

Shelf Life Profile

Product Information

Shelf Life of Krytox™ Perfluoropolyether (PFPE) Lubricants

Krytox™ PFPE grease and oil lubricants with no additives have an indefinite shelf life if left unopened and stored in a clean dry location. Unopened containers of these fluids have shown no change in properties after 20 or more years of storage at ambient temperatures.

Opened containers could be contaminated with moisture or dirt and should be used with caution if their storage history is unknown. If containers of Krytox™ lubricants are clean, uncontaminated, and have been stored so that oil loss is minimized, they are safe for use (because the oil and thickener do not degrade over time).

In fact, retained samples of Krytox™ grease that are 40 years old have been tested and still perform as well as they did when they were originally made. Krytox™ oils are perfluoropolyethers, and are inert to oxygen and most chemicals. They do not oxidize or degrade while sitting in storage or in use. They are stable under conditions up to their decomposition temperature, which is above 350 °C (662 °F). The most common thickener is polytetrafluoroethylene (PTFE) that is also inert and nonoxidizing, so it won't degrade with age.

Grease samples from 20-year-old bearings have also been examined and found to be in good condition. Grease in a bearing is also affected by the seal design and storage conditions, including temperature, humidity, vibration, and storage orientation, so performance can vary from that of a new bearing.

Some Krytox™ greases contain additives for enhanced performance. There is no long-term storage history on

Krytox™ grease with additives, but it is not expected to be significantly different than un-additized product. Although some of the additives may degrade and become less effective over time, Krytox™ greases are designed to handle these minor changes, and neither their performance nor their characteristics will be affected.

After sitting for long storage periods, some oil will separate from the grease and can accumulate on the surface of the material in the jars. This separation does not affect the performance of the grease; the oil can be mixed back into the grease by hand stirring.

Krytox™ XP series lubricants can develop an odor and a slight amber color over time; as a result, they have been given a three year shelf life. Testing has shown that these products retain their anti-rust properties, and lubricate and perform properly over their expected life, even if used near the end of their shelf life of three years.

Service Life vs. Shelf Life

Service life is different than shelf life. Service life is the life performance of a lubricant in the operating conditions; shelf life is based on the oxidative stability of the lubricant. On the shelf, standard lubricants can react with atmospheric oxygen and become less effective. If this happens, the appearance of the grease may remain unchanged, but it will not perform as well.

In general, the service life of grease will be shorter than its shelf life. Under ideal conditions, with cool operating temperatures, no contamination, no oil seepage past the seals (perfect seals), and no bearing wear (perfect lubrication), the service life will be equivalent to the shelf life.

Service life is unpredictable, because there are so many variables that can shorten it. However, in a properly designed bearing system, the service life of Krytox™ greases can be very, very long. For example, Krytox™ GPL 225 is rated up to 204 °C (399 °F). Chemours has tested this grease at 200 °C (392 °F) and 10,000 RPM for

over 5,000 hours in a bearing life test (ASTM D-3336). The bearings did not fail. The test was stopped at 5,000 hours, because no other grease tested survived for that long. At lower temperatures, the test could run for hundreds of thousands of hours without bearing failure.

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For product information, industry applications, technical assistance, or global distributor contacts, visit krytox.com or within the U.S. and Canada, call 1-844-773-CHEM/2436 or outside of the U.S., call 1-302-773-1000.

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