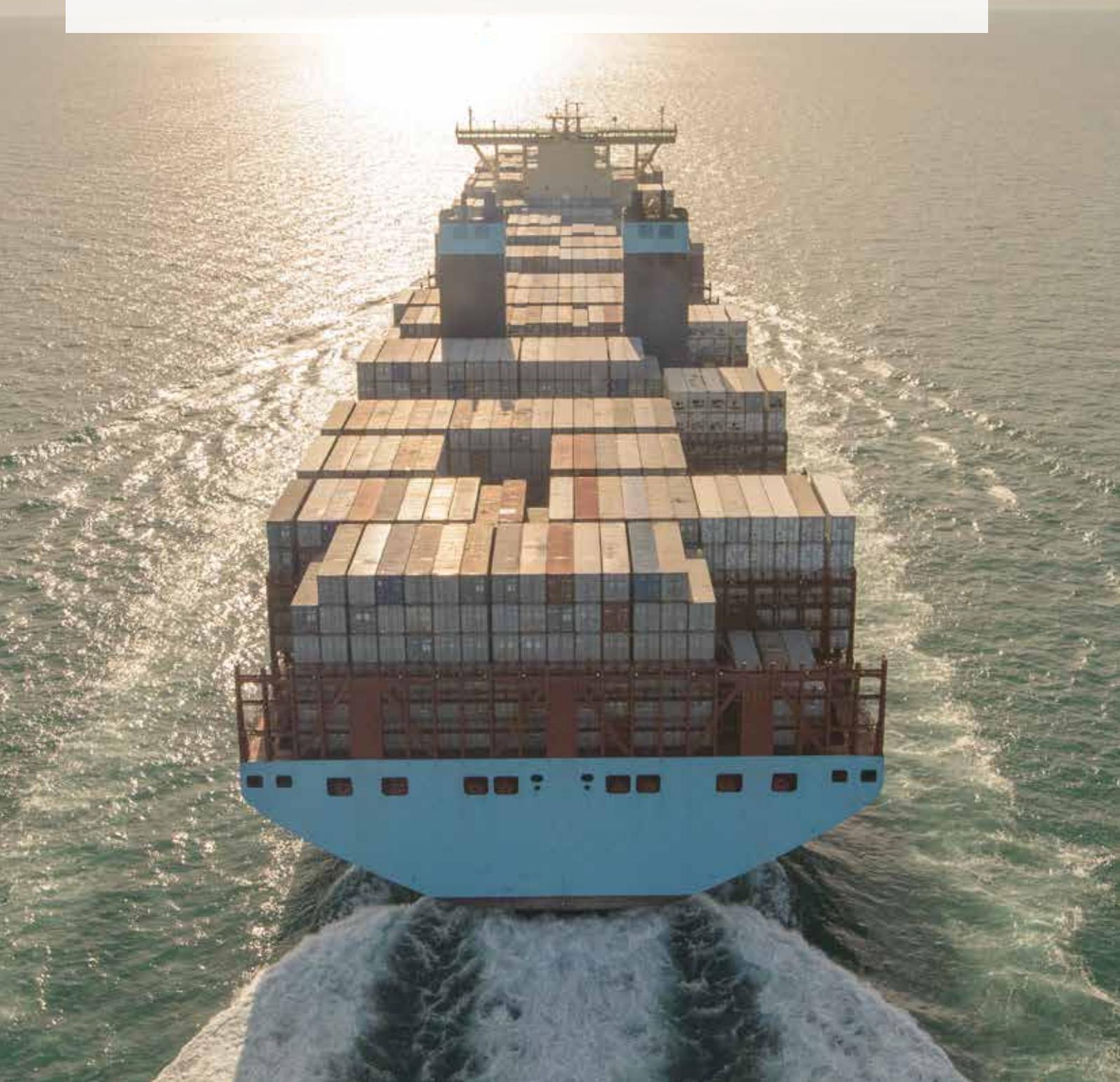


SUPERIOR TECHNOLOGY FOR OVERCOMING THE CHANGING CHALLENGES OF THE SEA



Shell
Alexia

Shell Marine



SHELL ALEXIA: A POINT OF REFERENCE IN A CHANGING WORLD

Over the last few years, the international marine industry has experienced significant changes. Vessel owners and operators are under pressure like never before to reduce operating costs and drive efficiency. New, ever-larger vessels are now commonplace, with container ship capacity rising up to almost 20,000 twenty-foot equivalent units. New highly efficient engines have been introduced by the major manufacturers. In addition, new emissions controls have come into place with the introduction of low-sulphur Emission Control Areas (ECA) in Europe and North America.

This period of uncertainty is unlikely to end soon. Fuel prices remain volatile, so operating conditions such as slow steaming and turbocharger cut-out are still being widely deployed. In addition, the focus on reducing sulphur and NOx emissions, and increasing the energy efficiency design index of ships will continue well into the future.



“WHATEVER YOUR ENGINE, FUEL OR OPERATING CONDITIONS, THERE IS A SHELL ALEXIA OIL YOU CAN RELY ON.”

SHELL ALEXIA PORTFOLIO

	BASE NUMBER (BN)	SAE ENGINE VISCOSITY GRADE	PRODUCT FEATURES
Shell Alexia S6	100	50	High-performance cylinder oil providing enhanced protection in the most demanding new or modified engines ¹
Shell Alexia 50	70	50	Shell's main grade cylinder oil for the majority of engines using heavy fuel oil. Millions of running hours have seen Shell Alexia 50 deliver exceptionally clean pistons and rings.
Shell Alexia S4	60	40	Suitable for low-sulphur, heavy fuel oil applications ^{1, 2}
Shell Alexia S3	25	50	For use in ECAs with low-sulphur and distillate fuels with up to 0.5% sulphur. ¹ Excellent cleanliness and protection for all engine types

¹For detailed application advice based on your specific engine type and operating conditions, please refer to manufacturers' guidelines.

²Available at selected ports. For further information, please contact your account manager





Cost pressures and changing legislation make investing in new and modified engine designs more attractive. However, both new and older engines that are highly de-rated or regularly operated on low-load or with turbocharger cut-out can suffer from excessive acid stress. Under certain slow steaming conditions, almost 300% more acid can be produced compared with older-generation engines. Unless acid production is controlled, this level of acidity can cause severe corrosive wear that leads to high maintenance costs. In addition, vessels are now likely to see very different types of fuel during a single voyage, so having a single lubricant onboard may no longer be a viable option.

At Shell Marine, we understand and anticipate the various challenges that shipping companies face. This has led to us developing four Shell Alexia cylinder oils designed to cover all operating conditions. Shell Alexia cylinder oils can help to prevent corrosion, can be used to minimise feed rates and, ultimately, can contribute towards reduced operating costs. The technical DNA of these oils is underpinned by our rigorous scientific understanding of oil stress and their proven performance in the field.

A team of technical experts is ready to help you to overcome operational complexities by recommending the right lubricant. Our experts are available to work with you on identifying the right lubrication strategies to help simplify your operations and on tailoring our services to your requirements, thereby helping to reduce your operating costs.

- Shell Alexia S6 – BN 100: developed to protect engines from cold corrosion and designed to reduce the cost of maintaining new and modified engines
- Shell Alexia 50 – BN 70: suitable for the majority of low-speed, crosshead diesel engines running on heavy fuel oil with up to 3.5% sulphur
- Shell Alexia S4 – BN 60: suitable for two-stroke engines operating on low-sulphur, heavy fuel oil^{1, 2}
- Shell Alexia S3 – BN 25: formulated specifically to protect low-speed, two-stroke diesel engines operating with low sulphur fuels, including marine gas oil and distillate fuel, and fuel oil containing up to 0.5% sulphur¹ in ECAs

¹For detailed application advice based on your specific engine type and operating conditions, please refer to manufacturers' guidelines.

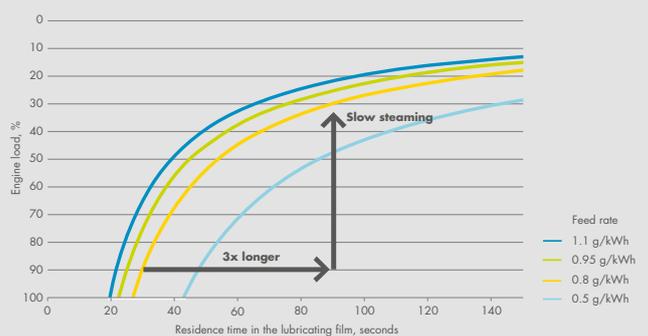
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OIL STRESS AND YOUR ENGINE

Oil stress in a lubricant can cause the product to degrade and become less effective. Two-stroke engine cylinder oil is exposed to four oil-stress factors:

- thermal stress
- insolubles stress
- acid stress
- humidity stress.

These stresses increase significantly under slow-steaming conditions because of the longer oil residence time in the cylinder. In fact, a reduction in engine load from 90% to 30% was found to cause a threefold increase in lubricant residence time. For some oils, slightly longer oil residence time could cause a rapid deterioration in lubricant performance, thereby affecting your engine's performance.



Three times longer: Plotting oil residence time against engine load for a fixed oil feed rate shows that slow steaming may force the oil to work for three times longer than at normal steaming speeds.



TECHNICAL SERVICES

SHELL LUBEMONITOR TO HELP FIND THE BALANCE BETWEEN LUBRICANT COSTS AND WEAR-RELATED MAINTENANCE EXPENSES

Shell Marine offers Shell LubeMonitor as part of its international technical support services, which include feed rate optimisation, cylinder condition monitoring and sweep test recommendations. Shell LubeMonitor helps you to understand the condition of your engine and is particularly recommended for use with the latest engine designs, which may be susceptible to cold-corrosion issues. Taking into account the latest recommendations from the major engine manufacturers, Shell LubeMonitor can be used to help optimise feed rates while ensuring that the engine remains protected from corrosion and wear.

Through our technical services, we can recommend the right products for your needs, offer flexible training programmes, help to optimise equipment performance and analyse and diagnose lubricant-related problems. We offer a suite of technical services programmes that aim to help you overcome operational complexities and reduce your operating costs.

Our full range of services is listed on the right.

SHELL SERVICES

Shell LubeMonitor

A condition monitoring programme for two-stroke engines that includes access to Shell tools and advice to help you strike an acceptable balance between cylinder oil costs and wear-related cylinder maintenance expenses

Shell Rapid Lubricants Analysis

A flexible used-oil laboratory analysis service designed to save you time and money on maintenance resulting from equipment failure. This early-warning system aims to give you peace of mind that your equipment and lubricants are in optimum working order.

Shell LubeAdvisor

This on-site support from a global team of field-based engineers includes lubrication surveys, vessel assessments and in-depth technical and applications support when required. Back-up support is provided by telephone fax or email

CONTACT US

To find out more about Shell Alexia or our technical services, please contact your local Shell Marine representative.

Visit www.shell.com/marine

