



2016 ELGI AGM Best Paper Award

28th ELGI AGM 16-19 April 2016, Venice Italy

ELGI's best paper committee has unanimously selected the paper / presentation "Valorization of Used Cooking Oil for the Production of Sustainable Lubricating Greases" by Dr. George S. Dodos, ELDON's S.A., Greece as winner of ELGI's Best Paper Award 2016.

The topic and paper are great contributions to 2016 AGM's theme "Sustainability in the Grease Industry" and embodies the spirit of originality and technological innovations ELGI is known for.

The aim of George's study was to exploit used cooking oils (UCO's) - both straight filtered and dewatered and also after chemical modification - as base fluids for the production of sustainable biobased lubricating greases. He first compared the fatty acid compositions and properties of UCO's to fresh cooking oils. Nine sustainable biobased lubricating greases were prepared and compared to two biobased references and one mineral-based reference grease. The formulated greases were evaluated regarding their primary physicochemical, mechanical and tribological properties. The use of UCO's was found to have a positive effect on the lubricating properties of greases.

On behalf of this committee and the ELGI board we would like congratulate George Dodos on this important and worthy achievement.

Best Paper Award Committee

ELGI Board of Directors



Dr. George S. Dodos has a Diploma and a PhD degree in Chemical Engineering from the National Technical University of Athens in Greece. He is working with ELDON'S S.A., involved mainly in research and development of new innovative products and in technical services. He also holds a Research Associate position in the Laboratory of Fuel Technology and Lubricants in the National Technical University of Athens with his research activities currently being focused in the field of renewable fuels and biobased lubricants. He has several publications in international peer-reviewed journals and conference proceedings on topics such as oxidation stability, tribological behaviour and microbial contamination of lubricants and fuels. He is affiliated to a number of international organisations including SAE and ACS. From 2013 he chairs the ELGI Biobased Greases WG

“Valorization of Used Cooking Oil for the Production of Sustainable Lubricating Greases ”

Key words: Biobased lubricating greases, used cooking/frying oil, sustainability, green chemistry, environmentally acceptable lubricants.

Synopsis

Biobased lubricants are high added value commodities and their market is considered to be one of the most promising universally. The positive perspectives of this product group mainly stem from the increasing environmental concern and the sustainable strategies for conserving natural resources. Biobased greases can be used either for general application or equipment working in areas where biodegradability is required such as in agriculture, forestry and coastal marine. Used cooking oil (or used frying oil) is actually a waste vegetable/edible oil that is practically a feedstock of low commercial value; therefore its valorization could be beneficial in terms of biolubricants' economics and sustainability. In

this study, a series of sustainable biobased anhydrous calcium lubricating greases were formulated by employing used cooking oil - either in its straight form (UCO) or after modification (UCOTMP) - as a base fluid at various mixing ratios. The performance of the prepared biobased greases was examined, in order to assess the effect of these fatty components in fundamental quality parameters, such as consistency, dropping point, copper corrosion, oxidation and roll stability, antiwear/extreme pressure properties, low temperature characteristics, water washout resistance and evaporation loss. It was shown that used cooking oils have a potential of being exploited in the formulation of sustainable biobased lubricating greases with competitive characteristics for general and environmentally sensitive applications.