



## HP Marine™ Synthetic 2-Stroke Oil

### The High-Performance Marine 2-Stroke Oil

High-quality motor oil is critical for maximum performance in modern two-cycle marine motors. Direct fuel injection (DFI) improves combustion efficiency, delivering the extra power enthusiasts want, while leaner gas-to-oil ratios provide the reduced exhaust emissions the government mandates. The leaner ratio leaves less oil to lubricate and protect these hotter, more powerful motors, which invites deposits and wear that threaten engine performance and life. HP Marine is proven to excel in these harsh challenges. It controls performance-robbing friction, heat and wear, yet produces low smoke and has low aquatic toxicity properties. It's an oil as advanced as the engines it protects.

#### Outstanding Wear Protection

The elevated heat and friction of modern two-cycle marine motors can exceed the film strength of inferior oils, increasing the likelihood of scuffing and wear. HP Marine's exclusive synthetic formulation provides increased lubricity for reduced wear during normal and lean-mix operation (see field study results). In 534 hours of field testing, HP Marine completely prevented piston skirt and cylinder bore scuffing, demonstrating its superior lubricity and ability to reduce friction between moving parts. It maintains a strong lubricating film even in lean-mix, severe-service conditions, helping marine engines achieve maximum life.

#### Excellent Deposit Control

HP Marine is formulated with MAXDOSE™, a system of advanced additives for "super-clean" operation. It helps prevent deposits that lead to poor performance. In field testing, HP Marine inhibited ring deposits that can cause ring sticking and ring jacking (carbon build-up behind the ring, forcing it outward), a phenomenon that occurs in modern DFI outboard motors. It also virtually eliminated exhaust port deposits for reliable, efficient operation.



**NMMA TC-W3  
API TC**

- Excellent for Evinrude® E-TEC™ factory-lean setting (replaces Evinrude XD100™ 2-Cycle Oil)
- Helps prevent deposits
- Protects against wear
- Low smoke
- Protects against rust
- Low aquatic toxicity
- Superior performance as an injection oil or at 50:1 pre-mix

#### Proven in Marine E-TEC Field Study

HP Marine was installed in a 250-hp Evinrude E-TEC engine powering a heavy-duty marine rescue vessel. Following a 28-hour break-in period at the normal oil setting, the engine was programmed to its factory-lean setting and operated for 506 hours prior to disassembly. An ASTM calibrated rater examined and awarded each component either a merit rating on a scale of 0 to 10 (with 10 representing no distress) or a percentage rating (with 0 percent representing no distress). Results prove HP Marine provided exceptional wear protection and deposit control. For complete study results, visit [amsoil.com/proof](http://amsoil.com/proof).

#### Marine E-TEC Field Study Results



The piston rings earned a perfect merit rating of 10, demonstrating no-stick performance. The piston skirts demonstrated 0.00% scuffing, proving HP Marine's superior lubricity and friction-reduction capabilities.

## TYPICAL TECHNICAL PROPERTIES

### HP Marine™ Synthetic 2-Stroke Oil (HPM)

Kinematic Viscosity @ 100°C, cSt (ASTM D 445) . . . . . 8.5  
Kinematic Viscosity @ 40°C, cSt (ASTM D 445) . . . . . 46.8  
Viscosity Index (ASTM D 2270) . . . . . 160  
Pour Point °C (°F) (ASTM D 97) . . . . . -46 (-51)  
Flash Point °C (°F) (ASTM D 92) . . . . . 86 (187)  
Fire Point °C (°F) (ASTM D 92) . . . . . 86 (187)  
ASTM Brookfield Viscosity @ -40°C (°F), cP . . . . . 14025

NMMA TC-W3® Rust Test . . . . . Pass  
Jaso M 342-92 Smoke Test (FD) . . . . . Pass  
TC-W3 Lubricity Test (ASTM D 4863) . . . . . Pass  
OECD – Guideline 203, Fish  
Acute Toxicity Test . . . . . 100% Survival Rate  
OECD – Guideline 202, Daphnia  
Acute Immobilization Test . . . . . 100% Survival Rate

## APPLICATIONS

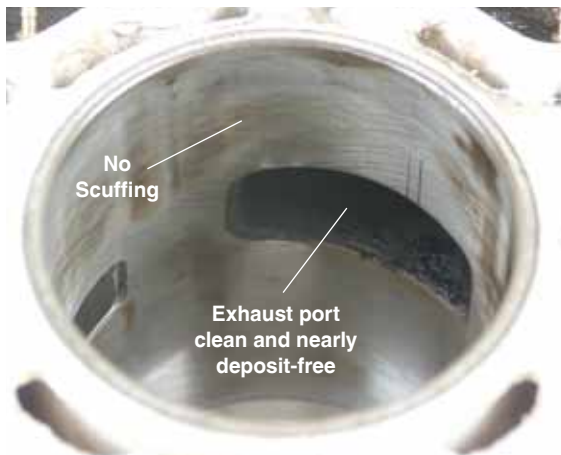
HP Marine™ is recommended for use in all two-cycle outboard motors including, but not limited to, Johnson® and Evinrude® FIGHT® & E-TEC™ (replaces XD100™ 2-Cycle Oil); Mercury® EFI & Optimax®; Yamaha®; Nissan® and Tohatsu® TLDI®; Suzuki®; Mariner® and Force®. It is also recommended for use

in all two-cycle personal watercraft (PWC). Use as injection oil or as 50:1 pre-mix (2.6 oz. per U.S. gallon of gas) where NMMA TC-W3 or API TC oils are specified. Compatible with mineral and synthetic TC-W3-type two-cycle oils; however, mixing two-cycle oils should be minimized.

## HP Marine E-TEC Field Study Results

For complete study results, visit [amsoil.com/proof](http://amsoil.com/proof).

### Cylinder Bore & Exhaust Port



Following 534 hours in service, the cylinder bores demonstrated 0.00% scuffing and the cross-hatch pattern is 100% intact. The exhaust ports are nearly deposit-free. Results prove the superior protection and clean-burning properties of HP Marine.

### Main Bearings



The main bearings showed only trace to light wear despite 534 hours of rigorous use, most at the Evinrude E-TEC engine's factory-lean oil setting. They earned a nearly perfect 9.95 merit rating for deposits.



AMSOIL products and Dealership information are available from your local AMSOIL Dealer.