



元能科技（厦门）有限公司

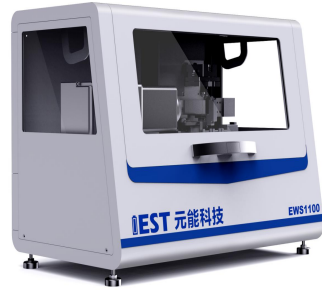
Initial Energy Science&Technology Co.,Ltd

Comprehensive Electrode Testing Solutions
IEST-R&D Team

Comprehensive Electrode Testing Solutions



BER Series
Resistance
Thickness



EWS Series
Wettability



ETS Series
Wettability



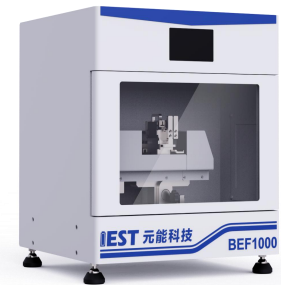
GDT Series
Wettability



CHT Series
Wettability



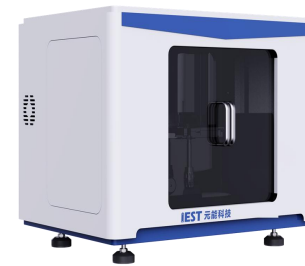
EIC Series
Tortuosity



BEF Series
Flexibility



FZT Series
Flexibility



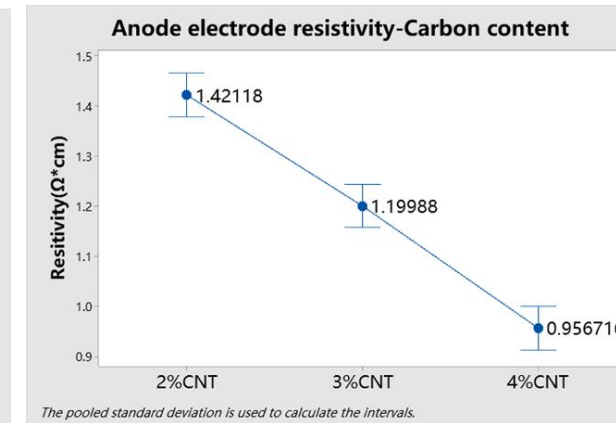
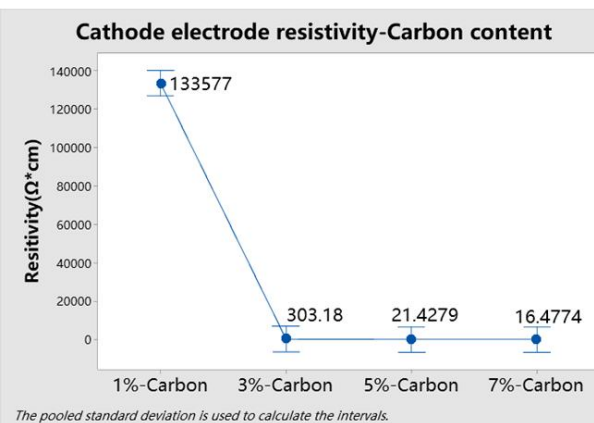
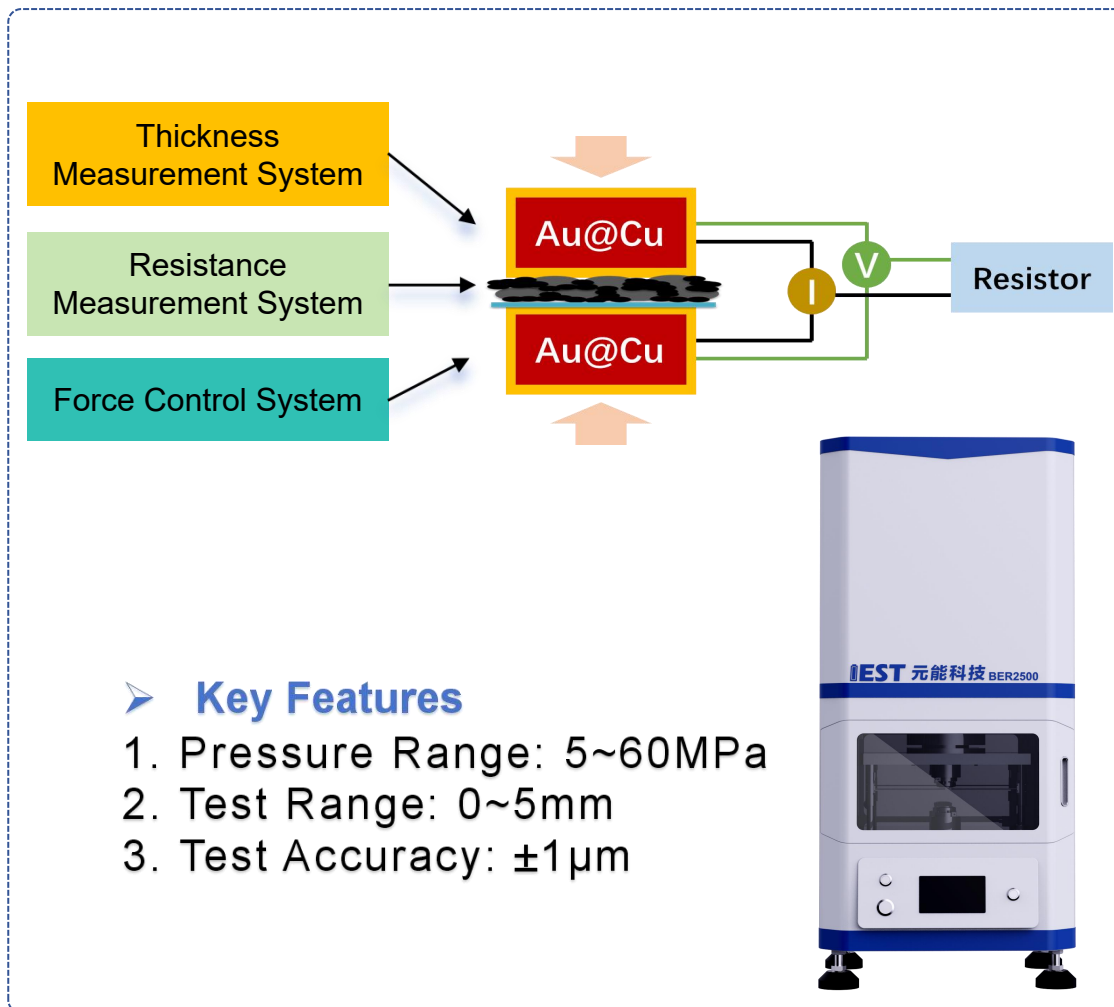
LECF Series
Adhesion



RSS Series
Swelling

1. Electrode Resistance Analyzer

◆ **Application Scenario:** Evaluation of the uniformity of the electronic conductive network inside the electrodes.

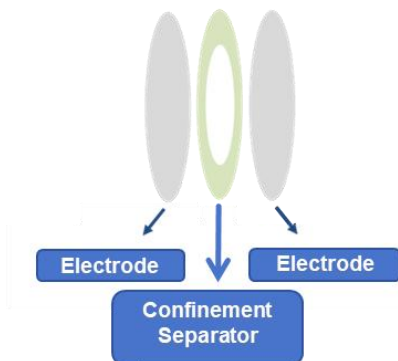


Model	Item	Specifications
<u>BER 2500</u>	Resistance Range & Accuracy	1μΩ~3.1kΩ(±0.5%F.S)
	Pressure Range & Accuracy	50~1000kg 5~60MPa(±0.3% F.S)
	Thickness Range	0-5mm
	Thickness Resolution & Accuracy	0.1μm/±1μm
	Instrument Dimension	355×320×800mm

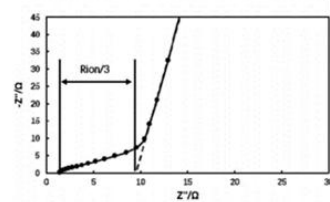
2. Electrode Ionic Conductivity Tester

◆ **Application Scenario:** Evaluation of the electrolyte percolation and ion transport efficiency of electrodes and separators.

➤ Testing principle



McMullin number calculation



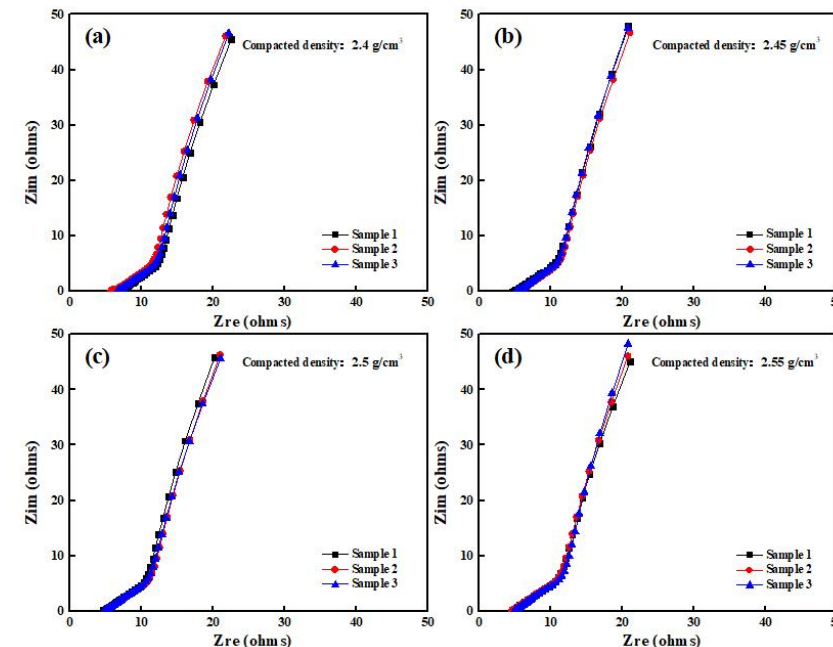
$$\tau = \frac{(R_{ion} \cdot A \cdot \epsilon \cdot \sigma)}{2d}$$

(Tested value) (Known value)

$$(McMullin \text{ number}) N_m = \frac{k_{int}}{k} = \frac{\tau}{\epsilon} \quad \begin{matrix} \text{(Tortuosity)} \\ \text{(Porosity)} \end{matrix}$$

➤ Key Features

1. Ar atmosphere
2. 4-Channel Testing
3. Applicable to Electrode & Separator
4. McMullin Number/Tortuosity Measurement

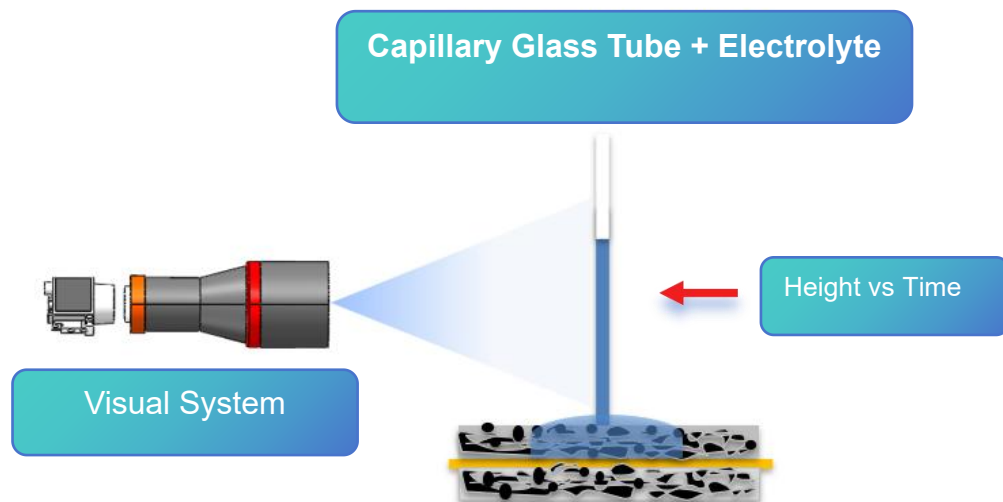


Model	Item	Specifications
EIC 2400M	Channel Number	4
	EIS Test Range	100k~0.01 Hz
	Pressure Range	10 - 50kg
	Sample Diameter	Electrodes: 16 - 22mm Separators: 20 - 24mm
	Instrument Dimension	630×560×1120mm

3. Electrode Wettability Tester——Capillary

◆ **Application Scenario:** Evaluation of the wettability performance of electrodes.

➤ Testing principle



➤ Key Features

1. Auto calibration, electrolyte filling, testing, and draining
2. Precise force control
3. In-situ, real-time measurement
4. Applicable samples: cathode & anode electrodes

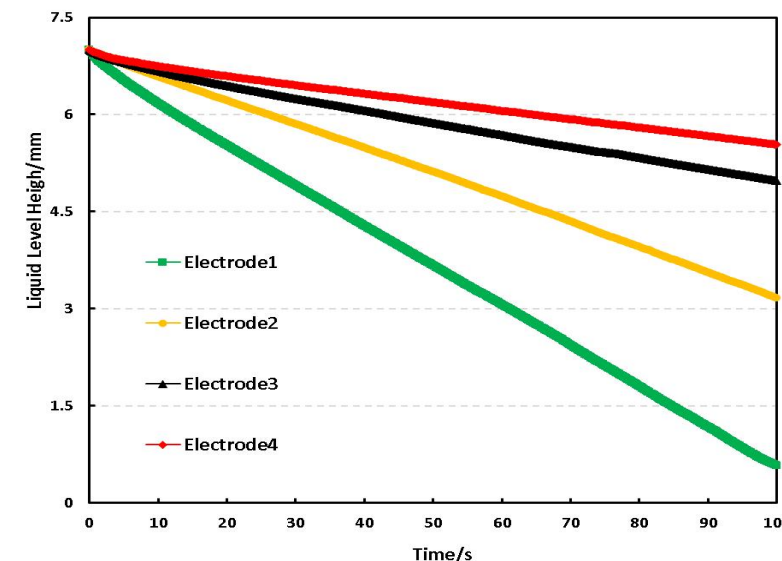
Test Condition:

Electrode1: 1.35 g/cm³

Electrode2: 1.50 g/cm³

Electrode3: 1.60 g/cm³

Electrode4: 1.65 g/cm³

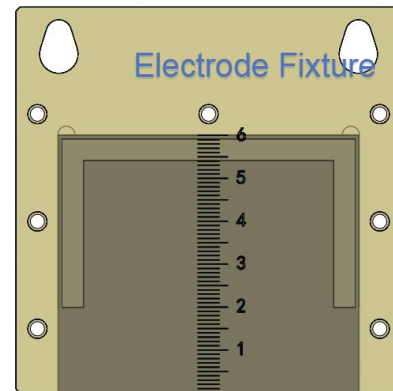
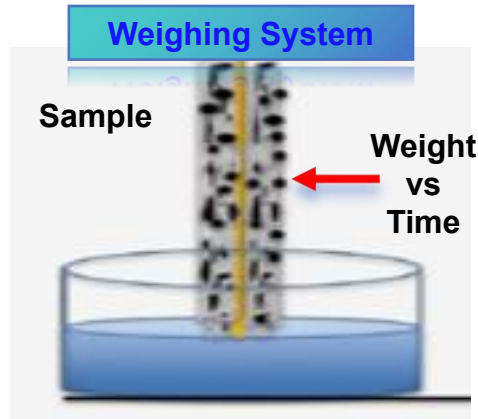


Model	Item	Specifications
EWS 2200 Pro	Pressure Control Range	0~200g
	Force Resolution/Accuracy	±0.5g/±0.3%F.S
	Pixel Accuracy	≤10μm
	Suction Capacity	10μL
	Sample Size	90*90mm(9 points)
	Instrument Dimension	650×420×530mm

4. Electrode Wettability Tester—Weight

◆ **Application Scenario:** Evaluation of the wettability performance of electrodes.

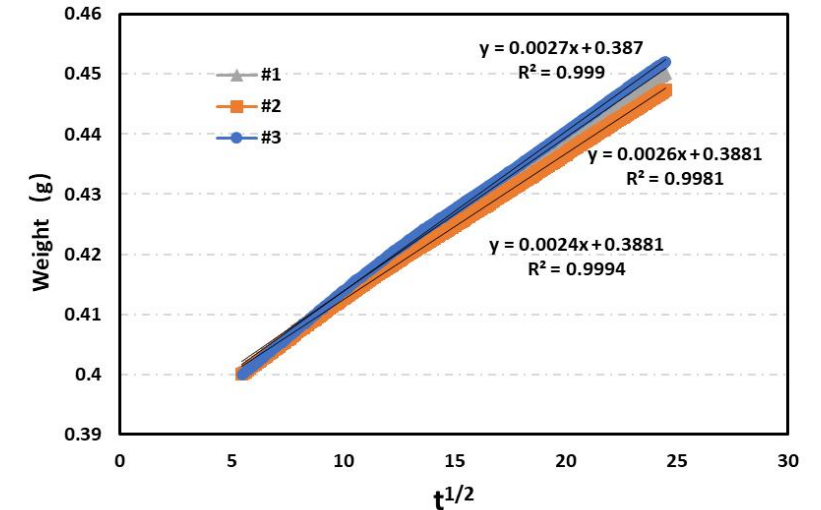
➤ Testing Principle



➤ Key Features

1. High-precision Testing
2. Automated electrolyte level control module
3. Inert Electrolyte-seal module
4. Applicable Samples: cathode & anode electrodes

Anode electrode

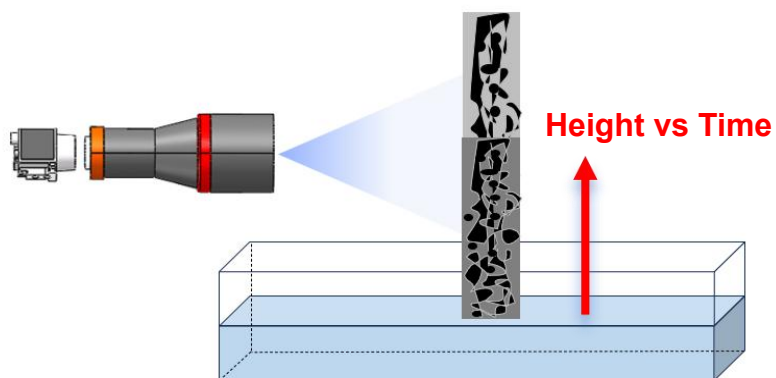


Model	Item	Specifications
<u>ETS 1500</u>	Balance capacity	0-1200g
	Weighing accuracy	±1mg
	Stage positioning accuracy	0.1mm
	Sample size	70×60mm (L×W)
	Instrument Dimension	400x400x800mm

5. Electrode Wettability Tester——Height

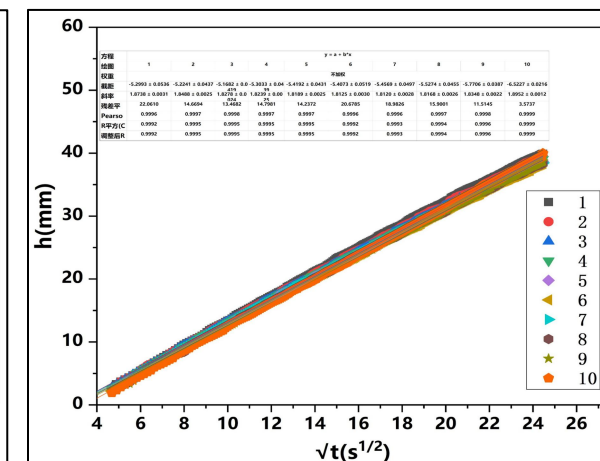
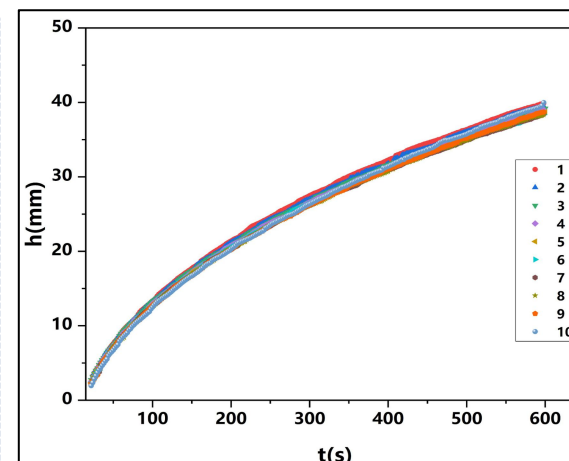
- ◆ **Application Scenario:** Evaluation of the wettability performance of electrodes.

Testing principle



Key Features

1. High-resolution vision system
2. Real-time, in-situ measurement
3. Multi-point wetting-height measurement
4. Applicable samples: cathode & anode electrodes, and separators



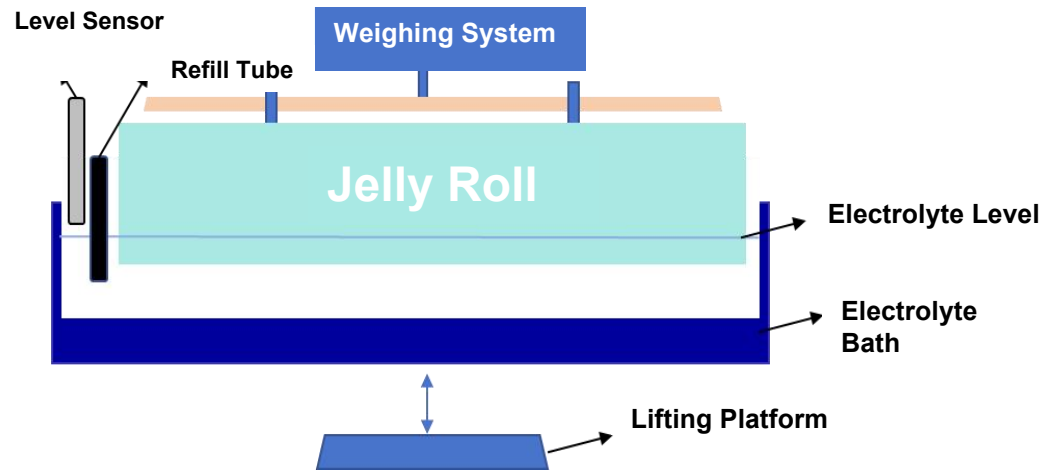
Applications of CHT-2000 on Anode Electrodes

Model	Item	Specifications
<u>CHT-2000</u>	Pixel resolution	3.46μm
	Wetting-height measurement accuracy	100μm
	Electrolyte-level control accuracy	±0.1mm
	Sample size	70×40mm (L×W)
	Instrument Dimension	710×460×550mm

6. Electrode Wettability Tester—Weight

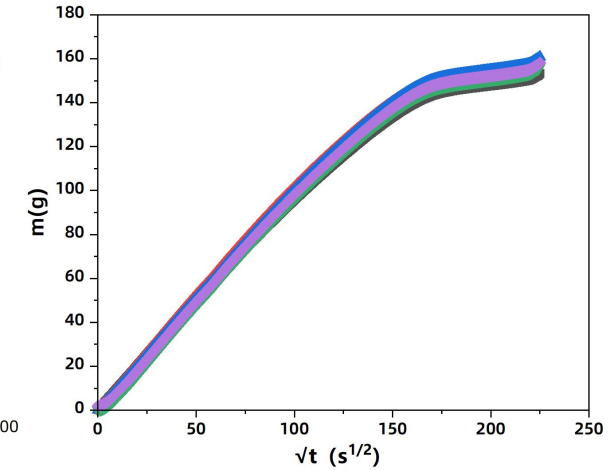
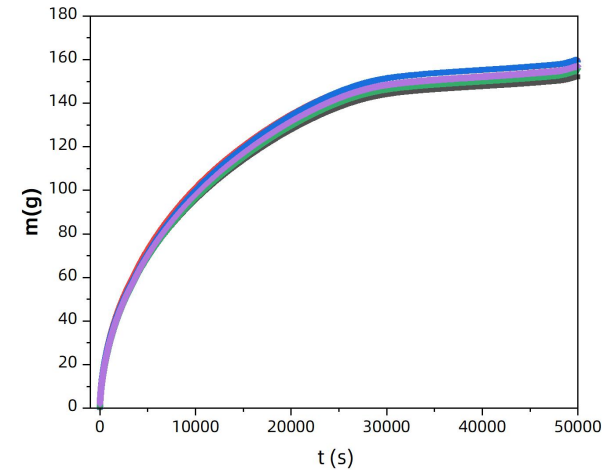
◆ **Application Scenario:** Evaluation of the wettability performance of jelly rolls.

➤ Test Principle



➤ Key Features

1. Auto electrolyte level control module
2. Applicable samples: Jelly rolls and Cylindrical cells

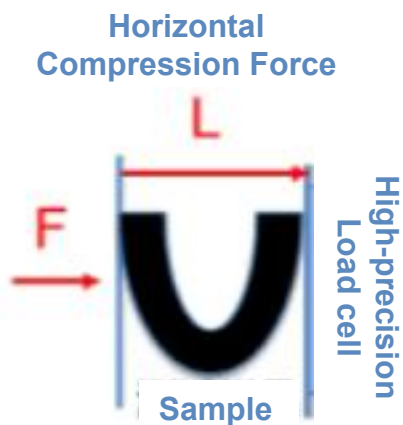


Model	Item	Specifications
GDT-2000	Balance capacity	0-10200g
	Weighing accuracy	±10mg
	Refill rate	0-10mL/s
	Electrolyte-level fluctuation	<0.1mm
	Max Sample size	530×30×400mm
	Instrument Dimension	770×700×1150mm

7. Electrode Flexibility Tester

- ◆ **Application Scenario:** Evaluation of Stress-Strain curves during electrode folding.

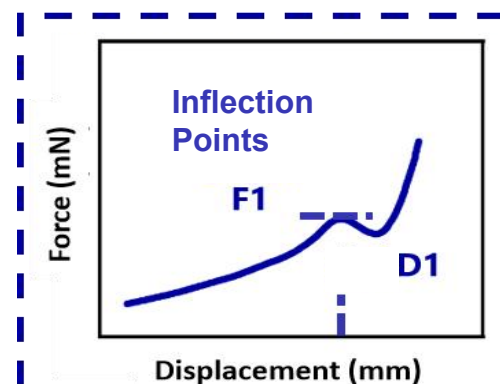
Testing principle



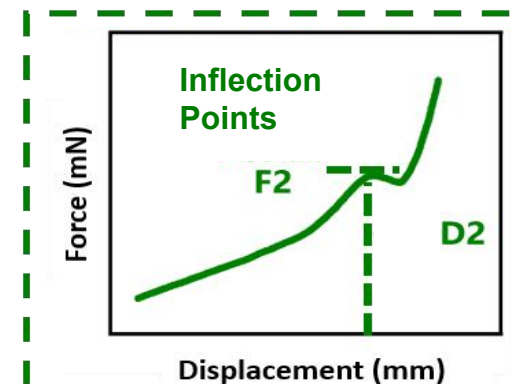
Key Features

1. Multiple folding and reciprocating modes
2. Applicable samples: anode & cathode electrodes

Samples with larger compaction density



Samples with smaller compaction density

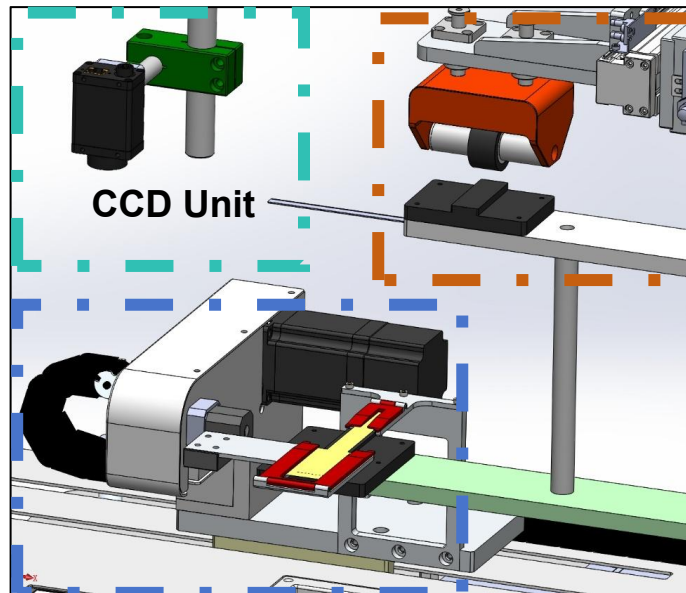


Model	Item	Specifications
BEF 1000	Pressure Range	0~10000mN
	Pressure Resolution	±0.01mN
	Pressure Accuracy	±10mN
	Displacement Range	0~18mm
	Displacement Resolution	0.1μm
	Displacement Accuracy	±10μm
	Instrument Dimension	404x400x465 mm

8. Electrode Flexibility Auto Tester

- ◆ **Application Scenario:** Evaluation of fatigue characteristics of anode and cathode electrodes after repeated folding and rolling.

Testing principle



Folding structure (0-270°)

Gravity roller
(rolling width 15-80mm)



Key Features

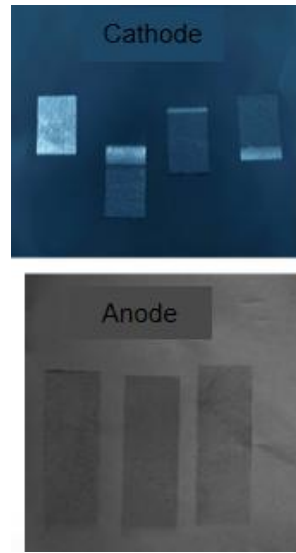
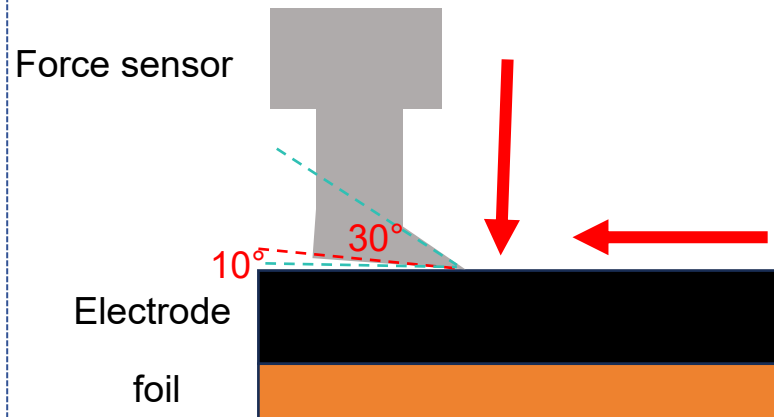
1. Folding angle: 0–270°
2. Rolling pressure: 2 ± 0.1 kg (customizable)
3. CCD inspection accuracy: 7 μ m

Model	Item	Specifications
FZT 1000	Sample Max folding Angle	270°
	Folding Accuracy	0.1°
	Maximum Rolling Speed	40mm/s
	Rolling Pressure Range/Accuracy	0-20N/0.1N
	Defect Detection Count	0 - 99 defects / sample
	Sample Size	10-80mm (width)
	Instrument Dimension	760x630x1300mm

9. Electrode Peel Strength Tester

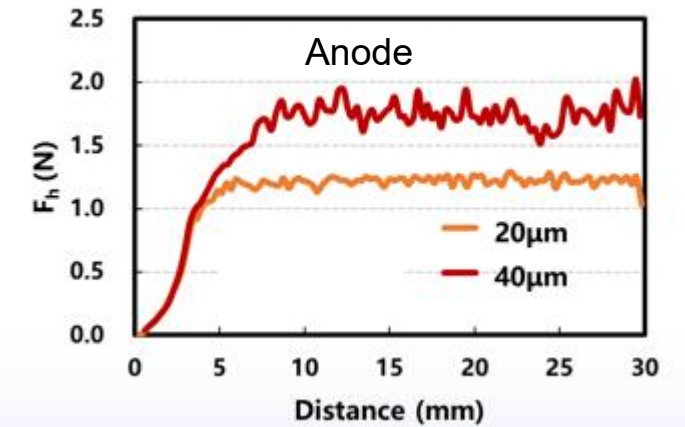
◆ **Application Scenario:** Evaluation of inter-layer adhesion and shear force of electrodes.

Testing principle



Key Features

1. Ceramic vacuum adsorption stage
2. Applicable samples: anode & cathode electrodes

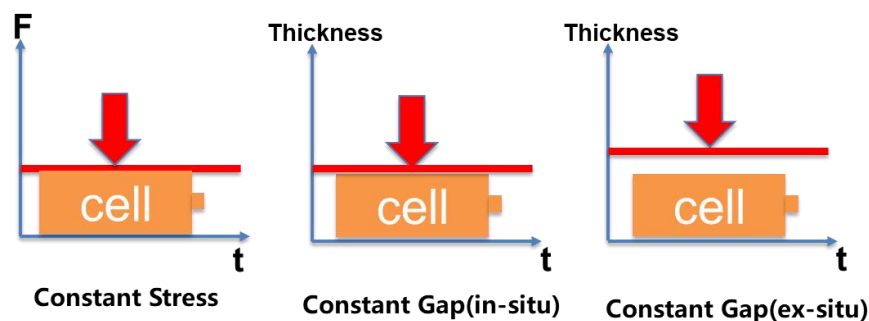


Model	Item	Specifications
LECF 1000	Force Resolution	0.01N
	Vertical Resolution	0.01μm
	Horizontal Resolution	0.1μm
	Thickness Test Range	400μm
	Length Test Range	20mm
	Width Test Range	20mm
	Instrument Dimension	550x600x750 mm

10. Silicon-based Anode Electrode Swelling

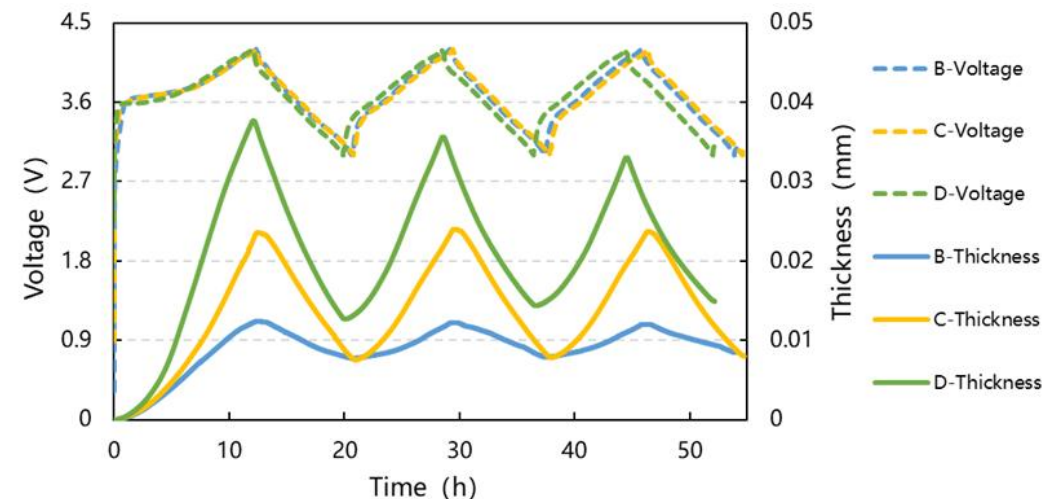
◆ **Application Scenario:** Evaluation of swelling thickness or swelling force change of electrodes during cycling.

Testing principle



Key Features

1. In-situ characterization
2. Multi-channel testing
3. Applicable samples: coin cells, stacking cells, pouch cells



Model	Item	Specifications
<u>RSS 1400</u>	Channel numbers	4 Channels
	Pressure Range	Up to 100 kg
	Pressure Resolution	±0.3%F.S
	Thickness Measurement	0~6mm
	Cell Thickness Measurement Resolution & Accuracy	0.01μm & ±1μm
	Instrument Dimension	1720×700×1700mm



Thank You!

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