DuPont™ Krytox® Lubricants
Chemical Stability

DuPont™ Krytox® PFPE[1] oils and greases thickened with PTFE[2] exhibit exceptional chemical stability.

Chemical stability and inertness are critical characteristics of DuPont™ Krytox® perfluorinated lubricants (PFPE). Krytox® oils and greases will not react with most chemicals[3] and other lubricants, nor cause them to degrade. In addition, as a result of their solubility characteristics and density, Krytox® lubricants do not mix well with most chemicals and other hydrocarbon-based lubricants and will separate out. Krytox® oils and greases are completely insoluble in water.

Krytox® PFPE oils are essentially inert to most chemicals. No reaction is observed with boiling sulfuric acid, fluorine gas at 200 °C, molten sodium hydroxide, chlorine trifluoride at 10-50 °C, uranium hexafluoride gas at 50 °C, or any of the following materials at room temperature: JP-4 turbine fuel, unsymmetrical dimethyl hydrazine, hydrazine, diethylenetriamine, ethyl alcohol, aniline, 90% hydrogen peroxide, red fuming nitric acid or nitrogen tetroxide. Krytox® oils are slightly soluble in hydrazine and have moderate (25 to 30 percent) solubility in nitrogen tetroxide.

Krytox® oils are not soluble in common organic solvents, acids and bases, but some solvents will dissolve PFPE oils. Krytox® oils are completely miscible in highly fluorinated solvents and refrigerant gases, such as:

- Trichlorotrifluoroethane (Freon 113),
- Hexafluorobenzene,
- 2,3-dihydrodecafluoropentane (Vertrel® XF)
- Perfluorooctane
- Perfluorohexane
- Perfluorodimethylcyclobutane isomers
- 1,1 dichloro-1-fluoroethane.

These fluorinated solvents will not react with PFPE oils, but the oils will be carried away from the lubricating point. PFPEs are freely soluble in supercritical CO2.

DuPont™ Krytox® lubricants have also been tested and used in the presence of gaseous and liquid oxygen and chlorine with no reactivity noted.

Krytox® lubricants are safe for use with rubber, elastomers, plastics and metals commonly used as seals and bearings.

A type of chemical known as a Lewis acid (electron pair acceptor) can react with PFPE oils and will limit the temperature at which they can be used. Typical Lewis acids are boron trifluoride, aluminum chloride, iron (III) chloride, and titanium tetrachloride. At elevated temperatures, these materials can lead to decomposition of any PFPE.

Caution should be taken with metallic alkalai such as sodium and lithium metals as reactions could occur readily.

Some grease grades contain additives for anti-corrosion or extreme pressure and these additives do not have the same chemical stability as the oils and thickeners. In chemical contact applications, it is typically common to use greases without additives.

DuPont™ Krytox® performance lubricants are not only resistant to oxygen and reactive gases, but they are inert to virtually all chemicals commonly used in most industries.

For more information or for technical assistance, please call us at 1-800-424-7502 or contact us at krytox@usa.dupont.com.

For international sales and support contacts, visit us at www.lubricants.dupont.com.

DUPONT PERFORMANCE LUBRICANTS
EXTREME CONDITIONS. EXTREME PERFORMANCE.

1 Perfluoropolyether
2 Polytetrafluoroethylene
3 Exceptions include Lewis acids and alkali metals

DuPont™ Krytox® lubricants have been used in contact with the following chemicals, in addition to many others not listed:

Acetone
Acrylonitrile
Alcohol
Acetylene
Hydrocarbon oils
Ammonia
Ammonium nitrate
Aniline
Aqueous caustic
Benzene
Boiling sulfuric acid
Brake fluids
Bromine
Butadiene
Butane
Butylene
Carbon dioxide
Carbon monoxide
Carbon tetrachloride
Chlorine, liquid or gas
Chlorine trifluoride
Chloroform
Compressed air
Dichlorosilane
Dimethylether
Diesel fuel
Diethylenetriamine
Ester oils
Ethane
Ethanol
Ethyl alcohol
Ethyl chloride
Ethylene
Ethylene glycol
Ethylene oxide
Fluorine
Formaldehyde
Gasoline
Helium
Heptane
Hexafluoropropylene
Hexane
Hydrobromic acid
Hydrocarbon compounds
Hydrocyanic acid
Hydrochloric acid
Hydrofluoric acid
Hydrogen
Hydrogen bromide
Hydrogen chloride
Hydrogen peroxide
Hydrogen sulfide
Iodine
Isopropyl alcohol
JP 4 & 8 turbine fuel
Lithium glycol
Methane
Methanol
Methylamine
Methylchloride
Methylbromide
Methylmercaptan
Methylsilane
Methylene oxide
Mineral acids
Monosilane
Molten caustic
Natural gas
Nitric acid
Nitrogen
Nitrogen oxide
Nitrogen oxides
Nitrogen trifluoride
Nitrotrifluorine
Nitrous oxide (anesthesia)
Organic acids
Organic compounds
Oxygen, liquid or gas
Ozone
Pentane
Polyalphaolefin
Potassium chloride
Potassium hydroxide
Perchloroethylene
Phosphoric acids
Phosgene
Polyalkylene glycols
PolyAlphOlefins
Polyol ester oils
Polyphenyleneoxide (PPO)
Potassium hydroxide
Potassium permanganate
Propane
Propylene
Red fuming nitric acid
Silicone products
Sodium hydroxide
Sulfur hexafluoride
Sulfuric acid
Sulfur oxides
Unsymetrical dimethy
Hydrazine
Uranium hexafluoride
Trifluoroacetylchloride
Trimethylamine
Vinyl chloride
Vinyl bromide
Vinyl fluoride
Water, steam

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