



Formerly Known As: **EcoSafe FR-46**

Shell EcoSafe S3 DU 46

Advanced Fire Resistant (HFDU) Synthetic PAG Hydraulic Oil

Shell EcoSafe S3 DU 46 is a synthetic fire-resistant hydraulic fluid, based on very high VI, polyalkylene glycol (PAG) base stocks, coupled with a proven ashless additive package. Shell EcoSafe S3 DU 46 has been designed to minimize fluid degradation and thus extend fluid changeout intervals under even the most severe operating conditions. Shell EcoSafe S3 DU 46 provides the performance properties demanded by today's high-performance hydraulic systems. At least 97% by mass of Shell EcoSafe S3 DU 46 components are readily biodegradable, achieving a passing result of $\geq 60\%$ according to OECD 301B.

- Enhanced sludge and varnish protection

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Excellent fire resistance**

Shell EcoSafe S3 DU 46 is inherently fire-resistant and is FM Approved, offering high flash point, high fire point and high auto-ignition temperature. It minimizes the risk of fire, which could potentially be caused by mineral oil products.

- **Enhanced system protection**

Shell EcoSafe S3 DU 46 offers excellent lubricity, for outstanding pump life under the most severe conditions. The fluid meets or exceeds the pump performance of premium, anti-wear mineral oils, even at 5,500 psi (380 bar) operating pressure. Shear stability is excellent. Shell EcoSafe S3 DU 46 achieved a 13-stage rating in the FZG Gear Test demonstrating a high level of protection against wear and scuffing.

- **Good hydrolytic stability**

Shell EcoSafe S3 DU 46 will not break down and react with water, minimizing fluid degradation and acid formation that can damage and eventually destroy hydraulic pumps. No acid removal/ion exchange filters are required.

- **High resistance to sludge or varnish formation**

Shell EcoSafe S3 DU 46 is formulated to provide high resistance against varnish and sludge formation. Field experience has shown long-term system cleanliness while extending maintenance intervals and service life. In addition, this fluid is very stable at high temperatures and resistant to thermal degradation up to 120°C.

- **Suitable for all-weather service**

A high viscosity index in combination with excellent low-temperature fluidity provide a year-round fluid that protects the machine from cavitation at cold startups and provides durability at higher operating temperatures.

- **Excellent compatibility**

While Shell EcoSafe S3 DU 46 is compatible with many different types of fluids, to ensure proper system performance, it is recommended to properly clean and flush hydraulic systems during conversions. Shell EcoSafe S3 DU 46 is compatible with commonly used seals, hoses and metals.

Detailed flushing procedures and compatibility data are available upon request.

Main Applications



- **Hydraulic fluid**

Shell EcoSafe S3 DU 46 can be used as the hydraulic fluid in industrial and mobile equipment, including high-pressure systems, hydrostatic drives, systems with servo valves, and robotics.

Specifications, Approvals & Recommendations

- FM Approved
- Shell EcoSafe S3 DU 46 is classified as FM Approved industrial fluids by Factory Mutual.

At least 97% by mass of Shell EcoSafe S3 DU 46 components are readily biodegradable, achieving a passing result of $\geq 60\%$ according to OECD 301B.

Shell EcoSafe S3 DU 46 meets or surpass Bosch-Rexroth, Sauer-Danfoss, Denison, Parker, Oil gear, and Eaton (Formerly Vickers) specification.

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

Typical Physical Characteristics

Properties	Method	Shell EcoSafe S3 DU 46
ISO Viscosity Grade		46
Kinematic Viscosity @40°C mm ² /s	ASTM D445	50.0
Kinematic Viscosity @100°C mm ² /s	ASTM D445	9.5
Viscosity Index	ISO 2909	178
Density @15°C kg/m ³	ASTM D4052	992
Flash Point °C	ASTM D92	275
Fire Point (COC) °C	ASTM D92	315
Autoignition temperature °C	ASTM E659	388
Air Release minutes	ASTM D3427	3
Pour Point °C	ASTM D97	-45
FZG (A/8,3/90) Fail Stage	ISO 14635-1	12

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 EcoSafe S3 DU 46 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 <https://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.