



## Renewable Lubricants, Inc.

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### Bio-Spindle™ Oil ISO 22



### *"Biobased Lubricants that Perform Like Synthetics"*

Bio-Spindle™ Oil is an ultimate biodegradable bio-synthetic formula that replaces mineral oil based spindle oils. It is formulated to perform in high speed, lightly loaded bearings that require excellent Anti-Wear, anti-rust, anti-oxidation, anti-foam, and demulsibility properties. This product is 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 (VI) of the Stabilized High Oleic Base Stocks (HOBS) into the formula, increases the viscosity index past synthetic levels (Energy Conserving Formulas). The super high viscosity index of the HOBS naturally improves the thermal shear stability of the formula and increases load capacity. It provides additional fluid value at the higher temperatures, which is a performance benefit over lower VI products of the same ISO viscosity. The HOBS's extremely low volatility increases the flash and fire safety features in the formula. An environmentally friendly zinc-free additive system has also been developed that meets the Anti-Wear requirements for high speed spindle bearings. Bio-Spindle Oil is designed to meet or exceed the ISO standard FC-22.

#### Typical Specifications

<b>ISO Grade</b>	<b>22</b>
VISCOSITIES:	
@100 <sup>o</sup> C., cSt.	4.9
@40 <sup>o</sup> C., cSt.	20.40
Viscosity Index	176
Flash Point, COC, °C	220
Pour Point, °C	-30
Copper Corrosion Strip 3hr @ 100°C	1A
4 Ball Wear, 1h, 167 <sup>o</sup> F, 1200 RPM, 40kg	.40
Demulsibility, ML Oil/Water/Emulsion	40/40/0
Foam Sequence I, II, III (D-892)	0
Rust Prevention, (D-665 A&B)	Pass
Rotary Bomb Oxidation, (min)	350
<b>Product Item #</b>	<b>84300</b>

Bio-Spindle™ Oil meets 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. This product exceeds the acute toxicity (LC-50 / EC-50 >1000 ppm) criteria adopted by the US Fish and Wildlife Service and the US EPA. Bio-Spindle Oil is an **ENVIRONMENTALLY RESPONSIBLE** product that is formulated from renewable agricultural plant resources. We believe Earth's environmental future rests in the use of renewable materials.

#### **<sup>1</sup>Ultimate 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. 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.

Patented Product: US Patent 6,383,992, US Patent 6,534,454 with additional Pending and Foreign Patents

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<b><u>Availability</u></b>	<b><u>F.O.B. :Hartville, Ohio, USA</u></b>	<b><u>1 Gallon</u></b>	<b><u>5 Gallon Pail</u></b>	<b><u>Drum</u></b>	<b><u>Totes</u></b>	<b><u>Bulk</u></b>
	<b>RLI Item #</b>	<b>84303</b>	<b>84304</b>	<b>84306</b>	<b>84307</b>	<b>84309</b>