Running-in: playing with friction history to promote super-low friction

Pr. Koshi Adachi, University of Tohoku (Japan)

Low friction technology is recognized as one of key issues for high efficient usage of energy in mechanical systems. To achieve the low-friction, new materials, coatings, surface treatment methods, lubricants and new surface design have been strongly required.

In dry contact, boundary lubrication regime and mixed-lubrication regime except perfect hydrodynamic lubrication regime, friction surfaces at a stable friction condition always change significantly from the initial designed surface. That is to say, design concept for initial surface to control formation of friction interface is needed for further low friction technology.

On the other hand, it is well-known that beginning of sliding so-called running-in period is an important for stable friction by formation of well-conformed interface. Recently, self-formed nanointerfaces during running-in period, which satisfy super-low friction, have been reported.

In this presentation comprehensive overviews of the super-low friction by nanointerface formed automatically during running-in are introduced. And from the viewpoint of nanointerface formed during running-in, future of ultra-low friction technology is discussed.