

ANNOUNCEMENT

To reduce the environmental impact of grease from once through systems, a better choice is now possible. 'VSG' grease uses a renewable and natural vegetable base oil combined with a state of the art calcium sulphonate thickener to provide a readily biodegradable and potentially less harmful product.

'VSG' performs! It has good resistance to water washout, it has extreme pressure and anti-wear characteristics, and it has good pumpability. In most cases it can be used now to directly replace existing mineral oil based products.

'VSG' or vane spindle grease, was developed to meet the requirements of established wicket gate bearing grease specifications and can also be used for many other bearings. It will be cost effective compared to existing products and will certainly be much less expensive than trying 'self-lubricating' inserts.

Also available are other greases, oils and dielectric fluids that may be 'environmentally better'. These have no added heavy metals, such as lead and zinc, or added chlorinated compounds.

VSG

'The Green Grease'

Typical Data

Biodegradability: % after 21 days, CEC	81
Ecotoxicity:	
Daphnia Magna test	LD50 >1000 ppm
Mysid Shrimp test	LD50 >1000 ppm
Trout test	LC50 >93 cm ³ /l
Lead Content: ppm	<1 (none added)
Density: kg/L	1.0
Color:	light tan
Odor:	pleasant cooking oil
Penetration: worked at 25EC,	325
Water Washout: % at 79EC	5
Timken OK Load: kg	25
4 Ball Wear: scar diameter in mm	0.42
Roll Stability: % change after 4 hours at 25EC	8
Roll Stability: % change with 50% water	-21 (stiffens)
Worked Stability: % change after 10,000 stokes with 20% water	-22 (stiffens)
Rust Protection:	panels clean
Copper Strip Corrosion:	1b
Salt Fog Corrosion: hours	>300
Dropping Point: EC,	260
USX Mobility: 150 psi & -18°C, g/min	226

No warranties, express or implied, including warranties of merchantability or fitness for a particular use, are made with respect to the products described herein. Nothing contained herein shall constitute a permission or recommendation to practice any invention covered by a patent without a license from the owner of the patent.

QUALITY, HIGH PERFORMANCE,
COST EFFECTIVE PRODUCTS

VSG

BIODEGRADABLE CANOLA OIL BASED GREASE

**Extreme pressure rated with
excellent corrosion protection
and pumpability.**

Applications could include hydroelectric wicket gate bearings, stop logs, slides, bicycles, gardening equipment, yard machinery, recreational equipment, boat ramps, door hinges, or farm machinery,

Other lubricants which can have less impact on the environment are available as well. Please call or write.

ECO FLUID CENTER LTD.

Toronto, Canada

**Phone: 416 466-3144 or toll free
888 442-5008 Fax: 416 466-3807**

**e-mail: info@fluidcenter.com
website: www.fluidcenter.com**

VSG

This is a state-of-the-art lubricant developed to reduce the impact on the environmental of greases used to lubricate wicket gate bearings on hydroelectric turbines.

VSG is the only biodegradable grease approved to the Ontario Hydro (now OPG) and Hydro Quebec specification for wickets gates.

It provides excellent performance and rust protection.

VSG contains a calcium sulphonate thickener which does not contain the lithium or barium often found in water resistant greases.

VSG has extreme pressure characteristics to reduce friction and wear without needing metal additives containing zinc or lead.

VSG contains no added coloring agents.

VSG is mainly canola oil which is renewable, sustainable and biodegradable.

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 has much lower ecotoxicity than mineral oil based products.

USER LIST

United States

Bureau of Reclamation
City of Tacoma, WA
Turlock Irrigation District, CA
TVA
US Army Corps of Engineers

Canada

BC Hydro
Fortis BC
Fortis Properties
Hydro Quebec
Manitoba Hydro
Nova Scotia Power
Nalcor Energy
Newfoundland & Labrador Hydro
Ontario Power Generation
Orillia Power Corporation

Overseas

Landsvirkjun, Iceland
Mighty River Power, New Zealand

Plus, other users sold through distributors.

Specific references can normally be made available upon request.

WEB INFORMATION

EPA: The US EPA had an article on VSG grease in EPP (Environmentally Preferable Purchasing) Update, Issue 10, January 2002, pages 10-11. This highlights the use of VSG at the Parker Dam in California and is the article '**Biobased' Lubricants'**.

www.epa.gov/epp/pubs/eppupdates/update10.pdf

Bureau of Reclamation: A report on '**Environmentally Safe 'Green' Lubricants for Wicket Gates'** by Leslie Hanna and Cliff Pugh, US Bureau of Reclamation, Water Resources Research Laboratory, Denver. In tests on a wicket gate VSG gave the lowest torque of all 'green' greases and did better than their mineral oil based grease. VSG was grease 'E'. It also is veggie based not a synthetic ester.

www.usbr.gov/pps/WaterOandMBulletins/186dec1998.pdf

Canadian Dam Association Bulletin, Fall 2005, '**Dam Lubricants: Make the 'Green' Choice'**.

<http://www.cda.ca/bulletins/CDA-Q0405.pdf>

'**Going Green'**, International Water Power & Dam Construction

www.waterpowermagazine.com/story.asp?storyCode=2024429

'**Choosing Environmentally Friendly Lubricants'**

Machinery Lubrication, Sept-Oct 2005

www.machinerylubrication.com/article_detail.asp?articleid=795&relatedbookgroup=Lubrication