

Engineering  
Quality  
Supply Chain  
Assembly  
Aftermarket & Production Kitting  
Vendor Managed Inventory

# Radial Shaft Seals

Selection  
Design  
Manufacturing  
Quality & Validation



**ENGINEERED**  
**SEAL PRODUCTS®**  
100% Employee-Owned

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# Radial Shaft Seal Capabilities

## Selection

There are many choices for sealing lip geometry and metal can configurations, each configuration is suited for a specific application. Choosing the seal design should be based on the application information for the area that needs to be sealed.

## Design

ESP can design and develop custom sealing components for your specific needs. Utilizing Solidworks, Pro/e, and advanced nonlinear FEA capabilities our highly-skilled engineers and manufacturing expertise can take your idea from concept to completion.

## Manufacturing

- Shell Processing
- Rubber Processing
- Molding
- Finishing

## Quality & Validation

### QUALITY







- Cold Lab
- Hot Lab
- State-of-the-art Equipment

### VALIDATION








- Hot Oil
- Dust & Slurry
- Seal Lip Pump Rate
- Seal Power Consumption

The Engineering team at ESP specializes in sealing applications with a focus on radial shaft seal technology and testing. We pride ourselves on our ability to innovate and think outside of the box, developing solutions for difficult problems.

## Standard Lip Designs

	Base Profile	Description	Application
S		Single Lip With Garter Spring	<b>Oil retention.</b> This style of lip is used for standard pressure oil sealing in clean environments. May be reversed for extreme grease sealing
T		Dual Lip (Dust Lip) With Garter Spring	<b>Oil retention for dusty applications.</b> This style of lip is used for standard pressure oil sealing industry/dirty environments
D		Double Lip With Garter Spring	<b>Designed to separate two media.</b>
V		Single Lip Without Garter Spring	<b>Grease retention.</b> This style of lip is used for standard pressure grease sealing in clean environments. May be reversed to purge grease cavity.
K		Dual Lip (Dust Lip) Without Garter Spring	<b>Grease retention for dusty applications.</b> A non-pressure medium, especially for sealing grease or viscous fluids. These seals are also used for dust or dirt exclusion.
U		Triple Lip Without Garter Spring	<b>Grease retention in heavy contamination environment.</b>

## Standard Can Designs

B		Outer Metal "L" Case	This style of case is the most common and economical design. A chamfer or curl is used to aid in installation.
C		Rubber Covered O.D.	Improved O.D. sealing in bores with minor imperfections and in soft alloy housings.
F		Rubber Covered O.D.	Similar to C but designed with an additional rubber covering fully protecting the internal steel case. Good option for applications prone to corrosion.
A		Outer Metal Case With Reinforcing Plate	Designed with an additional inner case providing increased structural rigidity when a more robust design is required. Good for larger diameters or when the seal is fitted from behind.
M		Outer Metal Case With Rubber Lining	Similar to B but designed with an additional covering to protect the internal face of the steel case from internal corrosion.
P		Outer Metal "P" Case Without Garter Spring	Designed for ease-of-removal and flange positioning.
D		"Heel" Case	Designed for reduced spring back and ease of installation. Combines sealability of rubber O.D. and bore retention of metal O.D.

# SEAL SELECTION



		CONTAMINATION EXPOSURE			RPM		
		LOW	MED	HIGH	< 300	< 1,000	<1,500
<b>OUB2 / V17</b>	Grease Only, Axles, Pinion	•			•		
<b>TC9 / LCO</b>	Axles, Swivel Housing, Brake Shafts	•					•
<b>Combi Seals</b>	4WD Front Axle, Clutch/Transmission		•			•	
<b>TSL9 / TSR</b>	4WD Front Axle, PTO, Implements			•		•	
<b>KSL</b>	Implements			•	•		
<b>Pinion Seal</b>	Pinion, High-Speed, High-Runout			•	•		

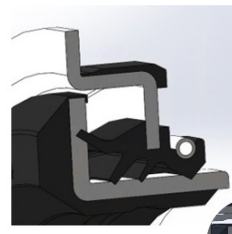


## OUB2 / V17

OUB2 seals are known for their durability and reliability, making them a popular choice for many applications. They are an important component to prevent lubricant leakage and contamination from outside substances.

### ESP SOLUTIONS

- Customized 4-lip
- Grease Purgeable for Extended Life



## TC9 / LCO

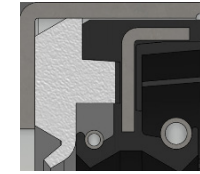
The design features a separate lip and sleeve that work together to provide enhanced sealing capabilities and improved durability. The lip of the seal is responsible for preventing lubricant leakage, while the sleeve serves as a protective barrier against dirt, debris, and other contaminants that could damage the seal and assembly.

### ESP SOLUTIONS

- Individual lip and sleeve design for easy installation and service replacement
- No need for shaft grinding
- Grease Purgeable, extended service life

## CUSTOM OPTIONS

ESP Engineering can design and develop custom sealing for your specific needs. Utilizing Solidworks, Pro/e, and advanced nonlinear FEA capabilities our highly-skilled engineers and manufacturing expertise can take your idea from concept to completion.

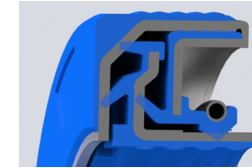


## COMBI SEALS

Combi seals are made from high-quality materials such as silicone and are designed to provide a tight and reliable seal. They are easy to install and remove, making them an ideal choice for replacement.

### ESP SOLUTIONS

- Internal PTFE structure can be modified based on the application requirements
- Higher axial load can be accommodated

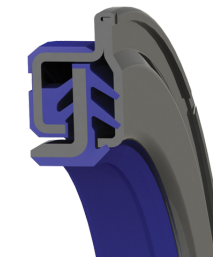


## TSL9 / TSR

Cassette seals are crucial in ensuring the proper functioning of equipment and machinery, preventing damage and reducing maintenance costs. It is specifically designed to fit into the groove of a cassette or housing unit, providing a secure seal between the stationary and rotating components.

### ESP SOLUTIONS

- Updated internal profile with axial loading lips for better contaminant resistance
- Chaplets design to accommodate axial load post installation
- Ribbed rubber OD design for ease of installation



## KSL

The KSL series radial shaft seals are used to protect components from damage caused by the ingress of dirt, dust, water, and other particles. KSL series is known for its high durability, reliability, and resistance to wear and tear, making it ideal for use in demanding environments.

### ESP SOLUTIONS

- Aggressive Contamination Exclusion
- Simplified Installation
- Purgeable & Non-purgeable options



## Pinion Seal

The high-deflection pinion seal is a specialized type of radial shaft seal designed to provide superior sealing performance in high-speed, high-load, and high-deflection applications. The high-deflection pinion seal is engineered to withstand extreme operating conditions including high temperatures, high pressures, and heavy loads.

### ESP SOLUTIONS

- High-Tear Strength NBR Bellows for Extended Life Under Extreme Runout Conditions
- Steel Garter Spring for Even Seal Loads with Hydrodynamic Aids Molded into the Sealing Lip
- Bore-Coated Steel Outer Shell for Ease of Installation & Superior Bore Sealing
- Peek Centralizer to Guide the Sealing Lip Under Extreme Runout Conditions

## The Highest Level Of Partnership

### Parker Seal Technology Center (STC)

For over 50 years, Engineered Seal Products has partnered with Parker Seals and is proud to be one of the FEW Premier Distributors to qualify as a "Parker Seal Technology Center (STC)".



- Proven engineering capability
- Expert material & technical support
- ISO quality approval
- Strong financial track record



#### JM Clipper® Seals

Moderate speed rotary & low speed reciprocating applications



#### FlexiSeals®

Radial applications with extreme conditions that involve lower speeds and higher pressures



#### Protech™ Bearing Isolators

For applications where improving the mean time between failure (MTBF) is critical

### Freudenberg Preferred Partner

- Involvement of engineering services & technical material know-how from FST
- Highest technical seal competence
- Efficient & speedy cross-linked processes with FST
- High & quick availability assuring a reliable delivery performance



#### Simmerrings®

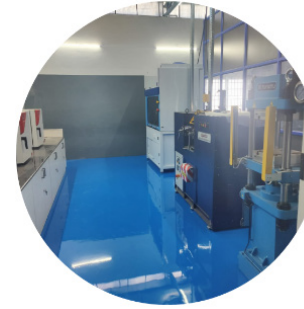


#### Combi Seals



#### NOK Seals®

## In-House Quality & Validation



### Rubber Labs

ESP is equipped with state-of-the-art rubber testing equipment. A cold and hot quality lab is essential for ensuring the highest quality products. By testing rubber in both cold and hot temperatures, we can identify any potential defects or weaknesses that could occur under different conditions. This can help to prevent product recalls and ensure that products meet your expectations.

### Testing Labs

ESP Engineering is dedicated to providing the necessary attention to detail to accurately administer industry-recognized testing services. We are proud of the innovation we bring to developing unique test protocols in situations where no established procedures exist. Leading our shaft seal test facility are a group of highly qualified degreed professionals. They are supported by innovative and talented mechanical and electrical technicians who execute tests and collect the necessary data. Collectively, our team has many years of experience in the design and execution of sophisticated shaft seal tests.

	Standard	High Pressure	Standard with End Play
<b>SIZE RANGE</b>			
Shaft	Ø7mm - Ø120mm	Ø7mm - Ø120mm	Ø7mm - Ø120mm
Bore	Ø130mm MAX	Ø130mm MAX	Ø130mm MAX
Width	16mm MAX Depth	16mm MAX Depth	16mm MAX Depth
<i>*Larger sizes can be accommodated with custom fixtures. Contact Engineered Seal Products Engineering Team for more information</i>			
<b>OPERATING PARAMETERS</b>			
Rotational Shaft Speed	200 - 10000 RPM ±10%	200 - 6000 RPM ± 10%	200 - 10000 RPM ±10%
Sump Temperature	150°C ± 5°C MAX	150°C ± 5°C MAX	150°C ± 5°C MAX
Pressure	0 - 1 Bar	0 - 30 Bar	0 - 1 Bar
Shaft Runout	2mm MAX	2mm MAX	2mm MAX
Shaft to Bore Misalignment	0 - 2mm	0 - 2mm	0 - 2mm
<b>TEST PROGRAM</b>			
Number of Modes/Steps	5	5	20
Run Time	0.1h Increments, 999.9h MAX	0.1h Increments, 999.9h MAX	0.1h Increments, 999.9h MAX
Stop Time	0.1h Increments, 999.9h MAX	0.1h Increments, 999.9h MAX	0.1h Increments, 999.9h MAX
Direction	CW/CCW	CW/CCW	CW/CCW
Contaminate Exclusion/Slurry Function	YES	NO	YES
	Paddle driven slurry agitation and delivery	-	Pump driven slurry agitation and delivery
End Play/Oscillation Function	NO	NO	YES
Leakage Detection	Visual Inspection	Visual Inspection	Visual Inspection
Capacity	4 Test Heads	2 Test Heads	8 Test Heads



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