



Renewable Lubricants, Inc.

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Bio-Food Grade™ Gear Oils

(ISO 32, 46, 68, 100, 150, 220, 320, 460, 680)



H1, H2



"Biobased Lubricants that Perform Like Synthetics"

Bio-Food Grade™ Gear Oils are biosynthetic formulations for gear drives and right angle gear drives commonly used in food processing equipment. These fluids provide exceptional benefits in environmentally sensitive areas such as in agriculture, marine, water treatment and food processing plants. They are recommended where DIN 51517 Part 3 or AGMA Mild-EP gear oil specifications are required for lubricating bearings, reduction units, and gear sets. These gear sets do not require Hypoid level of EP and because of this the lubricants most commonly specified by makers of gear reducers are R&O or ashless API GL-3 type antiwear fluids. ISO Viscosity Grades 32, 46, 68, and 220 meet and exceed "Military Specifications DOD-L-24651 Lubricating Oils, Food Grade, and Food Processing Equipment." This specification is approved for use by the Departments and Agencies of the U.S. Department of Defense. ISO Viscosity Grades 32, 46 and 68 meet DOD-L-24651 Type I and ISO Viscosity Grade 220 Meet DOD-L-24651 Type II for general purpose and gear oil lubricants. This food grade specification also requires a rating of USDA H-1 for incidental food contact. They are compatible with the same seals, filters, materials and components that are designed to operate on petroleum oil based formulations.

Bio-Food Grade™ Gear Oils have combined patented biosynthetic technology and food grade mild EP/anti-wear additives that meet and exceed the load stage 12 in the FZG (DIN51354) requirement for gear drive lubricants. 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). These Food Grade¹ formulas have improved performance over conventional food grade products in terms of antiwear, oxidation, thermal shear, biodegradability², and fluid film value (viscosity index). This super high viscosity index allows these products to be energy conserving in the startup mode, provide improved load protection, and reduce wear during operation. 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. The products also provide double the oxidation stability over the US Steel 127 test requirement of >125 minutes and shows excellent performance in ASTM D-1401 Turbine Oil Demulsibility with a rating of 40/40/0 in ten minutes. The results are high performance, patented biobased products which have long life and heat stability.

Features

- (1) Recommended for DIN 51517 Part 3, AGMA Mild-EP, and API GL-1, GL-2, GL-3 applications
- (2) Super high viscosity index and low pour point for wide temperature usage
- (3) Energy Conserving Formulas (Because of the natural lubricity and super high viscosity index (VI) of the Stabilized HOBS these products are more energy efficient in the startup mode at temperatures up to 40°C, but provide a more protective heavier fluid film than mineral based formulas at operating temperatures)
- (4) Fortified with food grade additives to resist wear, oxidation, rust and foam
- (5) More fire resistant and improved heat dissipation
- (6) ISO14000 compliant

¹The products are acceptable as lubricants with incidental food contact (H1) for use in and around food processing areas. Such compounds may be used on food processing equipment as a protective anti-rust film, as a release agent on gaskets or seals of tank closures, and as a lubricant for machine parts and equipment in locations in which there is a potential exposure of the lubricated part to food.

Bio-Food Grade™ Gear Oils (**ISO 32, 46, 68, 100 and 150**) meet the Environmental Protection Agency (EPA) 2013 Vessel General Permit (VGP) guidelines for **ENVIRONMENTALLY ACCEPTED 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. Bio-Food Grade™ Gear Oils are **ENVIRONMENTALLY RESPONSIBLE** lubricants that are formulated from renewable agricultural biobased resources. We believe Earth's environmental future rests in the use of renewable materials.

² Based on previous ASTM D-5864 studies and ASTM D-7373 Calculations, ISO 32, 46, 68, 100, and 150 are Ultimate/Readily Biodegradable >60% within 28 days in Aerobic Aquatic Biodegradation of Lubricants and 220, 320, 460, 680 provide Inherent Biodegradation.

STABILIZED by Renewable Lubricants™ is RLI's trademark on their proprietary and patented technology. High Oleic Base Stock (HOBS) are agricultural biobased 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. Patented Product with Pending and Foreign Patents: ™ Trademark of Renewable Lubricants, Inc. Copyright 1999 Renewable Lubricants, Inc.

Availability F.O.B.: Hartville, Ohio, USA 1 Gallon 5 Gallon Pail Drum Totes Bulk

Typical Data

NSF REGISTRATION #		ISO 46 14040 H1, H2			ISO 150 140441 H1, H2	ISO 220 140442 H1, H2	ISO 320 140443 H1, H2		
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ISO grade Replacement	32	46	68	100	150	220	320	460	680
AGMA Replacement	N/A	1	2	3	4	5	6	7	8
ASTM Grade	150	215	315	465	700	1000	1500	2500	3000
VISCOSITIES:									
@ 100°C., cSt. (D-445)	7.0	9.3	13.3	20.0	27.0	37.1	48.4	62.8	84
@ 40°C., cSt. (D-445)	31.6	45.0	65.4	97.9	142.0	212.5	306.8	442.5	640
Viscosity Index (D-2270)	193	196	210	229	228	226	221	216	219
Flash Point, COC, °C (D-92)	230	241	249	257	264	270	273	275	275
Pour Point, °C (D-97)	-40	-38	-33	-31	-27	-25	-22	-20	-18
Copper Corrosion 3hr @ 100°C (D-130)	1A	1A	1A	1A	1A	1A	1A	1A	1A
Acid Number (D-974)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
4-Ball Wear (D-4172)	.35	.35	.35	.35	.35	.35	.35	.35	.35
4-Ball EP Weld Point (kg)	200	200	200	200	200	200	200	200	200
4-Ball EP Load Wear Index	47	47	47	47	47	47	47	47	47
FZG A/8.3/90 (DIN 51354 Part 2)	11	12	12	12	12	12	12	12	12
Demulsibility (D-2711)	40/40/0	40/40/0	40/40/0	40/40/0	40/40/0	40/40/0	40/40/0	40/40/0	40/40/0
Foam Sequence I, II, III (D-892)	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam	< 30/0 Foam
Rust Prevention (D-665 A&B)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Dielectric Strength, kV (D-877)	>45	>45	>45	>45	>45	>45	>45	>45	>45
RPVOT Oxidation Stability (D-2272), Minutes	>250	>250	>250	>250	>250	>250	>250	>250	>250
Biodegradation Classification	² Ultimate	² Ultimate	² Ultimate	² Ultimate	² Ultimate	*Inherent	*Inherent	*Inherent	*Inherent
Meets US EPA VGP	Yes	Yes	Yes	Yes	Yes	No	No	No	No
RLI Product Item #	87200	87210	87220	87230	87240	87250	87260	87270	87280

RLI's Products have been analyzed by the USDA to meet the biobased content guidelines for BioPreferred Procurement by the U.S. Federal Agencies. The Biobased Content Guidelines are listed in law H.R. 2646 Section 9001