



TORONTECH

MULTI-PARAMETER TABLET TESTER



Multi-Parameter Tablet Tester - ToronTAB™ 4-in-1

ToronTAB™ 4-in-1 multi-parameter tablet tester consolidates dissolution, disintegration, hardness, and friability testing into a single workstation for pharmaceutical QC labs, contract testing organizations, teaching facilities, and small-to-mid batch manufacturers. Rather than sourcing four separate instruments, laboratories can qualify one integrated system that covers the standard solid-dosage QC panel from a shared touchscreen controller. Torontech built the platform around user-level access control, audit trail logging, and USB report export to deliver GMP-grade traceability across all four test functions.

The dissolution module runs six-vessel USP-compatible paddle and basket dissolution across a 10 to 300 RPM speed range. The disintegration module cycles a six-tube basket-rack at the standard 30 to 32 strokes per minute pharmacopoeial rate. The hardness module measures compressed tablet breaking force from 10 to 350 N at 0.01 N resolution and captures tablet diameter from 2 to 25 mm. The friability module tumbles tablets in a 286 mm drum at the standard 25 RPM default speed.

Torontech supplies the ToronTAB™ 4-in-1 with IQ/OQ qualification documentation for GMP validation and CE certification for the EU market. Consolidation into one instrument reduces qualification burden, calibration overhead, floor space, and total capital investment for laboratories running the full pharmacopoeial solid-dosage QC panel.

APPLICATIONS

Multi-Parameter Tablet Tester - ToronTAB™ 4-in-1 Applications

The ToronTAB™ 4-in-1 supports comprehensive tablet quality control across pharmaceutical QC, contract testing, R&D, and educational workflows.

- Consolidated Pharmaceutical QC: labs seeking to run dissolution, disintegration, hardness, and friability from a single qualified instrument rather than four separate testers with independent calibration schedules

- Small-to-Mid Batch Manufacturing: manufacturing operations testing modest daily volumes where four dedicated instruments exceed daily throughput requirements
- Contract Testing Organizations: CRO and CDMO clients requiring full solid-dosage QC capability at a compact footprint per lab bench
- Compounding Pharmacy Comprehensive QC: custom-compounded tablet testing across all four pharmacopoeial parameters at a single benchtop station
- Formulation Development: rapid multi-parameter characterization of prototype tablets during early formulation screening and process design
- Pharmaceutical Teaching Laboratories: universities and technical colleges training pharmacy students on the complete solid-dosage QC methodology in one lab session
- Regulatory Audit-Ready QC: labs consolidating audit trail documentation across dissolution, disintegration, hardness, and friability into a single instrument log
- Stability Program Testing: comprehensive multi-parameter tracking under ICH storage conditions covering mechanical and dissolution behavior in one campaign



Standards

The ToronTAB™ 4-in-1 carries CE certification for the EU market under the Machinery Directive and Electromagnetic Compatibility Directive.

- EN ISO 12100:2010 - Safety of Machinery: General Principles for Design, Risk Assessment and Risk Reduction
- EN 60204-1:2018 - Safety of Machinery: Electrical Equipment of Machines
- EN 61010-1:2010+A1:2019 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
- EN IEC 61326-1:2021 - Electrical Equipment for Measurement, Control, and Laboratory Use: EMC Requirements

CE certification covers the EU Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU. IQ/OQ qualification documentation is available upon request.

FEATURES

Multi-Parameter Tablet Tester - ToronTAB™ 4-in-1 Key Features

The ToronTAB™ 4-in-1 combines four pharmacopoeial test functions with unified user access, audit trail logging, and modular consumables in one benchtop workstation.

- Four Integrated Test Functions: dissolution, disintegration, hardness, and friability testing on one qualified instrument, replacing four separate testers with independent calibration and qualification programs
- Six-Vessel Dissolution Module: matches the standard USP six-vessel dissolution protocol with independent temperature regulation across the 10 to 300 RPM rotation speed range
- Six-Tube Disintegration Module: factory-set 30 to 32 strokes per minute pharmacopoeial reciprocation rate with 55 mm stroke distance and 2.0 mm net aperture

- 10 to 350 N Hardness Module: calibrated load cell measures compressed tablet breaking force at 0.01 N resolution with $\pm 1.5\%$ ± 1 digit accuracy plus integrated diameter measurement from 2 to 25 mm
- 286 mm Friability Drum: standard-geometry tumbling drum operates from 20 to 50 RPM around the 25 RPM pharmacopoeial default rotation rate
- Unified User Access Control: administrator, method developer, and operator roles apply across all four test functions from one login, replacing four separate user management systems
- Timestamped Audit Trails: every parameter change and operator action across all four modules logs with user ID and timestamp for full documentation traceability under GMP inspection
- Full-Color Touchscreen HMI: intuitive touchscreen navigation for method setup, run control, and result review across all four test modules from one interface
- Modular Consumables and Quick-Release Connectors: sampling heads, tubing sets, filter cartridges, and dissolution vessels swap in seconds without tools, cutting maintenance downtime between test types
- Multi-Language Interface: interface language selection supports laboratories operating in multiple regional languages
- USB Data Export and Report Generation: raw records from all four test functions transfer to lab PCs or LIMS for downstream documentation
- IQ/OQ Qualification Package: single-system installation and operational qualification documentation replaces four separate qualification programs

THEORY & METHOD

Theory and Method

The standard pharmacopoeial QC panel for compressed tablets and capsules covers four properties, each characterized by a defined apparatus and method. Dissolution testing quantifies drug release into a controlled medium under USP paddle or basket conditions. Disintegration testing measures the time required for a dosage form to break into fragments passing through a defined mesh. Hardness testing measures the diametric breaking force of tablets. Friability testing measures mass

loss under controlled tumbling in a baffled drum.

Traditional QC labs run these tests on four separate instruments with independent calibration cycles and four IQ/OQ packages. The ToronTAB™ 4-in-1 consolidates all four methods into one qualified system while retaining the geometry, speed, and force specifications of pharmacopoeial reference methods: six dissolution vessels for the USP six-vessel protocol, a six-tube basket-rack at 30 to 32 strokes per minute, a 10 to 350 N calibrated load cell, and a 286 mm friability drum at 25 RPM default.

Independent temperature regulation on the dissolution vessels holds bath conditions during dissolution runs, and shared operator access control logs all activity across the four functions with timestamped audit trails. This lets laboratories qualify the instrument once, calibrate consumables and sensors on a unified schedule, and pull batch-release documentation covering the full solid-dosage QC panel from a single instrument report.

TECHNICAL SPECIFICATIONS

Multi-Parameter Tablet Tester - ToronTAB™ 4-in-1 Technical Specifications

Dissolution Testing Parameters

Parameter	Specification
Number of Vessels	6 channels
Shaft Vertical Runout	≤ 0.5 mm
Shaft Rotation Deviation	≤ 1.0 mm
Shaft and Cup Concentricity	≤ 1.0 mm

Parameter	Specification
Rotation Speed Range	10 to 300 RPM
Rotation Speed Stability	$\leq \pm 1\%$
Sample Volume	< 100 mL
Sampling Interval	$\leq 9,999$ seconds

Disintegration Testing Parameters

Parameter	Specification
Number of Baskets	1 basket $\times$ 6 tubes
Reciprocation Frequency	30 to 32 cycles/min
Basket Stroke Distance	55 ± 1.0 mm
Minimum Distance Between Base and Net	25 ± 1.0 mm
Net Aperture Diameter	2.0 mm
Temperature Range	Ambient to 45.0°C

Hardness Testing Parameters

Parameter	Specification
Testing Range	10 to 350 N
Force Resolution	0.01 N
Force Accuracy	$\pm 1.5\% \pm 1$ digit

Parameter	Specification
Diameter Testing Range	2 to 25 mm

Friability Testing Parameters

Parameter	Specification
Number of Drums	1
Drum Diameter	286 mm
Default Rotation Speed	25 RPM
Speed Range	20 to 50 RPM

General

Parameter	Specification
Voltage	AC 220 V $\pm$ 10%, 50 Hz (110V is also available)



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