

Not All PTFE Seals Are Created Equal

"Polytetrafluoroethylene," or PTFE, is commonly referred to by the brand name, Teflon. It's a term Dupont created after discovering the compound in 1938. Regardless of the name, there are hundreds of configurations on the market today, each with unique characteristics. Many of the compounds are filled with materials such as fiberglass, bronze, carbon, graphite, metal oxides and other polymers.

Choosing the right one requires a careful balance of science and compromise. There are pros and cons to each one, but what all PTFE seals share is a remarkable resistance to wear and deformation. Below is a quick breakdown of the most common PTFE seal configurations and how they are used.



A low-friction PTFE seal with bronze filler for high-pressure, high-speed applications

PTFE Filled with Bronze

Pros:

- High amount of bronze filler (40%) makes this material very resistant to extrusion
- Bronze particles are compatible with sliding surfaces, such as chrome.
- Moderate to good compression strength (60% bronze filled guide bands)
- Very good wear characteristics
- Popular for use with hydraulic oil

Cons:

- Not recommended for short-stroke applications due to the potential of fretting corrosion
- Exposure to water-based fluids, coupled with high temperatures can create chemical reactions, such as galvanic corrosion.

PTFE Filled with Fiberglass and Moly (Molybdenum Disulphide)

Pros:

- Moderate fill (15%) of reinforcing glass-fiber for added strength and extrusion resistance



Heavy duty PTFE rod seal with Glass/Moly filler and profiled energizer, designed for large diameter cylinders

- Molybdenum Disulfide (5%), also known as Moly, is an internal lubricant that reduces friction.
- Compatible with metal sliding surfaces, such as chrome.
- Recommended for water-based applications
- Recommended for short-stroke applications
- Highly resistant to wear

Cons:

- Higher fills of glass-fiber may be abrasive to the sliding surface



Industrial PTFE face seal with carbon/graphite filler used in a high heat steel mill applications

PTFE/Carbon/Graphite

Pros:

- Carbon fiber filler adds strength and extrusion resistance
- Graphite filler reduces friction
- Good for soft sealing surfaces
- Good for high-temperatures

Cons:

- High carbon-filled PTFE compounds can be rigid



Unfilled PTFE backup ring commonly used with O-ring static seals

Unfilled PTFE

Pros:

- Lowest coefficient of friction available
- Recommended for FDA or food-grade applications
- Commonly used as back-up rings and in conjunction with o-rings

Cons:

- Potential for extrusion with standard e-gap clearances.
- Low strength compared to reinforced PTFE with fillers



Through technology, engineering, expertise, flexibility, and speed, we partner with our customers to reduce waste and maintenance costs while increasing operational uptime and efficiencies.



systemseals.com

9505 Midwest Avenue | Cleveland, OH 44125

P: 216.220.1800 | F: 216.220.1801

