

GAS PLANT AND PIPELINE LUBRICANTS



**SOLUTIONS FOR TODAY'S
NATURAL GAS OPERATIONS**

Beyond today's standards.™



PETRO-CANADA LUBRICANTS

SPECIALLY FORMULATED TO PROVIDE
TANGIBLE SAVINGS SOLUTIONS

Providing real bottom-line savings, Petro-Canada lubricants last longer, protect better and keep your natural gas engines, turbines and compressors running at their peak performance.

STATIONARY GAS ENGINE OILS

Our **SENTRON™** Natural Gas Engine Oils are high-performance, long-life oils for the demanding needs of gas plants and pumping stations.

SENTRON LD 8000, our premium, low-ash SAE 40, uses breakthrough technology to extend drain intervals by up to 300% versus the leading global conventional competitor.* This can mean lower maintenance costs and a more efficient operation. Meeting and exceeding the standards of many OEMs, **SENTRON LD 8000** has set a new industry standard.

TURBINE FLUIDS

Our **TURBOFLO™** turbine fluids demonstrate exceptional oxidative and thermal stability, providing excellent resistance to fluid breakdown caused by air and high temperatures.

For particularly tough applications, our **TURBOFLO LV**, **TURBOFLO XL**, **TURBOFLO EP** and **TURBOFLO R&O** premium turbine fluids exceed the demands of the world's leading turbine OEMs. For land-based aeroderivative gas turbines operating under extreme service conditions, **TURBONYCOIL™ 600** provides exceptional performance.

COMPRESSOR FLUIDS

The newly expanded Natural Gas Compressor Fluid product slate covers a range of product chemistries and viscosity grades to suit your application needs for both rotary screw and reciprocating compressor systems in natural gas production and service.

From cost-effective, mineral oil-based NG Screw Compressor Oils and the workhorse Compressor Oil RP, to new NG Compressor Oil PAO 150 and the premium SPX series PAG synthetics, Petro-Canada's Natural Gas compressor fluids can provide the lubrication performance necessary to keep your equipment working effectively.

*In Caterpillar G3500TALE engines running in gas compression, with >90% loads and pipeline quality fuel.

LUBRICANT SOLUTIONS

DELIVERING MORE THAN PROVEN PERFORMANCE

Processing and transporting natural gas depends on reliable equipment. The lubricants you use are a crucial part of keeping your engines, turbines and compressors running smoothly.

Scheduled or unexpected downtime at remote processing plants and pipeline compressors can cost your company money. That's why the combination of protection, performance and extended drain intervals has many in the gas industry turning to Petro-Canada as their solution for a broad range of lubricants.

It starts with performance that exceeds today's standards and your expectations.

Right now our products are performing for many of the world's leading companies – performing beyond expectations.

By exceeding specifications in ways that matter, our premium quality lubricants can help your business realize benefits beyond equipment performance, through operational efficiencies that reward your bottom line.

It continues with our knowledgeable people.

Backed by the expertise and foresight of our technical services team, we provide timely, on-site solutions that can extend equipment uptime, reduce maintenance costs and give you the best return on your investment. By actively helping you solve lubrication problems, we strive to give you solutions that get your natural gas engines, turbines and compressors running at maximum efficiency. And keep them that way.



FIELD TESTED. FIELD PROVEN.

SENTRON STATIONARY GAS ENGINE OIL

Petro-Canada's SENTRON Natural Gas Engine Oil (NGEO) is a family of premium performance, long-life products specially formulated to lubricate natural gas engines.

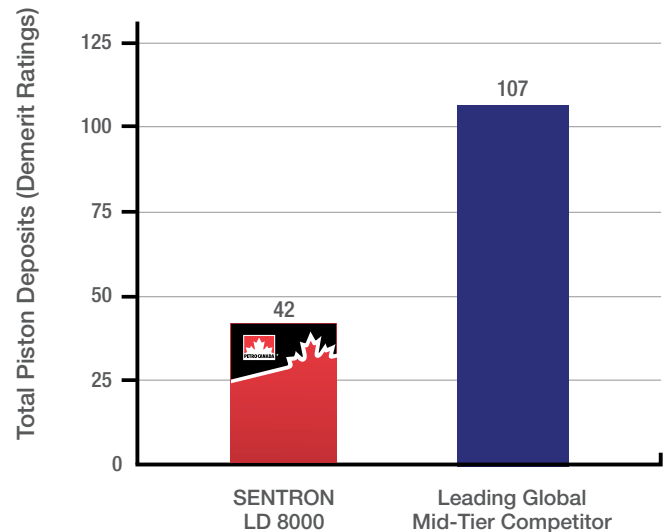
Its superior performance makes SENTRON ideal for use in the severe service situations common to gas plants. Outstanding anti-wear protection minimizes cylinder liner scoring and piston ring wear, while reducing carbon build-up. That can mean saving money and enhanced reliability through:

- Reduced wear for longer equipment life
- Longer-lasting oil for improved engine performance
- Extended drain intervals for less maintenance time and costs
- Knowledgeable recommendations for optimized productivity

PROVE IT IN YOUR OWN PLANT

SENTRON products have a proven track record under a wide range of operating conditions. Still, switching NGEO products is a big decision. Our knowledgeable experts can provide recommendations and help you conduct your own field tests. We're confident you'll see how SENTRON optimizes your engine productivity.

Caterpillar G3500TALE Engine Piston Deposit Comparison



In a trial on a Caterpillar G3500TALE natural gas engine, SENTRON LD 8000 reached up to 8,000 hours in a natural gas compression application with pipeline gas quality, under high load (>90%) conditions.

Outstanding anti-wear protection and reduced cylinder and piston wear provide enhanced reliability and savings.



SENTRON LD 8000

EXTENDING DRAINS AND EXTENDING PERFORMANCE

SENTRON LD 8000 takes oxidation control to unprecedented standards of performance, allowing you to extend drain intervals up to 300% longer than the leading global conventional competitor – that’s up to 8,000 hours between drain intervals.

In independent testing, it demonstrated high resistance to oxidation and nitration – leading to exceptional oil life. That means lower operating costs and optimal performance for both older engine types and new lean-burning engines.

A low-ash NCEO, SENTRON LD 8000 contains a specialized additive mix that provides greater TBN retention to help neutralize acids that can attack liner surfaces. In OEM testing, it showed outstanding deposit control, with anti-wear protection that enhances reliability and minimizes service downtime.

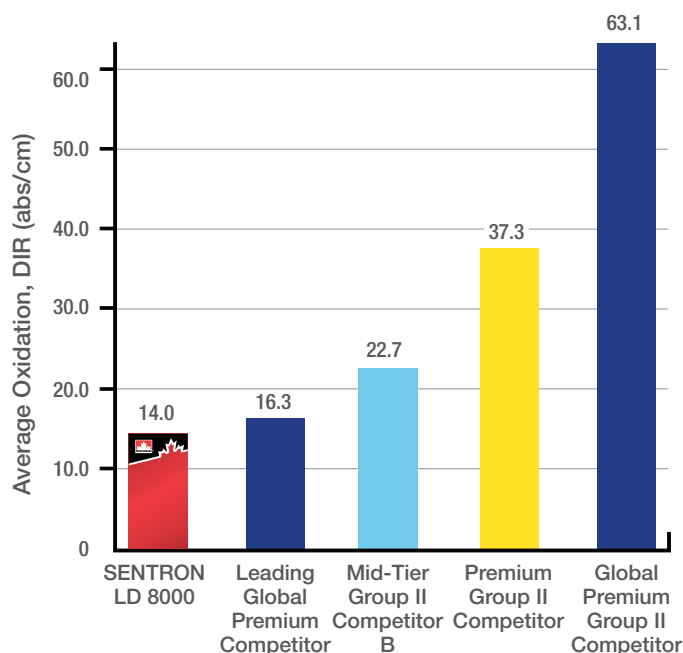
SENTRON LD 8000 verifications and approvals include: Caterpillar against their SEBU 6400 requirements in natural gas applications; MAN and GE-Waukesha for all natural gas engine models; GEJ Type 2, 3, 4 (both with/without steel pistons), and 6 without steel pistons; MTU-BR-4000 in pipeline gas applications; and other engines such as Caterpillar Power systems (MWM), TEDOM, 2G and Volkswagen.

DRAIN CAPABILITY (HOURS)

PARAMETER AVERAGES	SENTRON LD 8000	LEADING GLOBAL MID-TIER COMPETITOR
% Viscosity increase, TBN remaining, TAN increase percent, metals (Fe, Pb, Cu)	7,000-8,000	1,900
Oxidation, IR (abs/cm)	7,000-8,000	900
Nitration, IR (abs/cm)	> 8,600	4,200

In a trial on a Caterpillar G3500TALE natural gas engine, SENTRON LD 8000 reached up to 8,000 hours in a natural gas compression application with pipeline gas quality, under high load (>90%) conditions.

Oxidation - Oil Aging Test



Yesterday, 8,000 hours was unthinkable. Suddenly, anything less could be unacceptable.

A FULL SUITE OF HIGH-PERFORMING STATIONARY GAS ENGINE OILS[†]

ASHLESS PRODUCTS

SENTRON ASHLESS 40

Recommended for high performance in 2-stroke cycle engines. Helps minimize combustion chamber and spark plug deposits and minimizes port plugging.

LOW ASH PRODUCTS

SENTRON LD 8000

A revolutionary low-ash SAE 40 lubricant that takes oxidation and nitration control to unprecedented standards of performance. It allows you to extend drain intervals up to 300% longer in some engine types compared to the leading global conventional competitor. SENTRON LD 8000 helps prevent ash deposits – deposits that could otherwise result in higher oil consumption. In OEM testing, it showed outstanding deposit control, with anti-wear protection that enhances reliability and minimizes service downtime. It is highly recommended for engines operating on natural pipeline gas, pre-treated sewage/bio-gas and selective pre-treated process gases.

SENTRON LD 5000

Helps provide excellent performance for up to 200% longer drain intervals versus conventional competitors and exceptional overall engine protection for greater reliability and savings. Helps minimize piston, ring zone, valve stem and combustion chamber deposits. Both SENTRON LD 8000 and SENTRON LD 5000 are recommended for co-generation in GE (Waukesha) engine operations under high operating temperatures.

SENTRON LD 3000

Provides excellent protection and performance in regular operating conditions as well as severe conditions. Provides excellent control of engine deposits, even when there is a need for added high temperature deposit control. Recommended for use in 4-stroke cycle and some 2-stroke cycle gas engines.

SENTRON LD SYNTHETIC BLEND

A multigrade extension of the SENTRON LD line to extend drain intervals, reduce oil consumption and give better low-temperature performance in comparison to monograde SAE 40s. SENTRON LD SYNTHETIC BLEND has low-temperature starting capabilities down to -20°C/-4°F. Field trial results have shown outstanding piston cleanliness which may result in longer equipment life and less downtime.

SENTRON 590

Helps provide excellent control of engine deposits, and is especially catered towards engines that operate in severe nitrating conditions.

SENTRON VTP 10W-40

Formulation specially designed to meet the demands of diesel and gasoline fueled automotive and light truck engines converted to natural gas for exceptional component cleanliness through all seasons. Suitable in applications calling for Cummins CES 20074 specifications.

SENTRON VTP 0W-30

Formulation specially designed as an all-season solution for small to mid-sized engines that are difficult to start in severe winter conditions.

SENTRON CG 40 PLUS

A uniquely designed low ash formula for 4-stroke gas engines running in severe service landfill gas operations. SENTRON CG 40 PLUS provides excellent control of deposits and other issues caused by high halogen gas levels produced by landfills. Unlike conventional landfill / biogas / sewer gas engine oils, SENTRON CG 40 PLUS is specifically designed to address current and future engines running in this severe contaminated gas application where higher BMEP engines are used.

MEDIUM ASH PRODUCTS

SENTRON CG 40

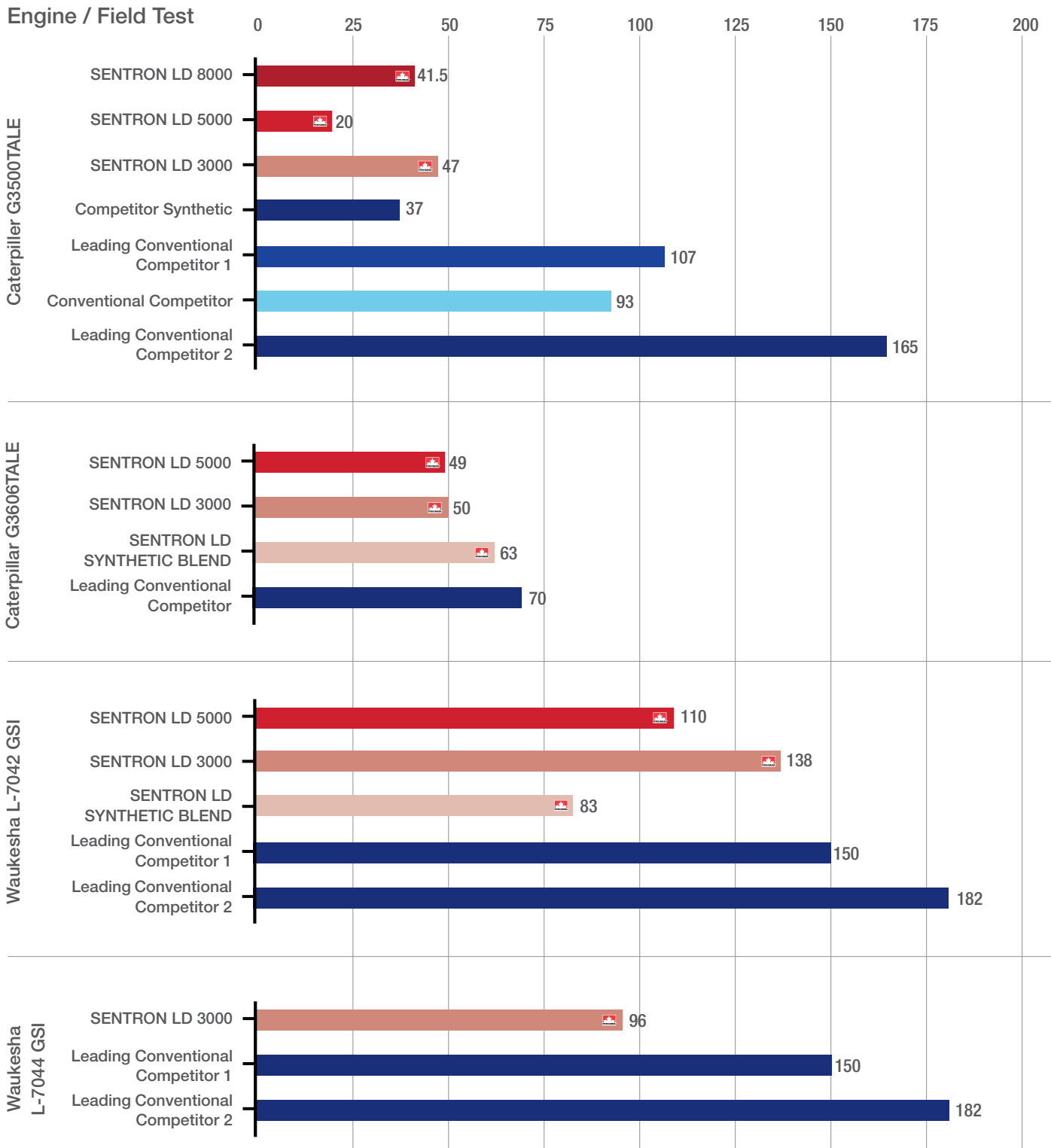
Specially formulated for performance in 4-stroke cycle engines running under severe acidic conditions including co-generation operations or for older engine designs where a mid ash product may be required.

SENTRON MID ASH 40

Recommended for older 4-stroke cycle natural gas engines that require mid ash products.

Piston Deposit Demerit Points

(The lower the number, the cleaner the piston)



[†]All SENTRON Natural Gas Engine Oils (except for SENTRON MID ASH 40) are suitable for engines equipped with catalytic converters.



COMPRESSOR FLUIDS

PROTECTION FOR YOUR COMPRESSOR

SELECT THE FLUID THAT MEETS YOUR SPECIFIC NEEDS

SPX 5000 and SPX 7100/7000/7220

Polyalkylene glycol (PAG) based compressor fluids help provide excellent lubrication and cooling for reciprocating and rotary screw compressors.

SPX 5000 is recommended for:

- Compression of sweet hydrocarbon gas
- Compression of propane in refrigeration systems
- Available in ISO 150 grade

SPX 7000 Series products are recommended for:

- Compression of sour hydrocarbon mixtures
- Natural gas field booster service
- Gas re-injection service
- Available in ISO 100, 150 and 220 grades

NGS 1000 and NGS 1500 Synthetic Blend

Compressor Fluids are excellent in flooded screw compressors handling the lightest hydrocarbon gases (methane and ethane), where the expected dilution is less than 10% by weight and where natural gas liquids are not significantly present.

NG Screw CompOil 100/150

These (HT) mineral oil based fluids are intended for use in flooded screw compressors in the compression of the lightest hydrocarbon gases (both sweet and sour) at moderate discharge temperatures.

NG CompOil PAO 150

This PAO based fluid is intended for use in flooded screw compressors in the compression of the lightest hydrocarbon gases (both sweet and sour) at elevated discharge temperatures. With excellent water separation characteristics and corrosion protection, it can also be used in reciprocating compressors for various gas streams.

RP 268 and RP 460

Compressor Oils help provide very good lubricity and wear protection in reciprocating compressors handling sour, wet or contaminated natural gas. Designed to compensate for gas dilution and wash off.



Our compressor fluids are designed to compensate for gas dilution and offer excellent wear and corrosion protection, whether you're operating rotary screw compressors or reciprocating compressors.

TURBINE FLUIDS

OUTPERFORMING THE COMPETITION FROM START TO FINISH

TURBOFLO fluids deliver the ultimate performance with exceptional oxidative and thermal stability, helping to provide protection and reliability for the most demanding operations.

TURBOFLO LV

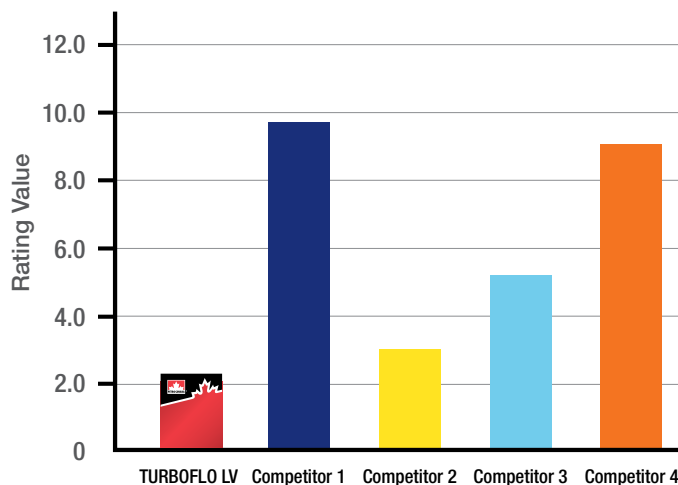
THE BETTER WAY TO MANAGE VARNISH BUILD-UP

A breakthrough in turbine fluid technology, TURBOFLO LV inhibits varnish formation as never before. Until now, even when following OEM recommendations, hard-to-detect varnish could still cause unplanned turbine outages. TURBOFLO LV helps turbines run cleaner, longer and leaves fewer deposits caused by varnish and sludge build-up. The result is optimal turbine performance and more time spent up and running.

TURBOFLO LV is recommended for:

- High-speed bearings in stationary gas turbines
- Steam turbines used for electric power generation and other industrial applications
- Extended, corrosion-free lubrication of bearings operating in ambient temperatures up to 260°C/500°F
- Available in LV 32 and LV 46 grades

MPC Varnish Test



Samples were thermally aged for 8 weeks in 80°C / 176°F oven.

Standard practice recommends varnish removal. We recommend varnish prevention.



TURBOFLO XL

Demonstrating exceptional wear protection, as well as oxidative and thermal stability, TURBOFLO XL helps customers reduce overall maintenance costs and provides a worry-free operation.

TURBOFLO XL is recommended for:

- High-speed bearings in stationary gas turbines
- Steam turbines used for electric power generation and other industrial applications
- Available in XL 32, XL 46 and XL 68 grades

TURBOFLO EP

A zinc-free, ashless anti-wear additive system helps TURBOFLO EP deliver excellent wear and scuffing protection for heavily loaded geared turbines.

TURBOFLO EP is recommended for:

- Gas and steam turbines in power generation, prime mover and other industrial applications
- Geared heavy duty gas turbines that require wear and scuffing protection
- Available in EP 32 and EP 46 grades

TURBOFLO R&O

TURBOFLO R&O Oils are high-quality lubricants designed to provide rust and oxidation resistance, reliable performance and extended service life.

TURBOFLO R&O and Premium R&O 77 are recommended for:

- Steam and gas turbines
- Circulating oil systems for various industrial machinery
- Other viscosity grades are also available

TURBONYCOIL 600

Petro-Canada markets TURBONYCOIL 600, which is a licensed and registered trademark of NYCO SA. Specially designed to effectively lubricate land-based aeroderivative gas turbines operating under extreme conditions, TURBONYCOIL 600 offers lower volatility and a higher flash point than many competitive products, which helps make it safer for operation.

TURBONYCOIL 600 is recommended for:

- Land-based aeroderivative gas turbine engines requiring a lubricant qualified against U.S. Military Specification MIL-PRF-23699G Standard (Non-Corrosion Inhibiting Classification)
- Land-based industrial marine gas turbine applications, approved by Rolls Royce and General Electric



A COMPLETE LINE OF LUBRICANTS

FOR GAS PLANT & PIPELINE

DURON™ HP

DURON HP heavy duty diesel engine oil meets and exceeds API CK-4/SN, is low in sulphated ash and is blended with the purest base oils. It helps provide excellent oxidative stability and durability. API CK-4 oils are required for low emission engine technology. Available in SAE 15W-40.

DURON UHP

Available in SAE 10W-40, 5W-40, 0W-30 and 0W-40 grades, these oils are Ultra High Performance full synthetic all-weather heavy duty diesel engine oils. They are designed to provide exceptional protection against engine wear and extended drain performance (exceeding OEM standard intervals)[†] even in the harshest operating conditions and maximum allowable load conditions. They combine superior pumpability and robust shear stability with excellent engine wear control and oil top-up performance through ease of start-ups and lower viscous drag.

Formulated to perform in the harshest cold temperatures, DURON UHP 0W-40 provides excellent engine protection and advanced soot control that minimizes viscosity thickening and aids in delivering faster cold start-ups and exceptional cold pumping abilities – minimizing engine stress and wear. It will provide protection in conditions as cold as -40°C/-40°F.

DURON SHP

DURON SHP is a Super High Performance synthetic blend heavy duty diesel engine oil that delivers exceptional performance. Outstanding shear stability combined with superior wear protection helps deliver comprehensive protection to vital engine parts over a wide range of operating conditions. DURON SHP is designed to handle more demanding operations, as well as extended drains.[†] Available in SAE 15W-40 and 10W-30.

DURON MONOGRADES

DURON Monogrades are designed to lubricate engines in heavy duty service. They are suitable for engines fuelled by diesel, gasoline, propane or compressed natural gas (CNG) where single grade API CF or CF-2 quality engine oil is recommended. Available in SAE 10W, 30, 40 and 50 grades.



[†]Extending drain intervals should always be undertaken in conjunction with a regular oil analysis program.

HYDREX™ HYDRAULIC FLUIDS

Longer-lasting fluids with up to 2x better wear protection than the leading global hydraulic oil brand**. They help resist degradation, minimize sludge and varnish for less maintenance, and reduce fuel consumption by up to 5%†.



ENDURATEX™ EP INDUSTRIAL GEAR OILS

High quality, extreme-pressure lubricants designed for enclosed industrial gear drives operating under severe load conditions or in wide temperature extremes. ENDURATEX EP is available in conventional and synthetic grades.

ENDURATEX SYNTHETIC OHV 680

Premium-performance, extreme-pressure lubricant capable of withstanding high impact load conditions, helping to reduce wear for maximized component life. ENDURATEX SYNTHETIC OHV 680 can be used in all types of enclosed gear drives requiring an ISO 680. It can also be used in bearings, including plain, rolling elements and anti-friction types. It is approved under GE Motorized Wheel D50E27E and D50E35E.

PEERLESST™ SVG 102 VALVE GREASE

A calcium sulphonate complex grease formulated primarily for the lubrication of valves employed in the production and distribution of sour gas.

PRECISION™ GREASES

A premium line of multi-application greases specially formulated to provide: 1) better long-life protection, 2) better water washout protection, and 3) better extreme pressure protection. Available in various product tiers and NLGI grades. PRECISION Synthetic, XL EP1 and XL EP2 all meet NLGI's GC-LB Automotive Service Classification.

PETRO-THERM™ AND CALFLO™ HEAT TRANSFER FLUIDS

Developed for use in non-pressurized, liquid phase, closed heat transfer systems. See product Tech Data for operating temperature capabilities.

ARDEE™ OIL

Lubricates and cools the mechanisms for water injection plunger pumps. Works well due to excellent tackifiers.

COMPRO™ COMPRESSOR FLUIDS

Extensive line of fluids for air compressors provides strong resistance to oxidative breakdown to reduce varnish and sludge formation, minimize premature shut-downs and provide long and reliable service life.

SYNDURO SHB FLUIDS

A family of synthetic multi-functional lubricants designed to deliver excellent component protection for equipment operating at high speed or mild EP loads over a wide temperature range during extended service intervals. They are especially suitable for a wide range of gear, bearing and compressor applications in the forestry, mining, marine and heavy-duty industries where low seasonal start-up temperatures and/or high operating temperatures prevail.



**Measured against leading North American hydraulic oil brands.

†HYDREX XV compared against leading North American monograde hydraulic fluids.

Petro-Canada manufactures a wide range of industrial lubricants designed for plant and pipeline, to help you operate under heavier loads and run at higher speeds with longer lubricating intervals. These products are specially formulated to provide long-life protection and deliver increased uptime to save you money.

WE'RE THERE FOR YOU

WHEN YOU NEED US

Our Technical Representatives and Research & Development team have an enviable reputation for helping customers increase productivity and cut operating costs. Our timely, on-site solutions help extend equipment uptime, and reduce costs. Face to face or over the phone, our support team is ready with cost-savings models, lube surveys as well as unbiased used oil analysis.

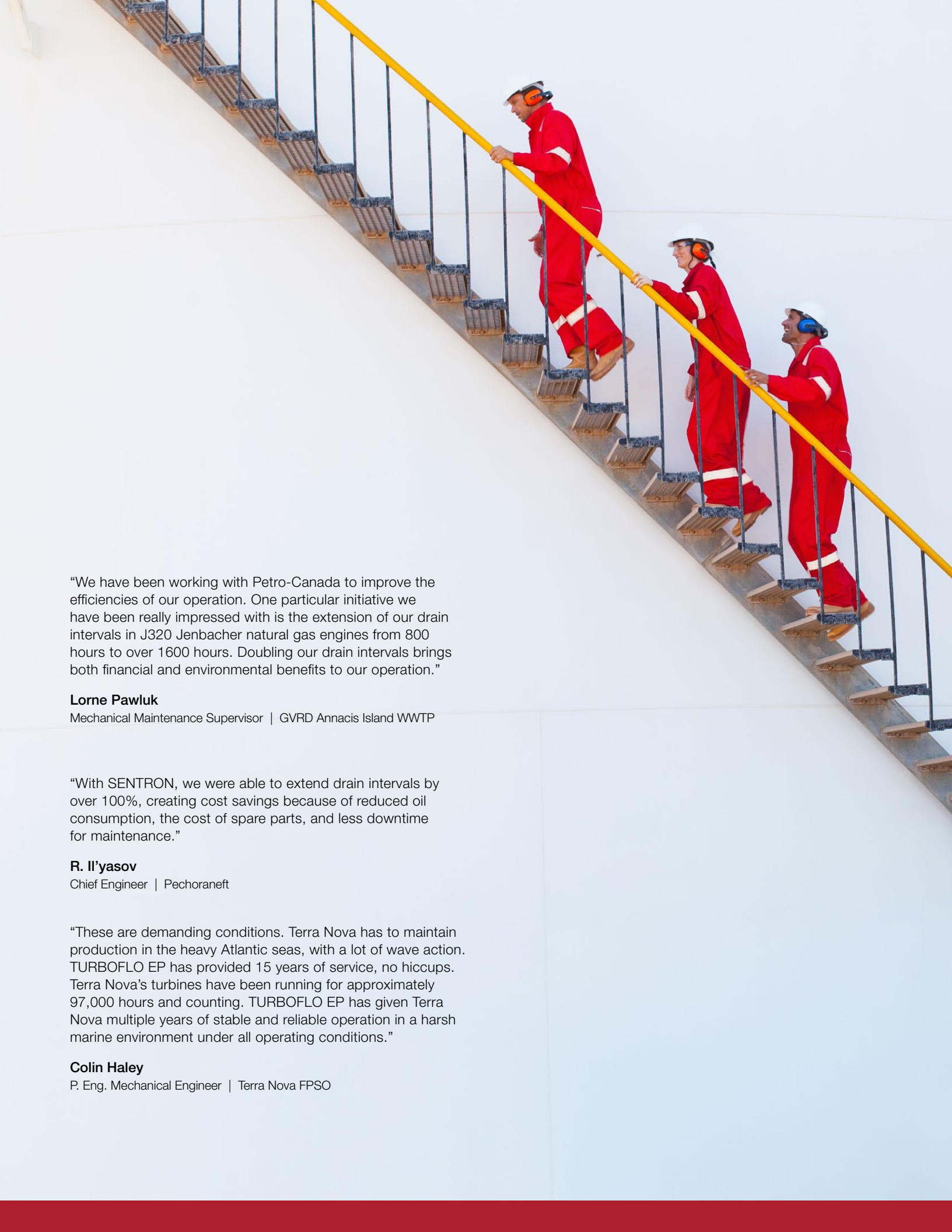
We've got the tools to help you consolidate your lubrication product inventories, too. And with Petro-Canada's world-class distribution network, you can always count on having the lubricants you need, when you need them. Choose the Petro-Canada team and get gas plant and pipeline solutions that go beyond today's standards.

Answering tomorrow's needs today.

Our lubricants meet or exceed equipment manufacturers' specs and the high quality standards of the industry. We're the first lubricants company in the world to achieve ISO/TS 16949, which replaced QS9000. We're also ISO 9001 registered. And with our ISO 14001 registration, we share the same growing commitment to the environment as you do.

Petro-Canada's commitment to quality and the environment.

Now more than ever, integrity is the foundation on which trust and success are built. For over 20 years, we've abided by a strict code of conduct and built a reputation as a responsible and ethical corporate citizen. We understand that operating a business means doing more than simply meeting legal and regulatory requirements. We must balance economic growth with environmental stewardship and local community support.



“We have been working with Petro-Canada to improve the efficiencies of our operation. One particular initiative we have been really impressed with is the extension of our drain intervals in J320 Jenbacher natural gas engines from 800 hours to over 1600 hours. Doubling our drain intervals brings both financial and environmental benefits to our operation.”

Lorne Pawluk

Mechanical Maintenance Supervisor | GVRD Annacis Island WWTP

“With SENTRON, we were able to extend drain intervals by over 100%, creating cost savings because of reduced oil consumption, the cost of spare parts, and less downtime for maintenance.”

R. Il'yasov

Chief Engineer | Pechoraneft

“These are demanding conditions. Terra Nova has to maintain production in the heavy Atlantic seas, with a lot of wave action. TURBOFLO EP has provided 15 years of service, no hiccups. Terra Nova’s turbines have been running for approximately 97,000 hours and counting. TURBOFLO EP has given Terra Nova multiple years of stable and reliable operation in a harsh marine environment under all operating conditions.”

Colin Haley

P. Eng. Mechanical Engineer | Terra Nova FPSO

OUR NO-NONSENSE LUBRICANTS 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.”

It’s more than just a warranty. It’s a commitment.

If you are an **existing customer** looking to place an order, please call a Customer Order Management Representative at:

Canada (English)Phone 1-800-268-5850

(French)Phone 1-800-576-1686

United StatesPhone 1-877-730-2369

Latin America/

Europe/AsiaPhone +1-866-957-4444

If you would like to **become a Petro-Canada Lubricants customer** and require more information about specialty fluids, oils and greases that can help maximize your equipment performance, savings and productivity, please contact us at:

North AmericaPhone 1-866-335-3369

EuropePhone +44 (0) 121-781-7264

GermanyPhone 0800-589-4751

ChinaPhone +86 (21) 6362-0066

You can also e-mail us at lubecsr@suncor.com

Visit us on the web at lubricants.petro-canada.com



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Beyond today's standards.™