Renewable Lubricants, Inc.
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Bio-Hydraulic™ Fluids
(ISO 32, 46, 68)

STABILIZED™ by Renewable Lubricants

"Bio-based Lubricants that Perform Like Synthetics"

Bio-Hydraulic™ Fluids are ultimately biodegradable[1] vegetable based formulas that meet and exceed Vickers M-2950-S, Vickers 1-286-5, U.S. Steel 126, and U.S. Steel 127. Bio-Hydraulic™ Fluids are formulated to perform in hydraulic systems that require Anti-Wear (AW), anti-rust, anti-oxidation, anti-foam, and demulsibility properties. There anti-wear performance exceeds the requirements for Vickers 35VQ-25 and V-104C (ASTM D-2882) vane pump stand tests, and DIN 51524 Part 2 load stage 10. They also meet the requirements for ashless GL-3 gear oils in reduction units and gear sets where they meet the viscosity ranges.

Bio-Hydraulic™ Fluids are highly inhibited against moisture and rusting in both fresh and sea water and pass both A and B Sequences of the ASTM D-665 Turbine Oil Rust Test. Incorporating the super high viscosity index of the Stabilized* High Oleic Base Stocks (HOBS) into the formula, increases the viscosity index past synthetic levels (Energy Conserving Formulas). Zinc-free additive systems have also been developed that are environmentally friendly and meet or exceed pump requirements.

The super high viscosity index of the HOBS naturally improves the thermal shear stability of the formula and increases load capacity. The HOBS's extremely low volatility increases the flash and fire safety features in the formula. They are formulated to provide seal conditioning for longer seal life and to reduce oil leakage from the system. Bio-Hydraulic Fluids should be used in hydraulic systems where low toxicity and BIODEGRADABILITY properties are required. Bio-Hydraulic Fluids are ENVIRONMENTALLY RESPONSIBLE lubricants that are formulated from renewable agricultural plant resources. We believe Earth's environmental future rests in the use of renewable materials.

STABILIZED by Renewable Lubricants™* is RLI™'s trademark on their proprietary and patented anti-oxidant, anti-wear, and cold flow technology. High Oleic Base Stock (HOBS) are agricultural vegetable oils. This Stabilized technology allows the HOBS to perform as a high performance formula in high and low temperature applications, reducing oil thickening and deposits.

[1] Ultimate Biodegradation (Pw1) within 28 days in ASTM D-5864 Aerobic Aquatic Biodegradation of Lubricants

Patented Product: US Patent 6,383,992, US Patent 6,534,454 with additional Pending and Foreign Patents
* Trademark of Renewable Lubricants, Inc.

Availability **F.O.B. :Bolton, ON, Canada** **5 Gallon Pails** **Drums** **Bulk**

Bio-Hydraulic™ Fluids ISO 32, 46, 68

TYPICAL SPECIFICATIONS Page 2	METHOD	**ISO 32**	**ISO 46**	**ISO 68**	Spec. Requirements
Specific Gravity @ 15.6°C	ASTM D-287	**.89**	**.90**	**.90**	Report
Viscosity @ 40°C	ASTM D-445	**32.83**	**45.45**	**66.16**	Note 1
Viscosity @ 100°C	ASTM D-445	**7.27**	**9.0**	**12.2**	Note 1
Viscosity @ -25°C, Brookfield	ASTM D-2983	**1,400 cP**	**3,200 cP**	**4500cP**	Note 1
Viscosity Index	ASTM D-2270	**182**	**184**	**185**	90 (min)
Pour Point	ASTM D-97	**-36°C**	**-36°C**	**-34°C**	Note 1
Flash Point (COC)	ASTM D-92	**230°C**	**240°C**	**250°C**	198°C (min)
Fire Point (COC)	ASTM D-92	**255°C**	**265°C**	**273°C**	218°C (min)
Foam Sequence I, II, III (10 min)	ASTM D-892	**0 Foam**	**0 Foam**	**0 Foam**	0 Foam
Rust Prevention	ASTM D-665				
Distilled Water		**Pass**	**Pass**	**Pass**	Pass
Syn. Sea Water		**Pass**	**Pass**	**Pass**	Pass
Copper Corrosion Strip 3hr @ 100°C	ASTM D-130	**1B**	**1B**	**1B**	DIN 51524 2(max)
Rotary Bomb Oxidation, (minutes)	ASTM D-2272	**260**	**260**	**260**	USS 120 (min)
Neutralization Number mg KOH/g	ASTM D-974	**0.3**	**0.3**	**0.3**	1.5 (max)
Swell of Synthetic NBR-L Rubber, % (Avg.)	DIN 53538, Part 1				
Volume Change (%)		**5.0**	**5.0**	**5.0**	0 to 12
Shore A Hardness Change (%)		**-4**	**-4**	**-4**	0 to -7
Demulsibility, ML Oil/Water/Emulsion	ASTM D-1401	**40/ 40/0**	**40/40/0**	**40/40/0**	40 (max) (30 minutes)
4-Ball Wear, 1h, 167°F, 1200 RPM, 40 kg	ASTM D-4172	**0.4**	**0.4**	**0.4**	USS 127 0.5 (max)
FZG Test	DIN 51354	**11**	**11**	**11**	US.Steel 10 (min)
Biodegradation Classification	ASTM D-5864	Ultimate PW1	Ultimate PW1	Ultimate PW1	Ultimate PW1
Environmentally Friendly	ISO 15380	yes	yes	yes	
USDA Biobased Tested	New Carbon	yes	yes	yes	meets/exceeds over 50%

Note 1 Viscosity Sufficient for Application
Note 2 Not Required