1010 72 Avenue NE, Calgary, Alberta, Canada T2E 8V9 • Tel: 403-250-8448 / 800-661-6100 • Fax: 403-444-0033 • Email: info@lubecorp.com

Lubritherm Performance Testing Summary

Tested per ASTM D7044-04a, Standard Specification for Biodegradable Fire Resistant Hydraulic Fluids as a B-HFC-0 type fluid, requiring conformance to ISO 12922, Lubricants, industrial oils and related products (class L) - Family H (Hydraulic systems) –Specifications for categories HFAE, HFAS, HFB, HFC, HFDR & HFDU and ASTM D6046, Standard Classification of Hydraulic Fluids for Environmental Impact. Note: Lubritherm is a lower viscosity grade and has lower water content than the ASTM standard.

Typical Performance Characteristics

PROPERTY	TEST METHOD	LUBRITHERM ALL-TEMP
Density, kg/m^3	ASTM D4052	1069 [2]
Water Content, %	ASTM D1744	24.34 [1]
pH @ 20° C	ASTM E70	9.3 [1]
Kinematic Viscosity, cSt	ASTM D445	
@ 40° C		10.20 [2, 1]
@ 100° C		1.812 [2]
@ -30° C	ASTM D5133	3611 [1]
Viscosity Grade	ISO 3448	ISO VG 10 [2]
Pour Point, °C	ASTM D2386	<-60
Foaming Characteristics, ml Sequence II (50° C)	ASTM D892	90/0 [1]
Air Release, min @ 50° C	ASTM D3427	1.2 [1]
Elastomer Compatibility, Buna Nitrile 168 hours @ 68° C	ASTM D6546M	Pass [1]
Corrosion Resistance	ISO 4404-1	
Liquid Phase (aluminum, steel, copper, brass)		Pass [2]
Vapor Phase (aluminum, steel)		Pass [2]
Not recommended for use with zinc		
Four Ball Wear scar dia. mm (1 hour, 40 kg, 75° C, 1200 rpm)	ASTM D4172	0.76 [1]
Four Ball EP	ASTM D2783	
Load wear index		39.47 [1]
Weld point, kg		160 [1]
Parker/Oildyne Pump Durability	Parker FCD-0122	Pass [4]
FZG Test, (gear box temp 60° C)	ASTM D5182	Pass stage 8 [1]
Spray Ignition Characteristics	ISO 15029-1	Non-flammable [2]
Hot Manifold Ignition Test	ISO 20823	Pass [2]
Typical Environmental characteristics	ASTM D5864	
Activated Sludge Inhibition Respiration Test "Absolutely Non-Toxic to wastewater treatment plant bacteria"	OECD 209	3-hour EC50>1000 mg/L [3] "Absolutely Non-Toxic"
Ready Biodegradability CO_2 Evolution Test Method, 1992	OECD 301B	>69% degradation in 28 days [3] "Biodegradable"
Acute Aquatic (US Fish and Wildlife, 1984)		
Ecotoxicity Classification (Rainbow Trout)	OECD 203	LC 50 = 148.3 mg/L [3] "Practically Non-Toxic"
Ecotoxicity Classification (Daphnia Toxicity)	OECD 202	EC 50 = 36.8 mg/L [3] (48 hr. immobility)
Ecotoxicity Classification (Selenastrum Toxicity)	OECD 201	EC 50 = 31.5 mg/L [3] (Cell Number 72 hr)

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Typical Performance Characteristics

Footnotes

[1] Clark Laboratories LLC, Fuels and Lubricant Laboratory, 4000 Tech Center Drive, Monroeville, PA. 15146
[2] Alberta Research Council, 250 Karl Clark Road, Edmonton, AB T6N 1E4
[3] AquaTox Testing & Consulting Ltd. 11B Nicholas Beaver Road, RR3, Guelph, ON N1H 6H9 (Stantec Consulting Ltd.)
[4] Parker Hannifin Corporation, Oildyne Division, Minneapolis, MN 55428 USA

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Contact local authorities to determine containment/remedial requirements in the event of accidental product release.