



Shell Naturelle Transformer Fluid S4 I

- Extra Performance
- Meets IEC 61099 T1

Advanced synthetic electrical insulating fluid

Shell Naturelle Transformer Fluid S4 I is a high performance, fully synthetic insulating fluid based on specially designed esters. It offers very high oxidation stability and good dielectric strength. Shell Naturelle Transformer Fluid S4 I is readily biodegradable and has low flammability.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Low flammability**
Shell Naturelle Transformer Fluid S4 I has low flammability characteristics. This makes the fluid particularly suitable when a mineral oil is not acceptable for safety reasons.
- **Readily biodegradable**
The nature of the synthetic ester base fluid makes it readily biodegradable, as per the OECD 301B biodegradability test. Shell Naturelle Transformer Fluid S4 I is the product of first choice whenever environmental aspects have the highest priority.
- **Extended Oil Life**
The fluid has very good ageing stability (resistance to oxidation) which allows a long service period without any oil change.
- **Transformer protection**
The fluid is compatible with commonly used transformer components.
- **System Efficiency**
The fluid ensures that heat transfer inside the machinery is effective.

Main Applications



- **Industrial transformers**
Electrical insulating fluid for power and distribution transformers, which may have advanced requirements regarding environment and fire protection e.g traction transformers and wind turbine applications.
- **Transformers in electrical locomotives**
Insulating and cooling fluid for mobile railroad transformers.

Specifications, Approvals & Recommendations

- IEC 61099 T1
- Meets IEC 61039 (replaced IEC 61100) K fire point classification, and low heat value classification 3
- The product meets the performance requirements of original equipment manufacturers.
- Maintenance should be carried out according to IEC 61203
- Meets the requirements of UBA (UmweltBundesAmt – the German authority for Environmental Authority) for classification as “nwg” (not hazardous to water).

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

Typical Physical Characteristics

Properties			Method	Shell Naturelle Transformer Fluid S4 I
Appearance			DIN 57370	Bright and clear
Density	@20°C	kg/m ³	ISO 12185	970
Kinematic Viscosity	@40°C	mm ² /s	ISO 3104	27.2
Kinematic Viscosity	@-20°C	mm ² /s	ISO 3104	1170

Properties		Method	Shell Naturelle Transformer Fluid S4 I
Flash Point (PM)	°C	ISO 2719 / ASTM D93	255
Firepoint (COC)	°C	ISO 2592 / ASTM D92	310
Pour Point	°C	ISO 3016	-57
Breakdown Voltage (after treatment)	kV	IEC 60156	72
Dielectric Dissipation Factor (After treatment)	@90°C	IEC 60747	0.01
Oxidation Stability (164 hrs) - Total Acidity	mg KOH/g	IEC 61125C	0.19
Oxidation Stability (164 hrs) - Sludge	% m	IEC 61125C	<0.01
Biodegradability	after 28 days %	OECD 301B	72

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 Naturelle Transformer Fluid S4 I 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 Precautions

The critical electrical properties of Shell Naturelle Transformer Fluid are easily compromised by trace contamination with foreign material. Typically encountered contaminants include moisture, particles, fibres and surfactants. Therefore, it is imperative that electrical insulating oils be kept clean and dry.

Note that this is especially critical for Shell Naturelle Transformer Fluid S4 I since, being ester-based, it is hygroscopic (tends to absorb moisture from the air).

It is strongly recommended that storage containers be dedicated for electrical service and include airtight seals. It is further recommended that electrical insulating oils be stored indoors in climate-controlled environments.

• Advice

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