Technical Data Sheet

Shell Naturelle *S4 Gear Fluid 100*

- *US EPA VGP COMPLIANT*

Special Purpose Biodegradable Synthetic Gear and Bearing Fluid

Shell Naturelle S4 Gear Fluid is an advanced synthetic fluid for use in gearing applications such as thrusters and propulsion drives. Manufactured from fully saturated esters, Shell Naturelle S4 Gear Fluid is designed to offer superior load carrying performance whilst also being readily biodegradable with low ecotoxicity. Shell Naturelle S4 Gear Fluid is an Environmentally Acceptable Lubricant (EAL) according to the definitions of the US EPA 2013 Vessel General Permit.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **High viscosity index**
  Provides a shear stable lubricant which helps to protect components over a wide temperature range.
- **Longer service life**
  Fully saturated esters ensure excellent resistance to oxidation and hydrolysis while offering high temperature thermal stability. Shell Naturelle S4 Gear Fluid offers the potential to extend service intervals compared to conventional mineral gear oils.
- **Load carrying and wear protection**
  Shell Naturelle S4 Gear Fluid is formulated to have excellent load carrying capacity and anti scuffing performance. Advanced non toxic additives provide protection over a wide range of conditions and ensure long component life, even under shock loading conditions.
- **Maintaining system efficiency**
  Shell Naturelle S4 Gear fluid has excellent water separation properties. Excess water can be easily drained from lubrication systems; which helps to extend the life of equipment and ensures efficient lubrication of contact areas.
- **Readily biodegradable**
  Shell Naturelle S4 Gear Fluid is biodegraded by over 60% after 28 days in the OECD 301 bio degradation test.
- **Low toxicity towards the environment**
  Reduced impact of accidental escape into the environment. Shell Naturelle S4 Gear Fluid is classified as 'not harmful' to bacteria, algae, freshwater and marine invertebrates, and fish when tested as water-accommodated fractions (WAFs) according to OECD and EPA test guidelines.
- **Recommended for use in environmentally sensitive areas**
  Shell Naturelle S4 Gear Fluid is an 'environmentally acceptable lubricant' as defined by the USA EPA 2013 Vessel General Permit and offers reduced harm when used in marine environments compared to conventional mineral oils. Has a reduced environmental impact in the event of a leak or accidental spillage. It is particularly suited for use in environmentally sensitive areas.

Main Applications

- Marine propulsion drives, thrusters and controllable pitch propellers
- Industrial gears, bearings and other components in circulated and splash lubricated systems

Specifications, Approvals & Recommendations

- ISO 3448 VG 68 / 100 / 150
- USA EPA VGP compliant
- DIN 51517-3 CLP E 68 / 100 /150
- ISO 14635 A20/8.3/90 >13

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

Compatibility & Miscibility

Fluid Compatibility

Shell Naturelle Gear Fluids are miscible with mineral oils. However, in order to ensure that the environmental properties and performance of Shell Naturelle Gear Fluids are maintained, the system should be drained and flushed thoroughly when changing fluids.

Owing to the surface-wetting properties of EAL's, if the system previously contained mineral oil, deposits formed in the system during previous operation may be loosened and accumulate in the system filters. The filters should therefore be checked at regular intervals, especially after change-over.

It is strongly recommended that an oil sample is taken from the system following changeover and analysed via the Shell Rapid Lubricants Analysis service to confirm the new fluid charge is fit for use.

Seal and Paint Compatibility

Shell Naturelle Gear Fluids are compatible with seal materials and paints normally specified for use with conventional mineral oils. However, advice should be sought from your OEM confirming suitability for use of Shell Naturelle Gear Fluid in your specific application. Further information is also available from your local Shell technical help desk.

Typical Physical Characteristics

Properties			Method	Naturelle S4 Gear Fluid 100
ISO Viscosity Grade				100
Kinematic Viscosity	@ 40°C	cSt	ISO 3104	100
Kinematic Viscosity	@ 100°C	cSt	ISO 3104	14
Viscosity Index			ISO 2909	140
Flashpoint COC		°C	ISO 2592	280
Pourpoint		°C	ISO 3016	-24
Density	@ 15°C	kg/m^3	ISO 12185	918
Demulsification			ISO 6614	<30 mins
FZG Load Carrying Test			Failure load stage A20/8,3/90 (ISO 14635-1)	>13

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 Naturelle S4 Gear Fluid 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 www.epc.shell.com

Protect the Environment

When used in marine applications, ensure used fluids are disposed of in accordance with IMO MARPOL 73/78 Annex V (as amended) regulations to a Port waste reception facility. For non-marine applications, 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.

Additional Technical Advice

Information and guidance offered for use of Shell Naturelle products is based on experience and understanding gained through the development and manufacturing of lubricants. Product performance can be influenced by a number of variables, not limited to, contamination, operating temperature, equipment application, external environment and material type. It is recommended that you

discuss application and fluid recommendations with both your OEM and local Shell technical representative before the product is used. Advice given is non binding and Shell will not be held liable for any consequence as a result of or through misuse of the fluid.