Bio-SynXtra™ Marine 2 Cycle Engine Oil
(High performance Universal Water and Air cooled 2 cycle engine oil)
"Biobased Lubricants that Perform Like Synthetics"

Bio-SynXtra™ Marine 2 Cycle Engine Oil is a patented, readily biodegradable, biobased synthetic formula, that meets and exceeds the EPA-VGP, National Marine Manufacturers Association (NMMA) requirements for TC-W3™ Water-Cooled 2T Outboard Engines, and API TC+ for high performance air cooled engines. It replaces NMMA obsolete Water-Cooled TC-W (BIA), TC-WII for older outboard water-cooled engines, and NMMA TC-W3™ newer outboard water-cooled engines requirements. This high performance 2-Cycle formula provides additional antiwear/anti-scuffing protection and is recommended for use in lawn and garden equipment, chainsaws, snow blowers, motor scooters, mopeds, snowmobiles and outboard water-cooled engines. TC-W3™ is a registered trademark / specification of the NMMA.

Bio-SynXtra™ Marine 2 Cycle Engine Oil contains enhanced lubricity boosters and additional cleanliness chemistry that improves lubrication performance for high output Motorcycle API TC, Husqvarna Chain Saw 242/266 and Meets or Exceeds TC-W3 outboard water-cooled engine requirements. It is specifically formulated to reduce visible smoke and burn clean, minimizing deposits and carbon buildup, and preventing ring sticking and spark plug fouling. In addition, this technology minimizing deposits and carbon buildup in equipment operating at high and low RPMs.

Bio-SynXtra™ Marine 2 Cycle Engine Oil is recommended in both carbureted and Direct Fuel Injected (DFI) systems. This ashless, Low-Smoke Formula contains Stabilized® Technology to improve fuel stability.

For premixed fuel-oil systems, see owner’s manual for recommended fuel: oil ratio.

**Typical Characteristics**

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity, cSt 100°C</td>
<td>8.0</td>
<td>ASTM D-445</td>
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<tr>
<td>Flash point, °C</td>
<td>185</td>
<td>ASTM D-93</td>
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<tr>
<td>Pour point, °C</td>
<td>-42</td>
<td>ASTM D-97</td>
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<tr>
<td>TBN (mg KOH/g)</td>
<td>6.0</td>
<td>ASTM D-2896</td>
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**TC-W3 Program Summary**

**Bench Tests**

- **Cloud point, °C**
  - Method Pass/Fail Criteria: ASTM D-2500
- **Compatibility**
  - Method Pass/Fail Criteria: NMMA_CTCW homogeneous after mixed separately with each reference oil and stored 48 hours
- **Brookfield (fluidity) cP @ -25°C**
  - Method Pass/Fail Criteria: ASTM D-2988
- **Miscibility (inversions @ -25°C)**
  - Method Pass/Fail Criteria: ASTM D-4682/8992
- **Rust test, %**
  - Method Pass/Fail Criteria: NMMA Procedure
- **Filterability, % Change, Candidate/Evaluation**
  - Method Pass/Fail Criteria: NMMA_FPT Procedure
- **Lubricity Test**
  - Method Pass/Fail Criteria: AF-27

1 Readily Biodegradable >60% within 28 days according to ASTM D 5864

*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.*
2-CYCLE ENGINE OIL PROGRAM SUMMARY

TYPICAL ENGINE TEST RESULTS:

OMC 40 Horsepower Test (100 hours)
- Average Piston Varnish, Candidate/Reference
- Top Ring Stick, Candidate/Reference
- Evaluation

Not lower than 0.6 below same ratings of reference**

OMC 70 Horsepower Test (100 hours)
- Average Piston Deposits, Candidate/Reference
- Second Ring Stick, Candidate/Reference
- Evaluation

Equal to or better than some ratings of reference**

Mercury 15 Horsepower Test (100 hours)
- 100 hours
- Scuffing, Candidate Evaluation
- Bearing Stickiness, Candidate Evaluation
- Compression Loss, Candidate Evaluation
- Overall Candidate Evaluation

100 hours with no stuck rings, plus:
a) scuffing within allowable limits (30%)
b) needles must fall easily from wrist pin
c) 20 psi maximum compression loss
(references run every 5 candidate runs)

Yamaha CE50S Tightening/Lubricity Test
- Torque Drop, lb-in. Candidate/Reference/Eval.

4.16 / 4.26 / Pass

90% confidence level

Yamaha CE50S Preignition Test (100 hours)
- Major Preignitions, Candidate/Reference/Eval.

Equal to or better than reference**

Reference ** OS250541

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<th>Availability</th>
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<th>Quart</th>
<th>Gallon</th>
<th>Pail</th>
<th>Drum</th>
<th>Totes</th>
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