

Overcoming the challenge of lubricant switching in two-stroke engines

For many shipping operators, adapting to the sulphur cap has been a challenge. The move to very-low-sulphur fuel oil (VLSFO) and ultra-low-sulphur fuel oil (ULSFO) has made it more difficult to balance engine performance with reliability. But, as Marcus Schaerer, General Manager Services and Technical at Shell Marine, explains, there is now an easier way to achieve that balance – one that can make lubricant switching a challenge of the past

Why is reliability such a serious issue for engines running on

VLSFO and ULSFO?

This is an interesting question. Our sector has changed at a rapid pace over the last few years, and we have seen manufacturers change their engine designs

to be more efficient and meet the IMO's sulphur cap. So, many ships are now running on VLSFO or ULSFO. This is a positive step, but the challenge is that modern engines operate at higher temperatures and higher pressures – creating deposits within the engine. These deposits, if not dealt with, can reduce the efficiency of the engine and

even lead to component failure. That is why it is vital for operators to focus on effective lubrication. Selecting the right engine cylinder oils can help operators to minimise deposits, improve cleanliness and enhance the reliability of their engines. However, making this selection is not always easy – and can lead to lubricant switching. ➤

Marcus Schaerer, general manager services and technical at Shell Marine



Close collaboration and common research with MAN Energy Solutions



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What is lubricant switching and why is it a challenge?

To deal with engine deposits, some operators had to use high base number lubricant products (BN100) that feature lots of additives and can clean up piston ring deposits for a limited amount of running hours. These oils are designed specifically to cope with high sulphur content and can cause deposits to appear in other areas of the engine. The industry has developed lower base number (BN40) lubricants with fewer additives. Though designed for modern engines, their cleanliness capability is usually lower than their BN100 counterparts. The answer to this? An inefficient process of switching back and forth between the two lubricant types to protect the engine.

Is there a way for operators to avoid this extra work and inefficiency?

In a word, yes. The need to swap between BN40 and BN100 lubricants was one of the reasons why we developed Shell Alexia 40 XC – our Category II cylinder oil for low-speed, two-stroke marine engines using low-sulphur fuels. It has a low base number but is 30% cleaner than Category I BN40 cylinder oils while offering the same cleanliness as Category II BN100 products.^{1,2} So, it can help minimise deposits, control wear and prolong component life. And all while improving the efficiency of on-board operations by removing the need for lubricant switching. The development of Shell Alexia 40 XC has been a remarkable journey of advancement. It has taken a large team of scientists and seafarers, in close collaboration with MAN Energy Solutions (MAN ES), roughly two years to find the right solution. We are proud that it has received a full No Objection Letter from MAN ES. It is important, however, to emphasise that lubrication is not the whole story. Operators should also be monitoring their cylinder oils to help them manage engine reliability.

Why is lubricant monitoring so important to shipping operations?

Cylinder condition monitoring is offering insights into the performance of a two-stroke engine. Shell LubeMonitor, for example, combines on-board and lab testing, engine inspection photos and measurements, and technical advice from Shell experts all in one place. Together, this gives operators vital information that can help them to optimise oil consumption, extend component life and reduce maintenance costs. You cannot assume that the oil alone will solve the challenge, and engine manufacturers are increasingly pushing for cylinder condition monitoring to become a more widespread practice. For example, MAN ES has highlighted its importance and requirements in two service letters (SL2023-737 / 738), and Shell LubeMonitor can help the industry meet these OEM requirements – as an all-in-one solution that goes beyond traditional cylinder condition monitoring.

How can lubrication monitoring get the most out of a product like Shell Alexia 40 XC?

Lubrication monitoring through technical services like Shell LubeMonitor can help operators to optimise their use of Shell Alexia 40 XC. Beyond managing oil consumption, effective monitoring can build trust in our lower-BN formulation – helping to demonstrate the cleanliness it delivers and give operators the confidence to move away from inefficient lubricant switching. This means they can focus on driving engine performance, knowing that they have found that balance between performance and reliability.

Lastly, can you tell us more about the support Shell Marine offers to its customers?

Of course. Alongside the availability of Shell Alexia 40 XC in Greece, we have dedicated Technical Advisors who work closely with vessel engineers to

SHELL LUBEMONITOR

Constant and optimal lubrication monitoring service



Selecting the right engine cylinder oils can help operators to minimise deposits, improve cleanliness and enhance the reliability of their engines

make sure the cylinder oil works as it should. We provided this exact support to Kiran Holdings A.S., a customer in the region looking to address deposits in their main engine piston rings without the need for lubricant switching. They were one of the first to make the switch to our new cylinder oil, so were understandably cautious about it.

But, with our expert advisors working with them to monitor oil conditions across five vessels, they saw a visible improvement in cleanliness,

particularly in the piston ring lands, when compared with previous inspections. It also helped to simplify their onboard operations and reduce the amount of engine inspections they had been carrying out previously. A happy crew all round, and we look forward to working with more operators like that in future. 📺

Disclaimers

[1] Based on results of field trials conducted in collaboration with MAN ES in which Shell Alexia 40 XC oil was tested against a

Category I BN40 cylinder oil (Vessel TS Sydney (Songa Toscana)).

[2] Based on results of field trials conducted in collaboration with MAN Energy Solutions (MAN ES) in which Shell Alexia 40 XC oil was tested against a Category II BN100 cylinder oil (Vessel Mingzhou); based on testing procedures for Category II cylinder oils by MAN ES, approved Category II cylinder oils have a cleaning ability equal to or better than a classical BN100 cylinder oil.



Shell Alexia 40 XC

A low-base number (BN), high-performance cylinder lubricant designed for modern low-speed, two-stroke marine engines using low (< 0.5%) sulphur fuels



Shell Marine