



## FRICTION & WEAR TESTING MACHINE

# Friction & Wear Testing Machine

While the four-ball test addresses one specific tribological contact geometry, real-world lubrication systems involve a wide variety of contact configurations — pin-on-disc, block-on-ring, reciprocating flat-on-flat, and others. Universal friction and wear testing machines provide the versatility to simulate multiple contact geometries and loading conditions on a single instrument platform, making them essential tools for comprehensive lubricant performance evaluation, material wear characterization, and tribological coating assessment.

Torontech's universal friction and wear testing machine is a multi-mode tribological testing platform capable of evaluating friction coefficient and wear performance across a range of standardized test configurations. The instrument's flexibility makes it an ideal solution for lubricant development, surface engineering research, and material qualification programs that require tribological testing beyond the specific geometry of the four-ball test.

## APPLICATIONS

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### Application

Universal friction and wear testing machines are applied in both petroleum/lubricant testing and broader materials science applications:

- Lubricant and additive evaluation: Comprehensive friction and wear performance assessment of base oils, formulated lubricants, and additive packages across multiple contact geometries.
- Anti-friction coating testing: Wear resistance and friction coefficient evaluation of DLC (diamond-like carbon), nitride, and other hard coatings applied to metal components.
- Polymer and composite material wear: Wear rate and friction characterization of engineering polymers, PTFE-based materials, and composite bearings under controlled conditions.

- Surface treatment qualification: Tribological performance verification for heat treatment, case hardening, PVD/CVD coating, and surface finishing processes.
- Seal and gasket materials: Friction and wear testing of elastomeric and PTFE sealing materials under representative lubrication and pressure conditions.
- Automotive component tribology: Friction and wear characterization of piston ring/cylinder liner material pairs and other engine component tribological systems.
- Research and academic tribology: The universal friction testing machine provides the test geometry flexibility required for fundamental tribological research across a broad range of material and lubricant combinations.

## FEATURES

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### Why Choose Torontech's Series for Your Friction & Wear Testing?

Torontech's universal friction and wear testing machine provides exceptional test flexibility and measurement capability:

- Multi-Geometry Capability: The universal design accommodates pin-on-disc, block-on-ring, reciprocating, and other standard contact geometries, providing tribological testing versatility that dedicated single-geometry friction testing machines cannot match.
- Simultaneous Friction and Wear Measurement: Real-time friction force (coefficient of friction) measurement combined with post-test wear quantification provides comprehensive tribological characterization in a single test run.
- Controlled Test Parameters: Programmable load, speed, stroke length (for reciprocating tests), temperature, and test duration ensure reproducible friction and wear testing conditions compliant with ASTM, DIN, and ISO tribological test standards.
- Wide Material Compatibility: Suitable for evaluating metals, ceramics, polymers, coatings, and composite materials in combination with petroleum lubricants, synthetic fluids, or dry/boundary lubrication conditions.
- Research and QC Versatility: The same instrument platform serves both rigorous research-grade tribological characterization and routine quality control wear testing, providing outstanding return on investment.



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