Shell Diala *S5 BD*

Technical Data Sheet

- Extra Performance
- Meets IEC 60296 - Higher Oxidation Stability & Low Sulphur Content

Premium Inhibited, Readily Biodegradable Electrical Insulating Oil, Excellent Low Temperature performance

Shell Diala S5 BD is the new readily biodegradable electrical insulating oil from Shell developed to meet the challenges of today's distribution transformers and tomorrow's power transformers. It offers excellent low temperature performance and extended oil life.
Shell Diala S5 BD is manufactured from zero sulphur base oils produced using Shell's GTL (gas-to-liquid) technology. These base oils offer a high degree of compositional consistency and have an excellent response to anti-oxidant. In addition they are free from PCBs, DBDS and passivators.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Readily Biodegradable according to OECD 301B**

  Shell Diala S5 BD is specifically designed for use in Power & distribution transformers, whenever environmental concerns are of highest priority.

- **Extended oil life**

  Shell Diala S5 BD is a fully inhibited oil giving outstanding oxidation performance and an extended oil life; therefore it is particularly suitable for use in highly loaded applications.

- **Transformer protection**

  Shell Diala S5 BD is manufactured from zero sulphur* base oils, making it intrinsically non-corrosive towards copper, without the need for passivation. Shell Diala S5 BD meets all relevant tests for copper corrosion, namely DIN 51353 (Silver Strip Test), IEC 62535 and ASTM D1275B.

  *Sulphur content below 1ppm detection limit of ASTM D5185

- **System efficiency**

  Excellent low temperature viscometric properties of the oil ensure proper heat transfer inside the transformer, even from very low starting temperatures.

- **Low water content**

  Shell Diala S5 BD is specially dried and handled to achieve a low water content and retain a high breakdown voltage at point of delivery. This enables it to be used in many applications without further treatment.

Main Applications

Specifications, Approvals & Recommendations

- IEC 60296 (Edition 5 year 2020); Type A, fully inhibited high grade oils
- IEC 60296 Ed4 (2012): Table 2 Transformer Oil (I) (Inhibited oil) Section 7.1 ("Higher oxidation stability & low sulphur content")
- *Sulphur content below 1ppm detection limit of ASTM D5185.

  Advice on applications not covered here may be obtained from your Shell or Shell Lubricants distributor representatives or technical helpdesks
- Meets performance requirements as outlined in Canadian specification CAN/CSA-C50-14 Table 1 Class A type II (inhibited)

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

Typical Physical Characteristics

Properties			Method	IEC Table 2 + section 7.1 minimum	IEC Table 2 + section 7.1 maximum	Shell Diala S5 BD 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	816
Kinematic Viscosity	@100°C	mm²/s	ISO 3104			2.2
Kinematic Viscosity	@40°C	mm²/s	ISO 3104		12	7.4
Kinematic Viscosity	@-20°C	mm²/s	ISO 3104			115
Kinematic Viscosity	@-30°C	mm²/s	ISO 3104		1 800	253
Kinematic Viscosity	@-40°C	mm²/s	ISO 3104			1 000
Flash Point		°C	ISO 2719	135		161
Pour Point		°C	ISO 3016		-40	-51
Fire Point		°C	ISO 2592			186
Neutralisation value		mg KOH/g	IEC 62021-1		0.01	0.01
Corrosive Sulphur			DIN 51353			Not corrosive
Potentially Corrosive Sulphur			IEC 62535			Not corrosive
Total Sulphur Content		mg/kg	ASTM D5185		Section 7.1 limit 500	1
Breakdown Voltage Untreated		kV	IEC 60156	30		40
Breakdown Voltage After Treatment		kV	IEC 60156			70
Dielectric Dissipation Factor	DDF @90°C		IEC 61125 C		0.005	0.002
Oxidation Stability	500h / 120°C		IEC 61125 C			High grade oil Type A
Total Acidity		mg KOH/g	IEC 61125 C		0.3	0.02
Sludge		%m	IEC 61125 C		0.05	0.02
Dielectric Dissipation Factor	@90°C	DDF	IEC 61125 C		0.05	0.02
Water content (Drums/IBC)		mg/kg	IEC 60296		40	14
Water Content (Bulk)		mg/kg	IEC 60296		30	14
2-Furfural and related compounds content		mg/kg	IEC 61198			Complies
Metal passivator additives		mg/kg	IEC 60666		Not detectable	Complies
Oxidation inhibitor content (DBPC)		%m	IEC 60666			0.23
PCA Content		%m	IP346			Complies
PCB content		mg/kg	IEC 61619		Not detectable	Complies
Biodegradability		%	OECD 301B			Readily Biodegradable

These characteristics are typical of current production, variations in these characteristics in future production may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Diala S5 BD 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 S5 BD 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

- **Storage precautions**

  The critical electrical properties of Shell Diala are easily compromised by trace contamination with foreign material. Typically encountered contaminants include moisture, particles, 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 are stored indoors in climate-controlled environments.

- **Advice**

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