Shell Diala Oil D

High performance insulating oil

Shell Diala D is a non-inhibited insulating oil manufactured from specially refined high naphthenic feedstock. It offers very high oxidation stability, very good dielectric properties and excellent low temperature properties without the use of pour point depressants.

Applications

- ***Industrial transformers***
  Electrical insulating oil for transformers and switch-gears.
  Grid and Industrial transformers up to maximum load.
- ***Electrical equipment***
  Components like rectifiers, circuit breakers, switch-gears.

Advice on applications not covered in this leaflet may be obtained from your Shell Representative.

Performance Features and Advantages

- ***Excellent oxidation stability***
  Diala D offers inherent natural resistance to oil degradation and is suitable for long life applications.
- ***Very good dielectric properties***
  It clearly exceeds the requirements from all major specifications.
- ***Very good low temperature properties***
  The naphthenic nature of the feedstock of Diala D provides a superior low temperature performance without the use of additives.
- ***Very good heat transfer characteristics***
  The very good fluidity of the oil ensures proper heat transfer inside the transformer, even from lowest starting temperatures.

Specification and Approvals

Shell Diala D meets the following specifications:

DIN 57370-1 (1978)	
VDE 0370 Part 1 (1978)	Class A
IEC 296 (1982	Class II
IEC 60296 (2003)	

Table 2 Transformer Oil (U), uninhibited

Note: If compliance with the newly emerging industry standards for copper corrosion is required, this product will require addition of a copper passivator such as Diala Concentrate P.

Storage precautions

The critical electrical properties of Shell Diala D are easily compromised by trace contamination with foreign material. Typically encountered contaminants include moisture, particles, fibers and surfactants. Therefore, it is imperative that electrical insulating oils be kept clean and dry. It is strongly recommended that storage containers be dedicated for electrical service and include air-tight seals. It is further recommended that electrical insulating oils be stored indoors in climate-controlled environments.

Health and Safety

Guidance on Health and Safety are available on the appropriate Material Safety Data Sheet which can be obtained from your Shell representative.

Shell Diala D is free of polychlorinated biphenyls (PCB).

Protect the environment
Take used oil to an authorized collection point. Do not discharge into drains, soil or water.

Typical Characteristics

Property	Units	Method	Specification requirements DIN 57370-1 Part 1 Class A	Specification requirements IEC 60296 Table 2 + section 7.1	Diala D	Diala D dried
Appearance		DIN 57370	Clear, free of solids		Complies	
Density at 15ºC	Kg/m^3	ISO 3675	<895	-	880	
Density at 20ºC	Kg/m^3	ISO 3675	<898	<895	877	
Kinematic viscosity at 40ºC	mm^2/s	ISO 3104	-	12 max	7.8	
Kinematic viscosity at 20ºC	mm^2/s		<25	-	16.6	
Kinematic viscosity at -30ºC	mm^2/s	ISO 3104		1800 max	755	
Flashpoint P.M.	ºC	ISO 2719 / ASTM D93	130 min	135 min	137	
Pourpoint	ºC	ISO 3016	-	< -40	-60	
Neutralisation value	mg KOH/g	DIN 51558-2	< 0.03	0.01 max	< 0.03	
Corrosive Sulphur		DIN 51353	Non-corrosive	Non-corrosive	Non-corrosive	
Breakdown voltage (after treatment)	kV	DIN EN 60156 / IEC 60156	>50	Min 70kV	> 30 (>70 upon treatment)	>60 ex works (>70 upon treatment)
Water content (ex works)	ppm	IEC 60814			<40 drums/IBC <30 bulk	10 – 15
Dielectric dissipation factor at 90ºC (after treatment)		DIN 57370 / IEC 247	<0.005	0.005 max	0.0005	
Oxidation Stability Baader (140h/110ºC)		DIN 51554				
Saponification value	mg KOH/g		< 0.6	-	0.06	
Sludge content	% m		<0.05	-	0.01	
Dielectric dissipation factor at 90ºC			<0.18	-	0.01	
Oxidation Stability (164h/100ºC)		IEC 1125 A				
Neutralisation value	mgKOH/g		<0.30	-	0.05	
Sludge content	%m		<0.06	-	0.04	
Oxidation Stability (164h/120ºC)		IEC 61125 C				
Total acidity	mg KOH/g		-	0.3 max	0.26	
Sludge	%m		-	0.05 max	0.04	
Tan delta 90ºC			-	0.05 max	0.03	

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.