



### Shell Turbo Oils CC

#### **Premium Quality Industrial Gas, Steam & Combined Cycle Turbine Oils**

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 these products offers substantially improved performance over conventional turbine oils. The unique combination of excellent oxidation and thermal stability, coupled with the resistance to formation of deposits and varnish, sludge control and surface properties make Shell Turbo Oils CC an excellent choice lubricant for emerging combined cycle turbine technology, as well as existing gas and steam turbine plants.

#### **Applications**

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

#### **Exceeding OEM Specifications**

Shell Turbo Oils CC meets or exceeds the major gas and steam turbine manufacturers lubricant requirements including:

- General Electric GEK 28143A, GEK 32568F, GEK 46506D, GEK 101941A, GEK 107395A
- Siemens-Westinghouse 21 T0591 & 55125Z3
- Solar ES 9-224, Revision W
- DIN 51515 Part 1 L-TD & Part 2 L-TG
- ISO 8068 L-TGB & L-TGSB
- GEC Alstom NBA P50001A
- JIS K-2213 Type 2
- ASTM D 4304 Type I and Type 2
- BS 489-1999

#### **Approved by OEM against:**

- Siemens TLV 9013 04
- Alstom HTGD 90-117

#### **Features and Benefits**

- **Superior oxidation and thermal stability**  
Modern combined cycle and stationary gas turbines operating at high power outputs can be very stressful on the oxidation and thermal properties of the turbine oil. Lubrication stability failure in this area can create operational problems, system deposits and the formation of varnish in critical areas. Shell Turbo Oils CC are especially designed to cope with these conditions. Their outstanding oxidation and thermal stability, coupled with the resistance to form deposits and varnish reduces the possibility of unplanned outages.

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The result is extended oil life, less maintenance and less downtime.

- **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 minimises 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 has outstanding demulsibility properties, water can be drained easily from the lubrication system, protecting the installation against corrosion and premature wear.

- **Good load carrying capacity**

An ashless, non-zinc anti-wear system reduces excessive gear tooth and turbine component wear making it suitable for use in turbines with highly loaded gears. Minimizing downtime and maintenance costs.

#### **Health & Safety**

Shell Turbo Oils CC are unlikely to present any significant health or safety hazard when properly used in the recommended application, and good standards of industrial and personal hygiene are maintained.

For further guidance on Product Health & Safety refer to the appropriate Shell Product Safety Data Sheet.

#### **Advice**

Advice on applications not covered in this leaflet may be obtained from your Shell Representative.

## Technical Data Sheet

### Typical Properties

<b>Shell Turbo Oils CC</b>	<b>ISO VISCOSITY GRADES</b>		
	<b>GEK 101941A ISO 32 Specification</b>	<b>32</b>	<b>46</b>
Viscosity (ASTM D 445)			
cSt @ 40°C	28.8 to 35.2	32	46
cSt @ 100°C		5.3	6.9
Viscosity Index (ASTM D 2270)	95 min	105	105
Color (ASTM D 1500)	2.0 max	L 1.0	L 1.0
Pour Point °F (ASTM D 5949)	10 min	10	10
Flash Point °F – COC (ASTM D 92)	420 min	430	460
Total Acid Number (mg KOH/g) (ASTM D 664/974)	0.20 max	0.19	0.19
Foaming (ml at 0/10 min) (ASTM D 892)			
Sequence I	50/Nil	10/Nil	10/Nil
Sequence II	50/Nil	20/Nil	20/Nil
Sequence III	50/Nil	10/Nil	10/Nil
Air Release (ASTM D 3427, min)	< 5	4	4
Water Demulsibility, Separation Time, minutes (ASTM D 1401)		15	15
Rust Control (ASTM D 665B, after water washing)	Pass	Pass	Pass
Load Carrying Capacity- FZG (DIN 51354) - Load Stage Fail	8 min	9 min	9 min
Oxidation Control Tests-			
A) TOST Life, (modified ASTM D 943, hr)	3,000 min	>10,000	>10,000
B) RPVOT (ASTM D 2272, min)	500 min	>1,200	>1,200
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

Shell Turbo Oils CC exceed the major gas and steam turbine manufacturers lubricant specifications. Full details may be obtained from your local Shell Representative.