



Shell Diala **S2 ZU-I Dried** *Uninhibited Electrical Insulating Oil*

- **RELIABLE PERFORMANCE**
- **MEETS IEC 60296**

Shell Diala S2 ZU-I Dried 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. It has excellent low temperature properties and is dried to achieve a higher breakdown voltage than required by standard industry norms.

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

Applications

- **Transformers**
Electrical insulating oil for grid and industrial transformers.
- **Electrical equipment**
Components such as rectifiers, circuit breakers 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 S2 ZU-I Dried offers inherent natural resistance to oil degradation through oxidation.
- **System efficiency**
The good low temperature properties of the oil ensure proper heat transfer inside the transformer, even from low starting temperatures.
Shell Diala S2 ZU-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.
- **Transformer protection**
Shell Diala S2 ZU-I Dried is non-corrosive towards copper, with no need for passivation. Shell Diala S2 ZU-I Dried 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.

Specification and Approvals

IEC 60296 (2003), Table 2 Transformer Oil (U), uninhibited

Storage precautions

The critical electrical properties of Shell Diala S2 ZU-I Dried 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.

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 S2 ZU-I Dried 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 Characteristics

Property	Units	Method	IEC 60296 Requirement	Shell Diala S2 ZU-I Gasoil Dried	Shell Diala S2 ZU-I Non-gasoil Dried
Appearance		IEC 60296	Clear, free from sediment and suspended matters	Complies	
Density at 15°C	kg/m ³	ISO 3675	-	878	882
Density at 20°C	kg/m ³	ISO 3675	Max. 895	875	879
Kinematic viscosity at 40°C	mm ² /s	ISO 3104	Max. 12	9,4	11,5
Kinematic viscosity at -30°C	mm ² /s	ISO 3104	Max. 1.800	940	1700
Flashpoint P.M.	°C	ISO 2719 / ASTM D93	Min. 135	140	
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 As delivered After treatment	kV	IEC 60156	Min. 30 Min. 70	>60 >70	
Dielectric Dissipation Factor (DDF) at 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 at 90°C		IEC 60247	Max. 0,5	0,1	

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