Shell Diala *S2 ZU-I gasoil tariff*

Technical Data Sheet

- *Reliable Performance*
- *Meets IEC 60296*

Uninhibited Electrical Insulating Oil

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

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Extended oil life**
  Shell Diala S2 ZU-I gasoil tariff 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 gasoil tariff is non-corrosive towards copper, with no need for passivation. Shell Diala S2 ZU-I gasoil tariff 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.

Main Applications



- **Transformers**
  Electrical insulating oil for grid and industrial transformers.
- **Electrical equipment**
  Components such as rectifiers, circuit breakers and switchgears.

Specifications, Approvals & Recommendations

- IEC 60296 (Edition 4.0 2012-02), Table 2 Transformer Oil (U), uninhibited

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk, or the OEM Approvals website.

Typical Physical Characteristics

Properties			Method	IEC 60296 Requirement	Shell Diala S2 ZU-I Gasoil
Appearance			IEC 60296	Clear, free from sediment and suspended matters	Complies
Density	@15°C	kg/m³	ISO 3675	-	878
Density	@20°C	kg/m³	ISO 3675	Max 895	875
Kinematic Viscosity	@40°C	mm²/s	ISO 3104	Max 12	9.4
Kinematic Viscosity	@-30°C	mm²/s	ISO 3104	Max 1.800	940
Flash Point (PM)		°C	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	Not corrosive	Not corrosive
Corrosive Sulphur			IEC 62535	Not corrosive	Not corrosive
Corrosive Sulphur			ASTM D1275B	-	Not corrosive
Breakdown Voltage As Delivered		kV	IEC 60156	Min 30	>30
Breakdown Voltage After Treatment		kV	IEC 60156	Min 70	>70
Dielectric dissipation factor (DDF)	@90°C		IEC 60247	Max 0.005	0.002

Properties			Method	IEC 60296 Requirement	Shell Diala S2 ZU-I Gasoil
Oxidation Stability (164 hrs) - Total Acidity	@120°C	mg KOH/g	IEC 61125 C	Max 1.2	0.9
Oxidation Stability (164 hrs) - Sludge	@120°C	%m	IEC 61125 C	Max 0.8	0.3
Oxidation Stability (164 hrs) - DDF at 90°C	@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.

Health, Safety & Environment

- **Health and Safety**

  Shell Diala S2 ZU-I Oil gasoil tariff 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.

  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 Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **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 S2 ZU-I gasoil tariff 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.

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.