



Renewable Lubricants, Inc.

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Bio-SynXtra™ Hydra-Gear Fluids



"Biobased Lubricants that Perform Like Synthetics"

Bio-SynXtra™ Hydra-Gear Fluids are specially designed, biosynthetic formulas that replace conventional mineral oil-based lubricants for bearing, hydraulic, and gear applications not requiring high levels of extreme pressure (EP). Their antiwear (AW) and mild EP performance meets or exceeds FZG load stage 12 in DIN 51354 Part 2 and they meet DIN 51517 Part 3, David Brown DB S1.53.101, Cincinnati Machine for mild EP Gear, and DIN 51524 Part 2 and 3 (HLP/HVLP) for AW Hydraulic requirements. They exceed US Steel 127, 136 & 126, MORGOIL & MORGOIL Advanced, and Morgan No-Twist Mill Specifications. They are recommended for use in marine turbine reduction gears, where heavy tooth loading and shock loading are encountered, they are recommended for worm gear configurations, and meet the requirements for ash less GL-1, GL-2, GL-3, and AGMA Non-EP gear oils in reduction units, bearings, gear sets, and compressors **where they meet the viscosity ranges**. The formulas have combined a high percentage of energy conserving Stabilized Biosynthetic technology with synthetic PAO base stocks. The result is an ultimate biodegradable¹ lubricant which has long life heat stability but which additionally offers AGMA Non-EP gear oils in reduction units, bearings, gear sets, and compressors **where they meet the viscosity ranges**. The products are zinc free and may also be used in systems with silver lined bearings and reduction units with protection advantages of increased bearing, gear, and pump life through extremely high film strength during operating temperatures, and meet the requirements for ash less GL-1, GL-2, GL-3, and units where original equipment manufacturers (OEM) require Turbine R&O fluids. These ash less (zinc free) fluids provide excellent anti-oxidation, anti-foam, and demulsibility properties and are highly inhibited against moisture and rusting in both fresh and sea water and pass A and B Sequences of ASTM D-665 Turbine Oil Rust Test to provide performance and Meets or Exceeds Turbine R&O Fluids, **where they meet the viscosity requirements:** Westinghouse, Dresser, ABB, Fiat Aviazione, Siemens, MIL L 17331, TLV901304, AFNOR NFE 48-600 HL & 48-603 HL, DIN 51515 & 51524 Part 1, U.S. Steel 120, British BS 489, GE GEK 32568F, Cincinnati Landis P-38/55/54, Brown Boveri HTGD 90117, Solar ES 9-224, Alstom HTGD 90117, MIL-H-17672C, and MIL L 17331. In addition, because they are bio-synthetic they provide excellent thermal and oxidation stability exceeding the 2000 hours ASTM D-943 TOST requirement for Solar Gas Turbine.

Typical Specifications

Industrial Grade		Light	Medium-Light	Medium	Heavy Medium	Heavy	Extra-Heavy		
ISO Grade	46	68	100	150	220	320	460	680	1000
AGMA Grade	1	2	3	4	5	6	7	8	8A
VISCOSITIES:									
@ 100°C., cSt. (D-445)	8.7	12.2	16.6	22.7	30.9	44	58	77	99
@ 40°C., cSt. (D-445)	42.7	64.2	93.5	139	203	306	426	638	925
Viscosity Index (D-2270)	188	191	193	193	196	202	207	203	201
Flash Point, COC, °C (D-92)	245	251	256	262	264	272	280	290	290
Pour Point, °C (D-97)	-45	-42	-40	-39	-38	-35	-32	-30	-27
Copper Corrosion (D-130)	1A	1A	1A	1A	1A	1A	1A	1A	1A
4-Ball Wear (US Steel S-205)	.35	.35	.35	.35	.35	.35	.35	.35	.35
4-Ball EP D-2783 Weld /LWI kg, min	200/45	200/45	200/45	200/45	200/45	200/45	200/45	200/45	200/45
FZG Test A/8.3/90 (DIN 51354 Part 2)	12	12	12	12	12	12	12	12	12
Demulsibility (D-1401)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Foam Sequence I, II, III (D-892)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Rust Prevention (D-665 A&B)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
RPVOT (D-2272), Minutes 150 °C	1,000	1,000	1,000	1,000	1,000	1,000	850	850	850
TOST	10,000+	10,000+	10,000+	10,000+	8,000+	8,000+	8,000	8,000	8,000
RLI Product Item #	82710	82720	82730	82740	82750	82760	82770	82780	82790

Features

- (1) Energy Conserving Formulas - Because of the super high viscosity index (VI) of the *Stabilized biosynthetic base oils, these products provide a lighter viscosity (more energy efficient) in the lower start-up temperatures up to 40-45°C and a improved protective viscosity over mineral based formulas in the higher operating temperatures
- (2) Super high viscosity index provides wider temperature performance and improved fluid film strength
- (3) Fortified with additives to resist wear, oxidation, rust, water, and foam
- (4) Improve bearing and gear protection with resistance to scuffing and micropitting
- (5) **Safer**, More fire resistant, improved heat dissipation, and seal protection
- (6) Superior Oxidation Stability over commercial available synthetic and mineral based fluids

Elastomer Compatibility: Bio-SynXtra™ Hydra-Gear Fluids are **recommended** for use with fluorocarbon (Viton), Teflon, fluorosilicone, polysulfide, Hydrogenated NBR (HNBR), low nitrile Buna-N and high nitrile Buna-N. They are compatible with same seals, materials and components that are designed to operate on mineral oil based formulations.

Bio-SynXtra™ Hydra-Gear Fluids meet the Environmental Protection Agency (EPA) 2013 Vessel General Permit (VGP) guidelines for Environmentally Acceptable Lubricants (EALs), and should be used where **LOW TOXICITY**, **BIODEGRADABILITY** and **NON-BIOACCUMULATION** properties are required. They exceed the acute toxicity (LC-50 / EC-50 >1000 ppm) criteria adopted by the US Fish and Wildlife Service and the US EPA. These Biobased Products are **ENVIRONMENTALLY RESPONSIBLE** lubricants that are formulated from renewable biobased resources. We believe Earth's environmental future rests in the use of renewable material.

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

STABILIZED by Renewable Lubricants* is RLI's trademark on their proprietary and patented anti-oxidant, anti-wear, and cold flow technology. These High performance Biosynthetic oils are agricultural biobased oils. This Stabilized technology allows the Biosynthetic oils to perform as a high performance formula in high and low temperature applications, reducing oil thickening and deposits. Patented Product: US Patent 6,383,992, US Patent 6,534,454 with additional Pending and Foreign Patents
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Availability F.O.B.: Hartville, Ohio, USA

1 Gallon

5 Gallon Pail

Drum

Totes

Bulk