DuPont™ Krytox® + Oxygen = Safety and Reliability

CHALLENGE: **Reduce safety hazards due to oxygen volatility.**

Oxygen reacts with conventional lubrication technologies involving mineral oil or synthetics and increases the potential for explosion, fire, deterioration of the lubricant, and component failure. It also accelerates the decomposition of hydrocarbon lubricants, rapidly forming tars and varnish. Furthermore, oxygen degrades additives more rapidly, thereby reducing the life of the lubricant and requiring more frequent relubrication. Additionally, conventional lubricants are subject to oxidation, attack by harsh chemicals or solvents, and volatilization of the base oil that lead to failure of the lubrication system and associated hazards. Conventional lubricant properties are often not adequate for critical systems where failure is not an option.

Use of noncompatible lubricants requires component installation behind explosion-proof barriers. To avoid fire and explosion, flammable lubricants need to be kept below their explosive limits by purging with nitrogen. While this process can keep lubricants below the ignition point, it is cumbersome, expensive, and relies on mechanical equipment and interlocks that can fail. The process also increases the risk of compression auto-ignition with standard lubricants if they are hit by a surge of oxygen.

SOLUTION: **Krytox® provides protection for oxygen systems.**

DuPont continuously experiments with Krytox® to expand the range of consumer applications. In various studies over the years, Krytox® was tested at temperatures greater than 900°F (482°C) in the presence of oxygen and at pressures up to 35 bar with no ignition.

Krytox® fluoropolymer lubricants have been used in oxygen service by NASA and the aerospace industry for over 35 years, where it became vital to find materials that were nonflammable and would not interfere with infrared sensor performance. Krytox® was also tested and approved for safe use in oxygen service by BOC, Air Liquide, West German Federal Institute for Materials Testing (BAM), Praxair, Air Products, NASA, General Dynamics, as well as numerous other oxygen industry authorities. Furthermore, Krytox® was successfully used in Cryostar, Cryomec, Estritio, Cosmodyne, APD cryogenic pumps, cryogenic blowers, bearings, connecting rods, oxygen bombs, valves, fittings, and O-rings. Krytox® oils are prevalent as vacuum pump fluids in oxygen service.

PERFORMANCE: **The wide range of chemically inert Krytox® lubricants provides the best available lubrication for all oxygen service equipment.**

Krytox® products provide excellent lubricity, leading to extended equipment life versus alternative technologies. In addition to being nonreactive towards oxygen, Krytox® products are also safe to use with other oxidizing chemicals, such as chlorine. They are chemically inert, thermally stable, nonflammable, and nonvolatile. This wide line of products provides excellent lubrication at both low and high temperature extremes, resulting in increased applications in the automotive, electronics, paper, chemical, aviation, and aerospace industries.

Krytox® lubricants will reduce the complexity of oxygen systems and provide safe operation for all mechanical components. Krytox® 100% compatibility and non-flammability may allow auxiliary systems designed to prevent fire and explosion to be eliminated.

There are several grades of Krytox® oil and grease to meet every lubricating requirement of oxygen and compressed gas users. For example, soft Krytox® greases with XP are excellent for cryogenic applications that require soft greases and anticorrosion additives to prevent skidding during start-up and prevent corrosion resulting from temperature cycling. Krytox® patented XP additive is the first robust, soluble, antiwear/anticorrosion additive for fluoropolymer lubricants and provides excellent protection for cryogenic applications. The XP additive provides the best available antiwear and anticorrosion prevention in an oxygen compatible lubricant.

For more information or technical assistance,
call the Krytox® hot line at 800-424-7502, or visit us
on the Worldwide Web @ http://www.lubricants.dupont.com
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