

# DuPont™ Krytox® XHT Extreme High Temperature Oils

## Product Data

DuPont™ Krytox® XHT series oils are special extreme high temperature grade oils with low evaporation and extra treatment to allow use at temperatures above the range of normal PFPE oils. These oils provide excellent lubrication over a broad temperature range. Krytox® XHT series oils are nonflammable and chemically inert.

Krytox® allows extended lubrication intervals and longer equipment life. The oil can begin to slowly degrade at temperatures above 330 °C (626 °F), and this will occur at an increasing rate as temperatures increase. Relubrication could be required at these temperatures to achieve optimum life.

### Krytox® PFPE Oils

Krytox® PFPE oils are clear, colorless, fluorinated synthetic oils that are nonreactive, nonflammable, safe in chemical and oxygen service, and are long lasting. Krytox® oil is a perfluoropolyether (PFPE) - also called perfluoroalkylether (PFAE) or perfluoropolyalkylether (PFPAE) - with the following chemical structure:



### Typical Properties of XHT PFPE Oil\*

Oil Grade	XHT-500	XHT-750	XHT-1000
Estimated Useful Range °C (°F)	-20-300 (-4-572)	-15-350 (5-662)	-5-360 (23-680)
Oil Viscosity, cSt			
20 °C (68 °F)	1712	2610	3500
40 °C (104 °F)	500	738	1023
100 °C (212 °F)	46.4	64.6	88.5
Oil Viscosity Index	148	157	171
Oil Pour Point °C (°F)	-25 (-13)	-15 (5)	-5 (23)
Oil Density, g/mL			
0 °C (32 °F)	1.95	1.95	1.95
100 °C (212 °F)	1.78	1.78	1.78
Maximum Oil Volatility, % in 22 hr			
204 °C (400 °F)	<1	—	—
260 °C (500 °F)	0.8	0.6	0.5
Vapor Pressure at 20 °C (Knudsen)	≤ 1 x 10 <sup>-9</sup>	≤ 3 x 10 <sup>-14</sup>	≤ 4 x 10 <sup>-15</sup>
Vapor Pressure at 100 °C (Knudsen)	≤ 8 x 10 <sup>-7</sup>	≤ 1 x 10 <sup>-9</sup>	≤ 2 x 10 <sup>-10</sup>
Vapor Pressure at 200 °C (Knudsen)	≤ 1 x 10 <sup>-4</sup>	≤ 2 x 10 <sup>-6</sup>	≤ 3 x 10 <sup>-7</sup>

\* This table gives typical properties (not specifications) based on historical production performance. DuPont does not make any express or implied warranty that these products will continue to have these typical properties.



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## Compatibility with Metals

Due to their low surface tensions, DuPont™ Krytox® oils easily wet metallic surfaces, and, because of their inertness, Krytox® oils have little or no adverse effect on metals when the oil temperature is lower than 288 °C (550 °F). The behavior of Krytox® oils in the presence of many alloys has been studied using the Micro Oxidation-Corrosion Test developed by the Air Force Materials Laboratory.

In general, nickel and cobalt alloys are the most resistant to corrosion and are suitable for use with Krytox® oils up to 371 °C (700 °F). Carbon steel alloy suitability should be studied for uses above 288 °C (550 °F). Some types of stainless steel are satisfactory at 316 °C (600 °F). A summary of metals compatible with Krytox® oils at various temperatures is given below.

Certain alloys have been found to cause catalytic depolymerization of Krytox® oils at high temperatures. At 316 °C (600 °F), for example, titanium alloys that contain aluminum function in this way. Aluminum alloy 2024 also catalytically depolymerizes Krytox® oils at 371 °C (700 °F). This depolymerization is considerably reduced in the absence of oxygen when an inert gas is substituted for the dry air flow. This suggests that the reactions involved are between the Krytox® oils and the oxide coating on the metal surface.

## Metals and Alloys Suitable for Use with Krytox® oil at Elevated Temperatures

Based on results of Micro Oxidation-Corrosion Tests, 72 hr at indicated temperature, 5 L dry air flow/hr, qualifying corrosion rate 0.4 mg/cm day

at 371 °C (700 °F)	Nickel alloys Cobalt alloys AMS 5547 steel
at 343 °C (650 °F)	AMS 5525 steel Titanium alloy Ti(6Al-6V-2Sn) Mg, Ag, Cr, V
at 316 °C (600 °F)	Types 301, 304, 316, 321, and 446 stainless steels N-155 Titanium alloy (13V-11Cr-3Al) Titanium alloy (6Al-4V) Aluminum alloy QQ-A-355 Bearing bronze
288 °C (550 °F)	Types 405, 410, and 440 stainless steels QQ-S-636, M-1, M-50, WB-49, and 52100 steels Titanium alloy Ti(8Mn) Copper

Below 288 °C (550 °F), most metal and alloys show little or no evidence of corrosion in the presence of Krytox® oils.

**For more information or for technical assistance, please call us  
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