



Canoil Canada Ltd.

“MEETING TOMORROW’S NEEDS TODAY”

VSG® - THE ‘GREEN’ GREASE

Description:

VSG® - THE ‘GREEN’ GREASE is a biodegradable canola oil based state-of-the-art grease developed to reduce the environmental impact. Applications are where the spend grease can or might get into the environment and/or where the many ‘green’ and/or performance characteristics can be advantageous. One proven use is to lubricate wicket gate bearings on hydroelectric turbines. These are very important and used to control the flow of water into the turbine. VSG is believed to be the only biodegradable grease approved to the Ontario Hydro (now OPG), Hydro Quebec and TVA specifications for wickets gates. Note that these were originally based on mineral oils so no important performance characteristics were compromised.

VSG provides excellent performance and rust protection and contains a calcium sulfonate complex thickener which does not contain the lithium or barium soaps often found in water resistant greases.

VSG has extreme pressure characteristics to reduce friction and wear without needing metal additives containing zinc or lead and has no added chlorine. Plus, this grease contains no added coloring agents and the base oil is mainly canola.

VSG has been found by independent laboratories to be more than 81% biodegradable. This is much better than the standard mineral oil based greases. VSG also has much lower ecotoxicity than many mineral oil based products and can be considered non-bio accumulative. In summary VSG can offer biodegradability, sustainability, less eco toxicity, non bio-accumulatively, while providing outstanding performance often with less consumption. VSG also meets many of the requirements of US Executive Order 13514 and meets the definition of “bio preferred” given in EO 13693 Section 19.

Product Features:

There are many key features for the environmental VSG is Readily Biodegradable according to CEC-L-33-T-82 testing. With that in mind VSG showed “no acute toxicity” in the Daphnia magna test. VSG showed no toxicity in the 48 hour EPA Mysidopsis bahia (shrimp) test and VSG has “no added lead, zinc, barium or chlorinated paraffin’s, and has no added coloring agents. Plus, being based on sustainable canola oil is another important attribute.

Other key grease features are VSG has an “extreme pressure” rating without the need for aggressive or unstable additives. This is directly related to wear resistance. VSG has excellent resistance to water washout and will stay in place longer. VSG also has very good rust preventing characteristics that will help protect the steel bearing journals. Plus, VSG is pumpable down to below 0°F (-18°C) without having to load the product up with oils or solvents. VSG is compatible with the traditional elastomers used similarly as seals for mineral oils. In addition, VSG has performance characteristics that are expected to be as good as or better than the greases currently being used in the industry. VSG can be utilized right away and in most existing equipment. It has been proven in-service and has approval from some of the largest utilities in the world.

For quality and consistency VSG is manufactured in North America by a US owned company at an ISO 9001 and 14001 registered plant by one of the leading grease manufacturing companies.

**Customer Benefits:**

Better than many other 'green' products being used now because VSG was specifically developed to meet utility specifications for hydroelectric turbines. Many users have been able to use much less VSG than with their previous mineral oil based products. In one case 42 times less for a large cost saving.

VSG is available in tubes, pails, kegs and drums and can also be provided for private branding. VSG is usually in stock and can normally be provided in very small order sizes. i.e. one case of ten tubes, one pail, one keg or one drum. Product availability is FOB Mississauga Ontario Canada. It has been shipped worldwide with the farthest being to New Zealand.

Applications:

VSG has been used for over twenty years for wicket gate bearings for both manual and automatic systems. It has also been used to lubricate wireropes, stop log racks, slides and other bearings. Please contact us for applications.

VSG should not be used for sustained high temperatures (above 200°F (93°C) nor in direct sunlight because of UV stability. VSG will harden in such applications because of the canola oil,

Typical Test Data:

NLGI Grade		Grade 1
Main ingredient:	Base oil	canola (vegetable) oil
Thickener:		calcium sulfonate complex
Biodegradability:	CEC L-33-T-82	81 % after 21 days
Eco-toxicity:	Daphnia Magna test	48 hours LC50 >1,000 ppm
Rainbow Trout test:	96 hours LC50	>93 cm ² /l
Daphnia Magna:	48 hours per EPA/600/4-90/027 F	LD50 >1,000 ppm
Mysid Shrimp:	48 hours per EPA/600/4-90/027 F	LD50 >1,000 ppm
Partition Coefficient test	OECD 107 Shake Flask method.	Log P 1.34
Lead Content:	Acid digested ICP	ppm <1 (none added)
Color:		light tan
Odor:		similar to cooking oil
Penetration:	ASTM D-217 worked at 25°C (77°F)	325
Dropping Point:	ASTM D-2265	250 (480) °C (°F),
Apparent Viscosity:	ASTM D-1092, Poise at 0°C (32°F),	15 reciprocal seconds 429 100 reciprocal seconds 102 500 reciprocal seconds 42
Lincoln Ventmeter:	psi drop @ 25°C C / 0°C / -18°C (77/32/0°F)	20 / 110 / 235
USX Mobility:	g/min @ -18°C (0°F) and 21.7 kPa (150 psi)	226
Worked Stability:	ASTM D-217, % change after 100,000 strokes 10,000 strokes with 20% water	+2.5 (softens) -20 (stiffens)
Roll Stability:	ASTM D-1831, % change, with 50% water	-19 (stiffens)
Water Washout:	ASTM D-1264, % loss at 79.4°C (175°F),	1.2
Oil Bleed:	ASTM D6184 % bleed 30 hours at 100°C (212°F)	0.9
Volatile Matter:	% loss after 3 hours @ 107°C (225°F)	0.4

Timken OK Load:	ASTM D-2509 kg,	25
4 Ball EP:	ASTM D-2596, load wear index, kgf	55
4 Ball Wear:	ASTM D-2266, scar diameter in mm	0.42
Rust Protection:	ASTM D-1743	pass
Copper Strip Corrosion:	ASTM D-4048 24 hours at 100°C (212°F),	1b
US Navy Gear Wear:	10 lb load, mg/1000 cycles	0.57
Salt Fog:	ASTM DB-117, hours to failure @ 1 mil d.f.t.	>300
Low Temperature Flexibility:	MIL-PRF-18458C, 1 hr @ -29°C (-20°F)	Pass
Adhesiveness:	MIL-PRF-18458, 15 minutes at 66°C (151°F)	99%

Plus, no added dyes, heavy metals, chlorinated compounds, zinc compounds or sodium nitrate. Other test data is available. If you do not see what you want, please contact us.

Corrosion Protection: ASTM B-117 Salt Fog Cabinet Test (150 hours)



TYPICAL MINERAL OIL BASED OTHER CANOLA OIL BASED VSG® CANOLA OIL BASED

VSG WORKS!

Users in the USA included the Bureau of Reclamation, Tennessee Valley Association (TVA) and the US Army Corps of Engineers. In Canada; BC Hydro, Fortis, Manitoba Hydro, Newfoundland & Labrador Hydro, Ontario Power Generation (OPG) and Hydro Quebec. Plus, utilities in Iceland and New Zealand.

References can be provided upon request.

Health and Safety:

When used for its intended application, this product is not expected to have any adverse health implications. For complete information on safe handling, as well as physical and chemical characteristics please refer to the Material Safety Data Sheet (MSDS) found on our website, www.canoilcanadald.com or call toll free 1-855-520-2022. Do not use this product for purposes other than its intended use. Please be responsible to the environment when disposing of used product.

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