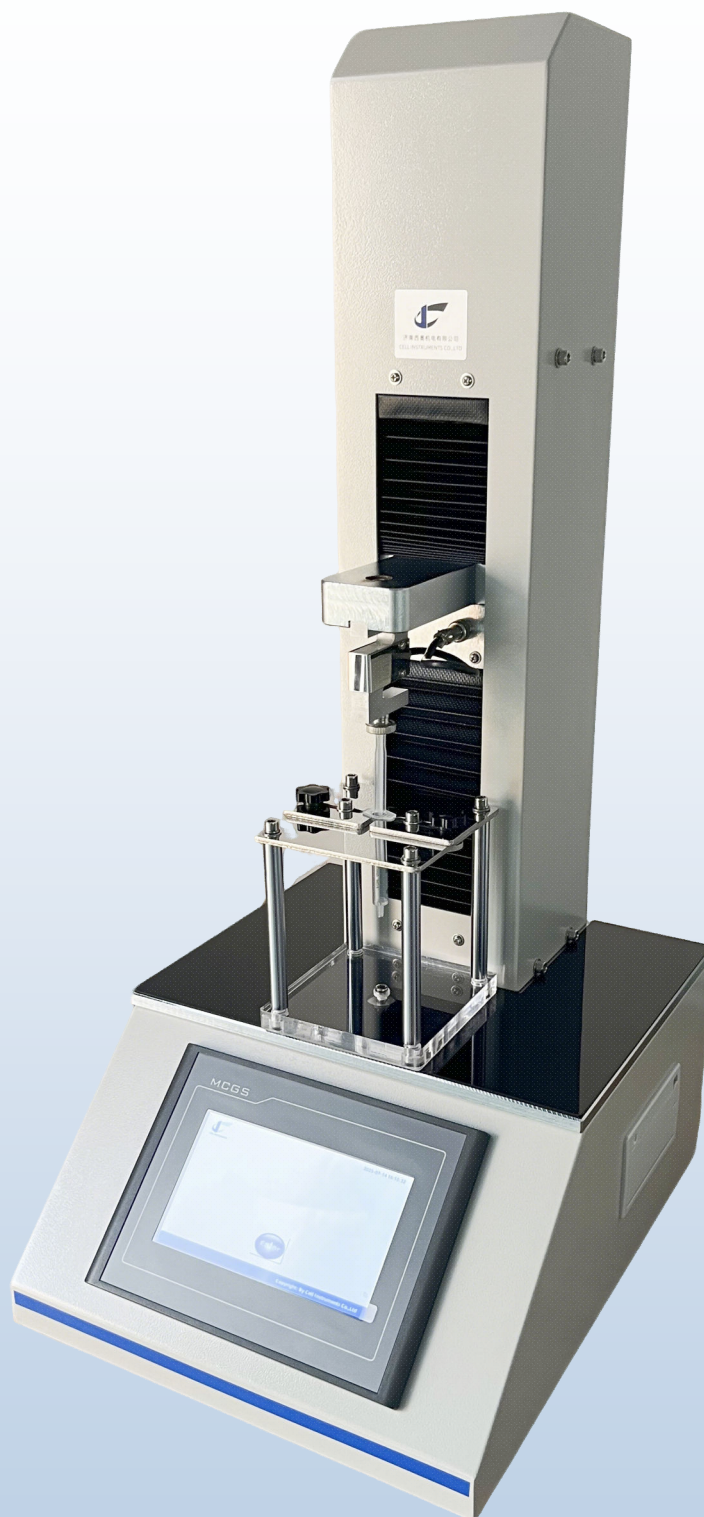




**CELL INSTRUMENTS**

*Material Testing Solutions*

# MST-01 Medical Syringe Tester



**MST-01:**

***Comprehensive Syringe and Needle  
Performance in One Smart Tester***

**[www.pharmacopoeiatest.com](http://www.pharmacopoeiatest.com)  
[www.syringetest.com](http://www.syringetest.com)**

***Decades of Innovation in Material Testing***



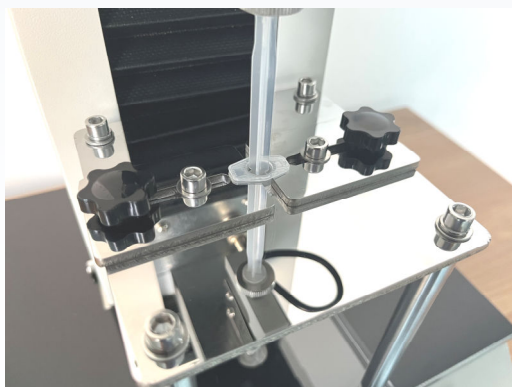
## Why Syringe and Needle Testing Matters

Medical syringes and needles are key to safe and effective healthcare delivery—from diagnostic sampling to drug administration. Mechanical testing verifies that syringes consistently deliver accurate dosages, maintain sterility, and resist fluid leakage, even under pressure. According to industry experts, comprehensive force and torque testing of syringe components helps identify defects early, enabling manufacturers to detect production anomalies and uphold quality across every batch. Without rigorous validation, subtle design flaws in plunger seals, tubing stiffness, or needle bonding can lead to under-dosing, contamination, or device malfunction—posing serious health risks.

Equally important, performance testing directly impacts clinical usability and patient comfort. Tests on needle insertion, bonding resistance, and plunger movement ensure that devices operate smoothly and reliably in actual use. Studies show that difficulty in needle control or excessive injection force not only undermines user experience but also increases risk of needlestick injuries, which carry significant clinical and economic costs—often exceeding thousands per incident. By evaluating these parameters, testing not only supports regulatory compliance and market access but also fosters trust, patient safety, and product reliability in real-world settings.

The **MST-01 Medical Syringe Tester** is a state-of-the-art benchtop instrument engineered to verify the mechanical integrity of syringes (with or without needles) and needles follow many ISO, ASTM, EN, DIN, GB, YBB, USP standards.

It combines multiple test programs—such as break-loose/glide force, leakage, needle penetration, and bond strength—into one efficient, modular device, delivering precision, compliance, and QC efficiency to syringe and needle manufacturers, as well as medical device labs.



## MST-01 Test Programs: What They Are & Why They Matter

### A. Initiating (Break-loose), Peak & Travel Force

- **Initiating Force:** Maximum force needed to begin movement
- **Peak Force:** Highest force during operation
- **Travel Force:** Average force required to sustain movement.

(Such as

### B. Peak Only

Measures just the maximum force applied (for validating specific mechanical thresholds., such as

### C. Peak and Travel Force

Captures both the initial break-loose effort and the sustained glide force

### D. Fixed Pressure

A precise, pre-set pressure is applied to the syringe plunger and is often held constant for a specified duration.

### E. Fixed Force

A constant axial force is applied and the displacement is often measured over time.

### F. Separation Force

Evaluates force required to separate components—such as needle bond, cap pull, or plunger pull-out tests, etc.

## Technical Features

1. PLC control with 7-inch touch-screen HMI for streamlined operation and user-defined test programming
2. Precision ball-screw drive ensuring consistent speed and displacement control (1–500 mm/min).
3. Modular fixtures to accommodate various syringe and needle testns.
4. Safety features: position restrictor, overload and over-travel protection, and automatic return to start position after each test.
5. Built-in microprinter, with optional RS-232 and PC software for data export and traceability.
6. High accuracy:  $\pm 0.5\%$  full scale, 0.01 mm resolution, stroke up to 200 mm, force range nominally 50 N~500N (customizable)
7. Access level setting and test data storage, to satisfy GMP and CFR 21 regulations

## However, Our Specifications are

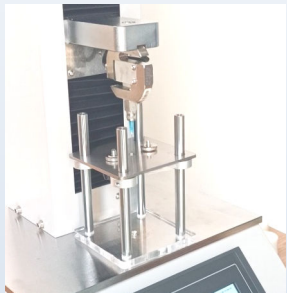



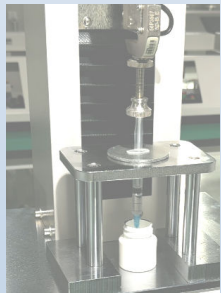
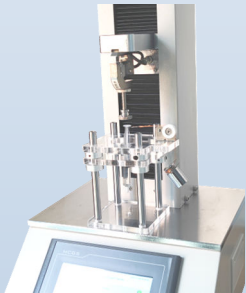


Test Range	30N, 50N~500N, etc.
Stroke	200mm(without stroke)
Accuracy	0.5% F.S., 0.01mm
Display	7 inch color HMI touch screen
Control	PLC
Power	AC 110~220V 50/60Hz

*Note: The user can choose certain program(s) of MST-01 based on need, which means a lower price. There are also separate models for each type of test.*

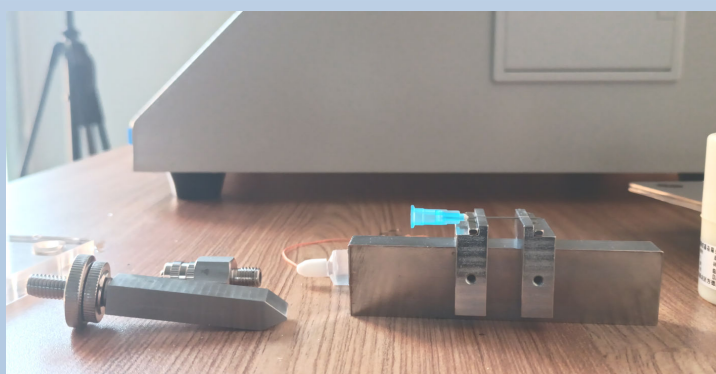
### Some Typical Standards

Standard	Test Name	Program Used
ISO 7886-1 Annex D	liquid leakage at syringe plunger stopper under compression	D
ISO 7886-1 Annex E, ISO 11499	force required to operate the piston	A
USP 381, USP 382, ISO 8871-5, Annex A, ISO 11040-4	Needle penetration test; Breakage test	B
ISO 7864 Annex D	Penetration and Drag Force Tester	C
ISO 7886-1 Annex D	Plunger stopper leakage under compression	D
ISO 9626, ISO 11608-3, ISO 11040-2	Tubing Stiffness; Leakage	E
ISO 11608-2, ISO 11608-2	Needle bonding strength	F

### Some Sample Jigs/Accessories

			
Needle Penetration and Drag Force	Puncture	Tubing Stiffness	Needle Bonding
			
Piston Gliding	Positive Pressure Tightness	Sliding Resistance	Breaking Test

*Note: The user can choose a certain test program(s) and jigs/accessories for their own need, because we also supply independent models for each test method.*



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