Floating Labyrinth Seals

Floating labyrinth seals were developed for use in RENK slide bearings. They are two-piece seals, freely movable in a seal carrier or directly in the bearing housing. Both halves are held together by a garter spring.

The radial clearance between the seal and the seal carrier is approx. 1 mm. This prevents damage to the seal by the shaft during assembly or due to finishing inaccuracies.

Floating labyrinth seals are available from stock for a size range from 80 to 355 mm diameter. The diameters are sized as per standard scale R 20.
The corresponding shaft diameters should be considered for a e8 tolerance.

Since the seals are produced in large quantities (by injection moulding), the unit price is extremely favourable.

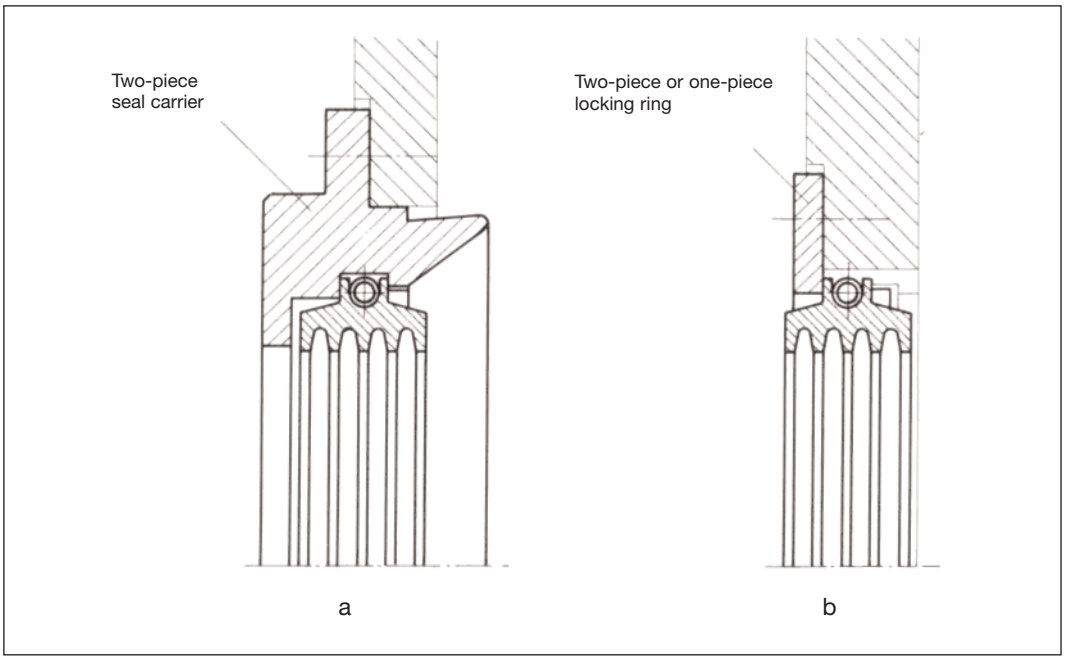
The split design, the excellent temperature, radiation and chemical resistance, together with their high dimensional stability under heat, permit application of the seals also in other locations on electric machines, fans or compressors.

Shaft outlets through end plates of electric machines are given here as an example. The illustrations show the use of floating labyrinth seals

a) combined with an E-Type bearing seal carrier (of two-piece design)

b) directly fitted in an appropriately machined end plate.

During final assembly the lateral faces of the floating labyrinth seals must be lightly coated with a nonhardening sealing compound such as for instance Curil T.



Material

The material selected for these seals is a high-duty high temperature resistant polyamidimide (RENKplastic therm P 50) with excellent sliding properties. The material is suitable for continuous operating temperature in air of 260 °C and for short periods even of 300 °C.

This material is also electrically insulating. Other typical physical and electrical values and additives are shown in the table below.

Additives

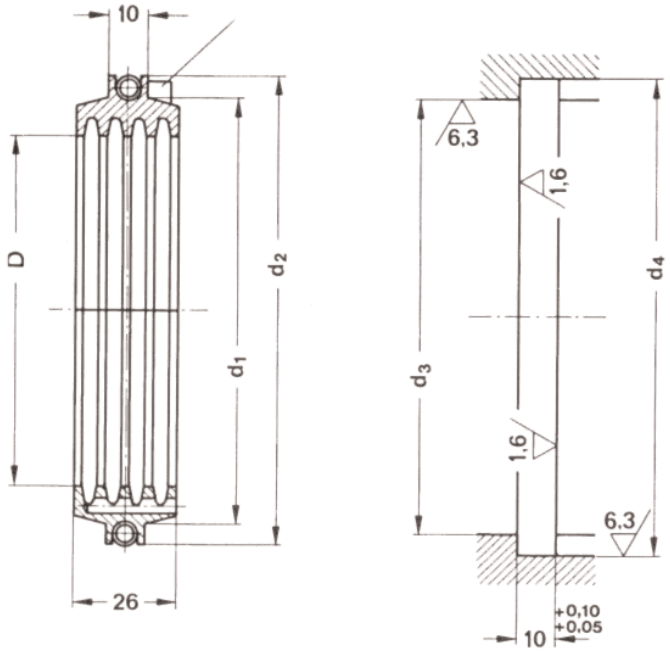
PTFE	1 %
Glass fibre	30 %

Physical parameters

Tensile strength (N/mm^2)	at	25 °C	198
	at	150 °C	138
Tensile elongation (%)	at	25 °C	5
	at	150 °C	6
Flexural E modulus (N/mm^2)	at	25 °C	$11,3 \cdot 10^3$
	at	150 °C	$10,6 \cdot 10^3$
Coefficient of linear thermal expansion $\left(\frac{m}{mK}\right)$			$1,8 \cdot 10^{-5}$
Density (kg/m^3)			1500
Volume resistivity (Ω cm)			$2,0 \cdot 10^{15}$
Surface resistivity (Ω)			$6,0 \cdot 10^{16}$

Dimensions

cam in the top half (width 6 mm; as anti-rotation device)



Dimensions in mm

Diameter D	d_1	d_2	d_3	d_4	garter spring ∅ 5 x 1 length	
80	100	110	102	112	304	
90	110	120	112	122	333	
100	120	130	122	132	361	
110	130	140	132	142	390	± 2
125	145	155	147	157	433	
140	160	170	162	172	477	
160	180	190	182	192	535	
180	200	210	202	212	593	
200	220	230	222	232	651	
225	245	255	247	257	704	
250	270	280	272	282	795	± 3
280	300	310	302	312	881	
300	320	330	322	332	942	
315	335	345	337	347	982	
355	375	385	377	387	1098	

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