Product	Benefits	Technology	ISO viscosity grades	Specifications and approvals (Full details of approvals for all products can be obtained from your Shell representative; approvals and claims will vary by viscosity grade.)
Shell **Omala *S4*** *GX*	■ Extra protection ■ Extra life ■ Special applications	Synthetic (advanced extreme-pressure, EP, system)	150, 220, 320, 460	Approved by or meets David Brown, GE (wind turbines), Gamesa and many other equipment manufacturers Industry standards: ANSI/AGMA 9005-E02 (EP); ISO 12925-1 CKD; DIN 51517-3 (CLP); US Steel 224
Shell **Omala *S4*** *WE*	■ Extra protection and life ■ Energy saving ■ Worm drives	Synthetic (polyalkylene glycol)	150, 220, 320, 460	Approved by or meets Bonfiglioli, David Brown and many other equipment manufacturers Industry standards: ANSI/AGMA 9005-E02 (EP); ISO 12925-1 CKE
Shell **Omala *S2*** *G*	■ Extra protection ■ Standard applications	Conventional (EP)	68, 100, 150, 220, 320, 460, 680, 1000	Approved by or meets David Brown, Cincinnati Machine, and many other equipment manufacturers Industry standards: ANSI/AGMA 9005-E02 (EP); ISO 12925-1 CKD; DIN 51517-3 (CLP); US Steel 224
Shell **Omala *S1*** *W*	■ Reliable protection ■ Worm drives	Conventional (compounded fatty oil)	460	Industry standards: AGMA 9005-EO2 (CP)
Speciality gear oils				
Shell Spirax oils	A range of automotive gear, axle and transmission oils to meet the needs of on- and off-highway vehicles			Contact your Shell representative for details

FULL PRODUCT AND SERVICE PORTFOLIO

Shell Lubricants is named the number-one finished lubricants supplier[2] and has a 60-year history of innovation. It constantly invests to develop better lubrication solutions, including advanced synthetic technologies such as

- Shell Tellus S4 ME synthetic hydraulic oil – for long life and energy saving
- Shell Corena S4 R air compressor oil – for up to 12,000 hours of protection.

In addition, Shell provides the excellent Shell LubeAnalyst oil condition monitoring service, which is designed to help improve your business performance.

Whatever your needs or application, Shell can provide a full range of oils and greases, including synthetic, high-performance products and additional services.

"Shell Lubricants" refers to the various Shell companies engaged in the lubricants business.

[1]Saving reported by one customer. Actual savings may vary, depending on the application, the current oil used, the maintenance procedures and the condition of the equipment.

[2]Source: Kline & Company, "Competitive Intelligence for the Global Lubricants Industry, 2008–2018.

For more information, please contact

shell.com/lubricants

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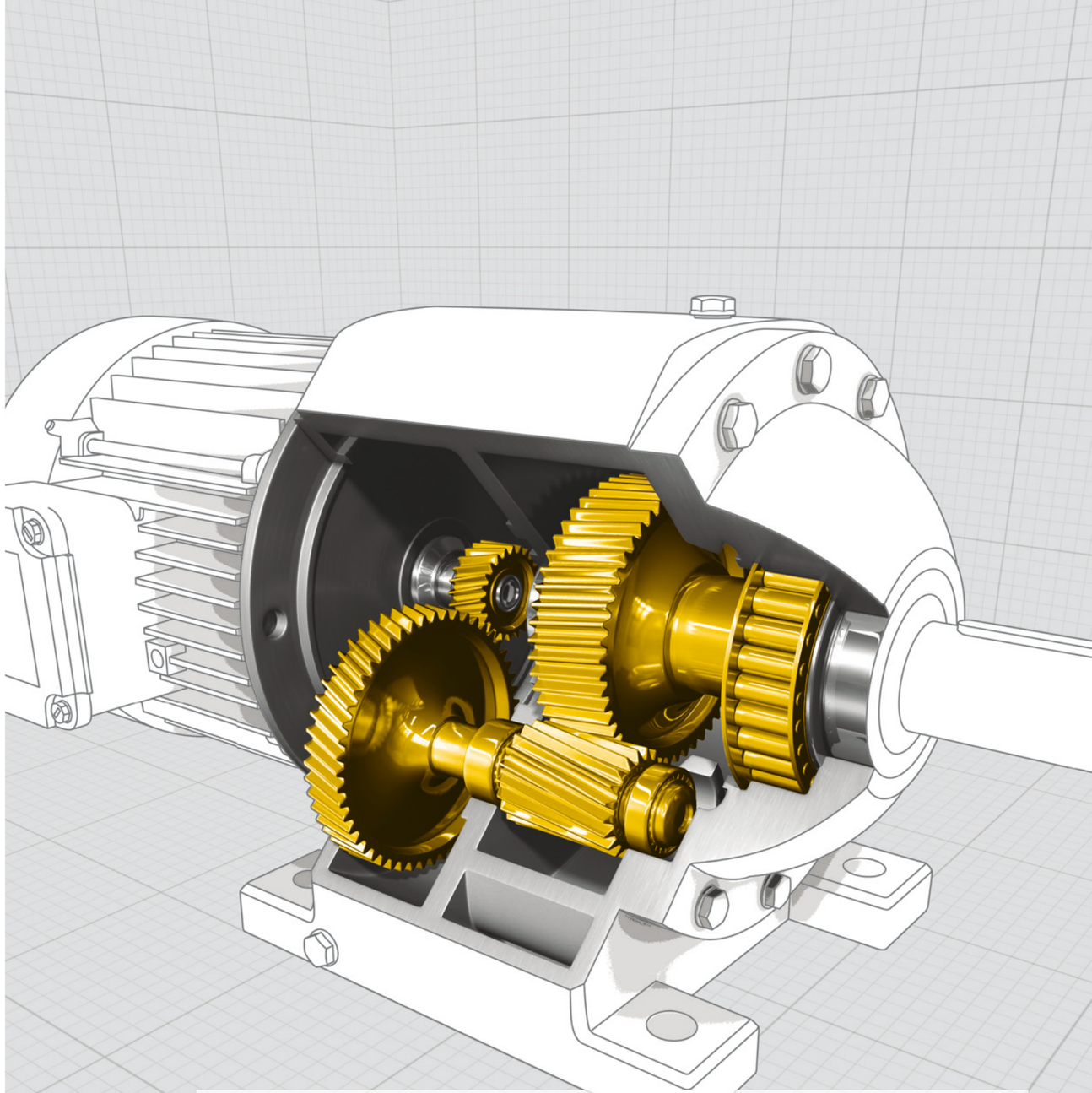


DESIGNED TO COPE WITH HEAVY DEMANDS.

JUST LIKE OUR INDUSTRIAL GEAR OILS – SHELL OMALA.

DESIGNED TO MEET CHALLENGES

EVERY PART OF YOUR MACHINE OR PROCESS HAS BEEN METICULOUSLY ENGINEERED, SO YOU WANT TO BE SURE THAT YOU CHOOSE A LUBRICANT THAT HAS BEEN DESIGNED TO ENSURE THAT YOUR EQUIPMENT IS WELL PROTECTED AND WORKS EFFICIENTLY.

The Shell Omala range of industrial gear oils has been developed to enable equipment operators to select the oil that will deliver optimum value to their operations through enhanced wear protection, long oil life and high system efficiency.

WEAR PROTECTION

Protecting machine gears from wear and corrosion is important for prolonging asset life and preventing breakdowns.

The Shell Omala range of industrial gear oils offers protection across a wide range of applications: from the extreme-pressure rolling contacts in spur gears to the sliding contacts in worm gears. It includes Shell's latest synthetic oils such as Shell Omala S4 GX, which offers exceptional long-life performance under extreme loads and temperatures.

OIL LIFE

The longer an oil's life, the less fluid maintenance your equipment requires, so it can continue to operate without interruption. The Shell Omala range enables you to match oil life to your operational needs.

Customers using Shell's standard products, such as Shell Omala S2 G, are extending oil-drain intervals by up to 200% for some applications. Customers are trading up to synthetic oils, such as Shell Omala S4 GX, for even longer oil life and other benefits.

SYSTEM EFFICIENCY

Shell Omala oils can help to maintain or improve system efficiency by protecting against the impact of oil ageing and contamination for efficient lubrication. Advanced synthetic oils such as Shell Omala S4 WE can offer additional benefits by providing improved energy efficiency compared with conventional oils.

A RANGE OF INDUSTRIAL GEAR OILS DESIGNED TO MEET YOUR NEEDS

To meet the challenges of a wide range of gear types and applications, Shell has designed a portfolio of oils that enables you to choose a product to best match your technical and operational needs.

PRODUCT NAME SUFFIX KEY

- **E** = Energy saving, high efficiency
- **G** = Gears – spur and helical
- **W** = Worm drive
- **X** = Extra/extreme performance

APPLICATION ICON KEY

- Factory/machine applications
- Enclosed gears
- High temperature
- Extreme load
- Long life
- Worm gear

INCREASINGLY EFFICIENT PROTECTION

ADVANCED TIER 4

MAIN LINE TIER 2

ENTRY TIER 1

THE SHELL OMALA "G" RANGE

Enclosed industrial spur and bevel gear applications from standard to demanding high-load and extended-duty applications

Shell Omala *S4 GX*

SYNTHETIC
- Extra protection
- Extra life
- Special applications

Better protection, longer oil life and better system efficiency

Shell Omala *S2 G*
- Extra protection
- Industrial applications

THE SHELL OMALA "W" RANGE

Industrial worm-drive applications from standard to demanding high-load and extended-duty applications

Shell Omala *S4 WE*

SYNTHETIC
- Extra protection and life
- Energy saving
- Worm drive

Better protection, longer oil life and better system efficiency

Shell Omala *S1 W*
- Reliable protection
- Worm drive

PERFORMANCE YOU CAN COUNT ON

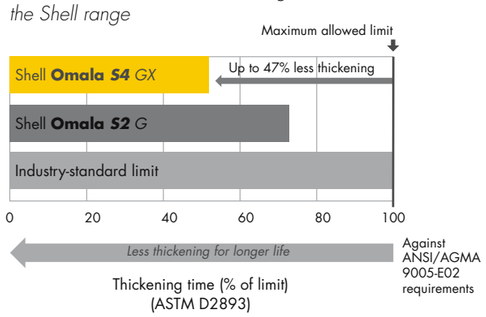
Shell's industrial gear oils are developed in close co-operation with customers and equipment makers. The Shell Omala range is approved or listed by hundreds of equipment makers, and its performance has been demonstrated in real-life applications to help reduce the possibility of your equipment letting you down.

REAL-WORLD VALUE DELIVERY

Users of Shell Omala oils across a wide range of industries are benefiting from proven, robust and reliable lubrication that adds value to their operations. For instance, by switching to Shell Omala S4 GX, some customers are

- increasing equipment protection: one customer reports virtually eliminating gearbox failures and saving over $50,000 a year
- extending oil-drain intervals. Some equipment manufacturers approve Shell Omala S4 GX for four-year drain intervals, and some customers have extended their oil-drain intervals by up to five times.
- enhancing operational efficiency. Wind-turbine operators have increased turbine availability by reducing shutdowns due to foaming, high temperatures and filter blocking.

Shell Omala S4 GX – For the longest oil life in the Shell range



Technical Data Sheet

Shell Omala *S2 GX 68*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 68)
- ISO 12925-1 Type CKC (ISO 68)
- DIN 51517- Part 3 CLP (ISO 68)
- AGMA EP 9005- F16 (ISO 68)
- AIST (US Steel) 224 (ISO 68)
- Fives Cincinnati: P-63 (ISO 68)

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 68
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	68
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	8.7
Viscosity Index			ISO 2909	100
Flash Point COC		°C	ISO 2592	>230
Pour Point		°C	ISO 3016	-27
Density	@ 15°C	Kg/m^3	ISO 12185	885

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell Omala *S2 GX 100*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 100)
- ISO 12925-1 Type CKC (ISO 100)
- DIN 51517- Part 3 CLP (ISO 100)
- AGMA EP 9005- F16 (ISO 100)
- AIST (US Steel) 224 (ISO 100)
- Fives Cincinnati: P-76 (ISO 100)

Approved or Recommended by:

- Siemens AG

  Shell Omala S2 GX 100 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 100
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	100
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	11.3
Viscosity Index			ISO 2909	99
Flash Point COC		°C	ISO 2592	>230
Pour Point		°C	ISO 3016	-24
Density	@ 15°C	Kg/m^3	ISO 12185	891

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell Omala *S2 GX 150*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 150)
- ISO 12925-1 Type CKC (ISO 150)
- DIN 51517- Part 3 CLP (ISO 150)
- AGMA EP 9005- F16 (ISO 150)
- AIST (US Steel) 224 (ISO 150)
- Fives Cincinnati: P-77 (ISO 150)

Approved or Recommended by:

- Siemens AG

  Shell Omala S2 GX 150 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 150
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	150
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	14.8
Viscosity Index			ISO 2909	98
Flash Point COC		°C	ISO 2592	>240
Pour Point		°C	ISO 3016	-24
Density	@ 15°C	Kg/m^3	ISO 12185	897

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell Omala *S2 GX 220*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 220)
- ISO 12925-1 Type CKC (ISO 220)
- DIN 51517- Part 3 CLP (ISO 220)
- AGMA EP 9005- F16 (ISO 220)
- AIST (US Steel) 224 (ISO 220)
- Fives Cincinnati: P-74 (ISO 220)

Approved or Recommended by:

- Siemens AG

  Shell Omala S2 GX 220 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 220
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	220
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	19.0
Viscosity Index			ISO 2909	98
Flash Point COC		°C	ISO 2592	>240
Pour Point		°C	ISO 3016	-18
Density	@ 15°C	Kg/m^3	ISO 12185	899

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell **Omala** *S2 GX 320*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 320
- ISO 12925-1 Type CKC (ISO 320)
- DIN 51517- Part 3 CLP (ISO 320)
- AGMA EP 9005- F16 (ISO 320)
- AIST (US Steel) 224 (ISO 320)
- Fives Cincinnati: P-59 (ISO 320)

Approved or Recommended by:

- Siemens AG

  Shell Omala S2 GX 320 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 320
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	320
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	24.4
Viscosity Index			ISO 2909	98
Flash Point COC		°C	ISO 2592	>250
Pour Point		°C	ISO 3016	-15
Density	@ 15°C	Kg/m^3	ISO 12185	903

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell Omala *S2 GX 460*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKD (ISO 460)
- ISO 12925-1 Type CKC (ISO 460)
- DIN 51517- Part 3 CLP (ISO 460)
- AGMA EP 9005- F16 (ISO 460)
- AIST (US Steel) 224 (ISO 460)
- Fives Cincinnati: P-35 (ISO 460

Approved or Recommended by:

- Siemens AG

  Shell Omala S2 GX 460 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 460
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	460
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	30.6
Viscosity Index			ISO 2909	97
Flash Point COC		°C	ISO 2592	>250
Pour Point		°C	ISO 3016	-12
Density	@ 15°C	Kg/m^3	ISO 12185	904

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Shell Omala *S2 GX 680*

- *EXTRA PROTECTION*
- *Against oxidation*
- *Against wear & micropitting*
- *Against corrosion & foaming*

Industrial Gear Oils

Shell Omala S2 GX oils are high quality extreme-pressure (EP) oils designed primarily for the lubrication of heavy duty industrial gearboxes. Their high load carrying capacity, protection against micropitting and compatibility with seals and paints, combine to offer excellent performance in enclosed gear applications.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life through oxidation stability and resistance to thermal stress – leading to reduced total cost of ownership**
  Shell Omala S2 GX oils are formulated to reduce the risk of thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C.
- **Excellent wear and micropitting protection**
  Shell Omala S2 GX is formulated to have excellent load carrying capacity and micropitting performance, providing long component life.
- **Gear system efficiency is maintained by optimized water separation performance, corrosion and foam control**
  Shell Omala S2 GX oils display a combination of excellent water shedding capability, corrosion protection and low foam forming tendency.
  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Excellent corrosion protection is provided, even in the presence of contamination by seawater and solids.
  The oils are designed to minimize the potential for foaming, often experienced in applications where oil reservoir residence times are marginal.
  Excellent shear stability, maintains viscosity stability throughout the service interval.
  Further system efficiencies are gained through compatibility with popular seals, sealants, and engineering adhesives, to help avoid leakage. Shell Omala S2 GX is compatible with prevalent paint finishes.

Main Applications

- **Enclosed industrial gear systems**
  Shell Omala S2 GX technology provides an effective extreme pressure (EP) formulation designed specifically for enclosed industrial gearboxes using steel-on-steel, spur, helical, or planetary gear drives, including highly loaded systems with splash or forced circulation systems.
  Shell Omala S2 GX oils are also suitable for the lubrication of non-geared applications, that include bearings and other steel-on-steel components with splash or forced circulation systems.
- **Other applications**
  Shell offers a wide range of products for other gear applications that have their own specific requirements
- Shell Omala S4 GXV is recommended for gear systems where a synthetic lubricant is specified, when the longest lifespan is required, or when operating in environments that experience large temperature variations.
- Shell Omala S5 Wind 320 is recommended for wind turbine main gear drives.
- Shell Omala S4 WE, Shell Morlina S4 B and Shell Omala S1 W are recommended for worm-wheel drives.
- For automotive gear applications, the appropriate Shell Spirax Oil should be used.
- For geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S2 GX.

Specifications, Approvals & Recommendations

Meets requirements of:

- ISO 12925-1 Type CKC (ISO 680)
- DIN 51517- Part 3 CLP (ISO 680)
- AGMA EP 9005- F16 (ISO 680)
- Fives Cincinnati: P-34 (ISO 680)

Approved or Recommended by

- Siemens AG

  Shell Omala S2 GX 680 is approved by Siemens AG for use in Flender, helical, bevel, planetary and marine gear units.

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

Typical Physical Characteristics

Properties			Method	Shell Omala S2 GX 680
Kinematic Viscosity	@ 40°C	mm^2/s	ISO 3104	680
Kinematic Viscosity	@ 100°C	mm^2/s	ISO 3104	42.1
Viscosity Index			ISO 2909	105
Flash Point COC		°C	ISO 2592	>250
Pour Point		°C	ISO 3016	-9
Density	@ 15°C	Kg/m^3	ISO 12185	912

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS), which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative

Technical Data Sheet

Previous Name: **Shell Omala Oils**

Shell **Omala** *S2 G 1000*

- *Extra Protection*
- *Standard Application*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life – Maintenance saving**

  Shell Omala S2 G Oils are formulated to resist thermal and chemical breakdown throughout the maintenance interval. They withstand high thermal loading and resist the formation of sludge to provide extended oil life capability, even with bulk oil temperatures of up to 100^{0}C in certain applications.

- **Excellent wear & corrosion protection**

  Excellent load carrying capacity reduces gear tooth and bearing wear on steel components.

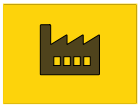
  Shell Omala S2 G has excellent corrosion protection, protecting steel components, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S2 G Oils have excellent water separation properties, such that excess water can be drained easily from lubrication systems to help extend the life of the gears and ensure efficient lubrication of the contact areas.

  Water can greatly accelerate surface fatigue of gears and bearings as well as promoting ferrous corrosion on internal surfaces. Water contamination should therefore be avoided or removed as quickly as possible after the occurrence.

Main Applications



- **Enclosed industrial gear systems**

  Shell Omala S2 G Oils are formulated using an effective sulphur-phosphorus additive system to provide an extreme pressure performance which allow trouble-free application in most enclosed industrial gearboxes using steel spur and helical gears.

- **Highly loaded gears**

  Shell Omala S2 G Oils have an effective full extreme pressure (EP) additive system allowing them to be used in highly-loaded gear systems.

- **Other applications**

  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, Shell Morlina S4 B and Shell Omala S1 W are recommended.

  For automotive hypoid gears, the appropriate Shell Spirax Oil should be used.

  Shell do not recommend/support use in systems with fine filtration (<10 microns) because sustained foam control performance is not assured. Please consult your Shell Local Technical Advisor and Product Application Specialist

Specifications, Approvals & Recommendations

- AGMA EP 9005 - EO2
- ISO 12925-1 Type CKC

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

Typical Physical Characteristics

Properties			Method	Omala S2 G 1000
ISO Viscosity Grade			ISO 3448	1000
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	1000
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	45.4
Viscosity Index			ISO 2909	85
Density	@15°C	kg/m^3	ISO 12185	931
Flash Point (COC)		°C	ISO 2592	270
Pour Point		°C	ISO 3016	-6

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Omala S2 G is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

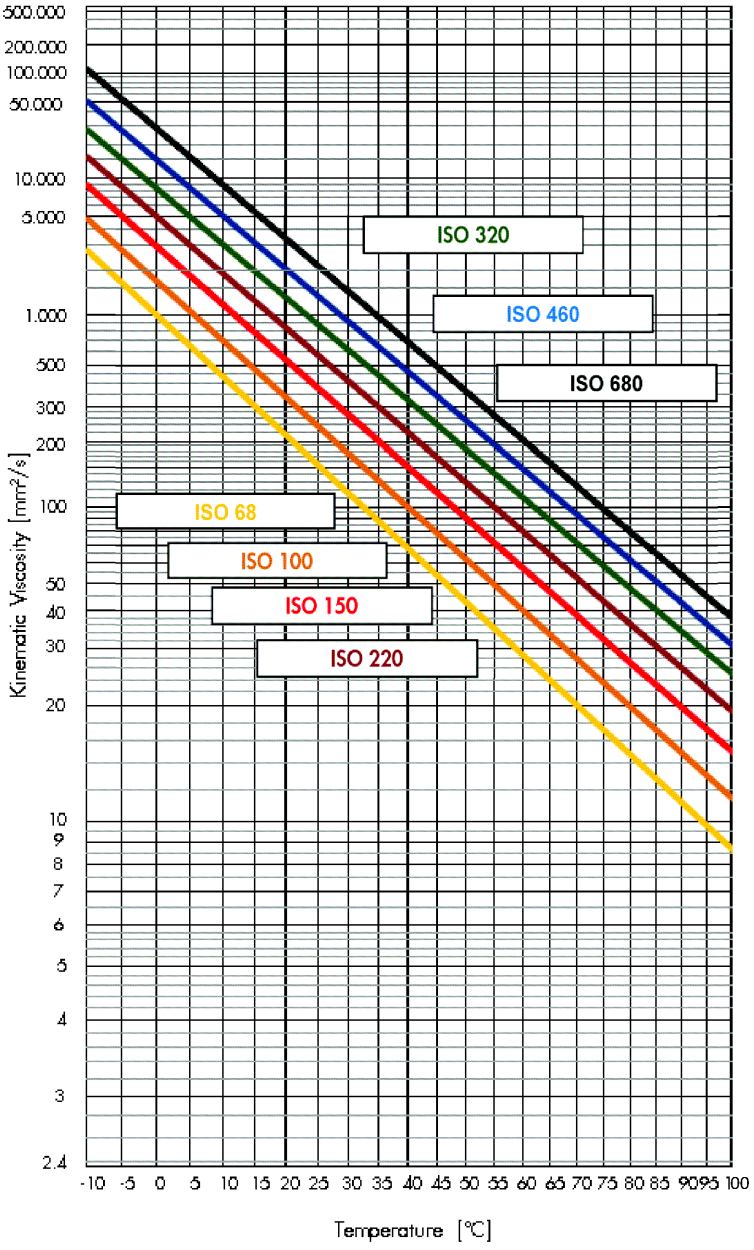
Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.

Shell Omala S2 G

Viscosity - Temperature - Diagram



Technical Data Sheet

Previous Name: **Shell Tivela S**

Shell **Omala** *S4 WE 320*

- *Extra Protection & Life*
- *Energy Saving*
- *Worm Drive Applications*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 WE is formulated to provide excellent oxidation and thermal stability, extending lubricant life and resisting the formation of harmful oxidation products at high operating temperatures. This helps maintain system cleanliness over extended maintenance intervals.

  Shell Omala S4 WE offers the potential to extend service intervals significantly compared to conventional industrial gear oils.

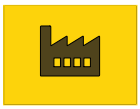
- **Excellent wear protection**

  Shell Omala S4 WE is formulated to have excellent load carrying capacity providing long component life even under shock loading conditions. It also has a high resistance to micro-pitting. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

- **Maintaining system efficiency**

  Shell Omala S4 WE offers improved energy efficiency and lower operating temperatures in worm gear applications. Rig testing has shown efficiency improvements of up to 15% in comparison with mineral oil-based products and 11% over other synthetic hydrocarbon-based lubricants. These results have been confirmed by OEM testing and field experience.

Main Applications

- **Enclosed industrial worm gear systems**

  Recommended for industrial worm gear reduction systems operating under severe 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 alloys.

  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.

Specifications, Approvals & Recommendations

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

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

Compatibility & Miscibility

- **Seal & Paint Compatibility**

  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.

- **Change-over Procedure**

  Shell Omala S4 WE contains polyalkylene glycols and is not compatible with mineral oils or most other synthetic lubricant types. Care should be taken when changing from such products to Shell Omala S4 WE.

The system should be flushed with the minimum quantity of Shell Omala S4 WE, operating under no load and draining whilst warm. Ideally, seals exposed to mineral oils should also be replaced. Inspect the lubricant after a few days use. Ensure that oil systems are clean and free from contamination.

Shell Omala S4 WE is also not miscible with some other polyalkylene glycols, so caution is needed when topping-up. Generally the preference is to avoid mixtures by draining and refilling.

Typical Physical Characteristics

Properties			Method	Shell Omala S4 WE 320
Viscosity Grade			ISO 3448	320
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	321
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	52.7
Viscosity Index			ISO 2909	230
Flash Point		°C	ISO 2592 (COC)	270
Pour Point		°C	ISO 3016	-39
Density	@15°C	kg/m^3	ISO 12185	1069
FZG Load Carrying Test		failure load stage	DIN 51354-2 A/8.3/90	>12

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

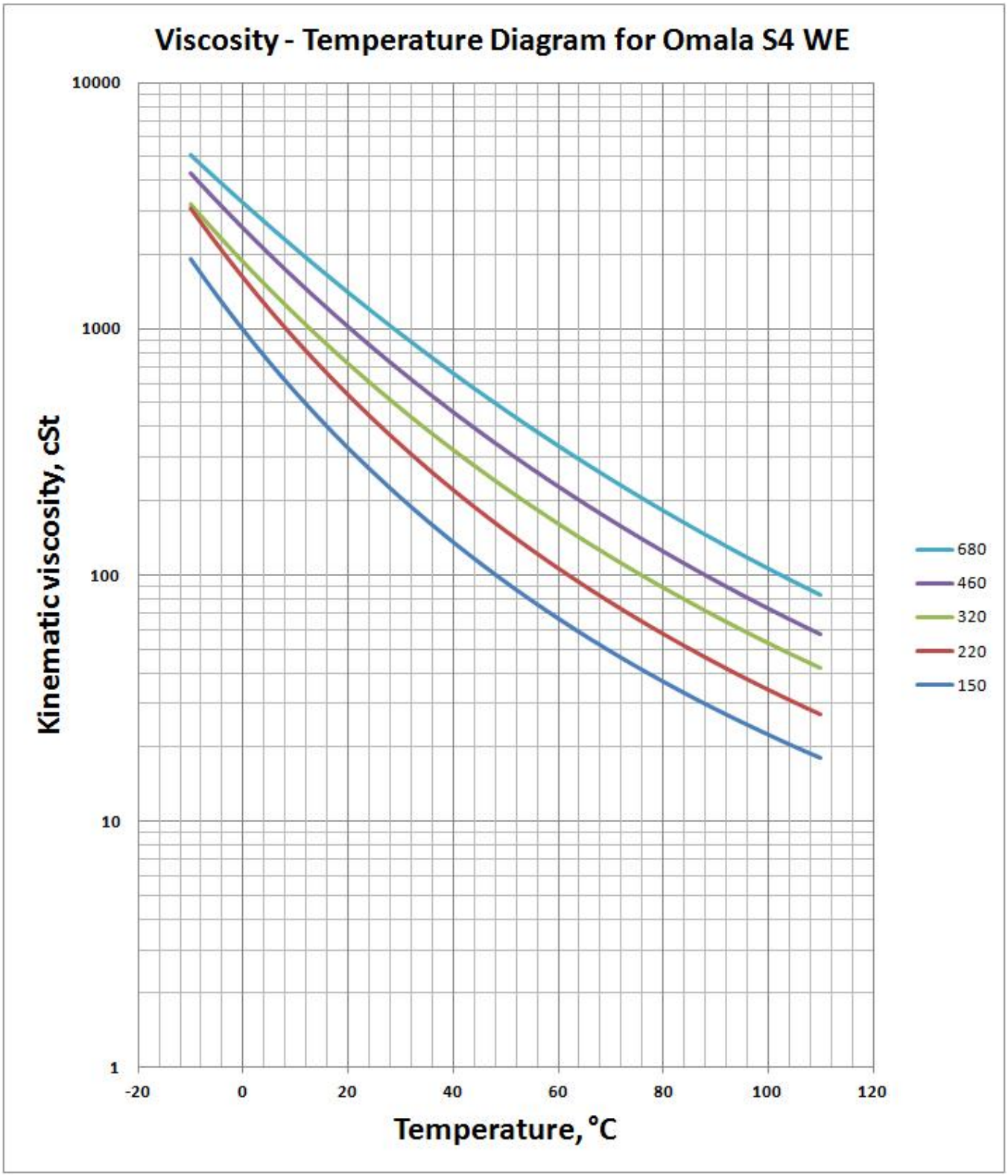
- **Protect the Environment**

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

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.


Viscosity - Temperature Diagram for Omala S4 WE
10000
1000
100
10
1
Kinematic viscosity, cSt
-20
0
20
40
60
80
100
120
Temperature, °C
680
460
320
220
150

Technical Data Sheet

Previous Name: **Shell Omala HD**

Shell Omala *S4 GX 150*

- *Extra Life and Protection*
- *Special Applications*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long duration and/or high temperature operation.

  Shell Omala S4 GX can operate successfully at bulk temperatures up to 120°C.

  Shell Omala S4 GX offers the potential to significantly extend service intervals compared to conventional industrial gear oils.

- **Excellent wear and corrosion protection**

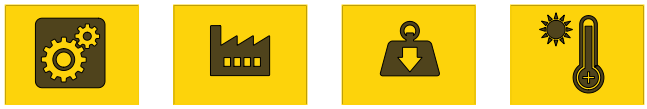
  Shell Omala S4 GX is formulated to have excellent load carrying capacity and micro-pitting performance providing long component life even under shock loading conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

  Shell Omala S4 GX also has excellent corrosion protection, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S4 GX can help maintain or enhance the efficiency of industrial gear systems through improved low temperature performance and lower friction in comparison to mineral oil-based products. This provides better lubrication at low start-up temperatures.

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 severe 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 geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S4 GX.

  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, except ISO 1000
- Approved for wind turbine gearboxes by:
  Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP), except ISO 1000

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

Typical Physical Characteristics

Properties			Method	S4 GX 150
Viscosity Grade			ISO 3448	150
Kinematic Viscosity	@40°C	mm^2/s		157.7
Kinematic Viscosity	@100°C	mm^2/s		21.7
Viscosity Index			ISO 2909	163
Flash Point		°C	ISO 2592 (COC)	238
Pour Point		°C	ISO 3016	-45
Density	@15°C	kg/m^3	ISO 12185	877
FZG Load Carrying Test			DIN 51354-2	-
FZG Load Carrying Test		failure load stage	A/8,3/90	>14
FZG Load Carrying Test		failure load stage	A/16,6/90	>14
Timken OK Load		lbs	ASTM D2782	>85

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Omala S4 GX 150 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Change over procedure**

  Shell Omala S4 GX is based on synthesized hydrocarbon fluids and is compatible with petroleum mineral oil-based industrial gear lubricants - no special change-over procedure is necessary. However, to achieve the complete benefit of Omala S4 GX they should not be mixed with other oils.

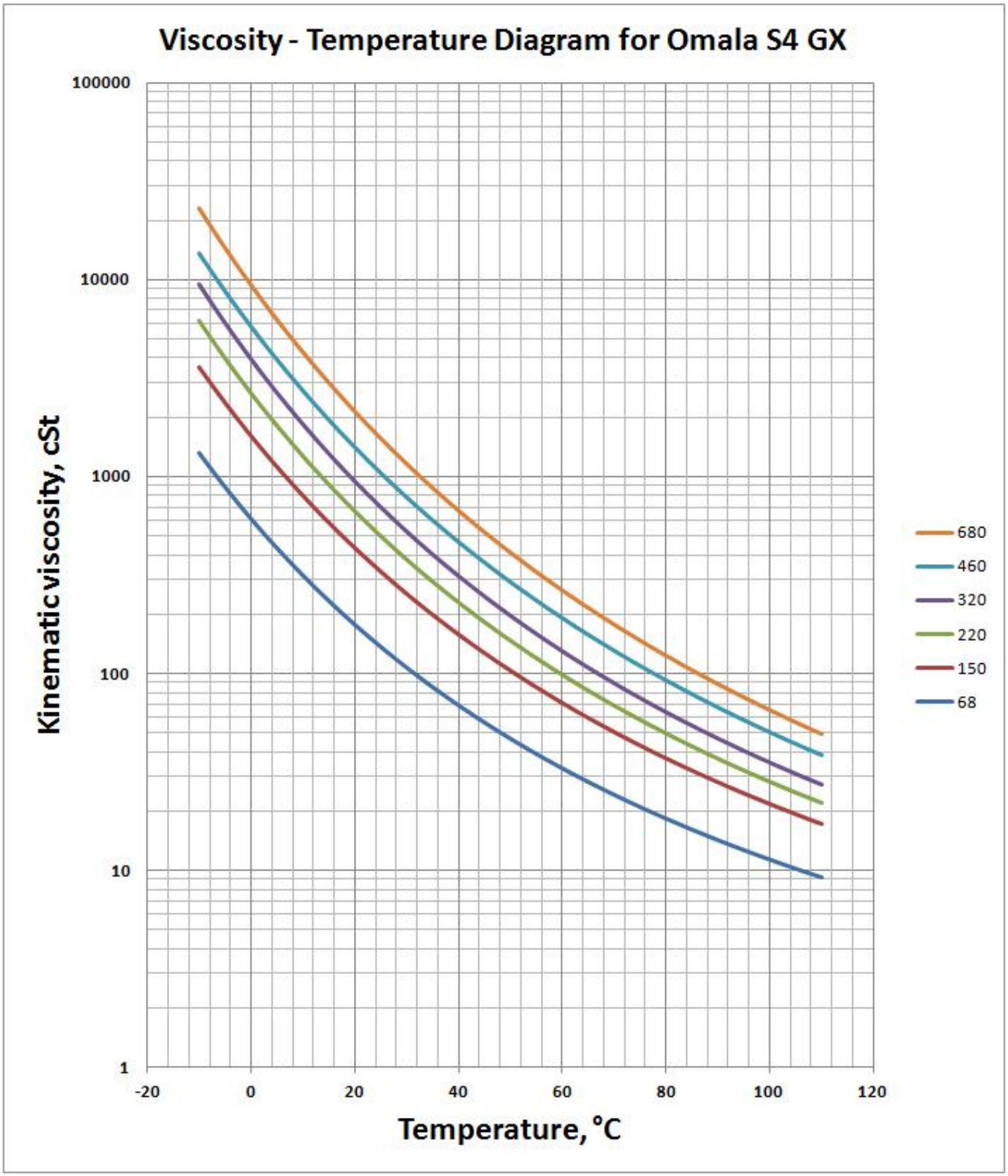
  It is also advisable to ensure that oil systems are clean and free from contamination.

- **Advice**

  Check compatibility with other products before use. Advice on applications not covered here may be obtained from your Shell representative.

- **Storage**

  Protect against the cold.


Viscosity - Temperature Diagram for Omala S4 GX
Kinematic viscosity, cSt
100000
10000
1000
100
10
1
-20
0
20
40
60
80
100
120
Temperature, °C
680
460
320
220
150
68

Technical Data Sheet

Previous Name: **Shell Omala HD**

Shell **Omala** *S4 GX 220*

- *Extra Life and Protection*
- *Special Applications*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long duration and/or high temperature operation.

  This performance is recognised by Flender AG where a formal approval for 20,000 hours (four years) at 80°C usage as been granted.

  Shell Omala S4 GX can operate successfully at bulk temperatures up to 120°C.

  Shell Omala S4 GX offers the potential to significantly extend service intervals compared to conventional industrial gear oils.

- **Excellent wear and corrosion protection**

  Shell Omala S4 GX is formulated to have excellent load carrying capacity and micro-pitting performance providing long component life even under shock loading conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

  Shell Omala S4 GX also has excellent corrosion protection, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S4 GX can help maintain or enhance the efficiency of industrial gear systems through improved low temperature performance and lower friction in comparison to mineral oil-based products. This provides better lubrication at low start-up temperatures.

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 severe 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

- Approved by Siemens MD for Flender gear units and gear motors T7300
- David Brown S1.53.106, except ISO 1000
- Approved for wind turbine gearboxes by:
  Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP), except ISO 1000

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

Typical Physical Characteristics

Properties			Method	Shell Omala S4 GX
Viscosity Grade			ISO 3448	220
Kinematic Viscosity	@40°C	mm^2/s		230
Kinematic Viscosity	@100°C	mm^2/s		30
Viscosity Index			ISO 2909	160
Flash Point		°C	ISO 2592 (COC)	250
Pour Point		°C	ISO 3016	-45
Density	@15°C	kg/m^3	ISO 12185	881
FZG Load Carrying Test			DIN 51354-2	-
FZG Load Carrying Test		failure load stage	A/8,3/90	>14
FZG Load Carrying Test		failure load stage	A/16,6/90	>14
Timken OK Load		lbs	ASTM D2782	>85

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/
- **Protect the Environment**

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

Additional Information

- **Advice**

  Check compatibility with other products before use.

  Advice on applications not covered here may be obtained from your Shell representative.

Technical Data Sheet

Previous Name: **Shell Omala HD**

Shell Omala *S4 GX 460*

- *Extra Life and Protection*
- *Special Applications*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long duration and/or high temperature operation.

  Shell Omala S4 GX can operate successfully at bulk temperatures up to 120°C.

  Shell Omala S4 GX offers the potential to significantly extend service intervals compared to conventional industrial gear oils.

- **Excellent wear and corrosion protection**

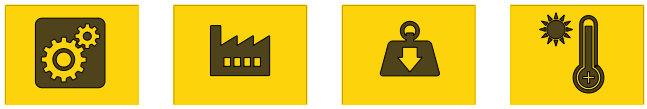
  Shell Omala S4 GX is formulated to have excellent load carrying capacity and micro-pitting performance providing long component life even under shock loading conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

  Shell Omala S4 GX also has excellent corrosion protection, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S4 GX can help maintain or enhance the efficiency of industrial gear systems through improved low temperature performance and lower friction in comparison to mineral oil-based products. This provides better lubrication at low start-up temperatures.

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 severe 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 geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S4 GX.

  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, except ISO 1000
- Approved for wind turbine gearboxes by:
  Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP), except ISO 1000

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

Typical Physical Characteristics

Properties			Method	S4 GX 460
Viscosity Grade			ISO 3448	460
Kinematic Viscosity	@40°C	mm^2/s		462.5
Kinematic Viscosity	@100°C	mm^2/s		50
Viscosity Index			ISO 2909	170
Flash Point (COC)		°C	ISO 2592	264
Pour Point		°C	ISO 3016	-36
Density	@15°C	kg/m^3	ISO 12185	879
FZG Load Carrying Test			DIN 51354-2	-
FZG Load Carrying Test		failure load stage	A/8,3/90	>14
FZG Load Carrying Test		failure load stage	A/16,6/90	>14
Timken OK Load		lbs	ASTM D2782	>85

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Omala S4 GX 460 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Change over procedure**

  Omala S4 GX is based on synthesized hydrocarbon fluids and is compatible with petroleum mineral oil-based industrial gear lubricants - no special change-over procedure is necessary. However, to achieve the complete benefit of Omala S4 GX they should not be mixed with other oils.

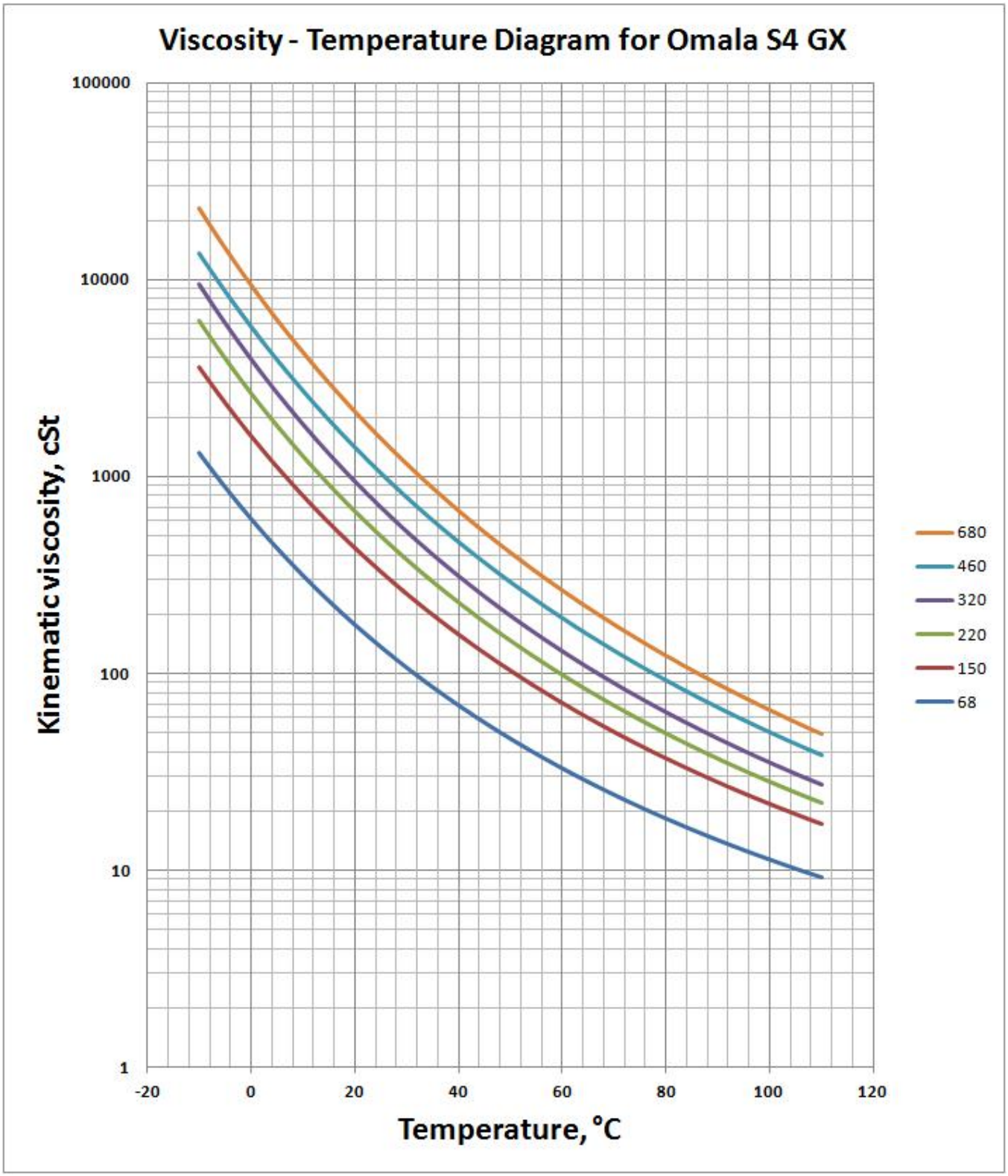
  It is also advisable to ensure that oil systems are clean and free from contamination.

- **Advice**

  Check compatibility with other products before use. Advice on applications not covered here may be obtained from your Shell representative.

- **Storage**

  Protect against the cold.


Viscosity - Temperature Diagram for Omala S4 GX
Kinematic viscosity, cSt
100000
10000
1000
100
10
1
-20
0
20
40
60
80
100
120
Temperature, °C
680
460
320
220
150
68

Technical Data Sheet

Previous Name: **Shell Omala HD**

Shell Omala *S4 GX 680*

- *Extra Life and Protection*
- *Special Applications*

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long duration and/or high temperature operation.

  Shell Omala S4 GX can operate successfully at bulk temperatures up to 120°C.

  Shell Omala S4 GX offers the potential to significantly extend service intervals compared to conventional industrial gear oils.

- **Excellent wear and corrosion protection**

  Shell Omala S4 GX is formulated to have excellent load carrying capacity and micro-pitting performance providing long component life even under shock loading conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

  Shell Omala S4 GX also has excellent corrosion protection, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S4 GX can help maintain or enhance the efficiency of industrial gear systems through improved low temperature performance and lower friction in comparison to mineral oil-based products. This provides better lubrication at low start-up temperatures.

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 severe 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 geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S4 GX.

  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, except ISO 1000
- Approved for wind turbine gearboxes by:
  Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP), except ISO 1000

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

Typical Physical Characteristics

Properties			Method	S4 GX 680
Viscosity Grade			ISO 3448	680
Kinematic Viscosity	@40°C	mm^2/s		670.4
Kinematic Viscosity	@100°C	mm^2/s		64.9
Viscosity Index			ISO 2909	169
Flash Point (COC)		°C	ISO 2592	256
Pour Point		°C	ISO 3016	-33
Density	@15°C	kg/m^3	ISO 12185	881
FZG Load Carrying Test			DIN 51354-2	-
FZG Load Carrying Test		failure load stage	A/8,3/90	>14
FZG Load Carrying Test		failure load stage	A/16,6/90	>14
Timken OK Load		lbs	ASTM D2782	>85

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Omala S4 GX 680 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Change over procedure**

  Omala S4 GX is based on synthesized hydrocarbon fluids and is compatible with petroleum mineral oil-based industrial gear lubricants - no special change-over procedure is necessary. However, to achieve the complete benefit of Omala S4 GX they should not be mixed with other oils.

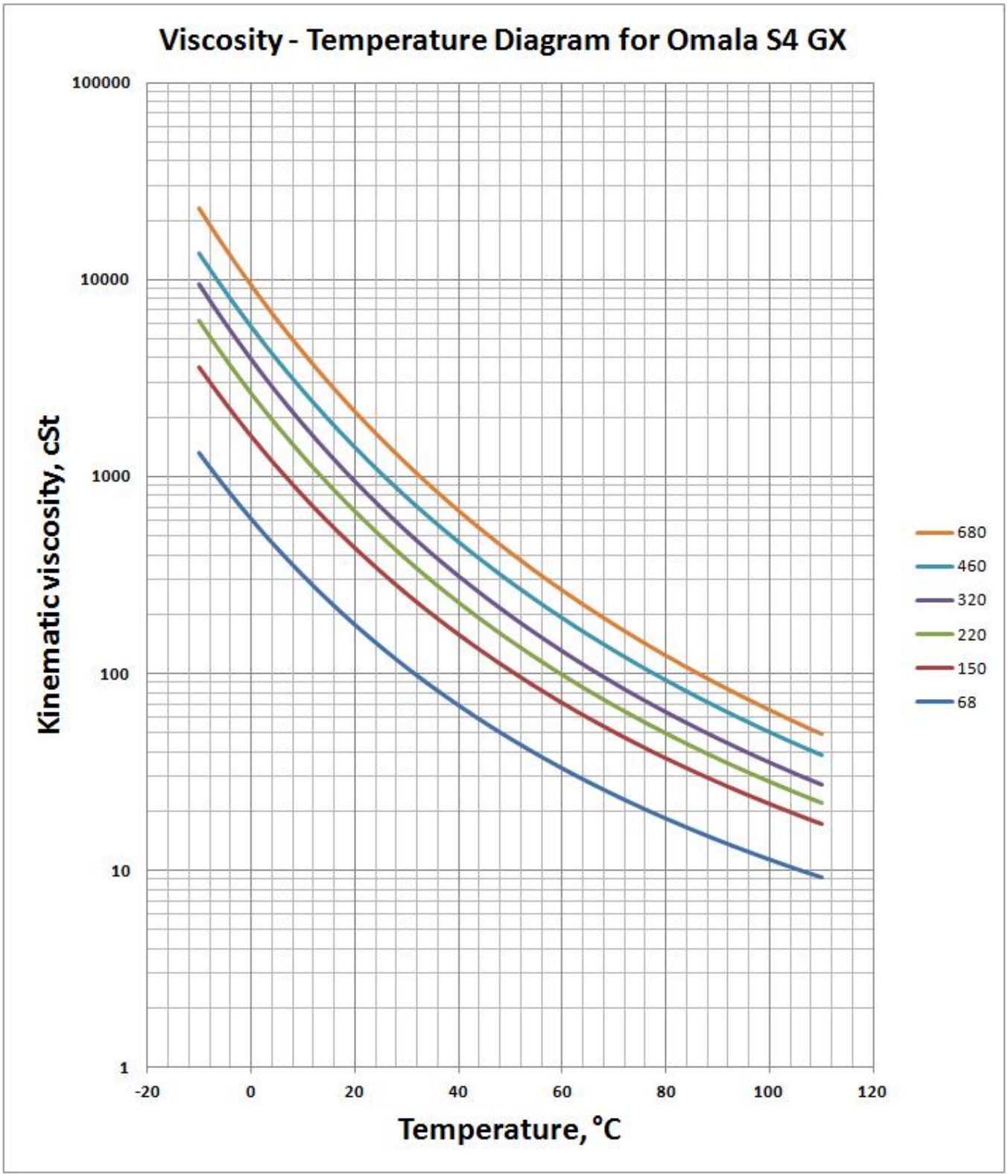
  It is also advisable to ensure that oil systems are clean and free from contamination.

- **Advice**

  Check compatibility with other products before use. Advice on applications not covered here may be obtained from your Shell representative.

- **Storage**

  Protect against the cold.


Viscosity - Temperature Diagram for Omala S4 GX
Kinematic viscosity, cSt
100000
10000
1000
100
10
1
-20
0
20
40
60
80
100
120
Temperature, °C
680
460
320
220
150
68

Technical Data Sheet

Previous Name: **Shell Omala HD**

Shell Omala *S4 GX 320*

Extra Life and Protection
Special Applications

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.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Long oil life - maintenance saving**

  Shell Omala S4 GX is formulated using an advanced additive system in combination with specially selected synthetic base fluids to provide outstanding resistance to breakdown over long duration and/or high temperature operation.

  Shell Omala S4 GX can operate successfully at bulk temperatures up to 120^{0}C.

  Shell Omala S4 GX offers the potential to significantly extend service intervals compared to conventional industrial gear oils.

- **Excellent wear and corrosion protection**

  Shell Omala S4 GX is formulated to have excellent load carrying capacity and micro-pitting performance providing long component life even under shock loading conditions. These features provide benefits over mineral oil-based products in terms of gear and bearing component life.

  Shell Omala S4 GX also has excellent corrosion protection, even in the presence of contamination by water and solids.

- **Maintaining system efficiency**

  Shell Omala S4 GX can help maintain or enhance the efficiency of industrial gear systems through improved low temperature performance and lower friction in comparison to mineral oil-based products. This provides better lubrication at low start-up temperatures.

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 severe 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 geared systems, or other applications that employ a filtration unit finer than 5 microns, please consult your Shell Local Technical Advisor and Product Application Specialist before using Shell Omala S4 GX.

  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, except ISO 1000
- Approved for wind turbine gearboxes by: Gamesa, Dongfang Wind Turbines, Dalian Heavy Industries and Sinovel
- ORBITAL2 approved for helical and planetary gear units for wind turbines
- ISO 12925-1 Type CKD, except ISO 1000
- ANSI/AGMA 9005-E02 (EP), except ISO 1000
- US Steel 224, except ISO 1000
- DIN 51517-3 (CLP), except ISO 1000

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

Typical Physical Characteristics

Properties			Method	Shell Omala S4 GX 320
Viscosity Grade			ISO 3448	320
Kinematic Viscosity	@40°C	mm^2/s	ISO 3104	335
Kinematic Viscosity	@100°C	mm^2/s	ISO 3104	40
Viscosity Index			ISO 2909	159
Flash Point		°C	ISO 2592 (COC)	252
Pour Point		°C	ISO 3016	-42
Density	@15°C	kg/m^3	ISO 12185	883
FZG Load Carrying Test			DIN 51354-2	-
FZG Load Carrying Test		failure load stage	A/8,3/90	>14
FZG Load Carrying Test		failure load stage	A/16,6/90	>14
Timken OK Load		lbs	ASTM D2782	>85

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Omala S4 GX 320 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

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

Additional Information

- **Change over procedure**

  Omala S4 GX is based on synthesized hydrocarbon fluids and is compatible with petroleum mineral oil-based industrial gear lubricants - no special change-over procedure is necessary. However, to achieve the complete benefit of Omala S4 GX they should not be mixed with other oils.

  It is also advisable to ensure that oil systems are clean and free from contamination.

- **Advice**

  Check compatibility with other products before use. Advice on applications not covered here may be obtained from your Shell representative.

- **Storage**

Protect against the cold.