

A photograph of an electrical substation under a clear blue sky. In the foreground, two workers wearing yellow hard hats and high-visibility orange and red safety vests are walking on a gravel path. Behind them is a long row of large, complex electrical equipment, including transformers and switchgear, supported by metal frames. The equipment is arranged in a perspective that recedes into the distance.

**WORKS HERE.**

**SHELL DIALA TRANSFORMER OILS – FOR  
ENHANCED PROTECTION, EXTENDED OIL  
LIFE AND EXCELLENT SYSTEM EFFICIENCY**

**Shell**  
**Diala**

[www.shell.com/lubricants](http://www.shell.com/lubricants)





**The Shell Diala range of transformer oils helps to protect your equipment and to ensure efficient operation throughout its lifetime.**

The Shell Diala range has been extended with the introduction of Shell Diala S4 ZX-I, a new GTL-based product engineered for optimum performance in the latest generation of transformers.

Shell Diala S4 ZX-I offers enhanced protection, longer oil life and greater efficiency.<sup>1</sup> It helps to meet the specific demands of today's transformers such as reduced sizes, increased loads, higher voltages and longer operational lifetimes.



**ENHANCED PROTECTION**

Oil is at the heart of your transformer. The Shell Diala range offers several options for the best possible protection. The new Shell Diala S4 ZX-I exceeds IEC 60296:Ed 4 2012 higher-oxidation stability, low-sulphur specification. In fact, it has essentially zero sulphur (below the detection limits), which means that the risk of oil-related copper corrosion is removed.

**LONGER OIL LIFE**

Shell Diala transformer oils are designed to last, thereby supporting the extension of your transformer's lifetime. Shell Diala S4 ZX-I exceeds the 500-hour oxidation test limit and extends oil life through its exceptional resistance to the effects of ageing, sludge formation and deposit build-up.

**GREATER EFFICIENCY**

For optimum transformer performance, electrical insulating oil must maintain its characteristics over a wide range of operating temperatures. Theoretical modelling predicts that Shell Diala S4 ZX-I could deliver improved operational performance under overload conditions owing to its enhanced thermal properties.<sup>1</sup>

**RESISTANCE TO CORROSION**

Shell is committed to minimising the possibility of insulating-oil-related corrosive sulphur developing, and the resultant copper corrosion. All Shell Diala products meet the industry standards for corrosive sulphur.

**SHELL HAS DESIGNED A PORTFOLIO OF FLUIDS THAT ENABLES YOU TO CHOOSE A PRODUCT TO MATCH YOUR TECHNICAL AND OPERATIONAL NEEDS.**

**SPECIALIST APPLICATIONS**

Shell offers products designed for specialist applications. Within the Shell Diala range, these include

- Shell Diala S4 ZX-IG, which is designed to meet the gas-absorbing challenges presented by high-voltage instrument transformers and bushings, and is effectively sulphur free. It helps to improve transformer reliability compared with conventional mineral oils.
- Shell Naturelle Transformer Oil S4 I. This is a synthetic-ester-based product that offers excellent low-flammability characteristics. It has a flash point of 275°C, is readily biodegradable and meets European Union Ecolabel requirements.



<sup>1</sup>Based on tests compared with Shell and competitors' products.



## A RANGE OF TRANSFORMER OILS TO MEET YOUR NEEDS

To meet the challenges of a wide range of equipment designs and applications, Shell has designed a portfolio of fluids that enables you to choose a product to match your technical and operational needs.

INCREASINGLY EFFICIENT PROTECTION

ADVANCED  
TIER 4

PREMIUM  
TIER 3

MAIN LINE  
TIER 2

### THE SHELL DIALA RANGE FOR STANDARD APPLICATIONS

#### Shell Diala **S4 ZX-I**

- Effectively zero sulphur
- Extra performance
- Exceeds IEC 60296: Edition 4 (2012) high oxidation stability and low sulphur content



### THE SHELL DIALA RANGE FOR SPECIAL APPLICATIONS

#### Shell Diala **S4 ZX-IG**

- Effectively zero sulphur
- Gas absorbency
- Exceeds IEC 60296: Edition 4 (2012) high oxidation stability and low sulphur content



#### Shell **Naturelle Transformer Oil S4 I**

##### SYNTHETIC

- Low flammability
- Readily biodegradable
- Meets IEC 61099 T1



#### Shell Diala **S3 ZX-I**

- Extra performance
- Meets IEC 60296: high oxidation stability and low sulphur content



#### Shell Diala **S2 ZU-I**

- Reliable performance
- Meets IEC 60296



##### PRODUCT-NAME SUFFIX KEY

- G** = Gas absorbing
- I** = Conforms to IEC specifications
- U** = Uninhibited
- X** = Fully inhibited
- Z** = Insulating oil

##### APPLICATION ICON KEY

- Transformer applications
- Power station applications

PRODUCT	CATEGORY DESCRIPTOR	BENEFITS	TECHNOLOGY	SPECIFICATIONS AND APPROVALS (Full details of approvals for all products can be obtained from your Shell representative; approvals and claims will vary by viscosity grade.)
<b>Shell Diala S4 ZX-I</b>	Premium, inhibited transformer oil	<ul style="list-style-type: none"> <li>■ Extra performance</li> <li>■ Exceeds IEC 60296: 2012 Edition 4: high oxidation stability and low sulphur content</li> </ul>	Inhibited	Meets the requirements of or is approved by most leading equipment manufacturers and utility companies Industry standards: IEC 60296: 2012 Edition 4, Table 2 Transformer Oil (I) (Inhibited oil); Section 7.1 ("Higher oxidation stability")
Shell Diala S3 ZX-I	Inhibited transformer oil	<ul style="list-style-type: none"> <li>■ Extra performance</li> <li>■ Meets IEC 60296: 2012 Edition 4: high oxidation stability and low sulphur content</li> </ul>	Inhibited	Meets the requirements of or is approved by most leading equipment manufacturers and utility companies Industry standards: IEC 60296: 2012 Edition 4, Table 2 Transformer Oil (I) (Inhibited oil), Section 7.1 ("Higher oxidation stability"); Baader oxidation test (obsolete) DIN 57370-1 (1978)
Shell Diala S2 ZUH	Uninhibited transformer oil	<ul style="list-style-type: none"> <li>■ Reliable performance</li> <li>■ Meets IEC 60296: 2012 Edition 4</li> </ul>	Uninhibited	Meets the requirements of or is approved by most leading equipment manufacturers and utility companies Industry standards: IEC 60296: 2012 Edition 4, Table 2 Transformer Oil (U) (Uninhibited oil)

## SPECIALITY GRADES

Shell Diala S4 ZX-IG	Premium, inhibited, gas-absorbing transformer oil	<ul style="list-style-type: none"> <li>■ Extra performance</li> <li>■ Exceeds IEC 60296: 2012 Edition 4: high oxidation stability and low sulphur content</li> </ul>	Inhibited	Meets the requirements of or is approved by most leading equipment manufacturers and utility companies Industry standards: IEC 60296: 2012 Edition 4, Table 2 Transformer Oil (I) (Inhibited oil); Section 7.1 ("Higher oxidation stability")
Shell Naturelle Transformer Oil S4 I	Advanced, synthetic transformer oil	<ul style="list-style-type: none"> <li>■ Extra performance</li> <li>■ Meets IEC 61099 T1</li> </ul>	Synthetic ester	Industry standards: IEC 61099 Type T1; European Ecolabel requirements for low environmental impact products; UBA for classification as no hazard to water (NWG)

## COMPREHENSIVE PRODUCT AND SERVICE PROVISION

Shell Lubricants is the number one lubricants supplier (Kline & Company, 2014) and has more than 60 years of innovation. We are constantly investing to develop better lubrication solutions, as demonstrated by

- Shell Turbo S4 X – a premium, industrial gas turbine oil based on Shell GTL technology for light- and heavy-duty gas turbines, and turbocompressors
- Shell Turbo S4 GX – a premium industrial gas turbine oil based on Shell GTL technology for steam, light- and heavy-duty gas and combined-cycle turbines, including geared turbines with load requirements
- Shell Mysella S5 N – which offers extended oil life and extra protection from deposits for demanding stationary gas engines<sup>2</sup>
- Shell Mysella S5 S – a specially designed low-ash oil for sour gas applications providing extra protection against deposits and corrosion.<sup>2</sup>

In addition, Shell provides the Shell LubeAnalyst service, an early-warning system that helps to identify potential oil and equipment failures before they become critical and to extend oil-drain intervals. It is a global platform available in 95 countries and 27 languages, and with more than 75 million data points.

<sup>2</sup> Based on tests compared with a competitor's product and lower-tier Shell products.



Find out more by visiting  
**[www.shell.com/lubricants](http://www.shell.com/lubricants)**