Technical Data Sheet

Formerly Known As: **PANOLIN HLP SYNTH**

Shell **PANOLIN** *S4 HLP Synth 32*

- Enhanced Life
- Bosch Rexroth Approved
- Readily Biodegradable

Hydraulic fluid - high performance, readily biodegradable, saturated synthetic esters

ISO 32,46,68 Shell PANOLIN S4 HLP Synth, the first Bosch approved HEES fluid, is our highest performance and industry leading biodegradable saturated ester (HEES) type synthetic hydraulic fluid. Shell PANOLIN S4 HLP Synth is formulated with special zinc-free additive technology, and high-performance fully synthetic saturated esters. Shell PANOLIN S4 HLP Synth offers increased machinery efficiency through enhanced oil life and premium wear protection. Particularly suited for use in environmentally sensitive areas and in stationary and mobile hydraulic systems including construction, earthmoving and forestry.

High-Performance Biodegradable Lubricants

Performance, Features & Benefits

- **Enhanced oil life**

  Shell PANOLIN S4 HLP Synth has an enhanced oil life and is designed to help equipment operate without interruptions, with multiple field examples of life time filling. Longer oil-drain intervals mean less oil being produced, purchased and disposed of. Shell PANOLIN S4 HLP Synth has an outstanding dry TOST life of over 6000 hours (modified ASTM D943 test). Shell PANOLIN S4 HLP Synth has good oxidative stability 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 labor costs.

- **Premium wear protection**

  Shell PANOLIN S4 HLP Synth, the first Bosch approved HEES fluid, is designed to help equipment operate without interruptions. Shell PANOLIN S4 HLP Synth offers exceptional wear protection of hydraulic equipment, and strong protection from the build up of sludge and varnish.

- **Designed to protect even in cold climates**

  Shell PANOLIN S4 HLP Synth has good cold flow behaviour which enables a safe start even in cold conditions, thereby reducing the risk of metal-on-metal wear. In addition to protecting the machine over a wide temperature operating range, shear-stable, high viscosity index fluids help enable increased hydraulic efficiency in comparison to typical HM mineral oil.

- **Lower 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 Ecotoxicity, classified as 'not harmful' when tested as water-accommodated fractions (WAFs) according to OECD test guidelines. Tested to Industry Standard by 3rd Party Lab, Shell PANOLIN S4 HLP Synth has been tested against OECD 201,202 & 203.

- Shell PANOLIN Lubricants are manufactured in Switzerland and also expanding in North America and Asia to support growing demand.
  Shell PANOLIN Lubricants plastic packs contain at least 25% recycled plastic (Post Consumer Resin (PCR)).
  Shell PANOLIN Lubricants combined with Shell lubricant services can help customers to unlock potential reductions in carbon footprints and improvements in operational efficiencies.

Main Applications

- For stationary and mobile hydraulic systems including earthmoving, forestry, construction and hydroelectric applications. Compressors, bearing lubrication and oil circulation systems & marine hydraulic systems.

Specifications, Approvals & Recommendations

- Bosch Rexroth Fluid Rating List RDE 90245
- ISO 15380: 2016 HEES
- Biodegradable OECD 301B >60%
- Japan Eco Mark

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.
- This lubricant should not be mixed with other biodegradable hydraulic fluids to ensure that the environmental properties and performance of fluid is maintained. The system should be drained and flushed thoroughly when changing fluids, guidelines on fluid change-over can be found in ISO15380 Annex A.
- This lubricant is compatible with fluoroelastomers (FPM/FKM) such as Viton. Other seal materials and system components such as paints may be adversely affected and advice should be sought from the respective manufacturers.

Typical Physical Characteristics

Properties			Method	Shell PANOLIN S4 HLP Synth 32
ISO Fluid Type			ISO 6743-4	HEES
Kinematic Viscosity	@-20°C	mm^2/s	ASTM D445	1 522
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	33.3
Kinematic Viscosity	@100°C	mm^2/s	ASTM D445	6.3
Viscosity Index			ASTM D2270	153
Density	@15°C	kg/m^3	ASTM D4052	915
Flash Point		°C	ASTM D92	240
Colour			ASTM D1500	Clear amber
Water Separability		minutes	ASTM D1401	15
TOST life		hours minimum	ASTM D943	7 000
Pour Point		°C	ASTM D97	-58
Biodegradability	after 28 days	% minimum	OECD 301B	85
Iodine Value		g I2/100g maximum	Oleon OA-020	7

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 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.