



Shell Omala S4 GXV Plus

Advanced synthetic industrial gear oil
approved by SEW and Flender

SHELL
LUBRICANT
SOLUTIONS

Gearboxes are becoming smaller and more sophisticated, and making greater use of lighter materials with higher teeth and bearing loading capacities for higher power, and greater durability and reliability.¹ These advances mean a smaller volume of oil needs to work harder in higher temperatures, with less time for air and water separation. At the same time, the oil is expected to perform for longer to keep your equipment working without interruption. Conventional formulations may fail to meet these challenges, leading to a high total cost of equipment ownership.

Performance at a glance

Shell lubricant	Operating temperature range	Oxidation stability	Wear protection	Corrosion protection	System efficiency	Compatibility
Shell Omala S4 GXV Plus	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Shell Omala S4 GXV	Very good	Excellent	Excellent	Excellent	Very good	Very good
Shell Omala S4 GX	Very good	Very good	Excellent	Very good	Very good	Good
Shell Omala S2 GX	Adequate	Good	Good	Good	Good	Good



¹Source: Kline & Company, Gear Oil Market Report, 5 March 2022



A new oil for current and future gearbox technologies

We have designed the new **Shell Omala S4 GXV Plus** advanced full synthetic industrial gear oil to meet the needs of current and future gearboxes. It passes the specific and demanding testing requirements of latest global industry standards leading gearbox manufacturers and is approved by manufacturers including SEW, Flender and Sumitomo.

In tests² against competitor oils, **Shell Omala S4 GXV Plus** offers

- extended oil life
- enhanced protection
- a wider operating temperature range
- greater system efficiency
- better compatibility.

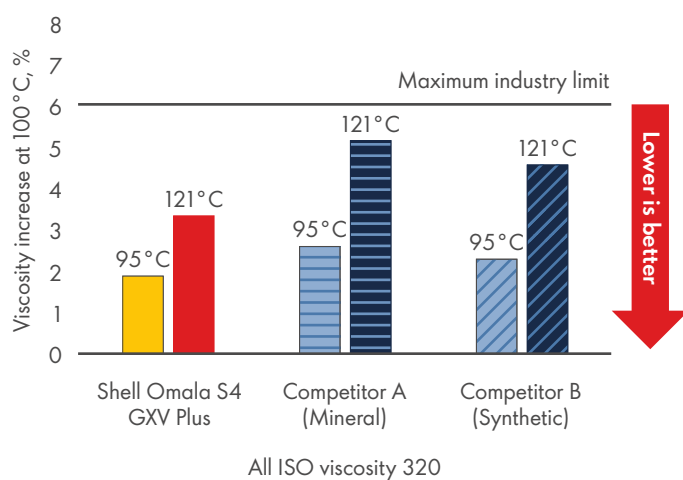


Extended oil life for reduced maintenance frequency

Uncontrolled oxidation can lead to sludge formation, increased viscosity and corrosion, which cause gear and bearing wear, smaller bearing clearances, plugged lines and blocked filters.

After oxidation (accelerated-aging) tests,

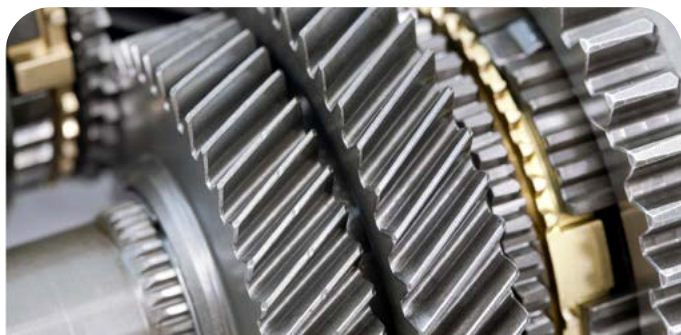
Shell Omala S4 GXV Plus had a **lower viscosity increase** than competitor oils tested.³



[Click here to read the expanded image description in the appendix](#)

²Based on Shell internal competitor benchmarking tests.

³ASTM D2893/DIN EN ISO 4263-4, 95 and 121°C, 312 hours. Data based on Shell internal competitor benchmarking tests.



Better protection for longer gear life

Wear and corrosion can lead to interruptions to your operations and high maintenance costs.



Shell Omala S4 GXV Plus

**has improved
load-carrying capacity
and wear protection**

to help extend component life even under bearing overload conditions⁴



passes rust tests

with distilled water and synthetic seawater,⁵ and has a



**1b rating in copper
corrosion tests⁶**

for good yellow metal compatibility.



⁴Four ball extreme pressure test IP 239/ASTM D2783 and DIN FE8 wear test (80 hours, 7.5 rpm, 80 kN, 80 °C), compared to Shell Omala S4 GXV. ISO 150, based on Shell internal tests results.

⁵ASTM D665 A&B/ISO 7120/IP 135, 4 h at 60 °C, all viscosity grades.

⁶ASTM D130, 3 hours at 130 °C, all viscosity grades.

Wider operating temperature range

In low temperature applications, fluidity is important for protecting equipment.

Shell Omala S4 GXV Plus
has better low-temperature fluidity,⁷

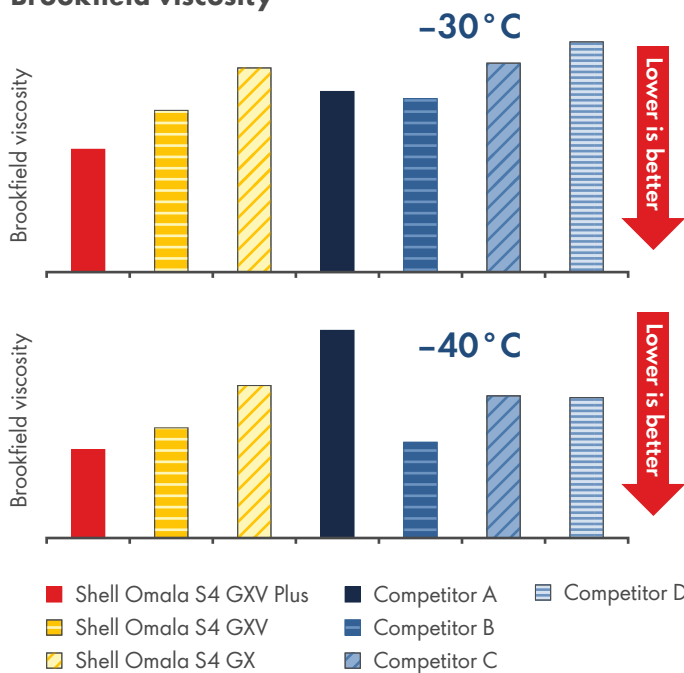
as demonstrated by lower Brookfield viscosity at -30°C and -40°C , and

is designed to retain performance at

operating temperatures up to 120°C

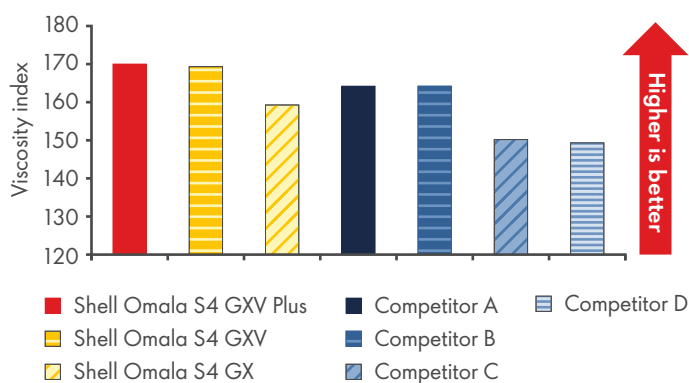
through a high viscosity index for less variation in viscosity with temperature change.⁸

Brookfield viscosity



[Click here to read the expanded image description in the appendix](#)

Viscosity index



[Click here to read the expanded image description in the appendix](#)



⁷ASTM D2983, Brookfield viscosity at -30°C and -40°C for ISO 320 oils, based on Shell internal competitor benchmarking tests.

⁸ASTM D2270, IP 226, for ISO 320 oils, based on Shell internal competitor benchmarking tests.

Greater system efficiency

Foaming can reduce a lubricant's ability to protect critical components, and lead to sump overflow and an unsafe work environment.

Shell Omala S4 GXV Plus

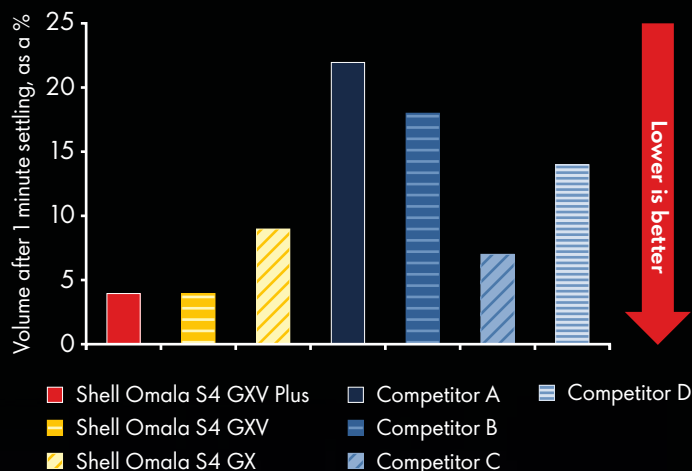
has better foam control

to help protect components and reduce sump overflow as demonstrated by the Flender foam test⁹

continues to pass foam tests after 10,000 Hydac filtration cycles,¹⁰

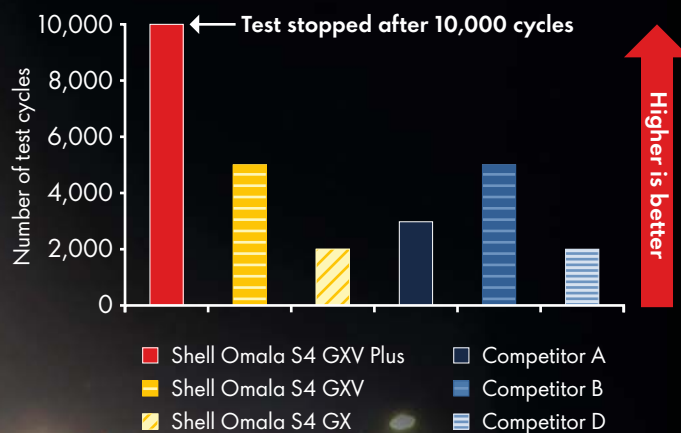
twice as many cycles as its nearest rival. Note that the test was stopped after 10,000 cycles.

Flender foam test⁹



[Click here to read the expanded image description in the appendix](#)

Hydac filtration cycles while passing the Flender foam test⁸



[Click here to read the expanded image description in the appendix](#)

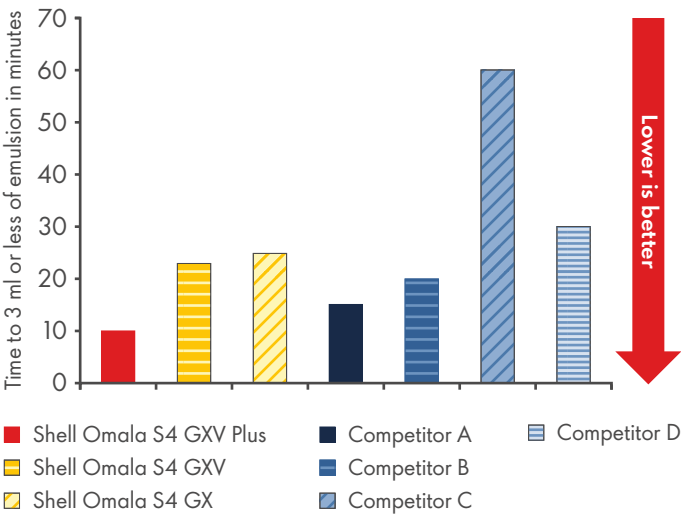


⁹The Flender foam test using neat fluid at 25 °C. ISO 320 oils, based on Shell internal competitor benchmarking tests.

¹⁰3µm, neat fluid at 25 °C, measuring volume after 1 minute settling as a percentage. ISO 320 oils, based on Shell internal competitor benchmarking tests.

Water contamination can accelerate oxidation and cause rust, leading to reduced oil life, higher maintenance costs and increased oil change frequency.

Shell Omala S4 GXV Plus has **improved water separability¹¹** for better system efficiency and reduced maintenance costs.



[Click here to read the expanded image description in the appendix](#)



¹¹ASTM D1401 with water and ISO 320 oils heated to 82°C, stirred for 5 minutes and measured every 5 minutes to determine levels of oil, water and emulsion. Based on Shell internal competitor benchmarking tests.



Proven component compatibility

Higher performance, and more energy efficient and durable gearboxes are being manufactured using advanced materials, including nitrile seals, ceramic bearings, diamond-like super finishes and light-weight alloys, thereby making good compatibility with a wide range of conventional and new materials increasingly important.

Shell Omala S4 GXV Plus

is approved by SEW and Flender

meeting their demanding compatibility tests, including for Freudenberg and Trelleborg seals in static and dynamic testing,¹² and is compatible with commonly used inner and outer paints from various manufacturers.

Key takeaways

Shell Omala S4 GXV Plus can help you reduce the total cost of owning geared equipment. It is designed for current and future gearboxes, and is the first synthetic gear oil to be approved by SEW, Flender and other key global gear manufacturers. Using **Shell Omala S4 GXV Plus** as a single oil for multiple applications can help you simplify your maintenance work, and reduce the complexity and potential risks for managing a large gear oil portfolio. It also offers better all-round performance than previous Shell Omala S4 formulations and the competitor oils we tested.

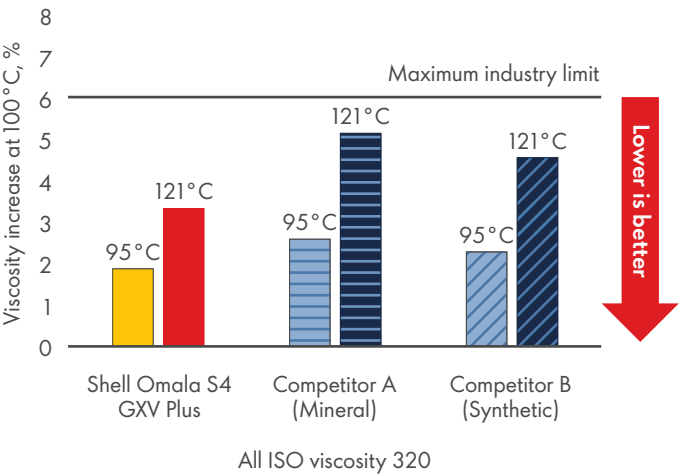
¹²ISO 1817 static and DIN 3761 dynamic testing.



For more information, please contact your Shell Lubricants representative.

www.shell.com/lubricants

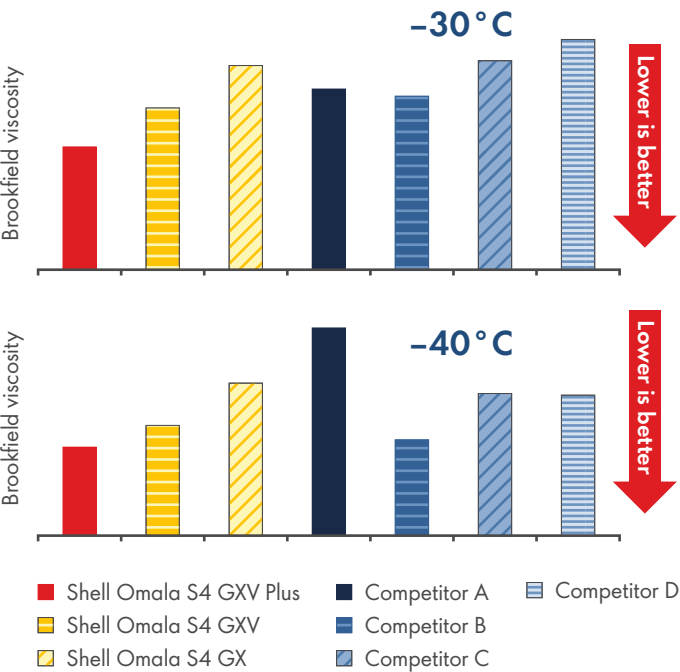
Appendix



The graph presents the results of an oxidation test comparing Shell Omala S4 GXV Plus with two competitor’s oils – one mineral-based and one synthetic. All oils tested have an ISO viscosity grade of 320. The test measures the percentage increase in viscosity at 100 degrees Celcius after 312 hours of oxidation exposure at two temperatures: 95 degrees Celcius and 121 degrees Celcius. A lower viscosity increase is better, as it indicates stronger resistance to oxidation and more stable long-term performance. The maximum industry limit for viscosity increase is shown as 6 per cent.

The bar chart shows that Shell Omala S4 GXV Plus has the lowest viscosity increase of all oils tested. It increased by less than 2 per cent at 95 degrees Celcius and between 3 and 4 percent at 121 degrees Celcius. In contrast, the viscosity of both competitor oils increased between 2 and 3 per cent at 95 degrees Celcius and around 5 per cent at 121 degrees Celcius.

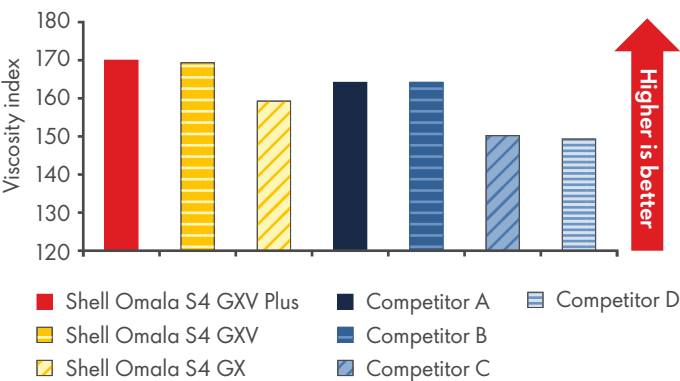
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Graphs show the results of the Brookfield viscosity test for low-temperature fluidity performance, comparing Shell Omala S4 GXV Plus with predecessor oils and four competitor’s oils, all with an ISO viscosity of 320.

The diagram is divided into two bar charts, showing the results of the Brookfield viscosity tests at minus 30 degrees Celcius and minus 40 degrees Celcius. A lower viscosity value is better, as it indicates improved flow and pumpability in cold conditions. At minus 30 degrees Celcius and minus 40 degrees Celcius, Shell Omala S4 GXV Plus shows the lowest viscosities among all oils tested.

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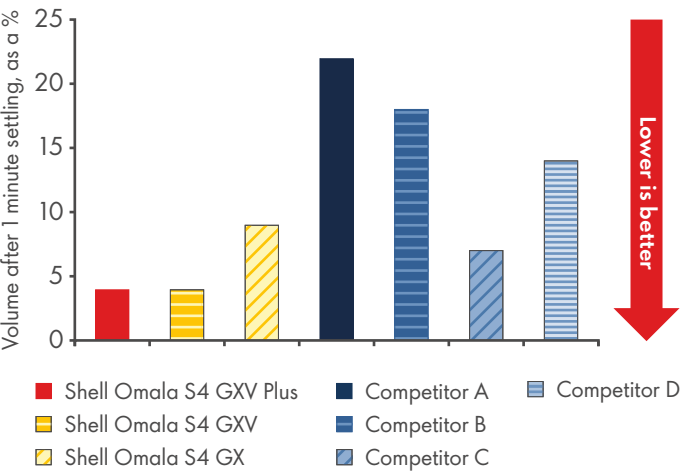
The graph compares the viscosity index of Shell Omala S4 GXV Plus with predecessor oils and four competitor’s oils, all with an ISO viscosity grade of 320. A higher viscosity index is better, as it indicates more stable performance and better equipment protection as temperatures rise.

The bar chart shows that Shell Omala S4 GXV Plus achieves the highest viscosity index among all the oils tested, of almost 170, followed closely by Shell Omala GXV.

Shell Omala S4 GX shows a viscosity index of between 150 and 160. Two of the competitor’s oils show viscosity indices of between 160 and 170, and the remaining two show viscosity indices of around 150.

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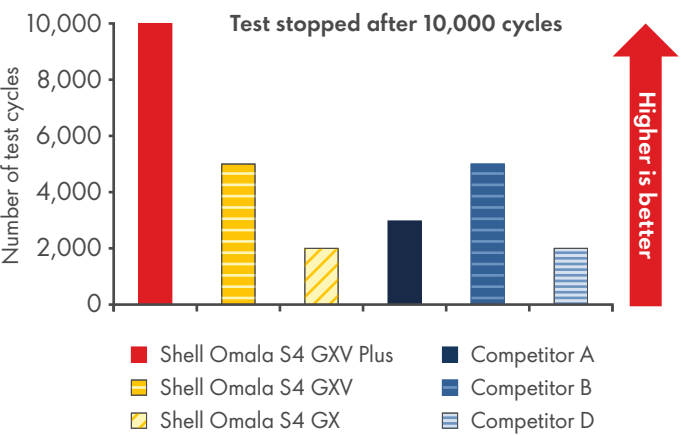
Appendix



The graph compares the Flender foam test results of Shell Omala S4 GXV Plus with predecessor oils and four competitor’s oils. The test measures the percentage of foam volume remaining after 1 minute of settling, with a lower value indicating better foam control and performance.

The bar chart shows that Shell Omala S4 GXV Plus and S4 GXV achieve the lowest foam volume, both of around 4 per cent, while Shell Omala S4 GX produced around 9 per cent volume. Competitor C produced around 7 per cent foam, and the remaining three produced around 22, 17 and 14 per cent foam volume.

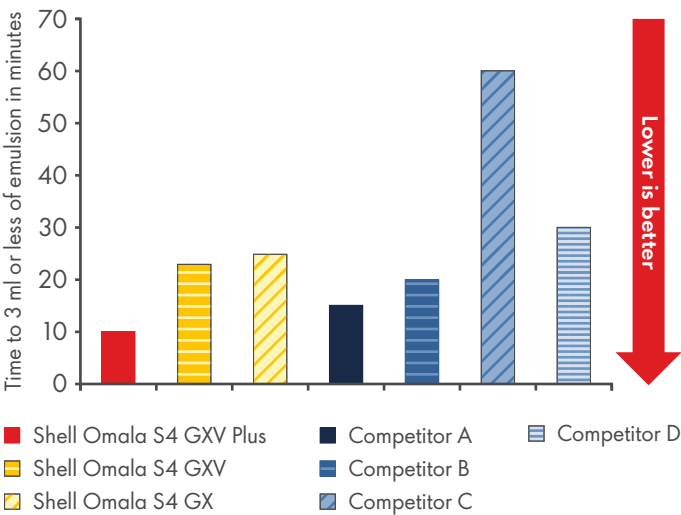
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The graph compares the Hydac filtration endurance test results of Shell Omala S4 GXV Plus with predecessor oils and three competitor’s oils, conducted while simultaneously passing the Flender foam test. The test measures how many filtration cycles each oil can complete before failing, with higher numbers indicating better filtration durability and foam resistance.

Shell Omala S4 GXV Plus completed the highest number of filtration cycles without failure, reaching 10,000 cycles, at which point the test was stopped. Shell Omala S4 GXV and S4 GX completed around 5,000 and 2,000 cycles respectively. Competitor A completed around 3,000 cycles, Competitor B around 5,000 and Competitor D around 2,000 cycles.

[Link to continue reading](#)



The graph compares the demulsibility performance of Shell Omala S4 GXV Plus, two predecessor Shell oils and four competitor oils. The test measures the time taken (in minutes) to reduce an emulsion to 3 millilitres or less. A lower time indicates better demulsibility, meaning faster and more effective separation of water from oil.

The bar chart shows that Shell Omala S4 GXV Plus has the fastest water separation performance, reaching the target emulsion level in less than 10 minutes. Shell Omala S4 GX and Shell Omala S4 GXV both separate in approximately 20 to 25 minutes. Competitor A and B take around 15 and 20 minutes respectively. Competitor C requires nearly 60 minutes. Competitor D takes around 30 minutes.

[Link to continue reading](#)