SHELL TURBO® Oils T

High quality industrial steam and gas turbine oil

SHELL TURBO® Oils T have been developed to offer performance capable of meeting the demands of the most modern non-geared steam turbine systems and light duty gas turbines. SHELL TURBO® Oils T are formulated from high quality hydrotreated base oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.

Performance Features and Benefits

- **Strong control of oxidation**
  The use of inherently oxidatively stable base oils together with an effective inhibitor package provides high resistance to oxidative degradation. The result is extended oil life, minimizing the formation of aggressive corrosive acids, deposits and sludge, reducing your operating costs.
- **High resistance to foaming and rapid air release**
  The oils are formulated with a non-silicone anti-foam additive, which generally controls foam formation. This feature coupled with fast air-release from the lubricant reduces the possibility of problems such as pump cavitation, excessive wear and premature oil oxidation, giving you increased system reliability.
- **Positive water-shedding properties**
  Robust demulsibility control such that excess water, common-place in steam turbines, can be drained easily from the lubrication system, minimizing corrosion and premature wear. Lowering the risk of unplanned maintenance.
- **Excellent rust and corrosion protection**
  Prevents the formation of rust and guards against the onset of corrosion ensuring protection for equipment following exposure to humidity or water during operation and during shut-downs, minimizing maintenance.

Main Applications

SHELL TURBO® Oils T are available in ISO grades 32, 46, 68 and 100 suited for application in the following areas:

- Non-geared industrial steam turbines
- Non-geared light duty gas turbines
- Hydro turbine lubrication
- Compressor applications
- Numerous applications where strong control over rust and oxidation is required

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

Specifications, Approvals, and Recommendations

The performance of SHELL TURBO® Oils T meet or exceed a number of major steam and gas turbine manufacturer lubricant specifications including:

- General Electric GEK 28143A, 32568F, 46506D
- Siemens - Westinghouse 21T0591 and 55125Z3
- DIN 51515 part 1 and 2
- ISO 8068
- Solar ES 9-224U, class II
- GEC Alstom NBA P50001
- JIS K2213 Type 2
- BS 489-1999
- ASTM D4304, Type I
- Siemens/Mannesmann Demag 800037 98

Approved by OEM against:

- Siemens TLV 9013 04
- Alstom HTGD 90117
- Man TURBO SP 079984 D0000 E9
- Cincinnati Approvals: P-38: TURBO T 32, P-55: TURBO T 46, P-54: TURBO T 68

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 T	**32**	**46**	**68**	**100**
Viscosity (ASTM D445)				
cSt @ 40°C	32	46	68	100
cSt @ 100°C	5.2	6.6	8.5	11.4
Color (ASTM D1500)	L 0.5	L 0.5	L 0.5	L 1.0
Pour Point °C (°F) (ASTM D97)	<-12 (10)	<-12 (10)	-9 (16)	-9 (16)
Flash Point (COC) (ASTM D92, °C (°F))	>215 (419)	220 (428)	240 (464)	250 (482)
Total Acid Number (ASTM D974, mg KOH/g)	0.05	0.05	0.05	0.05
Foaming (ASTM D 982, ml/ml)				
Sequence I	30/Nil	30/Nil	30/Nil	30/Nil
Sequence II	20/Nil	20/Nil	20/Nil	20/Nil
Sequence III	30/Nil	30/Nil	30/Nil	30/Nil
Air Release (ASTM D3427, min)	2	4	6	10
Water Demulsibility (ASTM D1401, min)	15	15	20	20
Steam Demulsibility (ASTM D51589, secs)	150	153	183	210
Copper Corrosion (ASTM D130, 100 °C/3hr)	1b	1b	1b	1b
Rust Control (ASTM D665B, after water washing)	Pass	Pass	Pass	Pass
Inertness to ammonia (Modifier ASTM D943)				
Acid Nmber (mgKOH/g)	0.04	0.04	NA	NA
Organic Sludge (%)	0.004	0.004		
Copper Content (ppm)	0	0		
FZG, Fail Load Stage (DIN 51354)	6	6	6	6
Oxidation Control Tests-				
A) TOST Life (modified ASTM D943, hr)	>10,000	>10,000	>10,000	>10,000
B) TOST 1000hr Sludge (ASTM D4310, mg)	30	30	30	30
C) RPVOT (ASTM D2272, min)	>950	>950	>950	>950

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