



Formerly Known As: PANOLIN EP GEAR SYNTH

## Shell PANOLIN S4 Gear 220

- Extended Life
- Biodegradability Profile: See Specifications and Approvals

### *Advanced Saturated Synthetic Ester Industrial Gear Oil*

Shell PANOLIN is our range of high-performance lubricants and greases tested for high biodegradability and lower environmental impact in aquatic environments. Shell PANOLIN S4 Gear is a synthetic fluid for use in gearing applications such as marine propulsion drives, thrusters and controllable pitch propellers, high-performance and based on saturated synthetic esters for industrial gear drives. Biodegradability profile:  $\geq 57\%$  w/w of this lubricant's components are readily biodegradable, achieving a passing result of  $\geq 60\%$  according to OECD 301B. The fully formulated lubricant meets the requirements of EN 17181:2019.

## DESIGNED TO MEET CHALLENGES

### Performance, Features & Benefits

- **Increased Wear Protection**

Carefully selected additives provide advanced wear protection over a wide range of conditions, ensuring long component life.

- **Maintaining system efficiency**

Shell PANOLIN S4 Gear Oil has a high viscosity index providing shear stability which helps protect components over a wide temperature range. The low pour point and cold flow characteristics provide protection and performance even in cold climates.

- **Longer Service Life**

Shell PANOLIN S4 Gear Oil has strong oxidative stability at high temperatures which results in reduced fluid degradation, reducing filter blockage and increased viscosity. This helps prevent component failures, frequent filter and fluid changes, downtime, fluid consumption and parts and labour costs.

- **Lower Environmental Impact**

Offers reduced impact of leaks or accidental spillage into aquatic environments compared to conventional mineral gear oils thanks to their higher biodegradability.

(Publication EPA 800-R-11-002).

### Biodegradability profile:

At least 57% by mass of this lubricant's components are readily biodegradable, achieving a passing result of  $\geq 60\%$  according to OECD 301B.

Meets the requirements of EN 17181:2019, a modified OECD 301B-based test method for determining the aerobic biodegradation of fully formulated lubricants.

### Low ecotoxicity:

Classified as not harmful to algae, freshwater invertebrates and fish when assessed by an independent laboratory using water-accommodated fractions (WAFs) in accordance with OECD Guidelines 201 and 202 on the finished product, and OECD 203 based on component assessment. Meets the requirements of EN 16807, with acute toxicity values  $>100$  mg/L.

### Main Applications



### Specifications, Approvals & Recommendations

- ZF TE-ML 04M
- $\geq 57\%$  w/w of this lubricant's components are readily biodegradable, achieving a passing result of  $\geq 60\%$  according to OECD 301B
- Meets requirements of EN17181:2019

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

## Compatibility & Miscibility

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

- Fluid Compatibility**

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

## Typical Physical Characteristics

| Properties          |       |                    | Method     | Shell PANOLIN S4 Gear 220 |
|---------------------|-------|--------------------|------------|---------------------------|
| Kinematic Viscosity | @40°C | mm <sup>2</sup> /s | ASTM D445  | 220                       |
| Pour Point          |       | °C                 | ASTM D97   | -51                       |
| Flash Point         |       | °C                 | ASTM D92   | 300                       |
| Density             | @15°C | kg/m <sup>3</sup>  | ASTM D4052 | 923                       |
| FZG Test Stage      |       |                    | DIN 51354  | 12                        |

These characteristics are typical of production, 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 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.