

## 23. Durability of Surfaces Due to Droplet Sliding (MEL 2409)

- Purpose: Testing degradation of Lubricant-infused surfaces (LIS) due to condensation and/or continuous sliding of water droplets falling on the sample surface.
- Operation: The weight loss of surface is a measure of the lubricant drainage from such surfaces.
  1. Transmittance test: Glass is coated with SiO<sub>2</sub> particles. The surface is infused with lubricant. Droplets rolling off the inclined sample damage the surface. Mass and optical transparency of the sample are measured during the process.
  2. Reflectance test: CuO is coated with HTMS (HeptadecafluorodecylTriMethoxySilane) and infused with lubricant. Shear damage by droplets will damage the surface. Mass and optical reflectance of the sample are measured.
  3. Condensation test: Condensation on CuO-HTMS-Lubricant LIS damage the surface. The process is under ambient air with 70% relative humidity, surface temperature 5 °C)
- Equipment
  - Analytical mass balance (Sartorius 224i-1sus, capacity: 220 g, readability: 0.1 mg)
  - Laser (wavelength: 650 nm, Output power: 50 mW)
  - Photo-detector (Edmund optics EO100-Si-HA-OD1, spectral range: 420 to 1080 nm, resolution: 1.5 pW)
  - Chiller (Polyscience 6100 series chiller, Working fluid: DI water, Temperature range: -10 to 40 °C, Temperature stability: 0.1 °C)

