+3	6+4
	1+2				
S1012	1+8	2+8	3+7	4+8	
S1315	1+8	2+8	3+7	4+8	
S16	1	2	3	4	
S17	1	2	3	4	
S18	1+8	2+8	3+7	4+8	
S19	6+Spring	7+Spring			
S20	2+8	3+6	3+7		
S21	1+2				
S22	1+8	2+8	4+8	2+7	
S24	1+2+8				
S2527	7	6+7			
S2931	7	6+7			
S32	1+8	2+8	3+7		
S35	1				

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

## Housing detail

### Standard materials, working conditions and applications



standard materials	working conditions			applications		
	temperature [°C]	pressure	sliding speed [m/sec]	oil-hydraulic	oil/H <sub>2</sub> O hydraulic	pneumatic
1 Ecopur	-30 up to + 110	400	0,5	+	up to 40° C	+
1 H-Ecopur	-20 up to + 110	400	0,5	+	up to 90° C	+
1 T-Ecopur	-50 up to + 110	400	0,5	+	up to 40° C	+
1 S-Ecopur	-20 up to + 110	400	0,7	+	up to 90° C	+
2 Ecorubber 1	-30 up to + 100	160	0,5	+	+	+
2 Ecorubber-H	-25 up to + 150	160	0,5	+	+	+
3 Ecorubber 2	-20 up to + 200	160	0,5	+	+	+
4 Ecorubber 3	-50 up to + 150	160	0,5	not mineral-oil resistant		
5 Ecosil	-60 up to + 200	160	-	+		
6 Ecoflon 1	-200 up to + 260	160	4	+	+	+
7 Ecoflon 2	-200 up to + 260	400	4	+	+	+
8 Ecotal	-50 up to + 100		1	+	+	+
8 Ecomid	-40 up to + 100		1	+	+	+

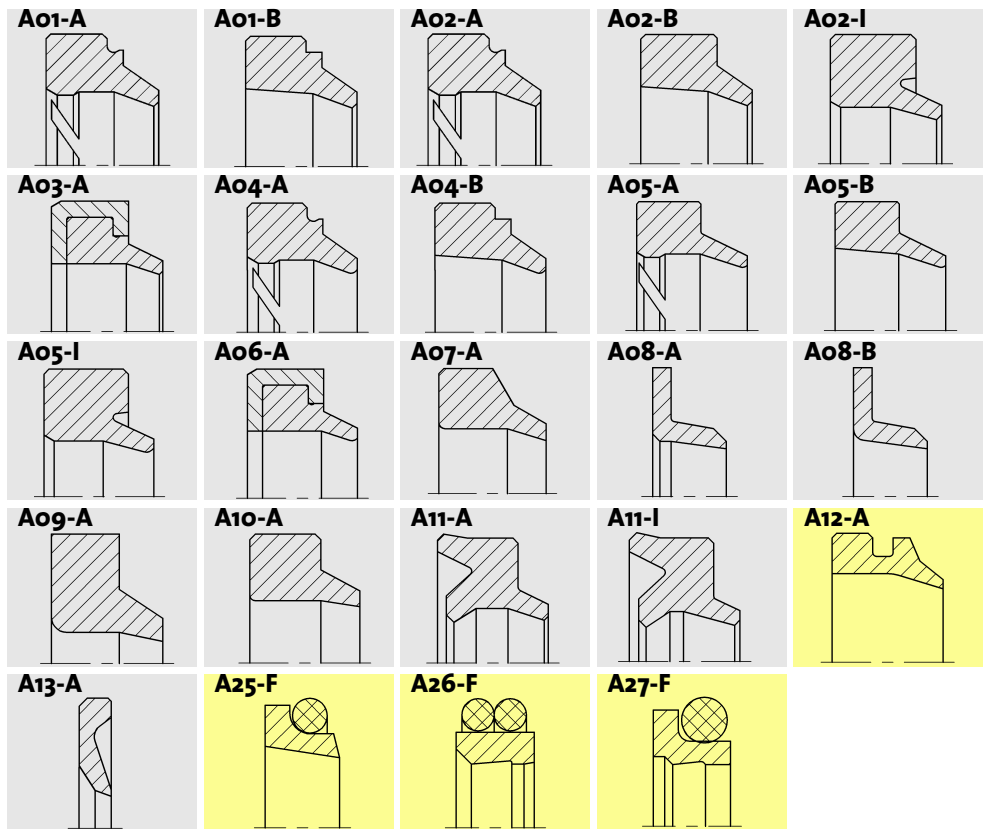
The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your next ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable

## New Line of Profiles

Win New Line

### Wipers

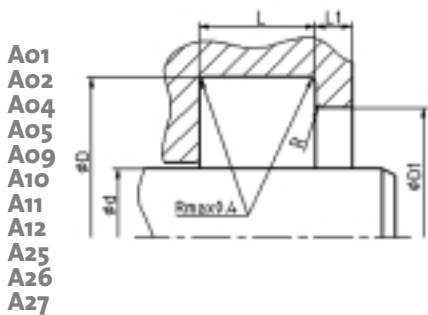


	Recommended Materials			
A01	1	2	3	4
A02	1	2	3	4 6 7
A03	1+8	2+8	3+7	
A04	1	2	3	4
A05	1	2	3	6 7
A06	1+8	2+8	3+7	
A07	1	2		
A08	1	2	3	4
A09	1	2	3	4
A10	1	2	3	4
A11	1	2	3	4
A12	1	2	3	4
A13	8			
A25	7+2	7+3		
A26	7+2	7+3		
A27	7+2	7+3		

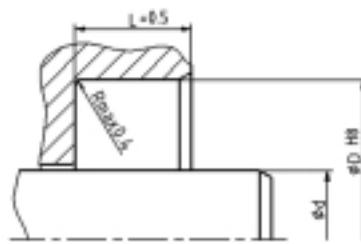
A.m. material code is referring to the table on the following page!

## Housing detail

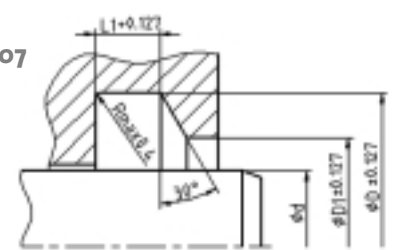
### Standard materials, working conditions and applications



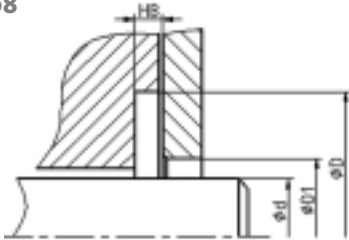
A03  
A06



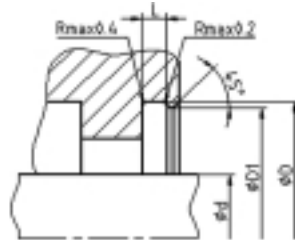
A07



A08



A13



Indicated dimensions are required to process an order

$\phi D$  ..... outside diameter

$\phi d$  ..... inside diameter

L ..... housing length

H ..... total wiper length

HB ..... clamp length

standard materials	working conditions		applications		
	temperature [°C]	sliding speed [m/sec]	oil-hydraulic	oil/H <sub>2</sub> O hydraulic	pneumatic
1 Ecopur	-30 up to + 110	4	+	up to 40° C	+
1 H-Ecopur	-20 up to + 110	4	+	up to 90° C	+
1 T-Ecopur	-50 up to + 110	4	+	up to 40° C	+
1 S-Ecopur	-20 up to + 110	5	+	up to 90° C	+
2 Ecorubber 1	-30 up to + 100	4	+	+	+
2 Ecorubber-H	-25 up to + 150	4	+	+	+
3 Ecorubber 2	-20 up to + 200	4	+	+	+
4 Ecorubber 3	-50 up to + 150	4		not mineral-oil resistant	
5 Ecosil	-60 up to + 200	-	+		
6 Ecoflon 1	-200 up to + 260	4	+	+	+
7 Ecoflon 2	-200 up to + 260	4	+	+	+
8 Ecototal	-50 up to + 100	1	+	+	+
8 Ecomid	-40 up to + 100	1	+	+	+

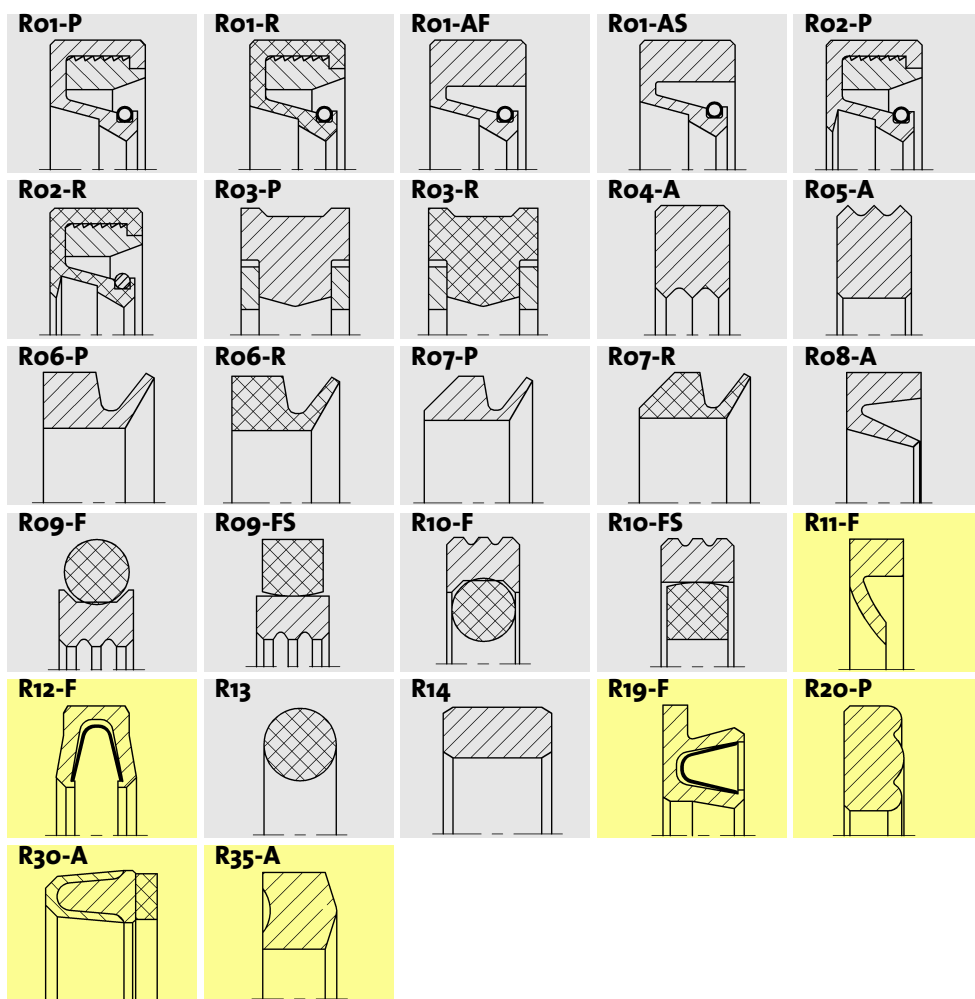
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+ = suitable

## New Line of Profiles

# Rotary Seals

### Rotary Seals



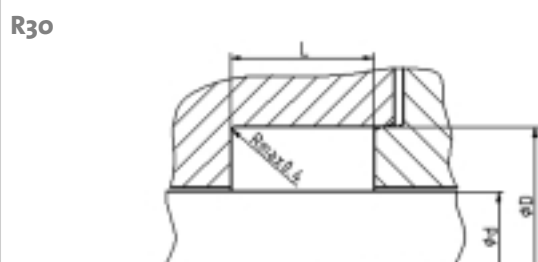
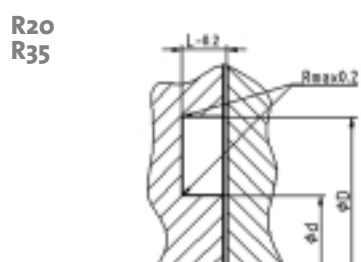
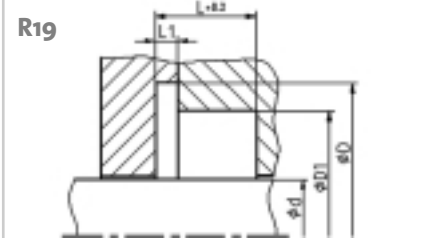
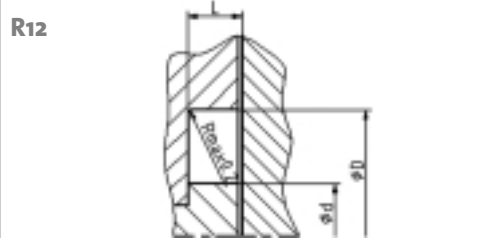
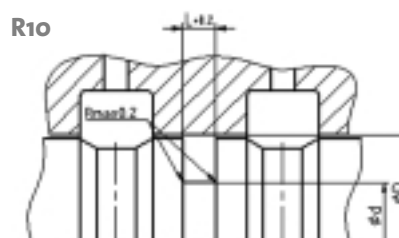
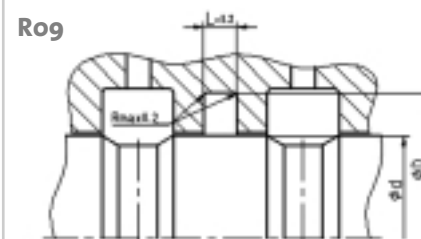
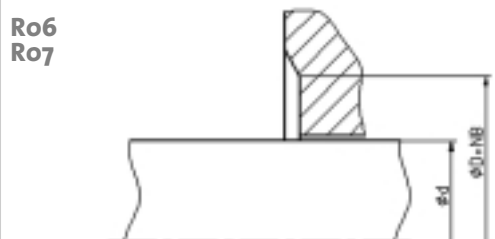
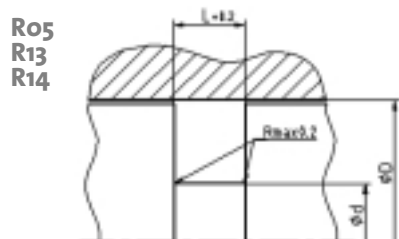
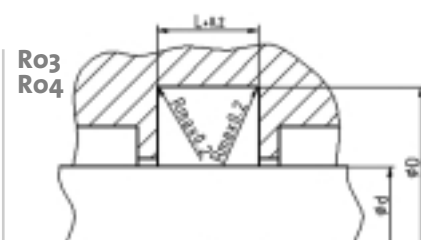
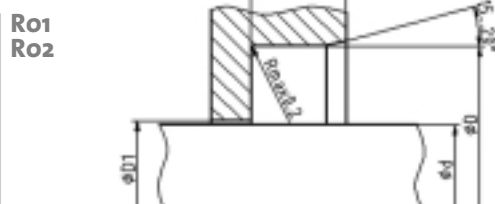
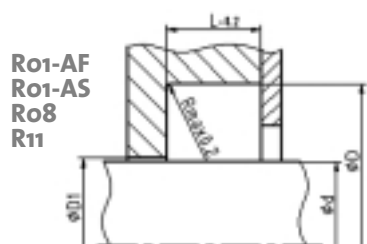
	Recommended Materials	
R01	1+8+Spring	2+8+Spring
	4+8+Spring	3+Metal+Spring
	5+Metal+Spring	
R02	1+8+Spring	2+8+Spring
	4+8+Spring	3+Metal+Spring
	5+Metal+Spring	
R03	1+8	2+8 3+7
R04	1 2 3 4 5	
R05	1 2 3 4 5	
R06	1 2 3 4 5	
R07	1 2 3 4 5	
R08	1 2 3 4 5 6 7	
R09	9+2 9+3	6+2
R10	9+2 9+3	6+2
R11	6 7 9	
R12	6+Spring	7+Spring 9+Spring
R13	1 2 3 4 5 6	
R14	1 2 3 4 5 6 7 8	
R19	9+Spring	
R20	1 2 3 4 5	
R30	6+2+8	6+4+8
R35	1 2 3 4 5	

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

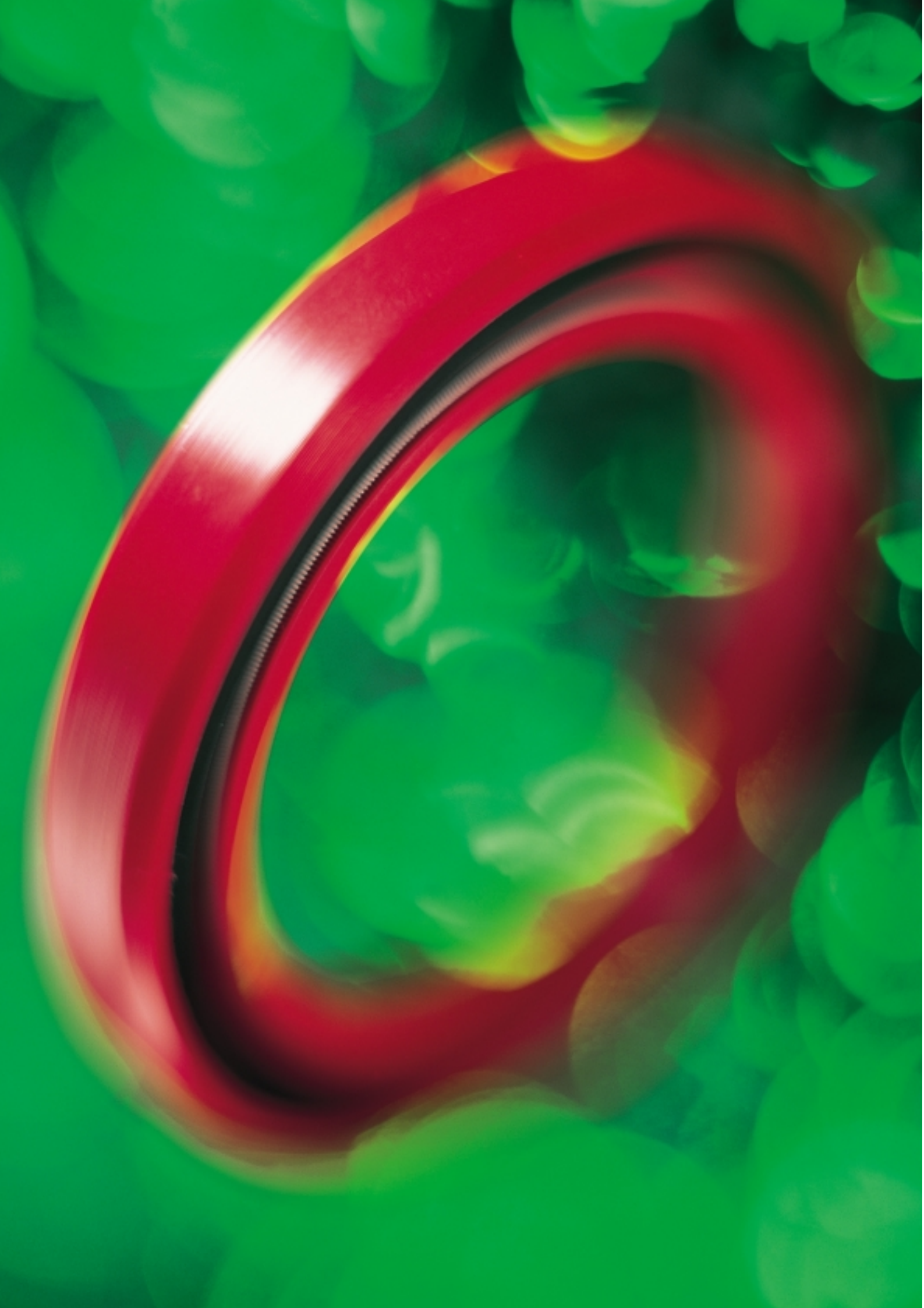
# Ural

## e of Profiles

### Housing detail



Indicated dimensions are required to process an order  
 $\phi D$  . . . . . outside diameter  
 $\phi d$  . . . . . inside diameter  
 $L$  . . . . . housing length  
 $L_1$  . . . . . clamp length





## Rotary Seals

### Standard materials, working conditions and applications

Material (+ = suitable)	R1	R2	R3	R4	R5	R6	R7	R8	R9/ R10	RO/13 static applications	Medium oil
<b>Ecopur</b>											
speed m/s	5	5	0,2	0,2	0,2						
pressure bar	0,5	0,5	400	250	250					600	+
temperature °C	80	80	110	110	110	110	110	110		110	
<b>H-Ecopur</b>											
speed m/s	5	5	0,2	0,2	0,2						
pressure bar	0,5	0,5	400	250	250					600	+
temperature °C	80	80	110	110	110	110	110	110		110	
<b>T-Ecopur</b>											
speed m/s	5	5	0,2	0,2	0,2						
pressure bar	0,5	0,5	400	250	250					600	+
temperature °C	80	80	110	110	110	110	110	110		110	
<b>S-Ecopur</b>											
speed m/s	6	6	0,3	0,3	0,3						
pressure bar	0,5	0,5	400	250	250					600	+
temperature °C	80	80	110	110	110	110	110	110		110	
<b>Ecorubber 1</b>											
speed m/s	10	10	0,2	0,2	0,2						
pressure bar	0,5	0,5	250	160	160					160	+
temperature °C	80	80	100	100	100	100	100	100		100	
<b>Ecorubber-H</b>											
speed m/s	10	10	0,2	0,2	0,2						
pressure bar	0,5	0,5	250	160	160					160	+
temperature °C	80	80	150	150	100	150	150	150		150	
<b>Ecorubber 2</b>											
speed m/s	15	15	0,2	0,2	0,2						
pressure bar	0,5	0,5	250	160	160					160	+
temperature °C	200	200	200	200	200	200	200	200		200	
<b>Ecorubber 3</b>											
speed m/s	10	10	0,2	0,2	0,2						
pressure bar	0,5	0,5	250	160	160					160	
temperature °C	80	80	150	150	150	150	150	150		150	
<b>Ecosil</b>											
speed m/s	5	5									
pressure bar	0,2	0,2								160	+
temperature °C	200	200				200	200	200		200	
<b>PTFE/Carbon</b>											
speed m/s									0,4		
pressure bar									350		
temperature °C									100		

material code:

1 Ecopur, H-Ecopur, T-Ecopur, S-Ecopur  
2 Ecorubber 1, Ecorubber-H

3 Ecorubber 2  
4 Ecorubber 3

5 Ecosil  
6 Ecoflon 1

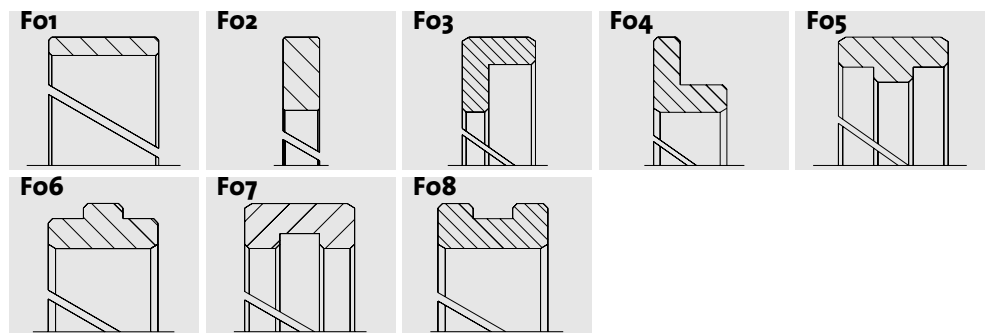
7 Ecoflon 2  
8 Ecotal, Ecomid

9 PTFE/Kohle

## New Line of Profiles

# Guide New Line

### Guide rings

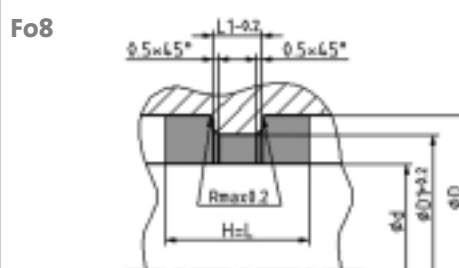
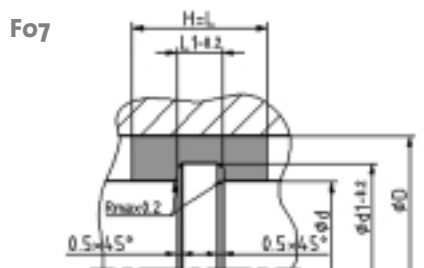
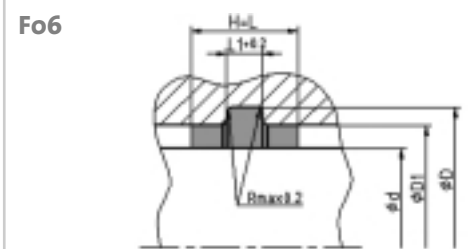
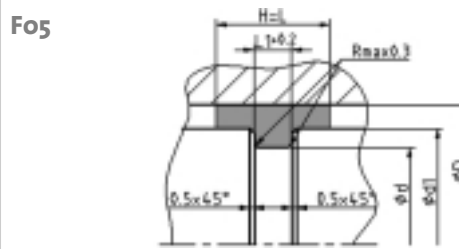
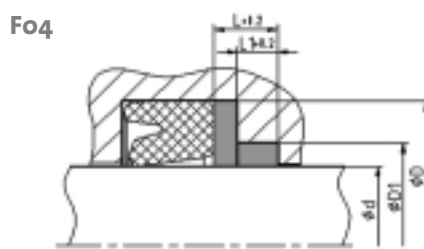
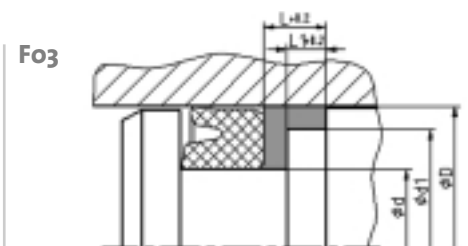
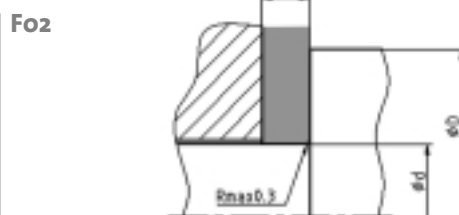
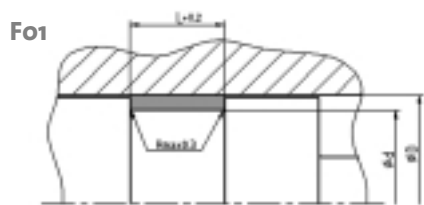


	Recommended Materials		
Fo1	8	6	7
Fo2	8	6	7
Fo3	8	6	7
Fo4	8	6	7
Fo5	8	6	7
Fo6	8	6	7
Fo7	8	6	7
Fo8	8	6	7

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

## Housing detail

Standard materials, working conditions and applications



**Indicated dimensions are required to process an order**

$\phi D$  ..... outside diameter  
 $\phi D1$  .. contact line diameter  
 $\phi d$  ..... inside diameter  
 $\phi d1$  .. contact line diameter  
 $L$  ..... housing length  
 $L1$  .... retaining ring length  
 cutting gap width

standard materials		working conditions			applications		
		temperature [°C]	admissible specific load [N/mm <sup>2</sup> ]	sliding speed [m/sec]	oil hydraulic	oil/H <sub>2</sub> O hydraulic	pneumatic
6	Ecoflon 1	200	1,5	4	+	+	+
7	Ecoflon 2	200	3	4	+	+	+
8	Ecotal	100	25	4	+	+	+
8	Ecomid	100	25	4	+		+

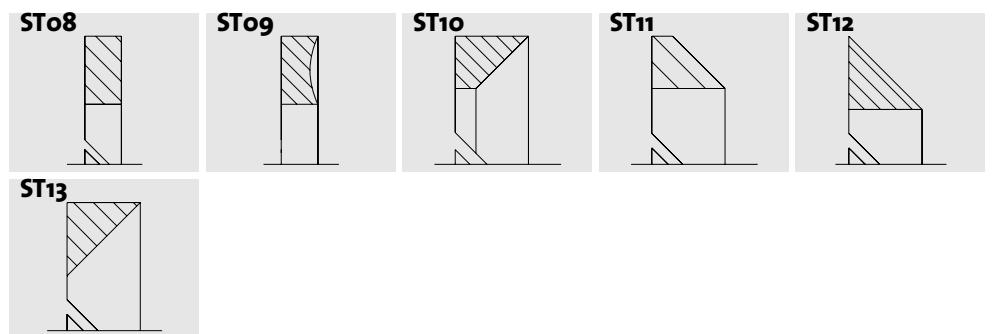
The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your next ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable

## New Line of Profiles

Back New rings

### Back-up rings

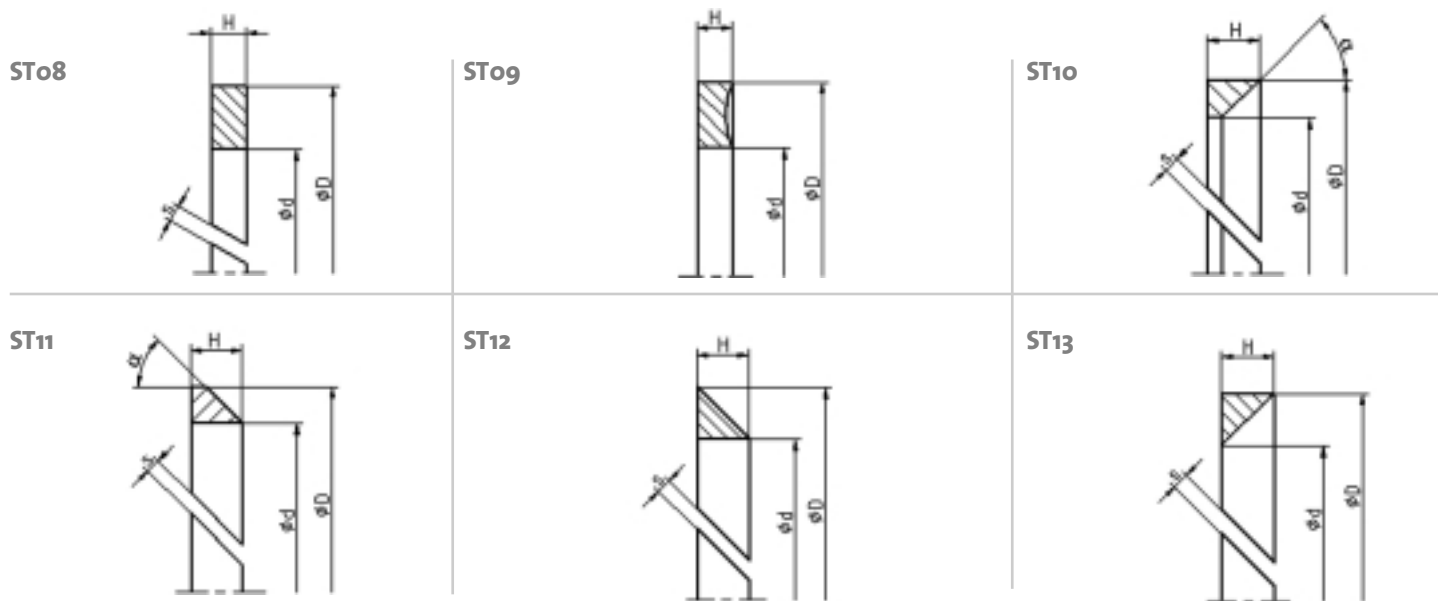


	Recommended Materials
ST08	1 6 7 8
ST09	1 6
ST10	6 7 8
ST11	6 7 8
ST12	6 7 8
ST13	6 7 8

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

## Housing detail

### Standard materials, working conditions and applications



Indicated dimensions are required to process an order

øD ..... outside diameter

ød ..... inside diameter

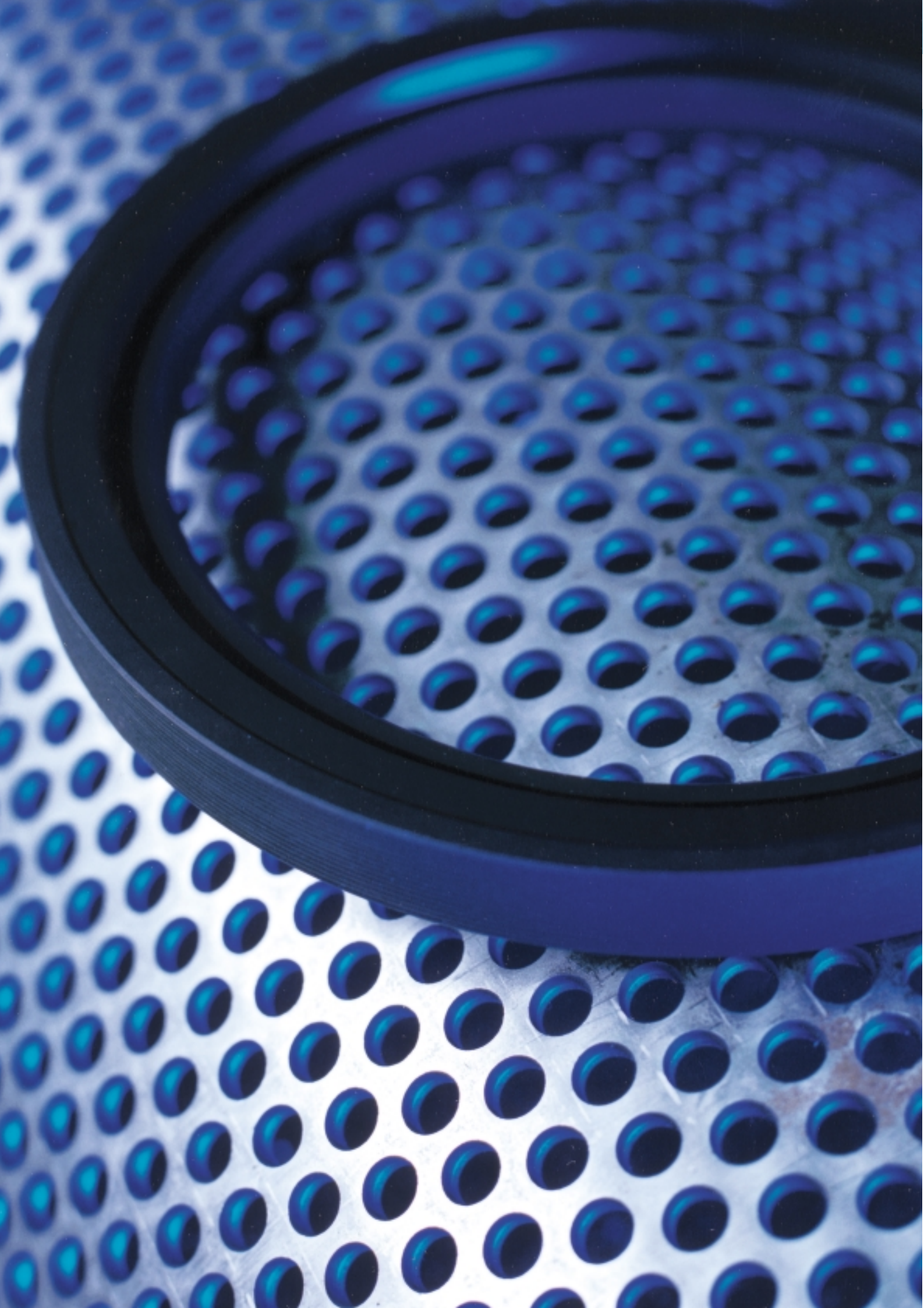
H ..... final height

S ..... cutting gap

	standard materials	working conditions			applications	
		temperature [°C]	oil hydraulic	oil/H <sub>2</sub> O hydraulic	pneumatic	
1	Ecopur	110	+	up to 40 °C	+	
1	H-Ecopur	110	+	up to 90 °C	+	
1	T-Ecopur	110	+	up to 40 °C	+	
1	S-Ecopur	110	+	up to 90 °C	+	
6	Ecoflon 1	260	+	+	+	
7	Ecoflon 2	260	+	+	+	
8	Ecotal	100	+	+	+	
8	Ecomid	100	+	+	+	

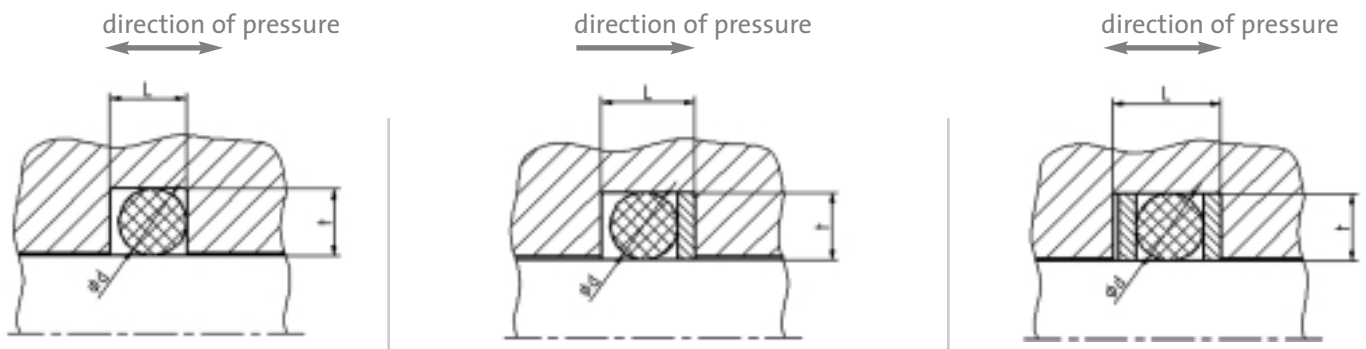
The quoted working conditions are a general reference. For some profiles, certain conditions may be exceeded, others should not be used to its maximum. In any case, if in doubt please contact your next ECONOMOS Subsidiary or ECONOMOS Austria.

+ = suitable



Housing dimension (static application)  
permissible tolerances in accordance with DIN 3771

O-Rings



cord (mm)	groove (mm)	without back-up ring (mm)	one back-up ring (mm)	2 back-up rings (mm)	recommended back-up ring width (mm)
$\varnothing d$	$t \pm 0,05$	$b + 0,25$	$b_1 + 0,25$	$b_2 + 0,25$	
1,5	1,10	2,1	3,1	4,1	1,0
1,78	1,35	2,5	3,5	4,5	1,0
2,00	1,56	2,7	4,2	5,7	1,5
2,50	2,05	3,3	4,8	6,3	1,5
2,62	2,18	3,5	5,0	6,5	1,5
3,00	2,52	3,9	5,4	6,9	1,5
3,50	3,00	4,4	5,9	7,4	1,5
3,53	3,00	4,4	5,9	7,4	1,5
4,00	3,40	5,0	6,7	8,4	1,7
5,00	4,25	6,3	8,0	9,7	1,7
5,33	4,53	6,7	8,4	10,1	1,7
5,70	4,85	7,1	9,1	11,1	2,0
6,00	5,10	7,5	9,5	11,5	2,0
6,99	5,94	8,8	10,8	12,8	2,0
7,00	5,95	8,8	10,8	12,8	2,0
8,00	6,80	10,0	12,5	15,0	2,5
10,00	8,50	12,5	15,0	17,5	2,5

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