Technical Data Sheet
Revision Date: 27.03.2024

PETRONAS TRANOL 360 PLUS

Premium Performance Inhibited Electrical Insulating Oil - Type A

PETRONAS TRANOL 360 PLUS is a premium performance inhibited electrical insulating oil specially developed for high temperature and long service applications of oil-filled transformer, switchgears, capacitors, tap changers and circuit breakers.
Formulated with high quality naphthenic base oil enhanced with antioxidant additive, PETRONAS TRANOL 360 PLUS oil provides high dielectric strength properties, low dissipation factors, good resistant to oxidation as well as low viscosity for easy circulation and efficient heat transfer which is free from polychlorinated biphenyls (PCBs).

PETRONAS TRANOL 360 PLUS was passed in the Doble laboratory test according to IEC 60296:2020 Type A, the report number is 287601-001.

Applications

PETRONAS TRANOL 360 PLUS is recommended for the use in:

- cool and dissipate the heat generated for oil-filled transformers during high load
- insulate the windings of transformers by replacing the air or gases between conductors
- quench the spark or arc that is formed when a breaker or switchgear opens under load
- insulate other oil-immersed electrical equipment such as switch breakers, switchgears, capacitors, tap changers, Fuses, and ignition coils

Features and Benefits

Features	Benefits
Ultra-low Sulphur	Making it intrinsically non-corrosive towards copper, without the need for passivation
Low viscosity	Easy and efficient heat transfer which prevents increased transformer temperatures
High dielectric strength	Low dissipation which assists the insulating characteristics
Excellent oxidation stability	High resistant to oxidation and deposit formation
Excellent compatibility with materials	Compatible with most materials used in transformers and switchgear
Low pour point	Excellent low temperatures properties providing good oil circulation and cooling which prevents overheating of transformers
Excellent breakdown voltage	Has excellent resistance to electrical breakdown

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Typical Properties

Characteristic	Method	Specification	TRANOL 360 PLUS
Appearance	-	Clear, free from sediment and suspended matter	Clear, free from sediment and suspended matter
Color	ISO 2049	L0,5 (<0,5)	L0,5
Density @20°C, kg/m^3	ISO 3675	Max. 895	887
Viscosity at 40°C, mm^2/s	ISO 3104	Max. 12	9,85
Viscosity at -30°C, mm^2/s	ISO 3104	Max. 1800	1524
Flash Point, °C	ISO 2719	Min. 135	151
Pour Point, °C	ISO 3016	Max. -40	-48
Acidity, mgKOH/g	IEC 62021-2	Max. 0,01	<0,01
Water content, mg/kg	IEC 60814	Max. 30	8
Total sulfur content, %	ISO 8754	Max. 0,05	<0,01
Corrosive sulphur	DIN 51353	Not corrosive	Not corrosive
Potentially corrosive sulfur	IEC 62535	Not corrosive	Not corrosive
DBDS, mg/kg	IEC 62697-1	Not detectable (<5)	Not detectable
Oxidation Stability @500h, % Sludge	4.8.1 of IEC 61125:2018	Max. 0,05	<0,01
Oxidation Stability @500h, Total acidity, mg KOH/g	4.8.4 of IEC 61125:2018	Max. 0,3	<0,01
Oxidation Stability @500h, DDF at 90 °C	4.8.5 of IEC 61125:2018	Max. 0,050	0,0017
Inhibitors, %	IEC 60666	(I) inhibited: (0,08 to 0,40%)	0,37
Metal passivator additives, mg/kg	IEC 60666	Not detectable (<5)	Not detectable
2-Furfural & related compounds content, mg/kg	IEC 61198	Not detectable (<0,05) for each individual compound	HMF: <0,001 FOL: <0,001 FAL: <0,001 AF: <0,001 MF: <0,001
PCB content, mg/kg	IEC 61619	Not detectable (<2)	Not detectable
PCA content, %	IP 346	<3	0,3
DDF at 90°C	IEC 60247	Max. 0,005	0,003
Breakdown voltage (as received), kV	IEC 60156	Min. 30	59
Breakdown voltage (after filtering), kV	IEC 60156	Min. 70	83
Interfacial tension, nN/m	ASTM D971	Min. 43	47,8

All technical data are provided for reference only and all specification based on ASTM D 3487 Type II / SS is available upon request including quality control limits

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Performance Levels

- ASTM D 3487 Type II
- IEC 60296:2020 Type A according to Doble Laboratory Report 287601-001

Health, Safety and Environment

This product is unlikely to present any significant health and safety hazards when used in the recommended application. Avoid contact with skin. Wash immediately with soap and water after skin contact. Do not discharge into drains, soil or water.

For further detail regarding storage, safe handling, and disposal of product, please refer to product SDS or contact us at: www.pli-petronas.com.

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