DISCOVERY HYBRID RHEOMETERS
TEMPERATURE SYSTEMS AND ACCESSORIES
The advanced TRIOS software offers easy setup and control of tribo-rheometry tests and contains a complete set of variables required for data analysis including the coefficient of friction ($\mu$), load force ($F_L$), friction force ($F_F$) and Gumbel number (Gu). These may be used to construct Stribeck curves, static friction measurements, or explore specific combinations of temperature, contact force, and motion.
The Tribo-Rheometry Accessory is compatible with both the Stepped Disposable Peltier Plate and the Environmental Test Chamber (ETC) for accurate and stable temperature control for all test geometries. The choice of four standard geometries – Ring on Plate, Ball on Three Plates, Three Balls on Plate, and Ball on Three Balls – meets the diverse requirements of tribology applications and offers a variety of contact profiles. The ring on plate geometry may also be configured as a partitioned ring, which permits the replenishment of lubricant between the two solid surfaces. The accessory’s versatile configurations and easily interchangeable substrates are ideal for studying the effect of friction and long-term wear on materials ranging from automotive components and greases, lubrication in prosthetic devices, and the performance of personal care creams and lotions.

The accompanying figure shows the coefficient of friction profiles of two commercially available toothpastes tested between textured PMMA plates (acting as tooth substitutes) using the ring on plate configuration. The whitening toothpaste, with abrasive particles, has higher friction at low speeds, but the gel toothpaste’s friction profile shows a rapid increase at higher speeds. This behavior can be explained by comparing the flow curves of the two toothpastes – although both materials are shear thinning, the viscosity of whitening toothpaste decreases more rapidly than the gel toothpaste. This results in increased hydrodynamic drag and greater friction at higher rotation speeds.