Technical Data Sheet

- Reliable Performance
- IEC 60296 (Edition 5) year 2020; Type A

Shell Diala *BX*

High Grade Inhibited Naphthenic Electrical Insulating Oil

Shell Diala BX is a fully inhibited, high-grade insulating oil manufactured from hydrotreated naphthenic containing feedstocks. It offers good dielectric properties, good oxidation stability and provides efficient heat transfer, and robust low temperature properties.
Shell Diala BX can be classified as TVAI and meets the IEC 60296 Type A specification.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Extended oil life**

  Diala BX provides excellent resistance to oil degradation, contributing to enhanced transformer life.

- **High Dielectric strength**

  Diala BX exceeds the requirements from all major specifications.

- **Good heat transfer characteristics**

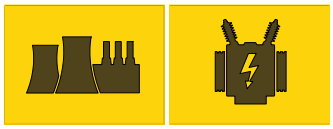
  The good low temperature properties of the oil ensure proper heat transfer inside the transformer even from lowest starting temperatures.

Specifications, Approvals & Recommendations

- IEC 60296 (Edition 5) year 2020; Type A, fully inhibited high grade oils (TVAI)
- Meets or exceeds all current relevant tests for copper corrosion including performance requirements of ASTM D1275B, IEC 65235 and DIN 51353

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

Main Applications



Electrical insulating oil for Power and distribution transformers and Electrical equipment Components including rectifiers, circuit breakers, switchgears.

Typical Physical Characteristics

Properties			Method	IEC 60296, Type A minimum	IEC 60296, Type A maximum	Shell Diala BX Typical
Appearance			IEC 60296	Clear, free from sediment and suspended matter	Clear, free from sediment and suspended matter	Complies
Density	@20°C	kg/m³	ISO 3675		895	859
Kinematic Viscosity	@40°C	mm²/s	ISO 3104		12	9.8
Kinematic Viscosity	@-30°C	mm²/s	ISO 3104		1 800	632
Flash Point PM CC		°C	ISO 2719	135		148
Pour Point		°C	ISO 3016		-40	-45
Acidity / Neutralisation value		mg KOH/g	IEC 62021-1		0.01	< 0.01
Interfacial Tension			IEC 62961	43		48

Properties			Method	IEC 60296, Type A minimum	IEC 60296, Type A maximum	Shell Diala BX Typical
Colour			ISO 2049		L0.5	< L0.5
Total Sulphur Content		m%	ISO 14596		0.05	0.0021
Corrosive Sulphur (silver strip)			DIN 51353		Not corrosive	Not corrosive
Potentially Corrosive Sulphur			IEC 62535		Not corrosive	Not corrosive
Corrosive Sulphur			ASTM D1275		n/a	Not corrosive
Breakdown Voltage (Untreated)		kV	IEC 60156	30		65
Breakdown Voltage After Treatment		kV	IEC 60156	70		> 70
Dielectric Dissipation Factor @90°C		DDF	IEC 60247		0.005	0.0004
Oxidation Stability	500h / 120°C		IEC 61125		High grade oil, Type A	High grade oil, Type A
Total Acidity (after oxidation)		mg KOH/g	IEC 62021-1		0.3	0.08
Sludge (after oxidation)		%m	IEC 61125		0.05	0.01
Dielectric Dissipation Factor (after oxidation)	@90°C	DDF	IEC 61125		0.05	0.0016
Water Content (Bulk)		mg/kg	IEC 60814		30	10
2 Furfural and related compounds content		mg/kg	IEC 61198		Not detectable	Not detectable
DBDS content			IEC 62697-1		Not detectable (< 5 mg/kg)	Not detectable
Metal passivator additives		mg/kg	IEC 60666		Not detectable (< 5 mg/kg)	Not detectable
Oxidation inhibitor content (DBPC)		% mass	IEC 60666	0.08	0.40	0.36
PCA Content		%m	IP 346		3	0.98
PCB Content		mg/kg	IEC 61619		Not detectable (< 2 mg/kg)	Not detectable

These characteristics are typical of current production.

Health, Safety & Environment

- **Health and Safety**

  Shell Diala BX 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.

  Shell Diala BX is free from polychlorinated biphenyls (PCB). 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 https://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

- **Stray Gassing, test data, part of requirements High Grade oil, type A, table 1 in IEC 60296 Ed5 (2020)**

  Typical test data from Stray Gassing test IEC60296, procedure in Clause A.4: Oil saturated with Air, in presence of copper (48 hours, at 105^{0}C)

DGA after stray gassing test (DGA test according to IEC 60567)	Requirements per IEC 60296 Ed5 (Table 3, Type A oil)	Shell Diala BX Typical value
Hydrogen (H2)	≤ 50 µl/l	<7
Methane (CH4)	≤ 50 µl/l	<1
Ethane (C2H6)	≤ 50 µl/l	<1

  Evaluation results per IEC 60296: Shell Diala BX is classified as non-stray gassing oil.

- **Storage precautions**

  The critical electrical properties of Shell Diala 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 are stored indoors in climate-controlled environments.

- **Advice**

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