

SHELL DIALA S2 ZU-I

UNINHIBITED ELECTRICAL INSULATING OIL

RECOMMENDED REPLACEMENT FOR SHELL DIALA B



DESIGNED TO MEET CHALLENGES

Shell Diala S2 ZU-I is an uninhibited electrical insulating oil manufactured from highly refined mineral oils. It offers good dielectric properties, good oxidation stability and provides efficient heat transfer even at low temperatures.

Shell Diala S2 ZU-I meets both the established and the new industry copper corrosion tests.

PERFORMANCE FEATURES

EXTENDED OIL LIFE

- Shell Diala S2 ZU-I offers inherent natural resistance to oil degradation through oxidation.

SYSTEM EFFICIENCY

- The good low temperature properties of the oil ensures proper heat transfer inside the transformer, even from low starting temperatures.

TRANSFORMER PROTECTION

- Shell Diala S2 ZU-I is non-corrosive towards copper, with no need for passivation. Shell Diala S2 ZU-I meets all relevant tests on copper corrosion, namely the established DIN 51353 (Silver Strip Test) and ASTM D1275, and also the latest more severe tests: IEC 62535 and ASTM D1275B.

APPLICATIONS

TRANSFORMERS

- Electrical insulating oil for grid and industrial transformers.

ELECTRICAL EQUIPMENT

- Components such as rectifiers, circuit breakers and switchgears.

SPECIFICATIONS, APPROVALS AND RECOMMENDATIONS

- IEC: 60296 (2003) Table 2 Transformer Oil (U): uninhibited.

STORAGE PRECAUTIONS

- The critical electrical properties of Shell Diala S2 ZU-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 be stored indoors in climate-controlled environments.

TYPICAL PHYSICAL CHARACTERISTICS

CHARACTERISTICS		
Appearance (IEC 60296)	Clear, free from sediment and suspended matters	Complies
Density (ISO 3675) @ 15°C kg/m ³	–	884
@ 20°C kg/m ³	Max. 895	881
Kinematic Viscosity (ISO 3104) @ 40°C mm ² /s	Guaranteed Max. 11.2 (IEC 60296 = Max. 12)	9,4
@ –30°C mm ² /s	Max. 1.800	940
Flash Point °C (PM) (ISO 2719/ASTM D93)	Min. 135	144
Pour Point °C (ISO 3016)	Max. –40	–57
Neutralisation Value mg KOH/g (IEC 62021-1)	Max. 0,01	<0,01
Corrosive Sulphur (DIN 51353), (IEC 62535) (ASTM D 1275 B)	Not corrosive –	Not corrosive Not corrosive
Breakdown Voltage kV (IEC 60156) Untreated	Min. 30	>30
After treatment	Min. 70	>70
Dielectric Dissipation Factor (DDF) @ 90°C (IEC 60247)	Max. 0.005	0.002
Oxidation Stability (164h/120°C) (IEC 61125 C) Total acidity mg KOH/g	Max. 1.2	0.9
Sludge %m	Max. 0.8	0.3
DDF @ 90°C (IEC 60247)	Max. 0.5	0.1

SHELL DIALA S3 ZX-I DRIED

PREMIUM INHIBITED ELECTRICAL INSULATING OIL



DESIGNED TO MEET CHALLENGES

Shell Diala S3 ZX-I Dried 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 Dried is dried to achieve a higher breakdown voltage than required by standard industry norms.

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

PERFORMANCE FEATURES AND BENEFITS

EXTENDED OIL LIFE

- Shell Diala S3 ZX-I Dried is a fully inhibited oil giving outstanding oxidation performance and an extended oil life. Shell Diala S3 ZX-I Dried is also suitable for use in highly loaded applications.

TRANSFORMER PROTECTION

- Shell Diala S3 ZX-I Dried is manufactured from an ultra low sulphur base oil, making it intrinsically non-corrosive towards copper, without the need for passivation.

SYSTEM EFFICIENCY

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

Shell Diala S3 ZX-I Dried 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.

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.

SPECIFICATIONS, APPROVALS AND RECOMMENDATIONS

- IEC 60296 (Edition 4.0 2012-02): Table 2
- Transformer Oil (I) (Inhibited oil)
- Section 7.1 ("Higher oxidation stability")
- Baader oxidation test of (obsolete).

TYPICAL PHYSICAL CHARACTERISTICS

CHARACTERISTICS		
Appearance (IEC 60296)	Clear, free from sediment and suspended matters	Complies
Density (ISO 3675) @ 15°C kg/m ³	–	881
@ 20°C kg/m ³	Max. 895	878
Kinematic Viscosity (ISO 3104) @ 40°C mm ² /s	Max. 12	8.0
@ –30°C mm ² /s	Guaranteed max. 800 (IEC 60296=Max. 1.800)	720
Flash Point °C (PM) (ISO 2719)	Min. 135	138
Pour Point °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), (IEC 62535), (ASTM D1275 B)	Not corrosive –	Not corrosive Not corrosive
Breakdown Voltage kV (IEC 60156)		
As Delivered	Min. 30	>30
After treatment	Min. 70	>70
Dielectric Dissipation Factor (DDF) @ 90°C (IEC 60247)	Max. 0.005	0.001
Oxidation Stability (500h/120°C) (IEC 61125 C)		
Total acidity mg/KOH/g	Max. 0.3	0.02
Sludge %m	Max. 0.05	0.01
DDF @ 90°C	Max. 0.05	0.005
Oxidation Stability Baader (28d/110°C) (DIN 51554)		
Neutralisation value mg/KOH/g	–	<0.03
Sludge content %m	–	<0.006
DDF @ 90°C	–	0.005