



**ELM**  
ENVIRONMENTAL LUBRICANTS MANUFACTURING, INC.

# Customer Bulletin

Winter 2005-06  
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## Our Vision

*Be the most respected and innovative Biobased lubricant company, which contributes to society and the environment through our high-quality products & services.*

## ELM Helps Cleanup after Hurricanes



ELM employees prepare the pails for donation: (L to R) Lori Johnston, Materials Manager; Dr. Kasturi Lal, VP of Technology; Alan Burgess, Production Supervisor; Ben Wildman, Production Assistant; Matt Kiehn, Production Assistant.

*Happy  
New  
Year!*



ELM contributed a truckload of soy biobased chainsaw bar oil to aid the vast hurricane cleanup efforts along the Gulf Coast. ELM employees donated their time to prepare the pails for shipment to hurricane affected areas. Everyone worked laboriously in order to get the consignment of soy chainsaw bar oil to Biloxi, MS. It was transported using ELM's own truck, thereby facilitating an

efficient delivery.

The Red Cross suggested that because of the quantity and type of material ELM is providing, it would be best to deliver the lubricants to utility companies, fire departments, and other groups involved in the cleanup. "Based on Red Cross input, Biloxi, MS, is the place to start," said Lou Honary, ELM President and CEO, "we

know the crews down there need as much chainsaw lubricant as they can get. We want to help and we think these products will be well received because they meet or exceed industry performance standards; they are biobased so they don't impact the short petroleum supply, and they are environmentally friendly -- which is very important in already polluted areas."

## New Product: SoyStik™ Solid Lube

ELM President and CEO, Dr. Lou Honary, presented a paper on Soybean Oil-Based Solid Stick Lubricant at the 72nd Annual Meeting of the National Grease Lubricating Institute (NLGI) on November 1, 2005, in San Antonio, Texas, introducing the SoyStik™ solid lubricants for use on locomotive-flanged wheels. Created from a combination of ELM's SoyTrak™ rail curve grease and hardening agents,

SoyStik™ is a superior solid stick lubricant that is also compatible with ELM's rail curve greases.

SoyStik™ incorporates bio-fibrous materials that improve lubricant delivery, and are biodegradable and environmentally friendly. SoyStik™ is available through Snyder Equipment Company, Inc. ([www.snyderequip.com](http://www.snyderequip.com))



### Special Interest Articles

- ELM helps with Hurricane Relief
- New Product: SoyStik™ Solid Lube
- SoyTrak™ Arctic Blend approved
- BEES Analysis of ELM Hydraulic Fluids

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## SoyTrak™ Arctic Blend Approved



SoyTrak™ Arctic Blend has been approved by the Research and Testing Center of Norfolk Southern Railroad. The need for a product that performs at subzero temperatures was recognized by ELM researchers early on, due to the diversity of ELM's customers' needs in various geographic areas.

The Arctic Blend incorporates cold temperature performance additives that enhance cold temperature flowability, while the soybean oil content improves lubricity and performance at higher temperatures. As a result, SoyTrak™ Arctic Blend performs at -30°F to about

50°F, one of the widest temperature ranges in non-synthetic greases.

**SoyTrak™ Arctic Blend is compatible with other SoyTrak™ products and can be mixed with SoyTrak™ Multi-Season grease to improve cold temperature flowability.**

The approval process involved both laboratory tests and performance tests of the actual lubricator in environment chambers.

These chambers simulate extended exposures at varying temperatures. Based on field data from last winter, the product formulation was enhanced to handle extreme temperature fluctuations.

SoyTrak™ Arctic Blend is compatible with other SoyTrak™ products and can be mixed with SoyTrak™ Multi-Season grease to improve cold temperature flowability. SoyTrak™ Arctic Blend provides superior wear protection and durability at extreme load and temperature conditions.

## Oil Cleanliness Extends Equipment Life



Particle Counter

**Due to their polar nature, Biobased Hydraulic Fluids effectively remove contaminants (manufacturing components and any debris added during the assembly process) from the equipment.**

The most important time in the life of a hydraulic or lubrication system is the initial run-in period. During this time, contaminants (manufacturing components and any debris added during the assembly process) are washed through the system and can cause three types of equipment failure: catastrophic, intermittent, and degradation failure. These contaminants come in all shapes and sizes; are usually abrasive; and are made up of a variety of materials.

It is critical, therefore, that contaminants be captured and removed from the system while it is in off-load operation. This cleaning process is also recommended when switching from a

conventional hydraulic fluid to a biobased product, to remove deposits resulting from extended use.

Due to their polar nature, biobased hydraulic fluids effectively remove contaminants. The best way to dislodge, isolate, and transport contaminants is by using a low-viscosity fluid traveling at high-line velocity, and operating at an elevated temperature. All valves should be operated several times to permit flow through all lines.

There are three steps involved in this flushing process: the system fluid should feed through all lines and components, the cleaning process must dislodge the contaminants from all

components and lines, and contaminants must be captured with a high-efficiency filter.

Fluid cleanliness is measured by scanning for particles of various sizes within a fluid. Cleanliness levels are expressed by numbers representing contaminant sizes of 2, 5, and 15 microns. The International Standard Organization (ISO) specifies cleanliness by three numbers which are indicative of the number of particles in 1 milliliter of the fluids, e.g. 21/18/16. As a rule of thumb, the higher the pressure of a system, or the more sensitive the components, the cleaner a hydraulic oil specification should be.

## BEES Analysis of ELM Hydraulic Fluids



In support of the 2002 Farm Security and Rural Investment Act (P.L. 107-171), BEES (Building for Environmental and Economic Sustainability) has been adapted by NIST for application to biobased products. BEES measures the environmental performance of building products by using the life-cycle assessment approach specified in ISO 14000 standards. All stages in the life of a product are analyzed: raw material acquisition, manufacture, trans-

portation, installation, use, and recycling and waste management.

Economic performance is measured using the ASTM standard life-cycle cost method, which covers the costs of initial investment, replacement, operation, maintenance and repair, and disposal. Environmental and economic performances are combined into an overall performance measure using the ASTM standard for Multi-Attribute Decision

Analysis. For the entire BEES analysis, building products are defined and classified according to the ASTM standard classification for building elements known as UNIFORMAT II.

BEES is supported in part by the US EPA Environmentally Preferable Purchasing (EPP) Program. The EPP program is charged with carrying out Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition," which encourages executive agencies to reduce the environmental burdens associated with the more than \$230 billion in products and services they buy each year, including building products.

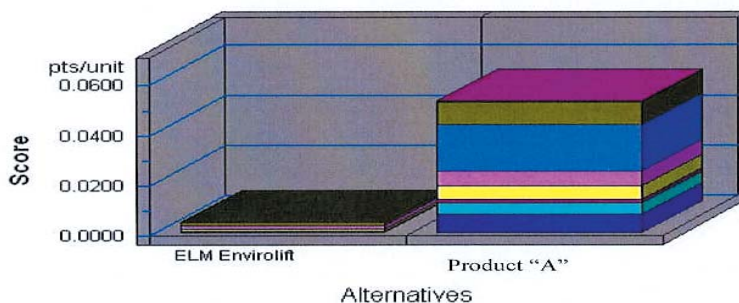
Shown below are the BEES results for the ISO 46 elevator hydraulic fluid (EnviroLift™) as compared to a competitive product. ELM's products demonstrated an extremely favorable rating in all of the categories.

Category	EnviroLift™	Product "A"
Acidification--5%	0.0000	0.0000
Critical Air Pollutants--6%	0.0000	0.0002
Ecological Toxicity--11%	0.0012	0.0093
Eutrophication--5%	0.0002	0.0181
Fossil Fuel Depletion--5%	0.0012	0.0063
Global Warming--16%	0.0008	0.0054
Habitat Alteration--16%	0.0000	0.0000
Human Health--11%	0.0004	0.0012
Indoor Air--11%	0.0000	0.0000
Ozone Depletion--5%	0.0000	0.0000
Smog--6%	0.0002	0.0045
Water Intake--3%	0.0002	0.0074
<b>Sum</b>	<b>0.0042</b>	<b>0.0524</b>

**BEES:**  
(Building for Environmental & Economic Sustainability) measures the environmental performance of building products by using the life-cycle assessment approach specified in ISO 14000 standards.

Acidification
Critical Air Pollutants
Ecological Toxicity
Eutrophication
Fossil Fuel Depletion
Global Warming
Habitat Alteration
Human Health
Indoor Air
Ozone depletion
Smog
Water Intake

### Environmental Performance



BEES Results: ELM Elevator Hydraulic Fluid (EnviroLift™) as compared with a competitive product (shown as Product A)

### Useful Links

[www.epa.gov/region7/](http://www.epa.gov/region7/)

The Environmental Protection Agency (EPA) has been working for a cleaner, healthier environment for America since 1970.

[www.soygrowers.com/](http://www.soygrowers.com/)

This is a one-stop interactive community for people with soybean interests. Access soy issues gallery, discussion boards, chat rooms, market prices, and agriculture news.

This is an environmentally friendly customer bulletin, printed with soy-based ink.

## Letter to the Editor

**Q. I am using petroleum ISO 220 slideway lubricant. Do I have to use a vegetable oil - based ISO 220 viscosity product or can I use a lower viscosity product?**

**A.** Vegetable oil-based lubricants have a better lubricity and viscosity index in comparison to petroleum-based lubricants. The typical viscosity index for a petroleum-based oil is around 80 to 100, whereas vegetable oils have a viscosity index of as high as 220. As a result, vegetable oil-based lubricants are able to provide lubrication effi-

ciently at high temperatures without significant loss of their flow properties.

Normally, VI improvers are added to petroleum based lubricants to improve their viscosity index, but some of these VI improvers break down under high shear conditions, resulting in a low viscosity product. On the other

hand, vegetable oil-based lubricants do not lose their VI properties under high shear.

Based on these properties, an ISO 68 or ISO 150 vegetable oil-based slideway lubricant can be used in applications where an ISO 220 or higher viscosity grade petroleum-based slideway lubricant is needed.

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