

DEDICATED TO LITHIUM-ION BATTERY TESTING AND DEVELOPMENT



# Coin-cell Automatic Assembly System

CAAS



- ANALYTICS BEYOND MEASURE -

## » Product Introduction

**Background:** Assessing the stability of electrode intercalation in material batches is a necessary procedure for both material manufacturers and battery cell factories. The consistency of personnel in assembling electrode intercalation significantly affects the judgment of material performance.

**Features:** Utilizing high-precision robotic arms, visual inspection systems, and automatic sealing devices to achieve automated and precise assembly of button-type batteries. The sealing pressure is stable.

**Application:** Automated assembly of electrode intercalations - Systematic evaluation of the electrochemical performance of lithium (sodium) battery positive and negative electrode materials.

### Feature Introduction and Advantages

#### High-precision Assembly

High-precision positioning system, with material assembly concentricity of  $\pm 0.1\text{mm}$ , ensuring consistent assembly of electrode intercalations.

#### Quick Assembly

High-speed robotic arm material handling, with a well-arranged material layout, achieving assembly speeds of 1 min/ea, ensuring high efficiency in sample assembly.

#### Assembly Process Traceability

Optional traceability system enables high-definition camera to capture images of material surface states and perform intelligent recognition, eliminating abnormal materials.

#### Automatic Lithium Foil Brushing Function

Optional automatic lithium foil brushing module, enhancing the surface quality of lithium foils and improving the consistency of sample assembly.

#### High-throughput Assembly

Capable of processing up to 200 samples at once, achieving high-throughput continuous assembly.

#### Modular Functionality

Modular design allows for configuration based on customer requirements, providing flexible and customizable services.

#### Data Processing Software

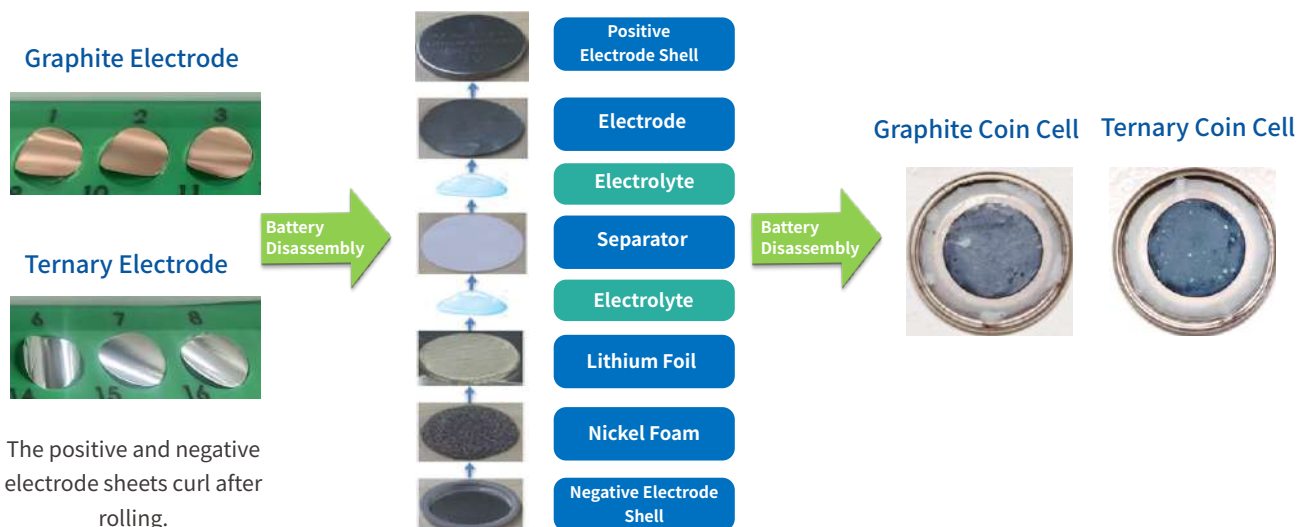
The equipment is equipped with proprietary data processing software, which can automatically aggregate process data for user convenience in storage and viewing.

#### Built-in Glove Box

Built-in glove box providing a moisture- and oxygen-free assembly atmosphere, ensuring the performance of electrode intercalations.

## » Application Case

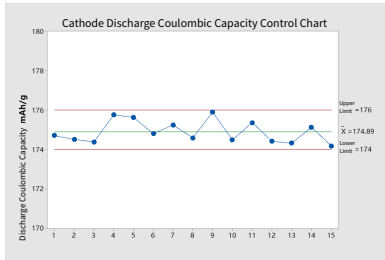
### Case 1: The Curling Issue of Single-Sided Electrode Sheets after Roll Pressing and Punching



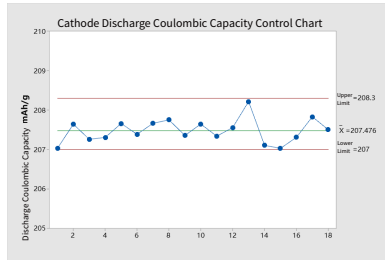
The positive and negative electrode sheets curl after rolling.

## Case 2: The Curling Issue of Ternary Positive Electrode Sheets after Automated Interlocking Assembly

### Positive Electrode1



### Positive Electrode2

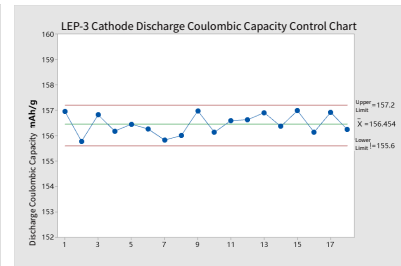
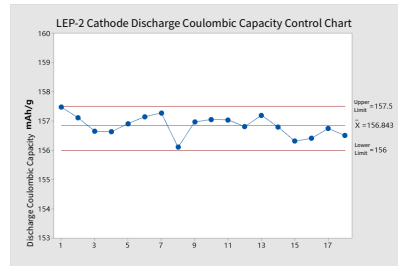
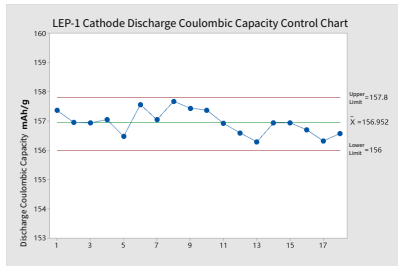


The consistency of discharge specific capacity of ternary positive electrode after interlocking assembly can be controlled within a range of 2mAh/g.

Assembly Environment		Dry room, humidity $\leq 5\%$ , temperature 25°C
Equipment		Automated assembly equipment
Electrode		Ternary positive electrode 1, ternary positive electrode 2, baking conditions: 105°C, bake for 5 hours
Electrolyte		Positive Electrode Electrolyte
Shell, Nickel Foam		All have undergone ultrasonic cleaning and drying treatment.
Separator		Single-sided ceramic separator
Lithium Foil		Lithium foil brushing process

Electrode Type	Positive Electrode1	Positive Electrode2
Electrode Range mAh/g	1.717	1.188
Mean Value mAh/g	174.894	207.476
$\sigma$	0.546	0.303
COV	0.31%	0.15%

## Case 3: Automated interlocking assembly of LFP positive electrode

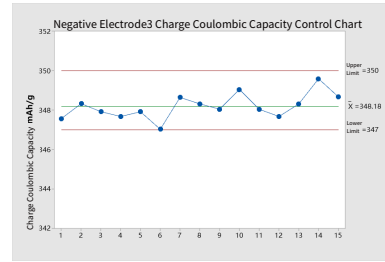
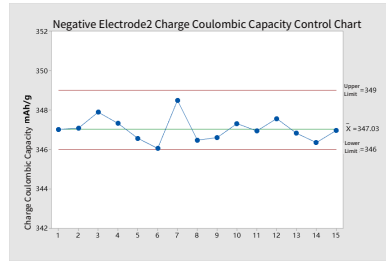
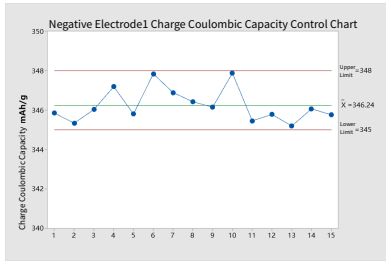


The consistency of discharge specific capacity of LFP positive electrode after interlocking assembly can be controlled within a range of 2mAh/g.

Experimental Conditions		
Assembly Environment		Dry room, humidity $\leq 5\%$ , temperature 25°C
Equipment		Automated assembly equipment
Electrode		Ternary positive electrode 1, ternary positive electrode 2, baking conditions: 105°C, bake for 5 hours
Electrolyte		Positive Electrode Electrolyte
Shell, Nickel Foam		All have undergone ultrasonic cleaning and drying treatment.
Separator		Single-sided ceramic separator
Lithium Foil		Lithium foil brushing process

Electrode Type	LEP-1	LEP-2	LEP-3
Electrode Range mAh/g	1.388	1.376	1.208
Mean Value mAh/g	156.953	156.843	156.454
$\sigma$	0.402	0.351	0.396
COV	0.26%	0.22%	0.25%

## Case 4: Automated interlocking assembly of graphite negative electrode



The consistency of charge specific capacity of graphite negative electrode after interlocking assembly can be controlled within a range of 3mAh/g.

Experimental Conditions	
Assembly Environment	Dry room, humidity $\leq 5\%$ , temperature 25°C
Equipment	Automated assembly equipment
Electrode	Graphite 1, Graphite 2, Graphite 3 Baking conditions: 105°C, bake for 5 hours
Electrolyte	Negative electrode electrolyte
Shell, Nickel Foam	All have undergone ultrasonic cleaning and drying treatment.
Separator	Single-sided ceramic separator
Lithium Foil	Lithium foil brushing process

Electrode Type	Negative Electrode1	Negative Electrode2	Negative Electrode2
Electrode Range mAh/g	2.680	2.441	2.562
Mean Value mAh/g	346.240	347.030	348.183
$\sigma$	0.816	0.607	0.613
COV	0.24%	0.17%	0.18%

## Model Parameters Table

Model	LISM1000	CAAS1000	CAAS1100	CAAS1200
Single Assembly	1ea	1ea	40ea	200ea
Assembly Accuracy	/	$\pm 0.1\text{mm}$		
Assembly Efficiency	/	1min/ea		
Functionality	<ol style="list-style-type: none"> <li>Manual material placement;</li> <li>Adjustable sealing pressure;</li> <li>Positioning and holding system to prevent curled electrode sheets from protruding;</li> <li>Assembly process traceability: Photographs recording the state of each material.</li> </ol>	<ol style="list-style-type: none"> <li>Single-station automated assembly system;</li> <li>High-precision assembly to improve sample performance;</li> <li>Quick assembly to enhance sample production efficiency;</li> <li>Assembly process traceability: Photographs recording the state of each material;</li> <li>Compatible with standard single-station glove boxes.</li> </ol>	<ol style="list-style-type: none"> <li>Multi-station automated assembly system;</li> <li>High-precision assembly to ensure stable sample performance;</li> <li>Quick assembly to enhance sample production efficiency;</li> <li>High-throughput assembly, processing multiple samples at once;</li> <li>Assembly process traceability: Photographs recording the state of each material;</li> <li>Optional automatic lithium foil brushing module to improve sample performance;</li> <li>Built-in dual-station glove box to ensure assembly atmosphere.</li> </ol>	

Note: IEST is committed to continuous product improvement. Any changes to technical specifications will be made without prior notice.



Tel: 86-0592-5367060  
Mobile: 86-139-5954-7432



info@iesttech.com



4th Floor, No. 2, Xinfeng 2nd Road,  
Huli District, Xiamen City, Fujian Province, China

IEST 3 Major Business

- ◆ Special Testing Instruments
- ◆ Third-party Testing Service
- ◆ R&D Solutions



IEST LinkedIn