ISO-9001 Registered Quality System.
ISO-21469 Compliant.

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PRODUCT DATA

LUBRIPLATE BIO-SYNXTREME HF SERIES

DESCRIPTION

The LUBRIPLATE BIO-SYNXTREME HF Series are high performance hydraulic fluids designed for demanding industrial and marine (Vessel General Permit) applications requiring environmental sensitivity, water solubility, fire resistance, and excellent anti-wear properties over wide temperature ranges. These Polyalkylene glycol (PAG) based fluids, which are available in three viscosity grades, are anhydrous (water-free). LUBRIPLATE BIO-SYNXTREME Hydraulic Fluids do not break down to form sludge, and they do no hydrolyze in the presence of water. Furthermore, because of their high viscosity indices and excellent low temperature characteristics, one viscosity grade fluid may replace two or three viscosity grades.

ADVANTAGES

- **Excellent Anti-Wear Performance** – Exceptional load-carrying capabilities and specially formulated (with no zinc or other metal additives) to provide effective corrosion protection and anti-wear performance in hydraulic systems. Rated as anti-wear (AW) fluids according to ASTM D7043 testing and FZG testing, which means the potential for greater operating reliability, less downtime, and lower maintenance costs.
- **Clean, Long-Lasting Operation –** When proper fluid and equipment maintenance procedures are followed, the Bio-Synxtreme HF series offer a long service life and operating reliability, lower maintenance costs, and reduced overall downtime.
- **Fire Resistance –** High flash and fire points provide safety in applications calling for fire resistant fluids, thus providing operating confidence and potentially reduced insurance costs.
- **All Season Performance –** High viscosity indices and low pour points, allowing year-round usage and eliminating seasonal changeovers.
- **Biodegradability –** Readily biodegradable according to OECD 301F.
- **Non-Sheening –** Does not cause a sheen or discoloration on the surface of the water or adjoining shorelines that would violate local water quality standards.
- **Aquatic Toxicity –** "Practically Non-Toxic" to fish and other aquatic wildlife according to the U.S. Fish and Wildlife Service hazard classification.

COMPATIBILITY

- **Other Hydraulic Fluids –** Not compatible with hydrocarbon-based hydraulic fluids. As with any fluid conversion, recognized industry procedures including system cleanup and flushing should be followed.
- **Paints –** PAG-based fluids show some solvency for common oil-based paints but minimal solvency for many epoxy-based paints.
- **Elastomers –** Suitable for use with many elastomeric materials used in seals and gaskets. *Compatible elastomers are: Viton, Kalrez, Silicone, Polysulfide, EPR, Butyl Rubber, Buna N, Fluoraz, EPDM, Natural Black Rubber, Natural Red Rubber, and Aflas.*
- **Plastics –** Compatibility should be assessed for any plastic components (such as reservoir sight glasses) exposed to a hydraulic fluid.

VGP Compliance Statement

The LUBRIPLATE BIO-SYNXTREME HF Series are Environmentally Acceptable Lubricants (EAL) according to the definitions and requirements of the US EPA 2013 Vessel General Permit, as described in VGP Section 2.2.9

	25°C	100°C
Polypropylene	Recommended	Recommended
Polyethylene, Low Density	Recommended	Not Recommended
Homalite Polycarbonate	Not Recommended	Not Recommended
Lucite/Plexiglas Polymethylmethacrylate	Not Recommended	Not Recommended
Polyurethane	Not Recommended	Not Recommended

PACKAGING AVAILABLE	HF 32	HF 46
5 Gallon Pail	L1020-060	L1021-060
55 Gallon Drum	L1020-062	L1021-062

PACKAGING AVAILABLE	HF 68
5 Gallon Pail	L1022-060
55 Gallon Drum	L1022-062

Typical Test Data

PROPERTY	TEST METHOD	TYPICAL RESULTS*		
Performance Properties		**32**	**46**	**68**
FZG Visual Gear Test, Stages Passed	ASTM D5182	12	12	12
Four Ball EP Test Load Wear Index Last Non-seizure, 80 kg (mm scar) Last seizure, 126 kg (mm scar) Weld Load, kg	ASTM D2783	 32.94 0.40 2.75 160	 33.10 0.40 2.60 160	 33.26 0.39 2.53 160
V104 Vane Pump Test (total mg wear)	ASTM D7043	<10	<10	<10
35 VQ Vickers Vane Pump Test Individual Cartridge Wear, mg Average Wear, mg	M-2950-S	Pass 8,8,8 8	***	***
Sonic Shear Stability Initial Viscosity @ 40°C (cSt) Irradiated Viscosity @ 40°C (cSt)	ASTM D5621	 36.8 36.9	 47.1 47.0	 68.9 69.2
Viscosity Properties				
Viscosity @ 40°C (cSt) Viscosity @ 100°C (cSt) Viscosity @ 0°C (cSt)	ASTM D445	35.4 8.0 294	46.0 9.8 390	68.0 13.7 614
Viscosity Index	ASTM D2270	194	200	209
Fire Properties				
Flash Point – Cleveland Open Cup, °C	ASTM D92	271	312	288
Flash Point – Pensky Martens Closed Cup, °C	ASTM D93	218	223	None[1]
Fire Point, °C	ASTM D92	304	316	322
Physical – Chemical Properties				
Specific Gravity @ 20°C	ASTM D1298	1.031	1.035	1.041
Foam Test – Sequence I, Initial Volume/ml Sequence II, Initial Volume/ml Sequence III, Initial Volume/ml	ASTM D892	 10/0 10/0 10/0	 10/0 10/0 10/0	 10/0 10/0 10/0
Vapor Pressure (mm HG)	ASTM E1719	<0.01	<0.01	<0.01
Specific Heat (Cal/g/°C)	ASTM E1269	0.476	0.481	0.478
Pour Point, °C	ASTM D97	-59	-51	-51
Ash Content (%)	ASTM D482	0.011	0.008	0.008
Corrosion Protection (TORT)	ASTM D665A	Pass	Pass	Pass
Copper Strip Corrosion	ISO 2160	1b, shiny	1a, shiny	1a, shiny
Aging Behavior (Hrs) Mg KOH/g Hours	DIN 51587	 1.14 1,008	 0.92 1,008	 0.31 1,008
Coefficient of Expansion @ 20°C @ 55°C	ASTM D1903	 0.00078 0.00080	 0.00080 0.00078	 0.00079 0.00078
Weight, lbs/gal. (20°C)		8.57	8.57	8.58

HYDRAULIC SYSTEM CONVERSION

For best results when converting to a LUBRIPLATE Bio-Synxtreme Hydraulic Fluid, ensure the following:

- The hydraulic system is thoroughly clean and free of contamination from previous fluids
- Oil filters are new
- Paint, plastics, seals and elastomers are compatible
- Standard industry procedures are followed

Conversion to Hydraulic Fluid:

Installation of LUBRIPLATE Bio-Synxtreme Hydraulic Fluid into systems that previously contained petroleum-based hydraulic fluid should follow the recommended flush procedure:

- Drain previous fluid from the equipment
- Fill the system with LUBRIPLATE HydroFlush Fluid. Run or circulate under minimum load for 30minutes. LUBRIPLATE HydroFlush Fluid will generally clean varnish and sludge build-up formed from petroleum-based hydraulic fluids
- Thoroughly drain the LUBRIPLATE HydroFlush Fluid from the system
- Inspect the fluid filters and replace as needed
- Fill the equipment with fresh LUBRIPLATE Bio-Synxtreme HF and begin normal operation
- Inspect and change filters as required

Contact your technical representative for assistance and detailed information on conversion procedures.

ENVIRONMENTAL DATA

Classified as "Practically Non-Toxic"

U.S. Fish & Wildlife Service Classification Based on inherent properties of the fluid and testing following the:

- U.S. EPA. Ecological Effects Test Guidelines, OPPTS 850.1010, Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids
- U.S. EPA. Ecological Effects Test Guidelines, OPPTS 850.1035, Mysid Acute Toxicity Test
- U.S. EPA. Ecological Effects Test Guidelines, OPPTS 850.1075, Fish Acute Toxicity, Freshwater and Marine
- U.S. EPA. Ecological Effects Test Guidelines, OPPTS 850.1000, Special Considerations for Conducting Aquatic Laboratory Studies
- OECD Series on Testing and Assessment, No. 23, Guidance Document on Aquatic Toxicity Testing of Difficult Substances and Mixtures

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Non-Sheening Passes Static Sheen Test (Bio-Synxtreme HF 46)

Test Method	Description	Results
Appendix 1 to Subpart A of 40 CFR 435	Static Sheen Test @ 23°C, 15 ml sample, distilled water, 15 minutes observation time	Observations: No sheen, No gloss, No color, No increase in reflectivity, No iridescence, No oil slick

Readily Biodegradable

Product	28 Day % Biodegradation
Bio-Synxtreme HF 32	81
Bio-Synxtreme HF 46	72
Bio-Synxtreme HF 68	80

Toxicity Results for Aquatic Species

EL50 = Bio-Synxtreme loading rate (mg/L as formulated fluid) associated with effects on 50% of tested population.

LL50 = Bio-Synxtreme loading rate (mg/L as formulated fluid) associated with lethality of 50% of tested population.

	Fresh Water Species	
Product	**48 h EL50 (mg/L) with water flea (Daphnia magna)**	**96 h LL50 (mg/L) with Fathead minnow (Pimephales promelas)**
Bio-Synxtreme HF 32	750	*
Bio-Synxtreme HF 46	430	297
Bio-Synxtreme HF 68	170	*
	Sea Water Species	
Product	**96 h LL50 (mg/L) with Mysid shrimp (Mysidopsis bahia)**	**96 h LL50 (mg/L) with Sheephead minnow (Cypronidon variegatus)**
Bio-Synxtreme HF 32	200	>1000
Bio-Synxtreme HF 46	250	>1000
Bio-Synxtreme HF 68	330	>1000

*Not tested. Bio-Synxtreme HF 32 and 68 are expected to have fathead minnow LL50 values similar to that of 46, based on similar results observed across these products for the other species tested.

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