

CARCOSEAL/UN

Radial lip shaft seal made by rubber and fabric reinforced

Carcoseal /UN is by far the most popular radial lip seal type. This type of seal is recommended for the majority of the heavy duty applications.

Carcoseal /UN is obtained by molding together a rubber lip and a back section in a rubber proofed fabric.

Shaft to bore misalignment and dynamic run-out are absorbed by a toroidal garter spring with a guarantee of efficient sealing.

The non-metallic construction of the Carcoseal provides the following benefits compared to the metal case seal:

- Easiest fitting, eliminating housing or seal damages during the installation.
- No shaft dismantling is necessary using split seal.
- Better static tightness due to the rubber proofed fabric on the back side.

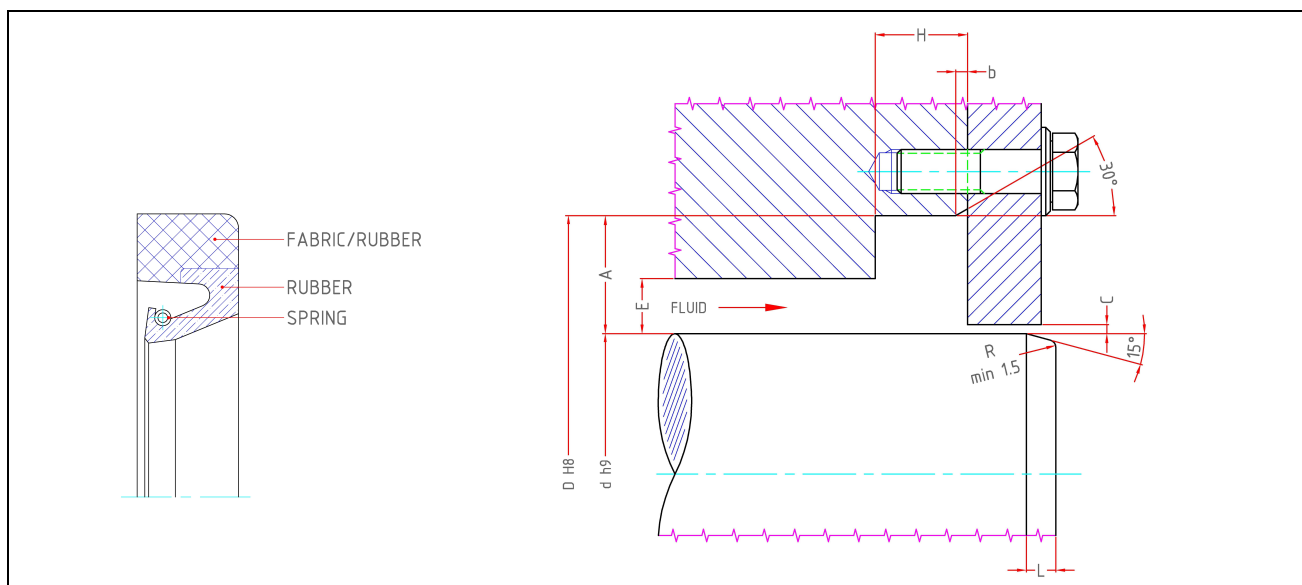
Carcoseal/UN offers additional benefits compared to other rubber seals:

- Dedicated elastomeric compounds with special additives and lubricants to reduce the torques, heating generation and rubber ageing.
- Engineered profile to minimize the radial contact pressure reducing shaft wear and heating generation
- Stainless steel spring for a wide range of applications.
- Special lip coating treatment called "CARCOFLON", to avoid stick-slip for long storage period between machine assembling and commissioning, to protect the seal during the first dry running turns, to reduce the friction torque.

Operating limits

Material	Elastomer type	Pressure (MPa)	Speed (m/s)	Working temperature (°C)	Peak Temperatures(°C)
S820	NBR	<0,05	15	-20 ÷ +100	-30 / +120
LT820	NBR Low temp	<0,05	10	-30 ÷ +90	-45 / +110
HT720	HNBR	<0,05	25	-30 ÷ +150	-45 / +170
Z420	FKM	<0,05	25	-20 ÷ +180	-30 / +200

Peak temperatures are respectively the lowest admissible survival temperature in static conditions and the highest admissible under-lip temperature .



Installation & Recommended dimensions

Carcoseal /UN requires an axially accessible housing with a retaining plate. When bolted in position the plate exerts adequate axial compression on the shoulder of seal, ensuring an efficient static tightness.

For this reason the Carcoseal /UN is supplied with an oversized diameter and height.

Recommended size & dimensions

Shaft d (mm)	H x A (mm)	b (mm)	E max (mm)	C max (mm)	H (mm)
100÷250	16 x 20	2,0	9,0	4,0	16 +0/-0,1
250÷400	20 x 22	2,2	11,0	6,0	20 +/-0,1
400÷600	22 x 25	2,5	11,0	7,0	22 +/-0,1
>600	25 x 32	3,2	14,0	8,0	25 +/-0,1

Shaft requirements

For the shaft diameter we recommend tolerance h9 but for reconditioned shaft a tolerance h11 can be applied.

A proper shaft finish is of vital significance for the performance as well as for the life of the seal.

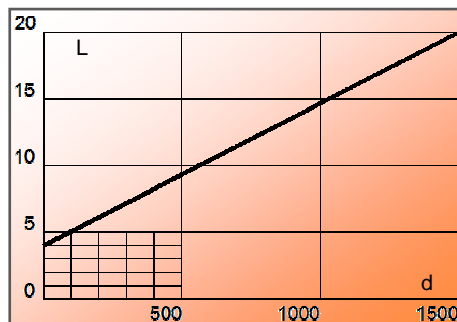
As the shaft speed increase the hardness of the shaft have to be increased in combination with a better surface roughness.

Please refer to the "Carco seal application guidelines" for detailed information about shaft surface requirements.

To facilitate the installation, the shaft should have a chamfer with length "L" as function of its diameter "d" as indicated in the graph.

Shaft surface recommendations

Shaft Speed (m/s)	Ra (μm)	Rt (μm)	Min. Hardness (HRC)
0÷8	0,2 ÷ 0,8	1,0 ÷ 4,0	35
8÷16	0,2 ÷ 0,6	1,0 ÷ 2,5	45
>16	0,2 ÷ 0,4	0,8 ÷ 1,5	55



Housing requirements

It's important that the bore housing is finished smooth and free from longitudinal scratches which could provide a leakage path.

Housing bore surfaces and flange in contact with the static side of the seal must have the following surface roughness requirements:

$Ra \leq 4 \mu\text{m}$ - $Rt \leq 16 \mu\text{m}$

Also a generous lead-in chamfer in the housing has to be created to facilitate the fitting.

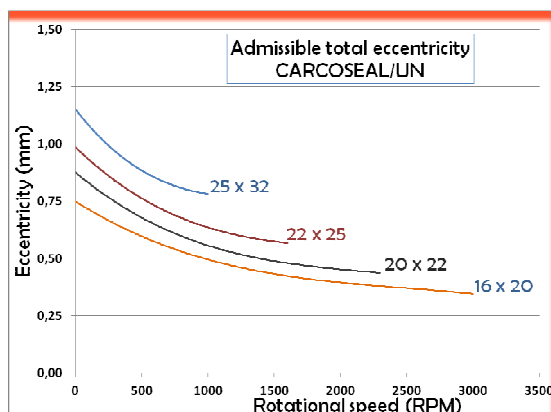
The retaining flange and fixing bolts have to be designed appropriately. Please ask for the proper design guideline.

Eccentricity limits

The total eccentricity, to which is subjected a radial lip seal, is the sum of two components :

- Shaft to bore misalignment (also called static eccentricity) : distance between the geometric centre of the shaft and the geometric centre of the seal housing bore.
- Shaft dynamic run-out (also called dynamic eccentricity) : distance between the geometric centre of the shaft and the axis of rotation.

Admissible eccentricity values for Carco seal/UN are indicated in the graph.



Materials

Materials	Description	Spring
S820	NBR Cotton reinforced	AISI 302
LT820	NBR Low temperature Cotton reinforced	AISI 302
HT720	HNBR Cotton reinforced	AISI 302
Z420	FKM (VITON® A) Cotton reinforced	AISI 302

Alternative materials are available on demand like: KEVLAR or NOMEX reinforcement, AFLAS, VITON GF, Monel spring, Encapsulated spring.

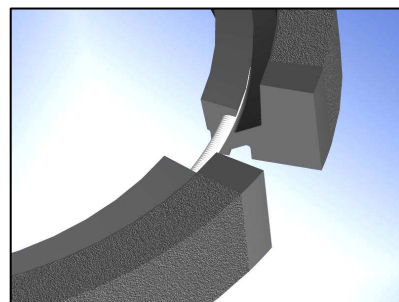
Split version

When shaft removal is impractical and downtime is critical, Carco seal/UN can be supplied in split version.

To ensure effective sealing at the split ends, a short full rubber section is molded at the seal ends, so that the contact between homogeneous elastic surface maximizes the sealing effect.

Attention must be paid when the fluid is under a certain amount of pressure or when there are severe dynamic conditions.

In such cases, we recommend to join on site the seal with our dedicated ISP Kit.



Note: All data and information in this data-sheet is based upon years of experience in the manufacture and application of sealing element and is given in good faith. In spite of all efforts on our part, suggestions included here cannot be regarded as generally binding because of the various unknown factors which arises in particular application. Data are subject to change without notice. The operating limits indicated in the data-sheet are given as indication and have to be verified in case of concomitance.