TORONTECH

MANUAL CAP TORQUE TESTER

Manual Cap Torque Tester - ToronTT™ M

Manual Torque Tester for Caps and Closures

The ToronTT™ M is a manual cap torque tester that measures the application torque, removal torque, and torque retention of bottle caps and screw closures. The container sits in a clamp while the operator turns the cap by hand, and a torque sensor reads the peak force in either direction. It suits caps and closures on containers up to 180 mm in diameter.

The ToronTT™ M reads torque to a 20 Nm standard range, with 40 Nm and 50 Nm options, at 0.001 Nm resolution and 0.3% accuracy. Peak, continuous, and limit-value tests run in clockwise and counterclockwise directions. A touchscreen shows the torque curve, and results display in multiple units with mean and standard-deviation statistics.

A built-in micro-printer records each result, and historical data query recalls past tests at the bench. The ToronTT™ M (Manual Torque Tester for Caps and Closures) suits food, beverage, pharmaceutical, and cosmetic packaging QC. The embedded system supports remote maintenance and upgrades.

APPLICATIONS

Manual Cap Torque Tester - ToronTT™ M Applications

The ToronTT™ M measures closure torque wherever cap tightness affects sealing, safety, and consumer experience.

- **Bottle and Jar Closures**: measures the application and removal torque of screw caps on bottles and jars.
- **Beverage Caps**: sets and verifies capping torque for water, juice, and carbonated drinks to prevent leaks.
- **Pharmaceutical Closures**: verifies closure torque on drug bottles and containers.
- **Child-Resistant Closures**: measures the torque of child-resistant closures for consistent function.

- **Cosmetic and Household Packaging**: checks caps on cosmetic, personal-care, and household-chemical containers.
- **Torque Retention Studies**: measures how closure torque changes over time after sealing.
- **Capping Line Setup**: sets capping-machine torque by measuring caps applied on the line.
- **Quality Control**: verifies closure torque against specification batch to batch.

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TORON TT™ M
Manual Cap Torque Tester
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TORONTECH
FORWARD
ToronTT™ M
Manual Cap Torque Tester
REVERSE

Standards

The ToronTT™ M is designed to align with internationally recognized standards for closure torque measurement.

- ASTM D2063 - Standard Test Methods for Measurement of Torque Retention for Packages with Continuous Thread Closures Using Non-Automated (Manual) Torque Testing Equipment
- ASTM D3198 - Standard Test Method for Application and Removal Torque of Threaded or Lug-Style Closures
- ASTM D3474 - Standard Practice for Calibration and Use of Torque Meters Used in Packaging Applications

FEATURES

Manual Cap Torque Tester - ToronTT™ M Key Features

The ToronTT™ M pairs a bidirectional torque sensor with touchscreen control for application, removal, and retention testing.

- **Application, Removal, and Retention**: measures all three closure torque values on one instrument.
- **Bidirectional Testing**: clockwise for application torque and counterclockwise for removal torque.
- **Peak, Continuous, and Limit Modes**: three test modes suit different closure evaluations.
- **Wide Clamp Range**: holds containers from Ø2 mm to Ø180 mm in diameter.
- **High Resolution**: reads torque to 0.001 Nm at 0.3% of full-scale accuracy.
- **Selectable Range**: a 20 Nm standard range, with 40 Nm and 50 Nm options.
- **Torque Curve Display**: the torque curve shows on the color TFT touchscreen during the test.
- **Onboard Statistics**: mean, standard deviation, and other statistics calculate at the bench.
- **Multiple Units**: results display in selectable torque units.
- **Historical Data Query**: past results are recalled on the touchscreen.
- **Built-In Micro-Printer**: prints a report for each test.
- **Overload Warning**: a built-in warning guards the sensor.

- **RS232 Communication**: a serial port connects the instrument to a PC.

THEORY & METHOD

Theory and Method

Cap torque is the rotational force needed to tighten or loosen a screw closure on a container. Two values matter most: the application torque used to seal the cap, and the removal torque needed to open it later. A cap that is too loose can leak or lose freshness, while one that is too tight is hard for a consumer to open.

The instrument holds the container in a clamp so it cannot spin, while the operator turns the cap by hand. A torque sensor in the base reads the rotational force through the turn and captures the peak value. Testing clockwise measures the application torque, and testing counterclockwise measures the removal torque.

Torque retention is the removal torque measured some time after sealing, since caps tend to loosen as liners relax and contents settle. Measuring it shows how well a closure holds its seal over time. Reading peak, continuous, and limit values, in either direction, covers application, removal, and retention on one instrument.

TECHNICAL SPECIFICATIONS

Manual Cap Torque Tester - ToronTT™ M Technical Specifications

Parameter	Specification
Torque Range	20 Nm (standard); 40 Nm, 50 Nm (optional)

Parameter	Specification
Accuracy	0.3% FS
Resolution	0.001 Nm
Sample Diameter	Ø2 mm to Ø180 mm
Test Directions	Clockwise and counterclockwise
Test Modes	Peak value, continuous, limit value
Voltage	AC 220 V, 50 Hz (110V is also available)
Dimensions	245 mm (L) × 340 mm (W) × 238 mm (H)
Net Weight	20 kg

Standard Delivery

Item	Description
Main Unit	Manual cap torque test instrument with clamp and touchscreen
Micro-Printer	Built-in printer for test reports
Micro-Printer Paper	Printer paper roll

Optional Accessories

Item	Description
Control Software	Computer software for data storage and reporting
Communication Cable	Connects the instrument to a PC
Micro-Printer Paper	Additional printer paper rolls

TORONTECH.com

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Torontech Inc.
251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC
601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE
Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE

Phone: +971 488 19252
Email: me@torontech.com

USA | Canada | EU | UAE | GCC | KSA | India | Africa | Latin America | Asia