Device

Tribology research activities in TUS

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Purpose of Research

The tribology can be applied to various fields, and it requires broad knowledge of science and technology. Since the systematized techniques in order have not been established yet, this subject tends to be shunned by field researchers. However, there are lots of unavoidable problems related to the tribology existed within mechanical system design and machine maintenance. Hence, we have been working on the research in order to develop unique key technology from the viewpoint that tribology is one of the strategically important technologies for enhancing competitiveness of industrial products.

Summary of Research

- Evaluate tribological features (Standardization, development of evaluation equipment)
- Fundamental mechanism (Super low friction, zero wear, tribo-chemical reaction)
- Surface analysis (Chemical and mechanical analysis of tribo-surface and layers)
- Evaluate nano-properties of surfaces (Nanoindentation, SPM)
- Develop a lubrication system for special environments by using new lubricants (Ionic liquid as a lubricant for high-temperature and high vacuum conditions)
- Develop technology for producing a functional surface by using a metal 3D printer
- Surface modification (Soft-mater and hard coatings, surface texturing)
- Design and evaluate high-functional bearings (Sliding bearing, rolling bearing or novel bearings)

Production: metal 3D printer, laser fine processing, coating, etc.

Tribology feature evaluation: develop international standard and evaluation device

Analysis/interpretation: shape measurement, nano-property evaluation (SPM), adsorption property (QCM), wettability evaluation and various surface analyses

Points

Tribology is very important and fundamental technology within a wide range of science and technology for creating the new product groups. Tribology is useful for improving mechanical system performances (high-energy efficiency, high reliability, long service life, high accuracy and low cost)

Both investigation and understanding the tribological phenomenon must to be understood correctly in order to perform troubleshooting or maintenance of the products. When the new product is developed, the tribo-element which is an essential component of the machine system tends to become a problem. Such a problem should be solved by the design technique based on the tribology. If you find any problems or obstacles related to the tribology or you want to get more information on mechanism and evaluation, please contact us

Future Developments

Open “Tribology Center” at Katsushika Campus on April 2015
International Tribology Conference 2015 (held by Japanese Society of Tribologists, Site: TUS Katsushika Campus)

■ Associated System:
Support project of open platform construction in university, one of 2013 Local Innovation Promotion Projects supported by Ministry of Economy, Trade and Industry
Subsidy for collaborative creation program (support for maintenance of facilities and equipments within university)