



Technical Data Sheet

Shell Diala S4 ZX-IG (ASTM)

- Extra Performance
- Meets the performance of ASTM D3487 Type II

Premium Inhibited Electrical Insulating Oil

Shell Diala S4 ZX-IG (ASTM) is an electrical insulating oil from Shell which meets the performance of ASTM D3487 Type II. In addition it has been designed to meet the gas absorbing challenges presented by specialised equipment such as high voltage instrument transformers and bushings. It offers an extended oil life with the peace of mind of zero sulphur content.

Shell Diala S4 ZX-IG 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. The product is free from PCBs, DBDS and passivators, containing only DBPC antioxidant, and a low level of aromatic hydrocarbon (for gas absorption behaviour).

Shell Diala S4 ZX-IG meets both the established and new industry copper corrosion tests.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

• Extended oil life

Shell Diala S4 ZX-IG is a fully inhibited gas absorbing oil giving outstanding oxidation performance and an extended oil life.

It has the ability to absorb gases such as hydrogen which can develop under partial discharge conditions. This makes Shell Diala S4 ZX-IG the recommended Shell product for special applications with high voltage gradients, such as bushings and instrument transformers requiring gas absorbing properties.

• Transformer protection

Shell Diala S4 ZX-IG is manufactured from a zero sulphur* base oil, making it intrinsically non-corrosive towards copper, without the need for passivation or other additives (apart from the DBPC antioxidant, and a low level of aromatic hydrocarbon (for gas absorption behaviour)).

Shell Diala S4 ZX-IG meets all relevant tests for copper corrosion, namely the established DIN 51353 (Silver Strip Test), ASTM D1275, and also the latest more severe tests: ASTM D1275B.

*Sulphur content below 1ppm detection limit of ASTM D5185

• System efficiency

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

Shell Diala S4 ZX-IG 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

• ASTM D3487 Type II performance

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

Typical Physical Characteristics

Properties	Method	ASTM D3487 Table 1, type II minimum	ASTM D3487 Table 1, type II maximum	Shell Diala S4 ZX-IG Typical
Appearance	IEC 60296	Clear, free from sediment and suspended matter	Clear, free from sediment and suspended matter	Complies
Density @20°C kg/m ³	ISO 3675			806
Kinematic Viscosity @100°C mm ² /s	ASTM D445		3	2.7
Kinematic Viscosity @40°C mm ² /s	ISO 3104 or ASTM D445			9.4
Kinematic Viscosity @0°C mm ² /s	ASTM D445		76	58
Kinematic Viscosity @-30°C mm ² /s	ISO 3104			381
Flash Point (PM) °C	ISO 2719			158
Pour Point °C	ISO 3016			-42
Total Sulphur Content mg/kg	ASTM D5185			1
Corrosive Sulphur	DIN 51353			Not corrosive
Corrosive Sulphur	ASTM D1275 B	Not corrosive	Not corrosive	Not corrosive
Dielectric Breakdown Voltage as received@60 Hz, VDE, 1 mm gap kV	ASTM D1816	20		36
Dielectric Breakdown Voltage after processing@60 Hz, VDE, 1 mm gap kV	ASTM D1816	28		complies
Dielectric Breakdown Voltage - Impulse kV	ASTM D3300	145		288
Dielectric Dissipation Factor (Power Factor) @25°C DDF	ASTM D924		0.05	0.001
Dielectric Dissipation Factor (Power Factor) @100°C DDF	ASTM D924		0.3	0.001
Aniline Point °C	ASTM D611	63		114
Interfacial Tension @25°C mNm	ASTM D971	40		53
Gassing Tendency mm ³ /min	ASTM D2300		30	
Oxidation Stability minutes	ASTM D2112	195		650
Oxidation Stability	ASTM D2440			
sludge 72 hrs % m	ASTM D2440		0.1	0.01
Total acid 72 hrs mg KOH/g	ASTM D2440		0.3	0.01
Sludge 164 hours % m	ASTM D2440		0.2	0.01
Total acid 164 hours mg KOH/g	ASTM D2440		0.4	0.01
Water content mg/kg	ASTM D1533		35	7
PCA Content %m	IP346			Complies

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

Health, Safety & Environment

- **Health and Safety**

Shell Diala S4 ZX-IG 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 S4 ZX-IG 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 your Shell representative.

- **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