PATL

# Dongguan Perfect Amperex Technology Limited

## Global Professional Small Polymer Lithium-ion Battery manufacturer

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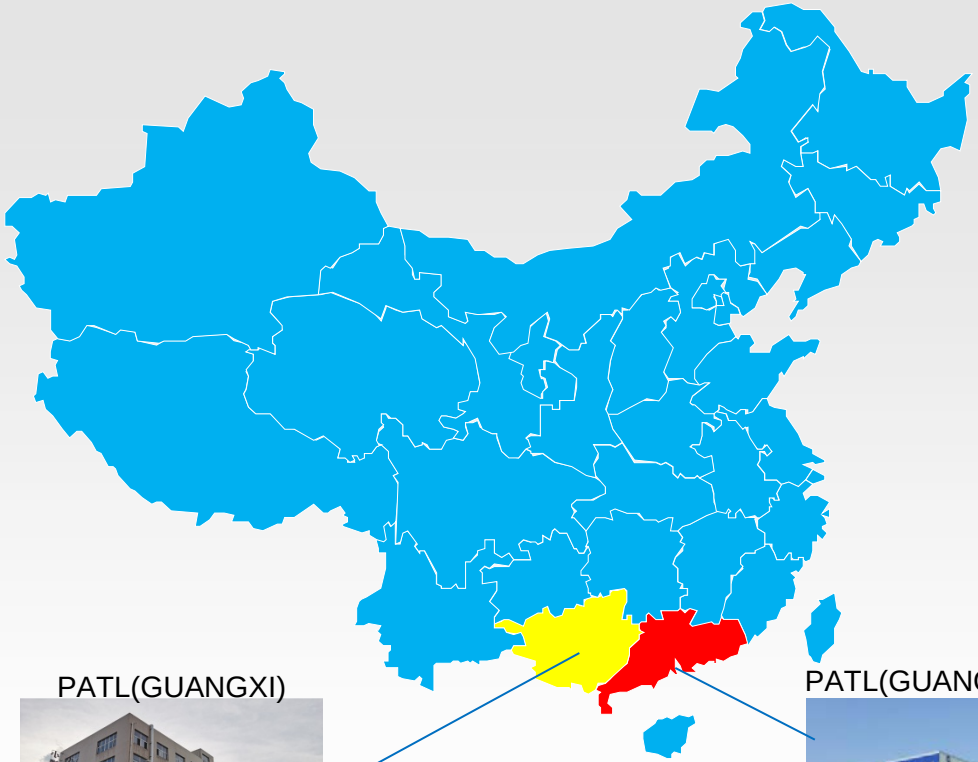
# Company Profile

- Founded in 2010
- Self-brand : PATL
- Located in Guangdong and Guangxi
- About 800 staffs
- Daily Production:600K
- Factory Area:>25,000 $M^2$
- Global Professional Small Polymer Lithium-ion Battery manufacturer



PATL(GUANGXI)

PATL(GUANGDONG)

# Development History

**Newly established company** — 2010

Founded in Liaobu Town, Dongguan

**Brand** — 2015

- Register the "PATL" brand
- High energy and high voltage technology breakthrough

**Steady development** — 2018

- Won the "Best Quality Award" of Xiaomi Ecological Chain Company
- Series products through "UL certification"
- To build a demonstration base for the cultivation of talents in provincial universities

**Leap into the future** — 2024

- Fully develop overseas markets
- Comprehensive breakthrough in fast charging performance technology
- Daily capacity：600Kpcs

**Continuous development** — 2013

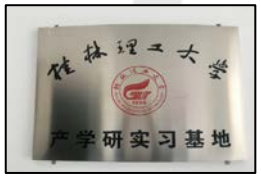
- Moved to Hengli Sanjiang Industrial
- Passed the quality management system ISO9001

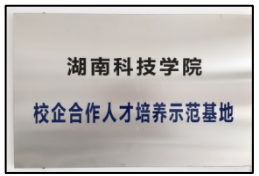
**Upswing period** — 2017

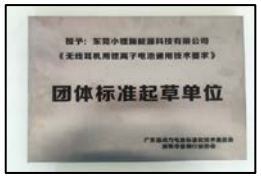
- The Development of Overseas Markets
- Launched soft pack cylindrical battery and special-shaped battery
- "Top 10 wearable Device Lithium Battery Enterprises in Guangdong Province"
- Successfully passed the "high-tech enterprise identification"

**steady development** — 2019

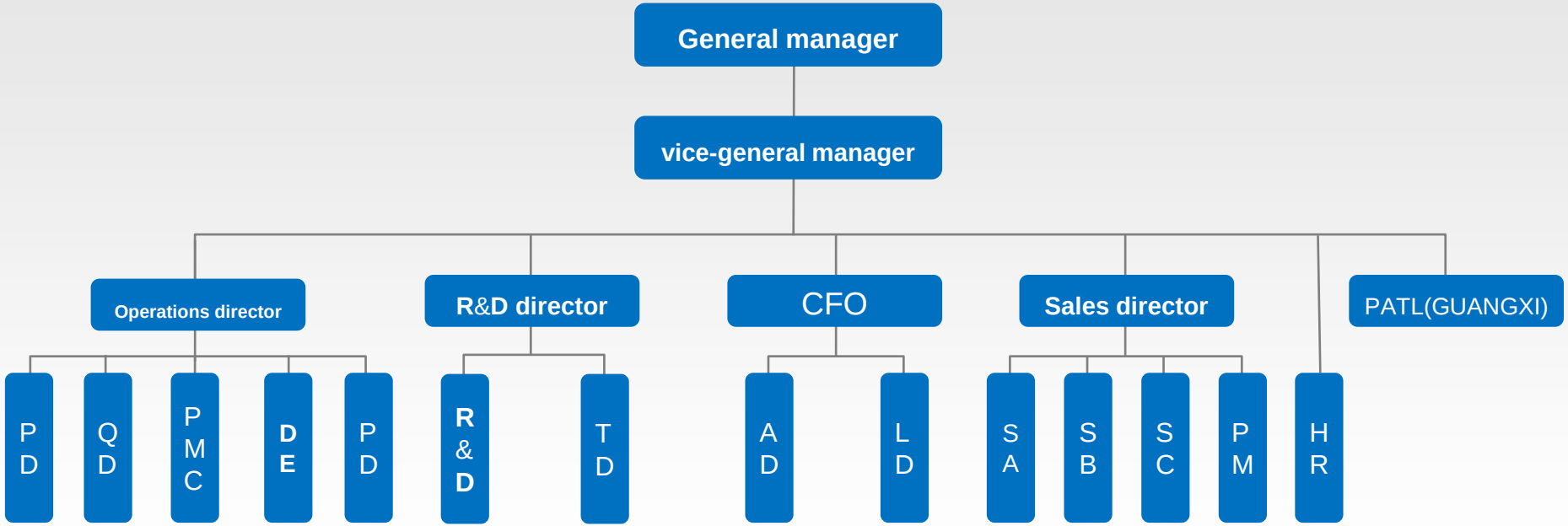
- Daily capacity：400Kpcs
- Launch soft-pack button battery and e-cigarette battery
- Passed ISO14001 environmental management system
- Set up PATL Guangxi
- Series of products through BIS, KC, PSE certification



# Organization structure



# Applications

bluetooth headset

e-cigarette

Smart wearable

others

# R&D

## Overview

Our company have built full intergrated R&D technology system. Led by senior technology experts who have rich development experience background at ATL/Highpower,the R&D team gathered a number of master degree and bachelor degree team members, cooperates with Central SouthUniversity to develop new products and new technology innovation.Now we have developed over 500 models of lithium polymer batteries for bluetooth and wearable products.

# Technical Innovation

证书号第5510469号

发明专利证书

发明名称：一种新型纽扣电池及壳体密封件结构制作安装方法

发明人：胡卫国;田华

专利号：ZL 2021 1 0214790.3

专利申请日：2021年02月25日

专利权人：东莞小锂新能源科技有限公司

地址：523460 广东省东莞市横沥镇三江工业区122号

授权公告日：2022年10月14日　　授权公告号：CN 113013527 B

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局长
申长雨

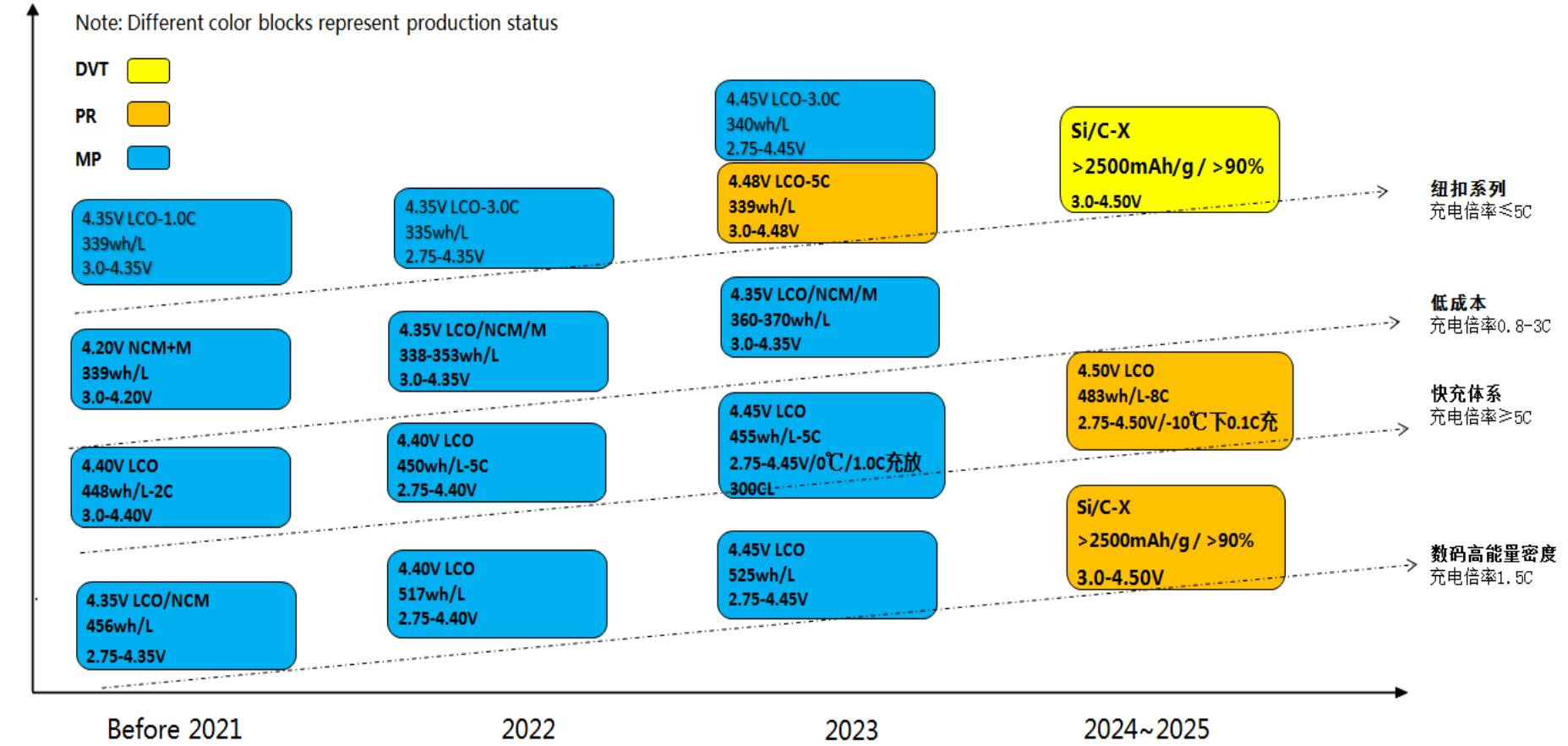
第1页(共2页)

其他事项参见续页

**Patent for invention**

1. We have obtained a number of patents for invention and new utility patents.
2. We spend over **6%** of our annual sales revenue on r&d and technology improvement.
3. We have an independent and complete product trial production line, a complete set of reliable performance testing laboratory and advanced analytical testing laboratory.
4. We work closely with top battery research institutions and universities.

# Technical roadmap



# Production environment

※ Class 100000 cleanroom

# Equipment

High-speed Mixing machine

搅拌机

Automatic coating machine

挤压涂布机

Automatic roller pressing machine

自动辊压机

Automatic slitting machine

自动分条机

Automatic production machine

自动制片机

Automatic winding machine

自动卷绕机

# Equipment

High vacuum oven

高真空烤箱

Automatic top side sealing machine

自动顶侧封机

Automatic injection machine

自动注液机

High precision capacity grading

高精度分容柜

Automatic moulding machine

自动成型机

High precision formation

高精度化成柜

# Quality control

The company strictly subject to the requirements of ISO9001: 2015 system to establish quality assurance system. Our QC Department is composed by the IQC, IPQC, QA,QE, FQC with more than 50 strict trained staffs to ensure the whole quality safety process from raw materials , production process to final product outgoing shipments.

Material lab：

ICP spectrometer: Test of trace elements (copper, iron, nickel, sodium) in lithium cobaltate and graphite, strictly according to GB/T24533-2019:ICP730-ES detection
Sampling frequency: The result of the first batch/software automatic control test

ICP spectrum analyzer

Dynamic adsorption surface analyzer: mainly test the specific surface area of powder materials;
Sampling frequency: The result of the first batch/software automatic control test

Dynamic adsorption

Laser particle size analyzer: test particle size, particle size, particle size distribution, D50 particle size, etc.
Sampling frequency: The result of the first batch/software automatic control test

Laser particle size analyzer

# Quality control

Material lab：Fluorescence analyzer: X-ray fluorescence analyzer, mainly testing RoHS2.0 test, halogen test, strict control of raw materials environmental protection test, main materials/auxiliary materials 100% sampling

Fluorescent Plate Reader

Diaphragm permeability tester: Testing isolation membrane permeability
Sampling frequency: the first batch/time of software automatic control test data
Test results can be accurately determined

Diaphragm permeability teste

Computer servo tensile testing machine:
Isolation film: mainly test puncture strength, tensile strength, adhesive paper;
Copper foil/aluminum foil: mainly test tensile strength;
Pole ear: pole ear welding tensile strength;
Sampling frequency: Test ledger control is established for the first batch/time

Servo tensile test machine

# Quality control

**Product process testing:**

Engineering: Coating
Job content: Automatic online 100% surface density detection
Management project:
Single/double sided density test

Online surface density detection

Engineering: Roll press
Job content: online laser thickness 100% test
Management item: pole thickness test

Laser thickness measurement

Project: pole strip
Job description: After the pole slice is cut, the edge transverse/longitudinal burrs are detected under the microscope
Management item: Marginal hairline

Two Dimensionalmeasuring

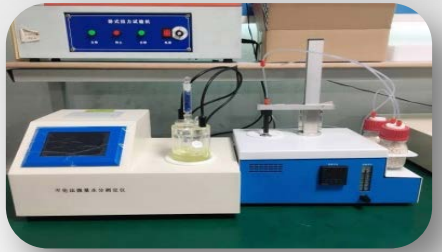
# Quality control

## Product process testing:

Engineering: X-ray inspection
Job Description: Use x-ray machine to measure the coating condition of positive and negative electrode plates
Management Project: overhang

X-ray test

Project: Baking
Operation content: Respectively take the positive and negative electrode plate samples for testing, the first layer oven 100% test
Management item: Moisture



Moisture test

Engineering: OCV (K Value Test)
Job content: The device automatically detects 100%K value test
Management items: Voltage/internal resistance

OCV test

# Electrical performance and Safety laboratory

| Environmental Testing | Mechanical Testing | Electrical safety Testing | Electrical function Performance |
|---|---|---|---|
| • Heating Test<br>• Temperature cycle test<br>• Altitute similation<br>• 85℃ High Temp. | • Crush<br>• Puncture<br>• Impact<br>• Vibration<br>• Drop | • Room temp.short circuit<br>• 55℃ short circuit<br>• Over charge<br>• Over discharge | • Primary performace<br>• Rate discharge<br>• Different Temp. discharge<br>• Cycle life<br>• Retention capability<br>• Storage capability |

# Supplier of materials

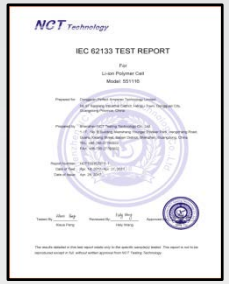
| Materials | Main supplier |
|---|---|
| positive pole | Hunan Shanshan Energy Technology Co., Ltd. |
| | Beijing Easpring Material Technology Co.,Ltd. |
| negative pole | ZCT JIANGXI ZICHEN TECHNOLOGY CO.,LTD |
| | Inner Mongolia Snow New Material Technology Co., Ltd. |
| electrolyte | Dongguan Shanshan Battery Materials Co.,Ltd |
| | Hubei Huachi New Energy Material Co., Ltd. |
| al-plastic film | SHOWA Denko BATTERY MATERIALS (SHANGHAI) Co., Ltd. |
| | Dongguan Excellent New Material Technology Co., Ltd. |
| diaphrag | Huizhou Xinji Meitai Technology Co., Ltd. |
| | Chongqing Enjieniumi Technology Co., Ltd. |

# Certification

ISO9001:2015

ISO14001:2015

CQC




IEC62133

UL

BIS

KC

CE

UN38.3

PSE

PATL

# Partner

# Thanks!

## Dongguan Perfect Amperex Technology Limited

www.patlcell.com

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