Technical Data Sheet

Replaces: **Shell Diala GX**

Shell **Diala** ***S3 ZX-IG***

Premium Inhibited Electrical Insulating Oil

- *EXTRA PERFORMANCE*
- ***MEETS IEC 60296***

Shell Diala S3 ZX-IG is a premium inhibited insulating oil manufactured from highly refined mineral oils. It offers very high oxidation stability, good dielectric strength, gas absorbing behaviour and excellent low temperature properties

Shell Diala S3 ZX-IG meets both the established and new industry copper corrosion tests.

Applications

- ***Transformers***
  All Power transformer types and applications (e.g. generator transformers, shunt reactors, distribution transformers) and high voltage DC (HVDC) converter stations
- ***Electrical equipment***
  Components such as rectifiers, circuit breakers, bushings, instrument transformers and switchgears

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

Performance Features and Advantages

- ***Extended oil life***
  Shell Diala S3 ZX-IG is a fully inhibited oil giving outstanding oxidation performance and an extended oil life.
  Diala S3 ZX-IG provides gas absorbing performance in transformers running under very high voltage and electrical stress. This makes it particularly suitable for Generator transformer and HVDC converter applications.
- ***Transformer protection***
  Shell Diala S3 ZX-IG is non-corrosive towards copper, with no need for additional passivation. Shell Diala S3 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: IEC 62535 and ASTM D1275B.
- ***System efficiency***
  The good low temperature properties of the oil ensures proper heat transfer inside the transformer, even from very low starting temperatures.

Specification and Approvals

IEC 60296 (2003), Table 2 Transformer Oil (I), inhibited

Baader oxidation test of (obsolete) DIN 57370-1 (1978)

Storage precautions

The critical electrical properties of Shell Diala S3 ZX-IG 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 be stored indoors in climate-controlled environments.

Health and Safety

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

Shell Diala S3 ZX-IG is free from polychlorinated biphenyls (PCB).

Protect the environment

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

Typical Physical Characteristics

Property	Units	Method	IEC 60296 Requirement	Shell Diala S3 ZX-IG
Appearance		IEC 60296	Clear, free from sediment and suspended matters	Complies
Density at 15 °C	kg/m^3	ISO 3675	-	890
Density at 20 °C	kg/m^3	ISO 3675	Max. 895	886
Kinematic viscosity at 40 °C	mm^2/s	ISO 3104	Max. 12	8,0
Kinematic viscosity at –30 °C	mm^2/s	ISO 3104	Max. 1.800	1.100
Flashpoint P.M.	°C	ISO 2719	Min. 135	136
Pourpoint	°C	ISO 3016	Max. -40	-57
Neutralisation value	mg KOH/g	IEC 62021-1	Max. 0,01	< 0,01
Corrosive Sulphur		DIN 51353	Not corrosive	Not corrosive
Corrosive Sulphur		IEC 62535	Not corrosive	Not corrosive
Corrosive Sulphur		ASTM D 1275 B	-	Not corrosive
Breakdown voltage	kV	IEC 60156		
Untreated			Min. 30	>30
After treatment			Min. 70	>70
Dielectric Dissipation Factor (DDF) at 90 °C		IEC 60247	Max. 0,005	0,002
Gassing	mm^3/min	IEC 60628 A	-	-14
Oxidation Stability (500 h /120 °C)		IEC 61125 C		
Total acidity	mg KOH/g		Max.1,2	1,0
Sludge	%m		Max. 0,8	0,45
DDF at 90 °C		IEC 60247	Max. 0,5	0,12
Oxidation Stability Baader (28 d /110 °C)		DIN 51554	-	
Neutralisation value	mg KOH/g			0,1
Sludge content	%m			0,01
DDF at 90°C				0,01

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