Technical Data Sheet

Shell **Turbo Oil** *T 46*

High Quality Industrial Steam & Gas Turbine Oils

Shell Turbo Oils T have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oils T have been developed to offer improved performance capable of meeting the demands of the most modern steam turbine systems and light duty gas turbines, which require no enhanced anti-wear performance for the gearbox. 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 & corrosion, low foaming and excellent demulsibility.

DESIGNED TO MEET CHALLENGES

Performance, Features & 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, minimising 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 an 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, minimising corrosion and premature wear, lowering the risk of unplanned maintenance.

- **Excellent Rust & Corrosion Protection**

  Prevents the formation of rust and guards against onset of corrosion ensuring protection for equipment following exposure to humidity or water during operation and during shut-downs, minimising maintenance.

Main Applications

- Shell Turbo Oils T are available in ISO grades 32, 46, 68 & 100 suited for application in the following areas:
- Industrial steam turbines & light duty gas turbines requiring
- Hydroelectric turbine lubrication.
- Numerous applications where strong control over rust and oxidation is required.
- Centrifugal and axial, dynamic turbo-compressors and pumps where an R&O type or turbine oil is recommended
- For special applications such as Ammonia or High Sulphur Syngas compressors with wet gas seals, please contact your local technical expert

Specifications, Approvals & Recommendations

The product meets or exceeds the following industry standards:

- ISO 8068 L-TGA, L-TSA, L-TGB, L-TGSB
- DIN 51515-1 L-TD, DIN 52515-2 L-TG, DIN 51524-1 HL
- GB11120 L-TSA, L-TGA, L-LGSB
- ASTM D4304 Type I & III
- JIS K 2213 Type 2
- Indian Standard IS 1012

The product has been approved by:

- Siemens Power Generation TLV 9013 04 & TLV 9013 05
- General Electric GEK 28143B, GEK 117064
- Alstom HTGD 90117 V 0001 AA
- Alstom Power Hydro Generators (spec HTWT600050)
- Andritz Hydro
- Dresser Rand (spec 003-406-001) Type I and Type III
- Solar ES 9-224AA Class II
- MAN D&T SE TED 10000494596, Rev. 3
- Baker Hughes (formerly GE Oil & Gas) ITN52220.04

no enhanced anti-wear performance for the gearbox.

- Siemens Energy (Siemens Industrial Turbomachinery - Lincoln Small Gas Turbins) 1CW0047915, WN80003798, REPORT 65/0027/04
- Siemens Energy - Finspong MGT mittel grosse Gasturbinen (formerly ABB) MAT812101/MAT812102
- ANSALDO TGO2-0171-E00000/B
- Siemens Energy (Turbo Compressors) Spec 80003798
- Skoda Technical Properties Tp 0010P/97 use in steam engines.
- Fives Cincinnati, LLC (formerly Cincinnati Machine): P-55

For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Typical Physical Characteristics

Properties			Method	Shell Turbo Oil T 46
Viscosity	@40°C	cSt	ASTM D445	46.0
Viscosity	@100°C	cSt	ASTM D445	6.90
Viscosity Index			ASTM D2270	105
Colour			ASTM D1500	L 0.5
Density	@15°C	kg/m^3	ASTM D4052	858
Pour Point		°C maximum	ASTM D97	-27
Flash Point (COC)		°C minimum	ASTM D92	220
Total Acid Number		mg KOH/g	ASTM D974	0.10
Air Release, Minutes	@50°C	minutes	ASTM D3427	4
Water Demulsibility		minutes	ASTM D1401	15
Steam Demulsibility		seconds	DIN 51589	153
Rust Control			ASTM D665B	Pass
Oxidation Control Test - TOST Life		hours minimum	ASTM D943	10 000
Oxidation Control Test - RPVOT - minutes		minutes minimum	ASTM D2272	Min 1 000

These characteristics are typical of current production. Whilst future production will conform to Shell's specification, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  Shell Turbo Oil T 46 is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Material Safety Data Sheet, which can be obtained from http://www.epc.shell.com/

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell representative.