INHIBITED / UNINHIBITED NAPHTHENIC TRANSFORMER OIL



Product Introduction

Petrofond naphthenic transformer oil is a refined mineral-based insulating and heat-transfer fluid designed for use in oil-filled transformers and electrical equipment compatible with mineral insulating oils. Its physical and chemical properties help provide electrical insulation and transfer heat generated within the equipment, supporting reliable operation under suitable service conditions.

The product is available in inhibited and uninhibited versions. Selection of the appropriate type should be based on transformer design, operating conditions, and equipment manufacturer requirements. Moisture and particulate contamination must be controlled to preserve the insulating properties of the oil.

Product Types

- Inhibited: Contains an antioxidant additive to reduce the rate of oil oxidation and help limit the formation of acidic compounds and deposits associated with oil degradation.
- Uninhibited: Contains no antioxidant inhibitor; its performance and service life depend on the inherent properties of the base oil and the operating conditions.

Operating Principle

Transformer oil fills the spaces between internal components and, together with solid insulation, forms part of the electrical insulating system. Dielectric breakdown strength is an important indicator of insulating performance and is affected by moisture and particulate contamination.

The oil also absorbs heat generated in the windings and core and transfers it to cooling surfaces through natural or forced circulation. Suitable viscosity facilitates circulation and heat transfer. In

the inhibited grade, the antioxidant additive additionally helps maintain chemical stability during service.

Features and Benefits

- Provides dielectric insulation for internal transformer components.
- Supports oil circulation and heat transfer through suitable viscosity.
- Naphthenic base-oil flow properties help enable operation at low temperatures.
- The inhibited version helps delay oxidative degradation.
- Controlling moisture and particulate contamination helps preserve electrical and chemical performance.
- Control of corrosive sulfur compounds is important for protecting metallic components.

Applications

- Oil-filled power transformers for electrical insulation and heat transfer.
- Oil-filled distribution transformers for internal insulation and cooling.
- Industrial and power-generation oil-filled transformers, subject to manufacturer requirements.
- Other oil-filled electrical equipment, provided that compatibility and technical specifications are confirmed.

Technical Specifications — Inhibited Naphthenic Transformer Oil

Property	Reference limit / value	Test method
Appearance	Clear; free from sediment and suspended particles	Visual inspection
Kinematic viscosity at 40 °C	Max. 12 mm^2/s	ISO 3104
Kinematic viscosity at −30 °C	Max. 1800 mm^2/s	ISO 3104
Pour point	Max. −40 °C	ISO 3016
Breakdown voltage — as delivered	Min. 30 kV	IEC 60156
Breakdown voltage — after laboratory treatment	Min. 70 kV	IEC 60156
Density at 20 °C	Max. 895 kg/m^3	ISO 3675 / ISO 12185
Dielectric dissipation factor at 90 °C	Max. 0.005	IEC 60247 / IEC 61620
Initial acidity	Max. 0.01 mg KOH/g	IEC 61621-1 / -2
Flash point (closed cup)	Min. 135 °C	ISO 2719
PCB content	Not detectable	IEC 61619
DBDS content	< 5 mg/kg	IEC 62695
Oxidation stability — test duration	500 h	IEC 61125

Technical Specifications — Uninhibited Naphthenic Transformer Oil

Property	Reference limit / value	Test method
Appearance	Clear; free from sediment and suspended particles	Visual inspection
Kinematic viscosity at 40 °C	Max. 12 mm^2/s	ISO 3104
Kinematic viscosity at −30 °C	Max. 1800 mm^2/s	ISO 3104
Pour point	Max. −40 °C	ISO 3016
Breakdown voltage — as delivered	Min. 30 kV	IEC 60156
Breakdown voltage — after laboratory treatment	Min. 70 kV	IEC 60156
Density at 20 °C	Max. 895 kg/m^3	ISO 3675 / ISO 12185
Dielectric dissipation factor at 90 °C	Max. 0.005	IEC 60247 / IEC 61620
Initial acidity	Max. 0.01 mg KOH/g	IEC 61621-1 / -2
Flash point (closed cup)	Min. 135 °C	ISO 2719
Oxidation stability — test duration	164 h	IEC 61125

Specification

ISO 3104;

IEC 60296;

IEC 60814;

IEC 60156;

IEC 60247;

IEC 61125;

IEC 61620.

Storage Conditions

Store naphthenic transformer oil in suitable, clean, fully sealed containers to prevent moisture, dust, and other external contaminants from entering. Keep the storage area dry, sheltered, and adequately ventilated. Protect containers from direct sunlight, heat sources, and physical damage.

Safety and Handling

Handle in accordance with the product-specific Safety Data Sheet (SDS) and applicable workplace procedures. Prevent contamination and avoid uncontrolled releases to the environment.

Note: Values and test methods above are translated from the supplied Persian reference PDF and require technical approval before publication as guaranteed product specifications.