

Advanced Tribological Ceramic Coatings

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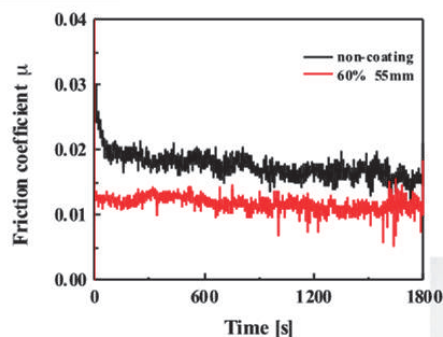
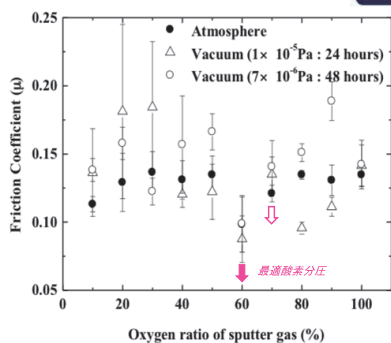
Background

- Contribution to brake down the global green house effect due to carbon dioxide emission
- Decrease in fuel consumption rate by reducing friction loss of internal combustion engines
- Development of advanced ceramic coatings to reduce friction under harsh environments

Aim

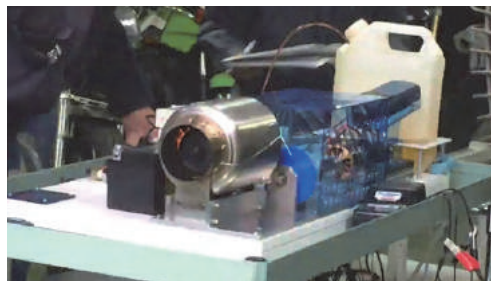
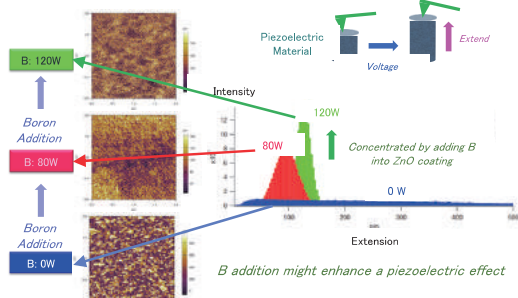
- Development of lubricative oxide coatings robust against harsh environments
- Generation of low friction by fine control of oxide crystal structure and orientations
- Coating of optimized lubricative zinc oxide on to the surface of bearing balls uniformly

Advanced Research Topics



Reduction in sliding friction of zinc oxide coatings

Reduction in rotation friction of zinc oxide coatings



Mechanism of reduction in friction of zinc oxide coatings

Desk top gas turbine generator using ball bearings coated with lubricated zinc oxide

Publications

- M.Goto, M.Sasaki, A.Kasahara, and M.Tosa, Frictional Property Depended on Crystal Preferred Orientation Analyzed by a Combinatorial Technique, *TRIBOLOGY LETTERS*, **55** (2014) 289-293.

Applied area and future prospects

- Power trains in general internal combustion engines
- Ball bearings lubricative at high speed rotation and among high temperatures
- Sliding motion lubricative under high pressures and in harsh environments

Issues for technology transfer

- Uniform coatings on the large surface of engines drive components
- Control of interface of coatings for high adhesion
- Robust coatings with long life time under harsh environments