



# 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.

- **Resistant to Reaction with Ammonia**

The use of highly refined base oils and specific additives, resistant to attack by ammonia, minimises the possibility of damaging oil soluble/insoluble ammonia compounds being formed in the lubricant.

Shell Turbo Oils T mitigates the formation of these deposits, which could impair the reliable operation of bearings and seal oil systems.

#### 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 which require no enhanced anti-wear performance for the gearbox.
- 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.

#### Specifications, Approvals & Recommendations

- Siemens Power Generation TLV 9013 04 & TLV 9013 05
- Alstom Power Turbo-Systems HTGD 90-117
- Man Turbo SP 079984 D0000 E99
- Fives Cincinnati, LLC (formaly Cincinnati Machine): P-55
- General Electric GEK 28143b – Type II
- DIN 51515-1 TD and DIN 51515-2 TG
- ISO 8068, L-TSA and L-TGA
- Solar ES 9-224W Class II
- GEC Alsthom NBA P50001A
- JIS K 2213: 2006 Type 2
- ASTM D4304, Type I and Type III
- GB11120, L-TSA and L-TGA
- Indian Standard IS 1012:2002

- Skoda, Technical Properties Tp 0010P/97 use in steam engines.
- Alstom Power Hydro Generators (spec HTWT600050)
- Dresser Rand (spec 003-406-001)
- Andritz Hydro
- Siemens Turbo Compressors (spec 800 037 98)
- MAN D&T SE TED 10000494596

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

### Typical Physical Characteristics

Properties			Method	Turbo 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		kg/m <sup>3</sup>	ASTM D4052	858
Pour Point		°C	ASTM D97	<-27
Flash Point (COC)		°C	ASTM D92	>220
Total Acid Number		mg KOH/g	ASTM D974	0.10
Air Release, Minutes		min	ASTM D3427	4
Water Demulsibility		min	ASTM D1401	15
Steam Demulsibility		secs	DIN 51589	153
Rust Control			ASTM D665B	Pass
Oxidation Control Test - TOST Life		hrs	ASTM D943	10,000+
Oxidation Control Test - RPVOT - minutes		min	ASTM D2272	>950

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.