



Renewable Lubricants, Inc.
476 Griggy Rd., P.O. Box 474
Hartville, Ohio 44632-0474

Bio-Fleet™ Hydraulic Fluids

(AW ISO 22 32, 46, 68)

Bio-Fleet™ Hydraulic Fluids are readily biodegradable formulas that directly replace zinc and zinc-free petroleum hydraulic fluids. These patented biobased hydraulic fluids are formulated to perform in fleet, marine, and industrial hydraulic systems that require Anti-Wear (AW), anti-rust, anti-oxidation, anti-foam, and demulsibility properties. Bio-Fleet™ Hydraulic Fluids have a long-term history of proven performance with over 20 years of successfully being used in a wide variety of stationary and mobile hydraulic equipment.

Benefits

- Readily biodegradable, environmentally non-toxic, not bioaccumulative
- Excellent oxidation stability and cold temperature performant
- Improved oxidation stability over straight plant/vegetable oil formulations
- Super high viscosity index provides energy efficiency in equipment
- Direct replacement for petroleum hydraulic fluids
- Environmentally friendly, zinc free formula
- Highly filtered formulation meets or exceeds OEM pump particle count
- Formulated with Stabilized technology increasing VI past synthetic levels
- Great demulsification properties, inhibiting moisture and rust in both fresh and salt water

Application / New Filling

- For construction, forestry, marine, and hydro-electric engineering
- Before changing over to Bio-Fleet, please ask for filling instructions

Specifications and Approvals

- OECD 301B Readily Biodegradable
- ASTM D 5864 Ultimately Biodegradable
- USDA Bio-preferred
- EPA EAL VGP Compliant
- Vickers (20VQ, 35VQ-25(M-2950-S), V-104C (ASTM D-2882), I-286-S)
- Dennison (T-5D)
- US Steel (126, 136, 127)

F.O.B: Hartville, Ohio

Availability: 1 Gallon, 5 Gallon Pail, Drum, Totes, Bulk

Bio-Fleet Typical Specifications

STABILIZED™
Renewable Lubricants

ISOGREEN™
CERTIFIED LUBRICANTS

The test data below shows that the Bio-Fleet™ 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-Fleet™ Hydraulic Fluids are formulated to improve performance in equipment that requires excellent anti-wear, rapid water separation and cold temperature pumpability as low as -35°C. They are compatible with the same seals, filters, materials and components that are designed to operate on petroleum oil-based formulations.

TYPICAL SPECIFICATIONS	METHOD	ISO 22	ISO 32	ISO 46	ISO 68	Spec. Requirements
Specific Gravity @ 15.6°C	ASTM D-287	0.88	0.88	0.88	0.88	Report
Viscosity @ 40°C	ASTM D-445	22.3	30.5	43.1	62.8	Note 1
Viscosity @ 100°C	ASTM D-445	5.27	6.7	8.8	11.9	Note 1
Viscosity @ -25°C, Brookfield	ASTM D-2983	1,000 cP	1,400 cP	3,400 cP	4,700 cP	Note 1
Viscosity Index	ASTM D-2270	182	186	190	189	90 (min)
Pour Point	ASTM D-97	-38°C	-35°C	-33°C	-30°C	Note 1
Flash Point (COC)	ASTM D-92	205°C	232°C	240°C	248°C	198°C (min)
Fire Point (COC)	ASTM D-92	230°C	255°C	264°C	270°C	218°C (min)
Foam Sequence I, II, III (10 min)	ASTM D-892	0 Foam	0 Foam	0 Foam	0 Foam	0 Foam
Rust Prevention	ASTM D-665					
Distilled Water		Pass	Pass	Pass	Pass	Pass
Syn. Sea Water		Pass	Pass	Pass	Pass	Pass
Copper Corrosion Strip 3hr @ 100°C	ASTM D-130	1A	1A	1A	1A	DIN 51524 2(max)
Dielectric Strength, KV (Avg)	ASTM D-877	46	40	48	40	>35
Rotary Bomb Oxidation, (minutes)	ASTM D-2272	270	272	270	260	USS 120 (min)
Neutralization Number mg KOH/g	ASTM D-974	0.4	0.4	0.4	0.4	1.5 (max)
Swell of Synthetic NBR-L Rubber, % (Avg.)	DIN 53538, Part 1	8.0	6.0	5.0	5.0	0 to 12
Volume Change (%)		-5	-4	-4	-4	0 to -7
Shore A Hardness Change (%)	ASTM D-1401					
Demulsibility, ML Oil/Water/Emulsion		40/40/0	40/ 40/0	40/ 40/0	40/ 40/0	40/37/3 (max)
	ASTM D-4172	<10 minutes	<10 minutes	<10 minute	<10 minute	(30 minutes)
4-Ball Wear, 1h, 167°F, 1200 RPM, 40 kg	DIN 51354	0.42	0.40	0.40	0.40	USS 127 0.5 (max)
FZG Test A/8,3/90		11	11	11	11	US.Steel 10 (min)
Biodegradation Classification	ASTM D-5864 OCED 301B	Ultimate PW1 Readily	Ultimate PW1 Readily	Ultimate PW1 Readily	Ultimate PW1 Readily	Ultimate PW1 Readily
Environmentally Friendly	ISO 15380	yes	yes	yes	yes	
USDA Biobased Tested	New Carbon	yes	yes	yes	yes	meets/exceeds over 50%
Note 1 Viscosity Sufficient for Application						
Note 2 Not Required						
RLI Product Item #		8081-	8082-	8083-	8084-	