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National service hotline

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Production Line For Intelligent Equipment

LITHIUM BATTERIES

One-stop Solutions

Technological Progress
Contributes to Social Development !!!

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COMPANY PROFILE

Mikrouna (Shanghai) Ind. Int. Tech. Co., Ltd.

Mikrouna is a German brand based on the concept of German business culture. The company is a high-tech enterprise that integrates research and development, production, and service. It is committed to providing customers with high-end intelligent equipment and services.

Our main products include inert atmosphere glove boxes and related intelligent equipment, protective sealing chamber equipment and related intelligent equipment, as well as corresponding accessories and services. These products are widely used in industries such as lithium battery research and production, physical and chemical research, powder metallurgy, nuclear nucleus technology, biological pharmacy, special welding, OLED, material processing, and fine chemicals.

Mikrouna integrates the design, R&D resources, and production experience of Dongguan Fengyuan Lithium Battery Equipment Co., Ltd., relying on more than 20 years of industry deep ploughing and technical precipitation, and deep cooperation with domestic key university laboratories, is committed to providing the whole process intelligent equipment solution for various solid-state batteries, lithium metal battery products trial line & pilot line, lithium metal material preparation, and large-scale production lines.

Mikrouna has a total of more than 100 invention patents, utility model patents, and software copyrights, among which 4 invention patents for lithium battery equipment and 34 utility model patents.

Mikrouna has a professional product R&D team, more than 100 engineering and technical personnel, including 1 researcher (professor-level senior engineer) and several senior engineers; participated in the R&D and manufacturing of related equipment for a national major science and technology project, and has several high-tech achievements transformation; has obtained high-tech enterprise certificates, Shanghai Specialized and New Enterprise Identification, CNNC qualified supplier certificate, ISO9001, CE, UL and other qualifications and certifications.

Mikrouna has R&D centers in Shanghai, Hubei, Shenyang, and Dongguan, and has built modern manufacturing factories in Shanghai, Hubei, and Tianjin (preparation), with a complete production process chain, which can undertake the research and development, production, and manufacturing of various large, medium, and non-standard automated equipment. In Dongguan Songshan Lake, it has built an advanced lithium battery intelligent equipment research institute and a cutting-edge lithium battery research intelligent equipment sharing platform.

Mikrouna fully implements information management, relying on the ERP/PLM system, integrates the production management, supply chain management, quality management and other system structure to realize the large-scale standardized mode production of non-standard equipment, and each product carries out strict quality control, full closed-loop traceability, to ensure that the equipment is delivered and accepted on time with high quality.

MIKROUNA'S PRODUCTS FOLLOW STRICT GERMAN MANUFACTURING STANDARDS

Company Mission

Technological progress contributes to social development

Manufacturing Standards

German standards, nuclear standards

Core Values

Fairness, Integrity, Technological Innovation, BrandStrategy, Social Responsibility, Abide by Laws and Regulations, and Teamwork

Mikrouna boasts **175 invention patents**, utility model patents, and software copyrights, including **2 lithium battery equipment invention patents**, **25 utility model patents**, and **6 software copyrights**.

Always committed to providing high-end intelligent equipment and services to customers around the world

Solutions

Integrated Solution for Lithium Battery Intelligent Equipment

Process Design Production Installation After-sales Service

Provide you with a full-process equipment solution

Mikrouna (Shanghai) Ind. Int. Tech. Co., Ltd.

Products

Product Coverage > > >

Mikrouna (Dongguan) Industrial Intelligence Technology Ltd. and Fengyuan Lithium Battery Equipment Research Institute are mainly dedicated to providing customers with integrated intelligent equipment solutions such as prismatic battery, cylindrical battery, pouch battery, lithium metal and solid-state batteries, we have completed the construction and application of several production lines at home and abroad.

According to customer requirements, we can customize intelligent, high-precision, and high-stability new energy intelligent equipment.

Main product series

Pouch Battery Preparation Equipment
It includes mixing, coating, rolling, cutting, stacking, welding, top-side sealing, baking, vacuum electrolyte injection, formation and grading, degassing and sealing, OCV test and sorting, etc

Cylindrical Battery Preparation Equipment
It includes slitting, winding, testing, shell insertion, welding, grooving, electrolyte injection, sealing, sorting, etc

Prismatic Battery Preparation Equipment
It includes mixing, coating, rolling, cutting, stacking, laser welding, helium leakage detection, baking, electrolyte injection, nail insertion, formation, nail removal, secondary electrolyte injection, Sealing pin laser welding, coating, thickness measurement, sorting, etc.

Solid-state Battery Preparation Equipment
It includes sintering, crushing, screening, grinding, hot pressing, testing, packaging, etc. in the glove box , and has complete sets of sulfide and oxide electrolyte preparation and validation, and testing experimental lines, etc.

Lithium Battery Automation Equipment
It includes lithium battery production line, integrated supercapacitor baking and electrolyte injection machine, solid-state battery R&D experimental line, lithium battery automation production line, etc.

Sodium Ion Battery Pilot Line
It includes the pilot line and automatic production line for sodium-ion batteries

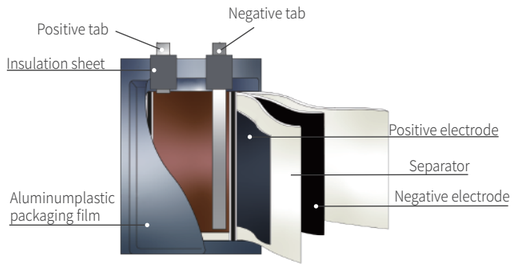
Lithium Metal Preparation Equipment
It includes extruding machine, lithium strip winding mechanism, lithium-copper combination machine, calendering machine, lithium ingot casting, etc.

Dry Electrode Production Equipment
It includes automatic dry film production line, powder rolling, film forming, combination, etc

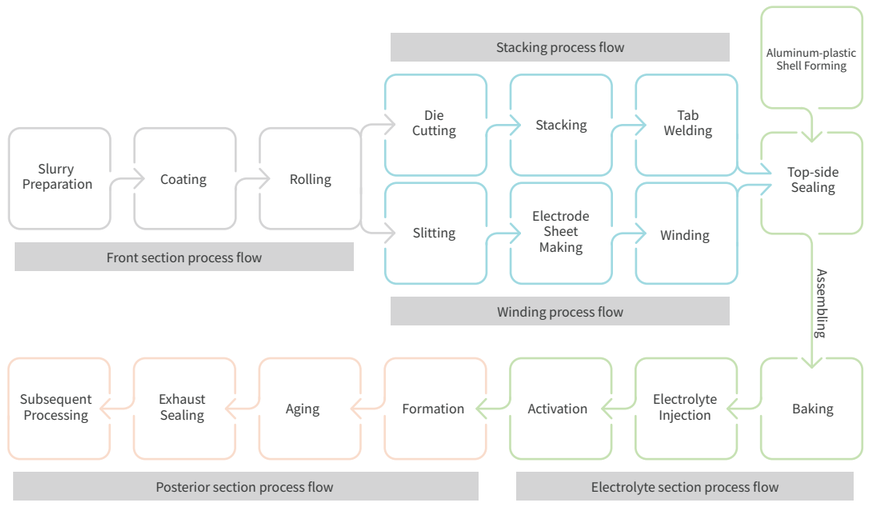
A. Pouch Battery Preparation Solution

Introduction to Pouch Battery Production Process

The pouch battery trial line is a small-scale production line used for research, development, and testing of lithium-ion pouch batteries. The design purpose of the pilot line is to simulate the production process on a smaller scale, enabling battery manufacturers, researchers, and developers to test new materials, processes, and technologies before full-scale production.



Main Process Flow of Pouch Battery



Stacking Process of Pouch Battery


1. Stirring and filtering


2. Electrode coating


3. Solvent treatment


4. Electrode rolling


5. Electrode cutting


6. Die cutting


7. Stacking


8. Tab welding


9. Shell punching


10. Top-side sealing


11. Vacuum baking, electrolyte injection, resting and pre-sealing


12. Formation


13. Final sealing


14. Shaping


15. Grading

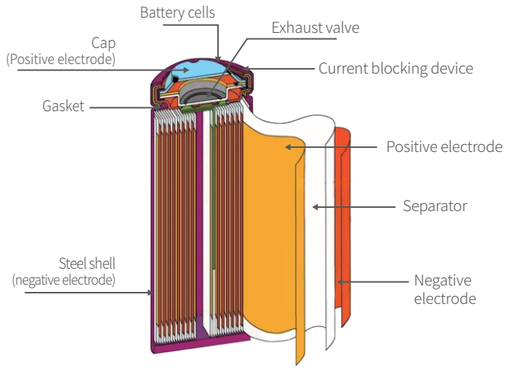
Subsequent Processing

*Customized winding and stacking process equipment

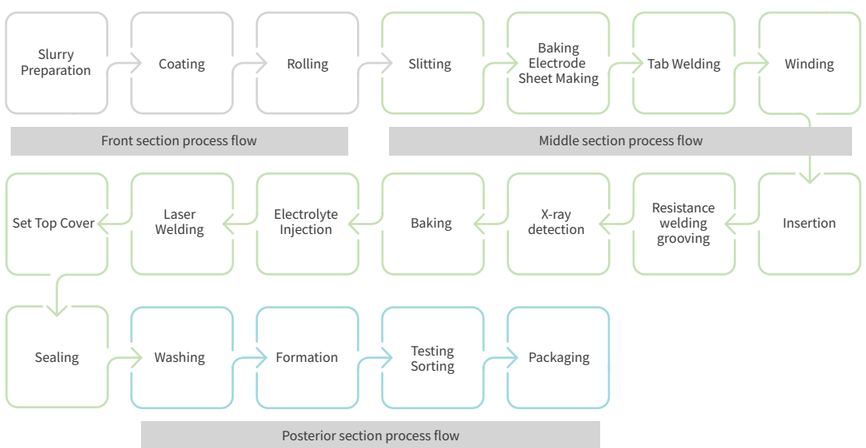
B. Cylindrical Battery Preparation Solution

Introduction to Cylindrical Battery Production Process

The cylindrical battery with lithium metal negative electrode adopts a mature winding process, with high automation, stable product quality, and relatively low cost. The consistency and stability of the produced cylindrical batteries have reached a high level. There are many models of **cylindrical batteries with lithium metal negative electrode**, such as common D-type and CR/ER type batteries.



Main Process Flow of Cylindrical Battery



Cylindrical Battery Production Process


1. Stirring and filtering


2. Electrode coating


3. Electrode rolling


4. Electrode Slitting


5. Winding


6. Insertion


7. Spot welding


8. Grooving


9. Baking


10. Electrolyte injection


11. Welding


12. Sealing


13. Washing


14. Battery test

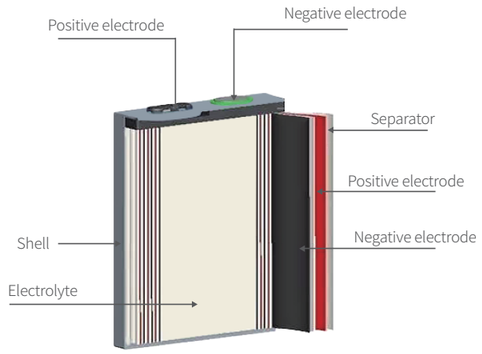

15. Testing and sorting

Subsequent Processing

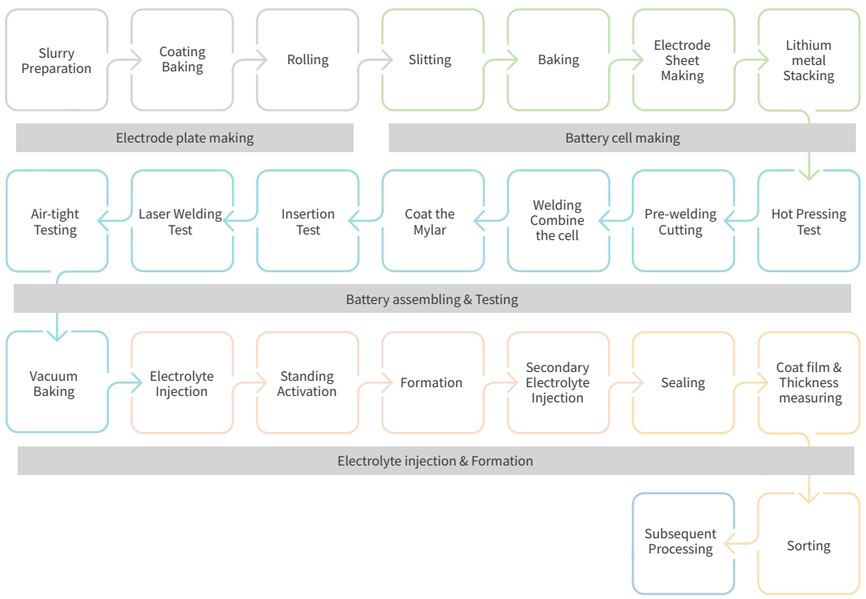
C. Prismatic Battery Preparation Solution

Introduction to Prismatic Battery Preparation Process

This solution plays a crucial role in driving the development of battery technology, improving battery performance, and ensuring the reliability of battery products in various industries and applications by testing, validating, and optimizing the prismatic battery cells before transitioning to mass production.



Main Process Flow of Prismatic Battery



Prismatic Battery Production Process


1. Stirring and filtering


2. Electrode coating


3. Electrode rolling

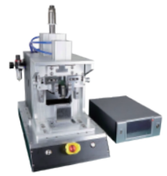

4. Electrode Slitting

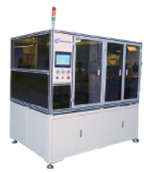

5. Electrode preparation

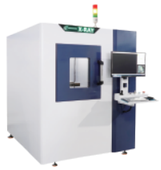

6. Winding


7. Lithium metal stacking


8. Hot pressing


9. Tab pre-welding


10. Transfer sheet welding


11. Coat the Mylar


12. X-ray detection


13. Laser welding


14. Vacuum baking


15. Electrolyte injection


16. Standing activation

*Customized winding and stacking process equipment

17. Negative pressure formation

18. Secondary electrolyte filling

19. Helium leakage detector

20. Steel ball mounting

21. Sealing pin

22. Cleaning of injection holes

23. Sealing

24. Filming

25. Thickness measurement

26. Sorting

Subsequent Processing

D. Solid-state Battery Preparation Solution

Compared with lithium-ion batteries using liquid organic electrolytes, solid-state batteries have received high attention from researchers due to their high safety, high energy density, low manufacturing cost, and wide operating temperature range.

It can meet the evaluation and screening of solid-state battery materials, as well as the development and testing of finished battery cells.

It can be used for process validation to convert electrolytes from liquid to semi-solid and then to full solid state.

The verification and performance testing of various systems of solid-state batteries such as polymers, oxides, sulfides, and the preparation of lithium batteries can be achieved through the construction of dry clean rooms and glove boxes.

Mikrouna provides a complete solution for solid-state battery research, including a range of related equipment from chemical raw materials to testing.

Preparation of solid electrolyte materials (ball milling, sintering, crushing, screening, etc.)

- 节能型气氛保护系统
- 高精度电子天平配比称重
- 管式&箱式高温炉自动控温烧结
- 超大离心加速度粉碎材料
- 行星球磨机实现出色细研磨细度（多数可实现纳米级）
- 超声震动筛分精细粉体

Ball milling

Sintering

Crushing

Screening

Dry preparation of electrolyte film/electrodes (film preparation, coating, induction heating, etc.)

Film preparation

Coating

Induction heating

Wet preparation of electrolyte film/electrodes (slurry production, coating, rolling, etc.)

Slurry production

Coating

Rolling

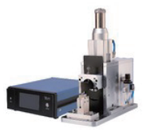
Solid state battery assembly (lithium strip cutting, lithium metal stacking, hot pressing, tab welding, sealing, cold isostatic pressing, etc.)

Lithium strip cutting

Lithium metal stacking

Hot pressing

Tab welding



Sealing

Cold isostatic pressing

Mikrouna (Shanghai) Ind. Int. Tech. Co., Ltd.

Lithium metal battery trial line (Lithium strip cutting、Lithium metal stacking、Hot pressing、Tab welding、Sealing、Vacuum electrolyte injection、Vacuum sealing etc.)

Energy-saving atmosphere protection system
Electrode cutting
Lithium foil pressing copper tab
Electrode die cutting and shaping
Lithium metal semi-automatic stacking
Hot press testing
Tab ultrasonic welding
Top-side sealing
Vacuum electrolyte injection
Vacuum sealing
Aluminum-plastic film manual forming (outside the glove box)

Lithium metal solid battery production line (Lithium strip cutting、Lithium metal stacking、Sealing、Cold isostatic pressing)

Energy-saving atmosphere protection system
Material weighing proportion
Vacuum stirring
Coating and baking & 3D printing forming
Rolling
Electrode cutting
Lithium foil pressing copper tab
Electrode die cutting and shaping
Lithium metal semi-automatic stacking
Hot press testing
Tab ultrasonic welding
Top-side sealing
Vacuum electrolyte injection
Vacuum sealing
Aluminum-plastic film manual forming (outside the glove box)

E. Lithium Battery Automation Equipment

Lithium battery automated production line

Energy-saving low dew point drying and dehumidification system
Lithium metal negative electrode automatic cutting and folding in one
Automatic hot press testing of laminated cell
Automatic ultrasonic welding of cell tab
Welding mark shaping cleaning and gluing
Automatic punch forming of aluminum-plastic film
Automatic shell encapsulation of cell
Post-encapsulation edge cutting & shaping & testing
Lithium metal cell vacuum electrolyte injection system
Scanning code and weighing before and after filling
Voltage and temperature monitoring after filling
High voltage standing after vacuum filling
MES system connection function

Super capacitor baking and electrolyte injection all-in-one machine

High vacuum drying and baking system
Ultra-low dew point glove box environment
Capacitor pumping high vacuum electrolyte injection
Vacuum positive pressure cycle standing
Automatically supply electrolyte and remove bubbles
Filling pipeline cleaning system
Scanning code and weighing before and after filling
MES system connection function

Sodium ion battery automated production line

This production line can independently complete the operations of quantitative powder injection, tunnel furnace type segmented continuous high-temperature heating, quantitative electrolyte injection, automatic sealing welding, negative electrode heating, automatic sodium injection, and automatic vacuum welding of ring sealing end caps. Finally, it is sent out of the discharge bin through the transmission line. The entire production process achieves automatic transmission and production, making it a relatively complete and advanced automatic production line for sodium ion batteries.

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Dry solid electrolyte film forming machine

Automatic fixed-length cutting of the electrode
Four-axis robot flexible turnover of the electrode
Applicable to printing and forming the materials of different battery systems
Flexible printing of different shaped products
Customized high-precision platform
Precisely controlled temperature drying
Single / double-sided printing
Product isolated stacking and collection
MES system connection function
Can be 3D printed

Lithium metal negative electrode automatic sheet making machine

Lithium strip low tension unwinding
Fixed length traction and cut into sections
CCD positioning & correction
Copper tab cutting and transfer
Tab and lithium foil pre-pressing and bonding
Tab final pressing flat and compounding
CCD detection and sorting
Lithium electrode isolation and stacking transfer
Lithium electrode sheet directly deliver into the lamination machine
MES system connection function

Lithium metal battery automatic cutting and stacking all-in-one machine

Lithium strip cutting
Lithium foil CCD positioning
Copper tab cutting and transfer
Tab and lithium foil pre-pressing and bonding
Tab flat pressing
CCD detection and sorting
Lithium electrode isolation and stacking
MES system connection function
Lithium negative electrode sheet making
positive electrode sheet bag making
Automatic stacking, automatic gluing
Automatic hot press testing, stacking and unloading

F. Lithium Metal Preparation Equipment

Lithium, the third element in the periodic table is the lightest metal element in nature. The lightweight nature of lithium enables the emergence of lithium magnesium alloys, a high-strength lightweight metal with excellent heat resistance, conductivity, and impact resistance. But unlike other important metals such as iron, copper, and aluminum that can be used as materials, lithium also plays multiple roles in energy and enjoys the reputation of being an "energy metal in 21st century".

Extruding machine

Applied to the lithium extrusion process, it has an independent power mechanism and electrical system, and adopts button centralized control. The process action is controlled by a PLC controller, which can achieve two operation modes: inching and semi-automatic.

The switchable mold can adjust the width and thickness of the lithium strip after lithium ingot extrusion.

It is equipped with lithium strip winding function.

Lithium ingot casting

Lithium alloy mixing

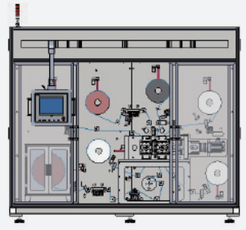
Fully sealed argon gas protection glove box

Casted into ingots

Calendering machine

Lithium strip calendering

Winding, unwinding and release film forming



Lithium/Copper Laminator

Lithium copper strip rolling combination and coiling

Low tension control

Realize the coiling of ultra-thin lithium strips

Lithium copper strip combination and coiling

G. Dry Electrode Production Equipment

The dry film preparation technology avoids the use of any solvent in the preparation of lithium batteries, thus solving the following problems:

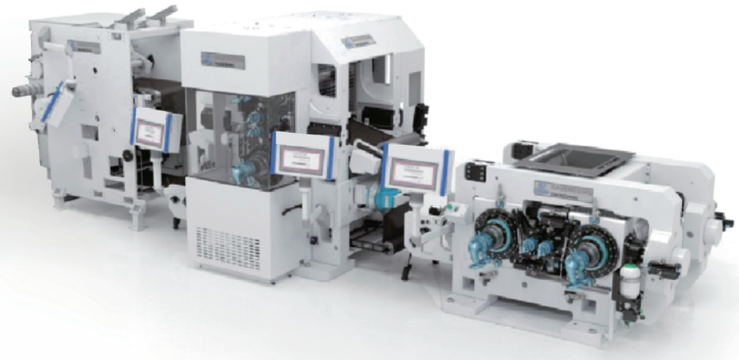
Cost reduction: Dry electrode technology saves solvents, as well as the cost of solvent evaporation, recovery, and drying equipment.

Inhibition of layering: Dry electrode technology does not use solvents during the mixing process of electrode components. Therefore, during the dry mixing process, due to the shear and friction of the mixer and particles, different components of the electrode material can be evenly distributed. Moreover, due to the absence of slurry during the dry mixing process, there is no longer electrode layering caused by solvent evaporation.

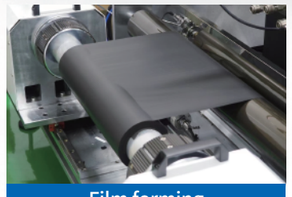
No restrictions on electrode thickness: dry film technology can easily control electrode thickness and uniformity of thick electrodes, without generating cracks. It has unique advantages in preparing thick electrodes.

Compatible with sulfide solid-state electrolytes: Dry film technology avoids the use of organic/polar solvents and only requires a small amount of adhesive during the film making process, making it particularly suitable for preparing sulfide all solid-state batteries. The dry film preparation technology is helpful in preparing solid-state sulfide electrolyte film and maintain its high ionic conductivity, as it does not involve the use of solvents that react with sulfide solid-state electrolyte.

Automatic dry film production line



Powder rolling



Film forming

Combination

Partners

List of some partners

CATL 宁德时代 | BYD | WELION 卫蓝新能源 | Li-S Energy

赣锋锂业 GanfengLithium | microvast | LG新能源 | CETC

清陶能源 | CSIC 中船重工第七一二研究所 | 中国科学院物理研究所 | ZEC

ATL | 广汽研究院 GAC R&D CENTER | 中国航天 | EVE

LIONGO | 中化 sinochem | CHANGHONG 长虹 | COSIC

清华大学 Tsinghua University | 同济大学 TONGJI UNIVERSITY | 华南理工大学 South China University of Technology | 天津大学 Tianjin University

复旦大学 FUDAN UNIVERSITY | 上海交通大学 Shanghai Jiao Tong University | 南方科技大学 Southern University of Science and Technology | 浙江大学 ZHEJIANG UNIVERSITY

Mikrouna (Shanghai) Ind. Int. Tech. Co., Ltd.

Service Network

Hubei Manufacturing Center

Shanghai Manufacturing Center

Mikrouna (Dongguan) Industrial Intelligence Technology Ltd
Fengyuan Lithium Battery Equipment Research Institute

2 major manufacturing factories

We have manufacturing plants in Shanghai and Hubei, and service centers in Beijing, Guangzhou, Shenzhen, Dongguan, Xi'an, Zhengzhou, Wuhan, Nanjing, Fuzhou, Hangzhou, Ningbo, Changsha, Hefei, Chengdu, Kunming, Changchun, Tianjin, Jinan, Qingdao and Dalian.