Technical Data Sheet

Shell **Naturelle** *HF-M 46*

Biodegradable hydraulic fluid

Shell Naturelle HF-M is a biodegradable anti-wear hydraulic fluid developed for use in hydraulic systems working either in or out of doors. It is a mixture of synthetic ester and vegetable oil blended with anti-wear additives and rust and oxidation inhibitors. It contains a significant amount of renewable resource.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **High Degree of Biodegradability**
  Exceeds the normal requirement of 60% biodegradation in the OECD 301B test after 28 days.
- **Stable Viscosity at -20°C**
  Careful selection of base fluids and additives overcomes the '72-hour' low temperature gelling problem normally associated with biodegradable fluids based on vegetable oil alone.
- **Reduced Tendency to Form Sticky Deposits when Accidentally Spilled**
  Incorporation of synthetic ester overcomes the 'sticky deposit' problem normally associated with vegetable oil.

Main Applications

Shell Naturelle HF-M can be used in hydraulic systems where biodegradable fluids are preferred for environmental reasons.

Specifications, Approvals & Recommendations

- Eaton (Vickers) I-286-S
- Eaton (Vickers) M-2950-S
- Shell Naturelle HF-M Fluids meet or exceed the requirements of the following standards:

  Shell Naturelle HF-M fulfils the requirements of the Swedish Standard SS 15 54 34 BV and is designated environmentally acceptable

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

Compatibility & Miscibility

- **Compatibility with Other Oils**
  The biodegradability and performance of Shell Naturelle HF-M may be compromised if it is mixed with other oils. It is recommended that contamination with engine oil is restricted to less than 1% and contamination with other hydraulic oils is restricted to less than 2%.
- **Change-over Procedure**
  In order to achieve maximum benefit from the use of Shell Naturelle HF-M, it is necessary to completely drain all mineral oil from the hydraulic circuit prior to filling with fresh fluid. A detailed change-over procedure can be obtained from your Shell Representative.

Typical Physical Characteristics

Properties			Method	Naturelle HF-M 46
ISO Viscosity Grade			ISO 3448	46
Color				Red
Kinematic Viscosity - 72 hrs	@-20°C	cSt	ISO 3104 / ASTM D445 / IP 71	1080
Kinematic Viscosity - 72 hrs	@40°C	cSt	ISO 3104 / ASTM D445 / IP 71	42
Kinematic Viscosity - 72 hrs	@100°C	cSt	ISO 3104 / ASTM D445 / IP 71	9.5
Viscosity Index			ISO 2902 / ASTM D2270 / IP 226	220
Density	@15°C	kg/m^3	ASTM D4052	924
Shear Stability (Taper Roller Bearing) 20 hrs	Vk @100°C	cSt	CEC L-45-A-99	8.2
Flash Point (COC)		°C	ISO 2592 / ASTM D92 / IP 36	256
Rust Protection			ISO 7120 / ASTM D665 / IP 135	Pass
Copper Corrosion			ISO 2160 / ASTM D130 / IP 154	Pass
Pour Point		°C	ISO 3016 /ASTM D97 / IP 15	-42
Air Release Value	@50°C	mins	ISO 9120	6

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-M 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

- **Storage**

  Shell Naturelle HF-M should be stored in closed containers, preferably as delivered, at temperatures between 0°C and 30°C.

- **Operating Temperature Range**

  The recommended operating temperature range is - 25°C to + 70°C. Continuous operation at temperatures in excess of 70°C may shorten the fluid life.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.