Renewable Lubricants, Inc.
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Bio-Synthetic™ TC-W3 2-Cycle Engine Oil

"Bio-based Lubricants that Perform Like Synthetics"

Renewable Lubricant's (RLI) TC-W3 2-Cycle Engine Oil is a readily biodegradable[1] formula that passes the National Marine Manufacturers Association (NMMA) requirements for TC-W3 Water-Cooled 2-Cycle Engine Oil and for high performance air-cooled engines. RLI's TC-W3 2-Cycle Engine Oil also meets and exceeds Water-Cooled TC-W (BIA) and TC-WII, Motorcycle API TC and Husqvarna Chain Saw requirements. This **Low-Smoke Formula** contains Stabilized Technology to improve fuel stability.

RLI's TC-W3 2-Cycle Engine Oil has been especially designed to operate in water-cooled gasoline engines for the boating industry, and in 2-cycle air-cooled engines for general-purpose equipment and for personal and recreational transportation, such as motorcycles, snowmobiles, chain saws, and lawn and garden equipment.

RLI's TC-W3 2-Cycle Engine Oil does not utilize a solvent to increase gasoline miscibility. This feature offers a significant safety advantage since the product has a flash point of 365°F and is, therefore, not classified as flammable or combustible according to OSHA or D.O.T. regulations. RLI's TC-W3 2-Cycle Engine Oil is readily biodegradable and has the potential of one product servicing both water-cooled and air-cooled 2-cycle engines.

Typical Characteristics

Property	Typical Value	Method
Viscosity, cSt 100°C	9.0	ASTM D-445
Flash point, °C	185	ASTM D-93
Pour point, °C	-36	ASTM D-97
TBN (mg KOH/gm)	2.94	ASTM D-2896

TC-W3 Program Summary

Bench Tests		Method Pass/Fail Criteria
Cloud point, °C	-29	ASTM D-2500
Compatibility	clear	homogeneous after mixed separately with each reference oil (*.**) and stored 48 hours
Brookfield (fluidity) cP		
@ -25°C	5130	ASTM D-2988
Evaluation	pass	less than 7500 cP
Miscibility (inversions @ -25°C)		ASTM D-4682
Candidate/reference	75/95	no more than 10% inversions
Evaluation	pass	than reference*
Rust test, %		NMMA Procedure
Candidate/reference	3.16/4.04	equal to or better than reference*
Evaluation	pass	NMMA Procedure
Filterability, % Change, Candidate/Evaluation	+6.5/ pass	decrease in flow not greater than 20%

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.

[1] Readily Biodegradable >80% within 21 days in CEC L-33-T-82 test.

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

* Trademark of Renewable Lubricants, Inc.

Availability **F.O.B. :Bolton, ON, Canada** **1 Gallon** **5 Gallon Pails** **Drums** **Bulk**

ENGINE TEST RESULTS:

OMC 40 Horsepower Test (98 hours)		Not lower than 0.6 below same ratings
Average Piston Varnish, Candidate/Reference	9.2 / 8.9	of reference*
Top Ring Stick, Candidate/Reference	10.0/9.5	
Evaluation	Pass	
OMC 70 Horsepower Test (100 hours)		Equal to or better than some ratings
Average Piston Deposits, Candidate/Reference	6.5 / 5.0	of reference***
Second Ring Stick, Candidate/Reference	9.6 / 7.6	
Evaluation	Pass	
Mercury 15 Horsepower Test (100 hours)	100 hours	100 hours with no stuck rings, plus
Scuffing, Candidate Evaluation	Pass	a) scuffing within allowable limits (30%)
Bearing Stickiness, Candidate Evaluation	Pass	b) needles must fall easily from wrist pin
Compression Loss, Candidate Evaluation	Pass	c) 20 psi maximum compression loss
Overall Candidate Evaluation	Pass	(reference*** run every 5 candidate runs)
Yamaha CE50S Tightening/Lubricity Test		Equal to or better than reference** within
Torque Drop, lb-in. Candidate/Reference/Eval.	5.18 / 5.43 / Pass	90% confidence level
Yamaha CE50S Preignition Test (100 hours)		Equal to or better than reference*
Major Preignitions, Candidate/Reference/Eval.	1 / 1 / Pass	

* #93738 (TC-W II reference oil) ** XPA-3259 *** OR-71591