

DuPont™ Krytox® Extra High-Temperature (XHT) Lubricants

GENERAL OVERVIEW



XHT Grades — High Performance Lubricants Beyond Your Expectations



Selection of the best lubricant involves analyzing operating conditions and choosing from the many synthetic and petroleum-based products available today. While most petroleum products begin to degrade before 99°C (210°F) and cease turning at temperatures just below -18°C (0°F), DuPont™ Krytox® fluorinated synthetic lubricants have operating ranges that are significantly broader (-70 to 316°C [-94 to 600°F]).

Krytox® lubricants are more effective at even higher temperatures, regardless of operating duration. Using base oils, thickeners, and additives with chemistry designed to create high and low viscosity, these products are targeted for use solely in the very high-temperature range. Available in several grades that offer anticorrosion, extra bonding, and non-melting properties, these lubricants have applications in a variety of industries, including chemical, textile, tire, aviation, conveyor, glass, plastic film, non-woven manufacturing, and mining and metal processing.



In oven at 232°C (448°F) for 40 hr:
Krytox® — 0% wt loss



In oven at 232°C (448°F) for 40 hr:
Hydrocarbon — 40% wt loss

High-Temperature Greases

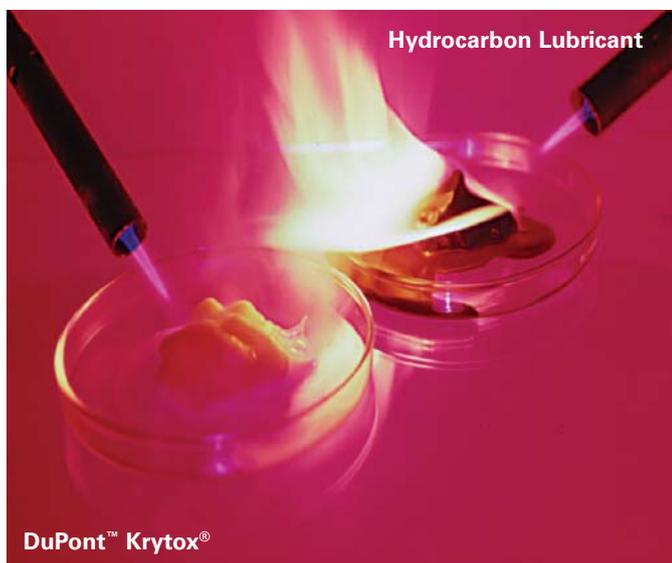
Because of its thermal stability and nonoxidizing characteristics, Krytox® is a natural high-temperature lubricant.

Krytox® XHT greases are available with useful temperature ranges up to 360°C (680°F) for continuous use, with spikes to 400°C (752°F), when used in proper metallurgy with periodic relubrication.

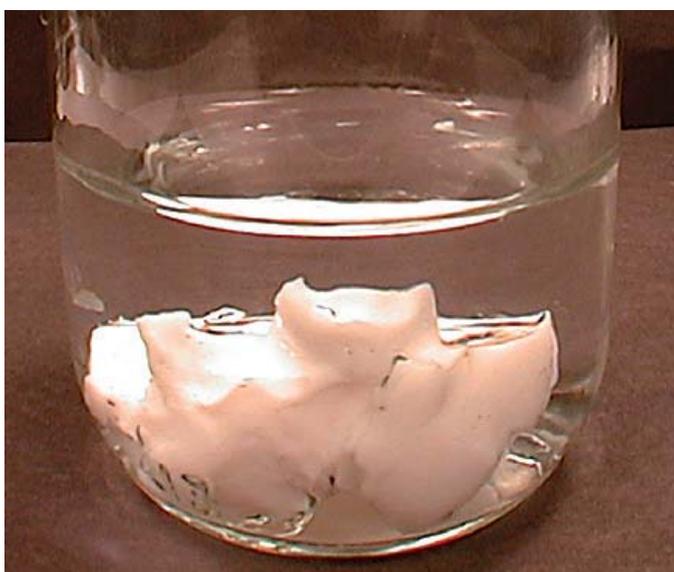


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DUPONT™ KRYTOX® XHT LUBRICANTS



Hydrocarbon-based lubricants burn; Krytox® does not.



Krytox® grease in hydrocarbon solvent is not dissolved.

Stability

Nonflammable

DuPont™ Krytox® lubricants contain only carbon, oxygen, and fluorine. Because hydrogen is not present, these products are nonflammable. They will not burn or support combustion, even in 100% liquid or gaseous oxygen.

Chemically Inert

Krytox® performance lubricants are not only resistant to oxygen, but are inert to virtually all chemicals used in a variety of industries.

They are insoluble in most solvents but are soluble in highly fluorinated fluids and in some supercritical fluids such as CO₂.

Thermal and Oxidative Stability

The temperature at which thermal decomposition of Krytox® oils takes place depends on the test method used and how the point of incipient deterioration is measured. By differential thermal analysis, deterioration occurs at about 470°C (878°F) in the absence of air. The isoteniscope technique shows an initial decomposition point of 355°C (671°F) as measured by excess pressure increase. At 355°C (671°F), the decomposition rate is approximately 0.03 wt% per day. At 399°C (750°F), the decomposition rate increases to 1.3 wt% per day. When tested under nitrogen for six hours at 371°C (700°F), Krytox® showed no increase in neutralization number and no significant change in viscosity. The presence of air does not substantially lower the decomposition point of Krytox® oils.

During depolymerization, gaseous decomposition products are given off, and the remaining fluid is less viscous, but no sludge or gummy deposits are formed.

User Guide/High-Temperature Grades

Standard Grades

XHT-S and XHT-SX

250–320°C (482–608°F)

Typical Applications: Small or large bearings with relatively high speeds. Higher viscosity, lower evaporation of oil extends life.

Anticorrosion Grades

XHT-AC and ACX or XHT-RUF and RUFX

250–320°C (482–608°F)

Typical Applications: For machines that run for shorter duration with frequent starts and stops. Frequently cooled machines require anticorrosion additives.

Extra Bonding Grades

XHT-BD, BDZ, and BDZ

300–400°C (572–752°F)

Typical Applications: For use when machine movement is not purely rotational. This grease is non-melting for high-temperature use and offers better adhesion to substrate.

Non-Melting Grades

XHT-NM and NMX

300–330°C (572–626°F)

Typical Applications: For slow moving applications at higher temperatures.



Krytox® XHT high-temperature greases can be used in many industrial applications in extreme thermal conditions.

Technical Properties

Grade	Thickener		Viscosity (cSt)			Volatility (ASTM D2595)	Anticorrosion Additive
	Type	Properties	at 40°C	at 100°C	at 200°C	at 204°C (%)	
XHT-S	PTFE	Low friction max. temp. 300°C	500	46	6.8	<1	NA
XHT-SX	PTFE	Low friction max. temp. 300°C	738	65	8.8	<0.4	NA
XHT-AC	PTFE	Low friction max. temp. 300°C	500	46	6.8	<1	Yes
XHT-ACX	PTFE	Low friction max. temp. 300°C	738	65	8.8	<0.4	Yes
XHT-RUF	PTFE	Low friction max. temp. 300°C	500	46	6.8	<1	Yes
XHT-RUFX	PTFE	Low friction max. temp. 300°C	738	65	8.8	<0.4	Yes
XHT-BD	Non-melting	Extra strong bonding to substrate	500	46	6.8	<1	NA
XHT-BDX	Non-melting	Extra strong bonding to substrate	738	65	8.8	<0.4	NA
XHT-BDZ	Non-melting	Extra strong bonding to substrate	1023	88	11.4	<0.3	NA
XHT-NM	Non-melting	High load, low speed	500	46	6.8	<1	NA
XHT-NMX	Non-melting	High load, low speed	738	65	8.8	<0.4	NA

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.

Additional Information and Literature Requests

The general physical characteristics of each DuPont™ Krytox® fluorinated oil product category are described in this brochure. More detailed data sheets showing specific properties for each Krytox® product are available.



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

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