Bio lubricants – An emerging technology

Bio based lubricants can have high demand in lubricants sector due to their advantages of excellent lubricity, non-toxicity, and biodegradability, coupled with energy saving and are bound to be used in all fields of industry.

Bio lubricants technology emerged about 30 years ago, when Lake Constance in Switzerland was observed to be losing its water level due to heavy deposition of petro lubricants and oils at the bottom, as these lubricants are not biodegradable. Petro lubricants, being toxic, also affected the quality of water.

Various legislative measures were immediately introduced in Europe to ban the discharge of any lubricants directly in the water. Effluent treatment plants (ETPs) were made mandatory for spent lubricants. It was also noted that any direct contact of petro lubricants or most of synthetic lubricants were causing disastrous effects on environment.

Bio lubricants emerged as positive solution for environment protection. It was also noted that, bio lubricants have following exclusive properties, which make them major energy conserver and much better performer as lubricant compared to petro lubricants and most of the synthetic lubricants.

The following are some of the exclusive properties of bio lubricants:

a) Very High Lubricity – Bio lubricants contain 4 times lubricant than mineral oil based products and twice that of synthetic oils. This results in high energy saving by reducing frictional energy losses, which are up to 20 % in case of gearboxes. There is also 40% reduction in temperature rise in case of gear oil. Thus, a much longer life for gearboxes and machines, as well as the lubricant.

b) Polar Nature – Unlike petro lubricants or synthetic oils, bio lubricants have adhesion with substrate avoiding dry metal to metal contact and erosion, plus excellent boundary layer lubrication and EP load.

c) High Viscosity Index – This results in less reduction in viscosity with rise in temperature: petro based – 95, synthetic – 140, bio based – 200. This results in fairly constant viscosity in operating temperature. Bio gear oils with almost half the viscosity replace heavy viscous petro gear oils, maintaining same viscosity during operations.

d) High flash point/low evaporation rate – Safe and good performance at high temperature applications.

e) Bio degradable & non-toxic – Must for food and pharma grade, near water/soil, mandatory requirement in developed countries. Spent lubricants are waste and not hazardous waste like petro lubricants or synthetic oils; hence no ETP, the waste can be burned or turned into compost and save fuel.
Intech Energy Systems Pvt Ltd, a company belonging to the Yashprabha Group, Pune, is a pioneer manufacturer of bio lubricants in India since 2011, under trade name ‘Dirghayu’, with excellent results for any application.

The company has introduced the following products in the Indian market with testimonies for excellent energy saving, environment protection and best performance:

1. Gear Oil and Extreme Pressure Grease – Dirghayu gear oils and greases were tested and certified by prominent and leading manufacturers of gearboxes for energy saving up to 15% and reduction in temperature rise by 40%. The same is also experienced by well-known gearbox manufacturers like Elecon Engineering Ltd, Premium Transmission Ltd, Cyclo Transmission Ltd and Transprecision Gears Pvt Ltd, among others. Besides gearbox manufacturers other prominent industries using bio lubricants in various segments are:

   Sugar Industry – Bajaj Hindustan Ltd, Purti Power & Sugar Pvt Ltd, Shri Sant Sukaram Sahakari Karkhana Ltd and Shreennath Mhaskoba Sakhar Karkhana Ltd, among others; Textile Industries – GTSI (Global Threads Supply India, Coats PLC, USA), Century Enka Ltd, Eurotex Industries & Exports Ltd, Nagreekha Exports Ltd, etc.

2. Wire Rope Greases for Marine Terminals: Adani Group – Hazira, etc.

3. High Temperature Chain Oil and Greases: Bajaj Auto, Pantnagar; Hero Moto, Ghaziabad; Endurance Group; Duro Shox Ltd; Savera Auto; Mahle Filters; and Aurangabad Electricals, etc.

4. Cleaning Oils – Spark Clean & Rust Free: JNPT, Godrej, Bharat Forge, etc.

5. Spindle oil for Textiles: GTSI (Global Threads Supply India, Coats PLC, USA), Century Enka Ltd, Eurotex Industries & Exports Ltd, Nagreeca Exports Ltd, etc.

6. Other Products Available: a) Hydraulic fluids (SEHF); b) Multipurpose/EP/HT/Super performance grease; c) Wheel Bearing & Chassis Grease for Automotives; and d) Oil for Bear-


With fascinating energy saving, the industries can recover the total cost of Dirghayu lubricants in just 3-4 months and can register 3-10 times cost of Dir-

(Readers may refer to web for international references with the following keywords: 1) Energy savings through use of advanced biodegradable lubricants; 2) Efficiency tests of a transfer gearbox: bio degradable non-toxic ester vs. mineral oil; and 3) Bio based lubricants: a viability study.)

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