

TURBOFLO™ EP PREMIUM TURBINE FLUIDS

Introduction

Petro-Canada™ Lubricants' TURBOFLO™ EP is a premium turbine fluid designed for the lubrication of geared heavy duty gas turbines with common gear and bearing lubrication systems. Its outstanding thermal and oxidative stability also make it an excellent choice for severe service gas and steam turbine applications. It is formulated with Petro-Canada Lubricants' ultra pure HT Severely Hydrocracked base oils and highly advanced antioxidant and EP additive technology to deliver a winning combination of enhanced wear protection as well as oxidative and thermal stability.

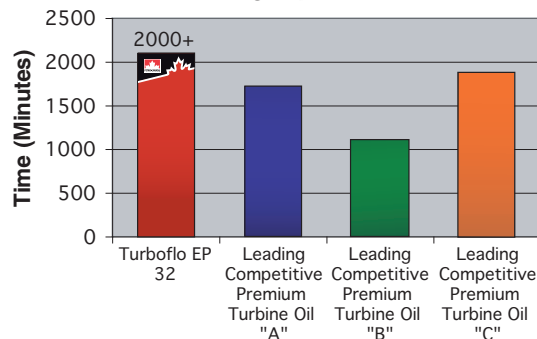
TURBOFLO EP with its zinc free, ashless anti-wear additive system delivers excellent wear and scuffing protection for heavily loaded geared turbines. At the same time, it demonstrates exceptional oxidative and thermal stability, which surpasses that of many competitive turbine lubricants on the market today. These in turn help customers to reduce overall maintenance costs and provide worry-free operation.

Features and Benefits

- **Exceptional resistance to fluid breakdown caused by exposure to air and high temperatures**
 - Rotating Pressure Vessel Oxidation Test (RPVOT) result of 2000+ minutes, which is higher than that of the leading competitive products tested
 - Synergistic blend of antioxidants provides exceptional oxidation and deposit resistance as well as outstanding viscosity stability
 - Thermally stable, low volatility additive system prolongs fluid life under the high temperature conditions common to modern heavy duty gas turbines

- Prevents formation of sludge and deposits that can lead to servo valve malfunction, filter plugging, and system corrosion
- Lowers operating costs by extending intervals between oil top-ups or complete change-outs

Rotating Pressure Vessel Oxidation Test (RPVOT)
ASTM D2272



- **Excellent air and water separability**
 - Low foaming characteristics prevent lubricant loss due to reservoir overflows, ensure stable operation and uninterrupted lubricating film in bearings
 - Rapid air release property prevents rapid pump wear and lubricant oxidation, ensures reliable and consistent operation of governor hydraulics
 - Excellent water separability allows water to be easily drained from the lubricant reservoir, minimizing corrosion and contamination of lubricant from water and steam

What is the HT difference?

Petro-Canada Lubricants starts with the HT purity process to produce water-white, 99.9% pure base oils. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.



- **Superior scuffing and wear protection**
 - FZG test results show superior protection against gear tooth scuffing and wear
 - Superior load carrying ability protects highly loaded gears in speed reduction systems
 - Lower maintenance costs and improved equipment reliability by reduced gear wear and longer component life
- **Robust, highly effective additive system**
 - Zinc free, non-toxic, ashless EP additive chemistry
 - High thermal and oxidative stability, very low volatility
 - Unique, synergistic combination of primary and secondary antioxidants
 - Excellent rust protection
 - Superior water separability, foaming resistance, and air release properties
- **Single Fluid for steam and gas turbines in both geared and non-geared applications**
 - Multi-application product to reduce lubricant inventory
 - Prevents misapplication of lubricants

Applications

TURBOFLO EP significantly exceeds the demanding service requirements of gas and steam turbine operators in power generation, prime mover, and other industrial applications. It is primarily recommended for geared heavy duty gas turbines that require a turbine fluid that provides wear and scuffing protection. It is also recommended for steam and gas turbine systems that do not require an EP fluid if consolidation of lubricants is a key priority.

TURBOFLO EP 46, has received **ALSTOM OEM** approval **HTGD 90117** (Lubricating and Control Oils for Turbines).

TURBOFLO EP fluids are suitable for use in steam and gas turbines requiring the following major manufacturer and industry specifications:

General Electric	GEK 101941A GEK 32568J GEK 28143A GEK 46506E (ISO 32 only)
Siemens	TLV 9013 04, TLV 9013 05
Siemens / Westinghouse	1500 0020, 5512Z3
Solar	ES 9-224Y
GE (Formerly Alstom ABB)	HTGD 90 117 V0001X
DIN	DIN 51515
ASTM	D 4304 Type II (EP)
JIS	K 2213 Type 2
Voith	Variable Speed Drives
Ansaldo Energia	TG02-0171-E00000/B

Operational Considerations

TURBOFLO EP with advanced additive chemistry and enhanced oxidative and thermal stability provides worry-free operation and reduced cost to customers under normal recommended conditions. However, actual oil life is dependent upon system design and operating practices. No Nonsense Lubricants Warranty applies.

Typical Performance Data

PROPERTY	TEST METHOD	TURBOFLO EP	
		32	46
Viscosity cSt @ 40 °C/SUS @ 100 °F cSt @ 100 °C/SUS @ 210 °F	D445 D445	34.15 / 176 5.58 / 45	46.37 / 239 6.82 / 49
Viscosity Index	D2270	100	101
Flash Point, COC, °C/°F	D92	220/428	237/459
Acid Number, mg KOH/g	D664	0.18	0.10
Pour Point, °C/°F	D5950	-33/-27	-30/-22
Mechanical Emulsion @ 54 °C	D1401	40-40-0 (5)	40-40-0 (10)
Foam Sequence I	D892	5/0	0/0
Foam Sequence II	D892	15/0	0/0
Foam Sequence III	D892	5/0	0/0
Air Release @ 50 °C minutes	D3427	2	4
Rust Protection A&B, 24 hr	D665	Pass, Pass	Pass, Pass
Copper Corrosion 3hr @ 100 °C	D130	1a	1b
FZG Failure Load Stage	DIN 51354	12	12
Rotating Pressure Vessel Oxidation Test, mins	D2272	2,000+	2,000+
Turbine Oil Oxidation Stability Test, hours to 2.0 acid number increase	D943	10,000+	10,000+

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

To order product or to learn more about how Petro-Canada Lubricants
can help your business visit: lubricants.petro-canada.com
or contact us at: lubecsr@petrocanadalsp.com



IM-8013E (2018.07)

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