

PEERLESS™ LLG & OG CALCIUM SULPHONATE GREASES

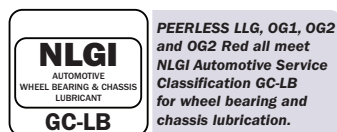
Introduction

Petro-Canada PEERLESS™ greases are premium performance, multi-application greases formulated to reduce operating costs and provide extended protection in high temperature or wet operating conditions.

PEERLESS LLG combines three areas of high technology, namely:

- Petro-Canada ultra pure HT Severely Hydrocracked base oils
- Petro-Canada's proven antioxidant chemistry
- The latest in calcium sulphonate complex grease thickeners

The PEERLESS OG line of extreme pressure (EP), high temperature multi-application greases are specially formulated to be highly effective in wet and marine environments. Based on a special calcium sulfonate complex thickener, these greases can absorb moderate amounts of water without softening, changing consistency or losing corrosion prevention capability.

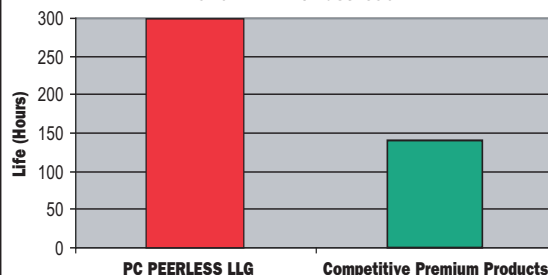


Features and Benefits for PEERLESS LLG

- **Long life under high temperature provides long-lasting equipment protection**
 - PEERLESS LLG lasts longer than competitive premium multi-application grease at high temperature
 - PEERLESS LLG's high operating temperature provides extended protection under severe conditions compared to leading competitive products

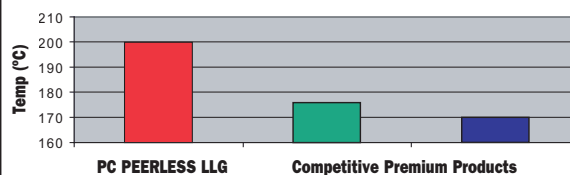
PC PEERLESS LLG's long life under high temperature provides long-lasting equipment protection

ASTM D3527 Bearing Life Performance Test at 160°C (320°F), 1000rpm speed and 111 N thrust load



* This test differentiates among wheel bearing greases having distinctly different high temperature characteristics. The longer the life, the better the protection.

PC PEERLESS LLG's operating temperature provides extended service life for customers



*ASTM D2265 Dropping Point Test indicates the temperature at which the grease thickener loses its capacity to retain oils and this temperature is also much higher for PEERLESS LLG versus the competitive products.

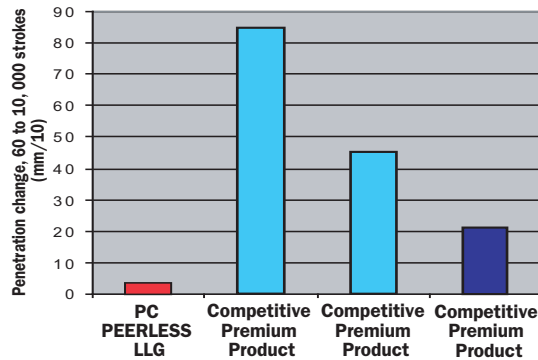
- **Excellent water resistance**
 - PEERLESS LLG superior water washout resistance reduces maintenance costs in wet environments
 - Stays in place in wet and marine applications
 - Maintains consistency after absorbing water
 - Strongly resists water wash-off and lengthens lubrication intervals

- **High mechanical stability in severe operating conditions**

- PEERLESS LLG also lowers maintenance costs as a result of reduced product breakdowns under low to moderately high shear conditions
- Reduces bearing wear and extends equipment life
- Protects bearings under heavy loading

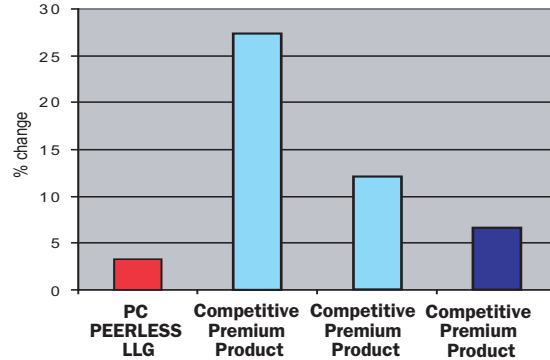
PC PEERLESS LLG with the lowest break-down under low shear conditions provides extended service life for customers

ASTM D217A at 10,000 strokes, 25°C (77°F)



PC PEERLESS LLG with the lowest break-down under moderate shear conditions provides stability, longer service life for customers

ASTM D217A at 10,000 strokes, 25°C (77°F)



* The significance of the tests is to demonstrate the stability of the grease under normal and moderate shear conditions. The lower the number in the graph, the stronger the grease performance, and the longer its service life.

Features and Benefits of Peerless OG Greases

- **Excellent performance in the presence of water**

- Stays in place in wet and marine applications
- Maintains consistency after absorbing water
- Excellent resistance to washout

- **Wide temperature / pressure range**

- Special thickener enhances high temperature and pressure capabilities
- Low temperature hand-gun dispensing capability
- Performs well in low ambient temperature applications

- **Great rust and corrosion protection**

- Protects components in the presence of water
- Reduces maintenance costs

- **Superior adhesive properties**

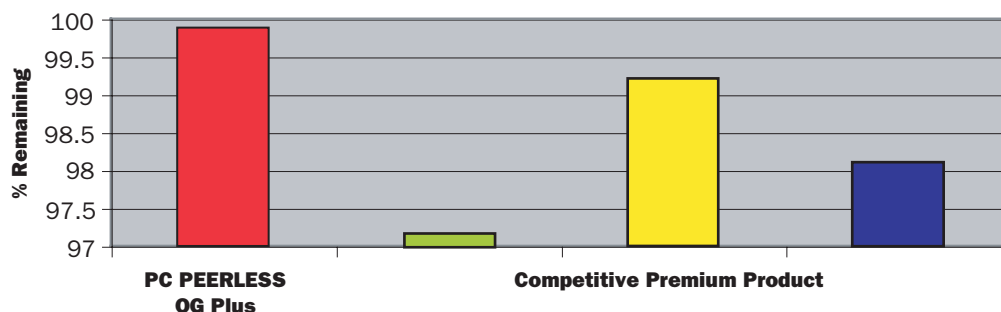
- Protects rotating parts to reduce equipment costs
- Excellent resistance to washout for better protection

- **State of the art formulations**

- Excellent protection against rust and corrosion especially in marine applications
- Excellent adhesive properties to protect rotating parts and reduce equipment cost
- Built-in, non-sacrificial anti-oxidant chemistry for long life

PC PEERLESS OG Plus with high resistance to water washout requires less re-greasing

ASTM D1264 Determining the water washout at 79°C (174°F), 5.0mL/sec. water flow rate and 600 rpm bearing speed



* This test demonstrates the water resistance of the grease under wet conditions. The higher the % remaining, the better.

Applications

Petro-Canada PEERLESS LLG and OG Greases are formulated to provide excellent lubrication in a wide range of applications especially under high temperature and extremely wet operating conditions. PEERLESS greases are recommended for a full range of industrial and automotive applications including:

- General Manufacturing
- Forestry
- Pulp & Paper
- Power Generating
- Fleet

PEERLESS LLG

A premium multi-application calcium sulphonate complex grease, Peerless LLG provides outstanding oxidation stability, excellent water resistance, outstanding rust protection and excellent load carrying ability under high operating temperatures. It is particularly recommended for high temperature and long life applications which include:

- Equipment running continuously at temperatures up to 200°C/392°F and extremely wet conditions
- Wheel bearings and automotive chassis
- Sealed-for-life bearings
- Constant velocity joints
- Small appliance
- Ovens and Kilns

PEERLESS OGO

A premium multi-application calcium sulphonate complex grease, Peerless OGO has excellent performance in the presence of water, wide operating temperature range, great rust and corrosion protection and superior adhesive properties. Applications include:

- Central lubricating systems
- Applications with low ambient temperatures
- Applications with the requirement for a softer grade product

PEERLESS OG1

A premium multi-application calcium sulphonate complex grease, Peerless OG1 has excellent performance in the presence of water, wide operating temperature range, great rust and corrosion protection and superior adhesive properties. Applications include:

- Wheel bearings
- Automotive chassis
- Central lubricating systems

PEERLESS OG2 and OG2 Red

A premium multi-application calcium sulphonate complex grease, Peerless OG2 and OG2 Red have excellent performance in the presence of water, wide operating temperature range, great rust and corrosion protection and superior adhesive properties. Applications include:

- Wheel bearings
- Automotive chassis
- Forklift mast slides
- Power shovel bucket pins
- Mining scoop trams
- Rock crushers
- Farming Equipment
- Pulp press roller bearings

PEERLESS OG PLUS

A premium multi-application calcium sulphonate complex grease, Peerless OG Plus is polymer enhanced and has excellent performance in the presence of water, wide operating temperature range, great rust and corrosion protection and superior adhesive properties. Applications include:

- Wet end bearings of paper mills
- Pulp press roller bearings
- Applications where superior adhesion is a key requirement

PEERLESS SVG 102

A premium multi-application calcium sulphonate complex grease, Peerless SVG 102 has excellent performance in protecting valves against corrosion and deleterious effects of hydrogen sulphide present in the gas streams in the oil and gas industry. Applications include:

- Internal parts of valves used in production and distribution of sour gas
- Valves used in LPG and water injection systems in oil and gas industry

PEERLESS XCG-FLEX

A premium multi-application calcium sulphonate complex coupling grease, Peerless XCG-Flex is a grease with outstanding mechanical stability and resistance to oil separation. It has a high-load carrying ability, high dropping point and excellent resistance to corrosion and water washout. It prevents oxidative fretting corrosion and protects against wear under potentially high gear tooth loadings and vibration. PEERLESS XCG-Flex meets AGMA coupling grease specifications CG-1 and CG-2. Applications include:

- High-speed flexible couplings where severe centrifugal forces are generated
- Industrial couplings of the gear and flexible steel type

Operational Considerations

PEERLESS line of products provides long wear protection under normal operating conditions. However, actual grease life is dependent upon system design and operating practices. No Nonsense Lubricants Warranty applies.

Typical Performance Data

PROPERTY	TEST METHOD	PEERLESS							
		LLG	OG0	OG1	OG2	OG2 RED	OG PLUS	SVG 102	XCG-FLEX
NLGI Grade	D217	2	0	1	2	2	2.5	1	1
NLGI Standard		GC-LB	-	GC-LB	GC-LB	GC-LB	-	-	-
Colour	PCM 264	Burgundy	Tan	Tan	Tan	Red	Tan	Green-Grey	Brown
Texture / Appearance	PCM 264	Buttery/Smooth	Buttery/Smooth	Buttery/Smooth	Buttery/Smooth	Buttery/Smooth	Stringy/Smooth	Buttery/Smooth	Buttery/Smooth
Dropping Point, °C/°F	D2265	314/597	284/543	310/590	304/579	300/572	309/588	262/504	290/554
Worked Penetration, 60 strokes	D217A	284	366	329	276	270	249	324	335
Oxidation Stability 100 hrs, psi drop	D942	2.2	2	2	2	2	2	3	-
Base Oil Viscosity, cSt @ 40°C/SUS @ 100°F	D445	100/523	38/193	53/270	73/378	73/378	78/406	80/412	329/1764
cSt @ 100°C/SUS @ 210°F	D445	10.8/63	7.3/50	8.9/56	9.4/58	9.4/58	9.4/58	11.2/64	22.5/112
Viscosity with Polymer ¹ cSt @ 40°C		214	80.6	127	117	906	1358	159	4732
cSt @ 100°C		22	11.5	16.1	14.5	86.5	128.6	17.6	278
Timken OK Load, Kg/lb	D2509	27/60	22.7/50	27/60	27/60	27/60	27/60	27/60	29.5/65
Four Ball Weld Point, kg	D2596	500	315	400	400	500	500	620	500
Four Ball Wear scar diam mm	D2266	0.45	0.42	0.38	0.52	0.42	0.39	0.51	0.41
Copper Corrosion	D4048	1b	1b	1b	1b	1b	1b	1a	1b
Water Washout % @ 79°C /174°F	D1264	1.5	-	2.8	2.2	2.8	0.1	1.5	1.5
Temperature Range, °C		-20 to 200	-35 to 163	-30 to 163	-25 to 163	-25 to 163	-20 to 163	-35 to 163	-20 to 163
Temperature Range, °F		-4 to 392	-31 to 325	-22 to 325	-13 to 325	-13 to 325	-4 to 325	-31 to 325	-4 to 325

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

¹ This grease contains a polymer additive which increases the active base oil viscosity providing enhanced performance, protection and load carrying capabilities. Petro-Canada Lubricants' specification only covers the base oil viscosity and not the viscosity with polymer.

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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