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Bio- Synthetic Transformer Fluids

STABILIZED™ by Renewable Lubricants

"Biobased Lubricants that Perform Like Synthetics"

Bio- Synthetic Transformer Fluid is the first renewable and biodegradable dielectric fluid that is a pure synthetic hydrocarbon developed from renewable plant biobased crops. This allows it to be a true drop-in compatible replacement for petroleum based Transformer Fluids, exceeding ASTM D3487 and IEC 60296 specifications. It is a highly Stabilized grade, specifically engineered to deliver maximum resistance to oil degradation for prolonged high-performance operation. High viscosity index and dielectric strength allow product use over a wide temperature range and under heavy electric stress. Outstanding oxidation stability and high temperature properties are expected to extend transformer and fluid life and reduce maintenance over conventional petroleum transformer fluids. It is compatible with petroleum hydrocarbons transformer fluids and transformer system components.

Bio- Synthetic Transformer Fluid meets the Environmental Protection Agency (EPA) 2013 Vessel General Permit (VGP) guidelines for Environmentally Acceptable Lubricants (EALs), and should be used in transformers where LOW TOXICITY, BIODEGRADABILITY and NON-BIOACCUMULATION properties are required. It exceeds the acute toxicity (LC-50 / EC-50 >100 ppm) criteria adopted by the US Fish and Wildlife Service and the US EPA. Bio-SynXtra Transformer Fluid is an ENVIRONMENTALLY ACCEPTED LUBRICANT (EAL) that is formulated from renewable biobased resources. We believe Earth's environmental future rests in the use of renewable materials.

1 Based on previous studies and ASTM D-7373 calculated, Bio- Synthetic Transformer Fluid is Ultimate/Readily Biodegradable >60% within 28 days in ASTM D-5864 Aerobic Aquatic Biodegradation of Lubricants, and meets German Blue Angel CEC L-33-T-82 and CEC L-33-A-934 tests, for Readily Biodegradable >80% within 21 days.

APPLICATIONS • Underground • Over Water • Mobile • Any Environmentally Sensitive Areas

TYPES • Power Transformers • Distribution Transformers

Meets and exceeds ASTM D-3487 & IEC 60296	Rigorous assurance of physical, electrical, and chemical properties and performance
Excellent heat transfer characteristics	Heat easily removed from core and windings
Outstanding oxidation stability	Extends transformer life and reduces maintenance
Low Pour Point	Can be used in very cold environments
Exceptional dielectric strength (49Kv)	Withstands high electric stress without breakdown
High purity synthetic hydrocarbon base oil	High performance and drop-in compatibility for mineral oil replacement
Low toxicity	Reduces environmental impact in case of leaks or spills
Biodegradable	Safer for use in areas where an unintended release would impact local environment

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 base 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.

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

Bio- Synthetic Transformer Fluid

TYPICAL SPECIFICATIONS	METHOD	***Bio-SynXtra Transformer Fluids***	*Spec. Requirements*
Specific Gravity @ 15.6°C	ASTM D-287	***0.88***	*Report*
Viscosity @ 40°C	ASTM D-445	***11.7***	*12.0 (max)*
Viscosity @ 100°C	ASTM D-445	***3.0***	*3.0 (max)*
Viscosity @ 0°C	ASTM D-445	***64.2***	*76.0 (max)*
Viscosity Index	ASTM D-2270	***184***	*90 (min)*
Pour Point	ASTM D-97	***-57°C***	*Note 1*
Flash Point (COC)	ASTM D-92	***178°C***	*145°C (min)*
Aniline Point (COC)	ASTM D-611	***113.4°C***	*63°C (min)*
Gassing Tendency, max, µL/min	ASTM D-2300	***-2.0***	*30 (max)*
Dissipation factor (power factor), at 60 Hz max, %:	ASTM D-924		*max*
25°C		***0.001***	*0.05*
100°C		***0.01***	*0.30*
Dielectric breakdown, kV	ASTM D-877	**49**	30 (min)
Dielectric breakdown, kV	ASTM D-1816		
	(1mm gap)	**31**	20 (min)
	(2 mm gap)	**48**	35 (min)
Copper Corrosion Strip 3hr @ 100°C	ASTM D-130	**1A**	DIN 51524 2(max)
Oxidation Stability (acid sludge)	ASTM D-2440		Max
72 Hours: %sludge by wt.		**0.1**	<0.01
Total acid no., mg KOH/g		**0.3**	<0.01
164 hours: % sludge by wt.		**0.2**	<0.01
Total acid no., mg KOH/g		**0.4**	<0.01
Oxidation Stability (Rotating Bomb), minutes	ASTM D-2112	**>550**	195 min
Corrosive Sulfur	ASTM D-1275B	**Non-corrosive 2d**	Non-corrosive Tarnish Level
Water content, ppm	ASTM D-1533	**9**	35 max
Neutralization Number, mg KOH/g	ASTM D-974	**<0.01**	0.03 max
PCM content, ppm	ASTM D-4059	**ND**	ND
Biodegradation Classification	ASTM D-5864	Ultimate PW1	Ultimate PW1
Environmentally Friendly	ISO 15380	yes	yes
USDA Biobased Tested	New Carbon	yes	meets/exceeds >50%
Environmental Management System	ISO 14001:1996	yes	yes

Availability	**F.O.B. :Hartville, Ohio, USA**	**5 Gallon Pails**	**Drums**
		82294	**82296**