

# Petro-Canada TechData



## HARNEX™ WIND TURBINE GEAR OIL TOUGH CONDITIONS. TOUGHER PROTECTION.

### Introduction

The challenges facing wind turbine transmissions are severe – high torque, temperature swings, severe corrosion, constant stopping and starting, and accessibility both in offshore applications and in bigger units.

What is needed is gear oil that stands up to these conditions while reducing downtime and maintenance costs.

### The right oil for the right application

Petro-Canada's HARNEX 320 Wind Turbine Gear Oil is a premium synthetic lubricant designed to provide exceptional anti-wear/EP and protection from water corrosion under the toughest conditions. HARNEX is specially formulated for lubricating onshore and offshore wind turbine gearboxes for reduced downtime and less maintenance, especially critical for difficult to access gearboxes.

It's designed using polyalphaolefin (PAO) chemistry that delivers good oil film thickness over a broad temperature range. The high viscosity index and low traction coefficient of this oil combine to provide significant reduction in power consumption in many gear drives.

### Meeting and exceeding industry challenges

Industry technology is constantly changing to meet ongoing maintenance challenges. Filter pore sizes have shrunk to 5 microns in main oil circuits and 3 microns in bypass circuits to reduce debris damage. HARNEX, with its special formulation, performs well in conjunction with these filters, and passes the latest OEM filtration tests.

### HARNEX meets the following industry specifications

- AGMA 9005-E02
- DIN 51517-3 (CLP 320)
- ISO 12925-1 Type CKD

### Features & Benefits

- Protects against micropitting and scuffing of gear teeth and provides extended bearing life under extreme conditions.
- Withstands breakdown at high temperatures to increase time between drain intervals, saving you time and labour.
- High quality synthetic base stocks reduce viscosity change, which is very critical in remote applications.
- Resists rust and corrosion for smooth operation.
- Passes the SKF Bearing filterability requirements.

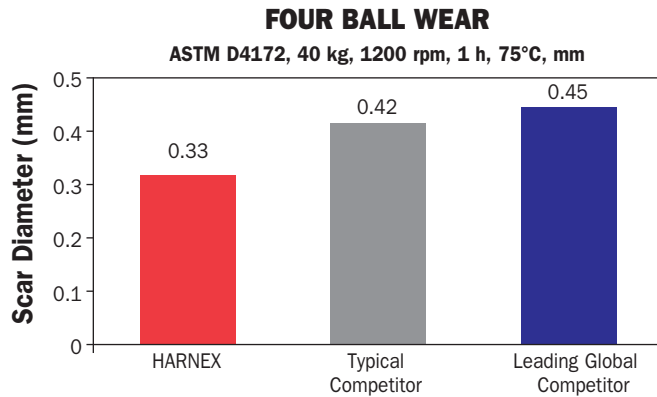
#### What is the HT difference?

Petro-Canada starts with the patented 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.



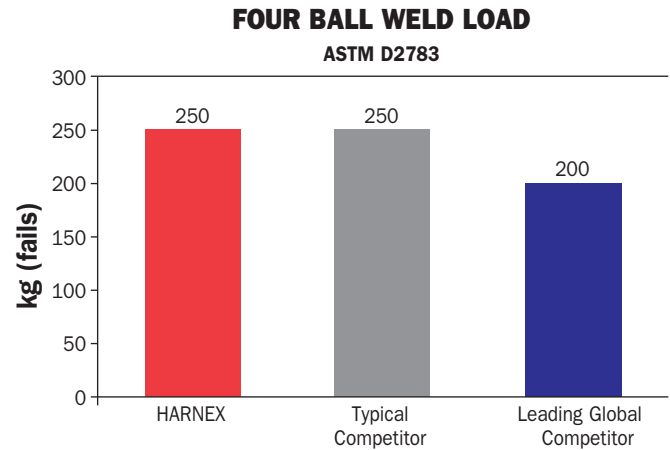
## Tested in our labs. Proven in operations like yours.

### Superior wear protection:



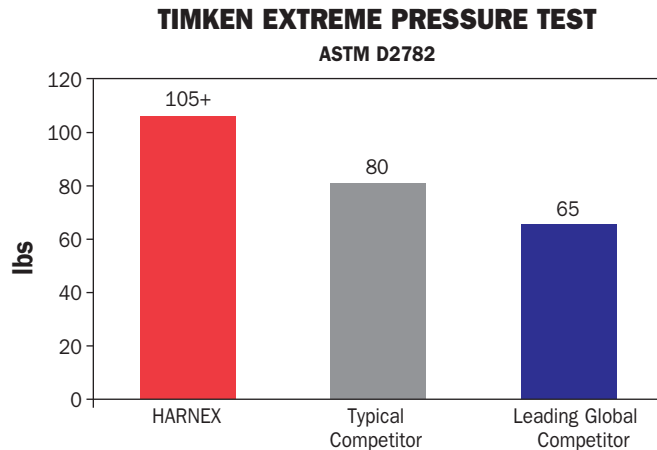
*HARNEX provides superior wear protection than its leading global competitor.*

### Exceptional extreme pressure weld performance:



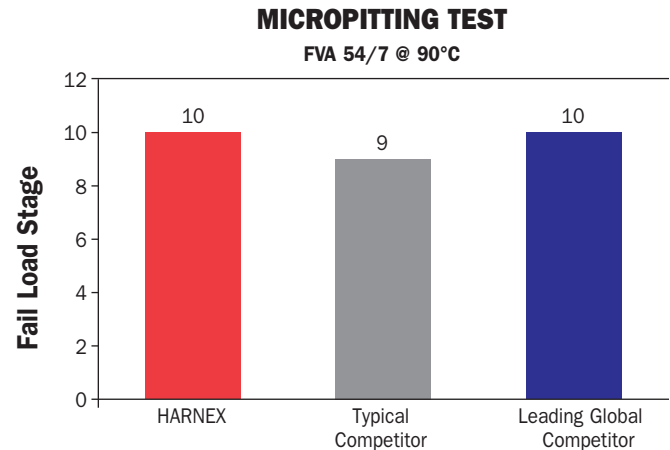
*HARNEX delivers high weld performance under extreme pressures.*

### High extreme load protection:



*HARNEX provides high Timken EP load protection under the toughest conditions.*

### Resists micropitting:



*HARNEX resists micropitting by dramatically reducing scuffing wear in gears. It meets the FVA 54/7 Micropitting Test (Fail 10) required by most European gearbox manufacturers.*

## Typical performance data

PROPERTY	TEST METHOD	HARNEX
Density @ 15°C	ASTM D4052	0.862
Viscosity @ 40°C, cSt	ASTM D445	323
Viscosity @ 100°C, cSt	ASTM D445	34.9
Viscosity Index	ASTM D2270	153
Flash point, COC, °C	ASTM D92	237
TAN, mg KOH/g	ASTM D664	0.7
Pour Point, °C	ASTM D5950	-42
Brookfield Viscosity @ -30°C, cP	ASTM D2983	139200
Brookfield Viscosity @ -35°C, cP	ASTM D2983	273600
Mechanical Emulsion @ 82°C	ASTM D1401	40-40-0 (20)
Foam, Sequence 1	ASTM D892	10/0
Foam, Sequence 2	ASTM D892	10/0
Foam, Sequence 3	ASTM D892	10/0
Cu Corrosion, 3 h, 120°C	ASTM D130	1b
Rust Test (Synthetic Sea Water)	ASTM D665B	Pass
Timken OK, lbs.	ASTM D2782	>105
4 Ball Weld, kg	ASTM D2783	250
4 Ball Wear @ 40 kg 1200 rpm, mm	ASTM D4172	0.33
FZG Scuffing Test A/8.3/90	DIN 14635-1	14
FZG Scuffing Test A/16.6/90	DIN 14635-1	14
FZG Micropitting Test @ 60°C	FVA 54/7	Fail 10
FZG Micropitting Test @ 90°C	FVA 54/7	Fail 10
FAG FE8 Test (Stages 1,2,3,4)	DIN 51818-3	Pass
Oxidation Test @ 121 °C	ASTM D2893	
Precipitation Number		0
Visc. Increase at 100 °C, %		2.7
Static Seal Test (NBR,FKM)	DIN 53521	Pass
Dynamic Seal Test (NBR,FPM)	DIN 3761	Pass
Paints Compatibility	Mäder	Pass
Sealants Compatibility	Loctite	Pass

## Health and Safety

To obtain Material Safety Data Sheets (MSDS), contact one of our TechData Info Lines.

## TechData Info Lines

If you would like to know more about Petro-Canada's HARNEX Wind Turbine Gear Oil or any other product in our complete line of quality lubricants, please contact us at:

**Lubricants Head Office**  
**Petro-Canada Lubricants Inc.**  
2310 Lakeshore Road West  
Mississauga, Ontario  
Canada L5J 1K2



**Canada - West** . . . . . Phone 1-800-661-1199  
**- East (English)** . . . . . Phone 1-800-268-5850  
**(French)** . . . . . Phone 1-800-576-1686  
**Other Areas** . . . . . Phone (416) 730-2408  
**E-mail** . . . . . lubecsr@suncor.com  
**Internet** . . . . . lubricants.petro-canada.ca

### Petro-Canada Europe Lubricants Limited

**Wellington House, Starley Way**  
**Birmingham International Park**  
**Solihull, B37 7HB, United Kingdom**

Telephone . . . . . +44 (0) 121 781 7264  
Fax . . . . . +44 (0) 121 781 7401  
UK Website . . . . . www.petro-canada.co.uk  
German Website . . . . . www.petro-canada.de

### Petro-Canada America Lubricants

**980 North Michigan Avenue**  
**Suite 1400, #1431**  
**Chicago, Illinois**  
**USA 60611**

Phone . . . . . 1-888-284-4572  
Fax . . . . . (708) 246-8994  
E-mail . . . . . email@petro-canadaamerica.com

### Petro-Canada Asia Pacific Holding Company Ltd.

**Jai Shi Lubricants Trading (Shanghai) Co. Ltd.**  
**1908 World Trade Tower**  
**500 Guangdong Road, Huangpu District**  
**Shanghai, China 200001**

Phone . . . . . +86-21-6362-0066  
Fax . . . . . +86-21-6362-0536  
E-mail . . . . . asiapacific@suncor.com  
Website . . . . . www.petrocanada.cn