



Shell **ALEXIA S4**

Cylinder Lubricant for two-stroke low speed diesel engines

- EXTRA PROTECTION
- OPERATIONAL SIMPLICITY

Shell Alexia S4 is a wide range cylinder lubricant designed for use in two-stroke low speed diesel engines. Shell Alexia S4 is suitable for use with engines burning residual fuel oils between 0.5% and 3.5% sulphur and removes the need for ship operators to carry two lubricant types to cover both low and high sulphur fuels.

Shell Alexia S4 has been especially formulated to deal with all aspects of Oil Stress found in most non-critical engine designs.

Shell Alexia S4 has a BN of 60 and is an SAE40 cylinder oil.

Performance Features and Benefits

- **Engine protection**

Shell Alexia S4 offers acid neutralising properties which helps to prolong the life of components.

It has superior deposit control and minimises deposit build up on pistons, piston rings, ring grooves, under piston spaces and in cylinder ports.

Shell Alexia S4 has been engineered to provide enhanced boundary lubrication properties resulting in low cylinder and piston ring wear with typical cylinder wear rates measured at below 0.05 mm per 1000 hours in the field trials carried out

- **Operational simplicity**

Shell Alexia S4 is a wide range lubricant suitable for use with all types of residual fuel oil. It will also offer protection from the effects of oil stress in non critical engines designs under many different operating conditions, such as slow steaming.

Main Applications

- **Two-stroke low speed diesel engines**

Cylinder lubrication of all types of non-critical two-stroke low speed diesel engines burning residual fuel oil from 0.5 – 3.5% sulphur levels.

Specifications, Validations & Recommendations

Shell Alexia S4 is validated for use by major manufacturers of low speed crosshead diesel engines including:

- Wärtsilä
- MAN
- MHI

- **Cylinder oil feed rates**

Insufficient cylinder oil feed rates can lead to corrosive wear, seized and broken rings and consequent blow-by and scavenge fire risks and to the formation of excessive deposits.

The feed rate should be determined in accordance with OEM guidelines and should then be further optimised using a combination of onboard analysis (such as Shell Analex Alert and Shell Onboard+) and onshore used oil analysis (such as Shell RLA).

Note that although Shell Alexia S4 has a BN of 60, it has been used at the same feed rate as a BN 70 cylinder oil in all the field trials carried out.

- **Mixing of cylinder lubricants**

Shell Alexia S4 is fully miscible with all other cylinder lubricants. However, for optimum performance, Shell Alexia S4 should not be used in conjunction with any other cylinder lubricant.



Typical Physical Characteristics

| Property | | Test Method | Shell Alexia S4 | Units |
|----------------------|-------------------|---------------------|-----------------|----------|
| SAE Viscosity Grade | | | 40 | |
| Viscosity Index | | ASTM D2270 - IP 226 | > 95 | |
| Density | 15 °C | ASTM D4052 - IP 365 | 0.926 | kg/l |
| Flash Point (Closed) | Pensky Martens | ASTM D 93 - IP 34 | > 210 | °C |
| Pour Point | | ASTM D 97 - IP 15 | < -6 | °C |
| BN | | ASTM D2896 - IP 276 | 60 | mg/KOH/g |
| Sulphated Ash | | ASTM D874 - IP 163 | 7.4 | % wt |

These characteristics are typical of current production.

Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health & Safety**

Shell Alexia S4 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of industrial and personal hygiene are maintained. Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

Guidance on Health & Safety is available on the appropriate Safety Data Sheet which can be obtained from your Shell representative

- **Protect the environment**

Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

- Advice on applications not covered in this leaflet may be obtained from your Shell Representative.