



# INDUSTRIAL STEAM, GAS AND COMBINED-CYCLE **TURBINE OIL**

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

## Shell **Turbo<sup>®</sup> S4 X**

### SETTING A NEW STANDARD

Shell Turbo<sup>®</sup> S4 X is based on gas-to-liquids (GTL) technology and has been developed to meet the demands of the latest high-efficiency turbine systems. It is designed to offer outstanding, long-term performance under the most severe operating conditions and will help to minimize deposit and sludge formation, even under cyclic peak-loading conditions.

### GLOBALLY CONSISTENT

Shell Turbo<sup>®</sup> S4 X is derived from purified natural gas, which produces a tightly specified hydrocarbon chemical structure. This defined chemistry delivers consistent and reliable performance, unlike crude-based oils that can vary significantly depending on their source and refining process.

The quality of Shell Turbo<sup>®</sup> S4 X is neither crude oil nor location dependent, and the oil's long-term availability is assured.

### APPLICATIONS

Shell Turbo<sup>®</sup> S4 X is designed for use in industrial light- and heavy-duty gas turbines, and turbo compressors.



### SPECIFICATIONS AND APPROVALS

Shell Turbo<sup>®</sup> S4 X meets and exceeds the specifications and requirements of the major turbine manufacturers, including MAN D&T, Siemens, GE, MHPS and Alstom.

**It is available in ISO grade 32.**

#### Industry specifications

ASTM 4304-13 Type I and III; GB (China) 11120-2011, L-TGA, L-TSA and L-TGSB; DIN 51515 Part 1 L-TD and Part 2 L-TG; ISO 8068, L-TGB and L-TGSB. GE approved as a Low Varnishing (LV) Fluid.



#### EXTRA LONG LIFE

**10,000+**

HOURS, TURBINE OIL STABILITY TEST (TOST LIFE)



#### SYSTEM EFFICIENCY

**1**

MINUTE, AIR RELEASE



#### DESIGNED TO PROTECT

**20**

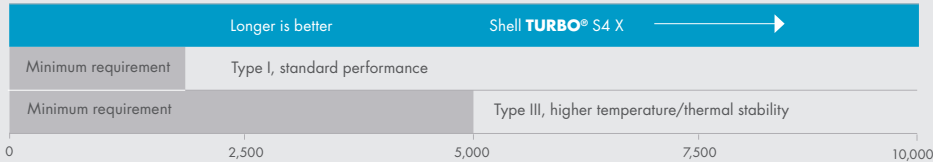
MG, SLUDGE (TOST 1,000 HOURS)

## DESIGNED FOR LONG OIL LIFE

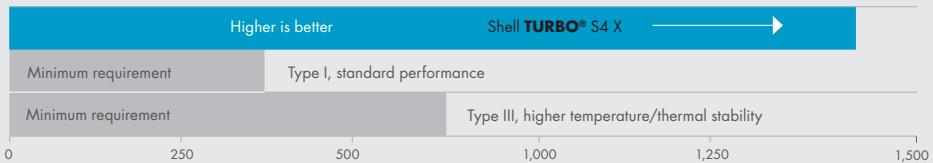
Shell Turbo® S4 X has outstanding resistance to degradation from oxidation and thermal stresses. In tests, Shell Turbo® S4 X performs twice as well as

the industry standard, thereby offering extended service life and reduced maintenance costs when compared with conventional mineral oil technology.

ASTM D4304, test method ASTM D943 TOST life, hours



ASTM D4304, method ASTM D2272 rotating pressure vessel oxidation test, minutes



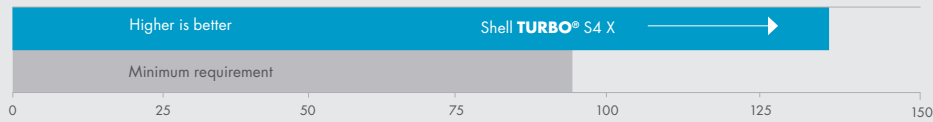
Product data shown is typical of the current product. While future production will conform to Shell's specification, variations in these characteristics may occur.

## ENHANCING SYSTEM EFFICIENCY

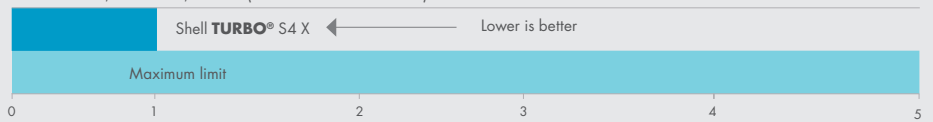
Demulsibility, air release, resistance to foaming and viscosity index are critical performance factors for oil in the latest turbine designs, especially turbines that

operate at higher temperatures and have smaller oil volumes with shorter oil reservoir residence times. Shell Turbo® S4 X offers excellent performance in all four areas.

GB 11120-2011, viscosity index



ASTM D4304, air release, minutes (test method ASTM D3427)



## DESIGNED TO PROTECT YOUR TURBINE

The excellent resistance to varnish and sludge formation provided by Shell Turbo® S4 X helps turbine systems to operate reliably even during severe peak-

load operation. Minimizing the formation of sludge and bearing deposits reduces wear and can help to reduce the risk of an unplanned turbine shutdown.

ASTM D4310, TOST 1,000 hours, deposit protection, sludge, mg



BS 489:1999, Steam demulsibility, seconds (test method IP 19)



## SUPERIOR PERFORMANCE

Shell's base oils derived from natural gas using GTL technology have a lower sulphur content and a more uniform structure than crude oil, thus enabling Shell Turbo® S4 X to offer enhanced performance compared with conventional mineral oils.

Shell Turbo® S4 X offers excellent resistance to degradation and provides enhanced equipment protection. It can help to maintain optimum operating conditions even under the most challenging situations.



## FULL PRODUCT AND SERVICE PORTFOLIO

Whatever your needs or application, we can provide a full range of oils and greases, including synthetic, high-performance products and additional services.

## CONTACT

Talk to us about the benefits that GTL-based Shell turbine oils could have for your business. Find out more by visiting [www.shell.us/power](http://www.shell.us/power)

**SHELL LUBRICANTS**  
TOGETHER ANYTHING IS POSSIBLE