

Mud Motor Rotary Seal

Extends operating life in drilling applications



RM Profile Rotary Seal

Extending the operating life of drilling motors is critical to reducing operating costs. Parker's material science and design engineer experts have developed a longer service rotary motor seal which extends drilling hours over the leading competitive seal. Available in an array of materials which withstand the rigorous conditions of downhole drilling, the unique features of the RM Profile enable it to last longer in retaining lubricating fluid and protecting bearings from drilling mud contamination.

Contact Parker to learn about our proven solution for extending service life in aggressive drilling environments.



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Product Features:

- Dynamic rotary sealing with no cross-contamination
- Rotary fluid retention grooves reduce friction and increase stability
- Contact relief valley reduces torque and high squeeze contact forces
- Extrusion resistant and explosive decompression resistant Parker proven oil field elastomers including materials certified to NORSOK M-710 (RGD and H₂S) and NACE TMO 192-2003 standards



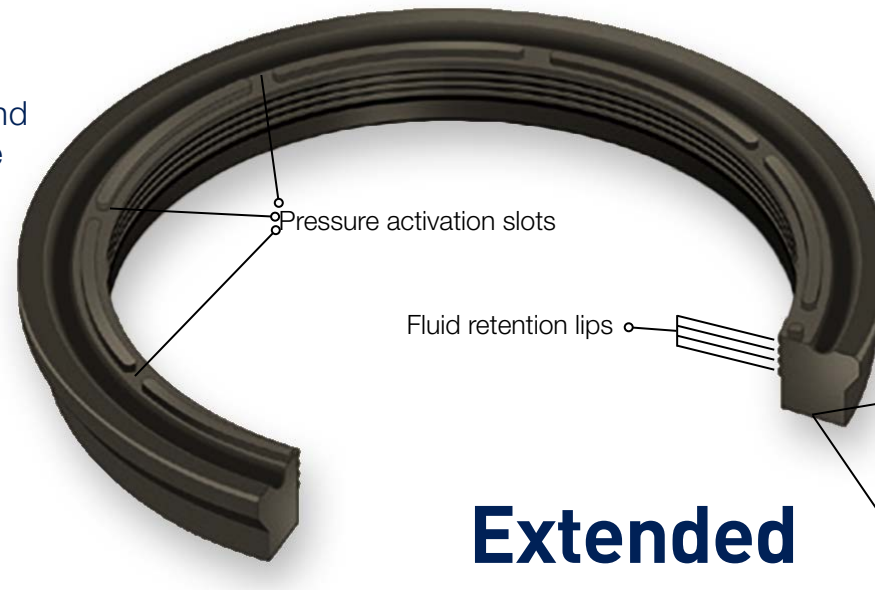
ENGINEERING YOUR SUCCESS.

RM Profile — Rotary Motor Seal

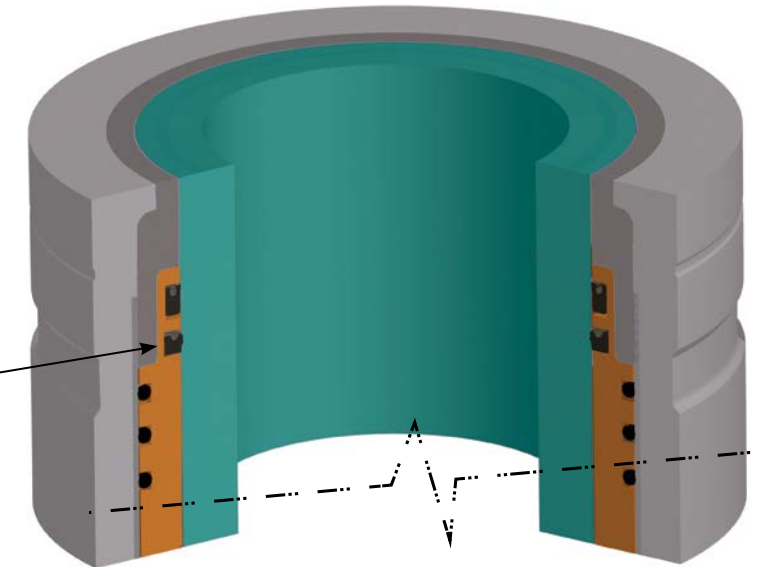
Features

Parker's RM Profile rotary motor barrier seal has been engineered to withstand the rigors and harsh service in downhole drilling and deliver extended service life over the competitor's design. Performance features of Parker's design include:

- Fluid retention lips on the inside diameter which
 - Prevent the seal from spinning in the groove and reduce frictional heat
 - Provide stable positioning for positive sealing at the outside diameter lip contact surface
- Activation slots which allow drilling mud to energize the sealing lip during pressure fluctuation



Typical Sealed Bearing Section



Extended performance

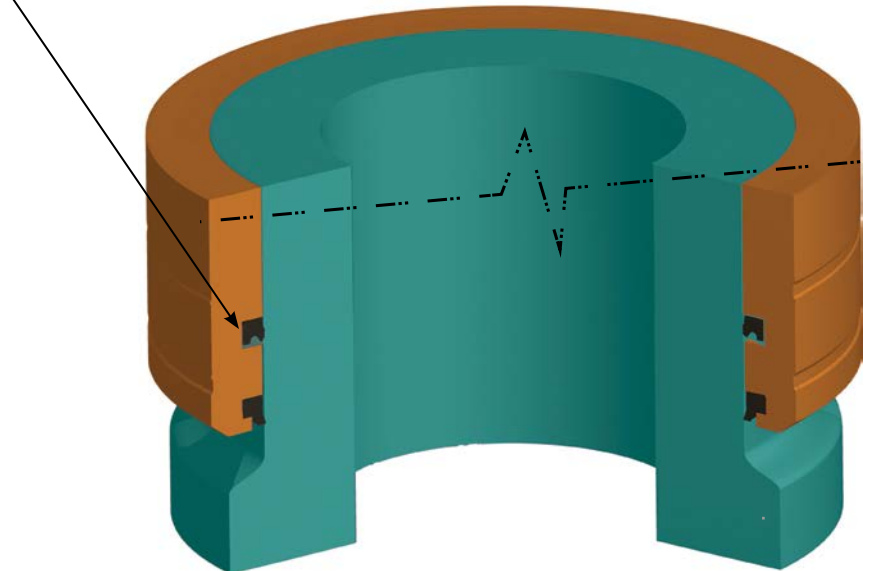
Longer service life extends mean time between failure

In an industry where time equals money, Parker's RM Profile seal improves efficiencies for drilling operations by reducing down time due to servicing needs. Our longer service rotary mud seal outperforms competitive mud motor rotary seal designs by delivering extended performance with no cross-contamination.

Parker's longer service RM profile in N4033A90 HNBR material was tested against the leading competitor's traditional seal design in a series of trials, and the results are significant.

Testing Parameters:

- Oil Operating Pressure: 1450 psi (100 bar)
- Drilling Mud Operating Pressure: 290 psi (20 bar)
- Speed: 200 rpm and 350 rpm
- Temperature: 212°F (100°C)
- Duration: Until failure or 240 hours



Constant pressure was applied to barrier seals in the test fixture which separated drilling mud from system lubricating oil. The performance capabilities of the respective seals was determined when cross-contamination between the fluids occurred; resulting in fluid contamination and thus, bearing failure.

Results. After 106 hours, the competitor seal experienced leakage greater than 100 grams/minute and testing was stopped. Examination of the competitor seal trials showed contamination of oil and mud

fluids – indicating seal failure per test parameters.

Parker's RM profile seal performed for 240 hours at which time the endurance test was stopped. Examination of the fluids in the Parker seal trials showed no indication of cross contamination of fluids.

Contact Parker to learn more about extending service life in mud motor drilling operations.

Available Materials

The RM profile seal is available in a broad range of engineered Parker sealing materials — each with unique physical properties and performance characteristics to meet your specific application requirements.

HNBR Elastomer — For Higher Temperatures

N4033A90 (KB163-90) & N4007A95. These high tensile strength, heat resistant elastomers have excellent compatibility with PPM hydrogen sulfide, corrosion inhibitors, water, and oil.

N9782A90. Parker also offers an internally lubricated HNBR for reduced friction and lower heat build-up.

Nitroxile® — Proprietary Carboxylated HNBR.

N4274A85. Nitroxile is Parker's proprietary formulation of carboxylated nitrile which has been extensively used down hole. Internal lubrication and proprietary additives help reduce friction and reduce heat build-up.

Fluoroelastomers

V4266A90 & V1238A95.

Parker offers a wide range of fluoroelastomers in varying durometers to meet the pressure and higher temperature requirements of rotary movement. In addition, Parker's V1238A95

is resistant to explosive decompression and to extrusion (exhibiting more than twice the extrusion resistance of standard 90 durometer materials), and shows no visual physical damage after prolonged exposure to 100% CO₂ concentrations.

Table 1. RM Profile Materials

Material Code	Material Type	Typical Applications & Description	Temp Range (°F)
N4033A90	HNBR	Superior mechanical characteristics, particularly high tensile strength, helps reduce extrusion and wear. RGD and H ₂ S resistant. Meets NORSOK M-710, (RGD, H ₂ S). Also known as Parker KB163-90.	-20 to 320
N4007A95	HNBR	Excellent extrusion resistance and explosive decompression resistance. Meets NORSOK M-710 (RGD and H ₂ S), NACE TMO 192-2003.	-20 to 320
N9782A90	HNBR	Internally lubricated HNBR for reduced friction and heat build up.	20 to 320
N4274A85	XNBR	Parker Nitroxile® carboxylated HNBR for improved wear resistance with enhanced modulus and tensile strength. This exceptionally low friction formulation has excellent resistance to petroleum oils, hydrocarbon fuels and water.	-10 to 250
V4266A95	FKM	Features extended wear and extrusion resistance over general purpose fluorocarbons.	-5 to 400
V1238A95	FKM	Resistant to explosive decompression and extrusion. Shows no damage after prolonged exposure to 100% CO ₂ concentrations.	-20 to 400



Part Numbering: RM Profile – Rotary Motor Seal

