



SENTRON™ STATIONARY GAS ENGINE OILS

Introduction

Petro-Canada™ Lubricants SENTRON stationary gas engine oils (SGEO) are premium performance, long life engine oils specially formulated to lubricate stationary gas engines and compressors. SENTRON's extended drain intervals can mean lower maintenance costs, less used oil to dispose of and a more efficient and profitable operation.

SENTRON's exceptional performance is especially important in the severe service conditions common in compression, power generation and combined heat and power applications. Its outstanding anti-wear protection helps to minimize polish and wear of cylinder liners and wear of piston rings, while helping to reduce carbon build-up.

That can mean:

- Longer service intervals
- Cleaner engines with less wear
- Less downtime
- Less backfiring
- Fewer service calls

SENTRON stationary gas engine oils are formulated with Petro-Canada Lubricants' ultra pure HT Severely Hydrotreated base oils and highly advanced additive technology to help deliver a combination of extended oil life, extended drain intervals and excellent control of engine deposits. Offering exceptional protection against wear and corrosion, SENTRON helps provide worry-free operation, increased engine durability and engine life, which can lead to a reduction in overall operating costs.

SENTRON stationary gas engine oils span the typical levels of sulphated ash and SAE viscosity grades required by gas engine manufacturers. Moreover, they have a proven track record of successful use under a wide range of operating conditions.

Features and Benefits

- **Longer oil life provides long-lasting equipment protection**
 - Exceptional resistance to breakdown caused by oxidation and nitration.
 - Helps extend engine life by reducing varnish, sludge and carbon deposits.
 - Helps improve engine performance.
- **Extended drain interval can reduce maintenance and provide savings**
 - SENTRON LD 8000 can extend oil drain intervals in Caterpillar engines by providing up to 300%* increase in oil life when compared to leading competitive conventional SGEOs. The extended drain interval helps to:
 - Reduce downtime and maximize production availability.
 - Lower operating costs by reducing maintenance costs.
- **Outstanding anti-wear/anti-scuff protection helps to:**
 - Control and minimize valve recession.
 - Reduce wear on piston rings, cylinder liners and bearings, prolonging engine life.
 - Reduce operating and maintenance costs.
- **Keeps engine parts clean by:**
 - Minimizing ring zone and valve stem deposits.
 - Minimizing port blockage in 2-cycle gas engines.
 - Improving engine lubrication by maintaining clean oil-ways.
 - Maximizing the time between major engine overhauls.
 - Preventing corrosion.
- **Extremely low oil volatility helps to:**
 - Improve work environment through absence of oil odour.
 - Minimize oil consumption.

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.



*In Caterpillar G3500 TALE engines running in gas compression, with >90% loads and pipeline quality fuel.

Applications

Petro-Canada Lubricants' SENTRON stationary gas engine oils are premium performance engine oils specially formulated to lubricate large natural gas engines and their integrated compressors, running on natural gas. Specific SENTRON oils also meet the more severe operational needs of co-generation, biogas, sewage gas, coal bed methane and halogen landfill gas operations. SENTRON SGEOs can be used in reciprocating compressor crankcases where an OEM allows an SAE 40 oil. SENTRON can also be used in compressor lubricators.

SENTRON stationary gas engine oils cover the three main levels of sulphated ash required by natural gas engine manufacturers: Please check with your Petro-Canada Lubricants Technical Services Advisor for suitability.

Ashless

SENTRON ASHLESS 40 (0.05% wt ash) is recommended primarily for 2-stroke cycle gas engines but may be used in certain 4-stroke cycle gas engines.

Low Ash

SENTRON LD 8000 (0.52% wt ash) is a premium low ash SAE 40 lubricant, suitable for use in 4-stroke engines operating on natural pipeline gas, pre-treated sewage/bio-gas and selective pre-treated process gases. It provides revolutionary performance of up to 300%* longer drain intervals over the leading global conventional competitor.

SENTRON LD 5000 (0.57% wt ash) provides excellent performance for up to 200%** longer drain intervals and exceptional overall engine protection for maximum reliability and savings.

SENTRON LD 3000 (0.47% wt ash) is recommended for most 4-stroke and some 2-stroke gas engines. It is suitable for use in engines fitted with catalytic converters. SENTRON LD 3000 helps provide a high level of performance in high output turbocharged engines that prefer a low ash oil.

SENTRON CG 40 PLUS (0.52% wt ash) is a uniquely designed low ash formula for 4-stroke gas engines running in biogas, sewage gas and landfill gas operations. SENTRON CG 40 PLUS is specifically designed to address current and future engines running in severely contaminated gas applications where higher BMEP engines are used.

SENTRON VTP 10W-40 (0.59% wt ash) is specially formulated to meet the demands of stationary natural gas engines for exceptional cleanliness of the engine through all seasons. SENTRON VTP 10W-40 is suitable for use in applications where Cummins CES 20074-2012 is specified.

SENTRON VTP 0W-30 (0.58% wt ash) is a low ash, synthetic blend SGEo formulated specifically as an all season solution for small to mid-sized engines that are difficult to start in severe winter conditions.

SENTRON LD SYNTHETIC BLEND (0.53% wt ash) is a 15W-40 multigrade extension of the SENTRON line, formulated as a synthetic blend to extend drain intervals and give better low temperature performance in comparison to mono-grade SAE 40's.

Medium Ash

SENTRON VTP 10W-40 PLUS (0.68 wt ash) is specifically designed to aid gasoline converted engines to natural gas engines that need additional anti-wear characteristics due to the valve train, and / or for engines where extreme improved low temperature performance benefits are desired due to cyclic engine on-off cycles. Please note that it is NOT suitable for some engines with catalytic converters due to higher Zn/P Sulphur.

SENTRON MID ASH 40 (0.80% wt ash) is recommended for use in high performance, 4-stroke cycle gas engines requiring a medium ash content.

SENTRON CG 40 (0.93% wt ash) is designed specifically for 4-stroke cycle gas engines running in severe service such as co-generation, sewage or sour gas or low halogen landfill gas operations.

Typical Performance Data

PROPERTY	ASTM TEST METHOD	PETRO-CANADA LUBRICANTS STATIONARY GAS ENGINE OILS										
		SENTRON MID ASH 40	SENTRON CG 40	SENTRON LD 8000	SENTRON LD 5000	SENTRON LD 3000	SENTRON LD SYNTHETIC BLEND	SENTRON VTP 10W-40 PLUS	SENTRON VTP 10W-40	SENTRON VTP 0W-30	SENTRON CG 40 PLUS	SENTRON ASHLESS 40
Ash Type	-	Medium Ash	Medium Ash	Low Ash	Low Ash	Low Ash	Low Ash	Medium Ash	Low Ash	Low Ash	Low Ash	Ashless
Sulphated Ash, % wt	D874	0.80	0.93	0.52	0.57	0.47	0.53	0.68	0.59	0.58	0.52	0.05
SAE Grade	-	40	40	40	40	40	15W-40	10W-40	10W-40	0W-30	40	40
Flash Point, COC, °C / °F	D92	269/516	273/524	277/531	272/522	273/524	247/477	231/448	245/473	239/462	283/541	276/529
Kinematic Viscosity cSt @ 40°C/SUS @ 100°F cSt @ 100°C/SUS @ 210°F	D445	126/657 13.9/75.2	123/641 13.6/74.0	121/631 13.3/73.2	124/575 13.4/73.5	124/647 13.7/74.4	106/491 15.6/79.6	104.1 / - 14.9 / -	101/542.4 15.1/81.9	62.1/313 11.2/64.4	119/614 13.4/73.2	125/652 13.7/74.4
Pour Point, °C / °F	D5950	-33/-27	-27/-17	-27/-17	-30/-22	-27/-17	-42/-44	-45/-49	-42/-44	-45/-49	-27/-17	-27/-17
Acid Number (AN), mg KOH / g	D664	2.0	0.58	0.86	1.1	0.86	1.0	1.97	1.9	1.8	1.5	0.7
Base Number (BN), mg KOH / g	D2896	6.9	8.1	4.6	4.9	3.9	4.7	4.2	3.9	4.8	4.5	1.6

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

*In Caterpillar G3500 TALE engines running in gas compression, with >90% loads and pipeline quality fuel.

**All data generated were on engines in gas compression service under >90% load using pipeline quality fuel and typical field conditions.

Petro-Canada Lubricants Gas Engine Oils Selection Table

★ Approved for Use ● Suitable ■ Verified for Use

PRODUCTS	SERIES	FUEL	REFERENCE	SENTRON LD 3000	SENTRON LD 5000	SENTRON LD 8000	SENTRON CG40	SENTRON CG40 PLUS	SENTRON LD Synthetic Blend	SENTRON VTP10W-40	SENTRON VTP10W-40 PLUS	SENTRON VTP0W-30	SENTRON MID ASH 40	SENTRON ASHLESS 40
2G	Agenitor, Avus 500, Avus 500 plus	Natural Gas			■	■								
	all other	Biogas					●							
				apply oil recommendation for prime mover OEM of the unit (Toyota, MAN, Liebherr, GE-J, etc)										
AgriKomp	All	All	Service letter		★									
Arrow	Pump Jack (Gasoline Engines Converted to Natural Gas)	Natural Gas								■		■		
Avesco AG	GM/TG/TBG/TBG K lean burn engines without catalyst	Natural Gas			★									
GE-Cameron	Ajax 2-stroke engines	Natural gas	ES1006											●
	Superior 4-stroke engines	Natural gas	ES1001				●						■	
	Cooper-Bessemer 4-stroke engines	Natural gas	SE 114-2	●	●	●								
	Cooper-Bessemer 2-stroke engines	Natural gas	SE 114-2											●
Caterpillar (USA)	G3300 → G3500	Biogas, Sewage, Landfill	SEBU6400-05		■			■						
	G3300 → G3600	Natural Gas	SEBU6400-05	■	■	■			■					
	G3300 → G3600 (Older versions requiring Very Low Ash)	Natural Gas	REN95907											■
Caterpillar Energy Solutions / MWM (formerly Deutz Power Systems)	MWM TBG 616, 620, 632 MWM TCG 2016, 2020, 2032 Cat CG 132, 170, 260	Natural Gas	2105/19	★	★	★			●					
	MWM TBG 616, 620, 632 MWM TCG 2016, 2020, 2032 Cat CG 132, 170, 260	Biogas, Sewage, Landfill	2105/19	★	★	★	★	★						
	MWM TCG 3016, 3020, 2032B Cat CG 132B, 170B, 260B	Natural Gas	2105/19		★	★								
	MWM TCG 3016, 3020, 2032B Cat CG 132B, 170B, 260B	Biogas, Sewage, Landfill	2105/19		★	★		★						
Caterpillar Motoren GmbH (formerly MaK)	All GCM	Natural Gas		●	●	●								
Cummins	Suitable B, C 5.9 / 8.3 Litre Engines	Natural Gas	14675QSV (stationary) 20074 (Fleet)							●	●			
	QSK	Natural Gas		●	●	●								
	QSV	Natural Gas		●	●	●								
Deutz (Cologne)	TCG2015			■	●			●						
Dresser Rand	Clark 2-stroke engines	Natural Gas											●	
Ford	350, Other V8 (Gasoline Engines Converted to Natural Gas)	Natural Gas								■		■		
Innio Jenbacher	Installations with catalyst		TA 1000-1109		★	★		■						
	2 - 3	A	TA 1000-1109		★	★								
		B	TA 1000-1109			★		★	★					
		C	TA 1000-1109					★	★					
	4 Version A + B	A	TA 1000-1109			★	★							
		B	TA 1000-1109				★		★					
		C	TA 1000-1109						★					
	4 Version C or newer	A	TA 1000-1109			★	★							
		B	TA 1000-1109			★	★							
		C	TA 1000-1109			★								
	6 Version C + E	A	TA 1000-1109			★	★							
		B	TA 1000-1109				★		★					
		C	TA 1000-1109						★					
	6 Version F or newer	A	TA 1000-1109			★	★							
		B	TA 1000-1109			★								
C		TA 1000-1109			★									
Innio-Waukesha (mandatory use of approved oils in cogen installations and in APG 220 installations)	VGF F18, H24, L36, P48 G, GL, GLD	all	12-1880AM	★	★	★		■	★					■
	VGF F18, H24, L36, P48, GSI, GSID	all	12-1880AM	★	■	★		■	★					■
	VGF F18, H24, SE	all	12-1880AM	★		★		■	★					
	VHP F3521, L5790, L7042, P9390 G, GSI, GL	all	12-1880AM	★	★	★	★	■	★				■	
	VHP F3514, F3524, L5794, L7044, GSI, L5774, L5794, LT	all	12-1880AM	★	★	★		■	★					
	VHP 5794, 7044GSI with factory-supplied catalyst	all	12-1880AM	★					★					
	275GL/GL+ 12V, 16V	all	12-1880AM	★	★	★	★	●	●				●	
	APG 16V150LTD	all	12-1880AM	●		●		●	●					
APG 12V220GL, 18V220GL	all	12-1880AM		★										
GM	350, Other V8	Natural Gas								■	■	■		
Liebherr	all	Natural Gas	LH-00-TFG		●	●								
Mitsubishi Heavy Industries	GS16R2	Natural Gas	JE17SGSR002		★	●								
MAN Augsburg	All gas engines	Natural Gas		●	●	●								
MAN Nuremberg	All stationary	Natural Gas	M 3271-2		★	★								
	All stationary	Biogas, Sewage, Landfill	M 3271-4				★	★						
MTU Onsite Energy (Rolls Royce Power Systems)	400 Series	Natural Gas	BR400		★	■								
		Biogas, Landfill, Sewage	BR400				★							
	4000 Series (L61, L62, L63)	Natural Gas	BR4000			★	★							
		Biogas	BR4000					★						

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MTU Onsite Energy (Rolls Royce Power Systems)	4000 Series (L32, L33, L64)	Natural Gas	BR4000			★								
		Biogas	BR4000				★							
Perkins	4000 Series	Natural Gas	Engine News 48 issue 5		★				●					
		Sour Gas	Engine News 48 issue 5				★							
Rolls Royce Bergen	Bergen K-G1 / -2 / -3	Natural Gas	Rolls Royce 1503		★	●								
	Bergen K-G4	Natural Gas	Rolls Royce 1502		●	●								
	Bergen B-G	Natural Gas	Rolls Royce 1503		★	●								
	Bergen CR-G	Natural Gas	Rolls Royce 1503		★	●								
Siemens (formerly Guascor)	Siemens SGE-E series	Natural Gas	IC-G-D-25-008e		★	★								
	Siemens SGE-H and SGE-S series	Natural Gas			★	●								
		Sour Gas					●							
	Guascor HGM, FGLD and SFGLD series	Natural Gas	IC-G-D-25-005e		★	●								
Tedom	T-50	Natural Gas	61-0-0281.1			★			●					
		Sour Gas	61-0-0281.1				★							
Toyota	Viessmann, EC Power, 2G	Natural Gas											■	
Wärtsilä	all SG gas engines and all DF dual fuel engines running predominantly on gas	Natural Gas	4V92A0780	●	★	●								
Volga Diesel Mamins	Gas Engines	Natural Gas		★										
Volkswagen	ECOBBLUE 2.0	Natural Gas				■								

Operational Considerations

SENTRON stationary gas engine oils with extended drain interval and oil life as well as excellent control of engine deposits and wear help provide worry-free operation and reduced cost to customers under normal recommended conditions. However, actual oil life is dependent upon

system design and operating practices, and should be established by used oil analysis, according to engine manufacturers' recommendations. Petro-Canada Lubricants' No-Nonsense Lubricants Warranty applies.

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



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