CELL INSTRUMENTS

Material Testing Solutions

MCT-01
Motorized Cap Torque Tester

***Seal Performance**: Tight caps prevent leaks and microbial contamination; loose caps increase spoilage or tampering risk .*

***User Experience**: Optimal torque ensures ease of opening—critical for medications, beverages, and personal care products .*

***Process Control**: Torque readings guide capping machine settings to ensure uniform torque across all products*

MCT-01: Automate torque testing with precision and production-level efficiency.

Automated Torque Testing—Precision, Speed, Assurance

CELL INSTRUMENTS
Material Testing Solutions

MCT-01
Motorized Cap Torque Tester

Proper Torque Matters

Proper cap torque is crucial because it ensures both **seal integrity** and **user experience**, striking a balance between being too tight and too loose.

1. **Too Tight – Over-Torque Risks**
   - **Thread damage and sealing failure** – Excessive torque can strip cap threads, fracture the cap, or create "jumping" of the closure, leading to compromised seals or cap damage
   - **User inconvenience** – Over-tightened caps are hard to open, frustrating consumers and increasing the risk of containers being forced open improperly, which could spill contents or contaminate package contents

2. **Too Loose – Under-Torque Risks**
   - **Leakage and spoilage** – Caps that are not tightened sufficiently can rattle during transit and allow liquids to leak or external contaminants to enter
   - **Seal integrity compromised** – Insufficient torque fails to compress the liner properly, jeopardizing the package's barrier properties and possibly causing product degradation

Proper torque is essential—not too tight to avoid damage or user frustration, and not too loose to prevent leaks and spoilage. Precision torque testing ensures this balance is maintained consistently, safeguarding both product integrity and the customer experience.

Applications

The **MCT-01 Motorized Cap Torque Tester** delivers automated, precise torque testing for cap application and removal on bottles, tubes, spouts, and closures—critical for quality assurance across packaging, pharmaceutical, food, beverage, cosmetic, and industrial products.

MCT-01 ensures a well-balanced torque, so that:

- The closure remains sealed under journey disturbances (temperature, pressure, vibration),
- Consumers can open it comfortably,
- Product safety, quality, and brand integrity are maintained..

Features & Benefit

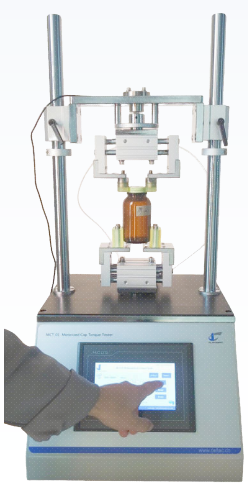
1. **Motorized Clamp & Rotation** : Automates torque application; simulates production environment .
2. **Dual Pneumatic Clamps** : Firm, repeatable grip on cap and container
3. **±1% Accuracy** : Captures extremely precise peak torque readings
4. **5 Measurement Units**: Supports kgf·cm, N·cm, daN·cm, in·lbs, N·m for global usability .
5. **PLC + HMI Touchscreen**: Offers recipe storage, intuitive controls, and automation ready interface.
6. **Automatic Peak Hold**: Ensures no peaks are missed during quick torque events.
7. **Overload Protection & Zero-Reset**: Prolongs instrument life; reduces setup errors .
8. **Integrated Micro-Printer & RS-232(optional)**: Provides on-site documentation and data export capabilities .
9. **Extended Clamp Range** (Cap Ø 5–80 mm; Bottle Ø 5–170 mm): Handles bottles, spouts, tubes, and closures across industries .
10. **Data Auto-Statistics** feature that automatically calculates and displays key metrics—Maximum, Minimum, and Average torque

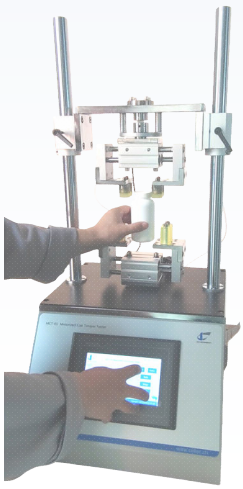
Standards

ASTM D2063, ASTM D3198, ASTM D3474, GB/T17876, BB/T0025, BB/T0034

Specifications

Test Range	10 Nm (or as required)
Accuracy	±1% of full scale (typical)
Resolution	0.001 Nm
Clamp Range	Cap Ø 5–80 mm; Bottle Ø 5–170 mm
Power	AC 110~ 220V 50/60 Hz





CELL INSTRUMENTS
Material Testing Solutions

MCT-01
Motorized Cap Torque Tester

Use Case Scenarios

- Pharmaceutical QC: Verify dosing-device caps (infusion, eyedrops, syringes).
- Food & Beverage: Monitor torque on PET, glass, or foil-sealed bottles.
- Cosmetics & Personal Care: Test ease and consistency in creams, lotions, and flip-top closures.
- **Industrial and chemical packaging**: Tests torque for safety-critical fluid containers

And a lot more

Key Benefits of Auto-Statistics:

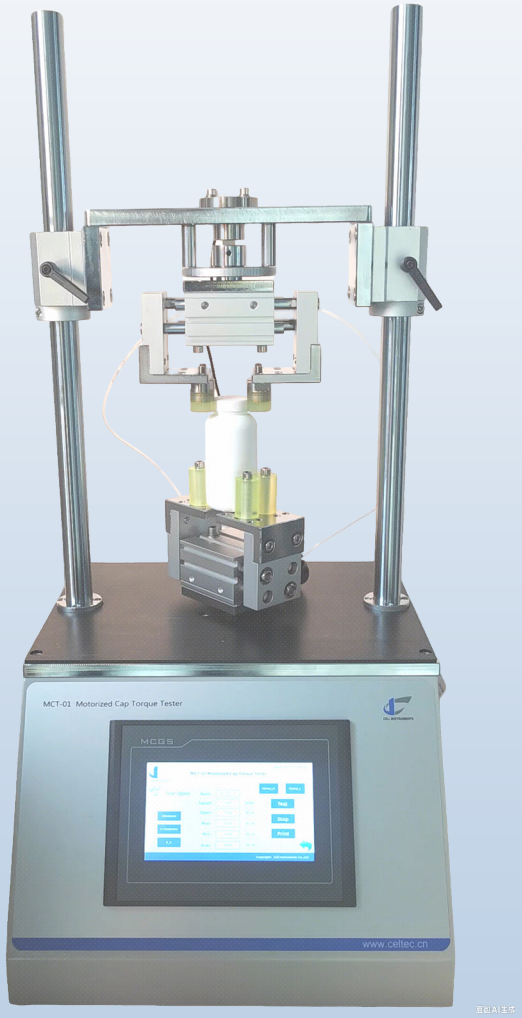
- **Maximum (Peak) Torque** Captures the highest torque measurement in the session—critical for identifying outliers such as over-torqued caps or manufacturing inconsistencies
- **Minimum Torque** Records the lowest torque value—useful for detecting under-tightened units that pose sealing risks or torque loss .
- **Average Torque** Computes the mean across all readings—provides a reliable indicator for the central tendency of cap tightness and helps with process monitoring

Automated vs Manual

- MCT-01: Automated torque application—ideal for simulation of real-world production processes and high throughput quality control
- TT-01: Manual torque tester—simple, portable solution for spot checks and lab-based validation

Test Methodology

1. **Loading**: Position sample—cap and bottle—between upper and lower pneumatic clamps.
2. **Clamping**: Press **CLAMP**; clamps secure both components.
3. **Testing**: Press **TEST**; motorized lower clamp twists cap clockwise for lock torque, then counter-clockwise for open torque.
4. **Measurement**: Internal torque transducer captures continuous and peak torque values, holding the maximum value automatically
5. **Output**: Torque readings are displayed, printed, and optionally exported via RS-232/software.



Distributed by: