



Previous Name: **Shell Diala DX**

Shell Diala **S3 ZX-I**

Premium Inhibited Electrical Insulating Oil

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

Shell Diala S3 ZX-I is a premium, inhibited electrical insulating oil manufactured from specially refined mineral oils with an ultra-low sulphur content. It offers very high oxidation stability and excellent dielectric and low temperature properties.

Shell Diala S3 ZX-I 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)
- **Electrical equipment**
Components such as rectifiers, circuit breakers and switchgear.

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

Performance Features and Benefits

- **Extended oil life**
Shell Diala S3 ZX-I is a fully inhibited oil giving outstanding oxidation performance and an extended oil life. Shell Diala S3 ZX-I is also suitable for use in highly loaded applications.
- **Transformer protection**
Shell Diala S3 ZX-I is manufactured from an ultra low sulphur base oil, making it intrinsically non-corrosive towards copper, without the need for passivation.
Shell Diala S3 ZX-I 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. With exceptional viscometrics at -30°C Shell Diala S3 ZX I can be classed as "Arctic grade".

Specifications and Approvals

IEC 60296 (2003): Table 2 Transformer Oil (I) (Inhibited oil) Section 7.1 ("Higher oxidation stability")

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

Storage precautions

The critical electrical properties of Shell Diala S3 ZX-I 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 airtight seals. It is further recommended that electrical insulating oils are stored indoors in climate-controlled environments.

Health & 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-I is free from polychlorinated biphenyls (PCB).

Protect the environment

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



Typical Physical Characteristics

Property	Units	Method	IEC 60296 Table 2 + section 7.1	Shell Diala S3 ZX-I
Appearance		IEC 60296	Clear, free from sediment and suspended matters	Complies
Density at 15 °C	kg/m ³	ISO 3675	-	881
Density at 20 °C	kg/m ³	ISO 3675	Max. 895	878
Kinematic viscosity at 40 °C	mm ² /s	ISO 3104	Max. 12	8,0
Kinematic viscosity at -30 °C	mm ² /s	ISO 3104	Guaranteed max. 800 (IEC 60296=Max. 1.800)	720
Flashpoint P.M.	°C	ISO 2719	Min. 135	140
Pourpoint	°C	ISO 3016	Guaranteed max. -45 (IEC 60296=Max. -40)	-60
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 Untreated After treatment	kV	IEC 60156	Min. 30 Min. 70	>30 >70
Dielectric dissipation factor (DDF) at 90 °C		IEC 60247	Max. 0,005	0,001
Oxidation Stability (500 h / 120 °C)		IEC 61125 C		
Total acidity	mg KOH/g		Max. 0,3	0,02
Sludge	%m		Max. 0,05	0,01
Dielectric dissipation factor (DDF) at 90 °C			Max 0,05	0,005
Oxidation Stability Baader (28 d /110 °C)		DIN 51554		
Neutralisation value	mg KOH/g		-	<0,03
Sludge content	% m		-	<0,006
Dielectric dissipation factor (DDF) at 90 °C			-	0,005

These characteristics are typical of current production.

Whilst future production will conform to Shell's specification, variations in these characteristics may occur.