

RADIAL SHAFT SEALS FOR PROCESS TECHNOLOGY APPLICATIONS

FREUDENBERG
SEALING TECHNOLOGIES

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RADIAMATIC® HTS II



The Radiamatic® HTS II is a special PTFE variant of the Simmerring® product group. This high-performance radial shaft seal sets standards in the sealing of rotating shafts and spindles.

HTS II radial shaft seals are characterized by low friction and low contact forces of the lip onto the shaft. The contact pressure is produced by the inflection in the sealing lip joint and the memory effect of the PTFE material. This reduces friction losses while simultaneously offering an excellent sealing function.

Particularly noteworthy is the high durability of HTS II radial shaft seals. The process media are in contact exclusively with PTFE. PTFE can be used in almost all media and cleaning agents in an outstanding way. This allows particularly hygienic processes in the production of foods and pharmaceuticals.

Application areas

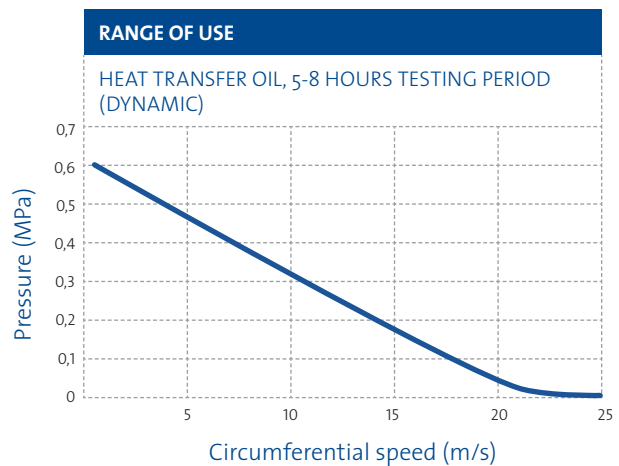
- Beverage bottling plants and food processing plants
- Aggregates in pharmaceuticals and cosmetics industries
- Gear boxes, compressors, pumps
- Electric motors
- Mixers, kneading machines, separators
- Machines with high rotational speeds
- Cleaning and sterilization processes

Limitations of use

- Pressure: 0.6 MPa
- Temperature: -80 °C to +200 °C (-112 °F to +392 °F)
- Circumferential speed: 25 m/s at normal pressure

YOUR BENEFITS AT A GLANCE

- Variable and reliable use in the food industry
- High media and temperature resistance
- Absence of dead spaces within the meaning of Hygienic Design
- Low friction and anti-adhesiveness
- Secure fit by means of clamping ring technology



MATERIAL	CHARACTERISTICS	RECOMMENDED APPLICATIONS
PTFE K212	<ul style="list-style-type: none"> • PTFE carbon compound • Standard material • Good wear and heat resistance • Electrically conductive; antistatic 	<ul style="list-style-type: none"> • For hard mating surfaces
PTFE C104	<ul style="list-style-type: none"> • Very good wear and pressure resistance • Good thermal conductivity • Electrically conductive; antistatic 	<ul style="list-style-type: none"> • For dynamically highly stressed seals • For waterproofing
PTFE Y002	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 and 3-A® Sanitary Standards compliant • Meets USP Ch. 88 Class VI (121 °C, 250 °F) and EU Reg. 10/2011 • Good wear resistance • Good dry running properties 	<ul style="list-style-type: none"> • For soft mating surfaces

FREUDENBERG XPRESS



Freudenberg Xpress manufactures turned standard seals, customized sealing solutions and formed parts – if necessary within 24 hours. Our portfolio ranges from the single seal for prototypes and repair requirements to small series production in economical quantities.

For seals and formed parts used in the process technology, Freudenberg Xpress uses specific high-performance materials.

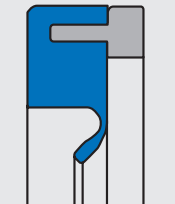
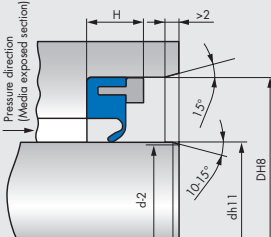

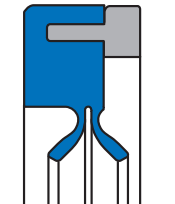
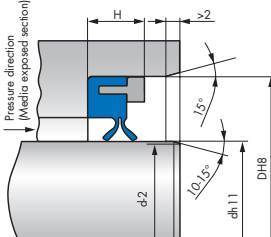

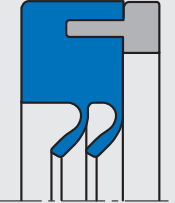
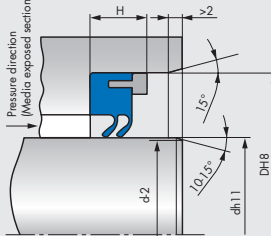

They can be manufactured from batch size one without tooling costs. We offer you original Freudenberg materials and profiles with industry-specific approvals, delivered at short notice. The „RMS“ Rapid Machined Simmerring completes the portfolio of more than 250 profiles.

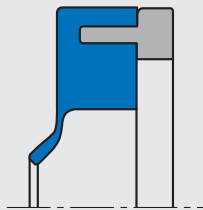
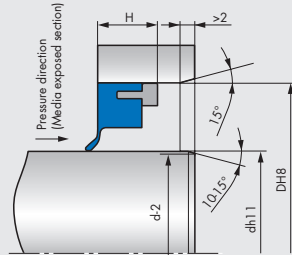

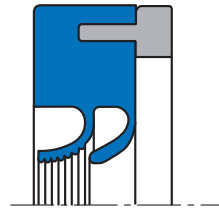
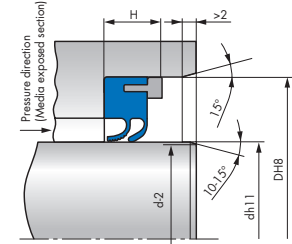

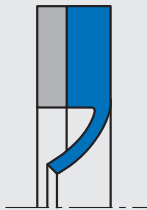
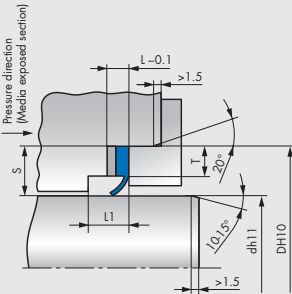

YOUR BENEFITS AT A GLANCE

- Original profiles and materials of the series production
- Numerous standard profiles and customized sealing solutions
- Prototyping
- Fast delivery in case of damage, if necessary within 24 hours
- Economical small series production
- Special manufacturing processes

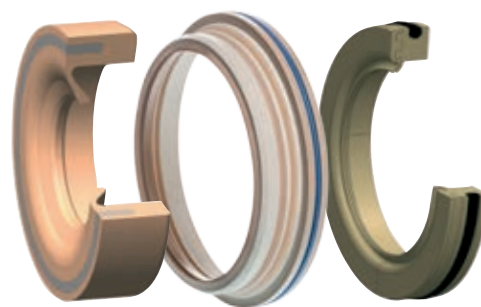
MATERIAL	COMPLIANCE/APPROVALS	DRINKING WATER APPROVALS
70 NBR 150	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 • 3-A® Sanitary Standards • EU Reg. 1935/2004 • ADI free 	<ul style="list-style-type: none"> • NSF 61
88 NBR 156	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 • 3-A® Sanitary Standards • EU Reg. 1935/2004 • ADI free 	
70 EPDM 291	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 • 3-A® Sanitary Standards • EU Reg. 1935/2004 • USP Ch. 87 and USP Ch. 88 – Class VI – 121 °C (250 °F) • NSF 51 • ADI free 	<ul style="list-style-type: none"> • KTW • W270 • NSF 61 • WRAS
85 EPDM 292	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 • 3-A® Sanitary Standards • EU Reg. 1935/2004 • USP Ch. 87 and USP Ch. 88 – Class VI – 121 °C (250 °F) • ADI free 	<ul style="list-style-type: none"> • KTW • W270 • NSF 61 • WRAS
75 Fluoroprene® XP 41	<ul style="list-style-type: none"> • FDA 21 CFR 177.2600 • 3-A® Sanitary Standards • EU Reg. 1935/2004 • USP Ch. 87 and USP Ch. 88 – Class VI – 121 °C (250 °F) • NSF 51 • ADI free 	
94 AU 21730	<ul style="list-style-type: none"> • FDA 21 CFR 177.1680 • 3-A® Sanitary Standards • EU Reg. 1935/2004 and 10/2011 	
EF FLON (PTFE Econol)	<ul style="list-style-type: none"> • FDA 21 CFR 177.1500 • EU Reg. 10/2011 	

THE DESIGNS

DESIGNATION	CHARACTERISTICS	PROFILE	INSTALLATION SPACE	IMAGE
Radiamatic® HTS II 9535	<ul style="list-style-type: none"> • With standard lip for conventional uses • Distinguished by low-friction function 			
Radiamatic® HTS II 9536 SL	<ul style="list-style-type: none"> • With additional dust lip • For use in highly polluted environments or in alternating pressure-vacuum operation 			
Radiamatic® HTS II 9538 DL	<ul style="list-style-type: none"> • With double sealing lip • For high safety requirements • Sealing lip variably adjustable 			

DESIGNATION	CHARACTERISTICS	PROFILE	INSTALLATION SPACE	IMAGE
Rdiamatic® HTS II 9539 VL	<ul style="list-style-type: none"> Version with no dead space made of PTFE Y002 Protruding sealing lip for applications in accordance with Hygienic Design 			
Rdiamatic® HTS II 9541 with twist	<ul style="list-style-type: none"> With dynamic return capability For applications with high liquid level For completely flooded aggregates For higher demands on the leak tightness 			
Shaft Seal WADB 9461	<ul style="list-style-type: none"> Short length sealing element For the smallest installation spaces 			

CUSTOMER-SPECIFIC SPECIAL SOLUTIONS



In addition to standard components, we have developed many customer-specific solutions during our many years in the sealing business.

They are used for special requirements, such as higher pressures, cavity-free designs or extreme dust loads. Even reductions of components can be realized economically for individual applications. By way of example, we present below three of our customer-specific solutions.

HTS II with shortened special clamping ring

In cooperation with a manufacturer of beverage bottling systems we developed a special solution based on the proven HTS II design. Special requirements with respect to a simplified assembly and disassembly made a shortened special clamping ring essential. It reduces the necessary press-in force significantly and simplifies the installation enormously. As an additional effect, the special design precludes unwanted contact corrosion between the clamping ring and the housing. Apart from the optimal media compatibility due to the use of FDA-compliant materials, the special sealing lip design ensures a low friction torque.

Split lip seal

In a joint development effort with a manufacturer of high-performance mixers and agitators, we created a separable mixer shaft seal. This lip seal is composed of four PTFE segments and an O-ring. Two sealing segments each form a ring and are installed with an offset of 90 degrees to each other. This innovative solution made from FDA-compliant materials does not require dismantling of the gearing and is extremely wear resistant. The front and rear sealing segments consist of the material PTFE Yoo2. The O-ring is made of FDA-compliant elastomers. The sealing lip contour is based on the proven geometry of the HTS II sealing lip, with a mode of action adapted in this application.

HTS II EWS

Another customized solution is the HTS II EWS. It was specifically developed for the requirements of a manufacturer of mixers and kneaders. Since large forces act on the agitator during the mixing process, an increased shaft runout is to be expected. In order to ensure safe processes, the Simmerring Radiamatic HTS II was supplemented by a bellows element and a friction bearing. The kinetic energy transmitted by means of the slide surface can be compensated in this way. The inserted stainless steel ring is partially enclosed by the PTFE body and provides for a firm connection of both components. The EWS is characterized by its cavity-free design. It is made from FDA-compliant materials. Thus, it meets all hygienic requirements and is ideally suited for use in the food industry.

YOUR BENEFITS AT A GLANCE

- Economical adaptation to individual requirements
- Co-development
- Numerous material versions
- Cavity-free variants

CONSTRUCTION NOTES AND ASSEMBLY INSTRUCTIONS

Our radial shaft seals win over with their immaculate function and long service life. The prerequisite for this is a careful installation. Detailed assembly instructions are supplied with the shipments.

General information

- HTS II shaft seals must be installed as a unit
- They consist of a PTFE seal and a stainless steel clamping ring
- The clamping ring is compressed during installation and can therefore be used only once
- The installation space must be axially accessible
- Lead-in chamfers must be applied on the shaft and the housing to prevent damage

Tolerances

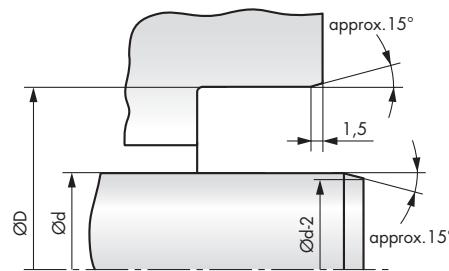
- Housing bore: H8 according to ISO 286
- Shaft: h11 according to ISO 286-2
- Shaft runout: maximum ± 0.05 mm
- With increasing rotation speed, the shaft runout must be limited more strongly

Surfaces

- Housing: Ra < 1.8 μ m, Rt < 10 μ m
- Shaft: Ra < 0.2 μ m, Rt < 1 μ m
- Hardness: 45-65 HRC
- Surfaces must be free of grooves. Installation spaces must be checked for cleanliness

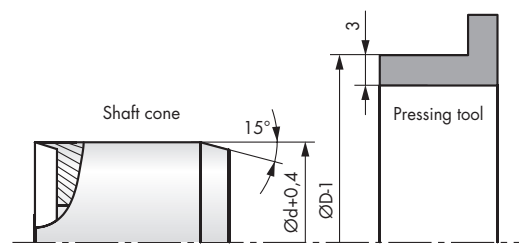
Installation space

The installation space must be axially accessible. It should be ensured that the edges are rounded and polished.



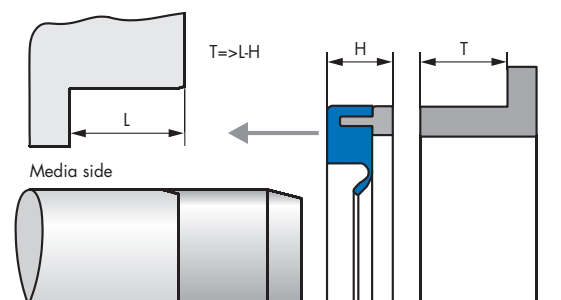
Auxiliary tools

We recommend the installation with auxiliary tools (not included in the scope of supply).



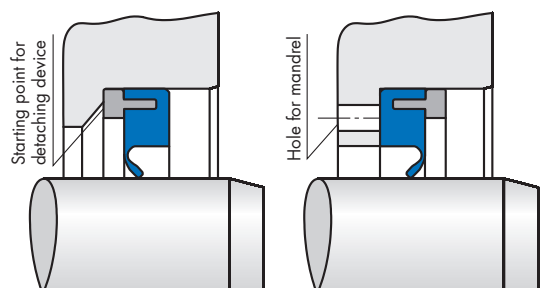
Installation

The rings/sealing lips must not be greased. If required, they can be oiled lightly.



Disassembly

Behind the radial shaft seal, a gap must be provided. This allows disassembly with a dismantling tool.



Editorial Information

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