

# SHELL TURBO® Oils CC

## *Premium quality industrial gas, steam and combined cycle turbine Oil*

SHELL TURBO® Oils CC have been developed to meet the severe demands imposed by modern, heavy duty turbine applications, exceeding OEM specifications for both gas and steam turbines. A patented, metal free additive technology, ensures that this product offers substantially improved performance over conventional turbine oils. Its unique combination of excellent oxidative stability, sludge control and surface properties make SHELL TURBO® Oils CC an excellent choice for combined cycle turbine technology, as well as existing gas and steam turbine plants.

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### Performance Features and Benefits

- **Superb oxidation resistance**

High temperatures and extended oil drain intervals demand effective oxidation properties of the oil. SHELL TURBO® Oils CC oxidative stability reduces the formation of sludge and other harmful oxidation products. The result is extended oil life, less maintenance and less downtime.

- **Outstanding thermal resistance**

Modern turbines impose high thermal stress on the oil, increasing the risk of failures. SHELL TURBO® Oils CC are specially designed to cope with these conditions. Their outstanding thermal stability, coupled with resistance to formation of lacquer helps reduce the possibility of unplanned outages.

- **Rapid air release and high resistance to foaming**

High oil flows contribute to the possibility of entrapped air, which can lead to pump cavitation, premature oil oxidation and excessive wear. SHELL TURBO® Oils CC exhibit excellent surface properties with minimal foam formation and rapid air-release, which minimizes air entrapment, reducing these effects of high oil flows to a minimum.

- **Excellent water-shedding properties**

Water contamination is commonplace in steam turbines, causing corrosion and affecting bearing lubrication. Because of SHELL TURBO® Oils CC outstanding demulsibility water can be drained easily from the lubrication system, protecting the installation against corrosion and premature wear.

- **Good load carrying capacity**

Helps reduce excessive gear tooth and turbine component wear making it suitable for use in turbines with highly loaded gears. Minimizing downtime and maintenance costs.

### Main Applications

- Power generation combined cycle turbines
- Industrial steam turbines
- Industrial gas turbines

Advice on applications not covered in this handbook may be obtained from your Shell representative.

### Specifications, Approvals, and Recommendations

SHELL TURBO® Oils CC exceed the major gas and steam turbine manufacturers' lubricant specifications including:

- General Electric GEK 28143 A, GEK 32568F, GEK 46506D, GEK 101941A
- Siemens-Westinghouse 21 T0591 and 5512523
- ABB STAL K-110-8121 08/09
- Solar ES 9-224, class II, Revision V
- DIN 51515 parts 1 and 2
- ISO 8068
- GEC Alstom NBA P50001A
- JIS K-2213 Type 2
- BS 489-1999
- Siemens/Mannesmann Demag 800 037 98

#### Approved by OEM against:

- Siemens TLV 9013 04
- Alstom HTGD 90 117

## Handling and Safety Information

For information on the safe handling, storage, or use of this product, refer to its Material Safety Data Sheet at <http://www.epc.shell.com/>. If you are a Shell Distributor, please call 1+800-332-6457 for all of your service needs. All other customers please call 1+800-237-8645 for all of your service needs.

## Protect the Environment

Do not discharge into drains, soil, or water.

## Typical Physical Characteristics

SHELL TURBO® Oils CC	ISO Viscosity Grades	
	32	46
<b>Viscosity</b>		
cSt @ 40 °C	32.0	46.0
cSt @ 100 °C	5.45	6.90
<b>Viscosity Index</b>	105	105
<b>Color</b> (D 1500)	L 1.0	L 1.0
<b>Pour Point</b> °C	-12	-12
<b>Flash Point</b> °C (COC)	218	238
<b>Total Acid Number</b> (mg KOH/g)	0.16	0.16
<b>Foaming</b> (ml/ml)		
Sequence I	10/Nil	10/Nil
Sequence II	20/Nil	20/Nil
Sequence III	10/Nil	10/Nil
<b>Air Release</b> (ASTM D3427, min)	4	4
<b>Water Demulsibility</b> (ASTM D1401, min)	15	15
<b>Rust Control</b> (ASTM D665B, after water washing)	Pass	Pass
<b>Load Carrying Capacity</b> - (FZG) (DIN 51354)–Load Stage Fail	9 min.	9 min.
<b>Oxidation Control Tests-</b>		
A) TOST Life (modified ASTM D934, hr)	>10,000	>10,000
B) RPVOT (ASTM D2272, minutes)	>1,300	>1,300
C) FTM-791b-5308		
TAN Increase (mg KOH/g)	+0.6	+0.6
Viscosity Increase @ 40°C (%)	+8.0	+8.0
Sludge formation (mg)	98	98

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*These characteristics are typical of current production. While future production will conform to Shell specifications, variation in these characteristics may occur.*