Jangyec

INNOVATIVE TECHNOLOGY FOR RESOURCE RECYCLING AND FOR ENVIRONMENTAL PROTECTION

Spent Lithium ion Battery Shredding and Separation Plant

All types of LiBs acceptable
As well as battery manufacturing scrap

Spent Lithium ion Battery Pre-Process & Disassembly

EV Batteries Evaluate, Traceability
Discharging, Disassembly, Re-purposing

Black Mass Hydro-metallurgy Process

Ternary(NMC)Lithium Battery Black Mass
LFP Lithium Battery Black Mass

QUALITY SYSTEM CERTIFICATE
WSF
ISO 9001

COMPANY PROFILE

Jangyec was established on March, 2009, located in Shaoshan city, Hunan Province, China

Jangyec is a high-tech enterprise which professionally engaged in R&D, manufacturing and selling waste lead acid battery recycling plant, waste lithium-ion battery breaking and separation plant, waste water disposing system, waste gas disposing system, large-scale of non-ferrous metallurgical and non-standard automation machinery.

We acquired 1 international patent,10 invention patents,23 utility model patents and 16 appearance patents. Relying on advanced technology and R&D productivity, we made a great progress in resource recycling and environmental protection fields.

Our main products including :waste lithium-ion battery breaking and separation system, waste lead acid battery breaking and separation system, lead paste desulfurization system, ammonium/sodium sulfate solution purification system, ammonium/sodium sulfate crystallization and drying system, high(low)temperature smelting system, lead refining and ingot casting system, off-gas treatment system, plastic recycling system, lead electrolysis manufacture plant etc.

Based on ten years of experience in the design and technology development, more than 60 sets of plants have been successfully operated and used in the world.

Follows the Quality Management System with the standard ISO 9001:2015, ensure the quality of product.

ENTERPRISE CULTURE

- **Enterprise vision:**
  Be the innovator of resources recycle and environmental protection field

- **Enterprise mission:**
  Leading high technology in environmental protection, making resources greenly recycle

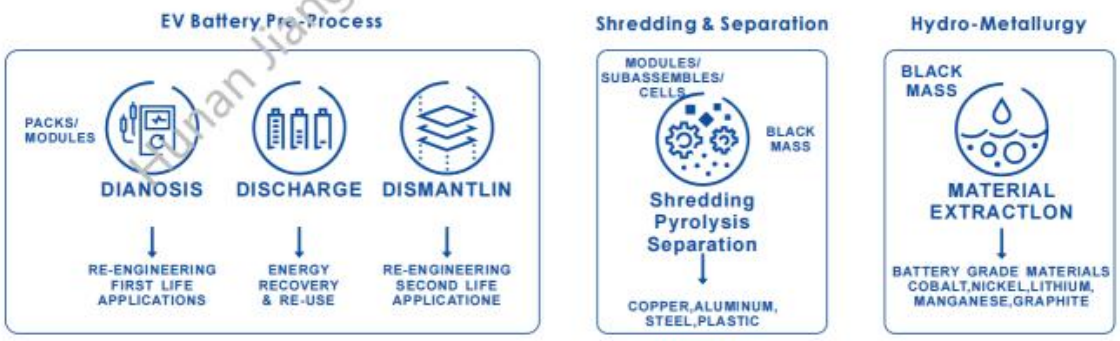
- **Enterprise spirit:**
  Innovation, Diligence, Honesty, Mutually beneficial

PRODUCTS INTRODUCTION

SUSTAINABLE RECYCLING OF LITHIUM-ION BATTERIES

Lithium-ion batteries supply smartphones, electric cars and bicycles and give your handheld power drill its power. And as mobile communication, electric vehicles and DIY are growing markets, the quantity of lithium-ion batteries will rise accordingly. At the same time, the number of lithium-ion battery cells produced will also increase significantly.

Sustainable utilisation from cell production to end of life will therefore become more and more important – but not a problem. For we offer a complete service including the recycling of all battery production waste (e.g. cathode material) and all types of lithium-ion batteries. Our state-of-the-art technology enables us to achieve high recycling rates.



PRODUCTS INTRODUCTION

BATTERY PACK PRE-PROCESS

Evaluate, assess, assign a unique ID.

Once batteries are received, whether repurposed or recycled, they are assigned a unique ID. All stages of the process will be recorded against the battery's ID to ensure full and complete traceability.

Following the collection and safe transportation of Lithium-ion EV batteries, the batteries are received at the Diagnostic and Disassembly Center and stored in an evaluation and pre-qualification area. Once ready for processing, the initial assessments are carried out and the batteries are assigned a unique ID.

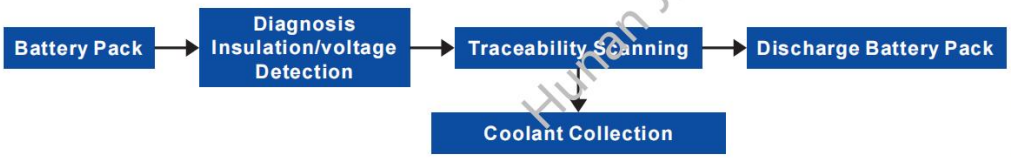
Initial assessments include:

Visual checks for physical damage

Safety tests including earth leakage and thermal imaging

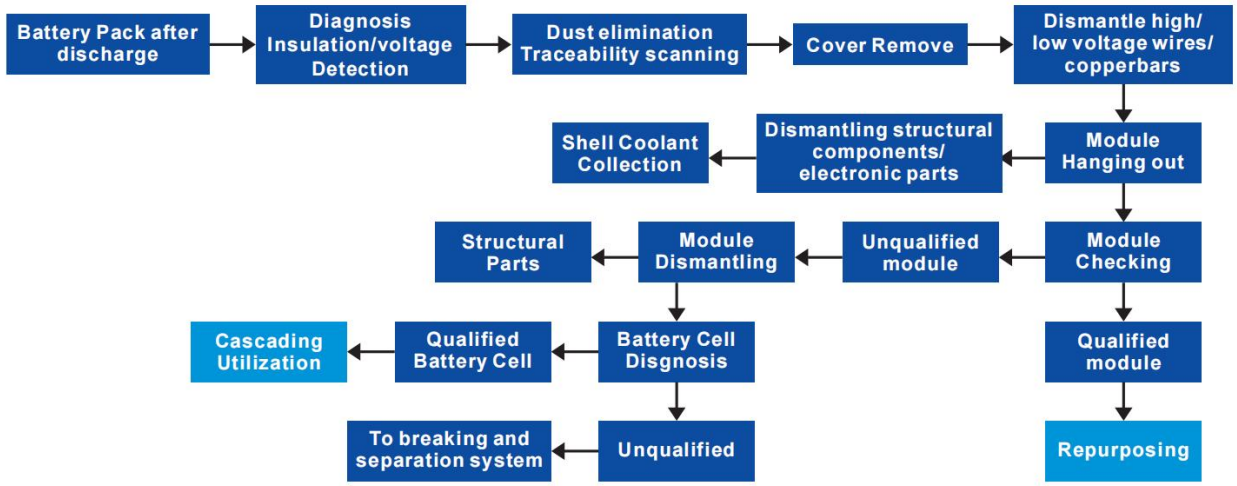
The battery is connected to CAN (Controlled Area Network). This enables communication with the battery (as if on the vehicle), enabling the battery to be investigated thoroughly.

Specialized high voltage test cycle protocols on the full Li-ion battery pack using advanced test equipment



Disassembly for every type of battery.

Electric Vehicle batteries have different construction and disassembly requirements, which are often complex and require special tooling. In some cases, detailed information is required from the manufacturer. A safe pre-evaluation and disassembly process is established and documented for every type of battery.



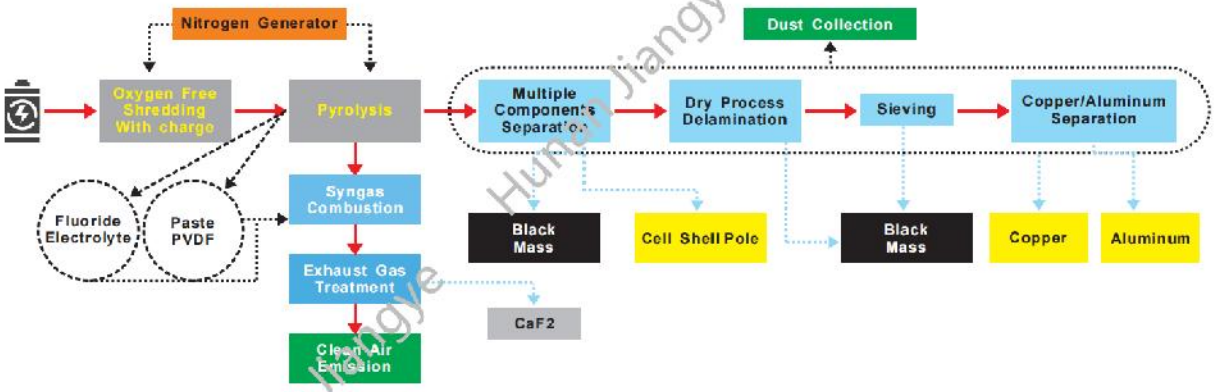
PRODUCTS INTRODUCTION

LITHIUM-ION BATTERIES SHREDDING AND SEPARATION TECHNOLOGY

Intelligented, high-efficiency and high recovery rate LiB shredding & separation technology and equipment enable maximum LiBs safety and environmental-friendly comprehensive utilization

JIANGYE adopts cutting-edge technologies of "flexible feeding - charged crushing - medium/low temperature thermal treatment - full components physical sorting". A mechanical closed process within Oxygen-free atmosphere is in place to guarantee low-emissions. This energy-efficient and economical treatment allows the crushing and proper sorting of parts and chemistries so that the major part of the battery can be recycled, regardless of design and chemistry.

JIANGYE specializes in responsibly recycling end-of-life batteries. We employ state-of-art technologies to recover critical materials while minimizing environmental impact. Committed to sustainability, we contribute to close loop recycling by state-of-art technology and promoting resource conservation for a greener future.



Batteries from Agnostic

Safey recieve & Recycle all types of LiBs,
as well as battery manufacturing scrap

Unique shredding & Material Separation Technology

Charged shredding, shearing,
pyrolysis,oxygen free solves the risk of explosion,
enable continuous mass production.
Low environmental impact

Toxic Elements Remove

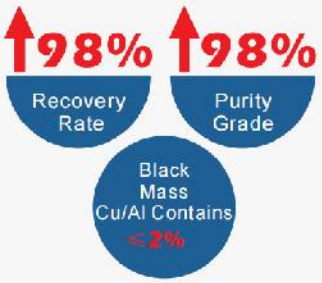
Flurorinated Gas HF PF5
Paste Material PVDF
Electrolyte

Efficient Recovery Rate

Up to 97% recovery rate
to return critical material
back to supply Chain

High Quality End Products

High Purity Black Mass
Copper / Al



PRODUCTS INTRODUCTION

LITHIUM ION BATTERY CATEGORY

SHREDDED FRACTIONS

RECYCLED MATERIAL

Black Mass

Copper

Alumium

CaF2

Metal Shell

Film

PRODUCTS INTRODUCTION

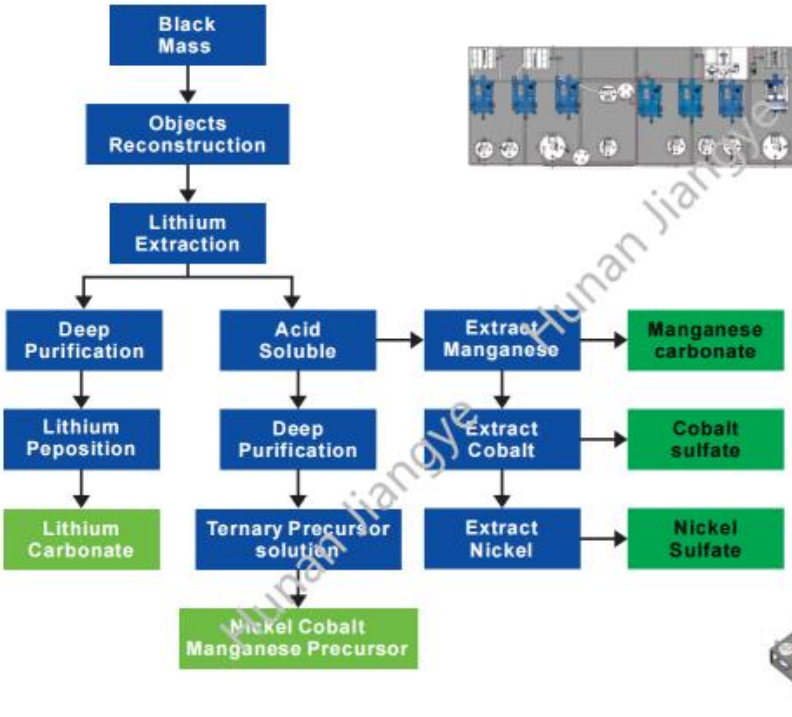
Hydrometallurgy Process

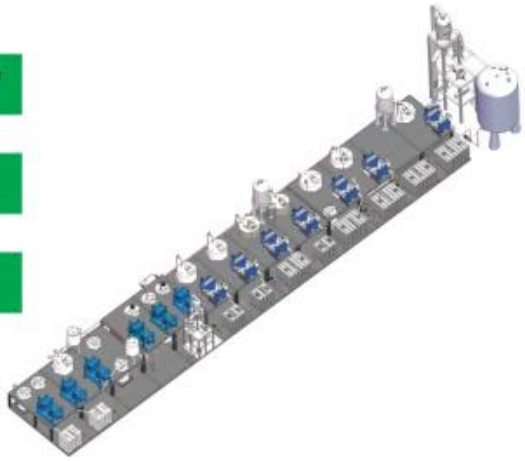
Relying on Centeral South University, JIANGYE intergrates advantages of recycling equipment and hydrometallurgy technology to achieve low carbon, energy saving, high impurities removal efficiency, which realize waste material regeneration and reuse.

Using mature hydrometallurgy processing technology, ternary Black Mass produces battery grade

- nickel sulfate,
- cobalt sulfate,
- manganese sulfate
- lithium carbonate or lithium hydroxide

The comprehensive recovery rate of nickel, cobalt, and manganese ≥98%



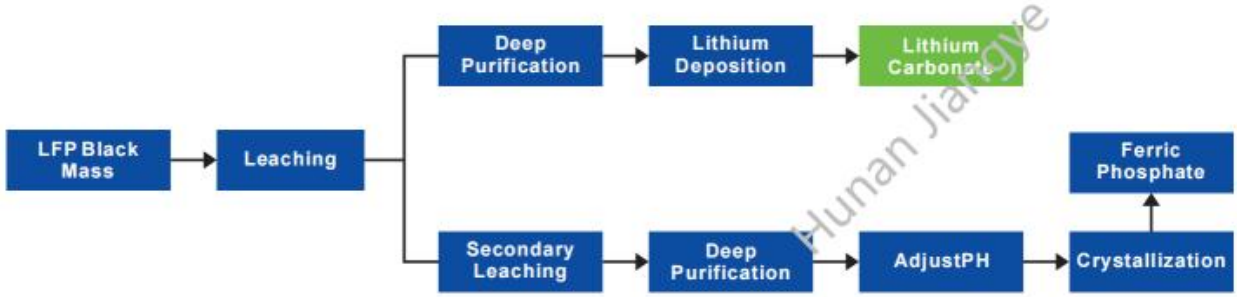


PRODUCTS INTRODUCTION

LFP BLACK MASS RECYCLING PROCESS

Based on the traditional ternary BM(Black Mass) hydrometallurgy process, a new process of lithium extraction has been developed to achieve high value recovery of lithium. Adopts countercurrent multi-stage leaching technology, dynamic monitoring intelligent adjustment automatic control method, chemical precipitation and solvent extraction combined technology.

Produces battery grade lithium carbonate. lithium recovery rate ≥ 90%.



PRODUCTS INTRODUCTION

POWER 10KPA Lithium battery breaking and sorting system

Gotion 250KPA Waste Lithium Battery Breaking and Sorting System

JINCHUAN 5KPA Waste Lithium Battery Breaking and Sorting System

Leoch 10KPA Waste Lithium Battery Breaking and Sorting System

More than 100 plants in the world

Jangyec

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