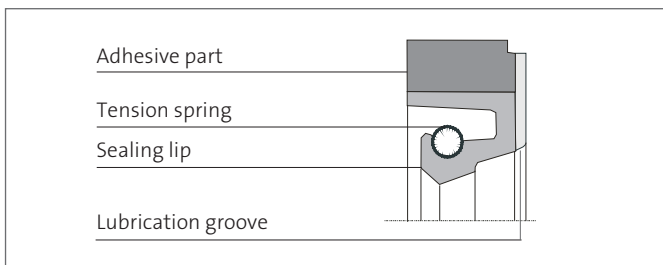


MERKEL RADIAMATIC R 58



Merkel Radiamatic R 58 is a radial shaft seal consisting of a fabric reinforced section of sturdy design, firmly bonded to the rubber sealing lip.

A helical tension spring assists radial contact pressure of the lip on the shaft. Radial shaft seal with a groove around the circumference to facilitate additional lubrication from the outside.



Applications

The Merkel Radiamatic R 58 was developed for the special requirements of grease-lubricated bearings in rolling mills.

Material

Sealing lip	Adhesive part	Tension spring
80 NBR B241	Impregnated cotton fabric	ST 1.4571

Further material combinations on request.

VALUE TO THE CUSTOMER

- A special reinforced fabric adhesive part of robust design
- Constant radial force assuring steady performance
- Highly wear resistant
- Also available as a joint-on-site version



FEATURES AND BENEFITS

Operating conditions

Material	80 NBR B241
Mineral oils	-40 ... +100 °C
Water	+5 ... +100 °C
Lubricating greases	-40 ... +100 °C
Rolling oil emulsion	on enquiry
Pressure	0,05 MPa
Sliding speed	15 m/s

Other media on demand. The figures given are maximum values and must not be applied simultaneously.

Surface finish

Peak-to-valley heights	R_a	R_{max}
Sliding surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4 \mu\text{m}$	$\leq 15 \mu\text{m}$

Machining is carried out most effectively by plunge grinding, i. e. without forward feed. The surface hardness should be approx. 60 HRC (min. depth of hardness 0,5 mm). The higher the peripheral speed the lower should be the surface roughness R_a of the mating surface. In order to ensure a sufficient lubricating film the surface should not be too smooth.

Standard value: $R_a \text{ min.} = 0,1 \mu\text{m}$.

Profile bearing length ratio $t_p > 50\%$ up to max. 90% at average depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Tolerances

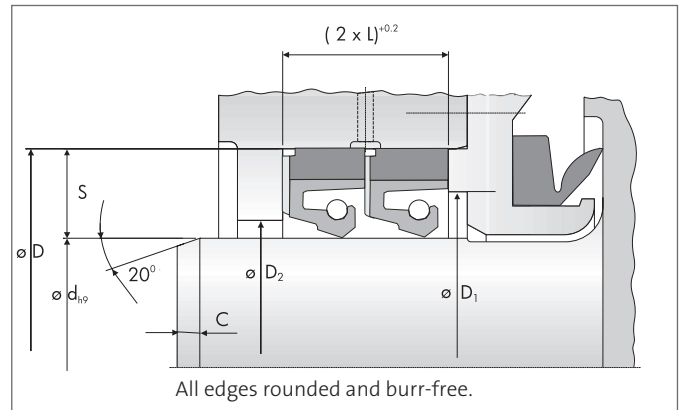
$\varnothing D$ [mm]	Tolerances
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal profile and circumferential speed. If necessary, we will provide recommended values.

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Design notes



Please note the general design-related remarks in our technical manual.

Installation chamfers

See dimension "C" in table of dimensions.

Housing recommendations for new designs

$\varnothing d$ [mm]	S (Profile) [mm]	L [mm]
>100	20	16
>250	22	20
>450	25	22
>750	32	25

Installation & assembly

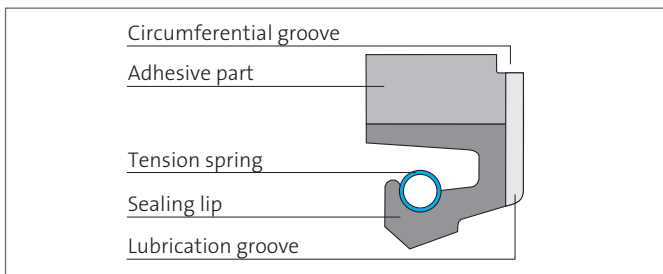
An axially accessible housing is necessary for the radial shaft seal Merkel Radiamatic R 58, as a clamping force must be applied to the rings.

The rotary shaft seal is delivered with an over-sized height. To ensure reliable operation the seal must be axially pressed to the dimension "L". An open housing with a cover plate and tightening screws is necessary. Certain deformation forces are necessary for pressing, and the cover plate and tightening screws should be designed accordingly. Please ask us for guide values.

MERKEL RADIAMATIC R 37



Merkel Radiamatic R 37 is a radial shaft seal consisting of a fabric reinforced section of sturdy design, firmly bonded to the rubber sealing lip. A helical tension spring assists radial contact pressure of the lip on the shaft.



VALUE TO THE CUSTOMER

- Highly wear resistant
- Constant radial force assuring steady performance
- Also available as joint-on-site version

Applications

Shaft seals Merkel Radiamatic R 37 are mainly used in heavy duty applications like rolling mills or large size gear boxes.

Material

Sealing lip	Adhesive part	Tension spring
80 NBR 245565	Impregnated cotton fabric	ST 1.4571
80 NBR B241	Impregnated cotton fabric	ST 1.4571
75 HNBR U467	Impregnated aramide fabric	ST 1.4571
80 FKM K670	Impregnated aramide fabric	ST 1.4571

Further material combinations on request.



FEATURES AND BENEFITS

Operating conditions

Material	80 NBR 245565	80 NBR B241	75 HNBR U467	80 FKM K670
Mineral oils	-20 ... +80 °C	-40 ... +100 °C	-30 ... +120 °C	-10 ... +180 °C
Water	+5 ... +80 °C	+5 ... +100 °C	+5 ... +100 °C	+5 ... +80 °C
Lubricating greases	-20 ... +80 °C	-40 ... +100 °C	-30 ... +120 °C	-10 ... +180 °C
Rolling oil emulsion	on enquiry	on enquiry	on enquiry	on enquiry
Pressure	0,05 MPa	0,05 MPa	0,05 MPa	0,05 MPa
Sliding speed	12 m/s	20 m/s	25 m/s	25 m/s

Other media on demand. The figures given are maximum values and must not be applied simultaneously.

Surface finish

Peak-to-valley heights	R_a	R_{max}
Sliding surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4 \mu\text{m}$	$\leq 15 \mu\text{m}$

Machining is carried out most effectively by plunge grinding, i. e. without forward feed. The surface hardness should be approx. 60 HRC (min. depth of hardness 0,5 mm).

The higher the peripheral speed the lower should be the surface roughness R_a of the mating surface. In order to ensure a sufficient lubricating film the surface should not be too smooth.

Standard value: $R_a \text{ min.} = 0,1 \mu\text{m}$.

Profile bearing length ratio $t_p > 50\%$ up to max. 90% at average depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Tolerances

$\varnothing D$ [mm]	Tolerances
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal Profile and circumferential speed. If necessary we will provide recommended values.

Housing recommendations for new designs

$\varnothing d$ [mm]	S (Profile) [mm]	L [mm]
>100	20	16
>250	22	20
>450	25	22
>750	32	25

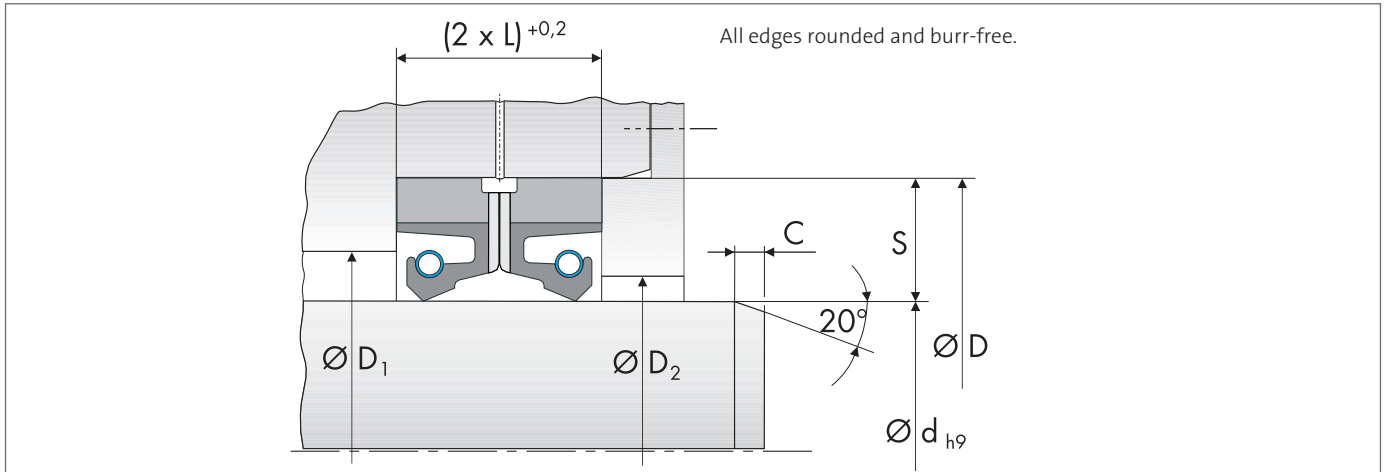
Installation & assembly

An axially accessible housing is necessary for the radial shaft seal Merkel Radiamatic R 37, as a clamping force must be applied to the ring. The rotary shaft seal is delivered with an over-sized height. To ensure reliable operation, the seal must be axially pressed to the dimension "L". An open housing with a cover plate and tightening screws is necessary. Certain deformation forces are necessary for pressing, and the cover plate and tightening screws should be designed accordingly. Please ask us for guide values.



FEATURES AND BENEFITS

Design notes



Please note the general design-related remarks in our technical manual.

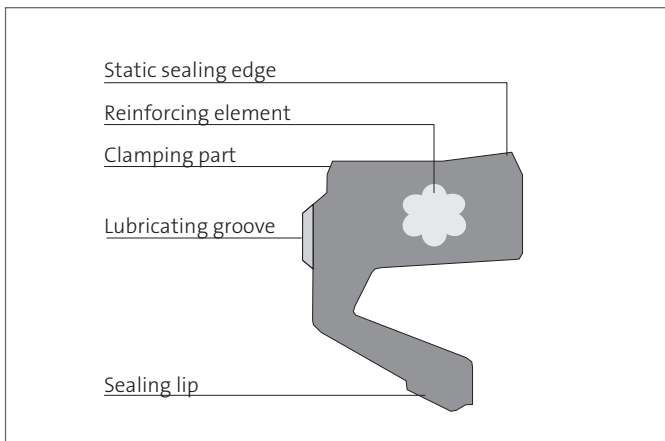
Installation chamfers

See dimension "C" in table of dimensions.

MERKEL RADIAMATIC RPM 41



Merkel Radiamatic RPM 41 is a radial shaft seal made of an elastomer material with an embedded steel body featuring radial and circumferential lubricating grooves for twin arrangement.



VALUE TO THE CUSTOMER

- Wide range of customized sizes of standard profiles
- Fast delivery for quick maintenance needs – within 24 hours, if needed
- Self-retaining with a secure press fit
- Suitable for open and cover plated housings
- Rubber at outer diameter for easy mounting or demounting and to prevent housing damage
- No exposed corroding components
- Without tension spring at sealing lip

Applications

Self-retaining rotary shaft seal typically used for sealing roller bearings in steel mills.

Material

Material	Designation
Nitrile rubber	85 NBR 245461

Operating conditions

Medium/Condition	NBR
Lubricating grease	-30 ... +100 °C
Rolling oil emulsion	on request
Pressure $\varnothing D \leq 700$ mm	0,05 MPa
Pressure $\varnothing D > 700$ mm	0,03 MPa
Sliding speed	15 m/s

The figures given are maximum values and must not be applied simultaneously.



FEATURES AND BENEFITS

Functional description

The Merkel Radiamatic RPM 41 is a tailor-made sealing element optimized by using FEM, and is made from an elastomer material developed specifically for this application. The sealing lip, manufactured from pure elastomer, does not require any spring support, and excels in terms of minimized friction coupled with a maximized sealing effect. The clamping part features radial and circumferential grooves, to enable additional lubrication to be provided from outside.

The press fit in the housing is assured by a reinforcing element integrated into the clamping body. Any damage to the housing is thus precluded. The Radiamatic RPM 41 – produced as an endless ring or as a jointed version – can be inserted in open housings or in housings with axial flanges or in axially chambered housings.

Surface finish

Roughness	R_a	R_{max}
Sliding surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	3,2 ... 6,3 μm	16 ... 25 μm

The running surface is best machined by grinding in plunging mode, i. e. without feeding. The surface hardness shall be approx. 60 HRC (hardening depth min. 0,5 mm).

With rising circumferential velocity, the counter surface should be manufactured with a decreasing roughness R_a . For adequate formation of a lubricating film, the surface should not become too smooth.

Recommended value: $R_a \text{ min.} = 0,1 \mu\text{m}$.

Profile bearing length ratio $M_r > 50\%$ to max. 90% with cutting depth $c = R_r/2$ and reference line $C_{ref} = 0\%$. Abrasive surfaces, scoring, scratches and cavities must all be avoided.

Tolerances

D	Tolerance
< 500 mm	H8
> 500 mm	+0,0004 mm x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between the shaft and the housing will depend on the seal profile and its circumferential velocity. Recommended values available on request.

Lead-in chamfers

d [mm]	α	C [mm]
200 ... 500	20° ... 30°	>7
500 ... 800		>9
800 ... 1.064		>11

Installation & assembly

The Merkel Radiamatic RPM 41 is supplied with a slight oversize at the outer diameter to provide a press fit.

An open housing with a cover plate and tightening screws is not required.

Available seal dimensions and profiles

S x L [mm]	D [mm]					
	200–260	261–300	301–360	361–470	471–684	685–1.064
15,0 x 16,0						
19,1 x 16,0						
19,1 x 18,0						
20,0 x 16,0						
20,0 x 18,0						
20,0 x 20,0						
22,0 x 20,0						
25,0 x 16,0						
25,0 x 18,0						
25,0 x 20,0						
25,0 x 22,0						
25,0 x 25,0						
30,0 x 30,0						
32,0 x 25,0						

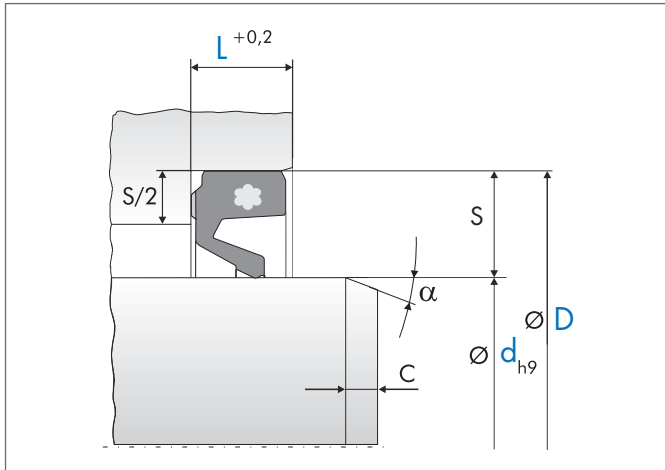
Further dimensions on request.



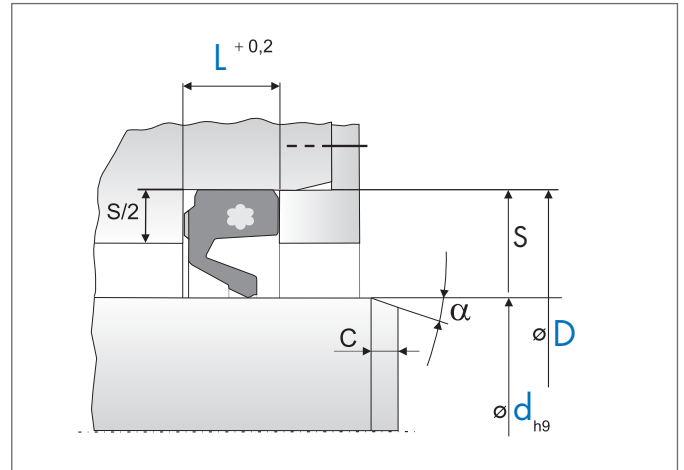
INSTALLATION

Installation

Self-retaining, for new designs



Cover plated, for new designs

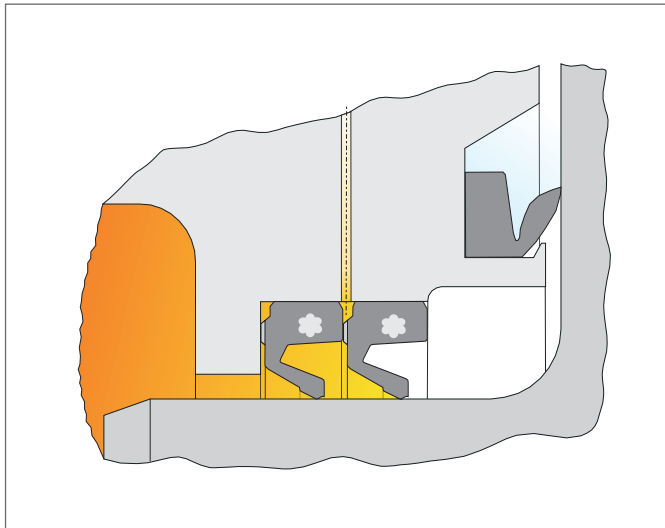


Order notes

For existing housings, only the following installation dimensions are required: **d x D x L**

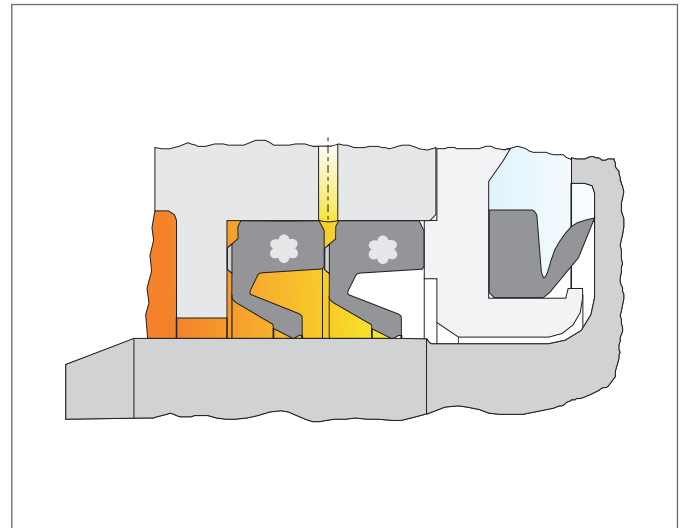
Sealing systems for work rolls

Example 1



Sealing system featuring a Merkel Radiamatic RPM 41 rotary shaft seal and an Merkel Enviromatic EA deflector for grease-lubricated bearings and open housings.

Example 2



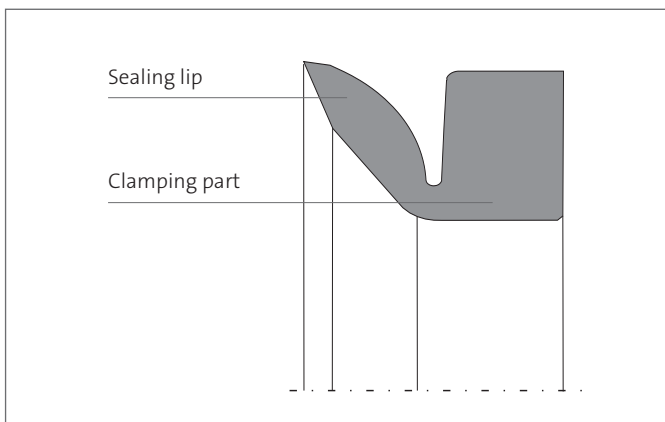
Sealing system featuring a Merkel Radiamatic RPM 41 rotary shaft seal and an Merkel Enviromatic EA deflector for grease-lubricated bearings and cover plated housings.

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MERKEL ENVIROMATIC EAX



Merkel Enviromatic EAX is a deflector seal made of elastomeric material featuring an axially acting sturdy sealing lip with a well-defined sealing edge.



VALUE TO THE CUSTOMER

- High wiping action against environmental factors over the part's entire lifetime
- Uniform and lasting contact pressure of a small sealing lip area, even when there is a large axial clearance
- Significant extension of the rotary shaft seal's lifetime within a sealing system
- Can be fitted into existing housings

Applications

The Merkel Enviromatic EAX deflector is used in a variety of heavy duty applications, mainly to protect roller bearings and gears in the iron and steel industry.

The deflector is able to protect against environmental contaminations, like e. g. dust, scale, carbon particles, spray water or rolling oil emulsions.

Material

Material	Designation
Nitrile rubber	70 NBR 85 NBR
Hydrogenated acrylonitrile-butadiene rubber	75 HNBR 85 HNBR
Fluoro rubber	75 FKM 85 FKM



FEATURES AND BENEFITS

Operating conditions

Material	NBR	HNBR	FKM
Mineral oil	-30 ... +100 °C (-22 ... 212 °F)	-20 ... +140 °C (-4 ... 284 °F)	-10 ... +150 °C (14 ... 302 °F)
Water	+5 ... +100 °C (41 ... 212 °F)	+5 ... +100 °C (41 ... 212 °F)	+5 ... +80 °C (41 ... 176 °F)
Mineral grease	-30 ... +100 °C (-22 ... 212 °F)	-20 ... +140 °C (-4 ... 284 °F)	-10 ... +150 °C (14 ... 302 °F)
Pressure	0,03 MPa (4,35 psi)	0,03 MPa (4,35 psi)	0.03 MPa (4,35 psi)
Sliding speed	20 m/s (65 ft/s)*	20 m/s (65 ft/s)*	20 m/s (65 ft/s)*
Axial clearance	±12 mm (±0,47 in)	±12 mm (±0,47 in)	±12 mm (±0,47 in)

The figures stated are maximum values, and must not be applied simultaneously.

* The indication is based on stationary water guards. Rotary seals have different limits.

Surface finish

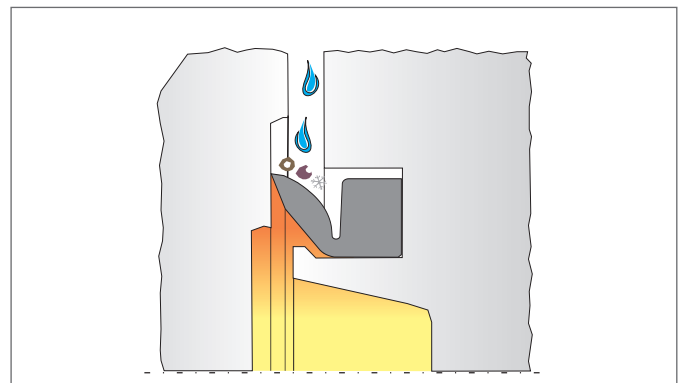
Peak-to-valley heights	R_a	R_{max}
Sliding surface	$\leq 0.8 \mu\text{m}$	$\leq 2.5 \mu\text{m}$
Housing	$\leq 4.0 \mu\text{m}$	$\leq 15.0 \mu\text{m}$

The surface hardness shall be approx. 30 HRC. Material content M, >50 % to max. 90% for a cutting depth of $c = R_z/2$ and reference line $C_{ref} = 0\%$

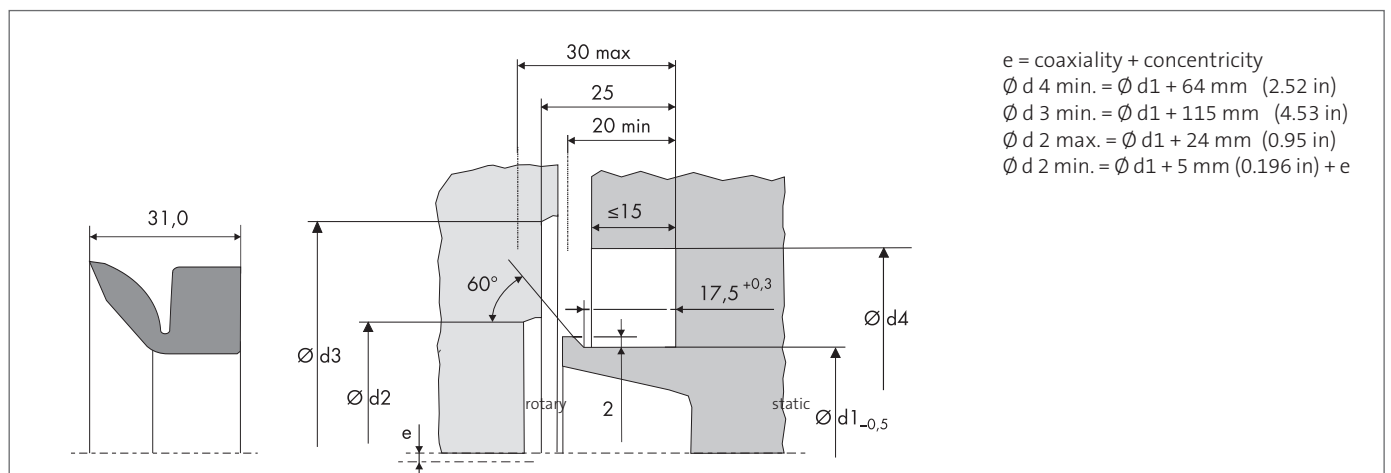
Axial support

An axial support should most definitely be provided for the Enviro-matic deflector. For further information, please get in touch with our applications consultancy services.

Example of assembly – work roll in a steel mill



Housing recommendation



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