PETRO-CANADA LUBRICANTS

A HOLLYFRONTIER BRAND

TECH DATA

TURBOFLO™ HTS 46

PREMIUM TURBINE FLUID

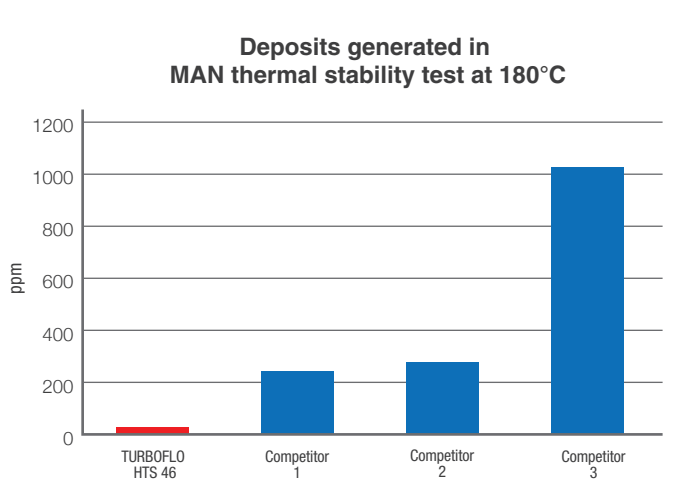
INTRODUCTION

TURBOFLO™ HTS 46 is a premium turbine fluid formulated with Petro-Canada Lubricants ultra-pure, severely hydrotreated base oils and highly advanced additive chemistry. The carefully selected components provide a synergy between the additives and the base oils that leads to excellent thermal stability and enhanced oxidative resistance. TURBOFLO HTS 46 provides excellent corrosion protection for ferrous and non-ferrous metals. It is an ashless product, free of metals or organometallic compounds. TURBOFLO HTS 46 meets major OEM and industry requirements for turbine oils and is available in ISO 46 viscosity grade.

FEATURES AND BENEFITS

Excellent thermal and oxidation stability

- Rotating Pressure Vessel Oxidation Test (RPVOT) result of 2000+ minutes proves exceptional oxidation resistance.
- Carefully designed formulation results in exceptionally low sludge and deposit forming tendency.
- Synergistic blend of antioxidants provides exceptional thermal stability and prolongs fluid life under the high temperature conditions common in modern gas turbines.



TURBOFLO HTS 46 demonstrates outstanding thermal stability as compared to competitor products.

Good varnish resistance

- Minimal varnish build up and sludge formation at high temperature qualifies TURBOFLO HTS 46 for the lubrication of modern gas turbines.
- Good varnish and sludge control leads to less maintenance and minimizes equipment downtime.

Good wear and scuffing protection

- FZG A/8.3/90 failure load stage of 9 (ISO 14635) means good protection against gear tooth scuffing and wear.
- Good load carrying ability protects loaded gears in speed reduction systems.
- Lower maintenance costs and improved equipment reliability are driven by reduced gear wear and longer component life.

Rapid air release and excellent steam and water demulsibility

- Rapid air release of TURBOFLO HTS 46 leads to less fluid break down and improves equipment reliability.
- Excellent steam and water demulsibility protects against water ingression as a result of condensation or leakage of water in steam turbine systems.

APPLICATIONS

TURBOFLO HTS 46 is a premium turbine fluid designed to significantly exceed the demanding service requirements of steam and gas turbines and stringent oxidative and thermal resistance requirements of major OEMs for modern turbine oils. It also provides extended, corrosion-free lubrication of bearings and control circuit of turbine units. It is recommended for geared turbines that require a turbine fluid with wear and scuffing protection. It is also recommended for non-geared steam and gas turbine systems that do not require an EP fluid.

TURBOFLO HTS 46 is suitable as a bearing lubricant, and control and governor fluid for use in geared and non-geared gas turbines and combined gas turbine/compressor units, steam turbines, and turbo-compressors.

TURBOFLO HTS 46 is approved by MAN Energy Solutions for MAN Energy Solutions TED 10000494596.

TURBOFLO HTS 46 also meets or exceeds the performance requirements of the following specifications:

- ASTM D-4304 TYPE I, II, TYPE III
- DIN 51515 PART 1, PART 2
- British Standard BS 489
- JIS K 2213 Type 2
- ISO 8068 TSE, TGE, L-TGSE
- GB (China) 11120-2011, L-TSE, L-TGE , L-TGA, L-TSA
- Siemens TLV 9013 04 standard thermal stability
- Siemens TLV 9013 05 high thermal stability
- Siemens Finspong MAT812109
- Siemens Turbo-machinery 65/0027/04 (except packages fitted with hydraulic start systems)
- GE (formerly Alstom) HTGD 90 117
- Ansaldo Energia TGO2-0171-E00000/B
- Solar ES 9-224Y

TYPICAL PERFORMANCE DATA

Property	Test Method	TURBOFLO HTS 46
Viscosity, cSt at 40°C/104°F Viscosity, cSt at 100°C/212°F	D445	46 6.8
Viscosity Index	D2270	> 100
Density @ 15°C/59°F	D1298	0.86
Flash point Cleveland Open Cup., °C/°F	D92	230 / 446
Pour point, °C/°F	D5950	-18 / 0
Acid Number, mg KOH/g	D974	0.03
Colour	D1500	<0.5
Water Separation Property after steam treatment, sec.	DIN 51589	78
Water separation property @ 54°C/129°F, min	D1401	5
Air release property @ 50°C/122°F, min	D3427	<2.5
Corrosive effect on copper	D130	1A
Rust, B Rust, A	D665	No Rust No Rust
Foaming tendency and stability I, II, & III, ml	D892	20/0, 30/0, 30/0
FZG Load carrying capacity (failure load stage)	D5182	9
TOST aging stability Time to TAN 2, h	D943	7000+
TOST 1000 h Sludge, mg	D4310	25
RPVOT oxidation stability, min	D2272	> 2000
Modified RPVOT, %	D2272	> 85

The values quoted above are typical of normal production. They do not constitute a specification.

Learn more about us: **lubricants.petro-canada.com**
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Committed to the disciplined operation of our business.

CERTIFIED
ISO 9001: 2015
ISO 14001: 2015
IATF 16949: 2016

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