

Shell NATURELLE® Oils HF-E

Fully synthetic biodegradable hydraulic fluids

Shell NATURELLE® Oils HF-E are advanced biodegradable hydraulic fluids for use in power transmission and hydraulic systems working in environmentally sensitive areas. Synthetic esters blended with specially tailored additive systems provide Shell NATURELLE® Oils HF-E with a superior balance of biodegradability, lubrication performance and compatibility with the environment.

Performance Features and Benefits

- **Readily biodegradable**
High potential to be broken down rapidly and extensively by micro-organisms in the environment to ultimately yield carbon dioxide and water as end products.
- **Excellent viscosity/temperature characteristics**
Minimum change of viscosity with variation in operating temperature, giving true 'multigrade' characteristics.
- **High shear-stability**
High shear stability ensures effective lubrication and efficient system operation.
- **Excellent corrosion protection**
Long term protection for common construction materials, including most metals, non-metals and seal materials such as viton and high nitrile.
- **Good oxidation resistance**
Resists the formation of acidic products generated when working at high operating temperatures.
- **Optimum wear protection**
Effective under all operating conditions, including low and severe duty situations.

Main Applications

- Heavy-duty hydraulic systems for construction and earth moving equipment
- Machine tool hydraulic systems
- Hydrostatic drive gears
- General industrial control equipment and hydraulic systems
- Moderately rated gearboxes where an anti-wear hydraulic oil is specified

Advice on applications not covered in this handbook may be obtained from your Shell representative.

Specifications, Approvals, and Recommendations

Shell NATURELLE® Oils HF-E can be used where DIN 51524 Part 2 or Part 3 (HLP/HVLP) anti-wear petroleum mineral hydraulic oil is specified. Bulk fluid operating temperatures should not be allowed to exceed 90°C and optimum fluid life will be realized if operating temperatures are maintained at approximately 55°C.

Compatibility and Miscibility

Compatibility with mineral oils Shell NATURELLE® Oils HF-E are miscible with conventional mineral oil based hydraulic oils in all proportions. However, in order to ensure that biodegradability properties are maintained, the system should be drained and flushed prior to change over.

Due to the surface wetting properties of Shell NATURELLE® Oils HF-E, if systems were previously operated using petroleum-based hydraulic oils, deposits formed in the system during operation may be loosened and deposited in system filters. The hydraulic filters should, therefore, initially be checked at regular intervals.

Seal and Paint Compatibility

Shell NATURELLE® Oils HF-E are compatible with all seal materials and paints normally specified for use with petroleum mineral oils. Certain plastics and industrial adhesives may be adversely affected and advice should be sought from the respective manufacturers.

Handling and Safety Information

For information on the safe handling, storage, or use of this product, refer to its Material Safety Data Sheet at <http://www.epc.shell.com/>. If you are a Shell Distributor, please call 1+800-332-6457 for all of your service needs. All other customers please call 1+800-237-8645 for all of your service needs.

Protect the Environment

Do not discharge into drains, soil, or water.

Typical Physical Characteristics

Shell NATURELLE® Oils HF-E	32	46
Color	Green	Green
Kinematic Viscosity		
@ 40°C cSt	31.6	46.1
@ 100°C cSt	6.3	9.1
Viscosity Index	156	182
Density		
@ 15°C kg/L	0.918	0.919
Pour Point	°F	
	-76	-60
Flash Point (COC)	°F	
	457	426
Biodegradability (OELD 301 B)	Readily Biodegradable	Readily Biodegradable

These characteristics are typical of current production. While future production will conform to Shell specifications, variation in these characteristics may occur.