Bio-1500 Dielectric Hydraulic Fluids

(AW ISO 32, 46, 68)

A specially formulated, ultimately biodegradable[1] product designed specifically for use in hydraulic equipment operating over a wide range of temperatures and where an oil with high dielectric (>35 KV) insulating property is required. Applications include power utility aerial lift buckets, mobile and stationary hydraulic systems, or other equipment where electrical insulating safety is preferred. Bio-1500 Hydraulic Fluids are formulated to perform in hydraulic systems that require Anti-Wear (AW), anti-rust, anti-oxidation, anti-foam, and demulsibility properties. They are highly inhibited against moisture and rusting in both fresh and sea water and passes both A and B Sequences of the ASTM D-665 Turbine Oil Rust Test. Incorporating the super high viscosity index of the high oleic base stocks into the formula, increases the viscosity index past synthetic levels (Energy Conserving Formula). A zinc-free additive system has also been developed that is environmentally friendly and meets or exceeds pump requirements.

Bio-1500 Hydraulic Fluids are designed for use in mobile and stationary hydraulic vane, piston, and gear-type pumps and has shown exceptional anti-wear performance. Very little wear was encountered, 0 to 25mg (Pass), in accelerated biobased tests using Denison T-5D, Vickers 20VQ, 35VQ-25 (M-2950-S), and V-104C (ASTM D-2882) pump stand tests at pressures and temperatures ranging from 2000 to 3000 psi and from 150^0 to 210^0F. The anti-wear performance exceeds the load stage 10 in the FZG (DIN 51354) requirements for US Steel 136, DIN 51524, and GM (LS-2). It also meets the requirements for ashless GL-3 gear oils in reduction units and gear sets where it meets the viscosity range.

The super high viscosity index of the base stock naturally improves the thermal shear stability of the formula and increases load capacity. Extremely low volatility increases the flash and fire safety features in the formula. It is formulated to provide seal conditioning for longer seal life and to reduce oil leakage from the system. Bio-1500 Hydraulic Fluids should be used in hydraulic systems where low toxicity, and biodegradability properties are required or advantageous. Base oils and additives in this product pass and exceed the acute toxicity (LC-50) criteria adopted by the US Fish and Wildlife Service and the US EPA. Bio-Hydraulic Fluids are environmentally responsible products formulated from renewable agricultural plant resources. We believe Earth's environmental future rests in the use of renewable materials.

The test data on the next page show that the Bio-1500 Dielectric Hydraulic Fluids provide high performance in a wide variety of stationary and transportation equipment that operate in broad ranges of environmental conditions. In equipment operating outside, wear from poor cold temperature pumpability, surge loads, moisture, and dusty environments are more prominent. Bio-1500 Dielectric Hydraulic Fluids are formulated to improve performance in equipment that requires excellent anti-wear, demulsibility, and cold temperature pumpability as low as -42^0C. In addition, the products may be used in machine tool hydraulic systems with the above Denison/Vickers pump requirements.

These products are based on a proprietary and patented anti-oxidant, anti-wear, and cold flow technology. Base stocks are non-GMO agricultural vegetable oils. This stabilized technology provides high performance 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.

To Order

Fax to 831-728-1753 or call 800-491-9473 for Customer Service
Visit **www.wiserenewables.com** or Email **sales@wiserenewables.com**

Available Size Container	5 gal. **Pail**	55 gal. **Drum**	330 gal. **Tote**
AW / ISO Grade			
Quantity (min.)			

PO Box 840, Freedom, CA 95019; F.O.B.: Ohio, USA

TYPICAL SPECIFICATIONS	METHOD	ISO 32	ISO 46	ISO 68	Special Requirements
Specific Gravity @ 15.6°C	ASTM D-287	**0.869**	**0.870**	**0.872**	Report
API Gravity @ 15.6°C	ASTM D-287	**31.3**	**31.1**	**30.9**	Report
Viscosity @ 40°C	ASTM D-445	**31.23**	**44.5**	**64.2**	Note 1
Viscosity @ 100°C	ASTM D-445	**7.05**	**9.37**	**12.2**	Note 1
Viscosity @ -15°C, Brookfield	ASTM D-2983	**500 cP**	**650 cP**	**1,200 cP**	Note 1
Viscosity @ -25°C, Brookfield	ASTM D-2983	**1,150 cP**	**1,400 cP**	**3,400 cP**	Note 1
Viscosity @ -30°C MRV TP1	ASTM D-4684	**2,600 cP**	**3,400 cP**	**7,200 cP**	10W= <60,000
Viscosity @ -35°C MRV TP1	ASTM D-4684	**4,500 cP**	**6,200 cP**	**12,000 cP**	5W= <60,000
Viscosity Index	ASTM D-2270	**199**	**201**	**191**	90 (min)
Dielectric Strength, KV	ASTM D-877	**>35**	**>35**	**>35**	35 (min)
Pour Point	ASTM D-97	**-42°C**	**-40°C**	**-36°C**	Note 1
Flash Point (COC)	ASTM D-92	**239°C**	**240°C**	**245°C**	198°C (min)
Fire Point (COC)	ASTM D-92	**261°C**	**263°C**	**269°C**	218°C (min)
Hydrolytic Stability	ASTM D-2619				
Copper Wt. Loss (mg)		**<0.02**	**<0.02**	**<0.02**	0.2
Copper Appearance		**1B**	**1B**	**1B**	Report
Water Layer		**3.0**	**3.0**	**3.0**	4
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	**1 B**	**1 B**	**1 B**	DIN 51524 2(Max)
Rotary Bomb Oxidation Test -- RBOT (minutes)	ASTM D-2272	**360**	**360**	**360**	USS 120 (min)
Oxidation Stability (Pressure Differential Scanning Calorimeter) min	ASTM D-5483 Modified	**70.0 (165°C)**	**70.0 (165°C)**	**70.0 (165°C)**	Note 2
Neutralization Number mg KOH/g	ASTM D-974	**<0.4**	**<0.4**	**<0.4**	1.5 (Max)
Swell of Synthetic NBR-L Rubber, % (Avg.)	DIN 53538, Part				
Volume Change (%)	1	**5.0**	**5.0**	**5.0**	0 to 10
Shore A Hardness Change (%)		**-4**	**-4**	**-4**	0 to -7
Filterability	Denison TP				
A-No Water (s) (Max)	02100	**150**	**270**	**340**	600 (max)
B-2% Water (s) (Max)	HF-0 Requirement	**175**	**300**	**450**	2xA (max)
Demulsibility, ML Oil/Water/Emulsion (Avg)	ASTM D-1401	**40/40/0**	**40/40/0**	**40/40/0**	40/37/3 (Max)
4-Ball Wear, 1h, 167°F, 1200 RPM, 40 kg	ASTM D-4172	**0.3 – 0.4**	**0.3 – 0.4**	**0.3 – 0.4**	USS 127 0.5 (Max)
FZG Test	DIN 51354	**12**	**12**	**12**	US.Steel 10 (min)
Biodegradation Classification	ASTM D-5864	Ultimate Pw1	Ultimate Pw1	Ultimate Pw1	Ultimate Pw1

Notes:
1. Viscosity Sufficient for Application
2. Not required