

RFN™ Treatment

Sealing components made of elastomeric materials can have inherently high surface energies (tackiness) and a high coefficient of friction (COF). Whenever an elastomeric seal makes contact with the mating component, the interface of the two surfaces can produce a “stiction” effect. This can be detrimental when the contact is intermittent. Applications that require low stiction and long service life such as valve sealing components and diaphragms can greatly benefit from RFN treatment.

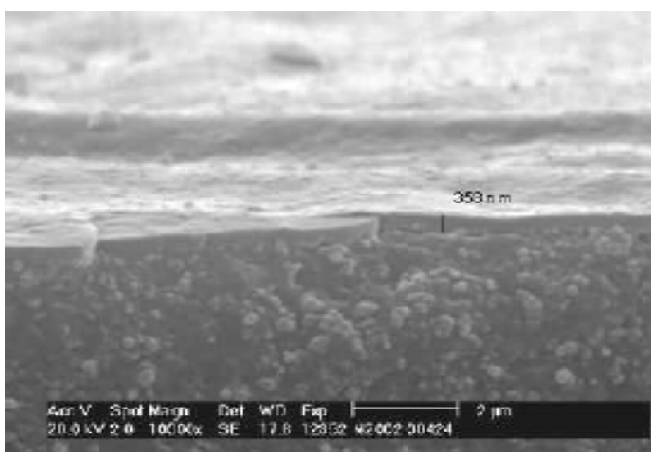


The RFN (Reduced Friction by Nanotechnology) process consists of applying a proprietary surface modification to rubber components to reduce the COF. RFN generates surfaces with high abrasion resistance, low COF, resistance to aggressive fluids and improved long-term service. Applications where release performance, quick response time, and load/torque reduction are required can benefit from the RFN process.

How it works...

Rubber sealing components are placed into the RFN equipment. Necessary medias are introduced and the process is turned on. A subsequent surface modification takes place within the equipment and results in a permanent surface change. All process input variables are automatically controlled. Process output control comprises both visual inspection and COF testing on each process lot. EKKSC has over eight years of experience with the RFN process for various applications including semiconductor seals, solenoid plunger valves, and fuel caps seals.

RFN Treatment at 10,000X Magnification



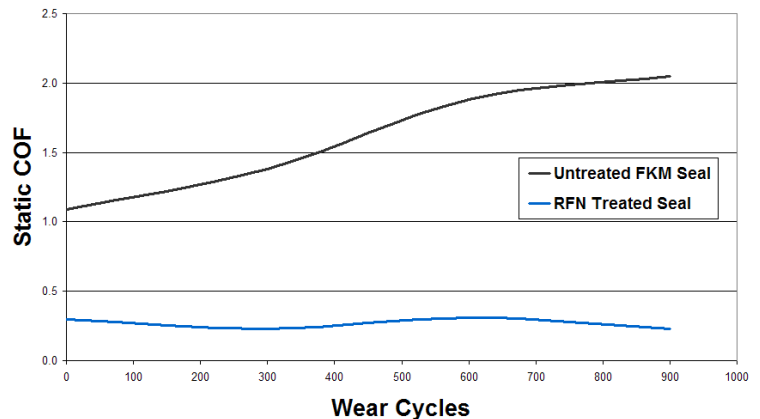
Product Information

- The RFN treatment is inert and compatible in applications that require purity.
- The RFN treatment is odorless and translucent in color.
- Comparative testing of untreated and treated specimens have consistently shown a 70% reduction in static COF.
- Long-term conditioning in fuel, ozone, and wear testing has consistently resulted in no increase of surface COF, while untreated specimen exhibit 80-100% increase in COF.

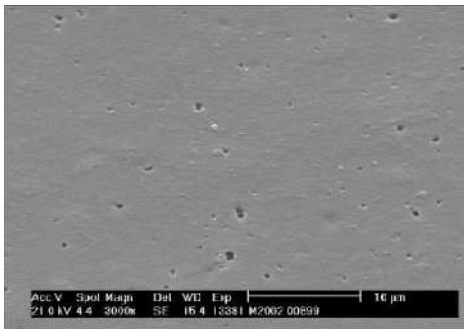
Comparitive Testing – Static COF:

Test Condition	Untreated FKM	RFN Treated FKM
Baseline	1.09	0.30
Fuel C - 168 Hrs	1.11	0.21
Fuel CM20 - 168 Hrs	1.43	0.27
Fuel B100 FAME - 168 Hrs	1.23	0.23
Fuel CE85 - 168 hrs	1.88	0.25
Ozone	1.54	0.19
Wear Cycles = 900	2.05	0.23

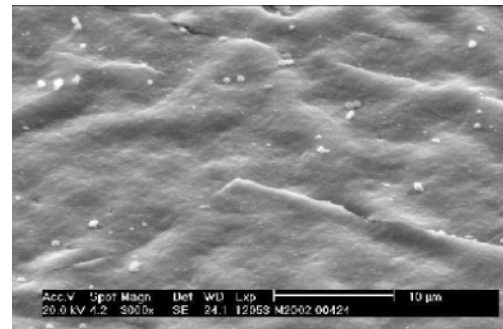
Effect of RFN



RFN Topology Comparison



Untreated



RFN Treated

Benefits

- **Low coefficient of friction** that results in improved performance.
- **Longer service life potential** – highly abrasion resistant surfaces.
- **Lower torque and loading** – valve seals, cap seals and applications with intermittent loading.
- **Aggressive media resistance** – COF remains constant with increased holding time whereas untreated materials become much worse with increased holding time.
- **Sealing performance** is maintained with no compromise to the physical properties of the elastomer.
- **Adhesion** to the elastomer and the ability to flex is maintained without micro cracking even with high forces and at -40°C.
- **EKKSC** will work with you to develop an RFN treatment that is best suited to your application.

World-Class Manufacturing

- **Zero defect philosophy** – Our global commitment to Six Sigma quality levels is evident in every step of every process and guarantees each part, no matter where it is produced.
- **Production know how** – EKKSC draws from more than 150 years of experience in producing seals.
- **Global production flexibility** – With facilities world-wide we are capable of supporting production programs globally.
 - **Testing** – We use state of the art test and measurement equipment for design validation and development.
- **System responsible** – Our entire approach to effective sealing is based on the knowledge that consistency is the key to reliability. The complete value of our systems approach is a function of leveraging EKKSC's quality and dependability in every component.