# Synthetic marine lubricants: delivering tangible benefits for inland and coastal vessels

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Economic and regulatory pressures across the marine industry have combined to create challenging conditions for inland and coastal operators. Vessel owners therefore require solutions that not only ensure compliance with environmental regulations, but ones that can also help them gain a competitive advantage.

The good news is that high performance synthetic lubricants and an integrated used oil analysis program can play a key role in helping to not only meet these challenges, but also deliver a wide range of benefits.

## Technology advancements

Advances in lubricant formulation, especially for fully synthetic-based products, have produced important breakthroughs in recent years. As a result of their base stock, synthetic lubricants can offer a number of benefits compared with mineral lubricants, particularly under severe operating conditions. These include enhanced equipment cleanliness, reduced component wear, extended oil drain intervals and a wide temperature operating range. Such benefits can help improve equipment reliability, extend engine overhauls and reduce maintenance-related downtime.

ExxonMobil has further enhanced these benefits by using a scientifically engineered 'balanced formulation' approach that enables it to develop synthetic lubricants that deliver exceptional performance across critical areas for each application. These include oxidative stability, component wear protection, corrosion control, filterability, shear stability and extreme temperature performance.

## Real life results: Cummins engine inspection

The potential benefits of synthetic lubricants were recently demonstrated during the inspection of a Cummins KTA38 marine diesel engine, one of two main engines on a U.S. inland waterways vessel.

The Cummins engine had accumulated 21,782 running hours over nine years with an initial fill of Mobilgard™ 1 HSD[1] fully synthetic diesel engine oil, specifically designed to provide exceptional wear protection to high speed diesel engines working in severe applications.

ExxonMobil engineers evaluated the cleanliness of the Cummins KTA38 engine using the Coordinating Research Council (CRC) method as per Deposit Rating Manual 20. This rates component sludge contamination on a scale from one to 10, with 10 indicating a complete absence of deposit build-up. After nearly a decade of use, Mobilgard 1 HSD synthetic diesel engine oil delivered exceptional results across a range of test areas, including:

- Engine component cleanliness rating: 9.80
- Sump rating: 9.66
- Front of the engine block rating: 9.80
- Valve covers rating: 9.95

The overall cleanliness rating for the engine was 9.84. There was also a significant lack of damage on common wear components, such as piston skirts, piston wrist pins, cylinder liners, crankshaft and gears. All parts showed minimal signs of distress. Results indicated that the marine engine could have continued to operate efficiently for even longer, due to the extremely high levels of cleanliness and low levels of wear[2].

## Extended oil drain intervals

Oil drain intervals for the Cummins engine were also safely extended to 3,000 hours – more than 10 times longer than the engine builder's recommendation – while maintaining Cummins' suggested filter change intervals.

This helped to reduce operating costs by minimizing total lubricant consumption, which in turn reduced the environmental impact of waste oil disposal. Additionally, oil drain extension can help to promote productivity and safety by cutting down on human-machine interactions (HMI) and equipment downtime. Cummins Marine also confirmed a switch from Mobil Delvac™ 1300 Super, a synthetic blend diesel engine oil, to Mobilgard 1 HSD can result in an increase in fuel efficiency.

## The value of used oil analysis

While high performance synthetic lubricants can play a key role in safely extending oil drain intervals, it's critical to implement a used oil analysis program to closely monitor the health of the engine. This approach can help identify engine issues before they become a problem, enabling preventative measures to be taken.

ExxonMobil's Mobil ServSM Lubricant Analysis was used to closely monitor the health of the Cummins KTA38 marine diesel engine throughout its operation period, with support from the ExxonMobil field engineering team. Engine and lubricant health were monitored and oil drains were extended over time with the support of ExxonMobil engineers.

Mobil Serv Lubricant Analysis is designed to provide a faster and more intuitive experience for operators. It features scan-and-go technology option which allows operators to simply scan the QR code (barcode) of the sample point and bottle, enter the sample information and submit the sample. Operators will then receive an informative report on the condition of equipment and lubricants with tailored recommendations and data trends designed to assist maintenance schedules. Mobil Serv Lubricant Analysis also offers mobile access, enabling operators to view data and results wherever and whenever needed, allowing for real-time updates of sample processing and results.

## Important performance benefits

Synthetic lubricants can offer inland and coastal vessel operators a wide range of important benefits, helping to ensure regulatory compliance while enhancing equipment performance and reliability, reducing human-machine interfaces (HMI) while maintaining safety standards. To take full advantage of these potential benefits, operators should always work with a reputable lubricants supplier that offers the best possible technical expertise and support.

To find out how ExxonMobil can help your operation visit: **www.exxonmobil.com/inlandandcoastal**

[1] Previously branded Mobil Delvac™ 1ESP 5W-40

[2] Based on the experience of a single customer. Actual results can vary depending upon the type of equipment used and its maintenance, operating conditions and environment, and any prior lubricant used.

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