Shell Diala Oil B

Electrical insulating oil

Shell Diala Oil B is an uninhibited electrical insulating fluid, for use where normal oxidation resistance is required. It is a highly refined naphthenic mineral oil with natural low pour point characteristics.

Applications

Shell Diala Oil B is primarily intended for use in:

- Transformers
- Circuit breakers
- Oil-filled switches
- An insulator and arc extinguishing agent in switchgear and circuit breakers

Performance Features

- **Highly resistant to oxidative degradation**
  Resists the formation of oxidation products that can reduce the ability of the oil to insulate and cool electrical windings

- **Rapid heat transfer properties**
  An essential quality in electrical insulating systems

- **Compatible with construction materials**
  Compatible with all common construction materials used in electrical systems.

- **Outstanding low temperature properties**
  Without the need for pour point depressants Shell Diala Oil B does not contain PCB's

Performance Specifications

Shell Diala Oil B meets the following specifications:

IEC 296 Class 1

BS 148 (1998)

Advice

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

Health & Safety

Shell Diala Oil B is unlikely to present any significant health or safety hazard when properly used in the recommended application, and good standards of industrial and personal hygiene are maintained.

For further guidance on Product Health & Safety refer to the appropriate Shell Product Safety Data Sheet

Storage Precautions

The critical electrical properties of Shell Diala Oil B are easily compromised by minute concentrations of contaminants. Typically encountered contaminants include moisture, particulates, fibres 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.

Table 1: Typical Properties of Shell Diala® Oil B

Properties	ASTM Method	Specification[1]	Typical Values
Appearance		Clear Sediment free Particulate free	Clear Sediment free Particulate free
Density, kg/dm3 @ 20°C	ISO 3675	0.895 max	0.866
PMCC Flash Point, °C	ISO 2719	143 min	146
Interfacial Tension, dynes/cm	ISO 6295		
@ 25°C		40 min[2]	45
Pour Point, °C	ISO 3016	-30 max	-34
Neutralization Value, mgKOH/g	IEC 296	0.03 max	<0.01
Kinematic Viscosity:	ISO 3104		
@ 40°C, cSt		16.5 max	9.102
@ 20°C, cSt		40 max	21
Corrosive Sulfur	ISO 5662	Non-corrosive	Non-corrosive
Water Content, mg/kg	IEC 733	30 max bulk[3]	25
		40 max drum[3]	16
Anti-oxidant Content	IEC 666	ND[4]	ND[4]
Oxidation Stability	IEC 74		
164 hrs @ 100°C			
Sludge, %w		0.10 max	0.05
Acidity, mg KOH/g		0.30 max	0.26
Breakdown Voltage, kV	IEC 156		
As Delivered		30 min	52
After Treatment		50 min	60
Dissipation Factor, 40-62 Hz	IEC 247		
@ 90°C		0.0030 max	0.0016

1 IEC 296 Class 1 Specification, unless otherwise noted.
2 Shell Diala B Specification
3 An IEC 296 recommendation, not an IEC 296 Specification
4 “ND” not detectable, or below lower limit of detectability

Table 2 Supplemental Information for Shell Diala® Oil B		
Properties	**ASTM Method**	**Typical Values**
PCB Content	D4059	ND
PCA (Polycyclic Aromatic) Content	IP 346	1.6
Gassing Tendency, mm3/min @ 80°C	D2300B	-7.9
Coefficient of Thermal Expansion mL/°C/mL		0.00075
Resistevity, OHM-cm	D1169	
@ 25°C		2000*E12
@ 100°C		500*E12
Relative Permittivity @ 25°C	D924	2.2-2.3
Specific Heat, g,-cal/gm @ 20°C	D2766	0.455
Thermal Conductivity	D2717	
cal/cm/sec/°C		0.0003
Color, Saybold	D156	+15
Viscosity		
@ 100°C in cSt	D445	2.33
@ 100°F in SUSf	D2161	67
Viscosity Index	D2270	58
Carbon Type Composition	D2140	
Ca, %w		7
Cn, %w		39
Cp, %w		54
Vapor Pressure, mm Hg		
@ 80°C		0.10
@ 93°C		0.24
@ 107°C		0.60
@ 121°C		1.25

NOTE: Product typical properties are current as of the date of publication of this Technical Bulletin. These properties are determined by averaging actual batch data provided by the manufacturing locations over a period of time. These typical data cannot be guaranteed to be identical to the products produced at any specific time. The data provided in this publication are presented as a guide to Shell Lubricants users. Check with your Shell Representative for the latest information.

Comparison with BS 148 (1998)

Properties	Unit	Method		Specification		Typical	BS 148 (1998) Class 1	
		ASTM	Other	Min	Max		Min	Max
API Gravity 15.56°C	-	D-4052		27.2		31.2		
Density @ 20°C	kg/l	D-4062			0.892	0.866		0.895
Appearance (visual)	-	Visual		Clear & Bright		C&B	Clear & Bright	
Pour Point	°C	D-97	ISO 3016		-30	-34		-30
Flash PMCC	°C	D-93	ISO 2719	143		146	140	
Kinematic Viscosity								
20°C	cSt	D-445			40	21		
-15°C	cSt	D-445			800	182		800
40°C	cSt	D-445			16.5	9.102		16.5
Neutralisation Number	mg KOH/g	D-974	IEC 296		0.03	<0.01		0.03
Corrosive Sulphur (19 hrs)	-	D-1275	ISO 5662	non-corrosive		NC	non-corrosive	
Inhibitor Content	%wt	D-2666	IEC 666	none detected		ND	none detected	
Dielectric Strength	KV	D-877		30		52	30	
Electric Strength	KV		IEC 156	60		84		
Power Factor 100°C		D-924	IEC 247		0.003	0.0016		0.005
Interfacial Tension 77°F	mN/m	D-971		40		45		
Silver Corrosion	-		ASE 3163	non-corrosive		NC		
Water (Karl Fisher)	%wt	D-1533	IEC 184		0.003	0.0016		0.003
PCB Content	ppm	D-4053		<1		<1	not detectable	
Gassing Tendency		D-2300			5	-7.9		5
Oxidation Stability (100°C)		D-2440	IEC 1125A					
Sludge 164 hrs	%wt				0.1	0.05		0.8
Tan-C 164 hrs	mg KOH/g				0.3	0.26		1.2
Total Furans	mg/kg							1
Polycyclic Aromatics	%m							3