Sulfide Solid Electrolyte Production Line Solutions

Material Sensitivity to Moisture and Oxygen

Special processes and equipment create a low-dew-point, low-oxygen production environment.

Equipped with high-efficiency dehumidifiers and inert gas protection systems (e.g., argon gas replacement) to strictly control moisture and oxygen levels.

High Environmental Control Requirements

Inert gas-filled glove boxes
Establish isolated safe operation zones.

Install partitioned isolation facilities in mass production lines.

Operators must wear standardized protective gear.

Exhaust Gas Treatment

Solutions

Acidic Component Absorption

Weak alkaline solutions are used to absorb acidic toxic components in exhaust gases.

Exhaust Gas Incineration Treatment

Convert toxic components into low-toxicity, stable sulfur dioxide through oxidation.

Equipment corrosion issues

- **Coating Protection**

  Special coatings are applied to equipment components to isolate corrosive materials from the base structure.

- **Material Selection**

  Equipment components are manufactured using corrosion-resistant materials.

Particle agglomeration challenges

Dispersant Addition

Physical/chemical adsorption on particle surfaces creates steric hindrance or electrostatic repulsion to prevent agglomeration.

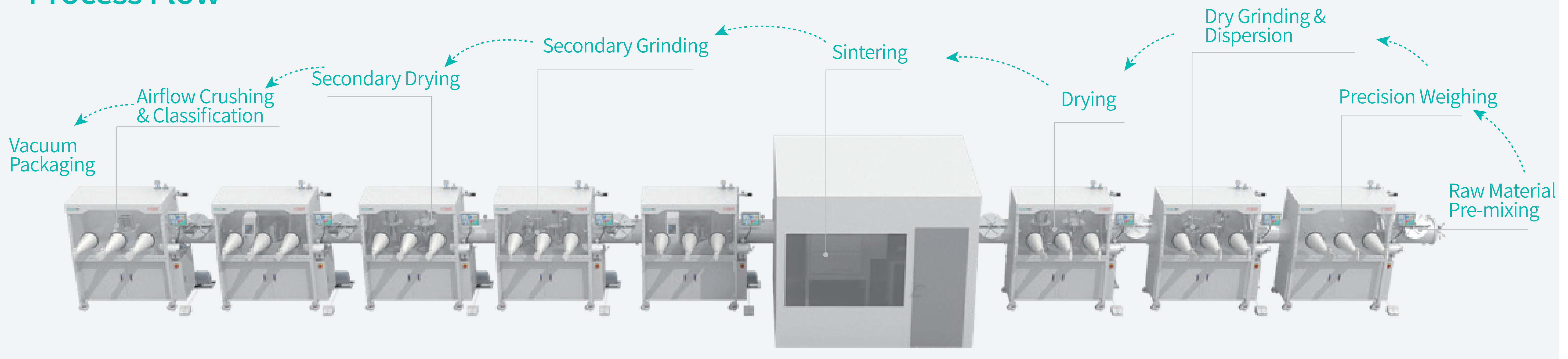
High-energy Dispersion

High-energy mechanical forces break agglomerates for efficient particle dispersion.

Surface Modification

Modify sulfide particle surfaces with inert oxides or polymer coatings to reduce surface energy and enhance repulsion.

Process Flow



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Oxide Solid Electrolyte Production Line Solutions

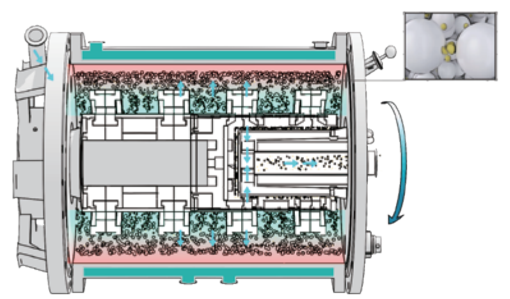
Material Moisture Sensitivity

- **Precise Control of Temperature & Humidity**
  Unpacking, feeding, and packaging processes must be conducted in temperature- and humidity-controlled rooms to prevent material moisture absorption.
- **Positive Pressure Conveying**
  Nitrogen is injected to protect materials from moisture during transportation.
- **Micro-positive Pressure Treatment**
  Nitrogen is used to maintain internal pressure higher than ambient, preventing moisture ingress and ensuring dry storage conditions.

Poor Mixing Uniformity

Achieve Uniform Dispersion

During operation, the bead mill repeatedly disperses and blends materials to significantly enhance mixing uniformity.



Sintering adhesion to crucibles

Solutions to Reduce/Prevent Material Adhesion:

- Material Sealing
- Material Modification
- Special-material crucibles
- Needle-punched structural design

High wear during airflow grinding

Traditional Challenge: High wear during airflow grinding, difficulty in processing large/hard particles

- **Innovative Solutions**
  Post-sintering: Jaw crusher pre-crushing → bead mill coarse + fine grinding
- **Technical Advantages**
  Reduced equipment wear and efficient large-particle crushing.

Poor pre-mixing dispersion performance

Deagglomeration Optimization

Process adjustments combined with dispersants enable efficient deagglomeration of oxide solid electrolytes.

Slurry Anti-sedimentation

Adjust slurry viscosity or add stabilizers to prevent sedimentation and ensure uniform dispersion.

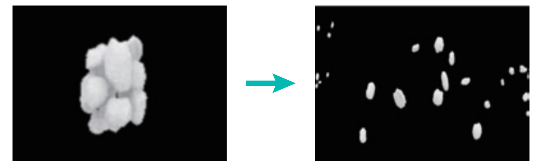
Large Particle Blocking

Precision screening technology prevents large particles from entering the grinding stage.

Challenges in Grinding Stage: Deagglomeration Difficulty, Poor Dispersion, Non-uniform Distribution

Turbine Bead Mill "Coarse + Fine Grinding

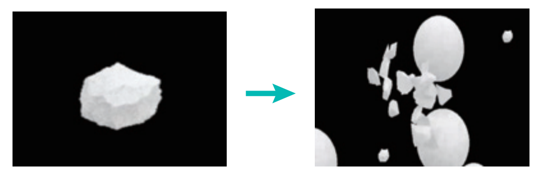
Overcoming deagglomeration, dispersion, and uniformity challenges in the grinding stage.



Before Deagglomeration → After Deagglomeration

Turbine Flow Channel Design

Achieves efficient dispersion, reduces particle agglomeration, and enhances powder uniformity.



Before Crushing → After Crushing

Process Flow

Bulk Bag Feeding → Powder Batching → Wet Mixing

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Crushing ← Sintering ← Drying

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Pre-mixing & Dispersion → Coarse/Fine Grinding → Slurry Filling

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Final Packaging ← (Screening & Demagnetization)

Spray Drying → Airflow Crushing

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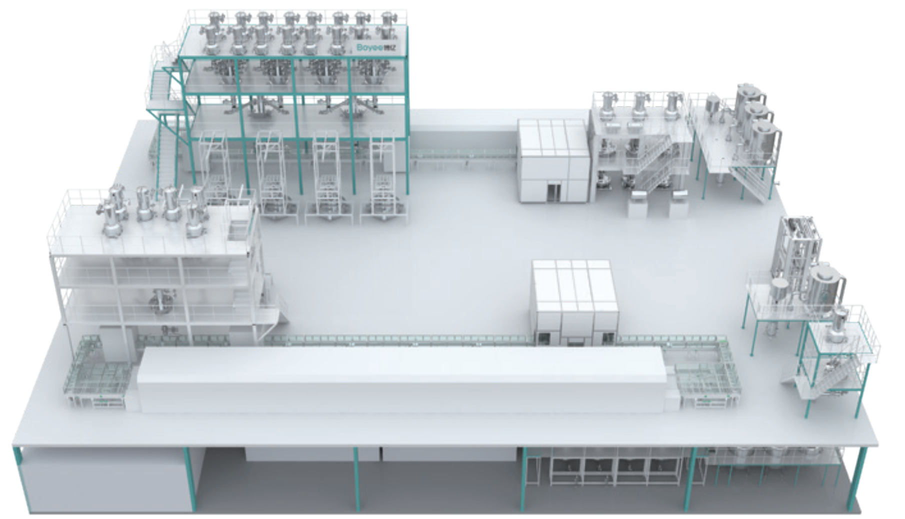
Screening & Demagnetization ← Mixing ← Drying



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One-stop Nanomaterial Solution Provider

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