



## Technical Data Sheet

# Shell Naturelle HF-E 46

- European Union Ecolabel
- Versatile Applications

*Environmentally Considerate, Fully Synthetic Hydraulic Fluid*

Shell Naturelle Fluid HF-E is an advanced hydraulic fluid for use in hydraulic and power transmission systems. It is readily biodegradable with a low ecotoxicity, and is particularly suited for use in environmentally sensitive areas. Fully synthetic esters, blended with ashless additives, provide Shell Naturelle Fluid HF-E with a superior blend of lubrication performance and environmental acceptability.

## DESIGNED TO MEET CHALLENGES

### Performance, Features & Benefits

#### ■ Excellent 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.

#### ■ Maintaining system efficiency

Superior cleanliness and filterability; coupled with excellent water separation, air release and anti-foam characteristics, all help to maintain or enhance hydraulic system efficiency. The filterability of Shell Naturelle Fluid HF-E exceeds the stringent DIN 51524 Part 3 HVLP requirements, even when contaminated with water. Shell Naturelle Fluid HF-E is delivered with a minimum ISO 4406 cleanliness of 21/19/16.

#### ■ Readily biodegradable

Shell Naturelle Fluid HF-E is biodegraded by over 60% after 28 days in the OECD 301 B carbon dioxide evolution test.

#### ■ Low toxicity towards the environment

Shell Naturelle Fluid HF-E is classified as 'not harmful' to bacteria, algae, freshwater and marine invertebrates, and fish when tested as water-accommodated fractions (WAFs) according to OECD and EPA test guidelines.

#### ■ Very high renewables content

Shell Naturelle Fluid HF-E has a mean biobased content of over 80% (ASTM D 6866).

The naturally high, shear stable viscosity index (VI) of Shell Naturelle Fluid HF-E helps deliver responsive performance from cold start to full load, heavy duty operation.

#### ■ General industrial control equipment and hydraulic systems

The excellent anti-wear properties and high viscosity index (VI) of Shell Naturelle Fluid HF-E, 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°C.

#### ■ Environmentally sensitive areas

Shell Naturelle Fluid HF-E is an 'environmentally acceptable' hydraulic fluid (ISO 15380 HEES), with 'reduced harm for water and soil during use' (European Union ecolabel). When compared to conventional mineral oil hydraulic fluids, it will have a reduced environmental impact in the event of a leak or accidental spillage. It is particularly suited for use in environmentally sensitive areas.

### Specifications, Approvals & Recommendations

- European Union ecolabel for lubricants
- Swedish Standard SS 15 54 34, SP listed.
- ISO 15380 HEES
- VDMA 24568 synthetic esters
- Dutch MIA/VAMIL Milieulijst
- German Positivliste Bioschmierstoffe
- USDA Bio-preferred program
- Shell Naturelle Fluid HF-E is approved as meeting the anti-wear requirements of the hydraulic fluid recommendations for Eaton Vickers products for mobile and industrial systems according to Brochure 03-401-2010.

For a full listing of equipment approvals and recommendations,

### Main Applications



#### ■ Mobile / exterior hydraulic applications

Hydraulic and fluid power transmission systems in exposed

environments can be subject to wide variations in temperature.

## Compatibility & Miscibility

### ■ Fluid Compatibility

Shell Naturelle Fluid HF-E is miscible with mineral oil hydraulic fluids. However, in order to ensure that the environmental properties and performance of Shell Naturelle Fluid HF-E are maintained, the hydraulic system should be drained and flushed thoroughly when changing fluids. Guidelines on fluid change-over can be found in ISO 15380 Annex A. Owing to the surface-wetting properties of Shell Naturelle Fluid HF-E, if the system was previously operated using a mineral oil hydraulic fluid, deposits formed in the system during operation may be loosened and deposited in the system filters. The filters should therefore be checked at regular intervals after fluid change-over.

please consult your local Shell Technical Help Desk, or the OEM Approvals website.

### ■ Seal & Paint Compatibility

Shell Naturelle Fluid HF-E is compatible with most seal materials and paints normally specified for use with conventional mineral oil based hydraulic oils. Certain plastics and industrial adhesives may be adversely affected and advice should be sought from the respective manufacturers.

## Typical Physical Characteristics

Properties			Method	Shell Naturelle HF-E
Viscosity grade				46
ISO Fluid Type			ISO 6743-4	HEES
Kinematic Viscosity	@-20°C	cSt	ASTM D445	1522
Kinematic Viscosity	@40°C	cSt	ASTM D445	47.2
Kinematic Viscosity	@100°C	cSt	ASTM D445	9.41
Viscosity Index			ASTM D2270	188
Density	@15°C	kg/m <sup>3</sup>	ASTM D4052	921
Flash Point (Cleveland Open Cup)			ASTM D92	322
Pour Point			ASTM D97	-42

These characteristics are typical of current production. While future production will conform to Shell's specification, variations in these characteristics may occur.

## Health, Safety & Environment

### ■ Health and Safety

Shell Naturelle HF-E 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 Material Safety Data Sheet, which can be obtained from <http://www.epc.Shell.com>

### ■ Protect the Environment

Take used oil to an authorized collection point. Do not discharge into drains, soil or water.

## Additional Information

### ■ Advice

Product recommendations for applications and specifications not covered here may be obtained from your Shell representative.



### Viscosity - Temperature Diagram for Shell Naturelle Fluid HF-E

