

# Tribological tests

Tribology is the study of the friction, lubrication, and wear of interacting surfaces in relative motion.

It is important to note that friction and wear are system properties and not material properties. They depend on the whole tribosystem :

- The material components
- The geometry, the contact mode (rolling, sliding..)
- The operating variables: load, velocity, temperature, operating duration

Thus the tribological tests should be performed under well controlled environment and in order to be representative, the testing geometries should be as close as possible to the real applications.

Our current testing capabilities are summarized in the following tables listing the tribometers, the dynamometers, the rotary abrasion testers and the wear measurements.

## Tribometers (COF, Torque)

Solvay Labs	Tribometer	Contact geometry	Test Features
EMEA ADL (Bollate)	SRV III (Optimol) SRV 5 (Optimol)	ball on disk cylinder on disk disk on disk	Linear oscillation Load: 2 - 2000 (N) Frequency: 1-511 (Hz) Stroke: 0.2-4 (mm) Temperature: ambient to +290°C Test time: 1 minute to 999 hours On SRV@5 : electrical resistance measurement during tribo test.
EMEA ADL (Bollate)	2 MCTT tribometers (Falex)	Thrust Washer Pin on Disk Ball on Disk	Rotary oscillation Loads: 44-3560 N Contact pressure: 0.1 MPa to 10 GPa Temperature: ambient to 200°C Speeds:15-3600 rpm
EMEA ADL (Bollate)	Four Ball Wear and EP Tester (Falex)	Ball on balls	Sliding or rolling motion Weight: 0 - 50 kg / 0 - 800 kg Temperature: ambient to 200°C Speeds:1-1800 rpm
EMEA ADL (Bollate)	Torque tester (Scavini)	Ball bearing	Unidirectional Temperature: -20°C to -73°C Speed: 1 rpm
APAC ADL (Fuji Lab)	Thrust washer tester	Thrust Washer	Unidirectional Ambient temperature Load: 0~100kgf 0~120 cm/sec

## Dynamometer (Static and Dynamic COF)

Solvay Labs	Dynamometer	Test Features
EMEA ADL (Bollate)	LF Plus (DGTS Lloyd instruments)	room temperature speed 150 mm/minute total length 200 mm.

US ADL (Alpharetta)		
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**Rotary abrasion tester (Wear)**

Solvay Labs	Abrasion tester	Test Features
EMEA ADL (Bollate)	Taber Linear Abrasion 5750	Unidirectional Room temperature 2-75 cycle/min stroke 0.2"-4" 350-2100 grams
PCL Alpharetta	Taber Linear Abrasion 5750	Unidirectional Room temperature 2-75 cycle/min stroke 0.2"-4" 350-2100 grams
China ADL (Shanghai)	Taber Linear Abrasion 5750	Unidirectional Room temperature 2-75 cycle/min stroke 0.2"-4" 350-2100 grams
ADL-Fuji Lab	Rotary Abrasion Tester	Unidirectional 60 rpm, 0.25 m/s Room Temperature up to 1 kg weight applied on each wheel

**Wear Measurements**

Solvay Labs	Equipment	Test Features
EMEA ADL (Bollate)	Digital Microscope (Motic)	Wear scar
EMEA ADL (Bollate)	ZeGage™ Pro no-contact 3D Optical Profiler	Wear scar Wear volume