

UNL 2021

PROGRAMME

**“From business resilience
to sustainable growth –
Re-imagining the future
of the lubricants industry”**

A Success Story in Bio-based Lubricants

Presenter: Dr. Lou A. Honary, President Environmental Lubricants Manufacturing, Inc.



Historical Development of Biobased-Biodegradable Lubricants

1. Europe began experimenting with vegetable oil-based lubricants in 1980s
2. US Lubricants companies began to research biodegradable products in 1990s
3. The Lubrizol Corporation led the way by developing a large array of additive packages for biodegradable lubricants
4. The University of Northern Iowa National Agriculture Based Lubricants Center was founded in 1991 – State, federal, and private funding was provided for R&D
5. The decades of 2000 saw most US manufacturers including The Lubrizol Corporation abandoning their efforts
6. Environmental Lubricants Manufacturing, Inc. was formed in 2000
7. Decade of 2010: Europeans began looking for biobased products from US companies where currently an estimated 40% of biobased lubricants are produced and used
8. The present decade has seen renewed interest for biobased lubricants worldwide.



A Bump In the Road for Environmental Lubricants Manufacturing

Search for a New Process

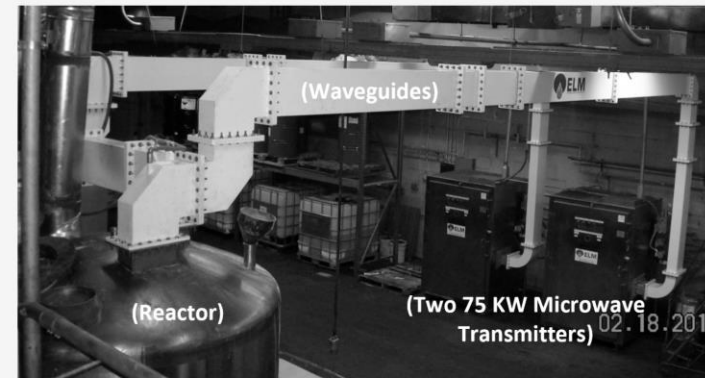


In 2007, a heat transfer fluid leak started a chain of events that led to the out-of-control fire at ELM. This led to the development of our microwave-based grease processing.

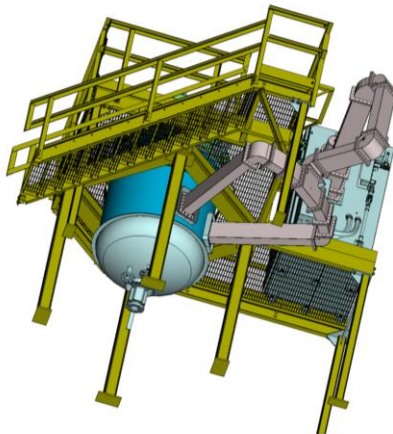


<http://greening-life.wordpress.com/2009/02/greerfire.jpg>

First Microwave Based Grease Reactor 2010 worked with Biobased Products Only



After 11 years of use and 3 patents, the latest microwave vessel is a Patterson Kettle designed to process mineral oil-based as well biobased greases.



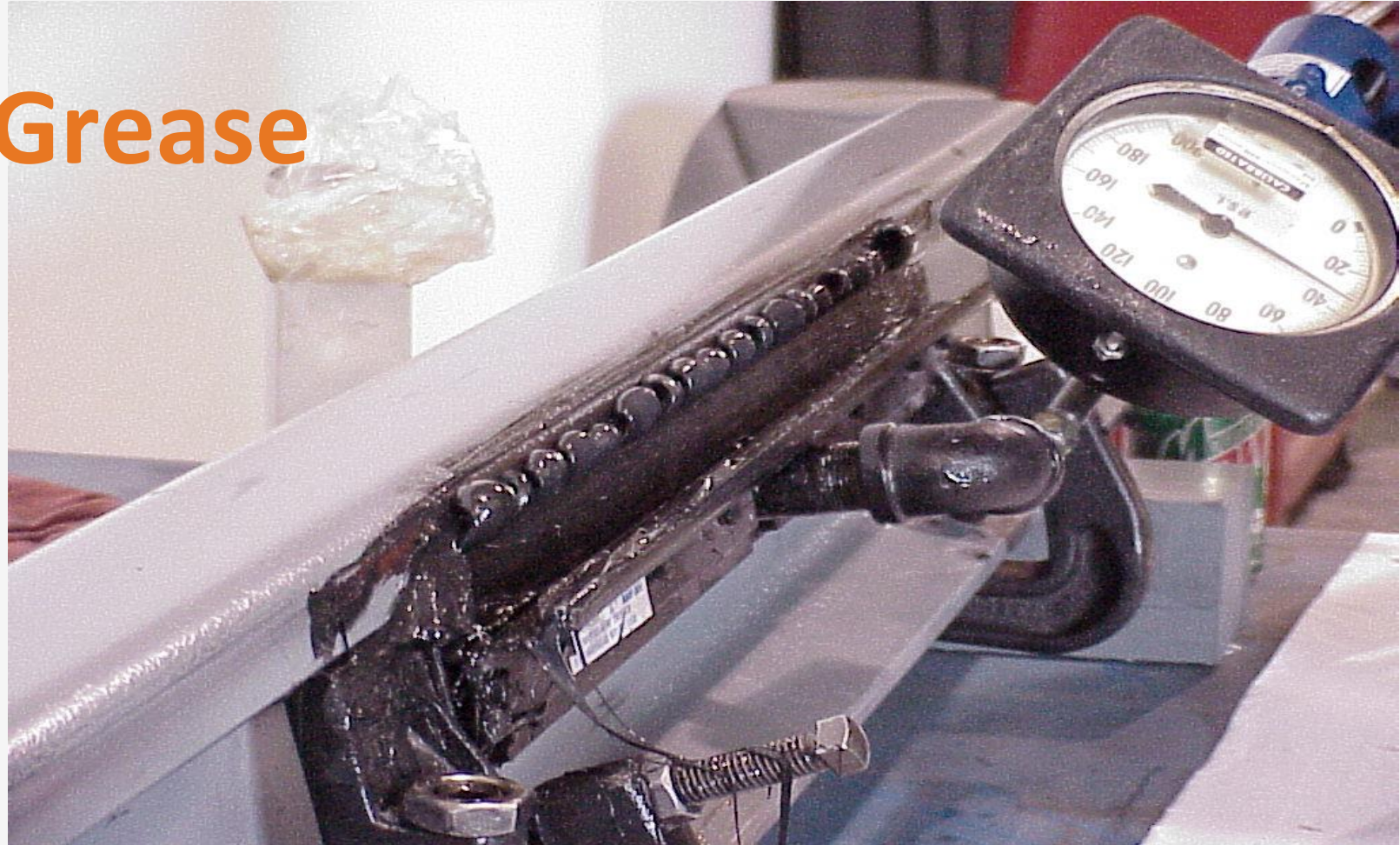
Examples of Successful Application Areas

1. Rail Curve Grease
2. Wire Rope Grease
3. Drill Rod Grease
4. Truck Grease
5. Food Grade Grease
6. Select Liquid Lubricants

Examples of Successful Application Areas

Rail Curve Grease

Wiper bars clamped
to inside of track



GF Grease Application Methods

- Wayside lubricator Components:
Trackside

- Grease tank/pump
- Solar Panel
- Wiper bars clamped to inside rails



GF Grease Application Methods

- Magnetic wheel sensor
- Controls for pump time (duration) and pump cycle frequency (number of wheels)



Verify Test Results in the Field



Hand-Held Tribometer Operation



High Speed Tribometer



Examples of Successful Application Areas

Wire Rope grease



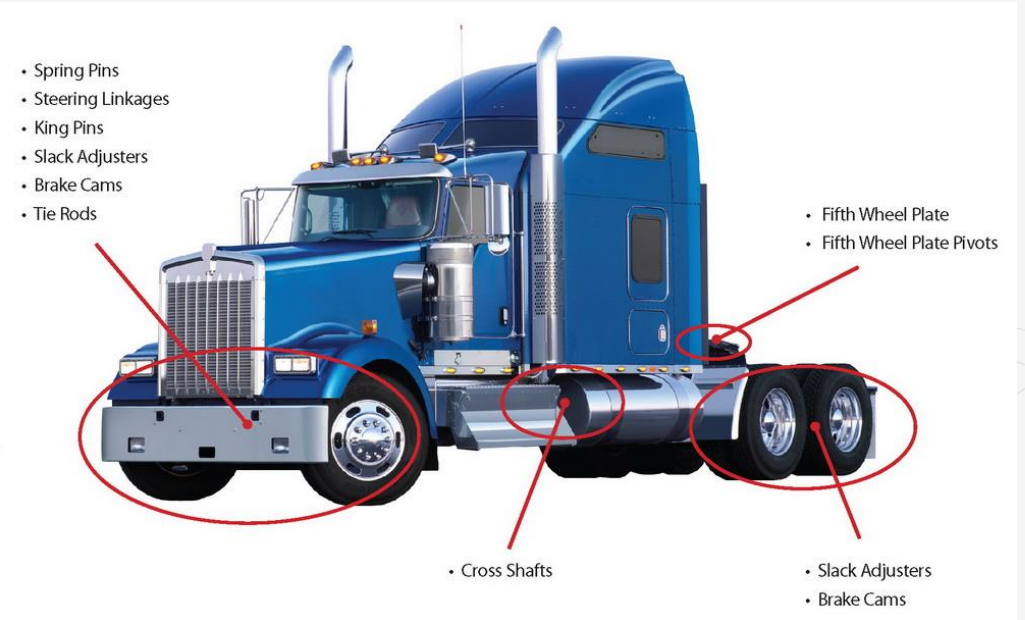
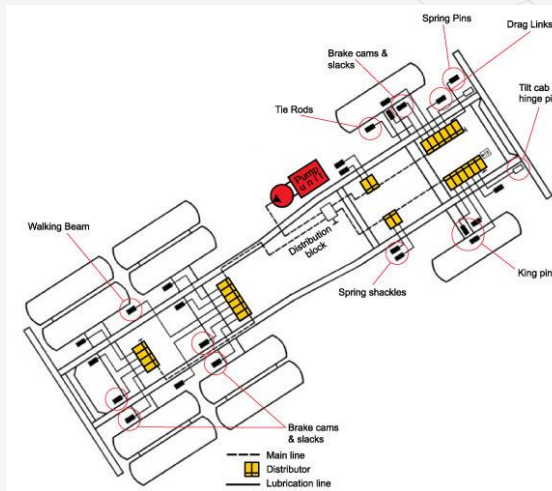
Examples of Successful Application Areas

Drill Rod Grease



Examples of Successful Application Areas

Truck Grease: Rated GC-LB



Source: https://www.flocomponents.com/SLN_On_Road_Auto_Lube_System.htm

Examples of Successful Application Areas

Food Machinery Grease



Thank You!