

# NASTY CONDITIONS CALL FOR SOME TOUGH PROTECTION



**New HARNEX\* – the best security  
for your wind turbine gears.**



Beyond today's standards.\*



# BE CONFIDENT KNOWING HARNEX\*

Wind turbines face some tough conditions. Constant stopping and starting, severe corrosion, and extended intervals between services mean that maintaining high performance is a challenge.

The wind turbine oil you choose must be tough enough to protect your wind turbines against these conditions.

That's why Petro-Canada brings you new HARNEX\* 320 Wind Turbine Gear Oil – the gear oil that stands up to these conditions while reducing downtime and maintenance costs.

## Proven chemistry makes HARNEX the ideal solution.

Petro-Canada's HARNEX 320 is designed using PAO or polyalphaolefin chemistry, known for its excellent viscosity index and low pour point. That makes HARNEX the ideal choice for applications where a wide range of operating temperatures exists.

## Maximum protection for multistage gearbox designs.

Rotary blades translate the wind into rotary motion, while transmission through multistage gearbox designs increases the speed of rotation 60 to 90 times. This is the critical stage – without smooth and continuous operation, power transmission is lost or wasted.

Petro-Canada's HARNEX is a premium synthetic lubricant designed to provide exceptional anti-wear/EP and protection from salt water corrosion. HARNEX is specially formulated for lubricating onshore and offshore wind turbine gearboxes, especially important when considering the challenges of offshore maintenance.

**Very high torque** – Wind turbine rotors turn very slowly while the generator turns very fast. This high torque generates extreme conditions for both the gearbox and gear oil.

**Accessibility** – The trend is towards bigger units, located in coastal areas or even out at sea, making accessibility very difficult. Add to that the fact that gearboxes are located at the top of 100-metre poles and that makes the intervals between change-outs very important. HARNEX's high quality synthetic base stocks reduce viscosity change, which is very critical in remote applications.

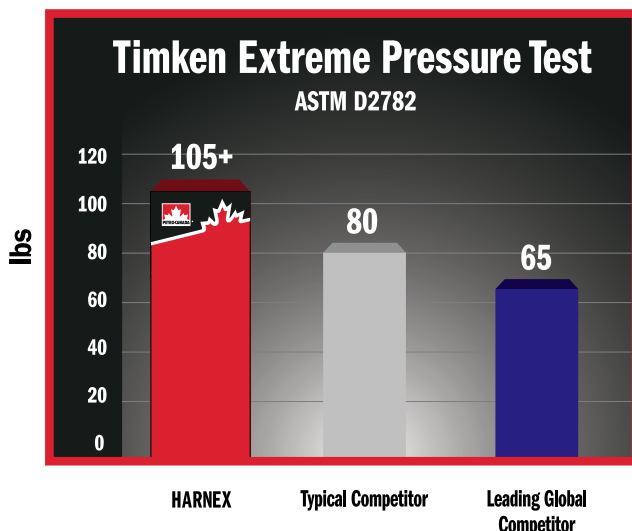
**Constant stopping and starting** – The constant stopping and starting faced by wind turbines places a huge strain on the bearings, which also carry enormous weight, making bearing fatigue common.

**Micropitting and gear scuffing** – HARNEX protects against micropitting and scuffing of gear teeth and provides extended bearing life under extreme conditions.

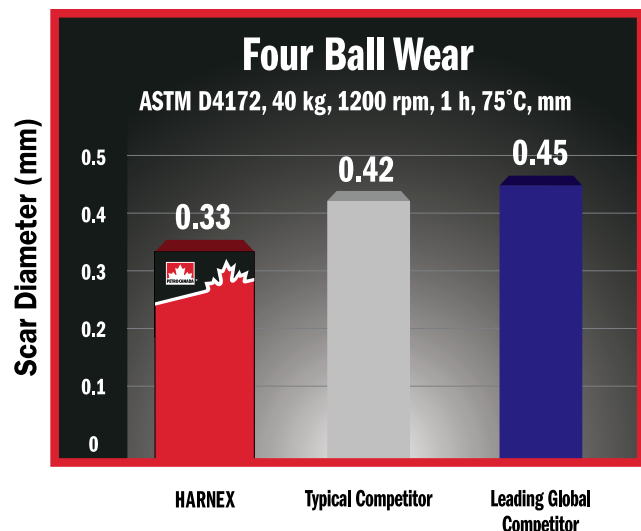
**High temperature breakdown** – HARNEX withstands breakdown at high temperatures to increase time between drain intervals, saving time and labour.

**Rust and corrosion** – HARNEX resists rust and corrosion for smooth, trouble-free operation. At the same time, HARNEX minimizes energy use while reducing operating temperatures.

**Compatibility** – HARNEX provides excellent compatibility for gearbox materials and with mineral-based gear oils for easy changeovers from mineral products.



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



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

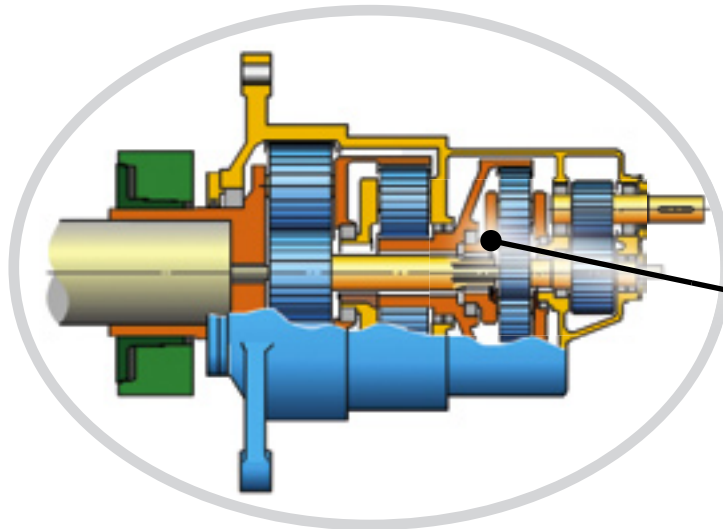
# IS ON DUTY.

## Petro-Canada's wind turbine lubrication solutions.

Petro-Canada lubricants help ensure trouble-free operation.



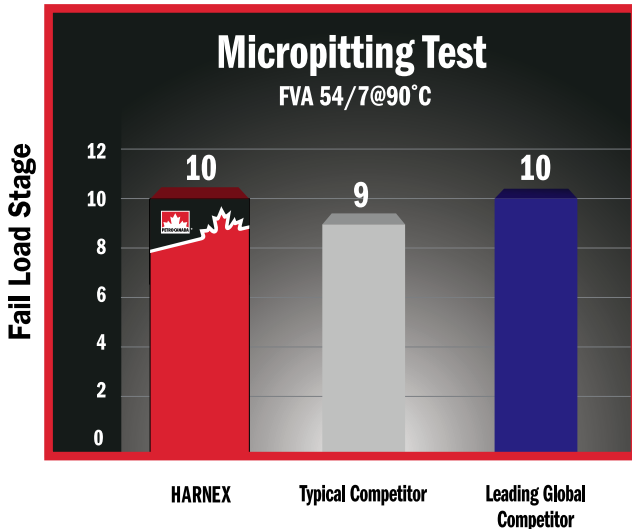
- PRECISION\* greases are perfect for heavy-duty operation at low and high speeds. Used in pitch and yaw bearings, main rotor bearings and generator bearings.



- HARNEX 320 Wind Turbine Gear Oil reduces downtime and maintenance costs. Used in the gearbox.



- HYDREX\* provides superior wear protection. Used in the brake system and pitch control.



▲ 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.



### HARNEX meets the following industry specifications:

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

HARNEX will soon complete a two-year trial in a European installation.

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# Minimize downtime. Maximize uptime.

**Petro-Canada's No-nonsense Warranty: "Petro-Canada will repair damaged equipment, or replace damaged equipment parts resulting from a failure due to defects of the Petro-Canada lubricant, as long as the lubricant is used in accordance with your equipment manufacturer's and our recommendations."**

## Our business is keeping your business going.

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

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