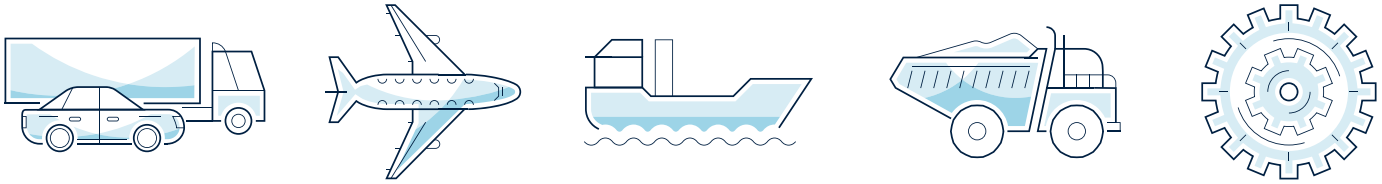
Viva Energy Lubricants Product Guide

July 2018



VIVA Energy Australia

Shell Lubricants Macro Distributor

The information contained in this publication is accurate at the time of printing and reasonable care has been taken to ensure that it is complete and accurate. However, please note that this information is subject to change from time to time, such as when formulations or usage and storage information change. For the latest product information you should visit shell.com.au or Vivaenergy.com.au

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The characteristics in this Product Guide are typical of current products. While future products will conform to industry and Shell specification, variation in these characteristics may occur. Further information on the listed products or specialist products not listed may be obtained from the Viva Energy Technical Solutions team.

Welcome to Viva Energy

Viva Energy is one of Australia's leading energy companies. We're proud to be Australian, proud of our 110-year history and extremely proud of our achievements.

We help Australians reach their destinations by making, importing and delivering the fuels, lubricants, chemicals and bitumen they need to get there. We're with workers on their daily commute and families on their school run. We're with industry, too, helping truck drivers move freight across the country and machinery operators in the mining, aviation and marine industries.

We have the capability to deliver products across Australia, from big cities to some of the most remote locations. Our supply chain has a proven record of delivering to keep our customers moving.

People trust our products. We are the exclusive supplier of high quality Shell fuels and lubricants in Australia. Through our extensive and rapidly growing network of over 1,200 Shell branded service stations across the country, our high quality products are conveniently located and easy to find wherever you are.

We are backed by Shell's strong technical support team with access to the Shell's global best practice and research and development programs. Our local Viva Energy technical team has a wide-range of experience in helping to analyse and maintain equipment, and train operators in best practice and we are here to help customers in the field.

This Lubricants Product Guide has been designed to help you choose the right Shell or Viva Energy lubricant for your application, with product information, key specifications, applications and quick reference charts. If you cannot find the information you are looking for our Technical Helpdesk are ready to assist during business hours on 1300 134 205 or technicalhelpdesk@vivaenergy.com.au

For more information visit vivaenergy.com.au

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Shell Card.

The easy way to manage your business fuel needs.

Are you like many other business owners, stressing over your fuel management? Receipts pile up, the books need to be reconciled and tax minimised.

Shell Card makes it easy. And it doesn't matter how many vehicles you operate, with a valid ABN you can enjoy a wide range of benefits.

Shell Card has been rated five stars for overall customer satisfaction by Canstar in 2018.






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- The online portal is simple to use and gives you complete 24/7 control.
- A single Tax Invoice and Statement itemises the GST for fuel purchases.
- Fuel claims are easily managed.

Great Value

- No more lost fuel receipts – you won't miss claiming a single cent at tax time.
- Flexible payment options give you greater control over cash flow.
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Earn Rewards

- Earn flybuys points at any Shell Coles Express site.
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Fraud Protection

- Control what your employees can purchase on their fuel card.
- Protected with anti-fraud technology and individual PIN number.
- Alerts and purchase controls provide security.
- Each card can be embossed with a vehicle number or a driver's name.

High Quality Fuel

- Shell fuel is backed by more than 100 years of technological expertise.
- Fuels offered include: Shell V-Power, Shell V-Power Diesel, Shell Premium 98, Shell Unleaded 95, Shell Unleaded 91 and Shell Diesel.

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- Shell Card can be used in over 1250 locations across Australia.
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Engine Oils

Designed to meet your needs, whatever your engine challenges.

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Engine Oils

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Shell Helix
Ultra SN 0W-20

Fully synthetic motor oil - The next oil generation for oil cleanliness

Shell Helix Ultra SN uses its latest active cleansing technology to help petrol engines operate to their full potential by keeping them as close as possible to factory clean. It provides unsurpassed sludge and wear protection.

Performance, Features & Benefits:

- Shell's latest active cleansing technology
- Meets ILSAC GF-5 fuel economy standards
- Unsurpassed sludge protection
- Unsurpassed wear protection
- Active clean-up
- Exceptional low-temperature performance
- Excellent resistance to oil degradation
- Low-evaporation formulation

Specifications, Approvals & Recommendations:

- API SN
- ILSAC GF-5
- ACEA A1/B1
- Chrysler MS-6395

Main Applications:

- Shell Helix Ultra SN's fully synthetic formulation offers Shell's maximum protection in very hot and extremely cold climates, and severe driving conditions

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Shell Helix Ultra ECT C2/C3 0W-30

Fully synthetic motor oil - Shell's ultimate protection for vehicle emission systems

Shell Helix Ultra ECT C2/C3 features its most advanced emissions-compatible technology that helps to keep diesel particulate filters clean to help maintain engine performance. It helps to reduce engine friction to provide enhanced fuel economy.

Performance, Features & Benefits:

- Shell's most advanced emissions-compatible technology for low SAPS oil
- Shell's ultimate active cleansing technology
- Unsurpassed sludge protection
- Superior wear protection
- Developed with special antioxidants
- Low viscosity and low friction
- Exceptional low-temperature performance
- Superior piston cleanliness
- Superior corrosion protection
- Superior intake valve cleanliness
- High resistance to mechanical stress
- Low evaporation formulation

Main Applications:

- Shell Helix Ultra ECT C2/C3's fully synthetic formulation uses Shell's most advanced emissions-compatible technology to help petrol engine exhaust catalysts and keep diesel particulate filters clean and protects it from ash build-up that can block the exhaust system and lead to reduced engine performance.
- Shell Helix Ultra ECT C2/C3 can be used for modern petrol engines, diesel engines with particulate filters and gas engines.
- Shell Helix Ultra ECT C2/C3 0W-30 is suitable for use in vehicles currently using SAE 5W-30 or 10W-30 grades, providing enhanced engine protection and fuel economy[1].

1. Applicable where an API SN or ACEA C2/C3 oil is required.

Specifications, Approvals & Recommendations:

- ACEA C2/C3
- API SN
- VW 504.00/507.00
- MB-Approval 229.52, 229.51, 229.31
- Fiat 9.55535-GS1, 9.55535-DS1 (meets requirements)
- Porsche C30

Shell Helix
Ultra ECT C3 5W-30

Fully synthetic motor oil - Shell's ultimate protection for vehicle emission systems

Shell Helix Ultra ECT C3 features its most advanced emissions-compatible technology that helps to keep diesel particulate filters clean to help maintain engine performance. It helps to reduce engine friction to provide enhanced fuel economy.

Performance, Features & Benefits:

- Shell's most advanced emissions-compatible technology for low SAPS oil
- Unsurpassed sludge protection
- Low viscosity and low friction
- Exceptional low-temperature performance
- High resistance to mechanical stress
- Low evaporation formulation
- Shell's ultimate active cleansing technology
- Developed with special antioxidants

Main Applications:

- Shell Helix Ultra ECT C3's fully synthetic formulation uses Shell's most advanced emissions-compatible technology to help petrol engine exhaust catalysts and keep diesel particulate filters clean and protects it from ash build-up that can block the exhaust system and lead to reduced engine performance.
- Shell Helix Ultra ECT can be used for modern petrol engines, diesel engines with particulate filters and gas engines.

Specifications, Approvals & Recommendations:

- ACEA C3
- API SN
- MB-Approval 229.51, 229.31
- BMW LL-04
- GM dexos2™ - Licence number GB2C0710014
- Chrysler MS-11106

Shell Lubricants
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Shell Helix Ultra 5W-40

Fully synthetic motor oil - Shell's most advanced formulation for high performance engines

Shell Helix Ultra uses unique active cleansing technology to help high-performance engines operate at maximum efficiency by helping to protect them from power-robbing deposits and wear. It is suitable for even the longest OEM-recommended drain intervals.

Performance, Features & Benefits:

- Shell's ultimate active cleansing technology
- Superior wear and corrosion protection
- Active clean-up
- Superior resistance to oil degradation
- Low-evaporation formulation
- Exceptional low-temperature performance
- Approved by car manufacturers
- Long life
- Multi-fuel capability

Main Applications:

- Shell Helix Ultra's fully synthetic formulation offers Shell's maximum protection in very hot and extremely cold climates, and severe driving conditions. Shell Helix Ultra can be used for modern petrol engines, diesel engines (without particulate filters) and gas engines, and it is also suitable for use with biodiesel and petrol/ethanol blends.

Specifications, Approvals & Recommendations:

- API: SN/CF
- ACEA: A3/B3, A3/B4
- BMW: LL-01
- MB-Approval: 229.5, 226.5
- VW: 502.00/505.00
- Porsche: A40
- Renault: RN 0700, RN 0710
- PSA: B71 2296
- Ferrari
- Fiat 9.55535-Z2 & Fiat 9.55535-N2 (meets the requirements of)
- Chrysler MS 10725
- Chrysler MS 12991

Shell Helix Ultra SN 5W-20

Fully synthetic motor oil - The next oil generation for oil cleanliness

Shell Helix Ultra SN uses its latest active cleansing technology to help petrol engines operate to their full potential by keeping them as close as possible to factory clean. It provides unsurpassed sludge and wear protection.

Performance, Features & Benefits:

- Long term oxidation stability.
- Shell's ultimate active cleansing technology
- Fuel economy
- Protection against wear
- Easy start-up

Main Applications:

- Shell Helix Ultra SN's fully synthetic formulation offers Shell's maximum protection in very hot and extremely cold climates, and severe driving conditions.
- Suitable for modern petrol engines fitted with catalytic converters and blow-by-gas recirculation.

Specifications, Approvals & Recommendations:

- API SN
- ILSAC GF-5
- ACEA A1/B1
- Chrysler 6395
- GM 6094M
- Ford WSS M2C945-A, M2C930-A

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Shell Helix Ultra Racing 10W-60

Fully synthetic motor oil - Shell's most advanced formulation for high performance engines

Designed to meet the demanding requirements of particular high-performance engines, including those requiring API SN or ACEA A3/B4.

Performance, Features & Benefits:

- Shell's ultimate active cleansing technology
- Superior wear and corrosion protection
- Unsurpassed sludge protection
- Used by Ferrari
- Superior resistance to oil degradation
- Low-evaporation formulation
- Multi-fuel capability

Specifications, Approvals & Recommendations:

- API SN/CF
- ACEA A3/B3, A3/B4
- Ferrari

Main Applications:

- Extreme-performance engines and racing conditions can cause excessive wear of bearings and other engine components. Shell Helix Ultra Racing has been formulated with a higher viscosity to provide exceptional bearing protection under extreme-performance and racing conditions compared with lower viscosity oils.
- Shell Helix Ultra Racing is designed for modified engines and racing engines using petrol, diesel and gas, and it is also suitable for biodiesel and petrol/ethanol blends.

Shell Helix Ultra Professional AF 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including Ford and those requiring ACEA A5/B5.

Performance, Features & Benefits:

- Fuel efficiency
- Engine wear and durability
- Engine cleanliness
- Soot control

Main Applications:

- Shell Helix Ultra Professional AF 5W-30 for petrol and diesel engines is approved against the technically challenging in-house Ford engine oil specification WSS-M2C913-C & WSS-M2C913-D.
- Meets the technical requirements of the Jaguar Land Rover engine oil specification STJLR.03.5003.

Specifications, Approvals & Recommendations:

- API SL
- ACEA A5/B5
- Ford WSS-M2C913-C & WSS-M2C913-D
- Jaguar Land Rover STJLR.03.5003

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Shell Helix Ultra Professional AG 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including General Motors and those requiring API SN or ACEA C3.

Performance, Features & Benefits:

- Fuel efficiency
- General Motors specific in-house tests
- Engine wear and durability
- Engine cleanliness
- Soot control

Specifications, Approvals & Recommendations:

- API SN
- ACEA C3
- GM dexos2™ license GB2B0611014

Main Applications:

- Shell Helix Ultra Professional AG 5W-30 for petrol and diesel engines is approved against the technically challenging General Motors engine oil specification GMW16177 (dexos2™). It is formulated specifically for the dexos2™ specification, which combines parts of API SN, ACEA C3 and in-house General Motors petrol and diesel engine tests, for use as a global service fill oil.

Shell Helix Ultra Professional AF-L 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including Ford, Jaguar and Mazda, and those requiring ACEA C1.

Performance, Features & Benefits:

- Fuel efficiency
- Engine wear and durability
- Engine cleanliness
- Soot control

Specifications, Approvals & Recommendations:

- ACEA C1
- Ford WSS-M2C934-B
- Jaguar Land Rover STJLR.03.5005

Main Applications:

- Shell Helix Ultra Professional AF-L for diesel engines is approved against the technically challenging in-house Ford engine oil specification WSS-M2C934-B. Also approved against the demanding technical requirements of the Jaguar Land Rover engine oil specification STJLR.03.5005.

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Shell Helix Ultra Professional AP-L 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including Peugeot, Citroen and Fiat, and those requiring ACEA C2.

Performance, Features & Benefits:

- Fuel efficiency
- Fiat specific in-house tests
- Peugeot specific in-house tests
- Engine wear and durability
- Engine cleanliness
- Soot control

Specifications, Approvals & Recommendations:

- ACEA C2
- PSA B71 2290

Main Applications:

- Shell Helix Ultra Professional AP-L 5W-30 for petrol and diesel engines meets the technically challenging Fiat 9.55535-S1 and Peugeot B71 2290 in house specifications.
- It is formulated specifically for use in modern Fiat and Peugeot diesel engines using diesel particulate filter technology.

Shell Helix Ultra Professional AP-L 0W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including Peugeot and Citroen and those requiring ACEA C2.

Performance, Features & Benefits:

- Fuel efficiency
- Peugeot specific in-house tests
- Engine wear and durability
- Engine cleanliness

Specifications, Approvals & Recommendations:

- ACEA C2
- PSA B71 2312

Main Applications:

- Shell Helix Ultra Professional AP-L 0W-30 for petrol and diesel engines meets the technically challenging Peugeot B71 2312 in house specification required in the latest Peugeot vehicles. To comply with Euro 6 regulations, it is formulated specifically for use in modern diesel engines using diesel particulate filter (DPF) technology and petrol engines with three way catalytic converters (TWC).

Shell Helix Ultra Professional AR-L 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance passenger car diesel engines, including Renault and those requiring ACEA C4.

Performance, Features & Benefits:

- Fuel efficiency
- Renault specific in-house tests
- Engine wear and durability
- Engine cleanliness
- Soot control

Specifications, Approvals & Recommendations:

- ACEA C4
- Renault RN 0720

Main Applications:

- Shell Helix Ultra Professional AR-L 5W-30 for diesel engines is approved against the technically challenging ACEA C4 and Renault 0720 specifications.
- It is formulated specifically for use in diesel engine vehicles using diesel particulate filter (DPF) technology.
- Its low-SAPS formulation helps protect DPF systems from plugging.

Shell Helix Ultra Professional AV-L 0W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including VW, Audi and Porsche.

Performance, Features & Benefits:

- Fuel efficiency
- Volkswagen specific in-house tests
- Engine wear and durability
- Engine cleanliness
- Soot control

Specifications, Approvals & Recommendations:

- ACEA C3
- Porsche C30
- VW 504.00/507.00

Main Applications:

- Shell Helix Ultra Professional AV-L 0W-30 for petrol and diesel engines is approved against the technically challenging, top-tier VW 504.00/507.00 specifications.

Shell Helix
HX8 ECT 5W-40

Fully synthetic motor oil - Relentless performance, cleansing and protection

Shell Helix HX8 ECT uses advanced emissions-compatible technology that helps to keep diesel particulate filters clean to help maintain engine performance. It helps to reduce engine friction to provide enhanced fuel economy.

Performance, Features & Benefits:

- Wear protection
- Faster flow
- Corrosion protection
- Viscosity control

Main Applications:

- Shell Helix HX8 ECT uses Shell's advanced emissions-compatible technology to help protect the vehicle's emission system. Its low-SAPs formulation helps to keep diesel particulate filters clean and protects them from ash build-up that can block the exhaust system and lead to reduced engine performance.
- Shell Helix HX8 ECT can be used for modern petrol engines, diesel engines with particulate filters and gas engines.

Specifications, Approvals & Recommendations:

- API SN
- ACEA C3
- MB-Approval 229.31, 229.51
- BMW LL-04
- GM dexos2™ License No. D20142GH014
- Renault RN 0700, 0710

Shell Helix HX8 Synthetic 5W-30

Fully synthetic motor oil - Relentless performance, cleansing and protection

Shell Helix HX8 Synthetic works hard to help keep modern engines clean and protected. It helps to prevent the formation of harmful deposits that can lead to performance loss and helps to reduce engine friction to provide enhanced fuel economy.

Performance, Features & Benefits:

- Shell's superior active cleansing technology
- Active clean-up
- Excellent wear protection
- Long-term resistance to oil degradation
- Low viscosity and low friction
- Enhanced low-temperature performance
- Low-evaporation formulation
- Multi-fuel capability

Specifications, Approvals & Recommendations:

- API SN/CF
- ACEA A3/B3, A3/B4
- VW 502.00/505.00
- MB-Approval 229.3
- Renault RN 0700, 0710

Main Applications:

- Shell Helix HX8 Synthetic's formulation can be used in engines in a wide variety of modern vehicles that face these demanding driving conditions, and should be recommended for customers who want to keep the same oil-drain interval and are carrying heavy loads, operating in extreme climates or driving in congested stop-start city traffic.
- Shell Helix HX8 Synthetic can be used for petrol engines, diesel engines (without particulate filters) and gas engines, and is also suitable for use with biodiesel and petrol/ethanol blends.

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Shell Helix HX8 Professional AG 5W-30

Fully synthetic motor oil - Tailored to meet engine manufacturer special requirements

Designed to meet the demanding requirements of particular high-performance engines, including General Motors and those requiring API SN or ILSAC GF-5.

Main Applications:

- Shell Helix HX8 Professional AG 5W-30 for gasoline engines is approved against the technically challenging GM engine oil specification GM dexos 1™ - Gen 2. It also meets the complete ILSAC GF-5 specification. It is formulated specifically for the GM dexos1™ - Gen 2 specification, which combines parts of the ILAC GF-5, ACEA A5/B5 and GM in-house engine tests, for use as a global service-fill oil.

Specifications, Approvals & Recommendations:

- API SN
- ILSAC GF-5
- GM dexos1™ - Gen 2 license D10043GD014

Shell Helix
HX7 ECT 5W-30

Synthetic technology motor oil - Protection for vehicle emission systems

Shell Helix HX7 ECT features emissions-compatible technology that helps to keep diesel particulate filters clean to help maintain engine performance. It helps to minimise the formation of sludge and deposits.

Performance, Features & Benefits:

- Synthetic Technology
- Shell's emissions-compatible technology (ECT) oil
- Shell's superior active cleansing technology
- Excellent sludge protection
- Developed with special antioxidants
- Low viscosity and low friction
- Low-temperature performance
- Resistance to mechanical stress

Specifications, Approvals & Recommendations:

- API SN
- ACEA C3
- MB-Approval 229.31
- Chrysler MS 11106

Main Applications:

- Shell Helix HX7 ECT's synthetic technology formulation uses Shell's emissions-compatible technology to help petrol engine exhaust catalysts and keep diesel particulate filters clean. It protects it from ash build-up that can block the exhaust system and lead to reduced engine performance.
- Shell Helix HX7 ECT can be used for modern petrol engines, diesel engines with particulate filters and gas engines.

Shell Helix
HX7 SN 10W-30

Synthetic technology motor oil - Long term protection against sludge

Shell Helix HX7 SN helps to keep petrol engines clean and operating efficiently. It provides excellent sludge protection and helps to prevent engine wear. It is suitable for use in a wide variety of vehicles driven in demanding traffic conditions.

Performance, Features & Benefits:

- Synthetic Technology
- Shell's unique active cleansing technology
- Active clean-up
- Premium sludge protection
- Superior wear protection
- Meets ILSAC GF-5 fuel economy standards

Specifications, Approvals & Recommendations:

- API SN
- ILSAC GF-5

Main Applications:

- Everyday motorway or city driving can mean severe conditions for engine oil. Shell Helix HX7 SN helps to provide protection for modern vehicles in demanding daily traffic conditions. Suitable for petrol, gas or ethanol containing fuels.

Shell Helix HX7 10W-40

Cleans and protects for extra responsiveness

Shell Helix HX7 has been formulated with special active cleansing technology. It works harder to protect than conventional motor oils by continuously helping to prevent dirt and sludge build-up for better responsiveness right up to the next scheduled oil change.

Performance, Features & Benefits:

- Synthetic Technology
- Shell's unique active cleansing technology
- Active clean-up
- Excellent wear protection
- Excellent resistance to degradation
- Low-temperature performance
- Low-evaporation formulation
- Multi-fuel capability

Specifications, Approvals & Recommendations:

- API SN/CF
- ACEA A3/B3, A3/B4
- JASO SG+
- MB Approval 229.3
- VW 502.00/505.00
- Renault RN 0700, 0710
- Fiat 9.55535-G2 (meets requirements)

Main Applications:

- Shell Helix HX7 helps to prolong the engine life of modern vehicles in demanding daily traffic conditions by protecting against wear. Shell Helix HX7 can be used for petrol engines, diesel engines (without particulate filters) and gas engines, and it is also suitable for use with biodiesel and petrol/ethanol blends.

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Shell Helix
HX7 High Mileage 15W-50

Synthetic technology motor oil - Helps to stop the ageing process in your engine.

Shell Helix HX7 High Mileage helps protect high mileage engines from the formation of sludge and engine deposits. It contains anti-wear additives to help slow down wear.

Performance, Features & Benefits:

- Unique active cleansing technology
- Enhanced with extra anti-wear agents[1]
- Enhanced with anti-wear agents[2]
- Resistance to oil degradation
- High viscosity

Specifications, Approvals & Recommendations:

- API SN/CF
- ACEA A3/B4

Main Applications:

- Everyday motorway or city driving can mean severe conditions for engine oil. Shell Helix HX7 High Mileage helps to prolong the engine life of modern vehicles in demanding daily traffic conditions.
- Suitable for petrol, diesel, gas or ethanol containing fuels.

1. Based on industry standard engine test
2. Compared with Shell Helix HX7 motor oils

Shell Helix HX5 15W-40

Premium multi-grade motor oil - Helps to remove sludge from dirty engines

Shell Helix HX5 is designed to help provide consistent engine performance. It works hard to help protect against engine sludge and reduce wear. It is suitable for a wide variety of vehicles for everyday driving conditions.

Performance, Features & Benefits:

- Active cleansing technology
- Active clean-up
- Effective wear protection
- Resistance to oil degradation
- Multi-fuel capability

Specifications, Approvals & Recommendations:

- API SN/CF
- ACEA A3/B3

Main Applications:

- Shell Helix HX5's premium multigrade formulation helps to provide protection in everyday daily driving conditions. Shell Helix HX5 can be used for petrol, diesel and gas engines, and it is also suitable for biodiesel and petrol/ethanol blends.

Shell Helix
HX3 20W-50

Multi-grade motor oil - Reliable protection for older engines

Shell Helix HX3 helps provide reliable protection for older, high-mileage engines. It helps to prevent sludge and reduce wear. it is suitable for use where API SL/CF is recommended.

Performance, Features & Benefits:

- Active cleansing technology
- Anti-wear additive
- High viscosity
- Multi-fuel capability

Main Applications:

- Shell Helix HX3's multigrade formulation helps to protect the engines of older, higher-mileage vehicles in everyday driving conditions. Shell Helix HX3 can be used for petrol, diesel and gas engines.

Specifications, Approvals & Recommendations:

- API SL/CF

Shell Rimula Ultra 5W-30

Fully synthetic heavy duty diesel engine oil

Shell Rimula Ultra oil features "Low-SAPS" additive technology and unique anti-wear systems. Protection power is enhanced with synthetic technology that delivers extended maintenance and fuel economy performance. Suitable for Euro 4, 5, 6 vehicles.

Performance, Features & Benefits:

- Fuel economy
- Maintenance saving
- Emissions system compatibility
- Low wear, low deposits

Main Applications:

- On-highway heavy duty applications. Particularly suited for a wide range of trucking and transportation applications in modern low-emission vehicles. Especially suitable for fleets with mixed Euro 4, 5 and Euro 6 engine types.

Specifications, Approvals & Recommendations:

- ACEA E6, E7, E9
- API CJ-4, CI-4, CH-4, CG-4, CF-4, CF
- Caterpillar ECF-3
- Cummins CES 20081
- Deutz DQC IV-10 LA
- IVECO TLS E6 (meets requirements)
- JASO DH-2
- MACK EO-O Premium Plus
- MAN M3477, M3677
- MB-Approval 228.51
- MTU Category 3.1
- Renault Trucks RLD-3
- Volvo VDS-4
- Scania LDF-4

Shell Lubricants
Macro Distributor

Shell Rimula
R6 LM 10W-40

Fully synthetic heavy duty diesel engine oil

Shell Rimula R6 LM oil features "Low-SAPS" additive technology and unique anti-wear system. Protective power is enhanced with synthetic technology, resulting in maintenance saving long drain capability, exceptional wear and cleanliness performance.

Performance, Features & Benefits:

- Maintenance saving
- Emissions system compatibility
- Low wear, low deposits
- Fuel economy

Main Applications:

- On-highway heavy duty applications
- Low emission engine use
- CNG engine oil performance

Specifications, Approvals & Recommendations:

- ACEA E6, E9
- API CJ-4, CI-4, CH-4
- Caterpillar ECF-3
- Cummins CES 20081
- DAF Meets ACEA E6
- Deutz DQC IV-10 LA
- IVECO NG2 (meets requirements)
- JASO DH-2
- MACK EO-O Premium Plus
- MAN M3477, M3271-1
- MB-Approval 228.51
- MTU Category 3.1
- Renault Trucks RLD-3
- Scania Low Ash
- Volvo VDS-4

Shell Rimula
R6 MS 10W-40

Fully synthetic heavy duty diesel engine oil

Shell Rimula R6 MS fully synthetic oils deliver highly responsive protection, maintenance saving long drain performance, protection against soot, wear, deposits and fuel economy. Suitable for most Euro 4, 5 engines and Euro 6 Scania engines.

Performance, Features & Benefits:

- Maintenance saving
- Exceptional piston cleanliness
- Low wear - long engine life
- Fuel economy

Main Applications:

- On-highway heavy duty applications
- Low emission engine use

Specifications, Approvals & Recommendations:

- ACEA E7, E4
- Deutz DQC IV-10
- IVECO T3 E4 (meets IVECO specification)
- MAN M3277
- MB-Approval 228.5
- MTU Category 3.
- Renault Trucks RXD
- Scania LDF-2 / LDF-3
- Volvo VDS-3

Shell Lubricants
Macro Distributor

Shell Rimula
R5 LE 10W-40

Synthetic technology heavy duty diesel engine oil

Shell Rimula R5 LE oils feature "Low-SAPS" additive technology while delivering energy savings. Protective power is enhanced through the use of synthetic base oil technology to deliver fuel economy performance with no compromise in durability.

Performance, Features & Benefits:

- Emissions system capability
- Fuel economy capability
- Improved engine cleanliness

Main Applications:

- European heavy duty engines
- Low emission engine use

Specifications, Approvals & Recommendations:

- API CK-4, CJ-4, CI-4 Plus, CI-4, CH-4, SN
- ACEA E9, E7
- JASO DH-2
- IVECO TLS E9 (meets requirements)
- Caterpillar ECF-3, ECF-2
- Cummins CES 20086, 20081
- Deutz DQC III-10 LA
- MTU Category 2.1
- MAN M3575
- MB-Approval 228.31
- Detroit Fluids Specification (DFS) 93K222, 93K218
- Volvo VDS-4.5, VDS-4
- Mack EOS-4.5, EO-O Premium Plus
- Renault Truck RLD-4, RLD-3
- CNH MAT 3521 (meets specification)

Shell Rimula
R4 L 15W-40

Heavy duty diesel engine oil

Shell Rimula R4 L oils use "Low-SAPS" additive technology to protect low emission engines under severe conditions. It delivers improvements in wear and deposit control, resistance to breakdown under high temperatures compared to previous oil.

Performance, Features & Benefits:

- Simplify inventory needs
- Emissions system capability
- Lower operating costs
- Outstanding wear protection

Main Applications:

- Severe duty heavy duty diesel engines
- Off-highway applications

Specifications, Approvals & Recommendations:

- API CK-4, CJ-4, CI-4 Plus, CI-4, CH-4, SN
- ACEA E9, E7
- Allison TES 439
- Caterpillar ECF-3, ECF-2
- Cummins CES 20086, 20081
- Detroit Fluids Specification (DFS) 93K222, 93K218
- Deutz DQC III-10 LA
- MAN M3575
- MB-Approval 228.31
- MTU Category 2.1
- JASO DH-2
- IVECO T2 E7 (meets specification)
- Volvo VDS-4.5, VDS-4
- MACK EOS-4.5, EO-O Premuim Plus
- Renault Trucks RLD-4, RLD-3
- CNH MAT 3521, 3522 (meets specification)

Shell Lubricants
Macro Distributor

Shell Rimula
R4 X 15W-40

Multigrade heavy duty engine oil

Shell Rimula R4 X is designed to provide Triple Protection to improve engine and oil durability. It helps to lower maintenance and increase reliability of vehicles. It's suitable for most heavy-duty diesel engines for on and off highway applications.

Performance, Features & Benefits:

- Acid and corrosion control
- Reduced engine wear
- Deposit control

Main Applications:

- Severe duty heavy duty diesel engines
- High technology low emission engines

Specifications, Approvals & Recommendations:

- API CI-4, CH-4, SL
- ACEA E7, E5, E3
- Global DHD-1
- Caterpillar ECF-2, ECF-1-A
- Cummins CES 20078,77,76,75,72,71
- DDC 93K215
- Deutz DQC III-10
- IVECO T1 (meets requirements)
- JASO DH-1
- Mack EO-N
- MAN M3275-1
- MB Approval 228.3
- MTU Category 2
- Renault Trucks RLD-2
- Volvo VDS-3
- CNH MAT 3520 (meets specification)

Shell Rimula R4 MV 15W-40

Heavy duty diesel engine oil

Shell Rimula R4 MV oils use "Low-SAPS" additive technology to protect low emission engines under severe operating conditions like mining, construction and quarrying.

Performance, Features & Benefits:

- Hardworking protection
- Longer oil life

Main Applications:

- Off-highway applications
- Emission controlled engines

Specifications, Approvals & Recommendations:

- API CK-4, CJ-4
- Caterpillar ECF-2, ECF-3
- Cummins CES 20086, 20081
- MTU Category 2.1
- DQC III-10-LA
- JASO DH-2

Shell Rimula
R3 MV 15W-40

Heavy duty diesel engine oil

Shell Rimula R3 MV oils provide low wear for long engine life, low deposit formation to maintain engine performance and resist breakdown by heat for continuous protection in demanding applications in mining, construction and quarrying.

Performance, Features & Benefits:

- Hard working protection
- Longer oil life

Main Applications:

- Off-highway applications
- Emission controlled engines

Specifications, Approvals & Recommendations:

- Caterpillar ECF-2, ECF-1A
- Cummins CES 20071, 72, 78
- DDC 93K215
- Mack EO-M+
- MTU Category 2
- API CI-4, CH-4, CG-4, CF-4, CF
- ACEA E3

Shell Rimula
R3+ 40

Heavy duty diesel engine oil

Shell Rimula R3 oil adapts to your driving needs to provide extra protection and keep pistons and other engine parts clean. It provides protection against wear for long engine life and protection against deposits for efficient engine performance.

Performance, Features & Benefits:

- Equipment manufacturer acceptance
- High standard of piston cleanliness
- Low engine wear and long component life

Main Applications:

- Dedicated diesel engine oil performance
- Construction industry application
- Stationary equipment

Specifications, Approvals & Recommendations:

- MAN 270
- MB Approval 228.0
- MTU Category 1
- API CF
- ACEA E2

Compatibility & Miscibility:

- Shell Rimula R3 oils should not be used in Detroit Diesel two- stroke engines. An SAE 40 oil meeting the API CF-II Specification and having a sulphated ash content of less than 1% should be used. For these applications, Rotella DD+40 should be used.

Shell Lubricants
Macro Distributor

Shell Rimula
R3+ 30

Heavy duty diesel engine oil

Shell Rimula R3 oil adapts to your driving needs to provide extra protection and keep pistons and other engine parts clean. It provides protection against wear for long engine life and protection against deposits for efficient engine performance.

Performance, Features & Benefits:

- Equipment manufacturer acceptance
- High standard of piston cleanliness
- Low engine wear and long component life

Main Applications:

- Dedicated diesel engine oil performance
- Construction industry application
- Stationary equipment

Specifications, Approvals & Recommendations:

- MAN 270
- MB Approval 228.0
- MTU Category 1
- API CF

Compatibility & Miscibility:

- Shell Rimula R3 oils should not be used in Detroit Diesel two-stroke engines. An SAE 40 oil meeting the API CF-II Specification and having a sulphated ash content of less than 1% should be used. For these applications Rotella DD+40 should be used.

Shell Rotella DD+ 40

Two-stroke heavy duty diesel engine oil

Shell Rotella DD+ Oil 40 is a high performance, heavy duty engine oil designed specifically for all two-stroke diesel engines manufactured by Detroit Diesel Corporation.

Performance, Features & Benefits:

- Low ash technology
- High thermal and oxidative stability
- Excellent protection
- Advanced detergent technology
- Shear stable SAE 40 monograde

Main Applications:

- Detroit Diesel two-stroke engines:
  Recommended for all Detroit Diesel two-cycle engines including '149-Series' used in mine haul trucks.
- Heavy Duty Diesel engines:
  Shell Rotella DD+ is also suitable for general purpose use in non-turbocharged and moderately rated turbocharged heavy duty diesel engines on and off-highway.

Specifications, Approvals & Recommendations:

- API Service Classification: CF-II, CF
- Detroit Diesel Corporation: 7SE 270 8810 (Sulphated Ash - less than 0.8%) - All equipment

Shell Advance 4T Ultra 10W-40

100% Synthetic four-stroke motorcycle engine oil

Shell Advance 4T Ultra with PurePlus Technology, is our top-tier four-stroke motorcycle engine oil. Shell patented PurePlus Technology converts pure natural gas into clear base oil with virtually none of the impurities of crude oil in the starting point for most conventional and synthetic motorcycle oils.

The 100% synthetic Shell Advance 4T Ultra is made from this pure and clear base oil, combined with a motorcycle-specific additive pack with unique Active Cleansing Technology. It helps to cleanse and keep the engine cleaner. A clean motorcycle engine helps provide better engine efficiency, performance and protection. Shell Advance Ultra has been race proven and endorsed by leading motorcycle manufacturers. The product exceeds the requirements of all motorcycle manufacturers.

Performance, Features & Benefits:

- Technology:
  Shell PurePlus Technology converts natural gas into a clear base oil with virtually none of the impurities of crude oil
- Shell Active Cleansing Technology helps prevent dirt particles sticking together to form deposits
- Keeps engine cleaner
- More efficient power delivery & enhanced responsiveness
- Reduces engine noise & vibration
- Protects & prolongs engine life

Main Applications:

- High-performance air and water-cooled four-stroke motorcycle engines, including race-tuned and ones with integral gearboxes and wet clutches.

Specifications, Approvals & Recommendations:

- API SN
- JASO MA2
- and are endorsed by Ducati

Shell Advance 4T Ultra 15W-50

100% Synthetic four-stroke motorcycle engine oil

Shell Advance 4T Ultra with PurePlus Technology, is our top-tier four-stroke motorcycle engine oil. Shell patented PurePlus Technology converts pure natural gas into clear base oil with virtually none of the impurities of crude oil in the starting point for most conventional and synthetic motorcycle oils.

The 100% synthetic Shell Advance 4T Ultra is made from this pure and clear base oil, combined with a motorcycle-specific additive pack with unique Active Cleansing Technology. It helps to cleanse and keep the engine cleaner. A clean motorcycle engine helps provide better engine efficiency, performance and protection. Shell Advance 4T Ultra has been race proven and endorsed by leading motorcycle manufacturers. The product exceeds the requirements of all motorcycle manufacturers.

Performance, Features & Benefits:

- Technology:
  Shell PurePlus Technology converts natural gas into a clear base oil with virtually none of the impurities of crude oil
- Shell Active Cleansing Technology helps prevent dirt particles sticking together to form deposits
- Keeps engine cleaner
- More efficient power delivery & enhanced responsiveness
- Reduces engine noise & vibration
- Protects & prolongs engine life

Main Applications:

- High-performance air and water-cooled four-stroke motorcycle engines, including race-tuned and ones with integral gearboxes and wet clutches.

Specifications, Approvals & Recommendations:

- API SN
- JASO MA2
- and are endorsed by Ducati

Shell Advance 4T AX7 10W-40

Synthetic based four-stroke motorcycle engine oil

Shell Advance 4T AX7 is our premium-tier four-stroke motorcycle engine oil. Its part synthetic content consists of Gas-to-Liquid (GTL) base oil and motorcycle-specific additive pack with Active Cleansing Technology.

GTL base oil is a crystal clear base oil made from pure natural gas. It contains virtually none of the impurities of crude oil used in the starting point for most conventional and synthetic motorcycle oils.

GTL base oil combined with the unique Active Cleansing Technology additive helps to cleanse and keep the motorcycle engine cleaner. A clean motorcycle engine will run more efficiently and will be better protected.

Shell Advance 4T AX7 four-stroke motorcycle engine oil meets the requirements of most motorcycle manufacturers.

Performance, Features & Benefits:

- Keeps engine cleaner
- More efficient power delivery & enhanced responsiveness
- Reduces engine noise & vibration
- Protects & prolongs engine life

Technology:

- Shell Active Cleansing Technology helps prevent dirt particles sticking together to form deposits

Main Applications:

- Performance air and water-cooled four-stroke motorcycle engines with integral gearboxes and wet-type clutch assembly.

Specifications, Approvals & Recommendations:

- API SM
- JASO MA2
- and are endorsed by Ducati

Shell Advance 4T AX7 15W-50

Synthetic based four-stroke motorcycle engine oil

Shell Advance 4T AX7 is our premium-tier four-stroke motorcycle engine oil. Its part synthetic content consists of Gas-to-Liquid (GTL) base oil and motorcycle-specific additive pack with Active Cleansing Technology.

GTL base oil is a crystal clear base oil made from pure natural gas. It contains virtually none of the impurities of crude oil used in the starting point for most conventional and synthetic motorcycle oils.

GTL base oil combined with the unique Active Cleansing Technology additive helps to cleanse and keep the motorcycle engine cleaner. A clean motorcycle engine will run more efficiently and will be better protected.

Shell Advance 4T AX7 four-stroke motorcycle engine oil meets the requirements of most motorcycle manufacturers.

Performance, Features & Benefits:

- Keeps engine cleaner
- More efficient power delivery & enhanced responsiveness
- Reduces engine noise & vibration
- Protects & prolongs engine life

Technology:

- Shell Active Cleansing Technology helps prevent dirt particles sticking together to form deposits

Main Applications:

- Performance air and water-cooled four-stroke motorcycle engines with integral gearboxes and wet-type clutch assembly.

Specifications, Approvals & Recommendations:

- API SM
- JASO MA2
- and are endorsed by Ducati

Shell Lubricants
Macro Distributor

Shell Advance 4T AX5 15W-50

Premium mineral four-stroke motorcycle engine oil

Shell Advance 4T AX5 is our conventional four-stroke motorcycle engine oil. It is made up of premium mineral base oil and motorcycle-specific additive pack with Active Cleansing Technology. The unique Active Cleansing Agent in the additive pack helps to cleanse and keep the motorcycle engine clean. A clean motorcycle engine helps provide better engine efficiency, performance and protection.

Shell Advance 4T AX5 four-stroke motorcycle engine oil meets the requirements of most motorcycle manufacturers.

Performance, Features & Benefits:

- Keeps engine clean
- Reduces engine noise & vibration
- Smooth clutch engagement

Technology:

- Shell Active Cleansing Technology helps prevent dirt particles sticking together to form deposits.

Main Applications:

- Standard air and water-cooled four stroke motorcycle engines with integral gearboxes and wet-type clutch assembly.

Specifications, Approvals & Recommendations:

- API SL
- JASO MA

Shell Advance VSX 2

Synthetic based motorcycle two-stroke engine oil

Shell Advance VSX 2 is a synthetic based lubricant specifically designed for excellent engine protection and performance in two-stroke motorcycle engines. It guarantees superior control against exhaust system blocking and minimises exhaust smoke. Shell Advance VSX 2 is suitable both for all oil-injection and premix systems and exceeds the requirements of leading manufacturers.

Performance, Features & Benefits:

- Excellent engine protection and cleanliness
- Superior control against exhaust system blocking
- Minimised exhaust smoke
- Superior engine efficiency and power
- Very good self mixing properties

Specifications, Approvals & Recommendations:

- JASO FC
- ISO-L-EGD
- Shell Advance VSX 2 meets the requirements of leading motorcycle manufacturers

Main Applications:

- All two-stroke motorcycle engines with oil injection or premix system
- Recommended for high-performance air and water cooled two- stroke engines
- Shell Advance VSX 2 should not be used in outboard engines. The appropriate Shell Nautilus Oil is recommended for this application.

Shell Lubricants
Macro Distributor

Shell Advance SX 2

Motorcycle two-stroke engine oil

Shell Advance SX 2 is a premium quality lubricant for two-stroke motorcycle engines. It guarantees very good engine protection and cleanliness, reliable control against exhaust system blocking and reduces exhaust smoke. Shell Advance SX 2 is suitable both for all oil-injection and premix systems and meets the requirements of leading manufacturers.

Performance, Features & Benefits:

- Very good engine protection and cleanliness
- Reliable control against exhaust system blocking
- Reduced exhaust smoke
- Very good self mixing properties

Main Applications:

- Two-stroke motorcycle engines with oil injection or premix system
- Shell Advance SX 2 should not be used in outboard engines. The appropriate Shell Nautilus oil is recommended for this application.

Specifications, Approvals & Recommendations:

- JASO FB
- ISO-L-EGB
- Shell Advance SX 2 meets the requirements of leading motorcycle manufacturers

Shell Argina S5 40

Lubricants for medium-speed trunk piston engines

Shell Argina S5 40 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel. Shell Argina S5 40 has a BN of 55 and is designed for the latest high output and low oil consumption engines.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of very high oil stress. These conditions usually occur:

- In newer, high output engine designs and especially DF (duel fuel) engines
- Where oil consumption is <0.5 g/kWh
- Where load factors are >90%
- Where fuels with sulphur >3% are in use

Note: Due to its high base number 55, this oil has a high ash content. To avoid excessive ash deposits, do not use with low sulphur fuels, or engines with high oil consumption. For these applications other products in the Shell Argina family may be more suitable.

Specifications, Approvals & Recommendations:

- Shell Argina S5 40 is approved by Wärtsilä and MAN

Shell Argina S4 40

Lubricants for medium-speed trunk piston engines

Shell Argina S4 40 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel. Shell Argina S4 40 has a BN of 40 and is designed for conditions of high oil stress. In addition Shell Argina S4 40 has been optimised to improve deposit control.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of high oil stress. These conditions usually occur:

In newer engine designs, less than 10 years old and/or fitted with flame rings

- Where oil consumption is 0.5-1 g/kWh
- Where load factors are >85%
- Where fuels with sulphur >2% are in use

Shell Argina S4 40 can also be used in marine engine reduction gears and certain other ship-board applications, where specialist lubricants are not required.

Specifications, Approvals & Recommendations:

- Shell Argina S4 40 is approved by Wärtsilä and MAN

Shell Argina S3 40

Lubricants for medium-speed trunk piston engines

Shell Argina S3 40 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual, blended or distillate fuels. Shell Argina S3 40 has a BN of 30 and is designed for conditions of moderate oil stress.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of moderate oil stress. These conditions usually occur:

- In newer engine designs, less than 10 years old
- Where oil consumption is >1 g/kWh
- Where load factors are <85%
- Where fuels with sulphur <3% are in use

Shell Argina S3 40 can also be used in marine engine reduction gears and certain other ship-board applications, where specialist lubricants are not required.

Specifications, Approvals & Recommendations:

- Shell Argina S3 40 is approved by Wärtsilä and MAN

Shell Lubricants
Macro Distributor

Shell Argina S3 30

Lubricants for medium-speed trunk piston engines

Shell Argina S3 30 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel. Shell Argina S3 30 has a BN of 30 and is designed for conditions of moderate oil stress.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of moderate oil stress. These conditions usually occur:

- In newer engine designs, less than 10 years old
- Where oil consumption is >1 g/KWh
- Where load factors are <85%
- Where fuels with sulphur <3% are in use

Shell Argina S3 30 can also be used in marine engine reduction gears and certain other ship-board application, where specialist lubricants are not required.

Specifications, Approvals & Recommendations:

- Shell Argina S3 30 is approved by Wärtsilä and MAN

Shell Alexia S6

Cylinder lubricant for two-stroke low-speed diesel engines

Shell Alexia S6 is a cylinder lubricant designed for use in two-stroke low speed diesel engines running under conditions of extreme oil stress. It provides additional protection in engines that require a very high performing product and is suitable for use with engines burning residual fuel with Sulphur levels >1.0%. It has been engineered to offer excellent performance for the new, more demanding engines, under challenging operational conditions such as "slow" and "flexible" steaming regimes and high fuel Sulphur levels. Shell Alexia S6 has a BN of 100 and is an SAE50 oil cylinder lubricant.

Performance, Features & Benefits:

- Engine protection

Main Applications:

- Two-stroke low speed diesel engines

Specifications, Approvals & Recommendations:

Shell Alexia S6 has been approved for use in:

- MAN B&W two-stroke engine designs (provided that the recommendations in engine type specific guidelines are followed.)
- Wärtsilä two-stroke engine designs (provided that the recommendations in engine type specific guidelines are followed.)
- MHI two-stroke engine designs (provided that the recommendations in engine type specific guidelines are followed.)

Cylinder oil feed rates:

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), in conjunction with engine inspections.

Compatibility & Miscibility:

Mixing of cylinder lubricants

- Shell Alexia S6 is fully miscible with all other cylinder lubricants. However, for optimum performance, Shell Alexia S6 should not be used in conjunction with any other cylinder lubricant.

Shell Alexia 50

Cylinder lubricant for low-speed crosshead diesel engines

Shell Alexia 50 is a high quality cylinder lubricant designed for use in low-speed crosshead diesel engines burning heavy fuel oil. Shell Alexia 50 has been specifically formulated with a proven and reliable technology. Shell Alexia 50 has a BN of 70 and is a SAE 50 cylinder oil.

Performance, Features & Benefits:

- Improved engine reliability
- Lower maintenance costs
- Re-assurance.

Main Applications:

- Shell Alexia 50 is a BN70 cylinder oil for low-speed marine diesel engines which burn heavy fuel oil. For detailed application advice based on your specific engine type and operating conditions refer to manufacturers' guidelines.

Specifications, Approvals & Recommendations:

- Approved by key manufacturers of low speed crosshead diesel engines.

Compatibility & Miscibility:

Mixing of cylinder lubricants

- Shell Alexia 50 is fully miscible with all other cylinder lubricants. However, for optimum performance, Shell Alexia 50 should not be used with any other cylinder lubricant.

Shell Alexia S3

Cylinder lubricant for two-stroke low-speed diesel engines

Shell Alexia S3 is a cylinder lubricant designed for use in two-stroke low speed diesel engines.

Shell Alexia S3 is suitable for use in engines when operating on low sulphur or distillate fuels of up to 0.5% sulphur. These fuels are expected to be used primarily in Emission Control Areas (ECAs) after the fuel Sulphur limit drops to 0.1% on 1st January 2015. Shell Alexia S3 has a BN of 25 and is an SAE50 cylinder oil.

Performance, Features & Benefits:

- Engine protection and cleanliness

Main Applications:

- Two-stroke low speed diesel engines

Specifications, Approvals & Recommendations:

Shell Alexia S3 is validated for use by major manufacturers of low speed crosshead diesel engines including:

- Wärtsilä
- MAN

Changeover Guidelines:

OEM advice should be followed in determining when an engine should switch to Shell Alexia S3

Cylinder Oil Feed Rates:

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 RLA Onboard Alert and Shell Onboard+) and onshore used oil analysis (such as Shell RLA), in conjunction with engine inspections.

Compatibility & Miscibility:

Mixing of cylinder lubricants

- Shell Alexia S3 is fully miscible with all other cylinder lubricants. However, for optimum performance, Shell Alexia S3 should not be used in conjunction with any other cylinder lubricant.

Shell Lubricants
Macro Distributor

Shell Melina S 30

Multifunctional lubricant for low speed marine diesel engines

Shell Melina S is a high performance multifunctional low speed diesel engine lubricant based on a blend of highly refined high viscosity index mineral oils and a balanced selection of additives. It is designed to provide the highest levels of machinery protection in highly rated low speed marine engines, but being multifunctional, can also be used in many different items of marine equipment and used to rationalise the number of grades of lubricant carried on board ship.

Performance, Features & Benefits:

Improved engine operation and reliability:

Shell Melina S effectively neutralises the highly corrosive combustion acids which can contaminate the main system where cylinder oil leaks past piston rod glands.

- Good resistance to corrosion results in protection of metal surfaces from corrosion.
- Good detergency keeps crankcases and under piston spaces clean and optimises efficiency.
- Good air release & antifoam properties mean that air is released from the oil without foaming.

Lower maintenance costs:

- Good oxidation stability combats thermal degradation of the oil and extends its useful life.
- Good water shedding properties mean that water can be easily removed by centrifuge.

Main Applications:

- Low speed marine diesel engine crankcase and piston cooling systems.
- Turbochargers, geared transmissions, oil lubricated stern tubes & deck machinery.
- All ancillary equipment requiring an SAE 30 oil.

Shell Gadinia S3 30

Lubricants for medium-speed marine diesel engines running on distillate fuels

Shell Gadinia S30 30 is a high quality, multifunctional diesel engine lubricant which has been specially designed for the most severe service main propulsion and auxiliary marine trunk piston engines burning distillate, hybrid and bio-fuels with a sulphur content up to 1%. The newly formulated Shell Gadina S3 30 has also been optimised for use in non-engine applications which are typically found on board, such as gearboxes, clutches and stern tubes.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

- Highly rated, medium speed, main propulsion & auxiliary trunk-piston stationary & marine diesel engines.
- Shell Gardinia S3 30 will also perform satisfactorily in smaller high-speed engines typically used in fishing fleets which operate under arduous conditions and have small sump sizes.
- Turbochargers, oil filled stern tubes and variable pitch propellers.
- Deck machinery & other marine applications requiring SAE 40 viscosity oils.

Specifications, Approvals & Recommendations:

- Yanmar
- Daihatsu
- MTU CAT I
- Simplex B&V
- Reintjes
- Siemens/Flender
- Renk, Rheine

Shell Lubricants
Macro Distributor

Shell Gadinia
S3 40

Lubricants for medium-speed marine diesel engines running on distillate fuels

Shell Gadinia S3 40 is a high quality, multifunctional diesel engine lubricant which has been specially designed for the most severe service main propulsion and auxiliary marine trunk piston engines burning distillate, hybrid and bio-fuels with a sulphur content up to 1%. The newly formulated Shell Gadinia S3 40 has also been optimised for use in non-engine applications which are typically found on board, such as gearboxes, clutches and stern tubes

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

- Highly rated, medium speed, main propulsion & auxiliary trunk-piston stationary & marine diesel engines.
- Shell Gadinia S3 40 will also perform satisfactorily in smaller high-speed engines typically used in fishing fleets which operate under arduous conditions and have small sump sizes.
- Turbochargers, oil filled stern tubes and variable pitch propellers.
- Deck machinery & other marine applications requiring SAE 40 viscosity oils.

Specifications, Approvals & Recommendations:

- Yanmar
- Daihatsu
- MTU CAT I
- Simplex B&V
- Reintjes
- Siemens/Flender
- Renk, Rheine

Shell Gadinia AL 40

Advanced lubricant for medium-speed trunk-piston engines running on distillate fuel

Shell Gadinia AL is a premium quality marine engine oil designed for use in medium speed trunk piston engines, which operate on distillate fuels. Shell Gadinia AL is specially designed to control oil consumption in modern engines, where liner-lacquering is a potential problem. Being multifunctional, Shell Gadinia AL can also be used for other shipboard applications such as reduction gears.

Performance, Features & Benefits:

- Improved engine reliability
- Lower maintenance cost
- Re-assurance

Main Applications:

- Highly rated, medium speed diesel engines operating under high load or overload conditions.
- General ship application, including gears, where specialist lubricants are not required.

Specifications, Approvals & Recommendations:

- Rolls-Royce, Bergen
- Deutz AG
- MAN B&W Diesel AG
- Simplex (Compact Sterntube Seals)
- API CF

Shell Lubricants
Macro Distributor

Shell Nautilus
Premium Outboard

Two-stroke premium outboard oil

Shell Nautilus Premium Outboard Oil is a high performance lubricant for the superior protection of all two-stroke petrol outboard motors. Its advanced formulation, which exceeds all outboard motor manufacturer's standards, is a guarantee of long and reliable engine life.

Performance Features & Benefits:

- Shell Nautilus Premium Outboard Oil exceeds the requirements of all major outboard motor manufacturers and all industry specifications.
- Certified by NMMA (National Marine Manufacturer's Association) for service TC-W3 at the manufacturer's recommended fuel/oil ratio (up to 100:1).

Main Applications:

- All two-stroke petrol outboard motors with or without separate oil tanks

Specifications, Approvals & Recommendations:

- NMMA TC-W3

Shell Mysella S5 S 40

Long Life, Low Ash Gas Engine Oil

Shell Mysella S5 S is a premium gas engine oil formulated for use in engines burning non-natural "sour" gas, such as biogas, sewage gas and landfill gas.

Shell Mysella S5 S has been specially developed to provide extended oil drain intervals in engines running on biogas, sewage gas and landfill gas. Shell Mysella S5 S uses a formulation which has been optimised to resist the corrosive and oxidative effects of sulphuric and halogenic acids which are often present in these gases.

Thanks to its low ash content, Shell Mysella S5 S minimises the contribution of the lubricating oil to combustion chamber deposits.

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

Gas Engines:

- All types of four-stroke gas engines burning biogas, sewage gas or landfill gas

Specifications, Approvals & Recommendations:

Shell Mysella S5 S is suitable in engine types where a "low ash" oil is required.

Shell Mysella S5 S is approved by:

- GE Jenbacher: Series 2, 3, Series 4 (Version B) and Series 6 (Version E) for Fuel Class B and C

In addition, Shell Mysella S5 S successfully conforms to the strict requirements of GE-Jenbacher's test for their modern high power density Series 6 (F) and Series 4 (C) engines.

- MAN T&B M-3271-2 (Natural Gas) & M-3271-4 (Special Gas)
- MWM gas engines – TR2105
- 2G agenitor series 2, 3 and 4
- Tedom: Biogas, Landfill gas, Sewage gas
- Caterpillar CG132, CG170, CG260 - TR2105

Shell Mysella S5 S meets all the requirements of the CAT- specification and has been successfully field tested.

It can be used freely in Caterpillar stationary gas engines for biogas and sour gas application. Shell Mysella S5 S also meets the requirements of Waukesha engines.

For engines under warranty, Shell advises contact with the engine manufacturer and Shell representative to choose the appropriate oil given the equipment operating conditions and customer maintenance practices.

Shell Mysella S5 N 40

Long life, low ash stationary gas engine oil

Shell Mysella S5 N is a high performance quality oil blended for use in highly-rated, four-stroke, spark-ignition engines which require a 'low ash' oil.

Shell Mysella S5 N satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology.

Shell Mysella S5 N is specially developed to provide extended drain intervals in those natural gas engines where oil life is a limiting operational factor.

Performance, Features & Benefits:

- Extended oil life
- System efficiency
- Engine protection

Main Applications:

- Spark-ignited gas engines fuelled by natural gas
- May also be used for landfill and biogases

Specifications, Approvals & Recommendations:

Shell Mysella S5 N is suitable in engine types where a "low ash" oil is required.

Shell Mysella S5 N is approved by:

- Cummins: QSV 81G/91G, OSK 60G
- GE Jenbacher: Series 2,3, 4 and CAT, Series 6 all versions Fuel Class A and CAT, Series 4 (from version C) Fuel Class B and C, Series 6 (from version F) Fuel Class B and C
- Guascor: FGLD, SFGLD
- MAN D&T: Medium Speed Engines for Gas Operation
- MTU Series 4000 L61, L62, L63, L64 and L32/L33
- MTU Onsite Energy Series 400
- MAN T&B: M3271-2
- MWM gas engines – TR 2105
- Caterpillar CG132, CG170, CG260 – TR 2105
- MAK: GCM 34 Category 1
- Rolls Royce: KG-1, KG-2, KG-3, KG-4, BV-G, CR-G
- Perkins:4000 series
- Wärtsilä: W 34SG, W 50SG, W 20DF, W 32DF, W 34DF, W 50DF, W25SG, W28SG, W 175SG, W 220SG
- Waukesha: Cogen and 220 GL (Pipeline Quality Natural Gas).

Shell Mysella S5 N meets requirement of:

- Caterpillar Stationary Gas Engines
- Waukesha: other gas engine types
- Tedom

For engines under warranty, Shell advises contact with the engine manufacturer and Shell representative to choose the appropriate oil given the equipment operating conditions and customer maintenance practices.

Shell Mysella S3 S 40

Medium ash gas engine oil

Shell Mysella S3 S is a high performance quality oil blended for use in four-stroke, spark-ignition engines which require a 'medium ash' oil or use sour gases such as landfill, bio or sewage gas as fuel.

Shell Mysella S3 S is also suitable for engines that traditionally require a medium ash oil to protect the valve seating area of the cylinder head.

Shell Mysella S3 S satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology.

Performance, Features & Benefits:

- Extended oil life
- Engine protection

Main Applications:

- Spark-ignited gas engines fuelled by natural gas
- May also be used for landfill and biogases
- "Dual-fuel" gas engines ignited by diesel pilot fuel

Specifications, Approvals & Recommendations:

Shell Mysella S3 S is suitable in engine types where a "medium ash" oil is required.

Shell Mysella S3 S is approved by:

- GE Jenbacher: Series 2, 3 Fuel Class B and C
- MAN: 3271-4
- Rolls Royce: KG-1, KG-2, KG-3 (Bio Gas Operation)
- Waukesha: Cogen Application (Pipeline Quality Natural Gas)

Shell Mysella S3 S meets requirements of:

- MAN: Ruston Engines (Natural Gas, Landfill/Digester gas/Biogas), Dual Fuel (Pilot Diesel)
- Wärtsilä: CR26.

For engines under warranty, Shell advises contact with the engine manufacturer and Shell representative to choose the appropriate oil given the equipment operating conditions and customer maintenance practices.

Shell Lubricants
Macro Distributor

Shell Mysella S3 N 40

Low ash stationary gas engine oil

Shell Mysella S3 N is a high performance quality oil blended for use in four-stroke, spark-ignition engines which require a 'low ash' oil and use natural gas as fuel.

Shell Mysella S3 N satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology

Performance, Features & Benefits:

- Extended oil life
- Engine protection
- System efficiency

Main Applications:

- Spark-ignited gas engines fueled by natural gas
- May also be used for landfill and biogases

Specifications, Approvals & Recommendations:

Shell Mysella S3 N is suitable in engine types where a "low ash" oil is required.

Shell Mysella S3 N is approved by:

- GE Jenbacher: Series 2, 3 Fuel Class A and CAT
- Series 4 (Version B) Fuel Class A, B, C and CAT.
- Series 6 (Version E) Fuel Class A, B, C and CAT.
- Hyundai H35/40G(V) series
- MTU: Series 4000 L61/L62/L63
- MWM gas engines – TR 2105
- Caterpillar CG132, CG170, CG260 – TR 2105
- MAK: GCM 34 Category 1
- Perkins: 4000 series
- Rolls Royce: KG-1, KG-2, KG-3
- Wärtsilä: W 34SG, W 50SG, W 20DF, W 32DF, W 34DF, W 50DF, W25SG, W28SG, W 175SG, W 220SG
- Waukesha: 220 GL (Pipeline Quality Natural Gas)
- MAN D&T : Medium Speed Engines for gas operation
- S.E.M.T Pielstick PC - Dual Fuel engines.

Shell Mysella S3 N meets requirement of:

- Caterpillar Stationary Gas Engines
- MAN: Gas engines (Natural Gas, Landfill Gas/Digester gas/Biogas). Dual Fuel (Pilot Diesel)
- Waukesha: other gas engine types.
- Nuovo Pignone: Reciprocating Compressor Service Class A

For engines under warranty, Viva advises to contact the engine manufacturer and Viva representative to choose the appropriate oil given the equipment operating conditions and customer maintenance practices.

Shell Caprinus XR 20W-40

Railroad diesel engine oil

Shell Caprinus XR oils are premium grade, heavy-duty engine oils, intended mainly for railroad diesel engines of North American origin, particularly those manufactured by General Electric and General Motors Electro-Motive Division (EMD).

Shell Caprinus XR oils use the latest, low-chlorine additive technology which offers both environmental benefits and improved performance. Shell Caprinus XR oils do not contain zinc and are approved for use by GM-EMD for their engines fitted with silver piston-pin bearings and by GE for their latest locomotives.

The performance of Shell Caprinus XR has been demonstrated in highly rated North American railroad operation subject to the most severe operating conditions.

Performance, Features & Benefits:

- Excellent detergency and dispersancy properties
- Good oxidation and thermal stability
- Good anti-wear properties
- High viscosity index base oils

Main Applications:

- North American diesel engines subjected to the most arduous duty where 'zinc-free' oils are recommended by the engine manufacturer. Applications are primarily for railroad locomotives, however Caprinus XR may also be suitable for certain engines in power generation, marine and mine-haul applications.
- Shell Caprinus XR oils are low chlorine formulations meeting the requirements of leading railroad operators in North America.

Specifications, Approvals & Recommendations:

- API - CF
- EMD - Approved "Worthy of full scale field test"(WOFT)
- General Electric - Gen 4 - Long Life "tentative approval"
- LMOA - Generation 5
- Detroit Diesel - Recommended for DDC Series 149 engines under severe conditions

Shell Caprinus XR 40

Railroad diesel engine oil

Shell Caprinus XR oils are premium grade, heavy-duty engine oils, intended mainly for railroad diesel engines of North American origin, particularly those manufactured by General Electric and General Motors Electro-Motive Division (EMD).

Shell Caprinus XR oils use the latest, low-chlorine additive technology which offers both environmental benefits and improved performance. Shell Caprinus XR oils do not contain zinc and are approved for use by GM-EMD for their engines fitted with silver piston-pin bearings and by GE for their latest locomotives.

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- Shell Caprinus XR oils are low chlorine formulations meeting the requirements of leading railroad operators in North America.

Specifications, Approvals & Recommendations:

- API - CF
- EMD - Approved "Worthy of full scale field test"(WOFT)
- General Electric - Gen 4 - Long Life "tentative approval"
- LMOA - Generation 5
- Detroit Diesel - Recommended for DDC Series 149 engines under severe conditions

Shell 2T

Two-stroke engine oil

Shell 2T is a quality oil specifically blended for all standard two-stroke petrol engines. Based on a high viscosity index mineral oil, contains carefully selected additives to provide long and trouble-free performance.

Performance, Features & Benefits:

- Reliable and consistent performance
- Self-mixing with leaded and unleaded petrol

Main Applications:

- Standard two-stroke engines with oil injection or premix systems:

  Shell 2T should not be used in outboard engines. The appropriate Nautilus Oil is recommended for this application.
- Petrol Mixture Systems:

  In engines lubricated by 'petrol' mixture systems, the engine manufacturers' recommended fuel/oil ratios should be strictly observed.

Specifications, Approvals & Recommendations:

Meets requirements of:

- JASO FA (obsolete)

Shell 4T

Four-stroke engine oil

Shell 4T is a quality petrol engine oil for four-stroke engines and gearbox/transmission systems of either two-stroke or four-stroke motorcycle engines.

Performance, Features & Benefits:

- Shell 4T is formulated from highly refined high viscosity index base oils. It contains additives carefully selected to promote excellent piston ring cleanliness, at the same time controlling oxidation and the harmful by-products of combustion.
- Reduced engine deposits
- Resistance to oil oxidation
- Protection of components against wear
- Resistance to rust and corrosion
- Good gearbox performance without clutch slippage

Main Applications:

- Four-stroke engines
- Gearbox/transmission systems of two-stroke and four-stroke motorcycles

Specifications, Approvals & Recommendations:

- API SF

Shell Helix Product Range Specification

	FULLY SYNTHETIC																SEMI SYNTHETIC				MINERAL	
SPECIFICATIONS	Ultra SN 0W-20	Ultra ECT C2/C3 0W-30	Ultra ECT C3 5W-30	Ultra 5W-40	Ultra SN 5W-20	Ultra Prof AP-L 0W-30	Ultra Prof AV-L 0W-30	Ultra Prof AF 5W-30	Ultra Prof AG 5W-30	Ultra Prof AF-L 5W-30	Ultra Prof AP-L 5W-30	Ultra Prof AR-L 5W-30	Ultra Racing 10W-60	HX8 Prof AG 5W-30	HX8 Synthetic 5W-30	HX8 ECT 5W-40	HX7 ECT 5W-30	HX7 SN 10W-30	HX7 10W-40	HX7 HM 15W-50	HX5 15W-40	HX3 20W-50
SAE	0W-20	0W-30	5W-30	5W-40	5W-20	0W-30	0W-30	5W-30	5W-30	5W-30	5W-30	5W-30	10W-60	5W-30	5W-30	5W-40	5W-30	10W-30	10W-40	15W-50	15W-40	20W-50
PurePlus	YES	YES	YES	YES	YES				YES				YES									
API	SN	SN	SN	SN/CF	SN			SL	SN				SN/CF	SN	SN/CF	SN	SN	SN	SN/CF	SN/CF	SN/CF/	SL/CF
ACEA	A1/B1	C2/C3	C3	A3/B3, A3/B4	A1/B1	C2	C3	A5/B5	C3	C1	C2	C4	A3/B3, A3/B4		A3/B3, A3/B4	C3	C3		A3/B3, A3/B4	A3/B4	A3/B3	
ILSAC	GF-5				GF-5									GF-5				GF-5				
JASO																			SG+			
BMW			LL-04	LL-01												LL-04						
Mercedes-Benz		229,.51, 229.52, 229.31	229.51, 229.31	229.5, 226.5											229.3	229.31, 229.51	229.31		229.3			
Volkswagen		VW 504.00/ 507.00		502.00/ 505.00			504.00/ 507.00								502.00/ 505.00				502.00/ 505.00			
Chrysler	MS-6395		MS-11106	MS-10725, MS-12991	MS-6395												MS-11106					
Ford					WSS-M2C945-A, WSS-M2C930-A			WSS-M2C913-C, WSS-M2C913-D		WSS-M2C934-B												
Ferrari				APPROVED									APPROVED									
GM			dexos2		6094M				dexos2					dexos1		dexos2						
Renault				RN 0700, 0710								RN 0720			RN 0700, 0710	RN 0700, 0710			RN 0700, 0710			
Porsche		C30		A40			C30															
Fiat		9.555535-GS1, 9.555535DS1*		9.55535. N2*, 9.55535.Z2															9.55535-G2*			
PSA				B71 2296		B71 2312					B71 2990											
Jaguar								STJLR.03.5003		STJLR.03.5005												
Land Rover								STJLR.03.5003		STJLR.03.5005												
Pack Sizes	5L, 20L, 209L	5L, 20L, 209L	1L, 5L, 20L, 209L	1L, 5L, 20L, 209L	209L	209L	209L	20L, 209L	20L, 209L	209L	209L	20L, 209L	209L	209L	5L, 209L	209L	1L, 5L, 20L, 209L, Bulk	5L, 20L, 209L, Bulk	1L, 5L, 20L, 209L, Bulk	1L, 5L, 209L	1L, 5L, 20L, 209L	1L, 5L, 209L

Valid at 1/7/2018. *Meets requirements of the manufacturer.

Shell Rimula Product Range Specification

	FULLY SYNTHETIC			SEMI SYNTHETIC	MINERAL							
Specifications	Shell Rimula Ultra 5W-30	Shell Rimula R6 LM 10W-40	Shell Rimula R6 MS 10W-40	Shell Rimula R5 LE 10W-40	Shell Rimula R4 L 15W-40	Shell Rimula R4 MV 15W-40	Shell Rimula R4 X 15W-40	Shell Rimula R3 MV 15W-40	Shell Rimula R3+ 40	Shell Rimula R3+ 30	Shell Rimula R3 10W	Rotella DD+ 40
Global Specifications												
SAE	5W-30	10W-40	10W-40	10W-40	15W-40	15W-40	15W-40	15W-40	40	30	10W	40
API	CJ-4	CJ-4		CK-4	CK-4 / SN	CK-4	CI-4 / SL	CI-4	CF	CF	CF	CF-II, CF
ACEA	E6, E7, E9	E6, E9	E7, E4	E9, E7	E9, E7		E7, E5, E3	E3	E2			
JASO	DH-2	DH-2		DH-2	DH-2	DH-2	DH-1					
Global							DHD-1					
US Specifications												
Caterpillar	ECF-3	ECF-3		ECF-3, ECF-2	ECF-3, ECF-2	ECF-3, ECF-2	ECF-2, ECF-1A	ECF-1A, ECF-2				
Cummins CES	20081	20081		20081, 20086	20086, 20081	20081, 20086	20078, 77, 76, 75, 72, 71	20071, 72, 78				
Detroit Diesel				93K218, 93K222	93K218 , 93K222		93K215	93K215				7SE 270 8810 (SASH<0.8%)
Allison					TES 439							
Case New Holland Mat				3521*	3521, 3522*		3520*					
Euro Specifications												
Mack	EO-O Premium Plus	EO-O Premium Plus		EO-O Premium Plus, EOS-4.5	EOS-4.5 , EO-O Premium Plus		EO-N	EO-M Plus				
DAF		E6										
Deutz	DQC IV-10 LA	DQC IV-10 LA	DQC IV-10	DQC III-10 LA	DQC III-10 LA	DQC III-10 LA	DQC III-10					
Iveco	TLS E6*	NG2#	T3 E4*	TLS E9#	T2 E7*		T1#					
MAN	M3477, M3677	M3477, M3271-1	M3277	M3575	M3575		M3275-1		270	270		
Mercedes Benz	228.51	228.51	228.5	228.31	228.31		228.3		228.0	228.0		
MTU	Category 3.1	Category 3.1	Category 3	Category 2.1	Category 2.1	Category 2.1	Category 2	Category 2	Category 1	Category 1		
Renault	RLD-3	RLD-3	RXD	RLD-4, RLD-3	RLD-4 , RLD-3		RLD-2					
Scania	LDF-4	Low Ash	LDF-3, LDF-2									
Volvo	VDS-4	VDS-4	VDS-3	VDS-4.5, VDS-4	VDS-4.5, VDS-4		VDS-3					
Pack Sizes	20L, 209L	20L, 209L, IBC	20L, 209L	20L, 209L	5L, 10L, 20L, 209L, IBC, Bulk	IBC, Bulk	1L, 6L, 20L, 209L, IBC	20L, 209L, Bulk	20L, 209L	20L, 209L	20L, 209L, IBC	20L, 209L

Valid at 1/07/2018. *Meets Specification #Meets Manufacturer Requirements IBC = Intermediate Bulk Container - 1000L.

VIVA EnergyAustralia

Shell Lubricants Macro Distributor

Transmission & Differential Oils

Applications

6.0 Automatic Transmission Oils

6.1	Spirax S3 ATF MD3	72
6.2	Spirax S4 ATF HDX	73
6.3	Spirax S5 ATF X	74
6.4	Spirax S6 ATF X	75
6.5	Spirax S6 ATF A295	76
6.6	Spirax S6 ATF ZM	77

7.0 Manual Transmission Oils

7.1	Spirax S2 ALS 90	78
7.2	Spirax S2 A 80W-90, S2 A 85W-140	79
7.3	Spirax S3 AX 80W-90	80
7.4	Spirax S3 AX 85W-140	81
7.5	Spirax S3 ALS 80W-90	82
7.6	Spirax S4 AT 75W-90	83
7.8	Spirax S5 ATE 75W-90	84
7.9	Spirax S6 GXME 75W-80	85
7.10	Spirax S6 AXME 75W-90	86
7.11	Spirax S6 AXME 80W-140	87
7.12	Spirax S6 GME 40	88

8.0 Off-Road or Mobile Equipment Transmission Oils

8.1	Spirax S4 CX 10W	89
8.2	Spirax S4 CX 30	90
8.3	Spirax S4 CX 50, S4 CX 60	91
8.4	Spirax S5 CFD M 60	92

9.0 Agriculture and Specialty Transmission Oils

9.1	Spirax S3 T	93
9.2	Spirax S4 TXM	94
9.3	Tegula V 32	95

Product Specifications

Automatic Transmission Fluid Product Range Specification	96
Manual Transmission and Axle Fluid Product Range Specification - Fully & Semi Synthetic	97
Manual Transmission and Axle Fluid Product Range Specification - Mineral	98

Shell Lubricants
Macro Distributor

Shell Spirax S3 ATF MD3

High performance automatic transmission fluid in many applications

Shell Spirax S3 ATF MD3 is a premium quality automatic transmission fluid based on high viscosity index mineral oils and carefully selected additives. It is blended to meet the stringent requirements of leading automotive transmission manufacturers.

Performance, Features & Benefits:

- Friction modified
- Exceptionally high oxidation resistance
- Excellent shear-stability
- Dependable anti-wear and gear protection
- Low temperature performance

Main Applications:

- Passenger car automatic transmission
- Heavy duty automotive transmissions
- Power steering units
- Certain hydraulic applications calling for oils meeting ISO VG, 32-46-68 viscosity requirements

Specifications, Approvals & Recommendations:

- Suitable for use in vehicles where GM Dexron® III, Ford Mercon® or Allison C-4 fluids are required. Do not use where GM Dexron® VI or Ford Mercon® V/Mercon® SP/ Mercon® LV fluids are specified.
- Dexron® is a trademark in many countries belonging to General Motors Company. Mercon® is a trademark in many countries belonging to Ford Motor Company.

Shell Spirax S4 ATF HDX

Advanced synthetic technology heavy duty automotive transmission fluid

Shell Spirax S4 ATF HDX is a superior quality automatic transmission fluid suitable for a wide range of heavy duty automotive transport and passenger car transmissions. Based on synthetic technology base fluid, Shell Spirax S4 ATF HDX is the ultimate performance automatic transmission fluid allowing extended drain intervals even under the most severe conditions.

Performance, Features & Benefits:

- Synthetic base oil technology
- Excellent shift feeling
- Extremely low temperature fluidity
- Shear stability
- Wear protection
- Maximum oil drain interval potential
- High temperature oxidation stability

Main Applications:

- Automotive automatic transmissions
- Automotive hydraulic systems
- Power steering
- Certain manual transmissions

Specifications, Approvals & Recommendations:

- ZF TE-ML 03D, 04D, 14B, 16L, 17C
- MAN 339 Typ Z2, V2
- Mercedes-Benz 236.9
- Voith 55.6336.XX (standard drain intervals up to 120,000km)
- Volvo 97341:39

Meets requirements of:

- Ford Mercon®
- General Motors Dexron® IIIG
- Allison C4

Shell Lubricants
Macro Distributor

Shell Spirax S5 ATF X

Premium, synthetic technology multi-vehicle automatic transmission fluid

Shell Spirax S5 ATF X is a premium performance, synthetic technology fluid designed to meet the needs of multiple vehicle types for service fill in automatic transmission service. Shell Spirax S5 ATF X meets the needs of many Asian and North American designed automatic transmissions.

Performance, Features & Benefits:

- Friction modified:
  Provides consistent, reliable, smooth and trouble free operation of automotive transmission systems.
- Exceptionally high oxidation resistance:
  Resistant to oil degradation and keeps automatic transmissions clean.
- Excellent shear-stability:
  A special 'VI' improver minimises the changes in viscosity with operating temperature.
- Dependable anti-wear and gear protection:
  Long component life.
- Low temperature performance:
  Excellent oil fluidity at low temperatures.
- Synthetic base fluids:
  Excellent fluid life in the most demanding applications

Main Applications:

- Passenger car automatic transmissions
- Heavy duty automatic transmissions
- Power steering units
- Hydraulic systems requiring this grade of fluid

Specifications, Approvals & Recommendations:

Suitable for use in applications which require:

- Allison C-4
- Aisin JWS 3309 (all applications)
- JASO 1-A, 2A-02
- Ford Mercon® V, Mercon®
- General Motors Dexron®, Dexron® II, Dexron® III
- Toyota T III, T IV

For a full listing of equipment approvals and recommendations, please consult the Technical Helpdesk.

Shell Spirax S6 ATF X

Premium, synthetic technology multi-vehicle automatic transmission fluid for lower viscosity AFT requirements in General Motors, Ford, and many other cars and trucks

Premium performance, synthetic technology fluid designed to meet the needs of multiple vehicle types for service fill in automatic transmission service. Shell Spirax S6 ATF X meets the needs of many Japanese, Asian, European, and North American designed automatic transmissions that require low viscosity automatic transmission fluids such as GM DEXRON® -VI, Ford MERCON® LV and Toyota WS.

Performance, Features & Benefits:

- Friction modified
- Exceptionally high oxidation resistance
- Excellent shear-stability
- Dependable anti-wear and gear protection
- Seal swell
- Low temperature performance

Main Applications:

- Passenger car automatic transmissions
- Commercial vehicle transmission and hydraulics
- Power steering units

Specifications, Approvals & Recommendations:

Exceeds the requirements of the following industry specifications:

- Ford MERCON® LV
- General Motors DEXRON® -VI
- JASO 1-A-LV

Shell Lubricants
Macro Distributor

Shell Spirax S6 ATF A295

Synthetic extended drain heavy duty automatic transmission fluid

Shell Spirax S6 ATF A295 Oil is a fully synthetic, heavy-duty automatic transmission fluid which is specifically designed and approved for use in transmissions requiring Allison TES-295 fluids. Shell Spirax S6 ATF A295 is approved for extended service intervals and remains stable even under severe operating conditions.

Performance, Features & Benefits:

- Long enhanced protection – long equipment life
- Long fluid life – maintenance saving
- Enhanced efficiency

Main Applications:

- Allison Medium/Heavy Duty Automatic Transmissions

Spirax S6 ATF A295 is recommended for use in transmissions found in the following applications:

- Municipal fleets
- Vans, school buses
- Buses and coaches
- Emergency vehicles
- Commercial vehicles and trucks
- Motor-homes
- Heavy duty pickup trucks
- Spirax S6 ATF A295 can also be used in some ZF and Voith heavy duty transmissions as well as those previously serviceable by Dexron® III and Mercon® Fluids, and is particularly suited to mixed fleet operations.

Specifications, Approvals & Recommendations:

Approved:

- Allison TES-295 AN-121008
- Allison TES-468 AN-121008

Suitable for use in applications calling for:

- Former Dexron® III applications
- Voith DIWA transmissions
- ZF TE-ML, 14A, 14B, 14C
- MAN 339 Z3
- MB 236.91
- Caterpillar AT-1

Shell Spirax S6 ATF ZM

Premium heavy duty transmission oil for ZF long drain

Shell Spirax S6 ATF ZM Oil is a fully synthetic, premium quality, heavy-duty automatic transmission fluid specifically designed in partnership with ZF as a lubricant for the newest generation of ZF-Ecomat- and ZF-Ecolife transmissions. Shell Spirax S6 ATF ZM is the ultimate performance automatic transmission fluid allowing extended drain intervals even under the most severe conditions.

Performance, Features & Benefits:

- Exclusive technology
- Maximum oil drain interval potential
- Extremely low temperature fluidity
- Shift comfort and maintenance costs

Main Applications:

- Heavy duty automatic transmissions:

  Shell Spirax S6 ATF ZM can also be used in all ZF-Ecomat-and ZF-Ecolife transmissions, and where retarders are used.

Specifications, Approvals & Recommendations:

- ZF TE-ML 04D, 14E, 16N, 16Q, 20F
- MAN 339 Type Z13 (ZF-Ecolife 240,000 – 120,000 km depending on working temperature)
- MAN 339 Type Z4 (ZF-Ecomat 150,000 km)

Shell Lubricants
Macro Distributor

Shell Spirax S2 ALS 90

High performance, GL-5 axle oil for limited slip differentials

Shell Spirax S2 ALS 90 oil is blended for use in a wide variety of automotive axle units with limited slip differentials.

Performance, Features & Benefits:

- Comprehensive Components:

  Specially selected additives impart good anti-wear, anti-rust characteristics, oxidation and thermal stability as well as the required coefficient of friction to meet requirements of limited slip differentials.

- High quality base oils:

  Maintains low temperature flow in the designed temperature range, resists oxidation, and maintains oil film between gears.

Main Applications:

- Automotive drivelines:

  Suitable for heavy duty vehicles, including construction machines or buses, and passenger cars which are fitted with limited slip differentials. May be used in other moderate to heavily loaded gear sets that will allow use of a friction modified, hypoid gear oil.

Specifications, Approvals & Recommendations:

- API Service Classification: GL-5 Limited Slip

Shell Spirax S2 A 80W-90, S2 A 85W-140

High performance, GL-5 axle oil

Shell Spirax S2 A is blended for use in a wide variety of automotive axle units subjected to heavy duty conditions.

Performance, Features & Benefits:

- Comprehensive Components:

  Specially selected additives impart good anti-wear, anti-rust characteristics, oxidation and thermal stability.
- High quality base oils:

  Maintains low temperature flow in the designed temperature range, resists oxidation, and maintains oil film between gears.

Main Applications:

- Automotive transmissions, differentials
- Moderate to heavily loaded gear sets in stationary and ancillary equipment
- Hypoid gear axles
- Motorcycle gear units separate from the engine
- Other automotive transmission units operating under high speed/shock load, high speed/low torque and low speed/high torque conditions.

Specifications, Approvals & Recommendations:

- API Service Classification: GL-5

Shell Lubricants
Macro Distributor

Shell Spirax S3 AX 80W-90

High performance, GL-5 axle oil for general applications

Shell Spirax S3 AX 80W-90 is a high performance, API GL-5 gear and axle oil for moderate to heavily loaded on and off-road driveline applications requiring SAE 80W-90 oil.

Performance, Features & Benefits:

- Multiple vehicle applications
- Longer oil drain capability
- Longer transmission life

Main Applications:

- Automotive differentials:

  Automotive gearboxes, differentials and hypoid gear sets in motorcycle, passenger car, commercial vehicles, off-road construction and agricultural equipment.
- General gear sets:

  Ancillary equipment gear sets and some industrial equipment.

Specifications, Approvals & Recommendations:

- Mercedes-Benz Sheet: 235.6
- MAN: 342 Type M2
- ZF TE-ML: 07A, 16C, 17B, 19B, 21A
- API Service Classification: GL-5
- US Military: MIL-L-2105D
- Shell Spirax S3 AX 80W-90 meets the service fill requirements of Mercedes-Benz Sheet 235.0.

Shell Spirax S3 AX 85W-140

High performance, GL-5 axle oil for general applications

Shell Spirax S3 AX 85W-140 is a high performance, API GL-5 gear and axle oil for moderate to heavily loaded on and off-road driveline applications requiring SAE 85W-140 oil.

Performance, Features & Benefits:

- Multiple vehicle applications
- Longer oil drain capability
- Longer transmission life

Main Applications:

- Automotive differentials:

  Automotive gearboxes, differentials and hypoid gear sets in motorcycle, passenger car, commercial vehicles, off-road construction and agricultural equipment.
- General gear sets:

  Ancillary equipment gear sets and some industrial equipment.

Specifications, Approvals & Recommendations:

- MAN: 342 Type M1
- ZF TE-ML: 07A, 16D, 21A
- API Service Classification: GL-5
- US Military: MIL-L-2105D

Shell Lubricants
Macro Distributor

Shell Spirax S3 ALS 80W-90

High performance, GL-5 axle oil for limited slip differentials

Shell Spirax S3 ALS 80W-90 oil is blended for use in a wide variety of automotive axle units with limited slip differentials including many ZF units.

Performance, Features & Benefits:

- Comprehensive Components:

  Specially selected additives impart good anti-wear, anti-rust characteristics, oxidation and thermal stability as well as the required coefficient of friction to meet requirements of limited slip differentials.
- High quality base oils:

  Maintains low temperature flow in the designed temperature range, resists oxidation, and maintains oil film between gears.

Main Applications:

- Automotive drivelines:

  Suitable for heavy duty vehicles, including construction machines or buses, and passenger cars which are fitted with limited slip differentials. May be used in other moderate to heavily loaded gear sets that will allow use of a friction modified, hypoid gear oil.
- Specifically suitable for ZF units including Liebherr where a limited slip fluid is required.

Specifications, Approvals & Recommendations:

- ZF TE-ML: 05C, 12C, 21C
- API Service Classification: GL-5 Limited Slip
- Meets: MIL-L-2105D

Shell Spirax S4 AT 75W-90

High performance, synthetic blend, GL-4/5 oil for gearboxes and axles

Shell Spirax S4 AT 75W-90 is a part-synthetic superior quality automotive gear lubricant specially designed for use in gearboxes and axles.

Performance, Features & Benefits:

- Part synthetic
- Specially selected extreme-pressure and anti-wear additives
- Excellent anti-rust and anti-corrosion properties
- Lower power loss increases gear efficiency and therefore fuel economy capabilities
- 'Cold shift' and 'hot rattle' problems overcome in passenger car and van 5-speed gearboxes
- Extended oil drain period potential

Main Applications:

- Automotive Transmissions:

  Heavily loaded axle drives, synchronised and non-synchronised gearboxes.
- Universal Driveline:

  This transmission oil has been designed to meet the requirements of both axles and gearboxes and can be used as "universal" Driveline lubricant in heavy duty and passenger car vehicles.

Specifications, Approvals & Recommendations:

- API Service Classification: GL-4, GL-5, MT-1

Shell Lubricants
Macro Distributor

Shell Spirax S5 ATE 75W-90

Premium performance, synthetic technology, GL-4/5 designed for sports cars

Shell Spirax S5 ATE 75W-90 is particularly designed to fulfill the highest requirements of extremely loaded passenger car drive train systems.

Performance, Features & Benefits:

- Outstanding gear protection and synchromesh performance
- Longer equipment life
- Improved drive train efficiency
- Environmentally friendly
- Recognised and used by leading sports cars manufacturers
- Part of the Shell synthetic lubricants range

Main Applications:

- Transaxle Transmissions:

  Heavily loaded "transaxle" transmission where hypoid axle and gearbox are in the same housing and lubricated by the same product. Particularly in sport passenger car drive train systems.
- Automotive Transmissions:

  Heavily loaded axle drives, synchronised and non-synchronised gearboxes.

Specifications, Approvals & Recommendations:

- Ferrari
- Getrag
- MB 236.26
- API Service Classification: GL-4, GL-5, MT-1

Shell Spirax S6 GXME 75W-80

Premium, synthetic technology, fuel economy manual transmission and gearbox oil

Shell Spirax S6 GXME 75W-80 is a unique fuel-efficient, long-life gear oil designed to give the ultimate in performance and protection to meet the requirements of current and future heavy duty gearboxes. Specially formulated fully synthetic base oils plus a unique new additive technology give improved lubrication and longer life for your equipment.

Performance, Features & Benefits:

- Low power loss - improved efficiency
- Longer oil drain capability
- Longer transmission life
- Less environment pollution
- Recognised by leading equipment manufacturers
- Part of the Shell synthetic lubricants team

Specifications, Approvals & Recommendations:

- API Service Classification GL-4
- MAN 341 Typ Z4, 341 E3
- ZF TE-ML 01L, 02L, 16K
- Volvo Transmission 97307

Main Applications:

- Automotive Transmissions:

  Synchromesh gearboxes, including those fitted with integrated retarders, and medium, loaded axle drives where mineral or synthetic gear oils are required.

Shell Spirax
S6 AXME 75W-90

Shell Lubricants Macro Distributor

Superior performance, synthetic, fuel efficient GL-5 axle oil for many premium applications

Shell Spirax S6 AXME 75W-90 is a unique fuel-efficient, long life transmission and axle oil, designed to provide ultimate protection to the latest heavy duty manual transmissions and axles. Specially formulated with synthetic base oils and additive technology unique for Shell, gives improved lubrication of the drive train, lowers the operating temperature and helps promote longer life for the equipment. Shell Spirax S6 AXME 75W-90 is also extended oil drain capable and is approved by several OEMs for their extended drain specifications.

Performance, Features & Benefits:

- Greater efficiency and therefore higher fuel economy
- Longer oil drain capacity
- Longer equipment life
- Less lubricant usage
- Recognised by leading equipment manufacturers

Main Applications:

- Transmissions and axles

Specifications, Approvals & Recommendations:

- SAE J 2360 (PRI GL 0582)
- Volvo 97312
- MAN 342 Typ S1, 341 GA-2
- Meritor 076-N, Meritor (EU) Extended Drain
- ZF TE-ML 05B, 12L, 12N, 16F, 17B, 19C, 21B
- Scania STO 2:0 G
- Scania STO 2:0 A FS
- DAF
- Mack GO-J
- API GL-5, MT-1
- US Military MIL-PRF-2105E
- Meets IVECO 18-1805 Extended Drain requirements

Shell Spirax S6 AXME 80W-140

Superior performance, extended drain, synthetic transmission axle oil for many premium applications

Shell Spirax S6 AXME 80W-140 is a fully synthetic, multipurpose, heavy-duty gear lubricant specifically designed for heavy duty differentials that call for an API GL-5 type product.

Performance, Features & Benefits:

- Outstanding thermal stability especially in applications where heat, wear and extended drain intervals contribute to severe service
- High film strength and excellent shear stability
- Excellent low temperature properties promote oil flow to help protect gears and bearings even at sub-zero temperatures
- Synthetic formula provides maximum protection over a wide range of temperatures
- Separates readily from water
- Compatible with other MIL-L-2105D or MIL-PRF-2105E quality gear lubricants

Main Applications:

- Heavy-Duty differentials
- All applications normally lubricated by automotive gear oil such as rear wheel bearings, manual steering gears and universal joints calling for an SAE 80W-140 grade.
- Transfer cases for automobiles, light and heavy-duty trucks, farm equipment and heavy construction equipment calling for SAE 80W-140 or 85W-140 grades.
- Industrial gear applications where extreme pressure oils with excellent low and high temperature properties are required.
- Differentials used in conjunction with Eaton and Meritor extended warranties calling for an SAE 80W-140 grade.
- Manual transmissions where the manufacturer specifies a GL-5 oil of SAE 80W-140 or 85W-140.

Specifications, Approvals & Recommendations:

- Dana Specification SHAES 429 Rev. A
- Mack GO-J
- ArvinMeritor Specification O76-B (standard drain), O76-Q or R (extended drain)
- SAE J2360
- Harnischfeger (P&H) 474
- International Truck and Engine TMS 6816
- API Service Classification GL-5 and MT-1
- General Electric D50E9C
- US Military MIL-PRF-2105E
- U.S. Steel Specification 224
- American Gear Manufacturers (AGMA) Standard 250.03
- Scania STO 1:0

Shell Spirax S6 GME 40

Premium synthetic ZF Freedom Line and Eaton long drain manual transmission oil

Shell Spirax S6 GME 40 is a synthetic heavy-duty transmission fluid specially formulated for extended drain and severe service applications. This fluid is approved as a Roadranger® Genuine Lubricant for use in Eaton extended warranty transmission service.

Performance, Features & Benefits:

- Fuel economy improvement
- Extended drain intervals
- Resists deposit and sludge formation
- Excellent protection from corrosion, foaming and rust
- Excellent high and low temperature performance
- Provides friction retention, friction durability and excellent shear stability
- Helps reduce sump operating temperatures

Main Applications:

Spirax S6 GME 40 Synthetic transmission fluid is recommended where wear, low temperature or heat present major problems and a non-EP lubricant is required.

Typical usage includes:

- Transmissions
- Transfer cases
- Wheel hub ends

Commercial vehicle applications include:

- Line haul
- Vocational
- Off-road
- Pickup and delivery
- Buses

Specifications, Approvals & Recommendations:

Spirax S6 GME 40 Synthetic transmission fluid is approved for these OEM applications:

- Eaton PS-386 (replaces Eaton PS 164, Rev 7)
- Con Met
- Meritor Specification O-81
- API MT-1

Shell Spirax S4 CX 10W

High performance off-highway transmission and hydraulic oil

Shell Spirax S4 CX 10W is designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment. Shell Spirax S4 CX 10W meets the demanding requirements of modern transmission, oil-immersed brake and hydraulic systems fitted to heavy-duty off-highway equipment.

Performance, Features & Benefits:

- Frictional performance and material compatibility
- Anti-wear protection
- Low temperature characteristics
- Optimum mechanical performance and long oil life
- Vickers 35V25 Hydraulic Pump Test
- Oxidation stability

Main Applications:

- Shell Spirax S4 CX 10W is recommended for use in heavy duty off-highway equipment produced by the world's leading manufacturers including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others.
- Powershift Transmissions
- Oil Immersed Brakes
- Hydraulic Systems

Specifications, Approvals & Recommendations:

- Caterpillar Tractor: TO-4
- ZF TE-ML 03C
- Suitable for use in applications where Allison C-4 type fluids are required.

Please check equipment manuals for appropriate selection of viscosity grade.

Shell Lubricants
Macro Distributor

Shell Spirax S4 CX 30

High performance off-highway transmission and hydraulic oil for many applications

Shell Spirax S4 CX 30 is designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment. Shell Spirax S4 CX 30 meets the demanding requirements of modern transmission, final drive, and oil immersed brakes fitted to heavy-duty off-highway equipment.

Performance, Features & Benefits:

- Frictional performance and material compatibility
- Anti-wear protection
- Low temperature characteristics
- Optimum mechanical performance and long oil life
- Vickers 35V25 Hydraulic Pump Test
- Oxidation stability

Main Applications:

- Shell Spirax S4 CX 30 is recommended for use in heavy duty off-highway equipment produced by the world's leading manufacturers including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others.
- Powershift Transmissions
- Final Drives
- Oil Immersed Brakes

Specifications, Approvals & Recommendations:

- Caterpillar Tractor: TO-4
- ZF TE-ML 03C, 07F
- Suitable for use in applications where Allison C-4 type fluids are required
- Shell Spirax S4 CX 30 oil is suitable for use in many powershift or manual transmissions, wet brake systems, and some hydraulic systems including Komatsu.

Shell Spirax S4 CX 50, S4 CX 60

High performance off-highway final drive and axle oil

Shell Spirax S4 CX 50 and 60 are designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment. Shell Spirax S4 CX 50 and 60 meet the demanding requirements of modern transmission, final drive, and oil immersed brakes fitted to heavy-duty off-highway equipment.

Performance, Features & Benefits:

- Frictional performance and material compatibility
- Anti-wear protection
- Low temperature characteristics
- Optimum mechanical performance and long oil life
- Oxidation stability

Main Applications:

- Shell Spirax S4 CX 50 and 60 are recommended for use in heavy duty off-highway equipment produced by the world's leading manufacturers including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others.
- Powershift Transmissions
- Final Drives
- Oil Immersed Brakes

Specifications, Approvals & Recommendations:

- Caterpillar Tractor: TO-4
- Suitable for use in applications where Allison C-4 type fluids are required.

Shell Lubricants
Macro Distributor

Shell Spirax S5 CFD M 60

High performance off-highway final drive and axle oil

Shell Spirax S5 CFD M 60 is a dedicated final drive and axle oil which offers significantly improved protection for gears and bearing in bevel gears, differentials, final drive and axles. It meets Caterpillar FD-1 final drive axle oil (FDAO) specification. Shell Spirax S5 CFD M 60 has been developed for continuous use in extreme ambient temperatures in off road vehicles.

Performance, Features & Benefits:

- Improved bearing life
- Improved corrosion protection
- Improved oil life

Main Applications:

- Shell Spirax S5 CFD M 60 is recommended for use in all Caterpillar Final Drive & Axles that currently specify the use of Cat FD-1 fluids. It can also be used in transmissions requiring TO-4 fluids that do not contain friction material. It is not recommended for final drives which contain brakes. It should also not be used in engines or hydraulic systems.
- Axles
- Final drives

Specifications, Approvals & Recommendations:

- Caterpillar FD-1 or where CAT FD-1 (FDAO) is specified

Compatibility & Miscibility:

- Shell Spirax S5 CFD M 60 is fully compatible with all seal material employed in CAT equipment; and is also compatible with Shell Spirax S4 CX oils and oils meeting CAT TO-4.
- Shell Spirax S4 CFD M 60 should not be used in transmissions containing friction materials (eg. those with wet brakes or clutch materials). Use of Shell Spirax S4 CX oils in those transmissions is recommended.

Shell Spirax S3 T

Premium performance, SAE 15W-40, universal tractor oil

Shell Spirax S3 T Oil is 'Super Tractor Oil Universal' (STOU) oil designed for use in a wide variety of modern agricultural equipment. It is a blend of high viscosity index base oils and an advanced additive package designed to give reliable performance in a wide range of farming applications.

Performance, Features & Benefits:

- Practical, convenient and multi-functional
- High performance
- Excellent gear protection
- Jerk-free hydraulic operation
- Excellent anti-corrosion properties

Main Applications:

- Universal performance

Suitable for many types of tractor transmission/ hydraulic systems:

- Oil immersed brakes
- Powershift transmissions
- Hydraulics
- Power steering systems
- Hydrostatic transmissions
- Conventional gear drive systems

Specifications, Approvals & Recommendations:

- Massey Ferguson M 1139, M 1144
- Caterpillar CAT TO-2
- John Deere JDM J27
- ZF TE-ML 06B, 06Q, 07B
- API Service Classification GL-4
- Can be used in applications requiring API CF-4 / SF performance level

Shell Lubricants
Macro Distributor

Shell Spirax S4 TXM

Premium SAE 10W-30 multi-functional tractor transmission and hydraulic oil

Premium "Universal Tractor Transmission Oil" (UTTO) designed for use in transmissions, hydraulic systems, oil immersed brakes and other ancillary systems fitted to agricultural tractors and off-road equipment. Spirax S4 TXM is recognised by leading agricultural equipment manufacturers and suitable for use in most modern equipment.

Performance, Features & Benefits:

- Enhanced protection
- Operator comfort
- OEM recognition

Main Applications:

- Agricultural tractor transmissions
- Hydraulic systems
- Oil immersed brakes

Warning: Not to be used as an Engine Oil

Specifications, Approvals & Recommendations:

- Suitable for use in applications where Allison C-4 type fluids are required
- Shell Spirax S4 TXM can be used when a SAE J 306 85W grade is recommended
- John Deere JDM-J20C
- Massey-Ferguson M1143, M1145
- Volvo WB 101, Transmission Oil 97303:015
- Caterpillar TO-2
- Komatsu – recommended for use in certain construction equipment
- Dana-Spicer mechanically controlled transmissions
- Shell Spirax S4 TXM is also recommended for use in Case equipment where fluids meeting MS 1207, 1209 or 1210 are specified.
- API Gear Performance: API GL-4
- ZF TE-ML 03E, 05F, 06D, 06K, 06M, 06N, 06R, 17E, 21F
- Case New Holland MAT 3525, M2C-134 A-D, FNHA-2-C.201.00

Shell Tegula V 32

Advanced technology oil for hydrodynamic transmissions

Shell Tegula V 32 is an advanced technology oil designed to meet the latest requirements of variators and advanced railway transmission systems combining hydrodynamic couplings and torque converters with mechanical gears.

Performance, Features & Benefits:

- Based on a blend of highly refined mineral oils and optimized additive system for superior thermal and oxidative stability.
- Meets increased thermal requirements of railway hydrodynamic transmissions for extended drain intervals.
- Provides excellent and constant air release properties over long period.
- Excellent extreme-pressure and micro-pitting resistance properties permit excellent load carrying capacity with reduced component wear.
- Compatibility with all seal materials and paints normally specified for use with mineral oil.
- Enhanced compatibility with yellow metals even at higher temperatures.
- Not recommended for use industrial couplings if excessive water entrainment cannot be avoided.

Main Applications:

Railway hydrodynamic transmission systems:

- Transmission systems for railway diesel engines consist of various combinations of fluid couplings, torque converters and transmission gears.
  This type of transmission is used in combination with a hydrodynamic brake which is operated to reduce brake shoe wear during periods of prolonged braking down long slopes. At times, the brake oil temperature may reach up to 140°C.
- Gears and PIV variator lubrication

Specifications, Approvals & Recommendations:

- Voith General Lubricant List 120.00059010, Version 6
- Voith 3.285-149 (for use in Voith Power Transmissions)
- Tegula V 32 is approved and recommended by Voith Turbo, PIV and Lenze

Automotive - Automatic Transmission Fluids
Product Range Specification

	ADVANCED		PREMIUM	MAIN GRADE
Specifications	Shell Spirax S6 ATF X	Shell Spirax S5 ATF X	Shell Spirax S4 ATF HDX	Shell Spirax S3 ATF MD3
Aisin		JWS 3309		
Allison	Some applications	C-4	C-4	C-4
Audi		G 055 025-A2, G 052 162-A1		
BMW	Some applications	LA2634, ETL-7045E, LT71141		
Caterpillar				
Chrysler	SP-IV M ATF			
Fiat	Some applications	9.55550 AV		
Ford	Mercon LV	Mercon V, Mercon, M2C138-CJ, M2C166-H, M2C202-B, M2C924-A (JWS 3309), M2C922-A1	Mercon	Mercon
GM Dexron	VI	III, II, IID, Type A Suffix A	IIIG	III
Honda	Service Fill	ATF-Z1		
Hyundai	ATF (except 8 speed SPH-IV RR)	SP III, SP II		
Isuzu	ATF	SCS, ATF-II, ATF-III, Genuine		
Jaguar	Some applications			
JASO	1-A-LV	1-A, 2A-02		
Kia	ATF (except 8 speed SPH-IV RR)	SP III, SP II, ATF Red I-K		
Land Rover	Some applications			
MAN		339F, Type V1, V2, Z1, Z2, Z3	339, Type Z2, V2	
Mazda	Service Fill	ATF M-111, ATF MV		
MB	236.1 to 236.10	236.1, 236.2, 236.5, 236.6, 236.7, 236.9, 236.10	236.9	
Mini	Some applications	83 2 0 402 42		
Mitsubishi	Service Fill	Diamond SP-III, SP-II		
Nissan	Matic Service Fill	Matic-D, Matic-J, Matic-K		
Porsche	Some applications	JWS 3309		
Saab	Some applications	JWS, 5 speed automatics, Transmax J, T IV		
Subaru	Service Fill	ATF, ATF-HP		
Suzuki	Service Fill	Dexron III		
Texaco		ETL-7045E, N402		
Toyota	Service Fill	T III, T IV		
Voith		55.6335.32 (G607, G1363), DIWA #13S	55.6336.XX (up to 120,000km)	
Volvo		1273.41 and 97340	97341:39	
VW		G 055 25-A2, TL-5612, TL-52162		
ZF TE-ML		02F, 03D, 04D, 09, 11A, 14A/14B/14C, 16L, 17C	03D, 04D, 14B, 16L, 17C	
Pack Size	20L, 209L	20L, 209L	20L, 209L	1L, 4L, 20L, 60L, 209L, IBC

Valid at 26/07/2018. *Meets the requirements of the manufacturer. IBC = Intermediate Bulk Container - 1000L.

Automotive - Manual Transmission & Axle Fluids
Product Range Specification

	ADVANCED			PREMIUM			MAIN GRADE				
Specifications	Shell Spirax S6 AXME 75W-90	Shell Spirax S6 AXME 80W-140	Shell Spirax S6 GXME 75W-80	Shell Spirax S4 AT 75W-90	Spirax S5 ATE 75W-90	Shell Spirax S4 TXM	Shell Spirax S2 A 80W-90, 85W-140	Shell Spirax S2 ALS 90	Shell Spirax S3 ALS 80W-90	Shell Spirax S3 AX 80W-90	Shell Spirax S3 AX 85W-140
SAE	75W-90	80W-140	75W-80	75W-90		10W-30	80W-90, 85W-140	90	80W-90	80W-90	85W-140
API	GL-5, MT-1	GL-5, MT-1	GL-4	GL-4, GL-5, MT-1	GL-4, GL-5, MT-1	GL-4	GL-5	GL-5	GL-5 Limited Slip	GL-5	GL-5
AGMA		250.03									
Allison						C-4					
Caterpillar						TO-2					
Case MS						1207, 1209, 1210					
Case/New Holland						MAT 3525, M2C-134 A-D, FNHA-2-C.201.00					
DAF	Suitable										
Dana		SHAES 429 Rev. A				Mechanically controlled transmissions					
Ferrari					Approved						
General Electric		D50E9C									
Getrag					Approved						
Harnischfeger (P&H)		474									
International		TMS 6816									
Iveco	18-1805 Extended Drain*										
John Deere JDM						J20C					
Komatsu						Suitable					
Mack	GO-J	GO-J									
MAN	342 Type S1, 341 GA-2		341 Type Z4, 341 Type E3							342 Type M2	342 Type M1
Massey Ferguson						M1143, M1145					
Mercedes Benz					236.26					235.0*, 235.6	
Meritor	076-N, Meritor (EU) Extended Drain	076-B (Standard Drain), 076-Q or R (Extended Drain)									
SAE	J2360 (PRI GL 0582)	J2360				J306 85W					
Scania	STO 2:0G, STO 2:0A FS	STO 1:0									
US MIL-	PRF-2105E	PRF-2105E							L-2105D*	L-2105D	L-2105D
Volvo	97312	224	97307			WB 101, 97303:015					
ZF TE-ML	05B, 12L, 12N, 16F, 17B, 19C, 21B		01L, 02L, 16K			03E, 05F, 06D, 06K, 06M, 06N, 06R, 17E, 21F			05C, 12C, 21C	07A, 16C, 17B, 19B, 21A	07A, 16D, 21A
Pack Size	**20L, 209L**	**20L, 209L**	**20L**	**20L, 60L, 209L**	**20L**	**20L, 209L, IBC**	**80W-90 = 20L, 60L, 209L, IBC. 85W-140 = 20L, 209L, Bulk**	**20L, 60L, 209L**	**20L, IBC, Bulk**	**209L**	**209L**

Valid at 26/07/2018. *Meets the requirements of the manufacturer. IBC = Intermediate Bulk Container - 1000L.

Heavy Duty On-Road - Automatic Transmission Fluids
Product Range Specification

	ADVANCED				PREMIUM	MAIN GRADE
Specifications	Shell Spirax S6 ATF ZM	Shell Spirax S6 ATF A295	Shell Spirax S6 ATF X	Shell Spirax S5 ATF X	Shell Spirax S4 ATF HDX	Shell Spirax S3 ATF MD3
Aisin				JWS 3309		
Allison		TES-295, TES-468	Some applications	C-4	C-4	C-4
Audi				G 055 025-A2, G 052 162-A1		
BMW			Some applications	LA2634, ETL-7045E, LT71141		
Caterpillar		AT-1				
Chrysler			SP-IV M ATF			
Fiat			Some applications	9.55550 AV		
Ford			Mercon LV	Mercon V, Mercon, M2C138-CJ, M2C166-H, M2C202-B, M2C924-A (JWS 3309), M2C922-A1	Mercon	Mercon
GM Dexron		III	VI	III, II, IID, Type A Suffix A	IIIG	III
Honda			Service Fill	ATF-Z1		
Hyundai			ATF (except 8 speed SPH-IV RR)	SP III, SP II		
Isuzu			ATF	SCS, ATF-II, ATF-III, Genuine		
Jaguar			Some applications			
JASO			1-A-LV	1-A, 2A-02		
Kia			ATF (except 8 speed SPH-IV RR)	SP III, SP II, ATF Red I-K		
Land Rover			Some applications			
MAN	339, Type Z13 (ZF Ecolife 240,000 to 120,000km). 339, Type Z4 (ZF Ecomat 150,000km).	339, Type Z3		339F, Type V1, V2, Z1, Z2, Z3	339, Type Z2, V2	
Mazda			Service Fill	ATF M-111, ATF MV		
MB		236.91	236.1 to 236.10	236.1, 236.2, 236.5, 236.6, 236.7, 236.9, 236.10	236.9	
Mini			Some applications	83 2 0 402 42		
Mitsubishi			Service Fill	Diamond SP-III, SP-II		
Nissan			Matic Service Fill	Matic-D, Matic-J, Matic-K		
Porsche			Some applications	JWS 3309		
Saab			Some applications	JWS, 5 speed automatics, Transmax J, T IV		
Subaru			Service Fill	ATF, ATF-HP		
Suzuki			Service Fill	Dexron III		
Texaco				ETL-7045E, N402		
Toyota			Service Fill	T III, T IV		
Voith		DIWA Transmissions		55.6335.32 (G607, G1363), DIWA #13S	55.6336.XX (up to 120,000km)	
Volvo				1273.41 and 97340	97341:39	
VW				G 055 25-A2, TL-5612, TL-52162		
ZF TE-ML	04D, 14E, 16N, 16Q, 20F	14A, 14B, 14C		02F, 03D, 04D, 09, 11A, 14A/14B/14C, 16L, 17C	03D, 04D, 14B, 16L, 17C	
Pack Size	**209L**	**20L, 209L, IBC**	**20L, 209L**	**20L, 209L**	**20L, 209L**	**1L, 4L, 20L, 60L, 209L, IBC**

Valid at 26/07/2018. *Meets the requirements of the manufacturer. IBC = Intermediate Bulk Container - 1000L.

Heavy Duty On-Road - Manual Transmission & Axle Fluids
Product Range Specification

	ADVANCED				PREMIUM	MAIN GRADE				
Specifications	Shell Spirax S6 GXME 75W-80	Shell Spirax S6 GME 40	Shell Spirax S6 AXME 80W-140	Shell Spirax S6 AXME 75W-90	Shell Spirax S4 AT 75W-90	Shell Spirax S3 AX 85W-140	Shell Spirax S3 AX 80W-90	Shell Spirax S3 ALS 80W-90	Shell Spirax S2 ALS 90	Shell Spirax S2 A 80W-90, S2 85W-140
SAE	75W-80	40	80W-140	75W-90	75W-90	85W-140	80W-90	80W-90	90	80W-90, 85W-140
API	GL-4	MT-1	GL-5, MT-1	GL-5, MT-1	GL-4, GL-5, MT-1	GL-5	GL-5	GL-5 Limited Slip	GL-5	GL-5
AGMA			250.03							
DAF				Suitable						
Dana			SHAES 429 Rev. A							
Eaton		PS 386								
General Electric			D50E9C							
Harnischfeger (P&H)			474							
International			TMS 6816							
Iveco				18-1805 Extended Drain*						
Mack			GO-J	GO-J						
MAN	341 Type Z4, 341 Type E3			342 Type S1, 341 GA-2		342 Type M1	342 Type M2			
Mercedes Benz							235.0*, 235.6			
Meritor		O-81	076-B (Standard Drain), 076-Q or R (Extended Drain)	076-N, Meritor (EU) Extended Drain						
SAE			J2360	J2360 (PRI GL 0582)						
Scania			STO 1:0	STO 2:0G, STO 2:0A FS						
US MIL-			PRF-2105E	PRF-2105E		L-2105D	L-2105D	L-2105D*		
Volvo	97307		224	97312						
ZF TE-ML	01L, 02L, 16K			05B, 12L, 12N, 16F, 17B, 19C, 21B		07A, 16D, 21A	07A, 16C, 17B, 19B, 21A	05C, 12C, 21C		
Pack Size	**20L**	**18.9L, 208.2L**	**20L, 209L**	**20L, 209L**	**20L, 60L, 209L**	**209L**	**209L**	**20L, IBC, Bulk**	**20L, 60L, 209L**	**80W-90 = 20L, 60L, 209L, IBC, 85W-140 = 20L, 209L, Bulk**

Valid at 26/07/2018. *Meets the requirements of the manufacturer. IBC = Intermediate Bulk Container - 1000L.

Off Highway - Automatic & Manual Transmission Fluids
Product Range Specification

	ADVANCED				PREMIUM						MAIN GRADE					
Specifications	Shell Spirax S6 ATF A295	Shell Spirax S6 AXME 75W-90	Shell Spirax S6 AXME 80W-140	Shell Spirax S5 CFD M 60	Shell Spirax S4 ATF HDX	Shell Spirax S4 AT 75W-90	Shell Spirax S4 CX 10W	Shell Spirax S4 CX 30	Shell Spirax S4 CX 50, 60	Shell Spirax S4 TXM	Shell Spirax S3 ATF MD3	Shell Spirax S2 A 80W-90, S2 A 85W-140	Shell Spirax S2 ALS 90	Shell Spirax S3 ALS 80W-90	Shell Spirax S3 AX 80W-90	Shell Spirax S3 AX 85W-140
SAE		75W-90	80W-140	60		75W-90	10W	30	50, 60	10W-30		80W-90, 85W-140	90	80W-90	80W-90	85W-140
API		GL-5, MT-1	GL-5, MT-1			GL-4, GL-5, MT-1				GL-4		GL-5	GL-5	GL-5 Limited Slip	GL-5	GL-5
AGMA			250.03													
Allison	TES-295, TES-468				C-4		C-4	C-4	C-4	C-4	C-4					
Caterpillar	AT-1			FD-1, FD-1 (FDAO)			TO-4	TO-4	TO-4	TO-2						
Case MS										1207, 1209, 1210						
Case/New Holland										MAT 3525, M2C-134 A-D, FNHA-2-C.201.00						
DAF		Suitable														
Dana			SHAES 429 Rev. A							Mechanically controlled transmissions						
Ford					Mercon						Mercon					
General Electric			D50E9C													
GM Dexron	III				IIIG						III					
Harnischfeger (P&H)			474													
International			TMS 6816													
Iveco		18-1805 Extended Drain*														
John Deere JDM										J20C						
Komatsu										Suitable						
Mack		GO-J	GO-J													
MAN	339, Type Z3	342 Type S1, 341 GA-2			339, Type Z2, V2										342 Type M2	342 Type M1
Massey Ferguson										M1143, M1145						
Mercedes Benz	236.91				236.9										235.0*, 235.6	
Meritor		076-N, Meritor (EU) Extended Drain	076-B (Standard Drain), 076-Q or R (Extended Drain)													
SAE		J2360 (PRI GL 0582)	J2360							J306 85W						
Scania		STO 2:0G, STO 2:0A FS	STO 1:0													
US MIL-		PRF-2105E	PRF-2105E											L-2105D*	L-2105D	L-2105D
Voith	DIWA Transmissions				55.6336.XX (up to 120,000km)											
Volvo		97312	224		97341:39					WB 101, 97303:015						
ZF TE-ML	14A, 14B, 14C	05B, 12L, 12N, 16F, 17B, 19C, 21B			03D, 04D, 14B, 16L, 17C		03C	03C, 07F		03E, 05F, 06D, 06K, 06M, 06N, 06R, 17E, 21F				05C, 12C, 21C	07A, 16C, 17B, 19B, 21A	07A, 16D, 21A
Pack Size	**20L, 209L, IBC**	**20L, 209L**	**20L, 209L**	**Bulk**	**20L, 209L**	**20L, 60L, 209L**	**209L, Bulk**	**20L, 209L, Bulk**	**CX 50 = 18.9L, 209L, Bulk, CX 60 = 209L, Bulk**	**20L, 209L, IBC**	**1L, 4L, 20L, 60L, 209L, IBC**	**80W-90=20L, 60L, 209L, IBC. 85W-140=20L, 209L, Bulk**	**20L, 60L, 209L**	**20L, IBC, Bulk**	**209L**	**209L**

Valid at 26/07/2018. *Meets the requirements of the manufacturer. IBC = Intermediate Bulk Container - 1000L.

VIVA Energy Australia

Shell Lubricants Macro Distributor

Industrial Oils

Products for industrial and hydraulic applications

Applications

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10.2	Tellus S2 VX 15, 22, 32, 46, 68, 100	104
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11.0 Industrial Gear Oils

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13.0 Bearing & Circulating Oils

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Industrial Oils

Applications

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Shell Tellus
S2 MX 22, 32, 46, 68, 100

High performance hydraulic fluid, Group II base oil technology, industrial applications

Shell Tellus S2 MX fluids are high performance hydraulic fluids based on Group II base oils that provide outstanding protection and performance in most manufacturing and many mobile equipment operations. They resist breakdown under heat or mechanical stress and help prevent damaging deposit formation that can decrease the efficiency of your hydraulic power system.

Performance, Features & Benefits:

- Long Fluid Life – maintenance saving
- Outstanding wear protection
- Maintaining system efficiency

Main Applications:

- Industrial hydraulic systems:

  Shell Tellus S2 MX fluids are suitable for a wide range of hydraulic power applications found in manufacturing and industrial environments.
- Mobile hydraulic fluid power transmission systems:

  Shell Tellus S2 MX fluids can be used effectively in mobile hydraulic power applications such as excavators and cranes, except where significant ambient temperature variations are encountered. For these applications we recommend Shell Tellus S2 VX.
- Marine hydraulic systems:

  Suitable for marine applications where ISO HM category hydraulic fluids are recommended.

Compatibility & Miscibility:

- Compatibility:

  Shell Tellus S2 MX fluids are suitable for use with most hydraulic pumps.
- Fluid Compatibility:

  Shell Tellus S2 MX fluids are compatible with most other mineral oil based hydraulic fluids. However, mineral oil hydraulic fluids should not be mixed with other fluid types (e.g. environmentally acceptable or fire resistant fluids).
- Seal and Paint Compatibility:

  Shell Tellus S2 MX fluids are compatible with seal materials and paints normally specified for use with mineral oils.

Specifications, Approvals & Recommendations:

Tellus S2 MX	ASTM D6158-05 (HM Fluids)	Bosch Rexroth RDE 90245	DIN 51524 Part 2 HLP Type	Eaton E-FDGN-TB002-E	Fives Cincinnati Machine	ISO 11158 (HM Fluids)	Parker Denison (HF-0, HF-1, HF-2)	Swedish Standard SS 15 54 35 AM
22	✓		✓	✓		✓		
32	✓	✓	✓	✓	P-68	✓	✓	✓
46	✓	✓	✓	✓	P-70	✓	✓	✓
68	✓	✓	✓	✓	P-69	✓	✓	✓
100	✓		✓	✓		✓		

Shell Tellus S2 VX 15, 22, 32, 46, 68, 100

High performance hydraulic fluid, Group II base oil technology, versatile applications

Shell Tellus S2 VX fluids are high performance hydraulic fluids based on Group II base oils that provide outstanding protection and performance across a wide range of temperatures. They resist breakdown under heat or mechanical stress and are ideally suited to most mobile equipment and other applications subjected to a wider range of ambient or operating temperatures.

Performance, Features & Benefits:

- Long Fluid Life – maintenance saving
- Outstanding wear protection
- Maintaining system efficiency

Main Applications:

- Mobile/exterior hydraulic systems:

  Hydraulic and fluid power transmission systems in exposed environments can be subject to wide variations in temperature. The high viscosity index of Shell Tellus S2 VX helps deliver responsive performance from cold start conditions to full load, severe duty operation.
- Precision hydraulic systems:

  Precision hydraulic systems require excellent control of fluid viscosity over the operating cycle. Shell Tellus S2 VX provides greater temperature-viscosity stability compared to ISO HM fluids that can help improve the performance of such systems.
- Marine hydraulic systems:

  Suitable for marine applications where ISO HV category hydraulic fluids are recommended.

Specifications, Approvals & Recommendations:

- Parker Denison (HF-0, HF-1, HF-2)(ISO vg 32, 46, 68)
- Eaton E-FDGN-TB002-E
- Fives (Cincinnati Machine) P-68 (ISO vg 32), P-70
- ISO 11158 (HV fluids) (ISO vg 46), P-69
- DIN 51524 Part 3 HVLP type (ISO vg 68)
- ASTM D6158 (HV fluids)
- Swedish Standard SS 15 54 34 AM (ISO vg 32, 46, 68)
- Bosch Rexroth RDE 90245 (ISO vg 32, 46, 68)

Compatibility & Miscibility:

- Compatibility:

  Shell Tellus S2 VX fluids are suitable for use with most hydraulic pumps.
- Fluid Compatibility:

  Shell Tellus S2 VX fluids are compatible with most other mineral oil based hydraulic fluids. However, mineral oil hydraulic fluids should not be mixed with other fluid types (e.g. environmentally acceptable or fire resistant fluids).
- Seal and Paint Compatibility:

  Shell Tellus S2 VX fluids are compatible with seal materials and paints normally specified for use with mineral oils.

Shell Tellus
S3 M 46, 68, 100

Premium zinc-free industrial hydraulic fluid

Shell Tellus S3 M hydraulic fluids are high performance lubricants that use exclusive zinc-free technology to provide outstanding protection and performance in most manufacturing and many mobile equipment operations. They resist breakdown under heat or mechanical stress, helping to prevent damaging deposits that can decrease the efficiency of your hydraulic system.

Performance, Features & Benefits:

- Long fluid life – maintenance saving
- Outstanding wear protection
- Maintaining system efficiency

Main Applications:

- Shell Tellus S3 M fluids are suitable for a wide range of hydraulic power applications found in manufacturing and industrial environments.
- Shell Tellus S3 M has a reduced environmental impact in the event of a leak or accidental spillage compared to conventional zinc-based hydraulic fluids.

For further reductions in environmental impact, we offer the Shell Naturelle range of environmentally considerate lubricants.

For applications that experience wide temperature variations we recommend the Shell Tellus "S2 V" series of hydraulic fluids.

Compatibility & Miscibility:

- Shell Tellus S3 M fluids are suitable for use with most hydraulic pumps.
- Shell Tellus S3 M fluids are compatible with most other mineral oil based hydraulic fluids. However, mineral oil hydraulic fluids should not be mixed with other fluid types (e.g. environmentally acceptable or fire resistant fluids).
- Shell Tellus S3 M fluids are compatible with seal materials and paints normally specified for use with mineral oils.

Specifications, Approvals & Recommendations:

Tellus S3 M	ASTM D6158-05 (HM Fluids)	DIN 51524 Part 2 HLP Type	Eaton Vickers Brochure (694)	Fives Cincinnati Machine	ISO 11158 (HM Fluids)	Parker Denison (HF-0, HF-1, HF-2)	Swedish Standard SS 15 54 35 AM
46	✓	✓	✓	P-70	✓	✓	✓
68	✓	✓	✓	P-69	✓	✓	✓
100	✓	✓			✓		✓

Shell Tellus S4 ME 46, 68

Advanced synthetic industrial hydraulic fluid

Shell Tellus S4 ME hydraulic fluids are designed to help users improve the energy efficiency of their hydraulic systems without compromising the protection of the system or maintenance procedures of their equipment and operations. Shell Tellus S4 ME has been demonstrated to improve energy efficiency in a wide range of applications such as plastic injection moulding, metal pressing, and mining conveyors. In addition, Shell Tellus S4 ME is also designed to help equipment service life and lower maintenance costs through providing outstanding wear protection and long oil life capability.

Performance, Features & Benefits:

- Energy efficiency
- Reduce maintenance costs
- Greater equipment protection

Main Applications:

- Particularly suitable for those systems with high intensity of hydraulic power usage such as injection moulding and high pressure metal pressing operations and where resistance to high temperatures or long oil life is required.
- Shell Tellus S4 ME is also suitable for use in certain mobile hydraulic fluid power transmission systems and in marine applications and provides superior low temperature fluidity compared to most conventional ISO HM type fluids.
- Shell Tellus S4 ME oils provide a reduced environmental impact in the case of leakage or accidental spillage compared to conventional zinc-based hydraulic fluids through the use of ashless anti-wear technology and low sulphur base oils.

Specifications, Approvals & Recommendations:

- Denison Hydraulics (HF-0, HF-1, HF-2)
- Five Cincinnati P-70 (ISO 46), P-69 (ISO 68)
- Eaton Vickers (Brochure 694)
- Bosch Rexroth RD 90220-01 (2011)
- Arburg (Injection moulding applications)
- ASTM D6158 (HM fluids)
- ISO 11158 (HM fluids)
- DIN 51524 Part 2 HLP type
- Swedish Standard SS 15 54 34 AM
- Krauss Maffei

Compatibility & Miscibility:

- Shell Tellus S4 ME fluids are suitable for use with most hydraulic pumps.
- Shell Tellus S4 ME fluids are compatible with most other mineral oil based hydraulic fluids. However, mineral oil hydraulic fluids should not be mixed with other fluid types (e.g. environmentally acceptable or fire resistant fluids).
- Shell Tellus S4 ME fluids are compatible with seal materials and paints normally specified for use with mineral oils.

Shell Naturelle HF-E 46

Fully synthetic, biodegradable, less-flammable hydraulic fluid

Shell Naturelle Fluid HF-E is an advanced biodegradable and HFDU type less flammable hydraulic fluid for use in hydraulic and power transmission systems. It is readily biodegradable with a low ecotoxicity, particularly suited for use in environmentally sensitive areas and in industrial equipment operating in areas subject to fire hazards, such as in steel mills, surface mines and foundries.

Performance, Features & Benefits:

- Excellent wear protection
- Maintaining system efficiency
- Readily biodegradable and low ecotoxicity
- Fire resistances

Main Applications:

- Mobile / exterior hydraulic applications
- General industrial control equipment and hydraulic systems
- Environmentally sensitive areas
- Industrial operation subject to fire hazards

Specifications, Approvals & Recommendations:

- European Union ecolabel for lubricants
- Ecolabel licence UK/27/004
- Swedish Standard SS 15 54 34, SP listed
- ISO 15380 HEES
- ISO 12922 HFDU
- Factory Mutual approved
- United States Environmental protection Agency's (EPA) 2013 Vessel General Permit (VGP)
- VDMA 24568 synthetic esters
- Dutch MIA/VAMIL Milieulijst
- German Positivliste Bioschmierstoffe
- USDA Bio-preferred program
- Sperry Marine
- Quantum Marine Engineering
- Rolls Royce Marine
- Shell Naturelle Fluid HF-E is approved as meeting the anti-wear requirements of the hydraulic fluid recommendations for Eaton Vickers products for mobile and industrial systems according to Brochure 03-401-2010.

Shell Lubricants
Macro Distributor

Shell Omala Oil F 320

Premium quality industrial gear oils

Shell Omala F Oils are premium quality, lead-free, extreme-pressure oils designed, primarily, for the lubrication of heavy duty industrial gears. Their high load carrying capacity and anti-friction characteristics combine to offer superior performance in gears and other industrial applications. They are formulated using high viscosity index, solvent refined, base oils, and incorporate a special sulphur-phosphorus additive to provide an extreme pressure performance significantly better than that provided by leaded gear oils.

Performance, Features & Benefits:

- Excellent load carrying and anti-friction characteristics
- Outstanding oxidation and thermal stability
- Effective corrosion inhibition
- Resistant to micro-pitting
- Lead free
- Excellent water shedding properties

Main Applications:

- Steel gear transmissions
- Industrial gear drives where a full EP performance is required
- Bearings
- Circulating and splash lubricated systems
- Shell Omala F should not be used for automotive hypoid fears. The appropriate Shell Spirax Oil should be used for this purpose.

Specifications, Approvals & Recommendations:

- Sufficient oxidation stability for a lifetime of 10, 000 hours or two years at 80°C
- Flender Foam Test
- A pass in the FVA-54/II micro pitting (grey staining) test at load stage 10 at 90°C
- A load stage 12 pass in the FZG double speed test (DIN 51354 Part 2)

Compatibility & Miscibility:

- Shell Omala F Oils are compatible with internal gearbox paints; also solid and liquid seals.

Shell Omala

S2 G 68, 100, 150, 220, 320, 460, 680, 1000

Industrial gear oils

Shell Omala S2 G oils are high quality extreme-pressure oils designed primarily for the lubrication of heavy duty industrial gears. Their high load carrying capacity and anti-friction characteristics combine to offer superior performance in gears.

Performance, Features & Benefits:

- Long oil life – maintenance saving
- Excellent wear & corrosion protection
- Maintaining system efficiency

Main Applications:

- Shell Omala S2 G oils are formulated using an effective sulphur-phosphorus additive system to provide an extreme pressure performance which allows trouble-free application in most enclosed industrial gearboxes using steel spur and helical gears.
- Shelly Omala S2 G oils have an effective full extreme pressure (EP) additive system allowing them to be used in highly-loaded gear systems.
- Shell Omala S2 G oils are suitable for lubrication of bearings and other components in circulating and splash-lubricated systems.
- For highly loaded worm drives, Shell Omala S4 WE and Shell Morlina S4 B are recommended.
- For automotive hypoid gears, the appropriate Shell Spirax oil should be used.

Shell does not recommend/support use in systems with fine filtration (<10 microns) because sustained foam control performance is not assured.

Specifications, Approvals & Recommendations:

Omala S2 G	Fives Cincinnati Machine	AGMA EP 9005-EO2	ISO 12925-1 Type	DIN 51517 Part 3 - CLP
68	P-63	✓	CKD	✓
100	P-76	✓	CKD	✓
150	P-77	✓	CKD	✓
220	P-74	✓	CKD	✓
320	P-59	✓	CKD	✓
460	P-35	✓	CKC	✓
680	P-34	✓	CKC	✓
1000	-	✓	CKC	✓

Shell Omala S4 GX 150, 220, 320, 460, 680

Advanced synthetic industrial gear oil

Shell Omala S4 GX is an advanced synthetic heavy duty industrial gear oil offering outstanding lubrication performance under severe operating conditions, including reduced friction, long service life and high resistance to micro-pitting for optimal gear protection.

Performance, Features & Benefits:

- Long oil life – maintenance saving
- Excellent wear & corrosion protection
- Maintaining system efficiency

Main Applications:

- Wind turbines and other inaccessible installations:

  Shell Omala S4 GX is particularly recommended for certain systems where extra long life is required, maintenance is infrequent or systems are inaccessible.
- Enclosed industrial gear systems:

  Recommended for industrial reduction gear systems operating under sever operating conditions, such as high load, very low or elevated temperatures and wide temperature variations.

Other applications:

- Shell Omala S4 GX oils are suitable for lubrication of bearings and other components in circulating and splash-lubricated systems.
- For highly loaded worm drives, the Shell Omala "W" series oils are recommended.
- For automotive hypoid gears, the appropriate Shell Spirax Oil should be used.

Specifications, Approvals & Recommendations:

- David Brown S1.53.106
- Approved for wind turbine gearboxes by: Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ISO 12925-1 Type CKD
- US Steel 224
- DIN 51517-3 (CLP)
- ANSI/AGMA 9005-E02 (EP)
- ORBITAL 2 approved for helical and planetary gear units for wind turbines (ISO vg 320 only)

Shell Omala S4 WE 150, 220, 320

Advanced synthetic industrial gear oil

Shell Omala S4 WE is an advanced synthetic heavy duty industrial worm drive gear oil formulated using specially selected polyalkylene glycol base fluids and additives. It offers outstanding lubrication performance under severe operating conditions, including improved energy efficiency, long service life and high resistance to micro-pitting.

Performance, Features & Benefits:

- Long oil life – maintenance saving
- Excellent wear protection
- Maintaining system efficiency

Specifications, Approvals & Recommendations:

- DIN 51517-3 (CLP)
- Fully approved by Bonfiglioli

Main Applications:

- Recommended for industrial worm gear reduction systems operating under sever operating conditions, such as high load, very low or elevated temperatures and wide temperature variations.
- Extended life systems:

  Shell Omala S4 WE is particularly recommended for certain systems where maintenance is infrequent or systems are inaccessible (eg. yaw gears in wind turbine installations).

Other applications:

- Shell Omala S4 WE oils are suitable for lubrication of bearings and other components in circulating and splash-lubricated systems.
- Shell Omala S4 WE is not recommended for the lubrication of components manufactured from aluminium or aluminium allows.
- For highly loaded spur and helical gears, the Shell Omala "G" series oils are recommended.
- For automotive hypoid gears, the appropriate Shell Spirax Oil should be used.

Compatibility & Miscibility:

- High quality epoxy paints are recommended, as polyalkylene glycols will tend to attack certain conventional paints. Shell Omala S4 WE has been found to be satisfactory with nitrile and Viton seal materials, although Viton seals are preferred.

Shell Omala S4 Wheel 680

Advanced synthetic industrial gear oil

Shell Omala S4 Wheel is an advanced synthetic heavy duty industrial gear oil offering outstanding lubrication performance under severe operating conditions, including improved energy efficiency and long service life. It is recommended specifically for use in General Electric off-highway motorised wheels fitted to haul trucks used in mining applications.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Excellent wear & corrosion protection
- Maintaining system efficiency

Main Applications:

- GE motorised wheel hubs:

  Specially suitable for the gearcases of General Electric motorised wheels fitted to haul trucks used in mining applications.
- Enclosed industrial gear systems:

  For use in enclosed industrial reduction gear systems operating under severe operating conditions, such as high load, very low or elevated temperatures and wide temperature variations.

Other applications:

- Shell Omala S4 Wheel oils are suitable for lubrication of bearings and other components in circulating and splash-lubricated systems.
- For highly-loaded worm drives, the Shell Omala "W" series oils are recommended.
- For automotive hypoid gears, the appropriate Shell Spirax Oil should be used.

Specifications, Approvals & Recommendations:

- David Brown S1.53.106H
- US Steel 224
- DIN 51517-3 (CLP)

Approved by GE under GEK-30375H against the following:

- ISO 680 GE Specification D50E35E

Compatibility & Miscibility:

- Seal & Paint Compatibility:

  Shell Omala S4 Wheel is compatible with all seal materials and paints normally specified for use with mineral oils.

Shell Omala S3 GP 1500

Special application industrial gear oils

Shell Omala S3 GP oils are specialist 'problem solving' lubricants developed to lubricate industrial gearboxes subject to extremely high and heavily shock loaded operations such as those found in steel, cement, mining and quarrying industries. There are formulated for use where ultra-high levels of extreme-pressure performance are required.

Performance, Features & Benefits:

- Long oil life – maintenance saving
- Excellent wear & corrosion protection
- Maintaining system efficiency

Main Applications:

- Shell Omala S3 GP oils are designed for use in enclosed industrial gear systems subject to severe operating conditions including high shock loading applications.
- These oils can be used in older gear systems that may be damaged or misaligned. The extreme pressure performance provides additional protection in such applications.
- Shell Omala S3 GP oils are suitable for lubrication of bearings and other components in circulating and splash-lubricated systems.
- For normal load applications the other Shell Omala "G" series oils recommended.
- For automotive hypoid gears, the appropriate Shell Spirax oil should be used.

Specifications, Approvals & Recommendations:

- Textron Power Transmission (former David Brown) S1.53.101E
- Arcelor Mittal FT163
- ISO 12925-1 Type CKD
- ANSI/AGMA 9005-E02 (EP)
- DIN 51517-3 (CLP)
- Shell Omala S3 GP 1500 is included in the Bucyrus Certified Lubricants list.

Shell Mine Gear 1500

Extreme pressure industrial gear oil

Shell Mine Gear 1500 is a premium quality, semi-synthetic, extreme pressure (EP) gear oil which is specifically developed for the enclosed gearboxes on walking draglines in the mining industry but can also be used in any large, low speed, high loaded industrial gearbox.

Shell Mine Gear 1500 has been formulated without the use of lead containing additives.

Performance, Features & Benefits:

- Extreme pressure performance

  Shell Mine Gear 1500 incorporates a special combination of performance additives that give it far superior EP performance compared to conventional industrial EP gear oils.

- Semi-synthetic oil

  Shell Mine Gear 1500 contains Poly-Alpha-Olefin (PAO) synthetic base oil for improved performance and longer oil life.

- Resistance to corrosion

  Shell Mine Gear 1500 does not contain aggressive EP additives that can attack certain gearbox metal components, such as yellow metal.

- Oxidation and thermal stability

  The ability to withstand high thermal loading, while affording increased resistance to oxidation, is of particular importance in a premium quality, heavy duty gear lubricant. Bulk oil temperatures of Shell Mine Gear 1500 may be raised higher than conventional gear lubricants without adverse effects.

- Load carrying capacity

  The load carrying capacity of Shell Mine Gear 1500, as determined in laboratory tests and confirmed by local experience in Australian draglines, ensures extremely low gear tooth wear, particularly under high load conditions.

Specifications, Approvals & Recommendations:

- Meets the requirements for Marion GL-250

Shell Turbo S4 GX 32

Premium based industrial steam, gas and combined cycle turbine lubricant for geared turbines

Shell Turbo S4 GX 32 is based on Gas-to-Liquid (GTL) technology and has been developed to meet the demands of the latest high efficiency turbine systems. Designed to offer outstanding, long term performance under the most severe operating conditions Shell Turbo GX 32 will minimise wear, deposit and sludge formation even under cyclic peak loading conditions.

Performance, Features & Benefits:

- Extended oil life
- Enhanced equipment protection
- Enhanced system efficiency

Main Applications:

- Power generation combined cycle turbines:

  Shell Turbo S4 GX 32 is used as the lubricating oil for main shaft bearings and mechanical gears as well as the governor oil in the turbine control valves in modern gas turbines.
- Further industrial applications:

  Shell Turbo S4 GX 32 may also be used for other industrial application requiring a high performance gas turbine oil, such as the lubrication of turbo compressors.

Specifications, Approvals & Recommendations:

- ASTM 4304-13 Type I, II & III
- GB (China) 11120-2011, L-TSE, L-TGE and L-TGSE
- DIN 51515 Part 1 L-TDP & Part 2 L-TGP, 51524-2-HLP
- JIS K 2213:2006 Type 2
- ISO 8068:2006 L-TGF, 8068:2006 L-TGSE
- Shell Turbo S4 GX is approved by Siemens Power Generation, spec TLV 9013 04 and TLV 9013 05
- General Electric GEK 32568K, 46506e, 28143b, 101941a, 107395a and 120498
- Alstom HTGD 90117 V0001 AA
- Dresser Rand 003-406-001 Type I & III
- Westinghouse 21 TO591 and 55125Z3 and Eng Spec_ DP21T-00000443
- Solar ES 9-224Y Class II
- MAN D&T SE TED 10000494596
- Shell Turbo S4 GX 32 meets the specification of Elliott Turbo-machinery X-18-0004
- Shell Turbo S4 GX 32 meets Siemens Turbo-machinery specifications 1CW0047915, WN80003798, and report 65/0027
- Shell Turbo S4 GX meets Siemens Finspong MAT812109
- GE Oil and Gas - Appropriate Specification listed under document ITN52220.04
- ANSALDO TGO2-0171-E00000/B
- Shell Turbo S4 GX 32 has been classified as a low varnishing type turbine oil by GE Oil & Gas against document ITN52220.04.

Shell Turbo S4 GX 46

Premium based industrial steam, gas and combined cycle turbine lubricant for geared turbines

Shell Turbo S4 GX 46 is based on Gas-to-Liquid (GTL) technology and has been developed to meet the demands of the latest high efficiency turbine systems. Designed to offer outstanding, long term performance under the most severe operating conditions Shell Turbo GX 46 will minimise wear, deposit and sludge formation even under the cyclic peak loading conditions.

Performance, Features & Benefits:

- Extended oil life
- Enhanced equipment protection
- Enhanced system efficiency

Main Applications:

- Power generation combined cycle turbines:

  Shell Turbo S4 GX 46 is used as the lubricating oil for main shaft bearings and mechanical gears as well as the governor oil in the turbine control valves in modern gas turbines.
- Further industrial applications:

  Shell Turbo S4 GX 46 may also be used for other industrial application requiring a high performance gas turbine oil, such as the lubrication of turbo compressors.

Specifications, Approvals & Recommendations:

- ASTM 4304-13 Type I, II & III
- GB (China) 11120-2011, L-TSE, L-TGE and L-TGSE
- DIN 51515 Part 1 L-TDP & Part 2 L-TGP, DIN 51524-2 HLP
- JIS K 2213:2006 Type 2
- ISO 8068:2006 L-TGF, 8068:2006 L-TGSE
- Shell Turbo S4 GX is approved by Siemens Power Generation, spec TLV 9013 04 and TLV 9013 05
- General Electric GEK 28143b, GEK 117064
- Alstom HTGD 90117 V0001 AA
- Dresser Rand 003-406-001 Type I & III
- Solar ES 9-224Y Class II
- MAN D&T SE TED 10000494596
- Shell Turbo S4 GX 46 meets Siemens Turbo-machinery specifications 1CW0047915, WN80003798, and report 65/0027
- Shell Turbo S4 GX meets Siemens Finspong MAT 812109
- GE Oil and Gas - Appropriate Specification listed under document ITN52220.04
- ANSALDO TGO2-0171-E00000/B

Shell Turbo S4 X 32

Premium based industrial steam, gas and combined cycle turbine lubricant.

Shell Turbo S4 X 32 is based on Gas-to-Liquid (GTL) technology and has been developed to meet the demands of the latest high efficiency turbine systems. Designed to offer outstanding, long term performance under the most severe operating conditions Shell Turbo S4 X 32 will minimise deposit and sludge formation even under cycle peak loading conditions.

Performance, Features & Benefits:

- Extended oil life
- Enhanced Equipment protection
- Enhanced System efficiency

Main Applications:

- Power and industrial steam, gas and combined cycle turbines:

  Shell Turbo S4 X 32 is used as the lubricating oil of choice in modern steam, gas and combined cycle turbines. Note that some applications with highly loaded gearboxes require a lubricant with enhanced anti-wear performance – for these applications use Shell Turbo S4 GX.
- Further industrial applications:

  Shell Turbo S4 X 32 may also be used for other industrial applications requiring a high performance gas turbine oil, such as the lubrication of turbo compressors.

Specifications, Approvals & Recommendations:

Shell Turbo S4 X 32 meets and exceeds international specification and requirements of the major turbine manufacturers including:

- ASTM D4304-13 Type I & III
- GB (China) 11120-2011, L-TGA, L-TSA, L-TGSB
- DIN 51515 Part 1 L-TD & Part 2 L-TG, DIN 51524-1 HL
- ISO 8068:2006, L-TGB and L-TGSB
- Shell Turbo S4 X 32 is approved by Siemens Power Generation, spec TLV 9013 04 and TLV 9013 05
- General Electric GEK 32568K, 46506e, 28143b, 107395a and 120498
- Alstom HTGD 90117 V0001 AA
- Dresser Rand 003-406-001 type I & III
- Westinghouse 21 TO591 and 55125Z3 and Eng Spec_ DP21T-00000443
- Solar ES 9-224Y Class II
- Man D&T SE TED 10000494596
- Shell Turbo S4 X 32 meets the specification of Elliot Turbo-machinery X-18-0004
- GE Oil and Gas – Appropriate Specification listed under document ITN52220.04
- Shell Turbo S4 X 32 meets the requirements of MS04-MA-CL001 (Rev. 4), MS-MA-CL002 (Rev 4.), MS04-MA-CL005 (Rev. 2) and MHI Compression
- Shell Turbo S4 X 32 has been classified as a low varnishing type turbine oil by GE Oil & Gas against document ITN52220.04.

Shell Turbo Oil T 32

High quality industrial steam & gas turbine oils

Shell Turbo Oils T have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oils T have been developed to offer improved performance capable of meeting the demands of the most modern steam turbine systems and light duty gas turbines, which require no enhanced anti-wear performance for the gearbox. Shell Turbo Oils T are formulated from high quality hydrotreated based oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.

Performance, Features & Benefits:

- Strong control of oxidation
- High resistance to foaming and rapid air release
- Positive water-shedding properties
- Excellent rust and corrosion properties

Main Applications:

Shell Turbo Oils T are available in ISO grades 32, 46, 68 and 100 and suited for application in the following areas:

- Industrial steam turbines and light duty gas turbines which require no enhanced anti-wear performance for the gearbox
- Hydroelectric turbine lubrication
- Numerous applications where strong control over rust and oxidation is required
- Centrifugal and axial, dynamic turbo-compressors and pumps where an R&O type or turbine oil is recommended

Specifications, Approvals & Recommendations:

- Siemens Power Generation TLV 9013 04 and TLV 9013 05
- Alstom HTGD 90117 V0001 AA
- Man Turbo SP 079984 D0000 E99
- Fives Cincinnati, LLC (formerly Cincinnati Machine): P-38
- General Electric GEK 28143b, GEK 32568k, GEK 46506e, GEK 120498
- Siemens – Westinghouse 21T0591 and PD-55125Z3
- DIN 51515-1 L-TD, DIN 51515-2 L-TG, DIN 51524-1 HL
- ISO 8068:2006 L-TGA & L-TSA
- Solar ES 9-224Y Class II
- GEC Alstom NCA P50001A
- JIS K 2213:2006 Type 2
- ASTM D4304, Type I and Type III
- GB 11120-2011, L-TSA and L-TGA
- Indian Standard IS 1012:2002
- Skoda: Technical Properties Tp 0010P/97 use in steam turbines
- Alstom Power Hydro Generators (spec HTWT600050)
- Dresser Rand (spec 003-406-001)
- Siemens Turbo Compressors (spec 800 037 98)
- GE Oil and Gas – Appropriate Specification listed under document ITN 52220.04
- For special applications such as Ammonia or High Sulphur Syngas compressors with wet gas seals, please contact your Viva Energy Technical Helpdesk.

Shell Turbo Oil T 46

High quality industrial steam & gas turbine oils

Shell Turbo Oils T have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oils T have been developed to offer improved performance capable of meeting the demands of the most modern steam turbine systems and light duty gas turbines, which require no enhanced anti-wear performance for the gearbox. Shell Turbo Oils T are formulated from high quality hydrotreated based oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.

Performance, Features & Benefits:

- Strong control of oxidation
- High resistance to foaming and rapid air release
- Positive water-shedding properties
- Excellent rust and corrosion properties

Main Applications:

Shell Turbo Oils T are available in ISO grades 32, 46, 68 and 100 and suited for application in the following areas:

- Industrial steam turbines and light duty gas turbines which require no enhanced anti-wear performance for the gearbox
- Hydroelectric turbine lubrication
- Numerous applications where strong control over rust and oxidation is required
- Centrifugal and axial, dynamic turbo-compressors and pumps where an R&O type or turbine oil is recommended

Specifications, Approvals & Recommendations:

- Siemens Power Generation TLV 9013 04 and TLV 9013 05
- Alstom HTGD 90117 V0001 AA
- Man Turbo SP 079984 D0000 E99
- General Electric GEK 28143b
- Fives Cincinnati, LLC (formerly Cincinnati Machine): P-55
- General Electric GEK 117064, GEK 28143b
- DIN 51515-1 L-TD and DIN 51515-2 L-TG
- ISO 8068:2006, L-TSA and L-TGA
- Solar ES 9-224Y Class II
- GEC Alstom NBA P50001A
- JIS K 2213:2006 Type 2
- ASTM D4304-13, Type I and Type III
- GB 11120-2011, L-TSA and L-TGA
- Indian Standard IS 1012:2002
- Skoda: Technical Properties Tp 0010P/97 use in steam turbines
- Alstom Power Hydro Generators (spec HTWT600050)
- Dresser Rand (spec 003-406-001)
- Siemens Turbo Compressors (spec 800 037 98)
- GE Oil and Gas – Appropriate Specification listed under document ITN 52220.04Andritz Hydro
- Andritz Hydro
- MAN D&T SE TED 10000494596
- ANSALDO TG02-0171-E00000/B
- For special applications such as Ammonia or High Sulphur Syngas compressors with wet gas seals, please contact your Viva Energy Technical Helpdesk.

Shell Turbo Oil T 68

High quality industrial steam & gas turbine oils

Shell Turbo Oils T have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oils T have been developed to offer improved performance capable of meeting the demands of the most modern steam turbine systems and light duty gas turbines, which require no enhanced anti-wear performance for the gearbox. Shell Turbo Oils T are formulated from high quality hydrotreated based oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.

Performance, Features & Benefits:

- Strong control of oxidation
- High resistance to foaming and rapid air release
- Positive water-shedding properties
- Excellent rust and corrosion properties

Main Applications:

Shell Turbo Oils T are available in ISO grades 32, 46, 68 and 100 and suited for application in the following areas:

- Industrial steam turbines and light duty gas turbines which require no enhanced anti-wear performance for the gearbox
- Hydroelectric turbine lubrication
- Numerous applications where strong control over rust and oxidation is required
- Centrifugal and axial, dynamic turbo-compressors and pumps where an R&O type or turbine oil is recommended

Specifications, Approvals & Recommendations:

- Alstom HTGD 90-117 V0001 Z
- Man Turbo SP 079984 D0000 E99
- Fives Cincinnati, LLC (formerly Cincinnati Machine): P-54
- General Electric GEK 28143b
- DIN 51515-1 L-TD, DIN 51524-1 HL
- ISO 8068:2006 L-TSA, L-TGA and L-THA
- JIS K 2213:2006 Type 2
- ASTM D4304-13, Type I
- GB 11120-2011, L-TSA and L-TGA
- Indian Standard IS 1012:2002
- Siemens Turbo Compressors (spec 800 037 98)
- Andrtiz Hydro
- For special applications such as Ammonia or High Sulphur Syngas compressors with wet gas seals, please contact your Viva Energy Technical Helpdesk.

Shell Turbo Oil T 100

High quality industrial steam & gas turbine oils

Shell Turbo Oils T have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oils T have been developed to offer improved performance capable of meeting the demands of the most modern steam turbine systems and light duty gas turbines, which require no enhanced anti-wear performance for the gearbox. Shell Turbo Oils T are formulated from high quality hydrotreated based oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.

Performance, Features & Benefits:

- Strong control of oxidation
- High resistance to foaming and rapid air release
- Positive water-shedding properties
- Excellent rust and corrosion properties

Main Applications:

Shell Turbo Oils T are available in ISO grades 32, 46, 68 and 100 suited for application in the following areas:

- Industrial steam turbines and light duty gas turbines which require no enhanced anti-wear performance for the gearbox
- Hydroelectric turbine lubrication
- Numerous applications where strong control over rust and oxidation is required
- Centrifugal and axial, dynamic turbo-compressors and pumps where an R&O type or turbine oil is recommended

Specifications, Approvals & Recommendations:

- DIN 51515-1 L-TD
- ISO 8068:2006 L-THA
- ASTM D4304-13, Type I
- GB 11120-2011, L-TSA
- Indian Standard IS 1012:2002
- For special applications such as Ammonia or High Sulphur Syngas compressors with wet gas seals, please contact your Viva Energy Technical Helpdesk.

Shell Morlina
S2 B 150, 220, 320

Industrial bearing and circulating oils

Shell Morlina S2 B oils are high performance oils designed to provide outstanding oxidation and water separation protection for most general industrial bearing and circulating oil system applications and certain other industrial applications which do not require oils with extreme pressure (EP) properties. These oils meet the requirements of the Morgan Construction Company and Danieli for common bearing oils.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Reliable wear and corrosion protection
- Maintaining system efficiency

Main Applications:

- Machine circulation systems
- Oil lubricated systems. Suitable for most plain and rolling element bearings and general industrial applications.
- Roll-neck bearings
- Enclosed industrial gear systems. Low or moderately loaded enclosed gears where EP performance is not required.

Specifications, Approvals & Recommendations:

- Morgan MORGOIL® Lubricant Specification New Oil (Rev. 1.1) (MORGOIL is a registered trademark of the Morgan Construction Company).
- Danieli Standard Oil 6.124249.F
- DIN 51517-1 - type C
- DIN 51517-2 - type CL

Compatibility & Miscibility:

- Shell Morlina S2 B oils are compatible with seal materials and paints normally specified for use with mineral oils.

Shell Morlina S2 BL 10

Special application bearing and circulating oils

Shell Morlina S2 BL oils are special low viscosity, solvent refined mineral oils blended with zinc free additives, to provide extended performance in the high speed spindles of machine tools.

Performance, Features & Benefits:

- Shell Morlina S2 BL oils are formulated with a well proven rust and oxidation inhibitor package that provides high resistance to oxidation, caused by heat in the presence of air, water and metal catalysts, such as copper, and helps to prolong oil life and lower maintenance costs.
- The special additives provide efficient anti-wear performance without reacting to the softer metals in bearings and enhance machine reliability.

In addition the additive package enhances the oil's natural corrosion protective properties and helps to prolong bearing life.

- The low viscosity components of these oils have been chosen to help promote the smooth running of high speed machine elements and minimize heat build up through frictional energy losses.

Main Applications:

- Machine bearing and circulating systems. Suitable for a range of machine lubrication systems that include oil lubricated plain and rolling element bearings.
- High speed spindles. The low viscosity fluids (ISO grades 2, 5 and 10) are particularly suitable for the lubrication of high speed spindles in machine tools.

Specifications, Approvals & Recommendations:

- Cincinnati Machine P-62 (ISO VG 10)
- Shell Morlina S2 BL oils are designed to meet specifications requiring a premium quality, light viscosity oil for applications running at high speeds such as those found in high speed frames and automated machine tools.

Shell Morlina S4 B 150, 220

Advanced bearing and circulating oils

Shell Morlina S4 B oils are high performance synthetic bearing and circulation lubricants, based on high performance base fluids. They offer outstanding lubrication performance under severe operating conditions, including improved energy efficiency and long service life even in severe operating conditions.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Reliable wear and corrosion protection
- Enhancing system efficiency

Main Applications:

- Shell Morlina S4 B is recommended for systems including moderately loaded gearboxes, operating under severe conditions such as low or high temperatures or with wide temperature variations.
- The long oil life of Shell Morlina S4 B makes it suitable for use in certain 'lubricated-for-life' systems.
- Bearing and circulating oil systems. Suitable for use in systems containing plain or rolling element bearings, including highly loaded bearings such as those found in cement or quarrying applications.

Specifications, Approvals & Recommendations:

- Alfa Laval Group D gearbox applications
- Aerzen Maschinenfabrik GmbH Blower Applications
- Baltimore Aircoil Gear Boxes
- David Brown Table H applications
- Emerson Power Transmission
- GEA Westfalia Separator GmbH
- Renold Gears (various applications)
- Sharpe E-series worm gear reducers
- Winsmith (Peerless-Winsmith Inc) worm gear reducer
- ISO 12925-1 Type CKS specification
- Cincinnati Machine Various P applications

Compatibility & Miscibility:

- Shell Morlina S4 B is compatible with all seal materials and paints normally specified for use with mineral oils.
- Shell Morlina S4 B is compatible with petroleum mineral oils and no special change-over procedure is necessary. However, to realise the full benefits, it should not be mixed with other oils.
- It is also advisable to ensure that oil systems are clean and free from contamination to optimise potential service life.

Shell Corena S2 P 68, 100, 150

Reciprocating (piston) air compressor oil

Shell Corena S2 P is a high quality air compressor oil designed to deliver the lubrication performance for high pressure reciprocating compressors. It is suitable for most reciprocating air compressors running at up to 220°C discharge temperatures at elevated pressures.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Outstanding wear protection
- Maintaining system efficiency
- Enhanced air line safety

Specifications, Approvals & Recommendations:

- ISO 6743-3A-L-DAB (ISO vg 150 only)
- ISO 6743-3A-L DAA Normal Duty
- DIN 51506 VDL (ISO vg 150 only)
- DIN 51506 VBL (ISO vg 68, 100 only)

Main Applications:

- Shell Corena S2 P is suitable for use in industrial reciprocating air compressors operating with air discharge temperatures of up to 220°C.
- Shell Corena S2 P may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.

Compatibility & Miscibility:

- Shell Corena S2 P oils are compatible with all sealing materials commonly used in air compressors.

Shell Lubricants
Macro Distributor

Shell Corena S3 R 46, 68

Premium rotary air compressor oil

Shell Corena S3 R is a premium quality air compressor oil designed to deliver high performance lubrication of rotary sliding vane and screw air compressors. It uses an advanced additive system to provide excellent protection and performance for compressors running at up to 20 bar and 100°C discharge temperatures with oil maintenance intervals of up to 6000 hours, under certain conditions.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving

Formulated to help:

- Resist formation of carbon deposits in sliding vane slots in vane compressors
- Resist formation of deposits on rotating components in screw compressors
- Resist thermal breakdown and deposit formation to maintain excellent internal surface cleanliness particularly in oil/air separator and coalescer systems
- Outstanding wear protection
- Maintaining system efficiency

Main Applications:

- Shell Corena S3 R is suitable for oil-flooded or oil-injected vane compressors, operating at pressures of up to 10 bar and with air discharge temperatures of up to 100°C under certain conditions.
- Suitable for oil flooded or oil injected, single or two-stage rotary compressors, operating at pressures of up to 20 bar and with air discharge temperatures of up to 100°C under certain conditions.

Specifications, Approvals & Recommendations:

- ISO 6743-3:2003 (E) L-DAJ

Compatibility & Miscibility:

- Shell Corena S3 R oils are compatible with seal materials specified for use with mineral oils.

Shell Corena S4 P 68, 100

Advanced synthetic reciprocating (piston) air compressor oil

Shell Corena S4 P is an advanced synthetic air compressor oil incorporating synthetic ester base fluids and a unique high performance additive system. It is designed to deliver the highest performance lubrication for high pressure reciprocating compressors running in excess of 220°C discharge temperatures at elevated pressures.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Outstanding wear protection
- Maintaining system efficiency
- Enhanced air line safety

Main Applications:

- Shell Corena S4 P is suitable for all industrial reciprocating air compressors, in particular those operating under severe conditions of air discharge temperatures in excess of 220°C with continuous high delivery pressures.
- Shell Corena S4 P may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.

Specifications, Approvals & Recommendations:

- DIN 51506 VDL ISO/DP 6521-L-DAB - medium duty
- ISO 6743-3:2003 DAB - Severe duty
- EN 12021

Compatibility & Miscibility:

- Shell Corena S4 P oils are fully miscible with mineral oils, although dilution with mineral lubricants will markedly reduce their performance.
- Shell Corena S4 P, in common with other ester-based lubricants, is not compatible with all seal materials, and some older compressors may need to have the seals changed before they can be run on the new grades.

Compatibility Guide : Acceptable

- High Nitrite content (SEB5)
- >36% acrylonitrile

Compatibility Guide : Majority Acceptable

- Medium nitrile content (SE70)
- 30 - 36% acrylonitrile

Compatibility Guide : Not recommended

- Low nitrile content
- <30% acrylonitrile

Shell Corena S4 R 46, 68

Advanced synthetic rotary air compressor oil

Shell Corena S4 R is an advanced synthetic air compressor oil incorporating a unique high performance additive system. It is designed to deliver the highest performance lubrication of rotary sliding vane and screw air compressors. It uses an advanced additive system to provide excellent protection and performance for compressors running at pressures over 25 bar and in excess of 100°C discharge temperatures with oil maintenance intervals of up to 12,000 hours, under certain conditions.

Performance, Features & Benefits:

- Long oil life - maintenance saving
- Outstanding wear protection
- Maintaining system efficiency
- Enhanced air line safety

Main Applications:

- Shell Corena S4 R is suitable for oil-flooded or oil-injected vane compressors, singe or two-stage compressors, operating at pressures of in excess of 25 bar and with air discharge temperatures over 100°C (including intermittent operation under these conditions).
- May also be used where exceptionally high ambient temperatures are found.
- The product is recommended for use in ABB turbochargers fitted to low and medium speed diesel engines used in marine and power generation applications under certain conditions.
- Perfectly suitable to cover applications where a synthetic bearing & circulating oil or R&O oil is required and will provide benefits due to increased temperature fluidity, and lowering equipment operating temperatures.

Specifications, Approvals & Recommendations:

- ISO 6743-3:2003 (E) L-DAJ
- Shell Corena S4 R 68 is approved by ABB for use in VTR turbochargers, with a maximum oil change interval of 5000 hours.

Compatibility & Miscibility:

- Shell Corena S4 R oils are fully miscible with mineral oils, although through dilution with mineral lubricants will markedly reduce their performance. Care must be taken to avoid mixing Shell Corena S4 R with certain types of synthetic fluids.
- Shell Corena S4 R oils are compatible with seal materials specified for use with mineral oils.

Shell Gas Compressor Oil S1 P 150

Gas compressor oil

Shell Gas Compressor Oil S1 P provides reliable performance for cylinder lubrication of reciprocating compressor handling hydrocarbon gas at high pressure. They are compounded with polar or fatty oils which enable the lubricant to resist being washed off cylinder walls by the action of wet air or gas. Shell Gas Compressor Oil S1 P also resists the solvent action of hydrocarbon gases such as propane and butane, as well as certain organic chemicals such as ketones and aldehydes.

Performance, Features & Benefits:

- Extended maintenance intervals
- Resists wash-off by wet air or gas and chemical solvents to ensure continued lubrication and protection to help reduce wear and maintenance downtime and increase operational availability and efficiency.

Main Applications:

- Reciprocating compressors having separate cylinder lubrication systems
- Compression of wet air, wet hydrocarbon, natural gas or certain chemically active gases
- Use for pressures below 1000 psi
- Bearings and machine parts of equipment requiring compounded products
- These oils should not be used to lubricate the running gear or crankcases of compressors as the fatty oil can separate from the lubricant, forming deposits on the surfaces of the crankcase and plugging oil passages.

Compatibility & Miscibility:

- Shell Gas Compressor Oil S1 P may be used with most common seal and packing materials.

Shell Lubricants
Macro Distributor

Shell Gas Compressor Oil S3 PSN 220

Special applications natural/sour gas compressor oil

Shell Gas Compressor Oil S3 PSN are unique, synthetic blend lubricants designed for the total loss lubrication of cylinders of high pressure reciprocating compressors used in severe, wet and/or sour, natural gas service.

Performance, Features & Benefits:

- Outstanding wear protection
- Maintaining system efficiency

Main Applications:

- Shell Gas Compressor Oil S3 PSN is designed for "once-through" cylinder lubrication of reciprocating compressors which use oil injection systems to lubricate cylinders and rod packings.
- It provides premium performance in propane compression and has been proven in field tests to satisfactorily lubricate propane refrigeration cylinders with -30°C suction temperatures.
- Shell Gas Compressor Oil S3 PSN oils are ideal for break-in of compressor cylinders and rod packings.
- They are also suitable for use when compressing wet air, wet gases/steam or solvent gases such as propane, and organic chemicals like aldehydes and ketones.

Specifications, Approvals & Recommendations:

- Shell Gas Compressor Oil S3 PSN complies with requirements of Dresser Industries and most other manufacturers.

Compatibility & Miscibility:

- Shell Gas Compressor Oil S3 PSN is compatible with all sealing materials commonly used in gas compressors.

Shell Heat Transfer Oil S2

High performance heat transfer fluid

Shell Heat Transfer Oil S2 is based on carefully selected, highly refined mineral oils chosen for their ability to provide superior performance in indirect closed fluid heat transfer systems.

Performance, Features & Benefits:

- Extended maintenance intervals
- System efficiency
- Wear protection

Specifications, Approvals & Recommendations:

- Classified as ISO 6743-12 Family Q
- Meets DIN 51522 requirements

Main Applications:

Shell Heat Transfer Oil S2 can be used in high temperature continuous heat transfer equipment with the following application limits:

- Max. film temperature : 320°C
- Max. bulk temperature : 300°C

Shell Refrigeration Oil S2 FR-A 68

Refrigerator compressor lubricant

Shell Refrigeration Oil S2 FR-A is a low miscibility compressor lubricant intended for use in refrigeration compressors using Ammonia refrigerant. It is formulated from specially refined paraffinic base oils in combination with additives selected to minimise system deposits and provide long service life.

Performance, Features & Benefits:

- System efficiency
- Extended maintenance intervals

Main Applications:

- Refrigerator compressors:

  Shell Refrigeration Oil S2 FR-A is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both rotary and reciprocating compressor types.
- Refrigerant Compatibility:
  - Shell Refrigeration Oil S2 FR-A is recommended for use with ammonia (R717) based refrigeration systems where it offers excellent performance, even under high compressor discharge temperatures, or down to evaporation temperatures of -30°C.
  - It can also be used in systems using hydrocarbons such as propane (R290).
  - Shell Refrigeration Oil S2 FR-A is not recommended for use with CFC, HCFC or HFC refrigerants such as R12, R22 or R134a.

Specifications, Approvals & Recommendations:

- Shell Refrigeration Oil S2 FR-A meets the requirements of DIN 51503 KAA and KE.

Compatibility & Miscibility:

- Seal Compatibility:

  Shell Refrigeration Oil S2 FR-A is compatible with all commonly used sealing materials designed for use with mineral oils.
- Lubricant Compatibility:

  Shell Refrigeration Oil S2 FR-A is completely miscible with mineral oil, alkylated benzene and PAO based lubricants.

Shell Refrigeration Oil S4 FR-F 68

Advanced synthetic refrigerator compressor lubricant

Shell Refrigeration Oil S4 FR-F is a synthetic refrigeration lubricant with a polyol ester base fluid. It has been developed for use with R134a and other HFC refrigerants.

Performance, Features & Benefits:

- Extended maintenance intervals
- System efficiency
- Wear protection

Main Applications:

- Refrigerator compressors:

  Shell Refrigeration Oil S4 FR-F is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both rotary and reciprocating compressor types.
- Refrigerant Compatibility:

  Shell Refrigeration Oil S4 FR-F is recommended for use with R 134a and other types of HFC refrigerant.
- Seal Compatibility:

  Shell Refrigeration Oil S4 FR-F is compatible with all sealing materials commonly used with HFC refrigerant systems.

Specifications, Approvals & Recommendations:

- Shell Refrigeration Oil S4 FR-F meets the requirements of DIN 51503 KD.

Shell Refrigeration Oil S4 FR-V 68

Advanced synthetic refrigerator compressor lubricant

Shell Refrigeration Oil S4 FR-V is a synthetic refrigeration lubricant based on alkylated benzenes. It offers a universal solution to the lubrication requirements of most refrigeration compressors and is compatible with all commonly used refrigerants with the exception of HFCs.

Performance, Features & Benefits:

- System efficiency
- Extended maintenance intervals

Main Applications:

- Refrigerator compressors

Specifications, Approvals & Recommendations:

- Shell Refrigeration Oil S4 FR-V meets the requirements of DIN 51503 KAA and KC.

Compatibility & Miscibility:

- Refrigerant compatibility

  Shell Refrigeration Oil S4 FR-V is designed for use with most commonly occurring refrigerants:

  - Ammonia (R717) systems where it offers excellent performance, even under high compressor discharge temperatures or down to evaporation temperatures of -33°C or lower.
  - Carbon dioxide (R744) systems
  - CFC and HCFC systems (R12 and R22)
  - Hydrocarbon systems such as propane (R290)
- Seal compatibility:

  Shell Refrigeration Oil S4 FR-V is compatible with all commonly used sealing materials used with mineral oils.
- Lubricant compatibility:

  Shell Refrigeration Oil S2 FR-V is completely miscible with mineral oil, other alkylated benzene and PAO based lubricants.

Shell Paper Machine Oil S3 M 150, 220

Paper machine circulating oils

Shell Paper Machine Oils S3 M are high performance oils based on modern ashless additive technology. They are designed to provide excellent all round protection for the diverse needs and conditions found in modern paper machines. They meet the requirements of Metso, SKF and Voith systems.

Performance, Features & Benefits:

- Long oil life
- Maintenance saving
- Reliable wear and corrosion protection
- Enhancing system efficiency

Main Applications:

- There is extensive operator experience with Shell Paper Machine Oils S3 M in many applications especially in Metso and Voith paper machine circulating systems, which include the dry and wet ends of the machine along with the calender stacks.
- Lubrication of bearings, gears and auxiliary equipment in the wet end and dryer sections of paper machines.
- Hydraulic and lubrication systems in deflection-compensating rolls.
- Enhanced protection of gears under severe operating conditions.

Specifications, Approvals & Recommendations:

- SKF (paper machine oils)
- Metso (paper machine oils)
- Voith VN 108
- DIN 51517-2 – type CLFAG FE-8 (120°C)
- FZG load stage 12 (DIN 51354)

Compatibility & Miscibility:

- Shell Paper Machine Oils S3 M are compatible with seal materials and paints normally specified for use with mineral oils.

Shell Diala S4 ZX-I

Premium inhibited electrical insulating oil

Shell Diala S4 ZX-I is the new electrical insulating oil from Shell designed to meet the challenges presented by the latest power transformers. It offers an extended oil life with the peace of mind of zero sulphur content.

Shell Diala S4 ZX-I is manufactured from zero suphur base oils produced using Shell's GTL (gas-to-liquid) technology. These base oils offer a high degree of compositional consistency and have an excellent response to anti-oxidant. In addition they are globally available and free from PCBs, DBDs and passivators.

Shell Diala S4 ZX-I meets both the established and new industry copper corrosion tests.

Performance, Features & Benefits:

- Extended oil life
- Transformer protection
- System efficiency

Specifications, Approvals & Recommendations:

- IEC 60296 (2012): Table 2 Transformer Oil (I) (Inhibited oil)
- Section 7.1 ("Higher oxidation stability & low sulphur content")

Shell Tonna S3 M 68, 220

Premium machine tool slideway oils

Shell Tonna S3 M oils are specially designed for the lubrication of machine tool slides, tables and feed mechanisms. Their enhanced tackiness and stick-slip characteristics are combined to offer superior frictional performance on slideways. They are specially recommended in cases where high precision and low speed machines are used.

Performance, Features & Benefits:

- Excellent frictional properties
- Advanced technology
- Good slide adhesion
- Ready separation from water-miscible cutting fluids
- Excellent corrosion prevention characteristics

Main Applications:

- Machine tool slideways, tables and feed mechanisms:

  Developed for use on a wide range of materials used for machine tool slideway surfaces, including cast iron and synthetic materials
- Machine tool hydraulic systems:

  Particularly recommended for machines which have a combined hydraulic and slideway lubrication system
- Machine tool gearboxes and spindles:
  - Also suitable for gear and headstock lubrication
  - The lower viscosity grades are intended for horizontal slide lubrication. For vertical slides use Shell Tonna S3 M 220.

Specifications, Approvals & Recommendations:

- Fives Cincinnati P-47 (ISO 68), P-50 (ISO 220)
- ISO 11158 / ISO 6743-4 HG
- ISO 12925-1 / ISO 6743-6 CKC
- ISO 19378 / ISO 6743-13 GA and GB
- CGLP Slideway Oils against DIN 51502

Shell Ondina 15, 32, 68

Medicinal white oils

Shell Ondina Oils are highly refined, non-additive, aromatic-free paraffinic white mineral oils complying with the stringent pharmacopoeia purity requirements. Ondina oils can be used in pharmaceutical, food packaging, cosmetic and other applications, where this high purity is required by legislation or important for the quality of the finished product.

Performance, Features & Benefits:

- High Purity
- Optimal quality control
- Excellent stability

Main Applications:

- Cosmetic and Pharmaceuticals:

  Components in cosmetic creams, lotions, oils, toiletries, etc.
- Food packaging:

  Extender oil in polystyrene and other plastics, price labels
- Technical applications and car components:

  Carrier fluid and extender oil for a variety of high quality applications, where colour and stability is important. Suitable when PVC is replaced by TPE elastomers
- Toys and similar articles:

  Extender oil in TPE elastomers (e.g. SBS, SEBS)
- Machinery lubrication:

  The use of medicinal white oil in direct and indirect food applications, e.g. as food additives or for food packaging, is regulated by international specifications supplemented by local legislation. These requirements may deviate from country to country and must be taken into account by the user.

Specifications, Approvals & Recommendations:

- European Pharmacopoeia 3rd Edition
- US Pharmacopoeia 29th and 30th Editions
- US FDA §172.878 ("White Mineral Oil") for direct food contact
- US FDA §178.3620(a) for indirect food contact
- FDA specifications, where above specified oils are positively listed e.g.
  §173.340, §175.105, §175.210, §175.230, §175.300, §176.170, §176.180, §176.200, §176.210, §177.1200, §177.2260, §177.2600, §177.2800, §178.3120, §178.3570, §178.3740, §178.3910, §573.680
- UK 'The Mineral Hydrocarbon in Food Regulations 1966'
- Japanese Pharmacopoeia XIII (ISO vg 68 only)
- European Directive 2002/72/EC for plastic materials coming into contact with foodstuffs (ISO vg 68 only)

Shell Catenex Oil S 523

Shell Catenex Oils S are paraffinic process oils manufactured via the solvent extraction process. They are general purpose process oils used as extended or carrier fluids.

Typical Physical Characteristics Table:

Properties			Method	Shell Catenex Oil S 523
Colour (ASTM)			ASTM D1500	1.0
Density	@15°C	kg/m^3	ISO 12185	868
Refractive Index	@20°C		ASTM D1218	1.478
Flash Point (COC)		°C	ISO 2592	210
Pour Point		°C	ISO 3016	-15
Kinematic Viscosity	@20°C	mm^2/s	ISO 3104	58
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	23
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	4.5
Sulphur (X-Ray)		% m/m	ISO 14596	0.6
Carbon Type Distribution : C/A (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	3
Carbon Type Distribution : C/N (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	28
Carbon Type Distribution : C/P (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	69
Refractive Intercept (RI)			DIN 51378	1.0450
Viscosity Gravity Constant (VGC)			DIN 51378	0.812
Aniline Point		°C	ISO 2977	100
Clay Gel Analysis : Polar Components		% m/m	ASTM D2007	0.6
Clay Gel Analysis : Aromatic Components		% m/m	ASTM D2007	23.4
Clay Gel Analysis : Saturated Components		% m/m	ASTM D2007	76.0
Evaporation Loss (22 hrs)	@107°C	% m/m	ASTM D972	0.8
Noack Volatility (1 hr)	@250°C	% m/m	ASTM D5800	18
PCA Content (DMSO Method)		% m/m	IP 346	< 3

Shell Catenex Oil T 129

High quality paraffinic process oil

Shell Catenex T Oils are highly refined hydrotreated paraffinic process oils, which are virtually colourless and sulphur free. These oils are highly saturated, free of aromatics and polar compounds. Shell Catenex T Oils are odourless and are recommended for use in process oil applications where colour stability, low volatility and low sulphur levels are required. These highly refined oils are ideal for use as process oils in rubber, elastomer, plastic, adhesive and numerous other manufacturing processes.

Typical Physical Characteristics Table:

Properties			Method	Shell Catenex Oil T 129
Colour (ASTM)			ASTM D1500	< 0.5
Colour (Saybolt)			DIN 51411	+ 26
Density	@15°C	kg/m^3	ISO 12185	867
Refractive Index	@20°C		ASTM D1218	1.475
Flash Point (COC)		°C	ISO 2592	225
Pour Point		°C	ISO 3016	-15
Kinematic Viscosity	@20°C	mm^2/s	ISO 3104	127.6
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	43.9
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	6.60
Dynamic Viscosity	@20°C	mPa.s	Calculated	110.3
Viscosity Index			DIN ISO 2909	100
Carbon Type Distribution : C/A (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	0
Carbon Type Distribution : C/N (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	35
Carbon Type Distribution : C/P (S-corr.)		%	DIN 51378/ ASTM D2140 mod.	65
Refractive Intercept (RI)			DIN 51378	1.0423
Viscosity Gravity Constant (VGC)			DIN 51378	0.806
Sulphur (X-Ray)		% m/m	ISO 14596	< 0.001
PCA Content (DMSO Method)		% m/m	IP 346	< 3.0

Shell Air Tool S2 A 100, 320

Pneumatic tool and rock drill oils

Shell Air Tool Oil S2 A has been developed to meet the special lubrication requirements of pneumatic tools, including percussion type pneumatic tools subjected to the most arduous conditions. They are designed to maintain high oil film strength and effectively lubricate even the most demanding requirements of pneumatic drill impact mechanisms as well as providing excellent mist lubrication of general purpose air tools.

Performance, Features & Benefits:

- Reliable wear & corrosion protection
- Maintaining system efficiency

Main Applications:

- Percussive pneumatic tools:

  Suitable for a wide range of mobile percussive pneumatic tools such as those used in rock drilling, mining and construction activities (eg. jack hammers, sinkers and other air operated tools).
- Oil mist lubrication applications:

  Shell Air Tool Oil can also be used in applications requiring mist lubrication, such as air tool installations commonly found in manufacturing.

Other:

- May be used in certain gear and bearing lubrication systems subject to water ingress.

Specifications, Approvals & Recommendations:

- ISO 6743-11 Types PAC and PBC

Compatibility & Miscibility:

- Shell Air Tool Oil S2 A is compatible with seal materials and paints normally specified for use with mineral oils.

VIVA EnergyAustralia

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Aviation

AeroShell oils, fluids and greases for your aircraft.

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AeroShell Oil 100

AeroShell straight mineral oils are blended from selected high viscosity index base stocks. These oils do not contain additives except for a small quantity of pour point depressant (which is added when improved fluidity at very low temperature is required) and an anti-oxidant.

Main Applications:

- The appropriate grades of these AeroShell Oils are approved for use in four-stroke (four-cycle) certified aircraft reciprocating piston engines (except Porsche) and other aircraft radial engines which use oil to specification SAE J- 1966 (MIL-L-6082) and which do not require use of an oil containing a dispersant additive.

These products are made in more than one location and the approval status and typical properties may vary between locations.

Specifications, Approvals & Recommendations:

- The U.S. Specification SAE J-1966 replaces MIL-L-6082E
- Although it was planned to replace the British Specification DERD 2472 with a DEF STAN specification this has now been put into abeyance and instead the SAE specification has been adopted
- U.S.: Approved J-1966 SAE Grade 50
- British: Approved J-1966 SAE Grade 50
- French: (AIR 3560/D Grade SAE 50)
- Russian: MS-20
- NATO Code: O-117 Obsolete
- Joint Service Designation: OM-270

( ) Indicates the product is equivalent to specification

AeroShell Oil Sport Plus 4

Developed in conjunction with ROTAX® AeroShell Oil Sport Plus 4 is the first oil specifically developed for light sport aviation piston engines such as the ROTAX® 912 & 914 series. A combination of low cylinder head temperature (compared with air cooled engines), low oil consumption and the engine internals requires a blend of high quality hydrocarbon base stocks, incorporating synthetic technology which allows full performance with different fuel types. This oil can be used in all climates.

Performance, Features & Benefits:

- First specific oil for light sport and very light/ultra light aircraft engines
- Promotes engine cleanliness
- Helps keep engines sludge and varnish free
- Helps reduce oil consumption
- Helps engines reach TBO (Time Between Overhauls)
- Protects highly stressed engines parts against scuffing and wear
- Anti-foaming additives to maximise lubrication effectiveness – especially for those engines operating an integrated gearbox
- Better cold flow characteristics for easier starts and quicker protection
- High thermal stability for longer-lasting and safer lubrication
- Can be used in any climate
- Advanced anti-rust and anti-wear package

Main Applications:

- AeroShell Oil Sport Plus 4 is intended for use in four-stroke aircraft piston engines such as the ROTAX® 912 & 914 series.
- AeroShell Oil Sport Plus 4 is to be used in integrated gearbox and wet clutch systems.
- AeroShell Oil Sport Plus 4 can be used in engines which operate on both unleaded fuel and Avgas 100LL.
- Please refer to Operators Handbook/Manual for the correct oil drain interval when operating on different fuels.

Specifications, Approvals & Recommendations:

- Approved to ROTAX® specification RON 424
- Listed in Rotax Service Instruction SI-912i-01/SI-0912-016/SI- 914-019 "Selection of Suitable Operating Fluids for Rotax Engine Type 912 and 914 (Series)" as an Aviation oil tested and released by BRP-Powertrain, for use with both leaded Avgas and unleaded fuel.
- Do not use AeroShell Oil Sport Plus 4 in engines that are designed to use aviation piston engine oils approved under the SAE J-1899 or SAE J-1966 specifications. This includes air- cooled Continental Motors and Textron Lycoming engines.

Please consult Operating Handbook/Manual to confirm the correct lubricant specification before use.

AeroShell Oil W 15W-50

AeroShell Oil W 15W-50 is a unique blend of high quality mineral oil and over 50% synthetic hydrocarbon base stocks, plus the AeroShell Oil W ashless dispersant additive system. This semi-synthetic blend offers high performance in a wide variety of applications and conditions. The synthetic base stock performance provides for better cold temperature pumping and protection than single grade oils. In addition, the blend of synthetic and high quality mineral base stocks provide high temperature performance superior to that of other fully approved aircraft piston engine oils. The mineral base stocks help disperse lead by-products of combustion, thereby keeping engines free of "grey paint" or lead sludge that can be a problem with some fully synthetic oils.

The anti-wear additive system in AeroShell Oil W 15W-50 provides outstanding wear protection for critical camshafts, lifters and other high wear components.

The anti-corrosion additive package in AeroShell Oil W 15W-50 helps protect low usage engines and engines in high humidity climates against rust and corrosion of critical engine parts such as camshafts and lifters.

AeroShell Oil W 15W-50 provides superior anti-corrosion protection for all types of certified aircraft piston engines. When used with proper maintenance procedures, the product provides maximum protection and improves the likelihood that aircraft engines will reach TBO. In addition, this product provides outstanding high temperature oxidation protection for hot running engines. It is designed to keep engines cleaner with less sludge and varnish build-up in critical ring belt and other areas.

Performance, Features & Benefits:

- Provides unsurpassed rust and corrosion protection for aircraft engines
- Promotes engine cleanliness, fights wear, offers excellent anti-foam properties
- Helps reduce oil consumption by up to 50% and provides superior oil flow at low temperatures
- Compatible with other approved aircraft piston engine oils
- Functions as an all season oil, no seasonal changes needed
- Reduces fuel consumption by up to 5% over straight grades
- Provides unequalled high temperature oxidation stability
- AeroShell Oil W 15W-50 is not recommended for use in automotive engines. For automotive engines converted for use in aircraft, the specific engine manufacturer or the conversion agency should be consulted for proper oil recommendation.

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AeroShell Oil W 15W-50 cont.

Main Applications:

- AeroShell Oil W 15W-50 is intended for use in certified four- stroke cycle aircraft piston engines.
- The anti-corrosion additive system is designed to prevent rust or corrosion in all types of aircraft piston engines.
- AeroShell Oil W 15W-50 can provide maximum anti-corrosion protection for aircraft piston engines, when combined with proper maintenance practices and proper operating conditions.
- Because of the improved flow characteristics of AeroShell Oil W 15W-50, operators may observe slightly lower oil temperatures in some aircraft. On larger aircraft, the oil cooler flap will normally compensate for this change. However, in small aircraft, oil temperature could be reduced slightly. Operators should always check the oil temperature to ensure that they are in the range specified by the manufacturer.

Specifications, Approvals & Recommendations:

- AeroShell Oil W 15W-50 was developed in co-operation with Textron Lycoming and Continental Motors and conforms to their specifications 301F and MHS-24A respectively. This oil is also approved under Military Specification MIL-L-22851 which is now obsolete and has been replaced by the SAE J- 1899 specification. AeroShell Oil W 15W-50 is also approved for use in all Pratt & Whitney radial aircraft engines.
- In addition AeroShell Oil W 15W-50 meets the provisions of Lycoming Service Bulletin 446C and 471, plus Service Instruction 1409A and meets the American FAA Airworthiness Directive 80-04-03 which specifies special anti-wear requirements for certain engine models.
- AeroShell Oil W 15W-50 already contains, in the correct proportions, an anti-wear additive equivalent to the Lycoming additive LW 16702; operators who use AeroShell Oil W 15W- 50 DO NOT need to add this Lycoming additive to the oil.
- AeroShell Oil W 15W-50 is qualified for use in all Teledyne Continental Motors' liquid cooled and air cooled aircraft piston engines.
- US: Approved SAE J-1899 Grade Multigrade
- British: Approved SAE J-1899 Grade Multigrade
- NATO: Code 0-162 Obsolete
- Joint Service Designation: OMD-162
- Textron Lycoming: 301F Service Bulletins 446C and 471, Service Instruction 14909A
- Teledyne Continental: MHS 24A SIL 99-2
- Pratt & Whitney: Service Bulletin 1183-S
- FAA: Airworthiness Directive 80-04-03

AeroShell Oil W100

AeroShell W Oils were the first non-ash dispersant oils to be used in aircraft piston engines. They combine non- metallic additives with selected high viscosity index base stocks to give exceptional stability, dispersancy and anti-foaming performance. These additives leave no metallic ash residues that can lead to deposit formation in combustion chambers and on spark plugs, which can cause pre-ignition and possible engine failure.

Performance, Features & Benefits:

- Promote engine cleanliness
- Helps keep engines sludge free
- Helps reduce oil consumption
- Helps engines reach TBO (Time Between Overhaul)
- Protects highly stressed engine parts against scuffing and wear

Main Applications:

- AeroShell W Oils are available in W100 and W120 viscosity grades
- AeroShell W Oils are intended for use in four-stroke cycle (four-cycle) certified reciprocating piston engines, including fuel-injected and turbocharged engines. AeroShell W Oils are not recommended for use in automotive engines. For automotive engines converted for use in aircraft, the specific engine manufacturer or the conversion agency should be consulted for proper oil recommendation.
- Most radial engine operators use AeroShell Oil W120 in warm weather operations with AeroShell Oil W100 or AeroShell Oil W 15W-50 being used in cooler ambient temperatures.
- AeroShell Oil W100 or AeroShell Oil W 15W-50 are the common choices for most operators of Lycoming and Continental flat engines.

Specifications, Approvals & Recommendations:

- U.S.: Approved J-1899 SAE Grade 50
- British: Approved J-1899 SAE Grade 50
- French: AIR 3570 (Grade SAE 50)
- Russian: MS-20
- NATO Code: O-125 Obsolete
- Joint Service Designation: OMD-250
- Textron Lycoming: 301F
- Teledyne Continental: MHS 24B
- Pratt & Whitney: Service Bulletin 1183-S
- Curtiss Wright: Various Service Bulletins – refer to relevant Bulletin
- Franklin Engines: Various Service Bulletins – refer to relevant Bulletin

( ) Indicates the product is equivalent to specification

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AeroShell Oil W100 Plus

AeroShell Oil W100 Plus is a new single grade oil that combines the single grade, ashless dispersant performance found in AeroShell Oil W100 and the anti-wear/anti-corrosion additives of AeroShell Oil W15W-50 Multigrade. It is the oil for pilots who prefer a single grade but who also want the extra protection and performance.

Performance, Features & Benefits:

- Blended from selected high viscosity mineral base oils
- Contains AeroShell's proven W Oils additive package
- Additional anti-wear additives (containing Lycoming additive LW 16702)
- Additional anti-corrosion additives
- AeroShell Oil W100 Plus already contains, in the correct proportions, an anti-wear additive equivalent to the Lycoming additive LW 16702; thus it already complies with FAA Airworthiness Directive 80-04-03. Operators who use AeroShell Oil W100 Plus DO NOT need to add this Lycoming additive to the oil.
- AeroShell Oil W100 Plus is qualified for use in all Teledyne Continental motors, liquid cooled and air cooled aircraft piston engines. Fully compatible with other approved aircraft piston engine oils.

Main Applications:

- Advanced additives work as a protective barrier to prevent critical parts from being slowly degraded by rust or wear, especially when an aircraft sits idle.

Specifications, Approvals & Recommendations:

- Approved SAE J-1899 SAE Grade 50
- Continental Motors liquid cooled and air cooled aircraft piston engines
- Textron Lycoming: 301F; Service Bulletin 446E and 471B; Service Instruction 1409C
- Teledyne Continental: SIL 99-2
- FAA: Airworthiness Directive 80-04-03R2

AeroShell Oil W120

AeroShell W Oils were the first non-ash dispersant oils to be used in aircraft piston engines. They combine non-metallic additives with selected high viscosity index base stocks to give exceptional stability, dispersancy and anti- foaming performance. These additives leave no metallic ash residues that can lead to deposit formation in combustion chambers and on spark plugs, which can cause pre-ignition and possible engine failure.

Performance, Features & Benefits:

- Promote engine cleanliness
- Helps keep engines sludge free
- Helps reduce oil consumption
- Helps engines reach TBO (Time Between Overhaul)
- Protects highly stressed engine parts against scuffing and wear

Main Applications:

- AeroShell W Oils are available in W100 and W120 viscosity grades.
- AeroShell W Oils are intended for use in four-stroke cycle (four-cycle) certified reciprocating piston engines, including fuel-injected and turbocharged engines. AeroShell W Oils are not recommended for use in automotive engines. For automotive engines converted for use in aircraft, the specific engine manufacturer or the conversion agency should be consulted for proper oil recommendation.
- Most radial engine operators use AeroShell Oil W120 in warm weather operations with AeroShell Oil W100 or AeroShell Oil W 15W-50 being used in cooler ambient temperatures.
- AeroShell Oil W100 or AeroShell Oil W 15W-50 are the common choices for most operators of Lycoming and Continental flat engines.

Specifications, Approvals & Recommendations:

- Textron Lycoming: 301F
- The U.S. specification SAE J-1899 replaces MIL-L-22851D
- Although it was planned to replace the British Specification DERD 2450 with a DEF STAN specification this has now been put into abeyance and instead the SAE specification has been adopted.
- U.S.: Approved J-1899 SAE Grade 60
- British: Approved J-1899 SAE Grade 60
- French: (AIR 3570 Grade SAE 60)
- NATO Code: O-128 Obsolete
- Joint Service Designation: OMD-370
- Teledyne Continental: MHS 24B
- Pratt & Whitney: Service Bulletin 1183-S
- Curtiss Wright: Various Service Bulletins – refer to relevant Bulletin
- Franklin Engines: Various Service Bulletins – refer to relevant Bulletin

( ) Indicates the product is equivalent to specification

AeroShell Turbine Oil 500

AeroShell Turbine Oil 500 is a 5 mm^2/s synthetic hindered ester oil incorporating a carefully selected and balanced combination of additives to improve thermal and oxidation stability and metal passivation.

Main Applications:

- AeroShell Turbine Oil 500 was developed essentially to meet the requirements of Pratt & Whitney 521 Type II and MIL-L- 23699 specifications and is entirely suitable for most civil and military engines requiring this class of lubricant. AeroShell Turbine Oil 500 is approved for use in a wide range of turbine engines as well as the majority of accessories.
- AeroShell Turbine Oil 500 contains a synthetic ester oil and should not be used in contact with incompatible seal materials and it also affects some paints and plastics.

Specifications, Approvals & Recommendations:

- Approved MIL - PRF - 23699G Grade STD (US)
- Approved SAE AS5780B Grade SPC (US)
- Approved DEF STAN 91-101
- Equivalent DCSEA 299/A (French)
- NATO Code O-156
- Joint Service Designation OX-27
- Pratt & Whitney: Approved 521C Type II
- General Electric: Approved D-50 TF 1
- Allison: Approved EMS - 53 (Obsolete)

AeroShell Turbine Oil 500 is approved for use in all models of the following engines:

- Honeywell: TFE 731, TPE 331, GTCP 30, 36, 85, 331, 660 and 700 series APUs. ALF 502, LF507, LTS101, LTP101, T53, T55, AL5512
- Allison (Rolls-Royce): 250 Series, 501 D13, T56, GMA 2100, GMA 3007
- BMW- Rolls-Royce: BR710, BR715
- GE 90, CF6, CT58, CF700, CJ610, CJ805, CF34, CT7, CT64
- Pratt & Whitney: JT3, JT4, JT8, JT9, JT12, PW4000, PW6000
- Pratt & Whitney, Canada: JT15, PT6A, PT6T, ST6, PW100, PW200, PW300, PW500
- Rolls-Royce: Tay, Gnome, Spey, RB183, Adour, M45H, Viper (Series MK 301, 521, 522, 526, 535, 540, 601, 623 and 632)
- AeroShell Turbine Oil 500 is also approved for use in the industrial and marine versions of the Rolls Royce Trent, Avon, Allison 501K and 570K, Honeywell TF35, Pratt & Whitney GG3/FT3, GG4/FT4, GG12/FT12, all General Electric LM Series of units, Turbomeca industrial engines and certain Solar gas turbine engines.
- Full details of the approval status of AeroShell Turbine Oil 500 in APUs and other engines/accessories is available.

AeroShell Turbine Oil 555

AeroShell Turbine Oil 555 is an advanced 5 mm^2/s synthetic hindered ester oil incorporating a finely balanced blend of additives to improve thermal and oxidation stability and to increase the load carrying ability of the base oil.

Main Applications:

- AeroShell Turbine Oil 555 was specifically developed to meet the high temperatures and load carrying requirements of SST engines and the DEF STAN 91-100 (formerly DERD 2497) and XAS-2354 specifications. AeroShell Turbine Oil 555 was also designed to give enhanced performance in current engines.
- More recently with the need to transmit more power and higher loads through helicopter transmission and gearbox systems (many helicopters use a synthetic turbine engine oil in the transmission/gearbox system) it has become apparent that the use of a very good load carrying oil, such as AeroShell Turbine Oil 555 is necessary. This in turn has led to the development of a U.S. Military Specification, DOD-L- 85734, which covers a helicopter transmission oil against which AeroShell Turbine Oil 555 is fully approved.
- AeroShell Turbine Oil 555 contains a synthetic ester oil and should not be used in contact with incompatible seal materials and it also affects some paints and plastics.

Specifications, Approvals & Recommendations:

- Approved DOD-PRF-85734A (US)
- Approved DEF Stan 91-100 (British)

Note: both UK and US production are manufactured to the same formulation.

- Nato Code O-160
- Joint Service Designation OX-26
- Pratt & Whitney: Approved 521C Type II
- General Electric: Approved D-50 TF 1
- Allison: Approved EMS-53 (Obsolete)

AeroShell Turbine Oil 555 is approved for use in all models of the following engines:

- General Electric: CT58, CT64, CF700, CJ610
- Motorlet: MD601D, E and Z
- Pratt & Whitney: JT3, JT4, JT8, JT9, JT12, PW4000
- Pratt & Whitney Canada: ST6, PW200
- Rolls-Royce: Gem, Gnome, M45H, Olympus 593, RB199
- Turbomeca: Adour
- US Military: Approved for helicopter transmission specification DOD-PRF-85734A
- Eurocopter: Approved for Super Puma, for other helicopters check with Eurocopter
- Agusta: Approved for A109 and A129 models, for other models check with Agusta
- Bell Helicopter Textron: Approved for all Bell turbine engined powered helicopters
- Boeing Vertol: Approved for Chinook
- McDonnell Douglas: Approved
- MBB: Approved
- Sikorsky: Approved for S-61N (note other types such as the S- 70 and S-76 do not use synthetic turbine oils in the transmission)
- Westland Helicopters: Approved for some models
- Honeywell: Auxiliary Power Units GTCP 30, 36, 85, 331, 660 and 700 Series

AeroShell Turbine Oil 555 is approved for an increasing number of helicopter transmissions, whilst details are listed, it is important that operators check latest status with the helicopter manufacturer. In all cases it is important to check compatibility with seals used in the transmission/gearbox.

AeroShell Turbine Oil 560

AeroShell Turbine Oil 560 is a third generation, high performance, low coking 5 mm^2/s synthetic hindered ester oil incorporating a carefully selected and finely balanced combination of additives to improve thermal and oxidation stability.

Main Applications:

- Changes which have taken place over the last twenty years in engine performance (in terms of improved fuel consumption, higher operating temperatures and pressures) and maintenance practices have resulted in increased severity in lubricant operating conditions.
- AeroShell Turbine Oil 560 was developed to withstand the hostile environments of today's high powered, high compression engines in which the older generation of oils can be stressed up to and beyond their thermal limits, as evidenced by oil coking in the high temperature bearing areas.
- By overcoming the problems associated with using old technology oils in new technology engines, AeroShell Turbine Oil 560:
  - maintains a cleaner engine
  - provides improved load carrying capacity
  - reduces maintenance costs
  - prolongs bearing life in both new and existing engines
- In order for military authorities to take advantage of this better performance in military engines the specification MIL-PRF-23699 was re-written to include a "High Thermal Stability" (HTS) grade as well as the Standard (STD) and Corrosion Inhibited (C/I) grades. AeroShell Turbine Oil 560 is fully approved as an HTS oil
- With effect from January 1st 2002, AeroShell Turbine Oil 560 has been manufactured with an improved formulation to further enhance its anti-coking performance.
- AeroShell Turbine Oil 560 contains a synthetic ester oil and should not be used in contact with incompatible seal materials and it also affects some paints and plastics.

Specifications, Approvals & Recommendations:

- Approved MIL - PRF -23699G Grade HTS (US)
- Approved SAE AS5780B Grade SPC
- Equivalent DEF STAN 91-101 (British)
- Equivalent DCSEA 299/A (French)
- Analogue to VNII NP 50-1-4F, B3V, LZ-240, VNII NP 50-1-4U and 36/Ku-A (Russian)
- NATO Code O-154
- Joint Service Designation: Equivalent OX-27
- Pratt & Whitney: Approved 521C Type II
- General Electric: Approved D-50 TF1
- Allison: Approved EMS-53 (Obsolete)
- COMAC Approved to QPL-CMS-OL-202

AeroShell Turbine Oil 560 is approved for use in all models of the following engines:

- Honeywell: TFE 731, TPE 331, Apus (majority of models), LTS 101, LTP 101, ALF 502, LF 507, AS907, AS977, GTCP 30, 36, 85, 331, 660, RE220
- Allison (Rolls-Royce): 250 Series
- BMW - Rolls-Royce: BR710, BR715
- CFM International: CFM 56 (all models)
- CFE 738
- Engine Alliance: GP7200
- GE 90, CF6 (all models), CJ610, CF700, CT34, GEnX
- IAE: V2500 Series
- IHI: FJR 710
- Hamilton Sundstrand: APS 500, 1000, 2000, 3000
- Pratt & Whitney: JT3D, JT8D, JT9D, PW4000 Series (cleared for flight evaluation in PW2000 engines)
- Pratt & Whitney Canada: PT6T, PT6A (some models only), PW120,121 Series, JT15D, PW200 Series, PW300 Series, PW500 Series, PW901A APU
- Rolls-Royce: Spey, Tay RB183, Adour, RB199
- Turbomeca: Arriel, Arrius, Makila, RTM 322, TM 319, TM 333, TP 319, MTR 390, Various Models of Astazou and Artouste engines

Full details of the approval status of AeroShell Turbine Oil 560 in APUs and other engines/accessories is available.

AeroShell Fluid 31

AeroShell Fluid 31 is a synthetic hydrocarbon based aircraft hydraulic fluid with greatly improved fire resistance characteristics when compared with conventional petroleum products.

AeroShell Fluid 31 has a specially designed base stock which imparts a relatively high flash point, excellent low temperature properties and good oxidation and thermal stability. In addition, AeroShell Fluid 31 is formulated with high technology additives to provide oxidation and corrosion resistance, antiwear, and anti-foaming protection.

AeroShell Fluid 31 is superclean filtered to ensure optimum performance in particulate monitored systems. AeroShell Fluid 31 is dyed red. The useful operating temperature range is –40°C to +205°C.

Main Applications:

- AeroShell Fluid 31 is recommended for use in aircraft, ordnance, and missile systems operating from –40°C to +205°C.
- This fluid should be considered for use in auto pilots, shock absorbers, brakes, flight control systems, hydraulic servo-controlled systems and other systems using synthetic elastomer seals. An increasing number of aircraft manufacturers now recommend use of this type of fluid in aircraft hydraulic systems in preference to mineral hydraulic oils. This move has been prompted by need to use fluids with better fire resistant properties.
- AeroShell Fluid 31 is also approved for use in the Honeywell (formerly Garrett) cooling turbine (cabin air compressors). Increasingly this type of hydraulic fluid is being adopted for use in hydraulic systems of military aircraft in place of mineral hydraulic fluids.
- AeroShell Fluid 31 is compatible with AeroShell Fluids 4, 41, 51, 61 and 71 and can be used in systems designed to operate with MIL-PRF-5606, MIL-PRF-6083, MIL-PRF-87257 and MIL-PRF-46170 fluids.
- Chlorinated solvents should not be used for cleaning hydraulic components which use AeroShell Fluid 31. The residual solvent contaminates the hydraulic fluid and may lead to corrosion.

Specifications, Approvals & Recommendations:

- Approved MIL-PRF-83282D (US)
- (MIL-PRF-83282D) (British)
- Equivalent to DCSEA 437/A (French)
- NATO Code H-537
- Joint Service Designation OX-19

AeroShell Fluid 41

AeroShell Fluid 41 is a mineral hydraulic oil manufactured to a very high level of cleanliness, and possesses improved fluid properties. AeroShell Fluid 41 contains additives which provide excellent low temperature fluidity as well as exceptional anti-wear, oxidation - corrosion inhibition and shear stability. In addition metal de-activators and foam inhibitors are included in this high viscosity index fluid to enhance performance in hydraulic applications. AeroShell Fluid 41 is capable of wide temperature range operation.

AeroShell Fluid 41 is dyed red.

Main Applications:

- AeroShell Fluid 41 is intended as an hydraulic fluid in all modern aircraft applications requiring a mineral hydraulic fluid. AeroShell Fluid 41 is particularly recommended where use of a "superclean" fluid can contribute to improvements in component reliability, and can be used in aircraft systems operating unpressurised between –54°C to +90°C and pressurised between –54°C to 135°C.
- AeroShell Fluid 41 should be used in systems with synthetic rubber components and must not be used in systems incorporating natural rubber.
- AeroShell Fluid 41 is compatible with AeroShell Fluids 4, 31, 61 and 71 and SSF/LGF.
- Chlorinated solvents should not be used for cleaning hydraulic components which use AeroShell Fluid 41. The residual solvent contaminates the hydraulic fluid and may lead to corrosion.

Specifications, Approvals & Recommendations:

- COMAC Approved to QPL-CMS-OL-104
- Approved MIL-PRF-5606H* (both U.S. and European production)
- Approved DEF STAN 91-48 Grade Superclean* (European production only)
- Meets DEF STAN 91-48 Grade Normal (European production only) Equivalent to DEF STAN 91-48 Grades Superclean* & Normal (U.S. production only)
- Approved DCSEA 415/A (French)
- Analogue to AMG-10 (Russian)
- NATO Code H-515* (equivalent H-520)
- Joint Service Designation OM-15* (equivalent OM-18)

* = Superclean

AeroShell LGF

AeroShell Landing Gear Fluid (LGF) is a mineral hydraulic fluid (MIL-PRF-5606) to which additional additives have been added to improve the extreme pressure characteristics and the fluid's natural lubricity. The lubricity agent provides a stable thin film layer to the metal surfaces at mild operating conditions. When severe conditions exist (landing/touchdown), the extreme pressure additive supplies the load carrying needed at the metal-to-metal surfaces to prevent the occurrence of such phenomena as "ladder cracking" and "slip stiction" of the piston component of the landing gear. AeroShell LGF is AeroShell Fluid 41 plus additives.

Main Applications:

- The excellent low temperature properties of AeroShell LGF make it particularly suitable in areas of low temperature operations.
- AeroShell LGF is straw yellow in colour

Compatibility & Miscibility:

- AeroShell LGF is compatible with AeroShell Fluids 4, 41 and 71

Specifications, Approvals & Recommendations:

- AeroShell Landing Gear Fluid (LGF) is not covered by any military specification
- McDonnell Douglas Approved DPM-6177
- Boeing Approved BMS 3-32C (AeroShell LGF is approved to Type II)

AeroShell LGF is approved for use in the shock struts of the following aircraft:

- Boeing 707/720, 727, 737, 747 (except those using BMS 3-11 fluids), 757, 767 and 777
- Lockhead L1011 Tristar
- McDonnell Douglas DC-8, DC-9, DC-10, MD-80, MD-11
- Airbus CML Code 02-004A (SSF)
- For use in the landing gear shock struts of other aircraft, operators must check with the respective manufacturer first.

AeroShell Grease 22

AeroShell Grease 22 is a versatile advanced general purpose grease composed of a synthetic hydrocarbon oil thickened with Microgel®, with outstanding performance characteristics. Appropriate additives are included to achieve the necessary oxidation and corrosion resistance, anti-wear properties and load carrying properties.

The useful operating temperature range is -65°C to +204°C.

Main Applications:

- Aeroshell Grease 22 is especially recommended for use wherever severe operating conditions are encountered as in high bearing loads, high speeds, wide operating temperature range, and particularly where long grease retention and high resistance to water washout are required.
- The wide range of applications include aircraft wheel bearings, engine accessories, control systems actuators, screw jacks, servo mechanisms and electric motors, helicopter rotor bearings, instruments, airframe lubrication, hinge pins, static joints, landing gears.
- Aeroshell Grease 22 contains a synthetic hydrocarbon oil and should not be used in contact with incompatible seal materials.

Specifications, Approvals & Recommendations:

- U.S.: Approved MIL-PRF-81322G NLGI Grade 2, Approved DOD-G-24508A
- British: Approved DEF STAN 91-52
- French: Approved DCSEA 395/A
- Russian: Analogue of CIATIM 201 and 203. VNII NP 207, ERA (VNII NP 286M) and ST (NK-50)
- NATO Code: G-395
- Joint Service Designation: XG-293
- COMAC Approved to QPL-CMS-OL-301

AeroShell Grease 33

AeroShell Grease 33 is a synthetic universal airframe grease composed of a lithium complex thickened synthetic base oil with corrosion and oxidation inhibitors and load carrying additives.

The useful operating temperature range is –73°C to +121°C.

Main Applications:

- AeroShell Grease 33 is approved to BMS 3-33B and offers the improved performance properties required by this specification.
- AeroShell Grease 33 can be used for routine lubrication on Boeing aircraft where MIL-PRF-23827C or BMS 3-24 is specified. AeroShell Grease 33 can also be used in some applications on Boeing aircraft which require use of MIL-G- 21164. Other applications on Boeing aircraft which require use of MIL-G-21164 and other greases are being reviewed and in due course Boeing will issue details of the full range of applications. For the current status, refer to the latest issue of Boeing Service Letter "BMS 3-33B General purpose Aircraft Grease".
- AeroShell Grease 33 can be used for routine lubrication in applications where MIL-PRF-23827C is specified on aircraft manufactured by McDonnell Douglas, Airbus, BAe Regional Aircraft, Canadair, Lockheed, Embraer, Fokker and Gulfstream (except for wheel bearings, applications above 121°C and sliding applications requiring molybdenum disulphide).

Specifications, Approvals & Recommendations:

- U.S.: Approved MIL-PRF-23827C (Type I)
- Boeing: Approved BMS 3-33B
- Airbus: Approved AIMS 09-06-002
- COMAC Approved to QPL-CMS-OL-302

Compatibility & Miscibility:

AeroShell Grease 33 contains a synthetic oil and must not be used with incompatible seal materials.

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AeroShell Grease 64

AeroShell Grease 64 comprises AeroShell Grease 33 fortified with 5% molybdenum disulphide. It possesses the enhanced anti-wear and anti-corrosion properties of AeroShell Grease 33 with the added EP (Extreme Pressure) properties provided by the addition of a solid lubricant.

The useful operating temperature range is –73°C to +121°C.

Main Applications:

- AeroShell Grease 33 has established itself as the answer to most of the airframe's General Purpose, airframe greasing requirements, being approved for use in Boeing, Airbus and many other aircraft types. It sets the standard with exceptional anti-corrosion and anti-wear performance while allowing aircraft operators to shrink their grease inventory and reduce the risk of misapplication. However, there remains a small number of highly loaded, sliding applications on the airframe where the additional boost of molybdenum disulphide will always be required. To address this need, Shell Aviation has developed AeroShell Grease 64. Sharing the same advanced grease technology as its parent, AeroShell Grease 64 also possesses the extreme pressure (EP) characteristics provided by molybdenum disulphide.

Specifications, Approvals & Recommendations:

- COMAC Approved to QPL-CMS-OL-311
- Approved MIL-G-21164D (US)
- Approved DEF STAN 91-57
- Equivalent DCSEA 353/A (French)
- NATO Code G-353
- Joint Service Designation XG-276

For a full listing of equipment approvals and recommendations please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility:

AeroShell Grease 64 contains a synthetic oil and must not be used with incompatible seal materials.

AeroShell Grease 7

AeroShell Grease 7 is an advanced multi-purpose grease, composed of a synthetic oil thickened with Microgel®, possessing good load carrying ability over a wide temperature range. It is inhibited against corrosion and has excellent resistance to water.

The useful operating temperature range is –73°C to +149°C.

Main Applications:

- AeroShell Grease 7 satisfies nearly all the airframe grease requirements of turbine engined aircraft and also those of piston engined aircraft provided that seal incompatibility does not occur.
- It is recommended for lubricating highly loaded gears, actuator screw mechanisms, etc., also for instrument and general airframe lubrication within the temperature range of –73°C to +149°C.

Specifications, Approvals & Recommendations:

- U.S.: Approved MIL PRF-23827C (Type II)
- COMAC Approved to QPL-CMS-OL-302

Compatibility & Miscibility:

- AeroShell Grease 7 contains a synthetic ester oil and should not be used in contact with incompatible seal materials.
- AeroShell Grease 7 is a clay-based grease approved to MIL- PRF-23827C Type II; it should not be mixed with soap-based greases approved to MIL-PRF-23827C Type I.

VIVA EnergyAustralia

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Shell GadusRail S2 Traction Motor Bearing Grease

High performance traction motor bearing grease

Shell GadusRail S2 Traction Motor Bearing Grease is one of Shell's highest quality lithium soap based greases. It is manufactured to specifications that provide excellent mechanical stability and long service life. These properties are needed for many critical anti-friction bearing applications. Shell GadusRail S2 Traction Motor Bearing Grease is a NLGI Grade 3 grease formulated using mineral base oils.

Performance, Features & Benefits:

- Outstanding mechanical stability
- Long service life
- Friction reducer
- Fill-for-life capability

Main Applications:

- Traction motor bearings of General Motors Electromotive Diesel and General Electric locomotives.
- Prepackaged anti-friction bearings intended for "life-time" service without re-lubrication, a feature highly desired by the railroad industry.

Specifications, Approvals & Recommendations:

- General Electric
- General Motors Electromotive Division (EMD)

Shell GadusRail S2 Wheel Flange Grease 2

High performance wheel-flange grease

Shell GadusRail S2 Wheel Flange greases are lithium soap greases fortified with a specifically formulated multi purpose additive package for use as railroad track lubricants. These greases may also find applications in construction, mining and agricultural equipment.

Performance, Features & Benefits:

- Shell GadusRail S2 Wheel Flange greases are lithium soap thickened greases made with highly refined base oils, a special EP additive package and 3% molybdenum disulfide.
- Shell GadusRail S2 Wheel Flange 2 has been designed to improve the lubricity and durability of the grease under the conditions imposed by hot weather.
- Enhanced wear protection of wheels and track
- Excellent heavy and shock load protection
- Excellent adherence to track even under adverse weather conditions
- Suitability for a variety of track and wheel lubricator systems
- Special formulation to reduce product loss at the application site

Main Applications:

- Shell GadusRail S2 Wheel Flange greases are specially formulated to meet the pumpability, adhesion, and load carrying requirements of a track lubricant. Additionally, Shell GadusRail S2 Wheel Flange greases are formulated to perform well when used on any equipment subjected to conditions of high loads and temperature extremes and provide excellent resistance to rust and corrosion.

Specifications, Approvals & Recommendations:

- Shell GadusRail S2 Wheel Flange greases are suitable for conventional railroad trackside and/or wheel/flange lubrication systems designed to handle greases, including lubricators made by KLF Lubriquip (formerly Madison-Kipp), Bijur, Portec and Moore and Steele.

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Shell Alvania Grease EPD

A long-life railroad roller bearing grease

Shell Alvania Grease EPD is a long-life railroad grease with extreme pressure additives to provide higher load carrying capacity. This grease meets the requirements of AAR M-942-(Revised 1992).

Performance, Features & Benefits

- Extended bearing life
- Water and corrosion protection
- Prolonged grease service life
- Simplified inventory

Main Applications:

- The Association of American Railways (AAR) have developed a grease specification AAR M-942 (Revised 1992), designed to eliminate field lubrication, so that they only have to grease bearings when rail cars are brought to the shop for wheel repair.
- Shell Alvania EPD is specifically designed as a long life railway bearing grease meeting the above AAR requirements.

Specifications, Approvals & Recommendations:

- Association of American Railways AAR M-942 (Revised 1992)

Shell Gadus
S2 OG 70, 80, 85

Superior performance open gear greases

Shell Gadus S2 OG greases are a range of premium quality lead and solvent free, full EP lubricants developed for the lubrication and protection of open gears and wire ropes subjected to extremes of ambient temperature and operating conditions.

Performance, Features & Benefits:

- Exceptional physical and mechanical
- Excellent anti-wear performance
- Superb load carrying capacity
- Water repellent
- Corrosion protection
- Environmental compliance

Specifications, Approvals & Recommendations:

- FLSmidth
- Norberg (70, 80)
- Ferry Capitain
- Falk (70, 80)
- Lincoln

Main Applications:

- Heavily loaded open gears
- Multi service lubricant
- Surface dressing of slow moving gears open to atmosphere
- Plain bearings, pivot pins/bushings and articulations found in earthmoving equipment
- Mooring, static and slow moving wire ropes
- Wide variety of heavy-duty mining and industrial applications

Shell Gadus
S3 OG 2

Premium open gear and wire rope grease

Shell Gadus S3 OG 2 is primarily designed for applications in mining equipment, shovels and excavators in open cut operations. Shell Gadus S3 OG is based upon an Aluminium Complex soap thickener dispersed in a high viscosity base oil containing enhanced extreme pressure-antiwear chemistry.

Performance, Features & Benefits:

- Excellent load carrying capacity under severe operation conditions
- Very high mechanical and thermal stability
- Withstands severe operation conditions
- Maintains adhesive characteristic over time
- No addition of chlorinated & undesired heavy metals

Specifications, Approvals & Recommendations:

- Liebherr Specification

Main Applications:

- Open gears
- Stick
- Circle Rail and rollers
- Anti-friction bearings
- Bushings

Shell Gadus
S4 OG Clear Oil 20000

Advanced open gear and wirerope lubricant

Shell Gadus S4 OG Clear Oil 20000 is an advanced part-synthetic, non-bitumastic viscous lubricant specifically developed to satisfy the demands of heavily loaded open gearing.

Performance, Features & Benefits:

- High viscosity
- Gear inspections due to clear film
- Extreme pressure performance
- Pumpability

Main Applications:

- Developed specifically for the lubrication of medium-size to large girth gear drives. It provides good adhesion, excellent resistance to high pressure and protection against wear.
- Shell Gadus S4 OG Clear Oil incorporates synthetic oil with thickening effect and high viscosity mineral oils blended with extreme pressure additives to give a modern high performance open gear lubricant.

Shell Lubricants
Macro Distributor

Shell Gadus S3 High Speed Coupling Grease

Premium gear coupling grease

Shell Gadus S3 High Speed Coupling Grease is a special grease for flexible gear couplings. It is based on high viscosity mineral oil and a lithium complex soap thickener.

Performance, Features & Benefits:

- Resists separation
- Resists hardening

Main Applications:

Shell Gadus S3 High Speed Coupling Grease is used for the grease lubrication of flexible gear couplings operating at a speed >300 RPM.

Shell Gadus
S2 V100 2, S2 V100 3

High performance multi-purpose grease

Shell Gadus S2 V100 is a general purpose grease based on a new lithium hydroxystearate soap thickener fortified with anti-oxidant, anti-wear and anti-rust additives.

Performance, Features & Benefits:

- Reliable high temperature performance
- Good oxidation and mechanical stability
- Good corrosion resistance characteristics
- Long storage life

Main Applications:

- Rolling element and plain grease lubricated bearings
- Electric motor bearings
- Sealed-for-life bearings
- Water pump bearings

May be used under a wide range of operating conditions. They offer very significant advantages over conventional lithium greases at high temperature or in the presence of water.

A medium consistency grease designed, mainly, for general industrial lubrication. Ideal for centralised lubrication systems operating at normal temperatures.

Shell Gadus S3 T100 2

Premium multi-purpose grease

Shell Gadus S3 T100 greases are high technology greases designed to give optimum performance for grease lubrication in industrial bearings. They are based on mineral oil with a special diurea thickener to give long life, low wear and shear-stable properties at high temperatures. In high temperature applications Shell Gadus S3T100 greases will outperform even fully synthetic (PAO) lithium complex greases proposed in the market.

Performance, Features & Benefits:

- Outstanding life at high temperatures
- Excellent wear protection
- Excellent mechanical stability at high temperatures
- Excellent oxidation resistance
- Good protection against false brinelling
- Low oil separation
- Excellent corrosion resistance
- Versatile
- Water resistant
- Lead and nitrate free
- High temperature performance
- Corrosion protection
- Load carrying capacity
- Re-lubrication extension
- Oxidation stability
- Water washout

Main Applications:

- Shell Gadus S3 T100 greases are particularly recommended for use in high temperature (160°C), lightly loaded industrial bearings. It is recommended for use where long operational life and extended re-greasing intervals are an important consideration.

Compatibility & Miscibility:

- Sealing

The rheology of Shell Gadus S3 T100 greases is such that at low shear rates and with heating the consistency increases. Consequently, in bearings operating at high temperatures the grease remains in place providing good sealing and continuous lubrication even in the presence of vibration.

Shell Gadus S5 V100 2

Advanced multi-purpose grease

Shell Gadus S5 V100 is a lithium complex grease based on synthetic base oils, containing antioxidants, EP-, wear-, and rust preventing additives. The product contains a special friction modifier which is suitable for high speed bearings, taper roller bearings and cylindrical bearings, type NJ, NUP plus applications with an angle ring.

Main Applications:

Shell Gadus S5 V100 is developed for lubrication of roller bearings operating at high speeds as well as bearing submitted to severe cold. The grease has very low starting and running torques at temperatures down to -50°C and therefore suitable for all year lubrication of, for example, out door fans and electrical motors. The grease has a very good mechanical and thermal stability and can be used in electrical motors, fans and pumps at bearing temperatures up to 150°C where there is a demand for long re-lubrication intervals.

Shell Lubricants
Macro Distributor

Shell Gadus S2 V220 00, S2 V220 0

High performance multi-purpose extreme pressure grease

Shell Gadus S2 V220 greases are high quality multi-purpose, extreme-pressure greases based on a blend of high viscosity index mineral oils and a lithium hydroxystreate soap thickener and contain extreme-pressure and other proven additives to enhance their performance in a wide range of applications. Shell Gadus S2 V220 greases are designed for multi-purpose grease lubrication of rolling element and plain bearings as well as hinges and sliding surfaces such as those found in most industrial and transport sectors.

Performance, Features & Benefits:

- Good anti-wear and EP performance
- Improved mechanical stability
- Good resistance to water wash-out
- Oxidation stability

Main Applications:

Shell Gadus S2 V220 greases are specifically designed for:

- Steel mill lubrication where a softer grease is necessary for specialised dispensing systems
- Gearbox applications where semi-fluid greases are required
- Centralised chassis lubrication systems on trucks and buses

Shell Gadus S2 V220 1

High performance multi-purpose extreme pressure grease

Shell Gadus S2 V220 greases are high quality multi-purpose, extreme-pressure greases based on a blend of high viscosity index mineral oils and a lithium hydroxystreate soap thickener and contain extreme-pressure and other proven additives to enhance their performance in a wide range of applications. Shell Gadus S2 V220 greases are designed for multi-purpose grease lubrication of rolling element and plain bearings as well as hinges and sliding surfaces such as those found in most industrial and transport sectors.

Performance, Features & Benefits:

- Good anti-wear and EP performance
- Improved mechanical stability
- Good resistance to water wash-out
- Anti-corrosion protection
- Oxidation stability

Main Applications:

Shell Gadus S2 V220 1 grease is designed for:

- Heavy duty bearings served by centralised dispensing equipment
- Extreme pressure gear grease for applications at normal ambient temperature
- Low temperature greasing applications

Shell Gadus S2 V220 2

High performance multi-purpose extreme pressure grease

Shell Gadus S2 V220 greases are high quality multi-purpose, extreme-pressure greases based on a blend of high viscosity index mineral oils and a lithium hydroxystreate soap thickener and contain extreme-pressure and other proven additives to enhance their performance in a wide range of applications. Shell Gadus S2 V220 greases are designed for multi-purpose grease lubrication of rolling element and plain bearings as well as hinges and sliding surfaces such as those found in most industrial and transport sectors.

Performance, Features & Benefits:

- Good anti-wear and EP performance
- Improved mechanical stability
- Good resistance to water wash-out
- Oxidation stability
- Good corrosion resistance characteristics

Main Applications:

Shell Gadus S2 V220 2 greases are designed for:

- Heavy duty bearings and general industrial lubrication

Shell Gadus S3 V220C 1, S3 V220C 2

Premium multi-purpose extreme pressure grease

Shell Gadus S3 V220C greases are premium multi-purpose greases based on high viscosity index mineral oil and a lithium complex soap thickener. They contain the latest additives to offer excellent high temperature oxidation performance and other additives to enhance their anti-oxidation, anti-wear and anti-corrosion properties. Shell Gadus S3 V220C greases are especially suitable for bearings operating at high temperature under load.

Performance, Features & Benefits:

- Excellent mechanical stability even under vibrating conditions
- Enhanced extreme-pressure properties
- Good water resistance
- High dropping point
- Long operational life at high temperatures
- Effective corrosion protection

Specifications, Approvals & Recommendations:

- Meets ASTM D4950 LB-GC
- SEB 18 12 53 (NLGI 2)

Main Applications:

Shell Gadus S3 V220C greases are used for the grease lubrication of heavy-duty bearings used in machinery found in:

- Continuous casting
- Vibrating sieves
- Quarries
- Breakers
- Roller conveyors
- Automotive wheel bearings

Shell Gadus S3 T220 2

Premium multi-purpose extreme pressure grease

Performance, Features & Benefits:

- Cost savings
- Peace of mind
- Convenience

Main Applications:

- General engineering, steel, paper, aluminium, chemical and many others
- Recommended as an extreme pressure grease for highly loaded ball, roller and plain bearing applications at high temperatures where extended service life is required.

Proven in the following applications:

- Hot strip mills
- Electrical motors (large)
- Paper mill bearings (dry end)

Shell Gadus S5 V220 2

Advanced multi-purpose extreme pressure grease

Shell Gadus S5 V220 is an advanced performance grease for general transport and industrial applications. It is based on high viscosity index synthetic base oil and a lithium complex soap thickener. It contains additives against wear, oxidation and corrosion.

Performance, Features & Benefits:

- Excellent mechanical stability and water resistance
- Corrosion protection
- Enhanced extreme-pressure properties
- High dropping point
- Long operational life at both high and low temperatures
- Compatible with seals

Specifications, Approvals & Recommendations:

- Meets ASTM D4950 LB-GC

Main Applications:

- Shell Gadus S5 V220 is used for the grease lubrication of bearings in both transport and industrial applications, including also both the wet and dry ends of paper machines.

Shell Gadus S2 V220AC 2

High performance multi-purpose extreme pressure grease

Shell Gadus S2 V220AC greases are high quality multi-purpose greases based on high viscosity index mineral oil and a mixed lithium/calcium soap thickener. They contain extreme-pressure, anti-wear, anti-oxidation and anti-corrosion additives to enhance their performance in a wide range of applications.

Performance, Features & Benefits:

- Excellent mechanical stability even under vibrating conditions
- Good corrosion resistance
- Extended life at moderate temperatures
- Good oil separation

Main Applications:

Heavy-duty plain and rolling element bearings operating in the following environments:

- Vibrating conditions
- Heavy load
- High temperature
- Shock
- Presence of water

Multi-purpose convenience, especially in the transport sector where product can be used for both wheel bearings and chassis lubrication of passenger cars, light trucks and heavy duty trucks. These greases are also suitable for construction equipment exposed to intense water washout.

Specifications, Approvals & Recommendations:

- ASTM D4950 LB

Shell Gadus S2 A320 2

High performance multi-purpose extreme pressure grease

Shell Gadus S2 A320 greases are smooth textured, calcium based greases for industrial and marine applications at moderate temperatures requiring extreme pressure performance.

Performance, Features & Benefits:

- Good water resistance
- Safe handling
- Extreme pressure performance

Main Applications:

- Plain and rolling bearings working under arduous conditions in the presence of water
- Stern tube bearings, cranes, davits, winches, windlass
- General wire rope or open gear lubrication
- Shell Gadus A320 greases are not recommended for rolling element bearings

Compatibility & Miscibility:

- Shell Gadus S2 A320 greases are compatible with all normal mineral oil seal materials

Shell Gadus S2 V220AD 1, S2 V220AD 2

High performance multi-purpose grease with solids

Shell Gadus S2 V220AD greases are high performance greases for the lubrication of bearings subjected to harsh conditions. They are based on high viscosity index mineral oil and a mixed lithium/calcium soap thickener and contain extreme-pressure, anti-oxidation, anti-corrosion and adhesion additives. They also contain solids to provide resistance to shock loading.

Performance, Features & Benefits:

- Good oxidation and mechanical stability
- Good corrosion resistance
- For shock loaded conditions
- Good adhesion properties
- Extreme pressure performance

Main Applications:

- Shell Gadus S2 V220AD greases are recommended for the lubrication of shock loaded heavy duty bearings working in damp hostile conditions. They are well-suited for use in off-highway applications and also for the lubrication of fifth wheels.

Shell Gadus S3 V460 2

Premium multi-purpose heavy duty grease

Shell Gadus S3 V460 greases are premium, high temperature greases for heavy duty industrial applications. This product is based on high viscosity index mineral oil and a lithium complex soap thickener and contains the latest additives to offer excellent high temperature oxidation performance and other additives to enhance its anti-oxidation, anti-wear and anti-corrosion properties.

Performance, Features & Benefits:

- High base oil viscosity to meet leading OEM requirements for slow moving large bearings
- Excellent mechanical stability even under vibrating conditions
- Enhanced extreme pressure properties
- Excellent water resistance
- Effective corrosion protection
- High dropping point

Main Applications:

Shell Gadus S3 V460 greases are used for the grease lubrication of heavy duty, slow moving bearings used in heavy industries.

- Steel (continuous casters, workroll bearings etc.)
- Cement
- Paper
- Chemical industry
- Mining

Shell Gadus S5 T460 1.5

Advanced multi-purpose heavy duty grease

Shell Gadus S5 T460 grease is a high performance, high temperature, long life grease for heavy duty industrial applications. It uses fully synthetic base stocks and the latest technology diurea thickener. It contains the latest additives to offer excellent high temperature oxidation performance and other additives to enhance its anti-oxidation, anti -wear and anti-corrosion properties. Shell Gadus S5 T460 grease is especially suitable for sealed & semi-sealed applications involving slow moving, heavy-duty bearings operating at high temperature and under severe loads.

Performance, Features & Benefits:

- High base oil viscosity to meet leading OEM requirements for slow moving large bearings
- Excellent resistance to high temperature & "heat soak"
- Enhanced extreme pressure properties
- Excellent water resistance
- High dropping point
- Effective corrosion protection

Main Applications:

Shell Gadus S5 T460 grease can be used for the grease lubrication of heavy duty, slow moving bearings (both sealed & semi-sealed) used in machinery found in the following industries:

- Steel
- Cement
- Paper
- Wind power
- Chemical industry
- Mining

Shell Gadus S3 V460D 2

Premium multi-purpose heavy duty grease with solids

Shell Gadus S3 V460D greases are high performance high temperature greases for slow moving heavily loaded large bearings subject to shock loads. They are based on high viscosity index mineral oil and a lithium complex soap thickener. Apart from containing the latest additives to ensure excellent high temperature, anti corrosion & anti oxidation performance, they also contain MoS_2 to ensure the grease can handle shock loads.

Performance, Features & Benefits:

- High base oil viscosity for load carrying
- Excellent mechanical stability even under vibrating conditions
- Enhanced extreme-pressure properties & resistant to shock loads
- Excellent water resistance
- Effective corrosion protection
- High dropping point

Main Applications:

Shell Gadus S3 V460D greases are used for the grease lubrication of heavy duty, slow moving bearings subject to shock loads found in the following industries:

- Mining
- Steel

Specifications, Approvals & Recommendations:

Shell Gadus S3 V460D is listed by several leading OEMs:

- Komatsu mining (Germany)
- Terex
- BE (certified)
- Dieffenbacher
- Konecranes
- CMI
- Flat Products Equipment
- Pfeiffer
- Voith Paper Environmental
- Meets the requirements of the 3% MoS_2 grease Caterpillar specification
- Rothe Erde

Shell Gadus S4 V460D 2

Advanced multi-purpose heavy duty grease

Shell Gadus S4 V460D grease is a high performance high temperature grease for slow moving heavily loaded pins, bushes and large bearings subject to shock loads. They are based on PAO synthetic oil and high viscosity index mineral oil and a lithium complex soap thickener. Apart from containing the latest additives to ensure excellent high temperature, anti-corrosion and anti-oxidation performance, they also contain MoS_2 to ensure the grease can handle shock loads. The enhancement of PAO synthetic base oil allows the grease to be pumped and perform in lubrication systems at much lower temperatures.

Performance, Features & Benefits:

- High base oil viscosity to provide excellent load carrying performance
- Excellent mechanical stability even under vibrating conditions
- Enhanced extreme pressure properties & resistant to shock loads
- Excellent water resistance
- Effective corrosion protection
- High dropping point

Main Applications:

Shell Gadus S4 V460D greases are used for the grease lubrication of heavy duty, slow moving pins and bushes and bearings subject to shock loads found in the mining and steel industries.

Shell Gadus S3 V460XD 2

Premium multi-purpose heavy duty grease with extra solids

Shell Gadus S3 V460XD greases are premium heavy duty greases designed for use in a wide range of industrial and mining applications. They are based on a high viscosity index mineral oil and lithium complex soap thickener. They also contain additives to offer excellent high temperature oxidation performance and enhanced extreme pressure, anti-wear and anti-corrosion properties. They also contain molybdenum disulphide to provide additional resistance to shock loading.

Performance, Features & Benefits:

- Wide operating temperature range
- Prolonged grease service life
- Excellent mechanical stability
- For shock loaded conditions
- Enhanced extreme pressure and anti-wear properties
- Low water wash-out
- Effective corrosion protection

Specifications, Approvals & Recommendations:

- Komatsu
- Komatsu Trucks
- Terex
- Liebherr Trucks
- P&H
- BE (certified)
- Caterpillar (exceeds specification)

Main Applications:

Shock loaded, heavy duty slow moving bearings and non-bearing applications, e.g. those found in large mobile mining equipment.

- Heavy earth moving pins and bushes
- Turntables

Shell Gadus S3 Wirerope

Premium wirerope grease

Shell Gadus S3 Wirerope grease is a tacky, high quality, lithium soap-based grease incorporating multifunctional, extreme pressure additives, finely dispersed graphite and molybdenum disulphide. Shell Gadus S3 Wirerope grease exhibits outstanding load-carrying capacity in bearings operating up to the maximum rated speed for grease lubrication in the temperature range -15°C to 70°C. The temperature range can be increased to 90°C for bearings operating at 75% of the maximum rated speed.

Performance, Features & Benefits:

- Provides continuous lubrication even under severely loaded and boundary lubrication conditions due to the presence of finely dispersed graphite and molybdenum disulphide
- Grease is retained under adverse conditions due to the presence of tackiness additive
- Excellent corrosion protection even under harsh conditions. Achieved a 'd' rating in the SKF TMG/ EMCOR dynamic rust test (IP 220) under salt water wash-out conditions.

Main Applications:

Shell Gadus S Wirerope is recommended for the lubrication of wire ropes.

Shell Gadus S4 OGT

Open gear grease

Shell Gadus S4 OGT is primarily designed for use in very heavy applications, and operations under hot weather conditions, in mining equipment, shovels, draglines and excavators in open cut operations. Gadus S4 OGT is based on Aluminium Complex soap thickener and high viscosity semi-synthetic base oil containing enhanced extreme pressure and antiwear chemistry.

Performance, Features & Benefits:

- Excellent load carrying capacity under severe operation conditions
- Very high mechanical and thermal stability
- Withstanding severe operation conditions
- Maintain adhesive characteristics over time
- Low friction
- Environmental compliance

Main Applications:

- Open gears on draglines, shovels, excavators, stackers and reclaimers
- Stickshifts
- Circle rail and rollers
- Heavily loaded, slow moving antifriction bearings
- Bushings
- Open gears in industrial sector such as cement, waste treatment or steel industry

Specifications, Approvals & Recommendations:

Shell Gadus S4 OGT is designed to meet the following specifications:

- Bucyrus SD 4713 (rev June 2011)
- P&H 464 Ver 09, 04-93
- P&H 520 Ver 00, 03-97
- CAT Service Advisory SA 11-005 SD 4713 updated 14th June '11

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Help Desk.

Shell Gadus S2 V1000AD 2

High performance multi-purpose heavy duty grease with solids

Shell Gadus S2 V1000AD 2 is a high performance grease for the lubrication of bearings subjected to the most arduous conditions. It is based on heavy duty part synthetic base oils and a mixed lithium/calcium soap thickener. It contains extreme pressure, anti-wear, anti-corrosion and adhesion additives. The addition of molybdenum disulphide provides additional resistance to shock loading.

Performance, Features & Benefits:

- Protects equipment under the heaviest loads
- Longer grease life
- Excellent water resistance
- Superior adhesion

Main Applications:

Shell Gadus S2 V1000AD 2 is recommended for the lubrication of severe duty applications even in damp and hostile conditions including:

- Heavy earth moving pins and bushes
- Turntables
- Slow moving industrial journal and rolling element bearings
- Particularly suited where flingoff, water and vibration are problems and heavy shock loads are experienced. This grease is not recommended for high speed bearings.

Shell Gadus S4 V2600AD 1.5

Advanced plain bearing grease

Shell Gadus S4 V2600AD is a unique lithium/calcium soap thickened part synthetic grease with superior adhesion and load carrying properties. It is formulated specially for very large and slow moving bearings, slides, bushes and other heavy duty industrial applications.

Performance, Features & Benefits:

- Protects equipment under the heaviest loads
- Longer grease life
- Resists grease loss and corrosion
- Cleaner working environment

Main Applications:

- Shell Gadus S4 V2600AD is recommended for the lubrication of sugar mill bearings, cement mill journals, plain bearings, pivot pins, slow speed cams and followers and open gears.

Please note that Shell Gadus S4 V2600AD is not recommended for high speed bearings.

Shell Rhodina Grease BBZ

High performance, part-synthetic grease, for bearings subject to fretting and false brinelling

Shell Rhodina Grease BBZ is specifically designed for high demanding outdoor applications, in particular when protection against false brinelling and fretting corrosion is required - even at very low temperatures.

Performance, Features & Benefits:

- Provides protection and lubrication for a wide range of temperature and in particular has excellent low temperature behaviour allowing trouble free operation, even under very cold climates.
- Very good water resistance properties
- Developed on the basis and knowledge of Shell's long time experience to protect blade bearings under operation and during idling.
- Minimises the risk of bearing failures which may be caused during transportation and mounting.
- The combination of selected base oils and additives is providing extended product and equipment lifetime.
- Designed for application in a temperature range from -55°C to 100°C

Main Applications:

- Shell Rhodina Grease BBZ is designed for lubrication of specific bearings in wind turbines (e.g. blade bearings) and other similar applications. Protection against fretting corrosion, moisture corrosion and false brinelling is provided.
- Shell Rhodina Grease BBZ can also be used in bearings operating at very low temperatures (e.g. under arctic conditions).

Viva Energy
Red Rubber Grease

Viva Energy Red Rubber grease is a premium quality grease with outstanding performance in a wide range of applications to provide lubrication where contact with rubber compounds is likely or required.

Viva Energy Red Rubber Grease is recommended as a general purpose rubber compatible grease for automotive and industrial components consisting of natural or synthetic rubber.

Performance, Features & Benefits:

- Compatible with natural and synthetic rubber compounds
- Excellent lubricity properties
- Protects against rust and corrosion
- Environmentally friendly ingredients

Automatic Single Point Lubricators

The following greases are also available as automatic single point lubricators:

- Shell Gadus S3 V220C 2
- Shell Gadus S3 T220 2
- Shell Gadus S3 V460D 2
- Shell Gadus S5 V100 2

Please contact Viva Energy for type of unit and capacity details.

VIVA EnergyAustralia

Shell Lubricants Macro Distributor

Coolants, Cleaning & Ancillary Products

Applications

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Viva Energy HD Premium N PG Pre-Diluted 50/50

Premium antifreeze, anti-boil and anti-corrosion pre-diluted, propylene glycol coolant/ antifreeze product ready to use directly in cooling systems

Performance, Features & Benefits:

- Protection for diesel engines using a nitrited, conventional coolant
- Propylene Glycol based formulation reduces toxicity compared to mono-ethylene glycol based formulations
- Pre-diluted to an optimum 50:50 dilution with demineralised water for improved stability, freeze protection, and boil protection
- Amine and phosphate free
- Provides wet sleeve liner cavitation protection without an initial charge of SCA or coolant extender
- Provides appropriate corrosion protection to all coolant system metals including copper, solder, brass, steel, cast iron and aluminium
- Excellent shelf stability, 2 years
- Excellent life with proper monitoring

Main Applications:

- Viva Energy HD Premium N PG Pre-Diluted 50/50 is a propylene glycol based coolant compatible with many other coolants. It is a pre-diluted coolant requiring no field dilution. It features propylene glycol for lowered toxicity. It is capable of extended life (up to 6 years, 12,000 hours, or 1,000,000km whichever comes first) without the use of SCAs. The need for SCAs should be monitored periodically.
- Viva Energy HD Premium N PG Pre-Diluted 50/50 is phosphate and amine free. Viva Energy HD Premium N PG Pre-Diluted 50/50 is designed for heavy-duty diesel applications namely on-road truck, off-road mining, farm and marine applications.

Specifications, Approvals & Recommendations:

Viva Energy HD Premium N PG Pre-Diluted 50/50 can be used in the following applications, meeting the performance requirements of each along with others requiring a fully formulated coolant:

- ASTM D3306, D4985, D6211
- Caterpillar
- Cummins
- Detroit Diesel
- Daimler Chrysler
- Ford HD Trucks
- Freightliner
- GM Heavy Truck
- Kenworth
- Landrover
- Mack Trucks
- MTU
- TMC RP 330
- New Holland
- PACCAR
- Peterbilt
- Perkins
- Saab-Scania
- Mercedes-Benz
- MAN
- Volvo Heavy Truck
- White Star

Viva Energy HD Premium N Antifreeze/Coolant Pre-Diluted 50/50

Premium extended life, fully formulated, OAT-Hybrid, nitrited heavy duty ethylene glycol engine coolant pre-diluted and ready to use

Viva Energy HD Premium Coolant N Pre-Diluted 50/50 is a fully formulated extended life heavy duty ethylene glycol antifreeze coolant. The product is a hybrid coolant, containing the combination of organic additive technology inhibitors boosted with borate, nitrite, nitrate, molybdate and silicate inorganic corrosion inhibitors. It is a low silicate, phosphate-free, and amine-free coolant. It is suitable for heavy duty applications without supplemental coolant additives (SCAs) during the initial fill. Viva Energy HD Premium Coolant N Pre-Diluted 50/50 is Ready-to-Use. It requires no further dilution with water.

Performance, Features & Benefits:

- All-climate year round performance
- Extended life capability
- Field compatibility

Main Applications:

- Heavy duty gasoline or diesel engine antifreeze

Specifications, Approvals & Recommendations:

- ASTM D3306, D4985, D6210
- AS/NZS 2108.1:1997 "Type A"
- Caterpillar EC-1 (Sections 2.3-4.5 incl.)
- Cummins Bulletin 3666132
- Daimler Chrysler MS-9769
- Detroit Diesel 7SE298 / 93K217
- Freightliner 48-22880
- General Motors 1825M, 1899M, Heavy Truck
- JIS K 2234
- John Deere JDM H24
- Landrover
- Mack Truck 014GS17004
- MAN 324
- Mercedes-Benz DBL 7700
- MTU MTL 5048
- PACCAR CS0185
- Peterbilt 8502.002
- SAE J1034
- TMC RP 329
- Volvo

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Viva Energy HD Premium N Antifreeze/Coolant Concentrate

Premium extended life, fully formulated, OAT-hybrid, nitrited heavy duty ethylene glycol engine antifreeze concentrate

Viva Energy HD Premium N Antifreeze is a fully formulated extended life heavy duty ethylene glycol antifreeze. The product is a hybrid antifreeze, containing a combination of organic additive technology inhibitors boosted with borate, nitrite, nitrate, molybdate and silicate inorganic corrosion inhibitors. It is a low silicate, phosphate and amine free antifreeze. It is suitable for heavy duty applications without supplemental coolant additives (SCAs) during the initial fill. Viva Energy HD Premium N Antifreeze is a concentrate and should be diluted with water. For the best results, consideration should be given to use demineralised or de-ionized water if possible.

Performance, Features & Benefits:

- All-climate year round performance
- Extended life capability
- Field compatibility

Main Applications:

- Heavy duty gasoline or diesel engine antifreeze

Specifications, Approvals & Recommendations:

- ASTM D3306, D4985, D6210
- AS/NZS 2108.1:1997 "Type A"
- Caterpillar EC-1 (Sections 2.3-4.5 incl.)
- Cummins Bulletin 3666132
- Daimler Chrysler MS-9769
- Detroit Diesel 7SE298 / 93K217
- Freightliner 48-22880
- General Motors 1825M, 1899M, Heavy Truck
- JIS K 2234
- John Deere JDM H24
- Landrover
- Mack Truck 014GS17004
- MAN 324
- Mercedes-Benz DBL 7700
- MTU MTL 5048
- PACCAR CS0185
- Peterbilt 8502.002
- SAE J1034
- TMC RP 329
- Volvo

Viva Energy Glycol Free Coolant Concentrate

Water based engine coolant that utilises organic acid technology (OAT)

This product is free of ethylene glycol, silicates, phosphates, borates, nitrates, nitrites and amines. It is fully compatible with other similarly formulated OAT coolants. The OAT corrosion inhibitors have shown little depletion from original levels during extensive laboratory and fleet testing.

When diluted to 7% it provides excellent protection in petrol, diesel and gas engines, in, buses, tractors, trucks, industrial equipment and mining equipment. When diluted to 5% with softened or demineralised water this product provides excellent cooling system protection for passenger cars It can be used where an antifreeze anti-boil product is not specified.

Performance, Features & Benefits:

- Excellent engine protection. Suitable for use in passenger and heavy duty road vehicles and mining equipment for petrol, diesel and gas engines. A universal use coolant designed to meet industry standard requirements for both automotive and heavy duty diesel applications.
- Long service life. In heavy duty applications - provides a service life of up to 4 years or 1,000,000km or 12,000 hours, whichever comes first In passenger cars it provides 3 years, 100,000km service life.
- Hard water compatible

Specifications, Approvals & Recommendations:

Dilution Rates:

- For heavy duty applications: 7%
- For passenger cars (with softened or demineralised water): 5%

Compatibility & Miscibility:

- Compatible with other long life organic acid technology (OAT) based engine coolants; for best performance it is recommended to flush the old coolant and replace entirely with premixed coolant at the desired dilution rates according to the application. It is also compatible with aluminium.
- For best results, Viva Energy GF Coolant must NOT be mixed with conventional high pH, phosphate, borate, silicate containing coolants. While deleterious effects are not expected to be significant, the mixing of conventional coolants with Viva Energy GF Coolant will result in a lower than expected lifetime (change-over intervals).

Shell Lubricants
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Viva Energy Glycol Free Coolant Premix

Water based engine coolant that utilises organic acid technology (OAT) that is pre-diluted and ready to use for multiple applications

This product is free of ethylene glycol, silicates, phosphates, borates, nitrates, nitrites and amines. It is fully compatible with other similarly formulated OAT coolants. The OAT corrosion inhibitors have shown little depletion from original levels during extensive laboratory and fleet testing. This product provides excellent cooling system protection for petrol, diesel and gas engines, in passenger cars, buses, tractors, trucks, industrial equipment and mining equipment. It can be used where an antifreeze anti-boil product is not specified.

Performance, Features & Benefits:

- Excellent engine protection. Suitable for use in passenger and heavy duty road vehicles and mining equipment for petrol, diesel and gas engines. A universal use coolant designed to meet industry standard requirements for both automotive and heavy duty diesel applications.
- Long service life. In heavy duty applications - provides a service life of up to 4 years or 1,000,000km or 12,000 hours, whichever comes first In passenger cars it provides 3 years, 100,000km service life.
- Hard water compatible

Compatibility & Miscibility:

- Compatible with other long life organic acid technology (OAT) based engine coolants; for best performance it is recommended to flush the old coolant and replace entirely with premixed coolant at the desired dilution rates according to the application. It is also compatible with aluminium.
- For best results, Viva Energy GF Coolant must NOT be mixed with conventional high pH, phosphate, borate, silicate containing coolants. While deleterious effects are not expected to be significant, the mixing of conventional coolants with Viva Energy GF Coolant will result in a lower than expected lifetime (change-over intervals).

Viva Energy Low Glycol 10/90 Coolant

Viva Energy Low Glycol 10/90 Coolant is a ready to use coolant based on Carboxylic Acid Technology. This product is free of silicates, phosphates, borates, nitrates, nitrites and amines.

Performance, Features & Benefits:

- Based on Carboxylic Acid Technology
- Compatible with other long-life organic acid technology (OAT) based engine coolants free of silicate. For best performance it is recommended to flush the old coolant and replace entirely with Viva Energy Low Glycol 10/90 Coolant.
- The main corrosion inhibitors in this product have shown little or no depletion from original levels during extensive laboratory and fleet testing.
- Provides protection for 5 years or 1,000,000kms, whichever comes first in automotive applications.
- Extended shelf life stability (2 years). No possibility of silicate drop-out or gel formation.
- Phosphate free

Main Applications

Viva Energy Low Glycol 10/90 Coolant is suitable for passenger cars, 4WDs and light duty vehicles made in Australia, Japan, Europe, Korea and North America.

Specifications, Approvals & Recommendations:

Viva Energy Low Glycol 10/90 is suitable where the performance requirements of the following engine coolant specifications are required:

- ASTM D-3306 / D-4985
- AS 2108-2004 for Type B Coolants
- JIS 2234
- SAE J1034 / J1941
- GM - DEXCOOL™* GM 6277M (Sections 4.1 - 4.13)
- Ford WSS-M97B44-D (Sections 3.1 - 3.4)
- Renault Type D
- VW TL 774 D
- Nissan NES 5059 LLC
- Peugeot B71 5110

For further information regarding equipment approvals and recommendations contact the Viva Energy Technical Help Desk.

*Trademark of General Motors Corp.

Shell Lubricants
Macro Distributor

Viva Energy Tyre Rim Protection Fluid

Viva Energy Tyre Rim Protection Fluid is specifically formulated to extend the life of the tyre and rim use and improves the contact of the tyre to the rim. The fluid is a distinctive green colour and designed for use in heavy duty earthmoving and construction equipment.

Performance, Features & Benefits:

- Mixed metal corrosion inhibitors for tyre rim protection.
- Assists in the transfer of heat from the tyres and rims, which improves the safety of operations.
- Contains Propylene Glycol which is non-toxic, and also allows the fluid to remain in the liquid state during the colder winter months.
- The formulation is chemically stable for long product life.
- Non-toxic and non-flammable. Contains no amines or phosphates.

Viva Energy Degreasing Fluid

Premium degreaser

Viva Energy Degreasing Fluid is a premium performance degreasing fluid which is designed to meet the stringent requirements of an oil and grease solvent and still maintain premium safety standards. Viva Energy Degreasing Fluid incorporates a unique solvent base to penetrate oil and grease bound dirt. Viva Energy Degreasing Fluid also contains an emulsifier which permits easy removal with water.

Performance, Features & Benefits:

- Safety:

  Viva Energy Degreasing Fluid has been reformulated with a unique low volatility, low flammability solvent (Flash Point 80°C). Viva Energy Degreasing Fluid is a significantly safer product than conventional turpentine-based degreasers which have a lower flash point. Viva Energy Degreasing Fluid is much less likely to ignite when it is applied to hot surfaces. Because of its low volatility, the hazard of inhaling organic vapours is reduced.
- Premium performance in removal of oil and grease bound dirt.
- Premium performance in safety, through use of a high flash point and low volatility solvent.
- Product losses through evaporation are significantly reduced. This improves cost effectiveness and also reduces vapour inhalation.
- Easy removal with water
- Pleasant pine odour ensures operator acceptance

Main Applications:

- Viva Energy Degreasing Fluid may be applied by spraying, brushing or swabbing, followed by removal with water. Very dirty pieces should be soaked in Viva Energy Degreasing Fluid for 15 minutes to 1 hour (or longer if necessary) followed by removal with water.

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Viva Energy Degreasing Fluid QB

Premium multi-purpose quick break degreasing fluid

Viva Energy Degreasing Fluid QB is a powerful degreasing product specifically designed to remove heavy oils, grease and oily solids from a variety of hard surfaces used in a variety of industries. The fluid is formulated with specific surfactants allowing a very quick breaking time making it effective in soil removal where separation of the oil and water phases is important, such as through interceptor pits.

Performance, Features & Benefits:

- Excellent degreasing performance:

  The high degreasing efficiency of Viva Energy Degreasing Fluid QB arises from the carefully selected blend of solvent and surfactants. These act to penetrate and suspend oil, grease and associated dirt, which can be easily removed.
- High Cutting Power:

  For effective removal of heavy oils, grease and soils with suspended and dissolved materials easily washed away with water.
- Quick emulsion break:

  Reduces problems associated with discharge into interceptor pits and settling tank systems.
- Low Odour Formulation:

  Ensures operators acceptance

Main Applications:

Viva Energy Degreasing Fluid QB is particularly suitable for the following applications:

- Degreasing and pre-maintenance cleaning of both stationary and mobile equipment
- Equipment cleaning for inspections
- Machinery and engine degreasing
- Concrete floor and work area degreasing

Viva Energy Degreasing Fluid QB may be applied by spraying, brushing or swapping, allowing time to penetrate, followed by removal with water. Very dirty pieces should be soaked for 15 minutes to 1 hour (or longer if necessary) followed by removal with water.

Degreasing in an open vat or bath, soak and brush and then rinse with water.

For heavily soiled areas it should be applied neat with brushing to aid penetration.

Viva Energy Dobatex Platinum

A readily biodegradable, water based quick-break detergent for heavy duty mining and industrial applications. Viva Energy Dobatex Platinum is a premium performance phosphorus-free* detergent suitable for a wide range of heavy-duty applications.

Performance, Features & Benefits:

- Excellent cleaning performance:

  Viva Energy Dobatex Platinum is highly effective on a wide range of dirt, oils and grease in both hard and soft water.

- Quick break:

  Viva Energy Dobatex Platinum emulsifies grease and oil with water, then can rapidly form separate oil and water phases, which allows for quick and efficient operation of grease traps and interceptors.

- Balanced stability and quick-break performance:

  Viva Energy Dobatex Platinum is uniquely formulated to provide the delicate balance in foaming stability which allows it to be used on all surfaces, even vertical surfaces, yet retain superior ability to separate quickly in interceptor pits into discrete oil and water layers.

- Multi-purpose convenience:

  Providing top-tier performance with a phosphorus free formulation, Viva Energy Dobatex Platinum can be used to reduce the number of detergents used on site without compromise.

- Reduced safety concerns:

  Being water based, readily biodegradable, non flammable and very low odour, Dobatex Platinum is ideal for use in workshops or in underground maintenance stations.

- Environmental benefits:

  Phosphorus free*, Viva Energy Dobatex Platinum can be used without contributing to algal blooms caused by excess detergent phosphates. Viva Energy Dobatex Platinum is water based and classified as readily biodegradable, and contains no hydrocarbon solvents or caustic alkalis.

Main Applications:

- Viva Energy Dobatex Platinum is a premium performance detergent suitable for a wide range of cleaning requirements, including heavy-duty and light-duty mining equipment, heavy truck fleets and machinery and engine degreasing.
- Viva Energy Dobatex Platinum is a quick break product enabling efficient and effective operation of grease traps and separators, delivery superior environmental outcomes.

Specifications, Approvals & Recommendations:

- Meets the requirements for readily biodegradability of a single organic substance or natural product when tested according to AS 4351.2 Biodegradability – Organic compounds in an aqueous medium: Determination by analysis of dissolved organic carbon (DOC).

Compatibility & Miscibility:

Viva Energy Dobatex Platinum can be used with all commercial high pressure cleaners and foaming systems.

*Formulation contains no phosphorus containing compounds.

Shell Lubricants
Macro Distributor

Viva Energy Dobatex Gold

Water based multi-purpose cleaning solution for truck, car and marine applications and heavy duty mining equipment

Viva Energy Dobatex Gold is a water based, multi-purpose cleaning detergent suitable for a wide range of industrial and automotive applications including the heavier duty demands of mining equipment and fishing and trucking fleets through to routine janitorial cleaning.

Performance, Features & Benefits:

- Viva Energy Dobatex Gold effectively removes dirt, grease and grime from all hard surfaces, even vertical surfaces, where its stable foaming action allows greater penetration and more thorough cleaning
- Viva Energy Dobtaex Gold will not promote rust or deteriorate paintwork, polished surfaces, metal or glass. It has strong colouring for ease of identification even at low dilution levels. Viva Energy Dobatex Gold is formulated to provide good results even where water quality is poor.
- Excellent cleaning performance:

  Highly effective on a wide range of dirts, oils and grease in both soft or hard water.
- Multipurpose convenience:

  Dobatex Gold is a versatile cleaner which can be used to reduce the number of detergents required on site.
- Reduced safety concerns:

  Being water based, readily biodegradable, non flammable and very low odour, Dobatex Gold is ideal for use in workshops in underground maintenance stations.
- Readily biodegradable:

  Classified as readily biodegradable according to AS 4351 Biodegradability – Organic compounds in an aqueous medium, and contains no hydrocarbon solvents or caustic alkalis.

Compatibility & Miscibility:

Viva Energy Dobatex Gold can be used with all commercial high pressure cleaners and foaming systems.

Main Applications:

Viva Energy Dobatex Gold is highly adaptable to a wide range of cleaning requirements. One flexible product enables you to cut down on inventory, and with varying dilutions and application methods Viva Energy Dobatex Gold in effective and recommended for:

- Truck fleets, car and small commercial vehicles
- Fishing fleets and marine leisure craft
- Heavy-duty and light-duty mining equipment
- Machinery and engine degreasing
- Routine and janitorial cleaning purposes such as:
  - Flooring
  - Commercial and home kitchens, and bathrooms
  - Food processing equipment
  - Abattoirs, fishing cooperatives, commercial food preparation areas
  - General purpose office and office furniture cleaning solution

Viva Energy Dobatex Gold is truly a multi-purpose detergent and cleaning fluid for many applications.

Specifications, Approvals & Recommendations:

- Meets the requirements for ready biodegradability of a single organic substance or natural product when tested according to AS 4351.2 Biodegradability – Organic compounds in an aqueous medium: Determination by analysis of dissolved organic carbon (DOC).

Viva Energy Dobatex Aqua Degreaser

A readily biodegradable water based degreasing agent for mining, automotive and industrial applications

A readily biodegradable water based degreasing agent for mining, automotive and industrial applications. Viva Energy Dobatex Aqua Degreaser is a water based degreaser formulated specifically for the removal of oil and grease in demanding applications in the general engineering, automotive, mining and construction industries.

Performance, Features & Benefits:

- Viva Energy Dobatex Aqua Degreaser is a water based, quick break formulation designed to perform exceptionally well for organic residue removal in water based degreasing applications in parts and equipment washing.
- Unlike most conventional degreasers, where a thin layer of hydrocarbon fluid may remain after cleaning, Viva Energy Dobatex Aqua Degreaser leaves a completely non-greasy surface.
- Being water based, Viva Energy Dobatex Aqua Degreaser is a particularly effective degreaser for indoor use. Viva Energy Dobatex Aqua Degreaser has no flash point, increasing safety over many hydrocarbon degreasers.
- Viva Energy Dobatex Aqua Degreaser is a particularly simple and effective readily biodegradable cleaner for nasty oil stains on driveway and workshop floors.
- Excellent cleaning performance: Highly effective on a wide range of oils, grease and grime.
- Reduced safety concerns: Being water based, readily biodegradable, non flammable and with a pleasant citrus fragrance, Viva Energy Dobatex Aqua Degreaser is ideal for use in workshops or in underground mining applications.
- Quick break: A special feature of Viva Energy Dobatex Aqua Degreaser is its ability to emulsify grease and oil with water, then rapidly form separate oil and water phases. This property allows for speedy and efficient operation of grease traps and interceptors.
- Neutral pH: Near-neutral pH increases operator compatibility and reduces risk of damage to metals, paints, seals and most under bonnet material.
- Readily biodegradable: Classified as readily biodegradable according to AS 4351 Biodegradability – Organic compounds in an aqueous medium, and contains no hydrocarbon solvents or caustic alkalis.

Main Applications:

Viva Energy Dobatex Aqua Degreaser has been designed for the effective removal of grease and oil/dirt residues from:

- Engineering parts and equipment
- Automotive workshops and parts cleaning
- Mining equipment
- Mechanical parts
- Factory and driveway floors where frequent oil stains may occur.

Viva Energy Dobatex Aqua Degreaser provides superior and cost-effective results.

Specifications, Approvals & Recommendations:

- Meets the requirements for ready biodegradability of a single organic substance or natural product when tested according to AS 4351.2 Biodegradability – Organic compounds in an aqueous medium: Determination by analysis of dissolved organic carbon (DOC).

Compatibility & Miscibility:

Dobatex Aqua Degreaser is suitable for use with commercial pressure cleaners, foamers or can be used with a simple 'garden type' spray applicator.

Shell Lubricants
Macro Distributor

Viva Energy Brake & Clutch Fluid DOT 3

Viva Energy Brake & Clutch Fluid DOT 3 is a high boiling point fluid suitable for brake systems and hydraulic clutch systems requiring FMVSS No 166 DOT 3 (ISO 4925 Class 3) fluid.

Performance, Features & Benefits:

- High boiling point:

  Viva Energy Brake & Clutch Fluid DOT 3 exceeds the normal requirements for Wet and Dry Equilibrium Reflux Boiling points (Wet ERBP and Dry ERBP). This helps prevent vapour lock under harsh braking conditions by dramatically reducing the likelihood of the brake fluid boiling.

- Corrosion protection:

  Viva Energy Brake Fluids are formulated to prevent corrosion of internal components under normal conditions of use and service.

- Compatibility:

  This product is fully compatible with other similarly formulated DOT 3 brake fluids.

- Optimal lubricity:

  Viva Energy Brake & Clutch Fluid DOT 3 consists of premium components which avoid abrasion of the brake system by friction.

- Seal compatibility:

  Elastomer seals are frequently used in braking systems to avoid fluid losses through gasket seals in the braking systems. Viva Energy Brake & Clutch Fluid DOT 3 contains ingredients which sufficiently boost seal swell, and therefore prevent fluid losses by effective prevention.

Main Applications:

Viva Energy Brake & Clutch Fluid DOT 3 is a premium performance polyglycol ether type brake fluid which is suitable for all applications requiring a DOT 3 performance level brake fluid.

It is suitable for the following applications:

- Passenger cars
- Commercial road transport vehicles
- Motorcycles
- Hydraulic brake systems
- Hydraulic clutch systems

where FMVSS No 116 DOT 3 fluids are mandatory.

Specifications, Approvals & Recommendations:

Viva Energy Brake & Clutch Fluid DOT 3 is suitable for use in applications where the following specifications are required:

- FMVSS No 116 DOT 3
- DIN ISO 4925 Class 3
- JIS K 2233 Class 3
- AS/NZ 1960 Class 1
- SAE J 1703

Note: When stored undercover, away from moisture and direct sunlight, this product should be suitable for use for up to one year after the date of manufacture.

Viva Energy Brake & Clutch Fluid DOT 4

Viva Energy Brake & Clutch Fluid DOT 4 is a very high boiling point fluid suitable for brake systems and hydraulic clutch systems requiring FMVSS No 166 DOT 4 (ISO 4925 Class 4) fluid.

Performance, Features & Benefits:

- High Boiling Point:

  Viva Energy Brake & Clutch Fluid DOT 4 exceeds the normal requirements for Wet and Dry Equilibrium Reflux Boiling points (Wet ERBP and Dry ERBP). This helps prevent vapour lock under harsh braking conditions by dramatically reducing the likelihood of the brake fluid boiling.

- Corrosion protection:

  Viva Energy Brake Fluids are formulated to prevent corrosion of internal components under normal conditions of use and service.

- Compatibility:

  This product is fully compatible with other similarly formulated DOT 3 and DOT 4 brake fluids.

- Optimal lubricity:

  Viva Energy Brake & Clutch Fluid DOT 4 consists of premium components which avoid abrasion of the brake system by friction.

- Seal compatibility:

  Elastomer seals are frequently used in braking systems to avoid fluid losses through gasket seals in the braking systems. Viva Energy Brake & Clutch Fluid DOT 4 contains ingredients which sufficiently boost seal swell, and therefore prevent fluid losses by effective prevention.

Main Applications:

Viva Energy Brake & Clutch Fluid DOT 4 is a premium performance polyglycol ether type brake fluid which is suitable for all applications requiring a DOT 4 performance level brake fluid. This product may also be used when a DOT 3 fluid is required.

It is suitable for the following applications:

- Passenger cars
- Commercial road transport vehicles
- Motorcycles
- Hydraulic brake systems
- Hydraulic clutch systems

where FMVSS No 116 DOT 3 and DOT 4 fluids are mandatory.

Specifications, Approvals & Recommendations:

Viva Energy Brake & Clutch Fluid DOT 4 is suitable for use in applications where the following specifications are required:

- FMVSS No 116 DOT 3, DOT 4
- DIN ISO 4925 Class 4
- JIS K 2233 Class 4
- AS/NZ 1960 Class 2
- SAE J 1703, 1704

Note: When stored undercover, away from moisture and direct sunlight, this product should be suitable for use for up to one year after the date of manufacture.

Shell Lubricants
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Shell Power Steering Fluid

Advanced automatic power steering fluid

Shell Power Steering Fluid is a premium quality fluid designed to provide high performance in power steering systems.

Performance, Features & Benefits:

- Helps protect power steering unit components against wear
- Helps prevent rust and corrosion
- Protects against seal and hose deterioration

Main Applications:

- Shell Power Steering Fluid is a premium quality fluid designed to provide high performance in power steering systems. It has been formulated to reduce power steering pump squeal even under severe conditions.
- Shell Power Steering Fluid offers high performance for virtually all power steering systems (see Applications) including those specifying the use of automatic transmission fluids.
- Shell Power Steering Fluid helps prolong the life of power steering units. ATF is often used as Power Steering Fluid. Recommended for complete fluid replacement or top-off in most passenger cars and light duty trucks.

Specifications, Approvals & Recommendations:

Meets the service requirements for:

- DaimlerChrysler MS5931
- Ford ESW-M2C128-C and D
- GM 9985010
- Volkswagen TL-VW-570-26
- Navistar TMS6810
- Also suitable for use in Mazda, Mercedes-Benz, Subaru and Volvo

Note: Do not use in power steering systems, which require Honda Part No. 08208-99961.

The owner's service manual specifications should be followed for all applications.

Shell AdBlue®

Shell AdBlue® is a fluid used in heavy-duty diesel engines that utilise a technology called Selective Catalytic Reduction (SCR) to help reduce the engine's exhaust emissions of oxides of nitrogen.

Performance, Features & Benefits:

- AdBlue® is stored in a separate tank on the truck and is sprayed in metered doses into the exhaust system of the vehicle. AdBlue® reacts with the exhaust gases from the engine and helps convert oxides of nitrogen emissions into harmless gas and water vapour.
- The shelf-life of AdBlue® should last up to 12 months as long as it is stored in the correct manner (please refer to the Product Safety Data Sheet and the labelling on the pack AdBlue® container). AdBlue® should not be kept in direct sunlight, and should not be stored in temperatures over 30°C or under -11°C (when it will freeze).
- AdBlue® supplied by Shell is produced following a stringent manufacturing and quality control process, so you can be sure AdBlue® supplied by Shell is of the highest quality. If AdBlue® is not manufactured, stored or dispensed properly it may become contaminated which may lead to damage to expensive SCR system components including exhaust catalyst.

Main Applications:

- The SCR technology with AdBlue® is one technology adopted by truck manufacturers to help meet the latest European legislation on diesel engine emissions. If the vehicle is equipped with SCR technology, it will require the use of AdBlue® to be operational.
- SCR vehicles are fitted with separate, dedicated AdBlue® tanks which can be filled at the pump with AdBlue® at select Coles Express service stations.
- Generally, trucks need to be refilled with AdBlue® every second fill of diesel fuel, but this may vary depending on the type of vehicle and driving conditions. Typically AdBlue® is metered at 5% of diesel use, or around five litres per 100 litres of diesel.
- Packaged AdBlue® supplied by Shell is also available at over 110 select Coles Express service stations.
- Modern engines are required to meet minimum emission levels. If there is no AdBlue® present, sensors in the exhaust can detect higher than allowable emissions, and through the engine control system the sensors will down rate the engine power output, meaning the engine will operate at a reduced capacity. AdBlue® level indicators in the cabin provide advance notice to drivers to refill their AdBlue® tanks.

Specifications, Approvals & Recommendations:

- AdBlue® supplied by Shell meets the international ISO22241 standard for AdBlue®.

Note: AdBlue® is clear, non-toxic, non-explosive, non-flammable and if stored and handled in the correct manner, is safe to handle and should not cause harm to the environment.

VIVA EnergyAustralia

Shell Lubricants Macro Distributor

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Appendix I Passenger Car Engine Oils

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m³	40°C	100°C		°C	°C
Helix HX3 20W-50	891	156.3	17.87	126	256	-33
Helix HX5 15W-40	866	106	14.27	137	241	-45
Helix HX7 10W-40	860	96.31	14.37	154	246	-45
Helix HX7 ECT 5W-30	836	69.02	12.11	174	238	-45
Helix HX7 High Mileage 15W-50	859	136.3	18.12	149	260	-39
Helix HX7 SN 10W-30	855	65.28	10.49	149	230	-45
Helix HX8 ECT 5W-40	850	84.7	14	171	236	-36
Helix HX8 Synthetic 5W-30	841	71.69	11.93	163	244	-48
Helix HX8 Prof AG 5W-30	836	66.60	11.60	171	237	-48
Helix Ultra ECT C2/C3 0W-30	838	58.7	11.9	204	226	-51
Helix Ultra ECT C3 5W-30	836	69.02	12.11	174	238	-45
Helix Ultra Prof AF 5W-30	851	52.51	9.62	170	222	-39
Helix Ultra Prof AF-L 5W-30	850	53.38	9.84	173	234	-39
Helix Ultra Prof AR-L 5W-30	847	67.1	12.0	178	230	-39
Helix Ultra Racing 10W-60	846	160.1	23.1	174	250	-42
Helix Ultra 5W-40	840	79.1	13.1	168	242	-45
Helix Ultra Prof AG 5W-30	836	69.02	12.11	174	238	-45
Helix Ultra Prof AP-L 0W-30	844	54.54	9.84	169	236	-45
Helix Ultra Prof AP-L 5W-30	844	59.59	10.2	162	233	-48
Helix Ultra Prof AV-L 0W-30	838	58.7	11.9	204	226	-51
Helix Ultra SN 0W-20	839	46.3	8.8	172	224	-48
Helix Ultra SN 5W-20	840	48.04	8.77	164	224	-48

Appendix II Heavy Duty Engine Oils

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point	TBN	Sulphated Ash
	kg/m³	40°C	100°C		°C	°C	mgKOH/g	%
Rimula R3+ 30	890	93	11	103	242	-18	-	-
Rimula R3+ 40	895	126	13.5	102	250	-15	-	-
Rimula R3 MV 15W-40	886	111	14.63	136	230	-39	-	-
Rimula R4 L 15W-40	876	115	15.3	139	236	-35	10	1.0
Rimula R4 MV 15W-40	876	115	15.3	139	236	-35	10	-
Rimula R4 X 15W-40	881	109	14.7	139	230	-36	10.5	1.45
Rimula R5 LE 10W-40	862	102	14.8	152	237	-42	10.0	1
Rimula R6 LM 10W-40	850	96.8	14.5	155	244	-36	12.9	0.95
Rimula R6 MS 10W-40	867	90.0	13.6	153	240	-42	15.9	1.9
Rimula Ultra 5W-30	851	73.6	12.2	164	234	-42	12.9	0.95
Rotella DD+ 40	899	138	14.4	103	250	-15	-	<0.8

Appendix III Motorcycle Engine Oils

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Advance 4T AX5 15W-50	870	132.2	19.1	150	235	-30
Advance 4T AX7 10W40	858	89	14.3	167	230	-33
Advance 4T AX7 15W-50	870	149	19.2	146	235	-30
Advance 4T Ultra 10W-40	858	90.2	14.2	163	230	-33
Advance 4T Ultra 15W-50	867	149	20.5	160	235	-30
Advance SX 2	872	63.1	8.9	116	122	-20
Advance VSX 2	863	-	7.0	-	70	-20

Appendix IV Automotive Gear & Transmission Oils

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Spirax S2 A 80W-90	904	146	14.7	100	175	-27
Spirax S2 A 85W-140	908	358	25.6	94	215	-15
Spirax S2 ALS 90	909	155	15	96	210	-18
Spirax S3 ALS 80W-90	-	-	14.7	100	-	-27
Spirax S3 ATF MD3	864	33.8	7.3	175	180	-48
Spirax S3 AX 80W-90	900	169	16.8	105	220	-30
Spirax S3 AX 85W140	910	435	29.6	96	225	-15
Spirax S3 T	890	110	14.5	135	226	-27
Spirax S4 AT 75W-90	875	92.6	15.4	177	170	-42
Spirax S4 ATF HDX	852	37	7.6	180	180	-51
Spirax S4 CX 10W	884	36	6	111	200	-36
Spirax S4 CX 30	899	93.9	10.9	100	205	-30
Spirax S4 CX 50	910	217.4	19	98	205	-18
Spirax S4 CX 60	912	295.7	23.4	99	215	-6
Spirax S4 TXM	882	60	9.4	138	220	-42
Spirax S5 ATE 75W-90	879	81	14.9	194	205	-45
Spirax S5 ATF X	850	35	7.2	176	190	-
Spirax S5 CFD M 60	904	-	24	-	260	-15
Spirax S6 ATF X	850	-	6.2	-	190	-54
Spirax S6 ATF A295	840	36	7.3	181	213	-51
Spirax S6 ATF ZM	843	61.8	10.2	153	240	-51
Spirax S6 AXME 75W-90	878	115	15.2	138	210	-42
Spirax S6 AXME 80W-140	912	271	30.5	146	201	<-40
Spirax S6 GME 40	850	95.1	14.8	163	238	-42
Spirax S6 GXME 75W-80	850	53.7	9.55	163	250	-51
Tegula V32	870	32	5.6	110	211	-30

Appendix V Industrial Oils

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Air Tool Oil S2 A 100	884	100	11.5	102	241	-24
Air Tool Oil S2 A 320	895	320	25	100	248	-18
Corena S2 P 68	883	68	7.8	-	235	-33
Corena S2 P 100	899	100	9.2	-	240	-33
Corena S2 P 150	902	155	12.1	-	240	-30
Corena S3 R 46	868	46	6.9	105	230	-30
Corena S3 R 68	873	68	8.9	104	248	-30
Corena S4 P 68	990	68	8.5	-	250	-51
Corena S4 P 100	988	100	10.2	-	260	-39
Corena S4 R 46	843	46	7.7	135	230	-45
Corena S4 R 68	848	68	10.2	135	248	-45
Diala S4 ZX-I	805	9.9	-	-	191	-42
Gas Compressor Oil S1 P 150	893	139	-	102	273	-9
Gas Compressor Oil S3 PSN 220	888	211	17.9	92	268	-24
Heat Transfer Oil S2	857	29	5.1	103	220	-12
Mine Gear 1500	0.944	1533	76	110	230	-6
Morlina S2 B 150	887	150	15	95	262	-15
Morlina S2 B 220	891	220	18.3	92	280	-15
Morlina S2 B 320	897	320	25	96	282	-12
Morlina S2 BL 10	881	10	2.3	-	150	-30
Morlina S4 B 150	854	150	21	158	275	-42
Morlina S4 B 220	854	220	28	164	275	-45
Naturelle HF-E 46	921	47.2	9.41	188	320	-42
Omala F 320	903	320	25	100	202	-18
Omala S2 G 68	887	68	8.7	100	236	-24
Omala S2 G 100	891	100	11.4	100	240	-24
Omala S2 G 150	897	150	15	100	240	-24
Omala S2 G 220	899	220	19.4	100	240	-18
Omala S2 G 320	903	320	25	100	250	-15
Omala S2 G 460	904	460	30.8	97	260	-12
Omala S2 G 680	912	680	38	92	270	-9

Appendix V Industrial Oils cont.

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Omala S2 G 1000	931	1000	45.4	85	270	-6
Omala S3 GP 1500	902	1500	82.6	124	224	-21
Omala S4 GX 150	877	157.7	21.7	163	238	-45
Omala S4 GX 220	881	230	30	160	250	-45
Omala S4 GX 320	883	335	40	159	252	-42
Omala S4 GX 460	879	462.5	50	170	264	-36
Omala S4 GX 680	881	670.4	64.9	169	256	-33
Omala S4 WE 150	1076	136	22.5	188	268	-42
Omala S4 WE 220	1074	222	34.4	203	278	-39
Omala S4 WE 320	1069	321	52.7	230	270	-39
Omala S4 Wheel 680	861	680	61	157	274	-43
Ondina 15	850	15	3.3	80	180	-12
Ondina 32	865	32	5.1	80	210	-12
Ondina 68	864	68	9.7	124	240	-9
Paper Machine Oil S3 M 150	890	150	14.8	98	240	-21
Paper Machine Oil S3 M 220	897	220	19.2	98	250	-21
Refrigeration Oil S2 FR-A 68	862	68	9	107	232	-39
Refrigeration Oil S4 FR-F 68	991	66	8.8	106	>230	-42
Refrigeration Oil S4 FR-V 68	871	68	6.2	-	190	-39
Tellus S2 MX 22	852	22	4.4	105	215	-30
Tellus S2 MX 32	854	32	5.4	105	220	-30
Tellus S2 MX 46	856	46	6.9	105	230	-30
Tellus S2 MX 68	860	68	8.9	105	230	-24
Tellus S2 MX 100	870	100	11.7	105	240	-24
Tellus S2 VX 15	820	15	3.7	143	200	-42
Tellus S2 VX 22	835	22	4.8	143	210	-42
Tellus S2 VX 32	854	32	6.1	143	215	-39
Tellus S2 VX 46	856	46	7.9	143	220	-36
Tellus S2 VX 68	860	68	10.5	143	230	-30
Tellus S2 VX 100	870	100	14.0	143	230	-24

Appendix V Industrial Oils cont.

Typical Physical Characteristics Table

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Tellus S3 M 32	855	32	5.5	105	215	-33
Tellus S3 M 46	865	46	6.8	105	220	-33
Tellus S3 M 68	870	68	8.9	105	235	-33
Tellus S3 M 100	875	100	11.4	100	250	-33
Tellus S4 ME 46	832	46	7.7	135	250	-51
Tellus S4 ME 68	835	68	10.2	135	250	-51
Tonna S3 M 68	879	68	8.6	98	225	-24
Tonna S3 M 220	894	220	19.1	98	250	-15
Turbo S4 GX 32	827	32.0	6.06	139	232	-42
Turbo S4 GX 46	829	43.5	7.5	139	245	-27
Turbo S4 X 32	827	32.0	6.1	135	230	-42
Turbo T 32	840	32.0	5.45	105	>215	<-33
Turbo T 46	858	46.0	6.9	105	>215	<-27
Turbo T 68	871	68.0	8.95	105	>240	<-24
Turbo T 100	873	100	11.7	105	>250	<-24

Appendix VI Greases

Typical Physical Characteristics Table

Product Name	Thickener Type	Base Oil Type	Worked Penetration	NLGI	Viscosity cSt		Dropping Point	Colour	Rec. Operating Temperature Range
			0.1mm @ 25°C		40°C	100°C	°C		°C
Alvania EPD	Lithium/Calcium	Mineral	305	1.5	173	16	183	Brown	-10 to + 120
Gadus S2 A320 2	Calcium	Mineral	265-295	2	320	16.5	85	Brown	-10 to + 60
Gadus S2 OG 70	Clay	Semi-synthetic	-	-	1100	70	-	Black	-
Gadus S2 OG 80	Clay	Semi-synthetic	-	-	1600	80	-	Black	-
Gadus S2 OG 85	Clay	Semi-synthetic	-	-	1750	85	-	Black	-
Gadus S2 V100 2	Lithium	Mineral	265-295	2	100	11	180	Brown	-
Gadus S2 V100 3	Lithium	Mineral	220-250	3	100	11	180	Brown	-
Gadus S2 V220 0	Lithium	Mineral	355-385	0	220	19	-	Brown	-20 to + 120
Gadus S2 V220 00	Lithium	Mineral	400-430	00	220	19	-	Brown	-
Gadus S2 V220 1	Lithium	Mineral	310-340	1	220	19	180	Brown	-
Gadus S2 V220 2	Lithium	Mineral	265-295	2	220	19	180	Brown	-20 to + 130
Gadus S2 V220AC 2	Lithium/Calcium	Mineral	265-295	2	220	18	175	Red	-20 to + 130
Gadus S2 V220AD 1	Lithium/Calcium	Mineral	310-340	1	220	18	170	Black	-25 to + 120
Gadus S2 V220AD 2	Lithium/Calcium	Mineral	265-295	2	220	18	175	Black	-25 to + 120
Gadus S2 V1000AD 2	Lithium/Calcium	Semi-synthetic	265-295	2	1000	60	184	Black	0 to + 130
Gadus S3 High Speed Coupling Grease	Lithium Complex	Mineral	310-340	1	700	34	>150	Brown	-
Gadus S3 OG 2	Aluminium Complex	Mineral	275-295	2	3200	110	240	Black	0 to + 60
Gadus S3 Repair	Aluminium Complex	Semi-synthetic	400-430	00	520	32	240	Black	-30 to + 200

Appendix VI Greases cont.

Typical Physical Characteristics Table

Product Name	Thickener Type	Base Oil Type	Worked Penetration	NLGI	Viscosity cSt		Dropping Point	Colour	Rec. Operating Temperature Range
			0.1mm @ 25°C		40°C	100°C	°C		°C
Gadus S3 T100 2	Diurea	Mineral	265-295	2	100	11	250	Brown	-30 to + 160
Gadus S3 T220 2	Diurea	Mineral	280	2	220	19	260	Brown	-30 to + 150
Gadus S3 V220C 1	Lithium Complex	Mineral	310-340	1	220	19	240	Red	-20 to + 140
Gadus S3 V220C 2	Lithium Complex	Mineral	265-295	2	220	19	240	Red	-20 to + 140
Gadus S3 V460 2	Lithium Complex	Mineral	265-295	2	460	31	250	Brown	-20 to + 140
Gadus S3 V460D 2	Lithium Complex	Mineral	265-295	2	460	31	>240	Black	-20 to + 140
Gadus S3 V460XD 2	Lithium Complex	Mineral	265-295	2	460	31	250	Black	-20 to + 140
Gadus S3 Wirerope	Lithium	-	460	000	130	10	170	Black	-
Gadus S4 OG Clear Oil 20000	-	Semi-synthetic	-	-	20000	420	-	Clear	-
Gadus S4 V2600AD 1.5	Lithium/Calcium	Semi-synthetic	305	1.5	2600	120	180	Black	0 to + 130
Gadus S4 V460D 2	Lithium Complex	Semi-synthetic	265-295	2	460	32	250	Black	-
Gadus S5 T460 1.5	Diurea	Synthetic	295	1.5	460	-	250	Brown	-
Gadus S5 V100 2	Lithium Complex	Synthetic	265 - 295	2	100	14	260	Brown	-
Gadus S5 V220 2	Lithium Complex	Synthetic	265-295	2	220	26	260	Brown	-
GadusRail S2 Traction Motor Bearing Grease	Lithium	-	230	3	93	10.2	193	Amber	-
GadusRail S2 Wheel Flange Grease 2	Lithium	-	265-295	2	220	15	177	Grey	-
Rhodina BBZ	Calcium	Semi-synthetic	300	1.5	13	3	145	Brown	-55 to + 100

Appendix VII Coolants, Cleaning & Ancillary

Typical Physical Characteristics Table: Coolants

Product Name	Density	Coolant Type	Colour	pH	Reserve Alkalinity	Freeze Point
	kg/m3				ml 0.1N HCL	°C
Glycol Free OAT Coolant Concentrate	1.015	OAT	Red	8.3	-	-
Glycol Free OAT Coolant Premix	1.015	OAT	Red	8.3	-	-
HD Premium N Antifreeze Coolant 50-50	1.075	Hybrid	Yellow	8.1	3.0 Min	-37
HD Premium N Antifreeze Coolant Concentrate	1.11	Hybrid	Yellow	8.1	6.0 Min	-37
HD Premium N PG 50-50	1.053	-	Blue	8.3	3.0 Min	-31
Low Glycol 10-90 Coolant	1.02	OAT	Green	8.5	-	-5

Typical Physical Characteristics Table: Detergents & Degreasers

Product Name	Density	pH	Colour	Flash Point
	kg/m3			°C
Dobatex Aqua Degreaser	1000	6.5	Pink-Red	-
Dobatex Gold	1100	10	Gold	-
Dobatex Platinum	1020	8	Green	-
Degreasing Fluid	810	-	-	>62
Degreasing Fluid QB	790	-	-	>62

Typical Physical Characteristics Table: Ancillaries

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point
	kg/m3	40°C	100°C		°C	°C
Power Steering Fluid	870	39.5	7.9	177	178	-42

Appendix VIII Aviation

Typical Physical Characteristics Table: Aviation Fluids

Product Name	Viscosity cSt		Viscosity Index	Density	Flash Point	Pour Point
	40°C	100°C		kg/m3	°C	°C
AeroShell Fluid 31	14.3	3.53	130	850	237	<-55
AeroShell Fluid 41	14.1	5.3	383	870	105	<-60
AeroShell Landing Gear Fluid	14.5	-	-	874	110	<-68
AeroShell Oil 100	230	19.7	98	886	>250	<-17
AeroShell Oil Sport Plus 4	94.2	14.46	159	871	228	-33
AeroShell Oil W 15W-50	140	19.6	160	860	238	-39
AeroShell Oil W100	200	20.2	118	895	>260	<-18
AeroShell Oil W120	270	24.8	115	898	>240	<-18
AeroShell Oil W100 Plus	195	19.96	116	899	288	-21
AeroShell Turbine Oil 500	25.26	5.17	139	1005	256	<-54
AeroShell Turbine Oil 555	29	5.4	123	994	>246	<-54
AeroShell Turbine Oil 560	26.71	5.24	131	996	268	-60

Typical Physical Characteristics Table: Aviation Greases

Product Name	Thickener Type	Worked Penetration	NLGI	Viscosity cSt		Dropping Point	Colour	Recommended Operating Temp Range
		0.1mm @ 25°C		40°C	100°C	°C		°C
AeroShell Grease 7	Microgel	296	2	10.3	3.1	>260	Brown	-73 to +149
AeroShell Grease 22	Microgel	275	2	30.5	5.7	>260	Amber	-65 to +204
AeroShell Grease 33	Lithium Complex	297	2	14.2	3.4	216	Blue-Green	-73 to+121
AeroShell Grease 64	Lithium Complex	281	2	14.2	3.4	234	Dark Grey	-73 to+121

Appendix IX Marine, Rail & Stationary

Typical Physical Characteristics Table: Marine

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point	TBN	Sulphated Ash	FZG
	kg/m3	40°C	100°C		°C	°C	mg-KOH/g	%	Load Stage
Alexia 50	932	225	19.5	>95	>205	<-6	70	8.7	-
Alexia S3	908	-	19.5	>95	235	<-12	25	-	-
Alexia S6	954	180	-	>95	>210	<-6	100	12.1	-
Argina S3 30	900	105	11.85	101	210	-21	30	3.8	11
Argina S3 40	905	130	13.7	101	230	-21	30	3.8	11
Argina S4 40	916	127	13.7	104	230	-21	40	5.0	11
Argina S5 40	920	123	13.7	108	230	-21	55	6.8	11
Gadinia S3 30	890	104	11.85	103	210	-21	12	1.5	12
Gadinia S3 40	890	103	13.7	103	230	-21	12	1.5	12
Gadinia AL 40	900	140	14.3	100	>200	-18	15	1.65	12
Melina S 30	888	104	11.6	102	227	-18	5	0.62	11
Nautilus Premium Outboard	871	38	7	0.01% w/w (SASH)	70	-35	-	-	-

Typical Physical Characteristics Table: Rail

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point	TBN	Sulphated Ash
	kg/m3	40°C	100°C		°C	°C	mg-KOH/g	%
Caprinus XR 20W-40	920	132	15.1	115	256	-9	13	1.5
Caprinus XR 40	908	150	15.1	98	260	-9	13	1.5

Typical Physical Characteristics Table: Stationary

Product Name	Density	Viscosity		Viscosity Index	Flash Point	Pour Point	TBN	Sulphated Ash
	kg/m3	40°C	100°C		°C	°C	mg-KOH/g	%
Mysella S3 N 40	890	135	13.5	94	230	-18	5	0.45
Mysella S3 S 40	894	135	13.5	94	230	-18	8.5	0.9
Mysella S5 N 40	890	125	13.5	103	264	-18	4.5	0.48
Mysella S5 S 40	890	125	13.5	103	268	-18	5.3	0.57

Appendix X Engine Oil Viscosity Classification

The most widely used system for engine oil viscosity classification is that established by the Society of Automotive Engineers (SAE) in the USA.

In this system two series of viscosity grades are defined - those containing the letter W and those without the letter W.

Grades with the letter W are intended for use at lower temperatures and are based on a maximum low temperature viscosity and a maximum borderline pumping temperature, as well as a minimum viscosity at 100°C. The low temperature viscosity is measured by means of a multi-temperature version of ASTM D2602.

'Method of Test for apparent Viscosity of Motor Oils at Low temperature using the Cold Cranking Simulator'. Viscosities measured by this method have been found to correlate with engine speeds developed during low temperature cranking. Borderline pumping temperature is measured according to ASTM D3829 'Standard Method for Predicting the Borderline Pumping Temperature of Engine Oil'. This provides a measure of an oil's ability to flow to the engine oil pump inlet and provide adequate engine oil pressure during the initial stages of operation.

Oils without the letter W, intended for use at higher temperatures, are based on the viscosity at 100°C only. These are measured by ASTM D445 'Method of Test for Kinematic Viscosity of temperature and Opaque Liquids'.

A 'Multi-grade' oil is one whose low temperature viscosity and borderline temperature satisfy the requirements of one the W grades and whose viscosity at 100°C is within the stipulated range of one-W-grades.

Automotive Lubricant Viscosity Grades [1] Engine Oils - SAE J 300, June 2001 (Dec. 1999)					
SAE Viscosity Grade	Viscosity (cP) at Temp (°C), MAX		Viscosity (cSt) at 100°C [4]		High-Shear Viscosity (cP) at 150°C and $10^6 sec^{-1}$, MIN [5]
	Cranking [2]	Pumping [3]	MIN	MAX	
0W	6200 at -35	60,000 at -40	3.8	-	-
5W	6600 at -30	60,000 at -35	3.8	-	-
10W	7000 at -25	60,000 at -30	4.1	-	-
15W	7000 at -20	60,000 at -25	5.6	-	-
20W	9500 at -15	60,000 at -20	5.6	-	-
25W	13,500 at -10	60,000 at -15	9.3	-	-
20	-	-	5.6	<9.3	2.6
30	-	-	9.3	<12.3	2.9
40	-	-	12.5	<16.3	2.96
40	-	-	12.5	<16.3	3.77
50	-	-	16.3	<21.9	3.7
60	-	-	21.9	<26.1	3.7

[1] All values are critical specifications as defined by ASTM D3244

[2] ASTM D5293

[3] ASTM D4684. Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.

[4] ASTM D445

[5] ASTM D4683, CEC L-36-A-90 [ASTM D 4741] or ASTM D5482

[6] 0W-40, 5W-40 & 10W-40 grades

[7] 15W-40, 20W-40, 25W-40 & 40 grades

Appendix X Automotive Gear Viscosity Classification

The classification is based on the lubricant viscosity measured at low and/or high temperatures. The high temperature values are determined according to method ASTM D445. The low temperature values are determined according to method ASTM D2983 'Method of Test for Apparent Viscosity at Low Temperature using the Brookfield Viscometer' and are measured in mPa.s. (c.P).

Multi-grade oil satisfies the viscosity requirements of one of the W grades at low temperatures and one of the non-W grades at high temperature.

It should be noticed that there is no relationship between the SAE engine oil and gear oil classifications. A gear lubricant and an engine oil having the same viscosity will have widely different SAE grade designation as defined in the two classifications.

The system is used to classify Shell automotive gear lubricants.

Automotive Lubricant Viscosity Grades Gear Oils - except SAE J 306, 1998			
SAE Viscosity Grade	ASTM D2983 Temperature °C for Viscosity of 150,000mPa.S [1]	ASTM D445 (mm2/s) Viscosity at 100°C	
	MAX	MIN [2]	MAX
70W	-553	4.1	-
75W	-40	4.1	-
80W	-26	7	-
85W	-12	11	-
80	-	7	<11.0
85	-	11	<13.0
90	-	13.5	<24.0
140	-	24	<41.0
250	-	41	-

[1] Using ASTM D2983, additional low temperature been viscosity requirements may be appropriate for fluids intended for use in light-duty synchronised manual transmission.

[2] Limit must also be met after testing in CEC 1-45-T-93, Method C (20 hours)

[3] The precision of ASTM D 2983 has not be established for determinations made at temperatures below -40°C. This fact should be taken into consideration in any producer-consumer relationship.

Note: 1 cP = 1 mPa.s; 1 cSt = 1 mm2/s

Appendix X Industrial Lubricant Viscosity Classification

The ISO viscosity classification uses mm2/s (cSt) units and relates to viscosity at 40°C. It consists of a series of 18 viscosity brackets between 1.98 mm2/s and 1650 mm2/s, each of which is defined by a number. The numbers indicate to the nearest whole number, the mid points of their corresponding brackets. For example, ISO viscosity grade 32 relates to the viscosity bracket 28.8 to 35.2 mm2/s, the mid point of which is 32.0 mm2/s. This is illustrated in the table below, which shows the ISO viscosity grade numbers, the mid-points of each bracket, and the viscosity limits.

The American Gear Manufacturers Association (AGMA) have issued specifications and recommendations for gear lubricants used in various types of gear applications. AGMA Standard 250.4 details specifications for rust and oxidation inhibited (R and O) and extreme-pressure (EP) lubricants used in enclosed gear drives. This system is now used to classify all Shell industrial lubricating oils where viscosity is an important criterion in the selection of the oil.

The viscosity brackets correspond to those given in ASTM D 2442 'Standard Recommended Practice for Viscosity System for Industrial Fluid Lubricants'.

The AGMA Standard 251.02 details specifications for three types of open gear lubricants - rust and oxidation inhibited (R and O), extreme-pressure (EP) and residual type gear oils. In this case the viscosity brackets for the high viscosity grades are measured at 100°C.

International Standards Organisation Viscosity Classification

ISO Viscosity Grade (ISO VG)	Kinematic Viscosity at 40°C (mm^2/s)		
	Minimum	Maximum	Mid-point
2	1.98	2.42	2.2
3	2.88	3.52	3.2
5	4.14	5.06	4.6
7	6.12	7.48	6.8
10	9	11	10
15	13.5	16.5	15
22	19.8	24.2	22
32	28.8	35.2	32
46	41.4	50.6	46
68	61.2	74.8	68
100	90	110	100
150	135	165	150
220	198	242	220
320	288	352	320
460	414	506	460
680	612	748	680
1000	900	1100	1000
1500	1350	1650	1500

AGMA Viscosity Grades for Enclosed Gearing

AGMA Lubricant No.	Viscosity Limits of former AGMA Classifications SUS at 100°F	Corresponding ISO Viscosity Grade
1	193 - 235	46
2, 2 EP	284 - 347	68
3, 3 EP	417 - 510	100
4, 4 EP	626 - 765	150
5, 5 EP	918 - 1122	220
6, 6 EP	1335 - 1632	320
7 Comp, 7 EP	1919 - 2346	460
8 Comp, 8 EP	2837 - 3467	680
8A Comp	4171 - 5098	1000

Oils marked 'comp' are compounded with 3 to 10% fatty material.

Appendix X Grease Consistency Classification

The commonly used grease consistency classification is that established in the USA many years ago by the National Lubricating Grease Institute (NLGI). This classifies greases solely in terms of their hardness or softness; no other property or performance level is taken into consideration.

The classification consists of a series of consistency range, each of which is defined by a number (or numbers) 000 to 6. The consistency, defined by the distance in tenths of a millimetre, that a standard cone penetrates a sample of the grease number under standard conditions at 25°C. This system is used to classify Shell industrial greases.

NLGI Grease Classification (National Lubricating Grease Institute)

NLGI CONSISTENCY (Grade No.)	ASTM Worked Penetration at 25°C (0.1 mm)
0	445 - 475
0	400 - 430
0	355 - 385
1	310 - 340
2	265 - 295
3	220 - 250
4	175 - 205
5	130 - 160
6	85 - 115

Appendix X Approximate Comparison of Different Viscosity Scales

The following table is for the conversion of viscosities in one system to those in another system at the same temperature.

Kinematic Viscosity cSt	Engler Degrees	Redwood No. 1 Seconds	Saybolt Universal Seconds	Kinematic Viscosity cSt	Engler Degrees	Redwood No. 1 Seconds	Saybolt Universal Seconds
1	1	28.5	-	16	2.43	71.5	81.1
1.5	1.06	30	-	16.5	2.5	73	83.1
2	1.12	31	32.6	17	2.55	75	85.1
2.5	1.17	32	34.4	17.5	2.6	77	87.1
3	1.22	33	36	18	2.65	78.5	89.2
3.5	1.16	34.5	37.6	18.5	2.7	80	91.2
4	1.3	35.5	39.1	19	2.75	82	93.3
4.5	1.35	37	40.7	19.5	2.8	84	95.4
5	1.4	38	42.3	20	2.9	86	97.5
* 5.5	1.44	39.5	43.9	20.5	2.95	88	99.6
* 6.0	1.48	41	45.5	21	3	90	101.7
* 6.5	1.52	42	47.1	21.5	3.05	92	103.9
* 7.0	1.56	43.5	48.7	22	3.1	93	106
* 7.5	1.6	45	50.3	22.5	3.15	95	108.2
* 8.0	1.65	46	52	23	3.2	97	110.3
* 8.5	1.7	47.5	53.7	23.5	3.3	99	112.4
* 9.0	1.75	49	55.4	24	3.35	101	114.6
* 9.5	1.79	50.5	57.1	24.5	3.4	103	116.8
10	1.83	52	58.8	25	3.45	105	118.9
10.2	1.85	52.5	59.5	26	3.6	109	123.2
10.4	1.87	53	60.2	27	3.7	113	127.7
10.6	1.89	53.5	60.9	28	3.85	117	132.1
10.8	1.91	54.5	61.6	29	3.95	121	136.5
11	1.93	55	62.3	30	4.1	125	140.9
11.4	1.97	56	63.7	31	4.2	129	145.3
11.8	2	57.5	65.2	32	4.35	133	150.7
12.2	2.04	59	66.6	33	4.45	136	154.2
12.6	2.08	60	68.1	34	4.6	140	158.7
13	2.12	61	69.6	35	4.7	144	163.2
13.5	2.17	63	71.5	36	4.85	148	167.7
14	2.22	64.5	73.4	37	4.95	152	172.2
14.5	2.27	66	75.3	38	5.1	156	176.7
15	2.32	68	77.2	39	5.2	160	181.2
15.5	2.38	70	79.2	40	5.35	164	185.7

Appendix X Approximate Comparison of Different Viscosity Scales cont.

The following table is for the conversion of viscosities in one system to those in another system at the same temperature.

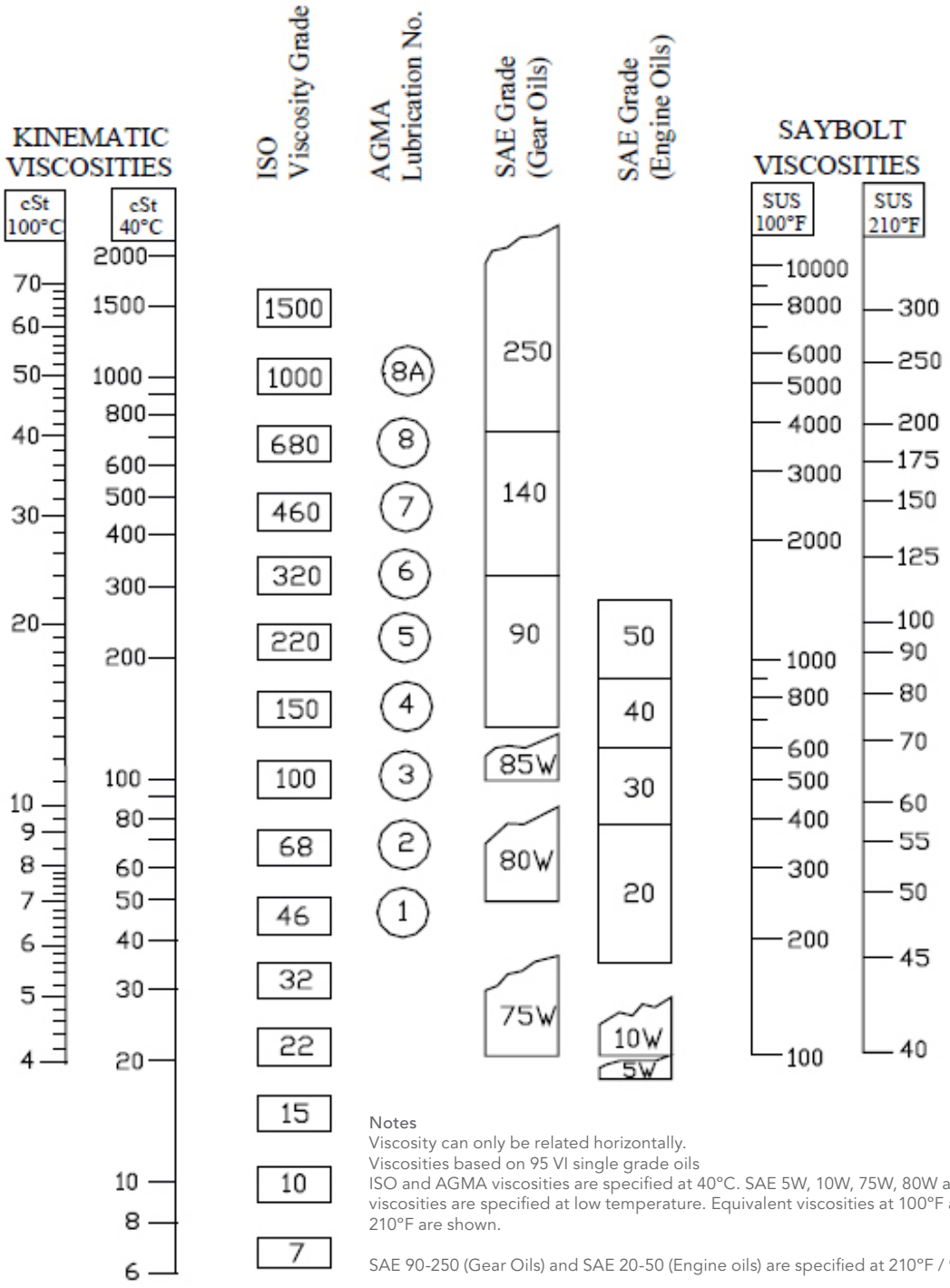
Kinematic Viscosity cSt	Engler Degrees	Redwood No. 1 Seconds	Saybolt Universal Seconds	Kinematic Viscosity cSt	Engler Degrees	Redwood No. 1 Seconds	Saybolt Universal Seconds
41	5.45	168	190.2	49	6.5	201	226.8
42	5.6	172	194.7	50	6.65	205	231.4
43	5.75	177	199.2	52	6.9	213	240.6
44	5.85	181	203.8	54	7.1	221	249.6
45	6	185	208.4	56	7.4	229	259
46	6.1	189	213	58	7.65	237	268
47	6.25	193	217.6	60	7.9	245	277.4
48	6.45	197	222.2	70	9.2	285	323.4

For higher viscosities, the following factors should be used:

Kinematic	= 0.247	Redwood	Saybolt	=35.11	Engler
Engler	= 0.132	Kinematic	Engler	= 0.0326	Redwood
Redwood	= 4.05	Kinematic	Saybolt	= 1.14	Redwood
Saybolt	= 4.62	Kinematic	KInematic	= 0.216	Saybolt
Kinematic	= 7.58	Engler	Engler	= 0.0285	Saybolt
Redwood	= 30.70	Engler	Redwood	= 0.887	Saybolt

Note: The first part of the table marked with an * should only be used for the conversion of kinematic viscosities into Engler, Redwood or Saybolt viscosities, or for Engler, Redwood and Saybolt between themselves. They should not be used for the conversion of Engler, Redwood or Saybolt into Kinematic viscosities.

Appendix X Comparative Viscosity Classification



Notes
Viscosity can only be related horizontally.
Viscosities based on 95 VI single grade oils
ISO and AGMA viscosities are specified at 40°C. SAE 5W, 10W, 75W, 80W and 85W viscosities are specified at low temperature. Equivalent viscosities at 100°F and 210°F are shown.

SAE 90-250 (Gear Oils) and SAE 20-50 (Engine oils) are specified at 210°F / 99°C.

Appendix X API Engine Service Classifications (Petrol Engines)

Category	Status	Service
SN	Current	"Introduced in October 2010, designed to provide improved high temperature deposit protection for pistons, more stringent sludge control, and seal compatibility. API SN with Resource Conserving matches ILSAC GF-5 by combining API SN performance with improved fuel economy, turbocharger protection, emission control system compatibility, and protection of engines operating on ethanol-containing fuels up to E85."
SM	Current	For all automotive engines currently in use. Introduced November 30, 2004, SM oils are designed to provide improved oxidation, resistance, improved deposit protection, better wear protection, and better low-temperature performance over the life of the oil. Some SM oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving
SL	Current	For all automotive engines presently in use. Introduced July 1, 2001, SL oils are designed to provide better high-temperature deposit control and lower oil consumption. Some of these oils may also meet the latest ILSAC specification and/or qualify as Energy Conserving.
SJ	Current	For 2001 and older automotive engines.
SH	Obsolete	For 1996 and old engines. Valid when preceded by current C categories.
SG	Obsolete	For 1993 and older engines.
SF	Obsolete	For 1988 and older engines.
SE	Obsolete	CAUTION - Not suitable for use in petrol-powered automotive engines built after 1979.
SD	Obsolete	CAUTION - Not suitable for use in petrol-powered automotive engines built after 1971. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SC	Obsolete	CAUTION - Not suitable for use in petrol-powered automotive engines built after 1967. Use in more modern engines may cause unsatisfactory performance or equipment harm.
SB	Obsolete	CAUTION - Not suitable for use in petrol-powered automotive engines built after 1963. Use in more modern engines may cause unsatisfactory performance or equipment harm. Use only when specifically recommended by the manufacturer.
SA	Obsolete	CAUTION - Contains no additives. Not suitable for use in petrol-powered automotive engines built after 1930. Use in modern engines may cause unsatisfactory engine performance or equipment harm. Use only when specifically recommended by the manufacturer.

Note: API intentionally omitted "SI" and "SK" from the sequence of categories.
For more information about API's Engine Oil Program, visit their website at www.api.org/eolcs

Appendix X API Engine Service Classifications (Diesel Engines)

Category	Status	Service
CK-4	Current	Introduced in 2016 for use in high-speed four-stroke cycle diesel engines designed to meet 2017 model year on-highway and Tier 4 non-road exhaust emissions standards as well as for previous model year diesel engines. These oils are formulated for use in all applications with diesel fuels ranging in sulphur content up to 500 ppm (0.05% by weight). However, the use of these oils with greater than 15 ppm (0.0015% by weight) sulphur fuel may impact exhaust after treatment system durability and/or oil drain interval. These oils are especially effective at sustaining emission control system durability where particulate filters and other advanced after treatment systems are used. API CK-4 oils are designed to provide enhanced protection against oil oxidation, viscosity loss due to shear, and oil aeration as well as protection against catalyst poisoning, particulate filter blocking, engine wear, piston deposits, degradation of low and high –temperature properties, and soot-related viscosity increase. API CK-4 oils exceed the performance criteria of API CJ-4, CI-4 with CI-4 PLUS, CI-4, and CH-4 and can effectively lubricate engines calling for those API Service Categories. When using CK-4 oil with higher than 15 ppm sulphur fuel, consult the engine manufacturer for service interval recommendations.
CJ-4	Current	Introduced in 2006. For high-speed, four-stroke engines designed to meet 2007 model year on-highway exhaust emission standards. CJ-4 oils are compounded for use in all applications with diesel fuels ranging in sulfur content up to 500 ppm (0.05% by weight). However, use of these oils with greater than 15 ppm (0.0015% by weight) sulfur fuel may impact exhaust aftertreatment system durability and/or oil drain interval. CJ-4 oils are effective at sustaining emission control system durability where particulate filters and other advanced aftertreatment systems are used. Optimum protection is provided for control of catalyst poisoning, particulate filter blocking, engine wear, piston deposits, low- and high-temperature stability, soot handling properties, oxidative thickening, foaming, and viscosity loss due to shear. API CJ-4 oils exceed the performance criteria of API CI-4 with CI-4 PLUS, CI-4, CH-4, CG-4 and CF-4 and can effectively lubricate engines calling for those API Service Categories. When using CJ-4 oil with higher than 15 ppm sulfur fuel, consult the engine manufacturer for service interval.
CI-4	Current	Introduced in 2002. For high-speed, four-stroke engines designed to meet 2004 exhaust emission standards implemented in 2002. CI-4 oils are formulated to sustain engine durability oils where exhaust gas recirculation (EGR) is used and are intended for use with diesel fuels ranging in sulphur content up to 0.5% weight. Can be used in place of CD, CE, CF-4, CG-4 and CH-4 oils. Some CI-4 oils may also qualify for the CI-4 PLUS designation.
CH-4	Current	Introduced in 1998. For high-speed, four-stroke engines designed to meet 1998 exhaust emission standards. CH-4 oils are specifically compounded for use with diesel fuels ranging in sulphur content up to 0.5% weight. Can be used in place of CD, CE, CF-4 and CG-4 oils.
CG-4	Obsolete	Introduced in 1995. For severe duty, high-speed, four-stroke engines using fuel with less than 0.5% weight sulphur. CG-4 oils are required for engines meeting 1994 emission standards. Can be used in place of CD, CE and CF-4 oils.
CF-4	Obsolete	Introduced in 1990. For high-speed, four-stroke, naturally aspirated and turbocharged engines. Can be used in place of CD and CE oils
CF-2	Obsolete	Introduced in 1994. For severe duty, two-stroke cycle engines. Can be used in placed of CD-II oils.
CF	Obsolete	Introduced in 1994. For off-road, indirect-injected and other diesel engines including those using fuel with over 0.5% weight sulphur. Can be used in place of CD oils.
CE	Obsolete	Introduced in 1985. For high-speed, four-stroke, naturally aspirated and turbocharged engines. Can be used in place of CC and CD oils.
CD-II	Obsolete	Introduced in 1985. For two-stroke cycle engines.
CD	Obsolete	Introduced in 1955. For certain naturally aspirated and turbocharged engines.
CC	Obsolete	CAUTION - Not suitable for use in diesel-powered engines built after 1990.
CB	Obsolete	CAUTION - Not suitable for use in diesel-powered engines built after 1961.
CA	Obsolete	CAUTION - Not suitable for use in diesel-powered engines built after 1959.

Appendix X API Automotive Gear Lubricant Specifications

API SERVICE CLASSIFICATIONS

The most important internationally accepted system defining automotive gear oil performance characteristics is laid down by the American petroleum Institute.

API GL-1

Designates the type of service characteristics of automotive spiral-bevel and worm gear axles and some manually operated transmissions operating under such mild conditions of low unit pressures and sliding velocities that a non-additive mineral oil can be used satisfactorily. Oxidation and rust inhibitors, anti-foam additives and pour point depressants may be utilised to improve the characteristics of lubricant for this service. Does not contain friction modifiers and extreme-pressure agents.

API GL-2

Designates the type of service characteristics of automotive-type worm gear axles operating under such conditions of load, temperature and sliding velocities that lubricants satisfying API GL-1 service will not suffice. Products suited for this type of service contain anti-wear or very mild extreme-pressure agents that provide protection for worm gears.

API GL-3

Designates the type of service characteristics of manual transmissions and spiral-bevel axles operating under moderately severe conditions of speed and load. These service conditions require a lubricant having load carrying capacity greater than that which will satisfy API GL-1 service, but below the requirements of lubricants satisfying API GL-4 service. Lubricants designated for this service typically contain additives that are active at the tooth surface at the temperatures resulting from high-speed or load.

API GL-4

Designates the type of service characteristics of gears in manual transmissions operating under severe conditions of sliding speed, particularly spiral bevel and hypoid gears in moderate service, in passenger cars and other automotive-type equipment operated under high speed/low torque and low speed/high torque conditions.

API GL-5

Designates the type of service characteristics of gears particularly hypoid, in passenger cars and other automotive equipment operated under high-speed/shock load, high-speed/low-torque, and low-speed/high-torque conditions. Equivalent to MIL-L-2105D, this category is mainly applicable to axles but may also be used for certain manual transmissions.

API GL-6 (Obsolete)

The type of service designated by API GL-6 is characteristic of gears, specifically high offset hypoid gears in passenger cars and other automotive equipment operated under high-speed high-performance conditions. This classification is obsolete. The equipment required for the test procedure to verify lubricant performance is no longer available.

Appendix X ACEA European Sequences

A/B Petrol and Diesel Engine Oil Sequences

Category	Service
A1 / B1	Oil intended for use in petrol and car + light van diesel engines specifically designed to be capable of using low friction, low viscosity oils with high temperature / high shear rate viscosity of 2.6mPa.s to 3.5mPa.s. These oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
A3 / B3	Stable, stay-in grade oil intended for use in high performance petrol and car + light van diesel engines, and/or for extended drain intervals where specified by the engine manufacturer, and/or for year-round use of low viscosity oils, and/or for severe operating conditions as defined by the engine manufacturer.
A3 / B4	Stable, stay-in grade oil intended for use in high performance petrol and direct injection diesel engines, but also for applications described under B3.
A5 / B5	Stable, stay-in-grade oil intended for use at extended drain intervals in high performance petrol and car + light van diesel engines designed to be capable of using low friction, low viscosity oils with high temperature / high shear rate viscosity of 2.9mPa.s to 3.5mPa.s.

Catalyst Compatible Oil Sequences

Category	Service
C1	Stable, stay-in-grade oils intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance gasoline and car and light van diesel engines requiring low friction, low viscosity, low SAPS oils with HTHS higher than 2.9mPa.s. These oils will increase DPF and TWC life and maintain the vehicles economy. (NB: These oils have the lowest SAPS limits and may be unsuitable for use in some engines, consult owner manual or handbook if in doubt.)
C2	Stable, stay-in-grade oils intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance gasoline and car and light van diesel engines designed to be capable of using low friction, low viscosity oils with a HTHS higher than 2.9mPa.s. These oils will increase DPF and TWC life and maintain the vehicles economy. (NB: These oils may be unsuitable for use in some engines, consult own manual or handbook if in doubt.)
C3	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance gasoline and car and light van diesel engines. These oils will increase DPF and TWC duration. (NB: These oils may be unsuitable for use in some engines, consult own manual or handbook if in doubt.)
C4	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines requiring low SAPS oil with a minimum HTHS viscosity of 3.5mP.a.s. These oils will increase the DPF and TWC life. Warning: these oils are unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C5	Stable, stay-in-grade Engine Oil with Mid SAPS-Level, for further improved Fuel Economy, intended for use as catalyst compatible Oil at extended Drain Intervals in Vehicles with all Types of modern Aftertreament Systems and High Performance passenger Car & Light Duty Van Gasoline and DI Diesel Engines that are designed to be capable and OEM-approved for use of Low Viscosity Oils with a minimum HTHS Viscosity of 2.6mPa.s.

SAPS: Sulphated Ash, Phosphorus, Sulphur.
TWC: Three Way Catalyst.
DPF: Diesel Particulate Filter.
HTHS: High Temperature / High Shear rate viscosity.

Appendix X ACEA European Sequences cont.

Heavy Duty Diesel Sequences

Category	Service
E4	Stable, stay-in-grade oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3, Euro 4, and Euro 5. emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for some EGR engines and some engines fitted with SCR NO_X reduction systems. However, recommendations may differ between engine manufacturers so driver manuals and/or dealers shall be consulted if in doubt.
E6	Stable, stay-in-grade oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3, and Euro 4 emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for EGR engines with or without particulate filters, and for engine fitted with SCR NO_X reduction systems. E6 quality is strongly recommended for engines with particulate filters and is designed for use in combination of low sulphur diesel fuel (max 50ppm). However, recommendations may differ between engine manufacturers so driver manuals and/or dealers shall be consulted if in doubt.
E7	Stable, stay-in-grade oil providing effective control of piston cleanliness and bore polishing. It further provides excellent wear and turbocharger deposit control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3, and Euro 4 emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturers' recommendations. It is suitable for engines without particulate filters, and for most EGR engines and most engines fitted with SCR NO_X reduction systems. However, recommendations may differ between engine manufacturers so driver manuals and/or dealers shall be consulted if in doubt.
E9	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear and turbocharger deposit control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV, and Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines with or without particulate filters, and for most EGR engines and for most engines fitted with SCR NO_X reduction systems. E9 is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulphur diesel fuel. However, recommendations may differ between engine manufacturers so driver manuals and/or dealers should be consulted if in doubt.

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