



# Renewable Lubricants, Inc.

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## **Bio-AW Turbine™ R & O Fluids** **(ISO 32, 46, 68, 100)**



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

Bio-AW Turbine™ R & O Fluids are ultimately biodegradable<sup>1</sup> biosynthetic formulas that were designed specifically to replace mineral oil based turbine oils in environmentally sensitive hydroelectric (water) turbine bearings. These bearings are subject to humid/moist conditions because of occasional seal leakage, but operate cooler than gas and steam turbine bearings.

Bio-AW Turbine™ Fluids are formulated to perform in R & O systems that require anti-foam, anti-rust, anti-oxidation, and demulsibility properties. They are highly inhibited against moisture and rusting in both fresh and sea water and pass both A and B Sequences of the ASTM D-665 Turbine Oil Rust Test. Incorporating the super high viscosity index of the Stabilized\* High Oleic Base Stocks (HOBS) into the formula, gives multi-grade synthetic base oil performance by boosting the viscosity index to synthetic levels. This super high viscosity index of the HOBS naturally improves the thermal shear stability of the formula and increases load capacity. The HOBS's extremely low volatility increases the flash and fire safety features in the formula. A zinc-free additive system has also been developed that is environmentally friendly and exceeds the load stage 10 in the FZG (DIN51354) requirements for both turbine oils and reduction gears. They also meet the requirements for ashless GL-3 gear oil.

#### **Typical Specifications**

<b>ISO Grade</b>	<b>32</b>	<b>46</b>	<b>68</b>	<b>100</b>
<b>VISCOSITIES:</b>				
@100 <sup>o</sup> C., cSt.	6.9	9.67	12.5	16.6
@40 <sup>o</sup> C., cSt.	30.87	43.8	64.1	92.1
Viscosity Index	184	216	198	196
Flash Point, COC, °C	236	243	270	280
Pour Point, °C	-40	-40	-39	-34
Copper Corrosion Strip 3hr @ 100 <sup>o</sup> C	1A	1A	1A	1A
4 Ball Wear, 1h, 167 <sup>o</sup> F, 1200 RPM, 40kg	.40	.40	.40	.40
FZG Test	12	12	12	12
Demulsibility (ASTM D-1401)	40/40/0	40/40/0	40/40/0	40/40/0
Foam Sequence I, II, III (ASTM D-892)	0	0	0	0
Rust Prevention, (ASTM D-665 A&B)	Pass	Pass	Pass	Pass
Rotary Bomb Oxidation, (min)	360	360	360	360
<b>RLI Product Item #</b>	<b>81700</b>	<b>81710</b>	<b>81720</b>	<b>81730</b>

Bio-AW Turbine™ R & O 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. Because they meet the environmental requirements they can also be used where ISO 15380 (HEES/HETG) Hydraulic Fluids are specified. Bio-AW Turbine™ R & O Fluids are **ENVIRONMENTALLY ACCEPTED LUBRICANTS (EALs)** that are formulated from renewable biobased 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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**Availability**    **F.O.B. :Hartville, Ohio, USA**    **1 Gallon**    **5 Gallon Pail**    **Drum**    **Totes**    **Bulk**