Technical Data Sheet

Formerly Known As: **PANOLIN BIOFLUID ZFH**

Shell **PANOLIN** *Biofluid ZFH*

- Versatile Application
- Readily Biodegradable
- ZF Approved

Readily Biodegradable

Shell PANOLIN Biofluid ZFH is a readily biodegradable lubricant with good thermal ageing stability. PANOLIN Biofluid ZFH is designed for use in transmissions and hydraulic systems.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Design to protect against cold**

  Excellent cold flow characteristics due to extremely low pour point.

- **Maintaining System Efficiency**

  Good thermal-ageing stability protects the machine over time.

- **Lower Environmental Impact**

  Recommended for use in environmentally sensitive areas - offers reduced impact of leak or accidental spillage into the environment compared to conventional mineral oils. Readily biodegradable, biodegraded by over 60% after 28 days in the OECD 301 B carbon dioxide evolution test. Low Ecotoxicy, classified as 'not harmful' when tested as water-accommodated fractions (WAFs) according to OECD and EPA test guidelines. Tested to Industry Standard by 3rd Party Lab, all Shell PANOLIN products are tested against OECD 202.

Main Applications

- **WARNING!**

  Not to be used as an Engine Oil.

Specifications, Approvals & Recommendations

- ZF TE-ML 03H, 06G, 07E
- Biodegradable OECD 301B >60%

  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 Rapid Lubricants Analysis 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 BIOFLUID ZFH
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	71.5
Pour Point		°C	ASTM D97	-55
Flash Point		°C	ASTM D92	244
Density	@15°C	kg/m^3	ASTM D4052	923

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.

- **Additional Technical Advice**

  The information and guidance offered for use of Shell PANOLIN products is based on experience and understanding gained through the development and manufacturing of lubricants. The performance of the products 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.