PTFE resin was discovered in 1938, but it wasn’t until the 1950s that it gained notice as a possible rotary lip seal material. However, PTFE (polytetrafluoroethylene) seals fell out of favor in the 1950s and 1960s, as they were shown to be unreliable performers in a number of applications.

In more recent decades, there has been significant progress in the areas of PTFE lip seal design and material processing.

How Does It Work?

A PTFE rotary lip seal is a seal that features a lip on the ID that fastens dynamically on a shaft and metal casing on its OD to press-fit into a bore.

Between the layers of sealing lips and the can is sandwiched a gasket, in order to seal off the potential leak path. Because the lip is not spring-energized, the radial lip contact forces are lower than a rotary spring energized PTFE seal, which allows the seal to function at much higher surface speeds (up to 10,000 sfpm.)

These seals are made from a wide range of PTFE composites and other machinable plastic materials. Standard gasket choices are fluocarbon, nitrile, EPDM and Armstrong reinforced paper.

A design engineer can choose between stainless steel, cold rolled steel, zinc-plated cold rolled steel and aluminum. This broad foundation of standard gasket, metal and PTFE materials can be tailored to suit nearly all applications. Standard and non-standard seal profiles are precision-machined to fit inch and metric gland geometries. PTFE rotary lip seals are used in demanding applications where operating conditions exceed the capabilities of elastomeric seals.

Features

Among the features and benefits of PTFE lip seals

- Low friction, long seal life with proper configuration
• Strong chemical resistance
• Surface speeds of up to 10,000 spfm
• Wide temperature range — -65 degrees F to 450 degrees F (-53 degrees C to 232 degrees C)
• High pressure in excess of 500 psi (35 bar)
• Extended seal life in dry or abrasive media
• Unlimited shelf life
• Large diameter capability
• Custom design profile

**PTFE seal applications include:**

• Motors
• Gearboxes
• Pumps
• Bearings
• Compressors
• Cryogenics
• Extruders
• Valves
• Blowers
• Spindles
• Mixers
• Robotics

To learn more about PTFE lip seals, download Gallagher Fluid Seals’ rotary seal guide.