Technical Data Sheet

Formerly Known As: **Shell Naturelle S2 Hydraulic Fluid, Shell Naturelle HF-E**

Shell **PANOLIN** *S2 Hydraulic DU EAL 68*

- EU Ecolabel Certified
- USA EPA VGP compliant
- Versatile Applications

Advanced biodegradable and HEES type synthetic hydraulic fluid.

Readily biodegradable with low ecotoxicity, particularly suited for use in environmentally sensitive areas where eco-label compliance is required including US waters. Fully synthetic esters, blended with ashless additives, provide this fluid with an excellent blend of lubrication performance and environmental acceptability.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Good wear protection**

  Advanced ashless (zinc-free) anti-wear additives provide protection over a wide range of conditions – proven protection in tough industry standard tests such as the Eaton Vickers 35VQ25 vane pump and Komatsu HPV35+35 high pressure piston pump. The excellent anti-wear properties and high viscosity index (VI) of mean that it can often be used where ISO 11158 (HM/HV) and DIN 51524 Part 2 or Part 3 (HLP/HVLP) mineral oil hydraulic fluids are specified. However, bulk fluid operating temperatures should not be allowed to exceed 90^{0}C.

- **Maintaining system efficiency**

  Excellent viscosity/temperature characteristics can minimize the changes of viscosity with variation in operation temperature, giving true ‘multigrade’ characteristics. Outstanding cleanliness and filterability, coupled with excellent water separation, air release and antifoam characteristics, all help contribute to maintaining or enhancing the efficiency of hydraulic systems.

- **Lower Environmental Impact**

  Recommended for use in environmentally sensitive areas: An ‘environmentally acceptable lubricant’ as defined by the USA EPA 2013 Vessel General Permit and offers reduced impact of leak or accidental spillage into the environment when used in marine environments 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’ to when tested as water-accommodated fractions (WAFs) according to OECD test guidelines.

- **Very high renewables content**

  A mean biobased content of 82% (ASTM D 6866).

- **Fire-Resistant**

  HFDU Fire-Resistance hydraulic fluid with a high flash point.

Main Applications



Specifications, Approvals & Recommendations

- ISO 15380: 2023 HEES
- Meets USDA Bio-preferred programme
- Meets requirements of EU Ecolabel certificate number NL/027/019
- Meets requirement of United States Environmental Protection Agency’s (EPA) 2013 vessel general permit (VGP)
- Swedish Standard SS 15 54 34 SP
- Sperry Marine
- Quantum Marine Engineering
- Rolls Royce Marine
- ISO 12922 (2012) HFDU
- FM Approved
- MSHA (Mine Safety and Health Administration) Approved

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

Helpdesk, or the OEM Approval website.

Compatibility & Miscibility

- **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.

- **Seal & Paint Compatibility**

  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 S2 Hydraulic DU EAL 68
ISO Viscosity Grade			ISO 3448	68
ISO Fluid Type			ISO 6743-4	HEES
Kinematic Viscosity	@-20°C	cSt	ASTM D445	2 640
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	67.7
Kinematic Viscosity	@100°C	mm^2/s	ASTM D445	12.3
Viscosity Index			ISO 2909	183
Density	@15°C	kg/m^3	ASTM D4052	924
Flash Point		°C	ASTM D92	320
Pour Point		°C	ASTM D97	-39
Biodegradable		%28days	OECD 301B	68

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.

  Bulk operating temperatures should not be allowed to exceed 90°C.

- **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.