



Suzhou Chonton Intelligent
Equipment Co., Ltd.

CHONTON INTELLIGENT

苏州诚拓智能装备有限公司



苏州诚拓智能装备有限公司

Suzhou Chonton Intelligent Equipment Co., Ltd.

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专注
光伏·储能智能装备
研发制造

Dedicated to R&D and
Manufacturing of Intelligent Equipment
for Photovoltaic & Energy Storage Industries

专注 光伏·储能智能装备 研发制造

Dedicated to R&D and
Manufacturing of Intelligent Equipment
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丝网印刷线
Solar Cell Screen Printing Line

电池片印胶线
Insulation Paste Printing Line

测试分选机(双/多分片)
High-Efficiency Test & Sort Line (Half-Cut / Multi-Busbar Half-Cell)

测试分选机(四分片)
High-Efficiency Test & Sort Line (Quarter-Cut Cell)

硼扩/氧化/退火/磷扩/LPCVD自动上下料系统
Diffusion / Oxidation / Annealing / Phosphorus Diffusion / LPCVD
Automatic Loading & Unloading System

制绒自动上下料系统
Texturing Automatic Loading & Unloading System

管式PECVD自动上下料系统
Tube PECVD Automatic Loading & Unloading System

ALD自动上下料系统
ALD Automatic Loading & Unloading System

槽式自动上下料系统
Wet Bench Automatic Loading & Unloading System

链式自动上下料系统
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PVD自动上下料系统
PVD Automatic Loading & Unloading System

PECVD自动上下料系统
PECVD Automatic Loading & Unloading System

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Founded in 2020

公司成立于
2020年

苏州诚拓智能装备有限公司，坐落于苏州太湖国家旅游度假区，专注光伏、储能两大板块智能装备的研发、制造与服务，是国家级高新技术企业、江苏省专精特新中小企业及瞪羚企业。

Suzhou Chonton Intelligent Equipment Co., Ltd. is located in the Suzhou Taihu National Tourism Resort, it specializes in the R&D, manufacturing, and service of intelligent equipment for the photovoltaic (PV) and energy storage. The company is a National High-Tech Enterprise, a Jiangsu Provincial Specialized, Sophisticated, Distinctive and Innovative Small and Medium-sized Enterprise, and a Gazelle Enterprise.

公司聚焦光储全产业链智能化升级，产品线覆盖光伏主流电池工艺整线装备及储能配套设备，可定制适配多规格片源，以专业设备助力两大领域产业升级。

The company focuses on the intelligent upgrading of the entire PV and energy storage industry chain. Its product portfolio covers complete-line equipment for mainstream PV cell manufacturing processes and supporting equipment for energy storage, with customized solutions available for a wide range of wafer specifications to support industrial upgrading in both sectors.

研发创新与 人才体系

R&D, Innovation and Talent System



公司重视研发创新与人才培养，现有员工800余人，其中研发人员160余人，累计专利及专利申请150余项；建立完善的人才培养体系，助力研发团队成长，持续强化技术核心优势。

The company attaches great importance to R&D, innovation and talent development. It has more than 800 employees, including over 160 R&D personnel, with more than 150 patents and patent applications in total. A sound talent training system has been established to support the growth of the R&D team and continuously strengthen core technological advantages.



COMPANY PROFILE

企业简介



扫码了解详情

现有员工
800+人
Total employees

研发人员
160+人
R&D staff

专利及专利申请
150+项
Patents

CORPORATE CULTURE

企业文化

企业使命

Corporate Mission



为客户提供全面解决方案, 带给产业无限可能

To provide customers with comprehensive solutions and unlock unlimited possibilities for the industry.

聚焦智能化装备挑战和压力, 为客户提供有竞争力的智能化设备解决方案, 给客户创造最大价值, 推动产业持续发展。

We focus on the challenges and demands of intelligent equipment, and provide competitive intelligent equipment solutions that create maximum value for our customers and drive sustainable industrial development.

核心价值观

Core Values



以人为本 People-Oriented

人才是企业财富的创造者, 诚拓坚持以人才为最大资产, 注重员工自身发展, 激发个人最高潜能及发挥团队精神, 以提高企业竞争力。

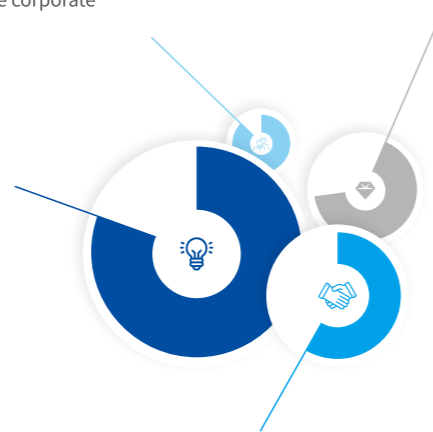
Talent is the creator of corporate wealth. Chonton regards talent as its greatest asset, values employee development, stimulates individual potential, and promotes teamwork to enhance corporate competitiveness.

开拓创新

Pioneering and Innovation

创新是企业进步的灵魂, 展望未来, 诚拓将坚持和谐创新, 与时俱进, 在产品上追求卓越, 不断突破, 共创美好未来。

Innovation is the soul of corporate progress. Looking ahead, Chonton will uphold harmonious innovation, keep pace with the times, pursue product excellence, and make continuous breakthroughs to create a better future together.



客户至上 Customer First

客户是企业的生存之本, 诚拓秉持客户的需求就是我们的追求, 客户的难题, 就是我们开发的课题, 持续为客户创造最大价值。

Customers are the foundation of survival. Chonton believes that customers' needs are our pursuit, and customers' challenges are our R&D topics, continuously creating maximum value for customers.

诚信务实

Integrity and Pragmatism

诚信乃企业立世之本, 诚拓以信用做事, 以真诚合作, 以最高的标准要求, 追求极致、精益求精、力求打造企业诚信品牌。

Integrity is the foundation of a company. Chonton acts with credibility, cooperates sincerely, adheres to the highest standards, pursues excellence, strives for perfection, and builds a trustworthy brand.

企业愿景

Corporate Vision



成为一流的智能化装备领跑者

Become a leading provider of intelligent equipment

智能化是社会发展的必然趋势, 诚拓旨在成为中国智能化行业领域最大、最强和最具影响力的企业。

Intelligentization is an inevitable trend of social development. Chonton aims to become the largest, strongest, and most influential enterprise in China's intelligent equipment sector.

商业理念与 客户承诺

Business Philosophy
and Customer
Commitments



**全天候技术
响应体系**

**24/7 Technical
Response System**

建立快速技术响应通道, 24小时处理客户技术咨询、故障排查需求, 同步提供现场技术支持, 保障设备正常运转。

A fast technical response channel is established to handle customer technical inquiries and troubleshooting requests 24 hours a day, with on-site technical support to ensure stable equipment operation.

**专属化定制
解决方案**

**Tailored Customized
Solutions**

结合客户生产实际需求, 量身设计设备及配套方案, 兼顾实用性与经济性, 适配不同场景落地使用。

Based on customers' actual production requirements, we design tailored equipment and supporting solutions that balance practicality and cost-effectiveness for different application scenarios.

**全维度设备
保障体系**

**Comprehensive
Equipment
Support System**

提供设备全生命周期运维、检修及升级服务, 定期排查设备隐患, 降低故障发生率, 保障生产连续性。

We provide full life-cycle operation, maintenance, inspection, and upgrade services, regularly identify potential risks, reduce failure rates, and ensure continuous production.

**客户承诺
Customer
Commitment**

坚守诚信经营, 严控设备质量, 高效落实技术服务与保障, 切实为客户降低生产运营成本、提升生产效率。

We adhere to honest operation, strictly control equipment quality, efficiently implement technical services and support, effectively reduce customers' production and operation costs, and improve production efficiency.

CORPORATE DEVELOPMENT HISTORY

企业发展历程

自2020年成立以来,苏州诚拓深耕新能源智能装备领域,以技术创新为驱动,六载砥砺,已成长为光伏、储能两大赛道智能装备整线解决方案提供商,助力新能源制造业智能化升级。

Since its founding in 2020, Suzhou Chonton has been committed to new energy intelligent equipment field. Driven by innovation, it has grown into a leading provider of turnkey line solutions for PV and energy storage equipment in six years, boosting the intelligent upgrade of new energy manufacturing.

2020 苏州诚拓正式成立,专注光伏、储能领域智能装备研发与整线交付,提供非标自动化整体解决方案,开启业务布局。

Suzhou Chonton was established, focusing on R&D and turnkey line delivery of PV and energy storage intelligent equipment, providing non-standard automated solutions and starting its business layout.

2021 聚焦光伏电池装备, HJT-500GW 高效电池量产整线成功推出并交付, 筑牢研发与工程化基础。

Focusing on PV cell equipment, the HJT-500GW high-efficiency cell mass production line was launched and delivered, laying a solid R&D and engineering foundation.

2022 客户群体拓展至光伏头部企业, 获评国家高新技术企业等资质; HJT-800GW 电池量产整线落地, 提升量产能力。

Customer base expanded to leading PV enterprises; recognized as National High-Tech Enterprise; HJT-800GW mass production line launched to enhance production capacity.

2023 获评江苏省专精特新中小企业、瞪羚企业, 成立工程技术研究中心; 苏州新制造基地投用, 推出半片 TOPCon 整线自动化装备。

Recognized as Jiangsu Specialized, Sophisticated, Distinctive and Innovative Small-Middle-Enterprise and Gazelle Enterprise; new Suzhou manufacturing base put into use; half-cell TOPCon turnkey line equipment launched.

2024 获评三星级上云企业, 加速数字化转型; 推出 BC 半片自动化整线、划片分选一体机, 跻身行业前沿。

Awarded Three-Star Cloud Enterprise, accelerating digital transformation; launched BC half-cell automation line and scribing-sorting integrated machine, leading the industry.

2025 获评上云企业、入选瞪羚计划; 发布丝网印刷线、多分片测试分选机等新品, 完善光伏装备研造体系。

Recognized as Cloud Enterprise and listed in Gazelle Plan; launched new products such as Solar Cell Screen Printing Line and multi-slice test and sort machine, improving PV equipment system.

2026 二期厂房加紧建设, 预计 2027 年投用, 扩充产能规模; 同步推出储能 PACK 整线设备, 布局光伏储能双赛道, 实现双向协同发展。

Phase-II factory is under intensive construction and scheduled for commissioning in 2027 to expand production capacity. Meanwhile, we will launch complete ESS PACK production lines, strategically positioning ourselves in both PV and energy storage sectors to achieve two-way synergistic development.

Suzhou Chonton Intelligent Equipment Co., Ltd.

苏州诚拓智能装备有限公司

PHOTOVOLTAIC SMART MANUFACTURING AUTOMATION SOLUTIONS

光伏智能制造自动化解决方案

专业提供光伏电池制造高效自动化产线, 涵盖丝网印刷线、电池片印胶线、测试分选机(半分片/四分片)及全工序自动上下料系统。全面兼容BC/HJT/TOPCon三大主流技术路线, 支持客户不同工艺平台的灵活选型与产能升级。一站式合作, 全套解决方案。

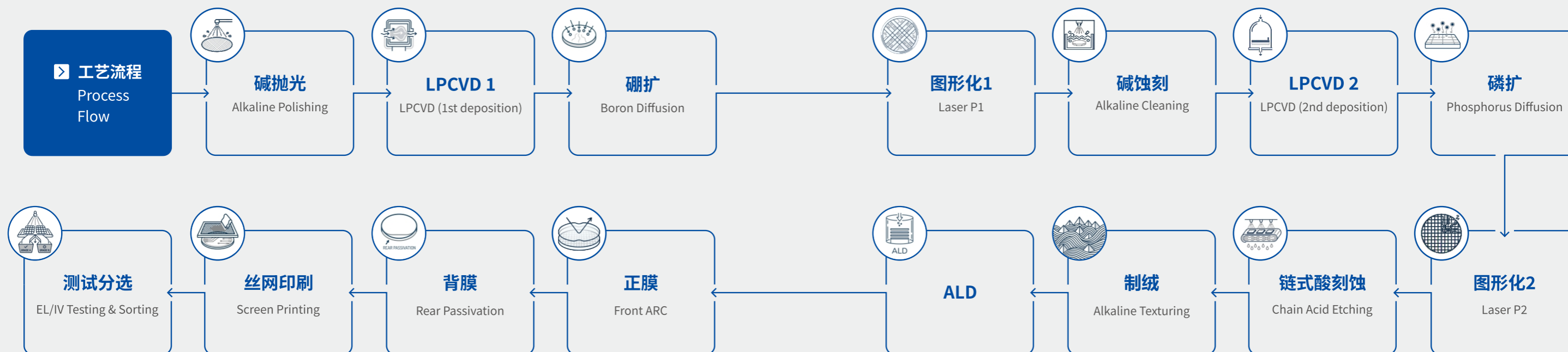
We professionally provide high-efficiency automated production lines for photovoltaic cell manufacturing, including screen printing lines, cell adhesive printing lines, testing and sorting machines (half-cut /quarter-cut), and full-process automatic loading and unloading systems. Fully compatible with the three mainstream technical routes: BC / HJT / TOPCon, supporting customers' flexible selection and capacity upgrading for different process platforms. One-stop cooperation, full set of solutions.

BC工艺全链自动化方案 Full-Chain Automation Solution for BC Cell Production Process

工艺概述 Process Overview

BC (Back Contact) 背接触电池是一种将正负电极均置于电池背面的高效电池技术。该工艺消除了正面栅线遮挡, 显著提升电池有效受光面积, 实现更高的短路电流。BC电池结合了IBC、TBC等多种技术路线, 具有转换效率高、美观性好等优势, 是高端光伏市场的首选技术。

BC (Back Contact) PV cell is a high-efficiency cell technology where both positive and negative electrodes are placed on the back side of the cell. This process eliminates the shading caused by front-side grid lines, significantly increasing the cell's effective light-receiving area and enabling higher short-circuit current. BC cells integrate various technical routes such as IBC and TBC, offering advantages like high conversion efficiency and excellent aesthetics, making them the preferred technology for the high-end photovoltaic market.



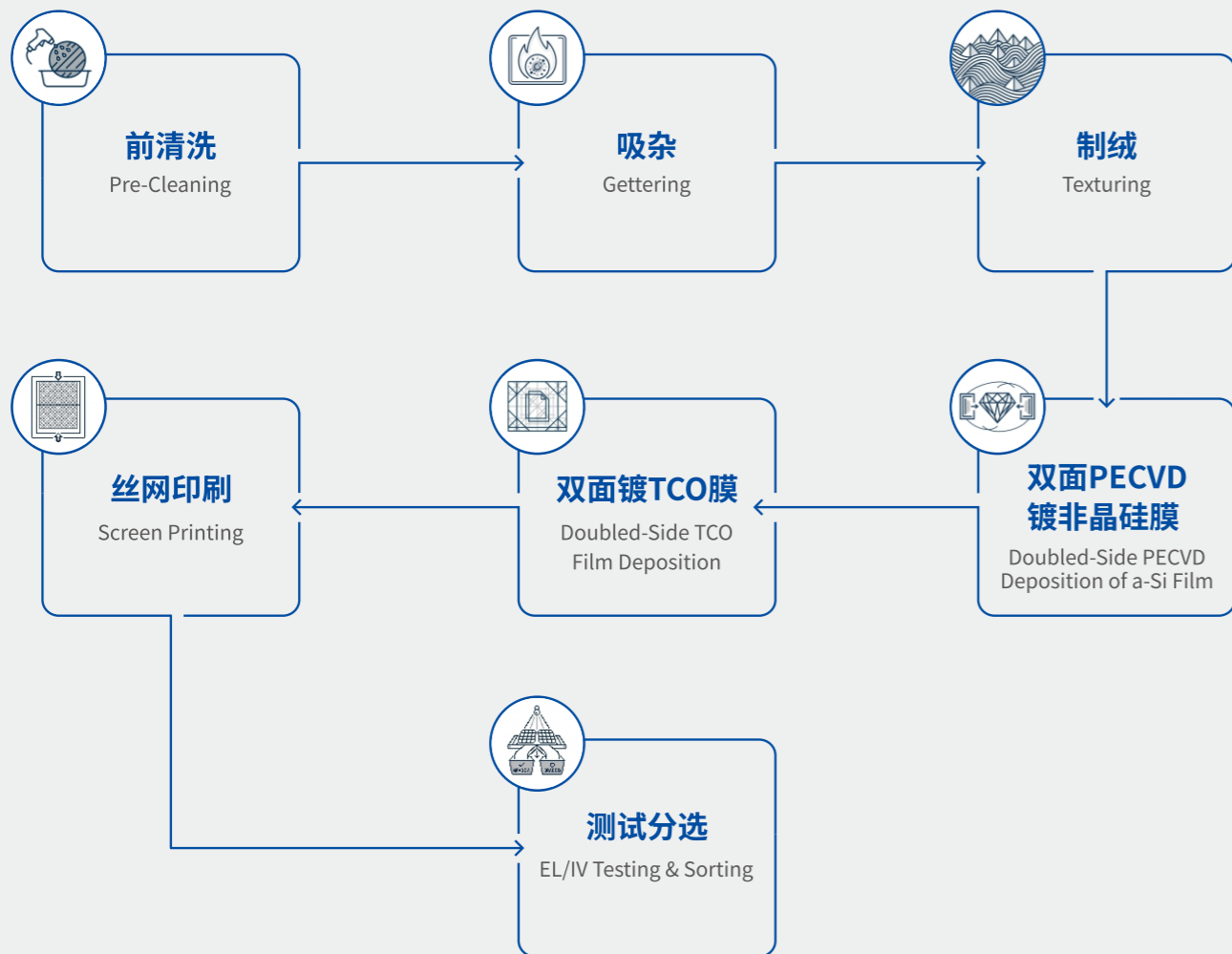
HJT工艺全链自动化方案 Full-Chain Automation Solution for HJT Cell Production Process

工艺概述 Process Overview

HJT (Heterojunction with Intrinsic Thin-layer) 异质结电池是一种结合晶体硅与非晶硅薄膜的高效电池技术。该工艺采用低温工艺路线 (<200°C), 通过在N型硅片双面沉积本征非晶硅层和掺杂非晶硅层, 形成异质结结构, 具有转换效率高、温度系数低、双面发电能力强等优势, 是目前最具发展潜力的高效电池技术之一。

HJT (Heterojunction with Intrinsic Thin-layer) is a high-efficiency cell technology combining crystalline silicon and amorphous silicon thin films. It adopts a low-temperature process (<200°C) and forms a heterojunction structure by depositing intrinsic and doped amorphous silicon layers on both sides of N-type wafers. It features high conversion efficiency, low temperature coefficient and strong bifacial power generation, making it one of the most promising high-efficiency cell technologies.

工艺流程 Process Flow



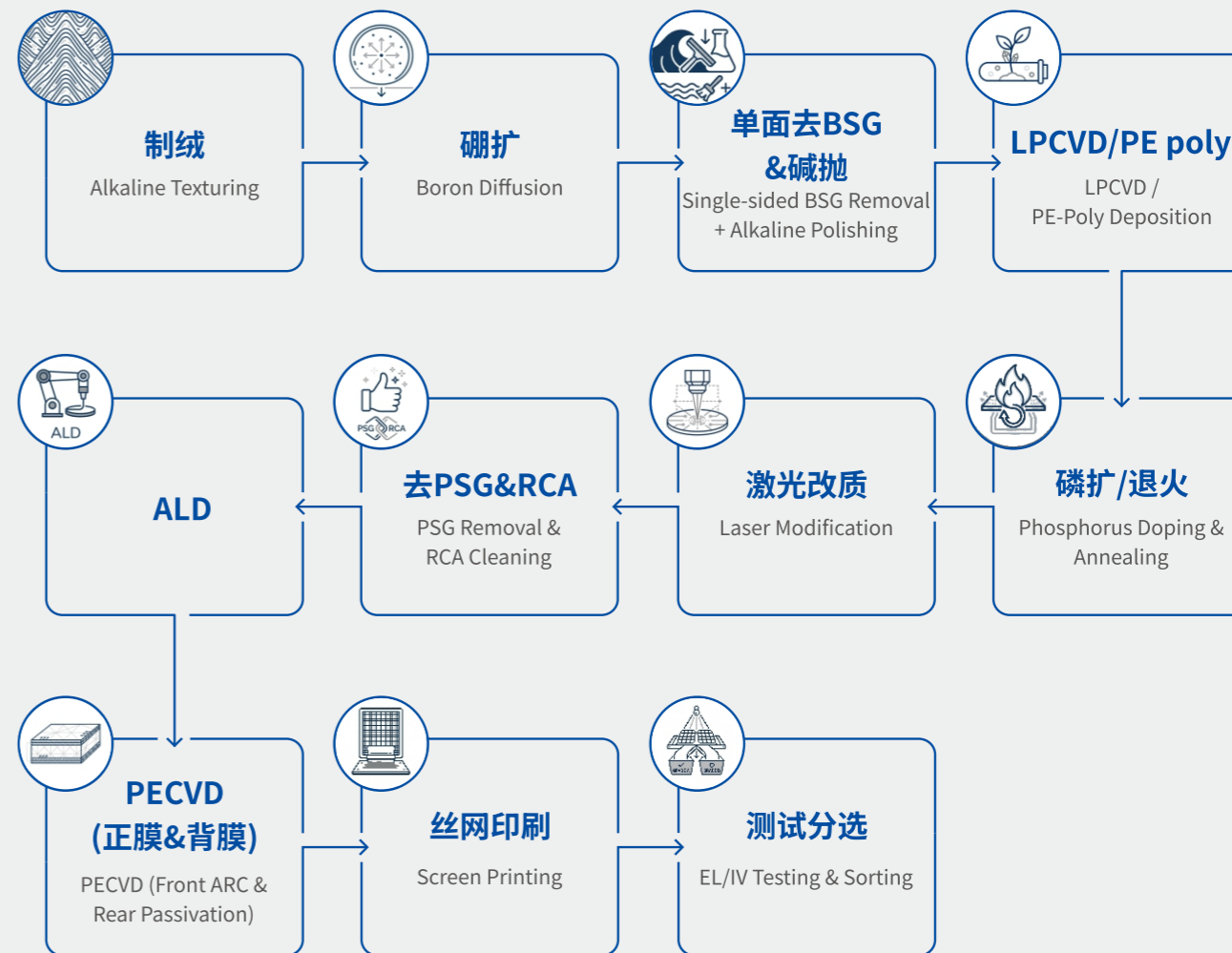
TOPCon工艺全链自动化方案 Full-Chain Automation Solution for TOPCon Cell Production Process

工艺概述 Process Overview

TOPCon (Tunnel Oxide Passivated Contact, 隧穿氧化层钝化接触) 电池是当前主流的高效N型光伏电池技术, 其核心创新在于电池背面采用超薄SiO₂隧穿层 (~1.5nm) 与掺杂多晶硅层 (Poly-Si) 组成的钝化接触结构。

TOPCon (Tunnel Oxide Passivated Contact) is a mainstream high-efficiency N-type photovoltaic cell technology. Its core innovation is a passivated contact structure composed of an ultra-thin SiO₂ tunnel layer (~1.5nm) and a doped polycrystalline silicon layer (Poly-Si) on the cell back.

工艺流程 Process Flow



丝网印刷线

Solar Cell
Screen Printing Line

±6μm

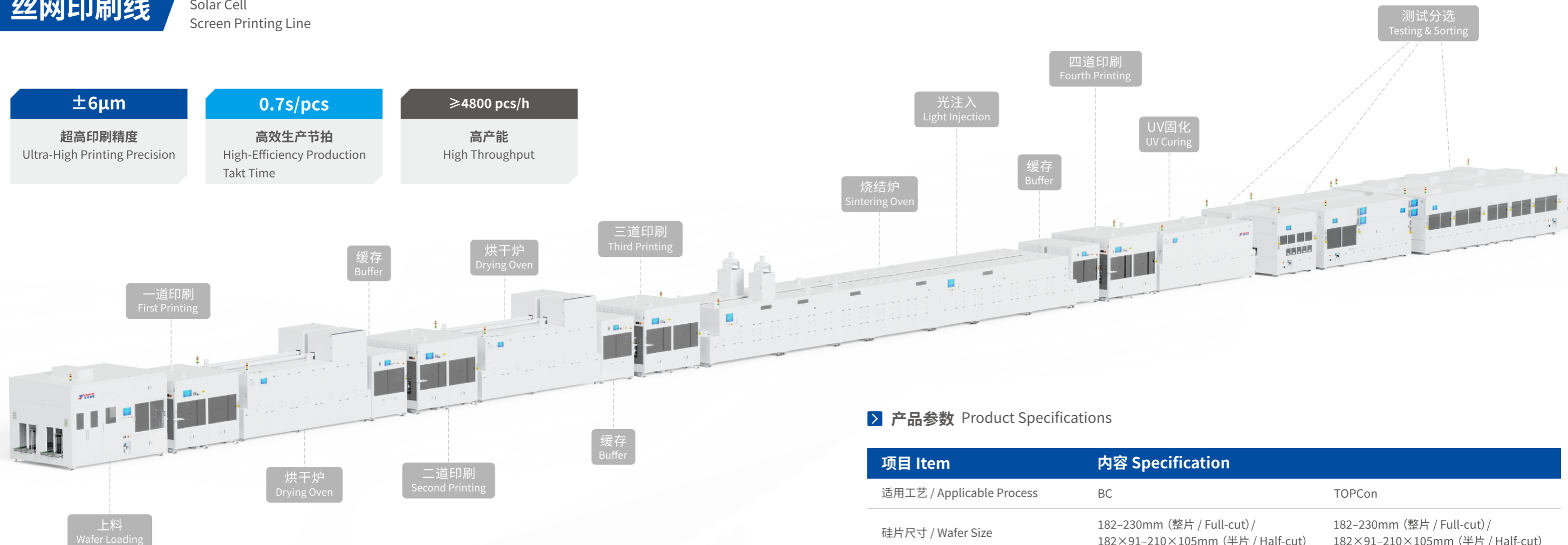
超高印刷精度
Ultra-High Printing Precision

0.7s/pcs

高效生产节拍
High-Efficiency Production Takt Time

≥4800 pcs/h

高产能
High Throughput



适用工艺 Applicable Process

BC、TOPCon

产品概述 Product Overview

本设备是用于光伏单晶硅太阳能电池的专业自动化丝网印刷生产线,集成印刷、烘干、烧结+光注入、UV固化及测试分选全工序段。通过高精度丝网印刷技术实现电池片电极的精准成型,结合高效热处理工艺与智能视觉检测系统,有效提升电池片光电转换效率与整体良率,保障大规模量产的一致性与可靠性。

This equipment is a professional automated screen printing production line for photovoltaic monocrystalline silicon solar cells, integrating the entire process flow including printing, drying, sintering + light injection, UV curing, and testing/sorting. Through high-precision screen printing technology, it achieves accurate formation of cell electrodes, combined with efficient thermal treatment processes and intelligent visual inspection systems, effectively improving the photoelectric conversion efficiency and overall yield of solar cells while ensuring consistency and reliability in mass production.

产品参数 Product Specifications

项目 Item	内容 Specification	
适用工艺 / Applicable Process	BC	TOPCon
硅片尺寸 / Wafer Size	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	≥4800 pcs/h (单轨整片 / Single track, full-cut)	≥4800 pcs/h (单轨整片 / Single track, full-cut)
碎片率/Breakage Rate	≤0.2% (不含来料 / excl. incoming)	≤0.1% (不含来料 / excl. incoming)
开机率/Uptime	≥98.5%	≥98.5%

产品优势 Product Advantages

全流程自动化集成
Full-Process Automated Integration

高精度印刷技术
High-Precision Printing Technology

龙门式稳定架构
Gantry-Style Stable Architecture

工艺广泛适应性
Broad Process Adaptability

维护便捷低能耗
Easy Maintenance and Low Energy Consumption

全流程品控体系
Full-Process Quality Control System

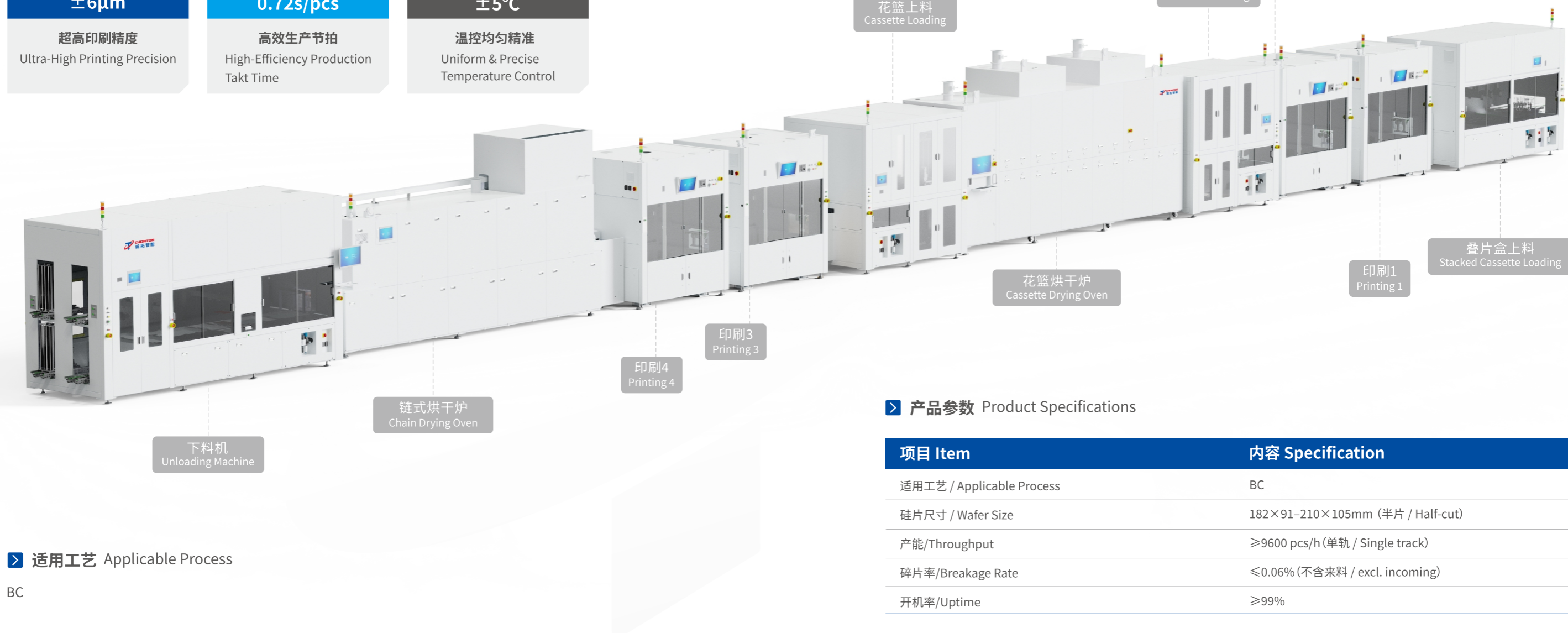
电池片印胶线

Insulation Paste
Printing Line



扫码了解详情

<p>±6μm</p> <p>超高印刷精度 Ultra-High Printing Precision</p>	<p>0.72s/pcs</p> <p>高效生产节拍 High-Efficiency Production Takt Time</p>	<p>±5°C</p> <p>温控均匀精准 Uniform & Precise Temperature Control</p>
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适用工艺 Applicable Process

BC

产品概述 Product Overview

本设备为背接触光伏电池片专用精密自动化印刷设备, 专注应用于IBC、背接触高效电池背面绝缘胶与锡膏的高精度印刷工艺, 通过精准控制胶量、图形对位与印刷一致性, 有效提升背接触电池的焊接良率与发电性能, 保障高效电池长期可靠性。

This equipment is a precision automated printing machine dedicated to back-contact (BC) PV cells, designed specifically for high-precision printing of insulation adhesive and solder paste on the rear side of IBC and other back-contact high-efficiency cells. Through precise control of adhesive volume, pattern alignment, and printing consistency, it effectively improves the welding yield and power generation performance of back-contact cells, ensuring long-term reliability of high-efficiency cells.

产品参数 Product Specifications

项目 Item	内容 Specification
适用工艺 / Applicable Process	BC
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)
产能/Throughput	≥9600 pcs/h (单轨 / Single track)
碎片率/Breakage Rate	≤0.06% (不含来料 / excl. incoming)
开机率/Uptime	≥99%

产品优势 Product Advantages

<p>背接触电池结构 Back-contact cell structure adaptation</p>	<p>保障良率与电池性能 Yield and performance assurance</p>	<p>结构稳定可靠 Stable and Reliable Structure</p>	<p>工艺兼容广泛 Broad Process Compatibility</p>
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测试分选机(双/多分片)

High-Efficiency Test & Sort Line
(Half-Cut / Multi-Busbar Half-Cell)

适用工艺 Applicable Process

BC, TOPCon

产品概述 Product Overview

通过AOI、IV/EL及PL等多个检测系统,依据检测结果对硅片完成自动分档,最终通过转运小车将料盒移送至AGV对接机或包装线,实现全流程自动化作业。该设备是光伏电池生产线的最后一道关键工序,可对电池片进行全面的质量检测与分级,确保出厂产品品质,为下游组件生产提供可靠的品质保障。

Through multiple inspection systems including AOI, IV/EL, and PL, the machine automatically sorts cells into bins based on inspection results, and finally transfers cassettes via shuttle carts to AGV docking stations or packaging lines, achieving fully automated end-to-end operation. As the last critical process in the PV cell production line, this equipment performs comprehensive quality inspection and grading of cells to ensure outgoing product quality, providing reliable quality assurance for downstream module production.

≤0.04%

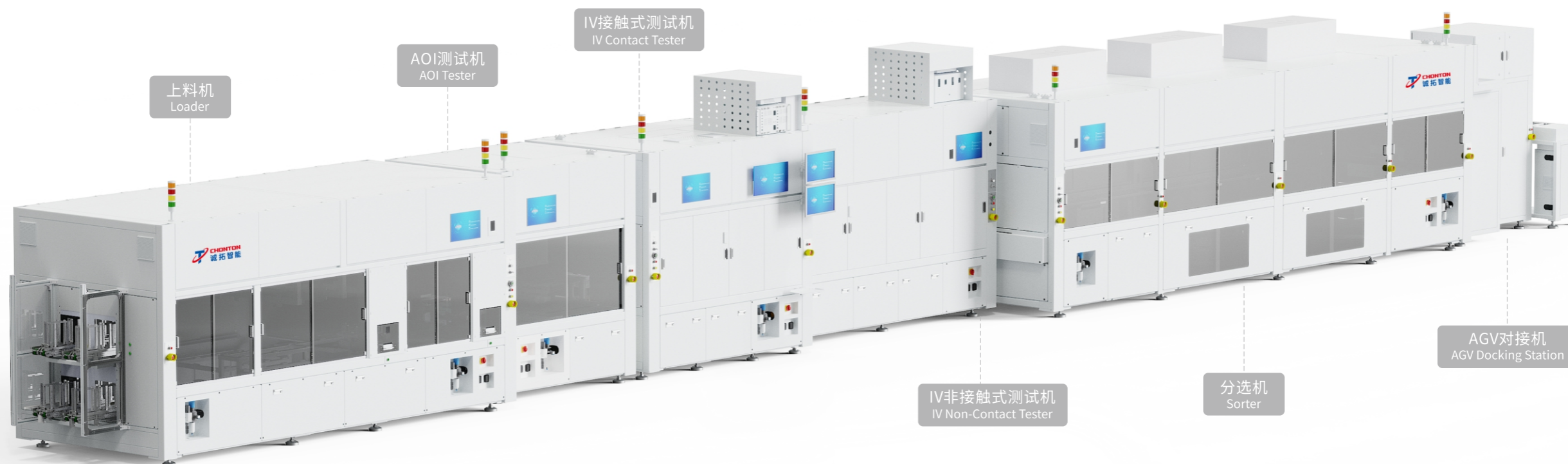
超低碎片率
Ultra-Low Breakage Rate

0.7s/pcs

高效生产节拍
High-Efficiency Production
Takt Time

top ±0.075mm
BC: ±0.02mm

定位精度
Positioning Accuracy



产品参数 Product Specifications

项目 Item	内容 Specification	
适用工艺 / Applicable Process	BC	TOPCon
硅片尺寸 / Wafer Size	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	≥5000 pcs/h (整片 / Full-cut 单轨 / Single Track)	≥4800 pcs/h (整片 / Full-cut 单轨 / Single Track)
碎片率/Breakage Rate	≤0.05% (不含来料 / excl. incoming)	≤0.04% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%

产品优势 Product Advantages



整齐收料设计
Neat Cassette Loading Design



模块化灵活配置
Modular Flexible Configuration



便捷维护保养
Convenient Maintenance



扫码了解详情

测试分选机 (四分片)

High-Efficiency Test & Sort Line
(Quarter-Cut Cell)



扫码了解详情

≤0.05%

超低碎片率

Ultra-Low Breakage Rate

0.75s/pcs

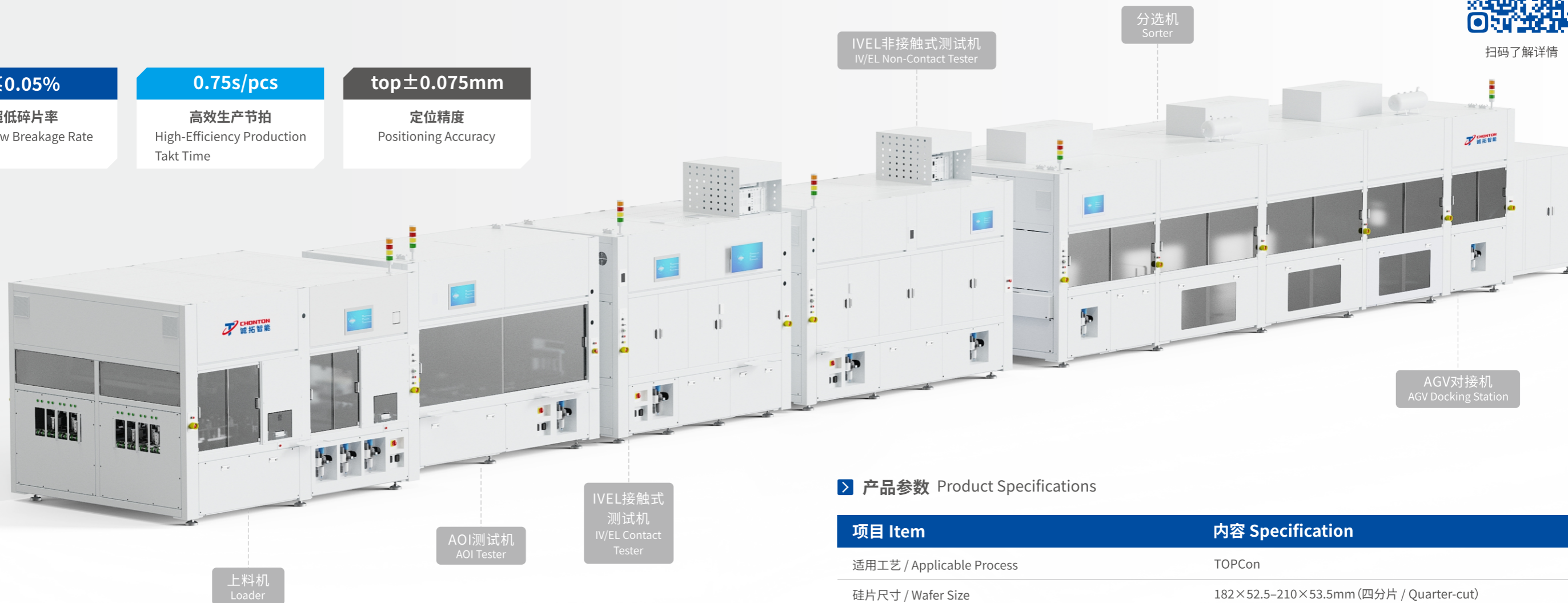
高效生产节拍

High-Efficiency Production Takt Time

top±0.075mm

定位精度

Positioning Accuracy



适用工艺 Applicable Process

TOPCon

产品概述 Product Overview

通过AOI、IV/EL及PL等多个检测系统,依据检测结果对硅片完成自动分档,最终通过转运小车将料盒送至AGV对接机或包装线,实现全流程自动化作业。该设备专为四分片电池片设计,可对四分片电池片进行全面的检测与分级,确保出厂产品品质,满足高效电池组件生产需求。

Through multiple inspection systems including AOI, IV/EL, and PL, the machine automatically sorts quarter-cut cells into bins based on inspection results, and transfers cassettes via shuttle carts to AGV docking stations or packaging lines for fully automated operation. Specially designed for quarter-cut cells, this equipment performs comprehensive quality inspection and grading to ensure outgoing product quality, meeting the production requirements of high-efficiency cell modules.

产品参数 Product Specifications

项目 Item	内容 Specification
适用工艺 / Applicable Process	TOPCon
硅片尺寸 / Wafer Size	182×52.5-210×53.5mm (四分片 / Quarter-cut)
产能/Throughput	≥4500 pcs/h (整片 / Full-cut 单轨 / Single Track)
碎片率/Breakage Rate	≤0.05% (不含来料 / excl. incoming)
开机率/Uptime	≥98%

产品优势 Product Advantages



暗箱高精度定位
Dark-Box High-Precision Positioning



智能预排列分档
Intelligent Pre-Arrangement Sorting



可视数字化调试
Visual Digital Tuning



真空吸附平稳传输
Vacuum-Adsorption Stable Transport



特殊轨道设计
Special Track

硼扩/氧化/退火/磷扩/LPCVD自动上下料系统

Diffusion / Oxidation / Annealing / Phosphorus Diffusion / LPCVD Automatic Loading & Unloading System

精密吸盘分片技术
Precision suction cup wafer separation

模块化兼容设计
Modular compatible design

智能化系统集成
Intelligent system integration



产品概述 Product Overview

IGV小车将花篮转运至花篮输送段, 机器人将花篮搬运至移栽机构并传输至插取片位, 经由龙门移栽或六轴机器人, 并搭配精密吸盘机构与智能控制系统及安全防护机制, 将硅片取出插入石英舟并搬运至工艺机。反之, 工艺完成后, 从石英舟中取出硅片插入花篮并运转下道工序。该设备可广泛应用于硼扩、氧化、退火、磷扩、LP等多种高温工艺, 实现硅片的自动化上下料作业。

IGV carts transfer cassettes to the cassette conveyor section, where robots transport cassettes to the transfer mechanism and forward them to the pick-and-place station. Via gantry transfer or 6-axis robots equipped with precision suction cups, intelligent control systems, and safety mechanisms, wafers are extracted from cassettes and loaded into quartz boats, then conveyed to the process tool. Conversely, after processing, wafers are unloaded from quartz boats into cassettes and transferred to the next process. This equipment is widely applicable to boron diffusion, oxidation, annealing, phosphorus diffusion, LP, and other high-temperature processes for automated wafer loading/unloading.

适用工艺 Applicable Process

BC、HJT、TOPCon

产品优势 Product Advantages



凸台式吸盘设计
EF-Type Raised-Platform Suction Cup



高强度框架结构
High-Strength Frame Structure



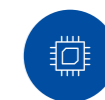
模块化兼容设计
Modular Compatible Design



风刀吹扫碎片机构
Air Knife Cleaning System



智能外接设备接口
Smart External Equipment Interface



智能化软件系统
Intelligent Software System

产品参数 Product Specifications

项目 Item	内容 Specification		
适用工艺 / Applicable Process	BC	HJT	TOPCon
硅片尺寸 / Wafer Size	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)	182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	12000 pcs/h (整片 / Full-cut) / 18000 pcs/h (半片 / Half-cut)	18000 pcs/h (半片 / Half-cut)	12000 pcs/h (整片 / Full-cut) / 20000 pcs/h (半片 / Half-cut)
碎片率/Breakage Rate	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%	≥99%

制绒自动上下料系统

Texturing Automatic Loading & Unloading System

产品概述 Product Overview

制绒上料机通过叠片盒完成硅片上料，自动将硅片插入花篮，由机械手将花篮搬运至槽式设备接驳台，实现连续稳定供片。下料机由机器人从槽式设备接驳台将花篮转运至自动化工位，经视觉检测合格后，流转至AGV系统，完成自动化下料与输送。该设备专为光伏电池制绒工艺设计，能够高效完成硅片的自动化上下料作业，大幅提升生产效率与工艺稳定性。

The texturing loading machine completes wafer loading via stacked cassettes, automatically inserting wafers into cassettes, which are then transported by robotic arms to the tank equipment docking station for continuous and stable wafer feeding. The unloading machine transfers cassettes from the tank docking station to automated stations via robots; after passing visual inspection, cassettes are routed to the AGV system for automated unloading and transport. Specially designed for PV cell texturing processes, this equipment efficiently completes automated wafer loading/unloading operations, significantly improving production efficiency and process stability.



产品参数 Product Specifications

项目 Item	内容 Specification		
适用工艺 / Applicable Process	BC	HJT	TOPCon
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)	182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	32000 pcs/h (半片 / Half-cut)	32000 pcs/h (半片 / Half-cut)	16000 pcs/h (整片 / Full-cut) / 32000 pcs/h (半片 / Half-cut)
碎片率/Breakage Rate	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%	≥99%

产品优势 Product Advantages

- 低碎片率设计 Low Breakage Rate Design
- 机器人搬运系统 Robot Handling System
- 可视化风刀系统 Visual Air Knife System
- 高强度框架结构 High-Strength Frame
- 高精度传片控制 High-Precision Wafer Transfer
- 自动补片功能 Auto Wafer Supplement

高效自动化上下料
High-efficiency automated loading/unloading

低碎片率保障
Low breakage rate assurance

多工艺路线兼容
Multi-process route compatibility

适用工艺 Applicable Process

BC、HJT、TOPCon

管式PECVD自动上下料系统

Tube PECVD Automatic Loading & Unloading System

四吸嘴稳固搬运

Four-nozzle suction head for stable handling

机器人高效路径

Efficient robot path planning

智能化系统集成

Intelligent system integration



适用工艺 Applicable Process

BC, TOPCon

产品概述 Product Overview

AGV小车将来料花篮经皮带线输送至花篮提升机构，硅片通过硅片跑道传送到变截距机构；由机器人将硅片从变距机构取出，置入待工艺石墨舟，完成自动上料。下料时，机器人从已完成工艺的石墨舟中取片，放回变距机构，硅片经跑道输送入花篮，实现自动下料。该设备专为管式PECVD工艺设计，可实现硅片在花篮与石墨舟之间的精准转换，确保镀膜工艺的高效稳定运行。

AGV carts deliver incoming cassettes via belt conveyor to the cassette elevator mechanism. Wafers are conveyed through the wafer track to the pitch-changing mechanism. A robot picks wafers from the pitch-changing mechanism and places them into process-ready graphite boats, completing automatic loading. During unloading, the robot extracts wafers from processed graphite boats and returns them to the pitch-changing mechanism; wafers are then conveyed via tracks into cassettes for automatic unloading. Specially designed for tube PECVD processes, this equipment achieves precise conversion of wafers between cassettes and graphite boats, ensuring efficient and stable coating operation.

产品参数 Product Specifications

项目 Item	内容 Specification	
适用工艺 / Applicable Process	BC	TOPCon
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut)
产能 / Throughput	16000 pcs/h (半片 / Half-cut)	7500 pcs/h (整片 / Full-cut)
碎片率 / Breakage Rate	≤0.03% (不含来料 / excl. incoming)	≤0.03% (不含来料 / excl. incoming)
开机率 / Uptime	≥99%	≥99%

产品优势 Product Advantages



四吸嘴稳固搬运 Four-Nozzle Stable Handling



机器人高效路径 Efficient Robot Path



MES系统集成 MES System Integration



智能化管理 Intelligent Management

ALD自动上下料系统

ALD Automatic Loading & Unloading System

精密吸盘分片技术

Precision suction cup separation

模块化兼容设计

Modular compatible design

智能化系统集成

Intelligent system integration



产品概述 Product Overview

IGV小车将花篮转运至花篮输送段, 机器人将花篮搬运至移载机构并传输至插取片位, 经由龙门移载或六轴机器人, 并搭配精密吸盘机构与智能控制系统及安全防护机制, 将硅片取出插入石英舟并搬运至工艺机。反之, 工艺完成后, 从石英舟中取出硅片插入花篮并运转下道工序。该设备专为ALD原子层沉积工艺设计, 可实现硅片在石英舟与花篮之间的精准转换, 确保ALD工艺的高效稳定运行。

IGV carts transfer cassettes to the conveyor section, robots transport cassettes to the transfer mechanism and forward them to the pick-and-place station. Via gantry transfer or 6-axis robots equipped with precision suction cups and intelligent control systems, wafers are extracted from cassettes, loaded into quartz boats, and conveyed to process tools. After processing, wafers are unloaded from quartz boats into cassettes and transferred to the next process. Specially designed for ALD (Atomic Layer Deposition) processes, this equipment achieves precise conversion of wafers between quartz boats and cassettes, ensuring efficient and stable ALD operation.

适用工艺 Applicable Process

BC、TOPCon

产品参数 Product Specifications

项目 Item	内容 Specification	
适用工艺 / Applicable Process	BC	TOPCon
硅片尺寸 / Wafer Size	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	16000 pcs/h (整片 / Full-cut) / 20000 pcs/h (半片 / Half-cut)	16000 pcs/h (整片 / Full-cut) / 20000 pcs/h (半片 / Half-cut)
碎片率/Breakage Rate	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%

产品优势 Product Advantages



凸台式吸盘设计
EF-Type Raised-Platform Suction Cup



高强度框架结构
High-Strength Frame Structure



风刀吹扫碎片机构
Air Knife Debris Blowing



模块化兼容设计
Modular Compatible Design



智能外接设备接口
Smart External Equipment Interface



智能化软件系统
Intelligent Software System

槽式自动上下料系统

Wet Cassette Automatic Loading & Unloading System

智能AGV对接

Smart AGV docking

视觉检测保障

Visual inspection assurance

高效自动化作业

High-efficiency automated operation



> 产品参数 Product Specifications

项目 Item	内容 Specification		
适用工艺 / Applicable Process	BC	HJT	TOPCon
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)	182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	32000 pcs/h (半片 / Half-cut)	32000 pcs/h (半片 / Half-cut)	16000 pcs/h (整片 / Full-cut) / 32000 pcs/h (半片 / Half-cut)
碎片率/Breakage Rate	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%	≥99%



> 适用工艺 Applicable Process

BC、HJT、TOPCon

> 产品概述 Product Overview

槽式上料机接收AGV输送的花篮，传输至自动化工位，由机器人自动搬运至槽式设备接驳台，实现高效上料。下料机由机器人从槽式设备接驳台将花篮转运至自动化工位，经视觉检测后流转至AGV，实现自动化出料与智能转运。该设备专为光伏电池槽式工艺设计，可广泛应用于清洗、制绒、刻蚀等多种槽式处理工序。

The tank loading machine receives cassettes from AGV transport, conveys them to automated stations, and robots automatically transfer cassettes to tank equipment docking stations for efficient loading. The unloading machine transfers cassettes from tank docking stations to automated stations via robots; after visual inspection, cassettes are routed to AGVs for automated discharge and intelligent transfer. Specially designed for PV cell tank processes, it is widely applicable to cleaning, texturing, etching, and other tank-based treatment processes.

> 产品优势 Product Advantages



机器人高效搬运
Efficient Robot Handling



花篮带液检测
Cassette Liquid Detection



高强度框架结构
High-Strength Frame

链式自动上下料系统

Chain Conveyor Automatic Loading & Unloading System

适用工艺 Applicable Process

BC、HJT、TOPCon

产品概述 Product Overview

链式上料机接收AGV输送的花篮，传输至自动化工位，将花篮内硅片逐排取出，经检测模块完成不良品剔除后，整排硅片精准送入链式机。中转机将链式机出料的整排硅片，按工艺要求分收入对应花篮，由机器人将花篮搬运至槽式设备接驳台。下料机由机器人从槽式设备接驳台将花篮转运至自动化工位，经视觉检测后流转至AGV，实现全流程闭环自动化生产。

The chain loading machine receives AGV-delivered cassettes, conveys them to automated stations, and extracts wafers from cassettes row by row. After defect rejection via inspection modules, complete rows of wafers are precisely fed into the chain machine. The transfer machine sorts complete rows of wafers from the chain machine output into corresponding cassettes per process requirements, with robots transporting cassettes to tank equipment docking stations. The unloading machine transfers cassettes from tank docking stations to automated stations via robots; after visual inspection, cassettes are routed to AGVs, achieving fully automated closed-loop production.

整排精准传输

Precision row-by-row transport

闭环自动化生产

Closed-loop automated production

流片不停机功能

Non-stop wafer processing

链式上料
Chain-type Loading

产品参数 Product Specifications

项目 Item	内容 Specification		
适用工艺 / Applicable Process	BC	HJT	TOPCon
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)	182×91-210×105mm (半片 / Half-cut)	182-230mm (整片 / Full-cut) / 182×91-210×105mm (半片 / Half-cut)
产能/Throughput	28000 pcs/h (半片 / Half-cut)	28000 pcs/h (半片 / Half-cut)	14000 pcs/h(整片 / Full-cut) / 28000 pcs/h(半片 / Half-cut)
碎片率/Breakage Rate	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)	≤0.02% (不含来料 / excl. incoming)
开机率/Uptime	≥99%	≥99%	≥99%

产品优势 Product Advantages



直流传输设计
DC Transfer Design



伺服精密控制
Precision Servo Control



流片不停机功能
Non-stop wafer processing



机器人灵活搬运
Flexible Robot Handling



高强度框架结构
High-Strength Frame



自动补片功能
Auto Wafer Supplement

链式中转
Chain-type Transfer

链式下料
Chain-type Unloading



PVD自动上下料系统

PVD Automatic Loading & Unloading System

高精度纠偏定位

High-precision correction positioning

线接触无损传输

Line-contact damage-free transport

模块化快速维护

Modular quick maintenance



适用工艺 Applicable Process

HJT

产品优势 Product Advantages



线接触无损传输
Line-Contact Damage-Free Transport



稳定载板输送
Stable Carrier Transport



高精度纠偏定位
High-Precision Correction



模块化快速维护
Modular Quick Maintenance



视觉定位可靠性
Vision Positioning Reliability

产品概述 Product Overview

自动将花篮内的硅片取出,经检测机构检测,通过相机拍照定位载板穴位与硅片位置,经过高精度纠偏机器人将硅片放置在载板穴位内。该设备专为PVD物理气相沉积工艺设计,可实现硅片从花篮到载板的精准转换,确保PVD镀膜工艺的高效稳定运行,是光伏电池TCO镀膜工序的关键自动化装备。

Automatically extracts wafers from cassettes, inspects them via inspection mechanisms, and uses camera positioning to locate carrier slot positions and wafer positions. High-precision correction robots then place wafers into carrier slots. Specially designed for PVD (Physical Vapor Deposition) processes, this equipment achieves precise conversion of wafers from cassettes to carriers, ensuring efficient and stable PVD coating operation. It is a key piece of automation equipment for the PV cell TCO coating process.

产品参数 Product Specifications

项目 Item	内容 Specification
适用工艺 / Applicable Process	HJT
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)
产能/Throughput	25000 pcs/h
碎片率/Breakage Rate	≤0.05% (不含来料 / excl. incoming)
开机率/Uptime	≥99%

PECVD自动上下料系统

PECVD Automatic Loading & Unloading System

适用工艺 Applicable Process

HJT

产品概述 Product Overview

自动将花篮内的硅片取出,经检测机构检测,通过相机拍照定位载板穴位与硅片位置,经过高精度纠偏机器人将硅片放置在载板穴位内。该设备专为PECVD等离子体增强化学气相沉积工艺设计,可实现硅片从花篮到载板的精准转换,确保PECVD镀膜工艺的高效稳定运行,是光伏电池镀膜工序的关键自动化装备。

Automatically extracts wafers from cassettes, inspects them, and uses camera positioning to locate carrier slots and wafer positions. High-precision correction robots place wafers into carrier slots. Specially designed for PECVD (Plasma-Enhanced Chemical Vapor Deposition) processes, this equipment achieves precise conversion of wafers from cassettes to carriers, ensuring efficient and stable PECVD coating operation. It is key automation equipment for the PV cell coating process.

高精度纠偏定位

High-precision correction positioning

线接触无损传输

Line-contact damage-free transport

模块化快速维护

Modular quick maintenance

产品参数 Product Specifications

项目 Item	内容 Specification
适用工艺 / Applicable Process	HJT
硅片尺寸 / Wafer Size	182×91-210×105mm (半片 / Half-cut)
产能/Throughput	25000 pcs/h
碎片率/Breakage Rate	≤0.1% (不含来料 / excl. incoming)
开机率/Uptime	≥99%

产品优势 Product Advantages



线接触无损传输

Line-Contact Damage-Free Transport



高精度纠偏定位

High-Precision Correction



模块化快速维护

Modular Quick Maintenance



视觉定位可靠性

Vision Positioning Reliability



智能装备专家
Expert in Intelligent Equipment

CHONTON

AUTOMATION ESS SOLUTIONS

储能自动化系统解决方案

专业提供储能应用高效自动化产线, 涵盖 PACK 入簇机、PACK 自动化产线及智能储能柜系统线。一站式合作, 全套解决方案。

We professionally provide high-efficiency automated production lines for energy storage applications, including PACK rack-in machines, PACK automation lines and intelligent energy storage cabinet system lines. One-stop cooperation, full set of solutions.

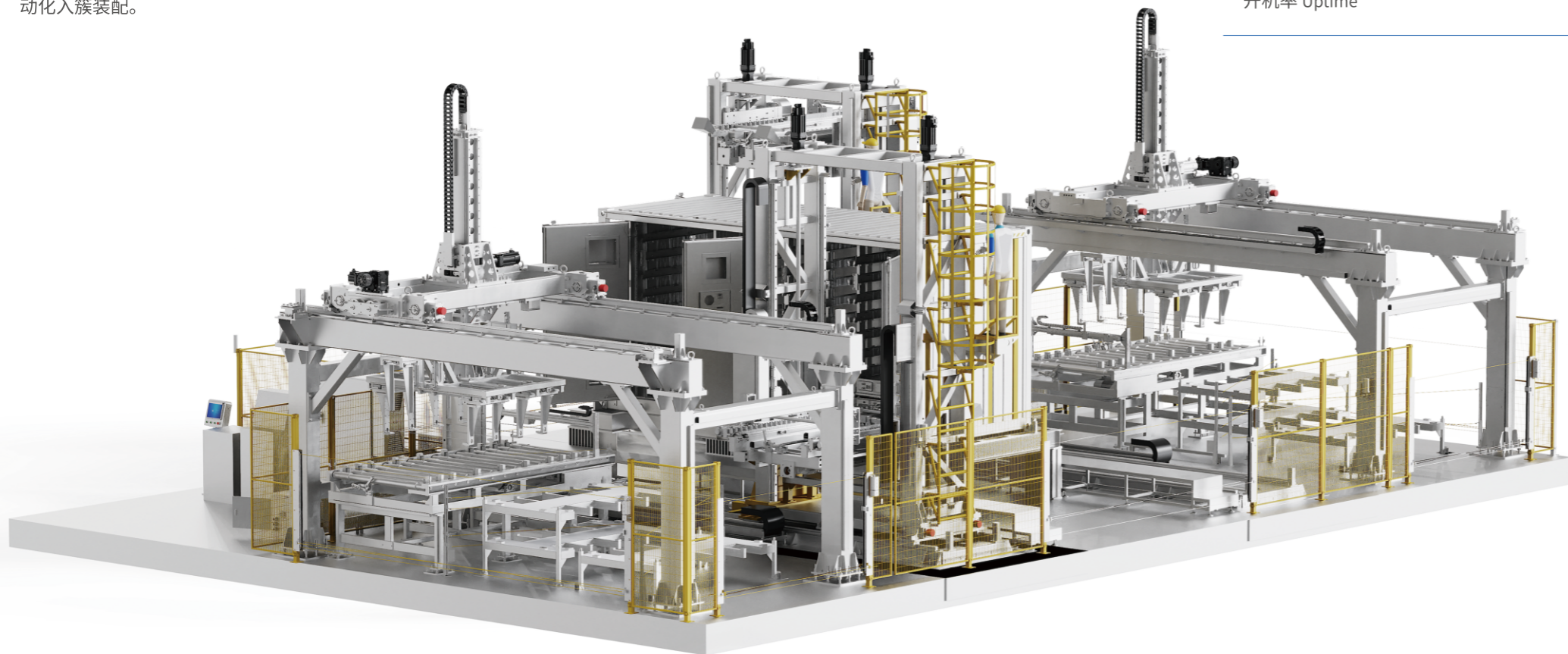
PACK入簇机

PACK Rack-In Machine

产品概述 Product Overview

PACK包由循环上料机或AGV自动输送至电池包装配系统, 经精准定位后, 设备依据视觉纠偏系统检测数据自动完成姿态校正与位置微调; 随后通过输送链将PACK包平稳送入电池架, 由末端推臂机构将其可靠推入并精准就位, 实现全流程自动化入簇装配。

PACK units are automatically conveyed to the battery rack assembly system by a cyclic loader or AGV. After precise positioning, the equipment automatically completes posture correction and fine positioning based on vision correction system data. The PACK unit is then smoothly fed into the battery rack via a conveyor chain, and reliably pushed into precise position by the end push arm mechanism, realizing fully automated rack-in assembly.



产品参数 Product Specifications

项目 Item	内容 Specification
电芯规格 Cell Specification	280Ah、314Ah、587Ah
产能 Throughput	60分钟/台 60 min/rack
故障率 Failure Rate	≤1%
开机率 Uptime	≥99%

产品优势 Product Advantages



全流程自动化作业
Fully Automated Operation



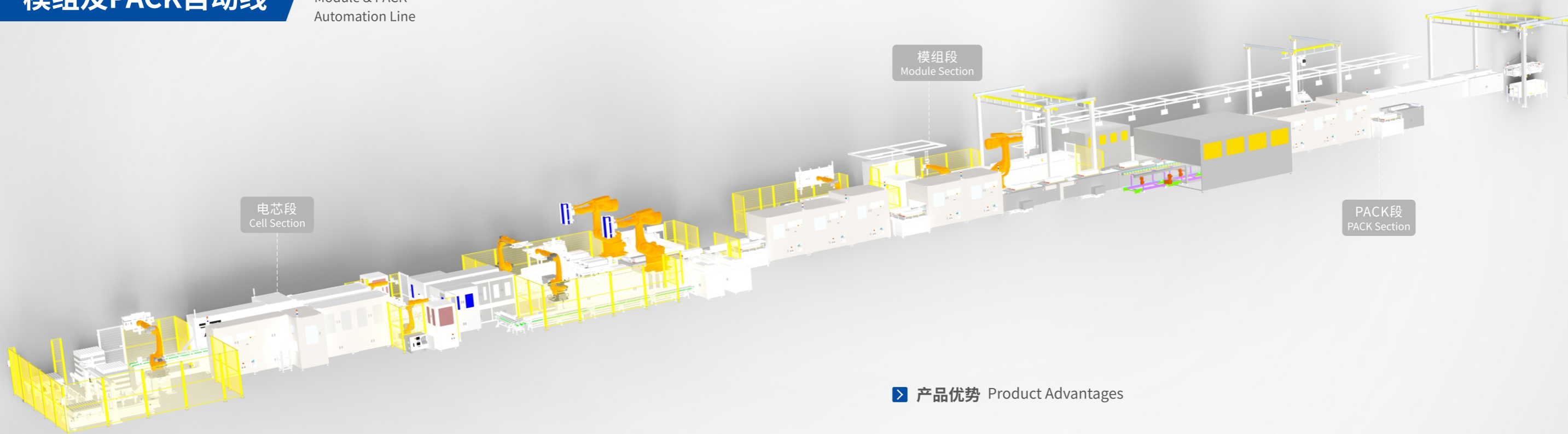
智能自动润滑维护
Intelligent Auto-Lubrication



高可靠入簇保障
High-Reliability Rack-In

模组及PACK自动线

Module & PACK Automation Line



产品优势 Product Advantages



强兼容多规格适配
Multi-Specification Compatibility



全流程数据可追溯
Full-Process Data Traceability



模块化柔性设计
Modular Flexible Design

产品概述 Product Overview

本PACK自动化生产线覆盖方形铝壳电芯上线至成品PACK下线全流程工序,集成自动上料、电芯预处理、模组预堆叠、模组端板刻码、模组焊前安规检测、极柱寻址定位、极柱清洗、ICCS安装、汇流排焊接、模组自动清洁、模组自动入箱、PACK总成装配及PACK-EOL综合性能测试等智能化工站,实现储能PACK制造全流程自动化、标准化与品质可控化。

This PACK automated production line covers the full process from prismatic aluminum-case cell loading to finished PACK offline. It integrates intelligent stations including automatic loading, cell pre-treatment, module pre-stacking, module end plate coding, pre-soldering safety testing, pole positioning, pole cleaning, ICCS installation, busbar welding, automatic module cleaning, automatic module boxing, PACK assembly and PACK-EOL comprehensive performance testing, enabling fully automated, standardized, and quality-controlled manufacturing for energy storage PACKs.

产品参数 Product Specifications

项目 Item	内容 Specification
电芯规格 Cell Specification	280Ah, 314Ah, 587Ah
产能 Throughput	20 PPM
故障率 Failure Rate	≤2%
开机率 Uptime	≥99%

智能储能柜系统线

Intelligent Container
ESS Production Line

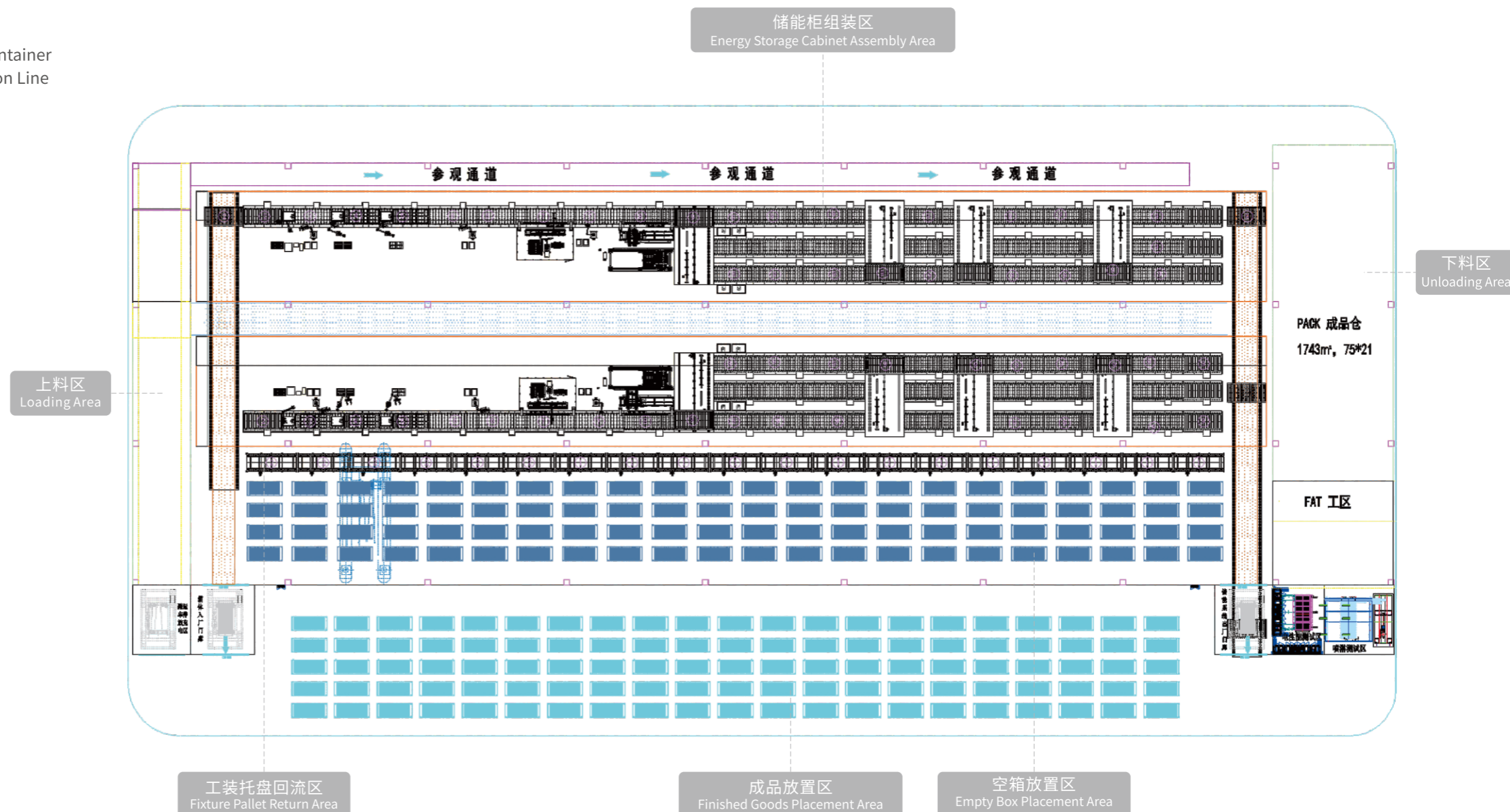
产品概述 Product Overview

储能系统集成线——面向集装箱式储能柜生产的高效自动化产线解决方案,实现从PACK入箱到成品下线的全流程智能管控。

Energy storage system integration line — a high-efficiency automated production line solution for containerized energy storage cabinet manufacturing, realizing full-process intelligent control from PACK boxing to finished product unloading.

产品参数 Product Specifications

项目 Item	内容 Specification
电芯规格 Cell Specification	314Ah、587Ah
产能 Throughput	10箱/线/天 10 containers/line/day



产品优势 Product Advantages



柔性物流设计
滚筒输送线 + RGV智能调度小车

Flexible Logistics Design
The entire line uses roller conveyor + RGV smart scheduling carts



产品防护到位
全程采用专用工装隔离

Product Protection
Lstated with dedicated Fixture throughput the process



高度自动化
整线用工控制在18人以内

High Automation
Total line headcount controlled within 18 persons



稳定高产能
单线日产10箱

Stable High Throughput
Single line daily output of 10 containers



扫码了解详情

INTELLIGENT PACKAGING & WAREHOUSING

智能包装与智能仓储

自动化包装线: 面向硅棒机加后下料至码垛全流程的一站式自动化解决方案。

Automatic Packaging Line: One-stop automated solutions covering the entire process from silicon rod machining unloading to palletizing.

硅棒自动化包装线

Silicon Rod Automated Packaging Line

对接硅棒机加自动化设备, 实现硅棒清洁、自动检测 (边距、直径、弧长投影、垂直度)、自动配棒及机器人码垛、AGV转运

Integrated with silicon rod machining automation for cleaning, auto inspection (edge distance, diameter, arc projection, perpendicularity), automatic rod pairing, robot palletizing, and AGV transfer

节省人力16人/线, 配套WMC&WCS系统, 实现智能调度和信息上传MES

Labor saving: 16 workers/line; integrated with WMC&WCS systems for intelligent scheduling and MES data upload

产品参数 Product Specifications

项目 Item	内容 Specification
正常运行时间 Uptime	≥98%
节拍 Takt	≤50s/根 (rod)
兼容硅棒尺寸 Compatible rod size	182-230mm (W×H)
兼容长度 Length	180-850mm
测量精度 Measurement precision	边距 ≤0.02mm, 端面垂直度 ≤0.15mm (Margin ≤0.02mm, End face perpendicularity ≤0.15mm)
配棒库位 Rod storage	≥300根 (rod)
码垛库位 Palletizing	≥24托位 (pallet)
成品库位 Finished goods	≥140托 (pallet)

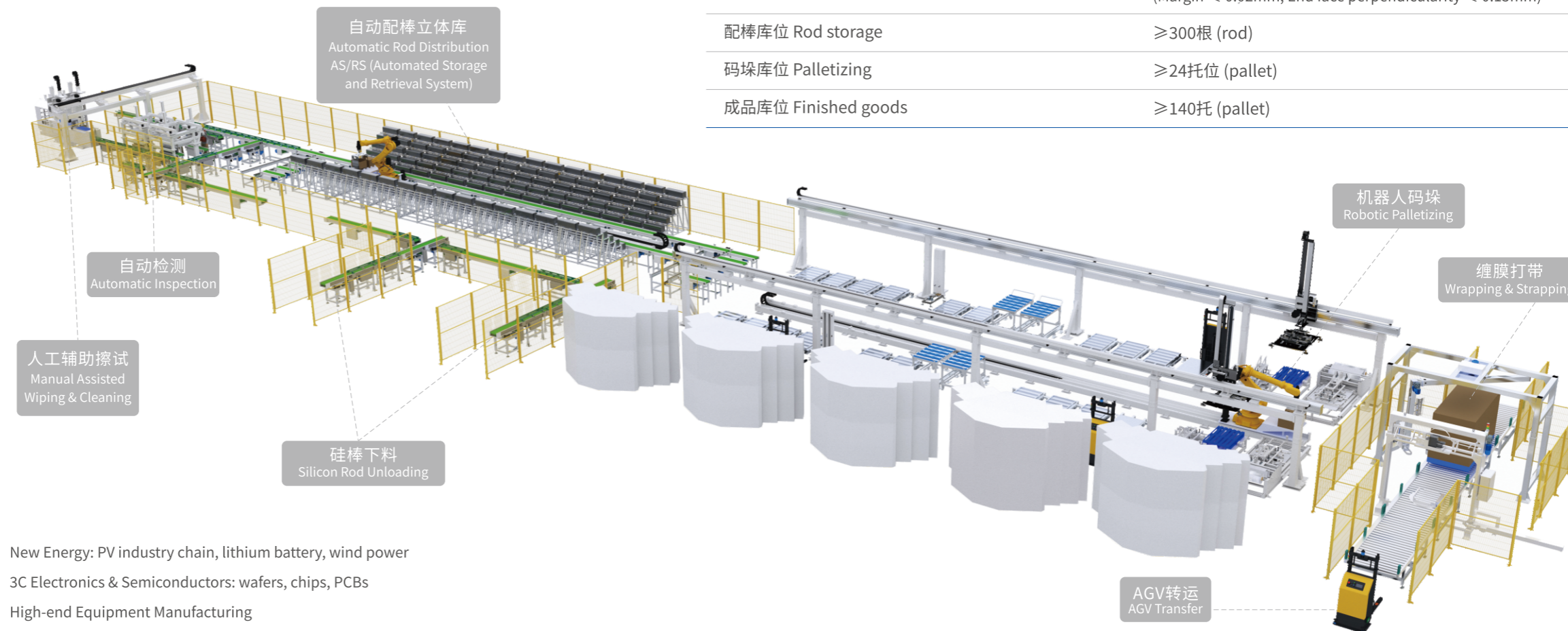
产品概述 Product Overview

硅棒包装线专为硅棒 (多晶硅棒、单晶硅棒) 设计, 可实现从硅棒分拣、检测、缓冲、包装到码垛入库的全流程无人化操作, 适配不同规格硅棒, 解决人工包装污染风险高、效率低、破损率高的行业痛点。

The silicon rod packaging line is specially designed for silicon rods (polycrystalline and monocrystalline silicon rods). It realizes unmanned operation throughout sorting, testing, buffering, packaging and palletizing, adapts to various rod sizes, and solves industry pain points of high pollution risk, low efficiency and high damage rate in manual packaging.

产品应用 Product Applications

新能源行业: 光伏产业链、锂电、风电
3C电子与半导体: 晶圆/芯片/电路板
高端装备制造



New Energy: PV industry chain, lithium battery, wind power
3C Electronics & Semiconductors: wafers, chips, PCBs
High-end Equipment Manufacturing

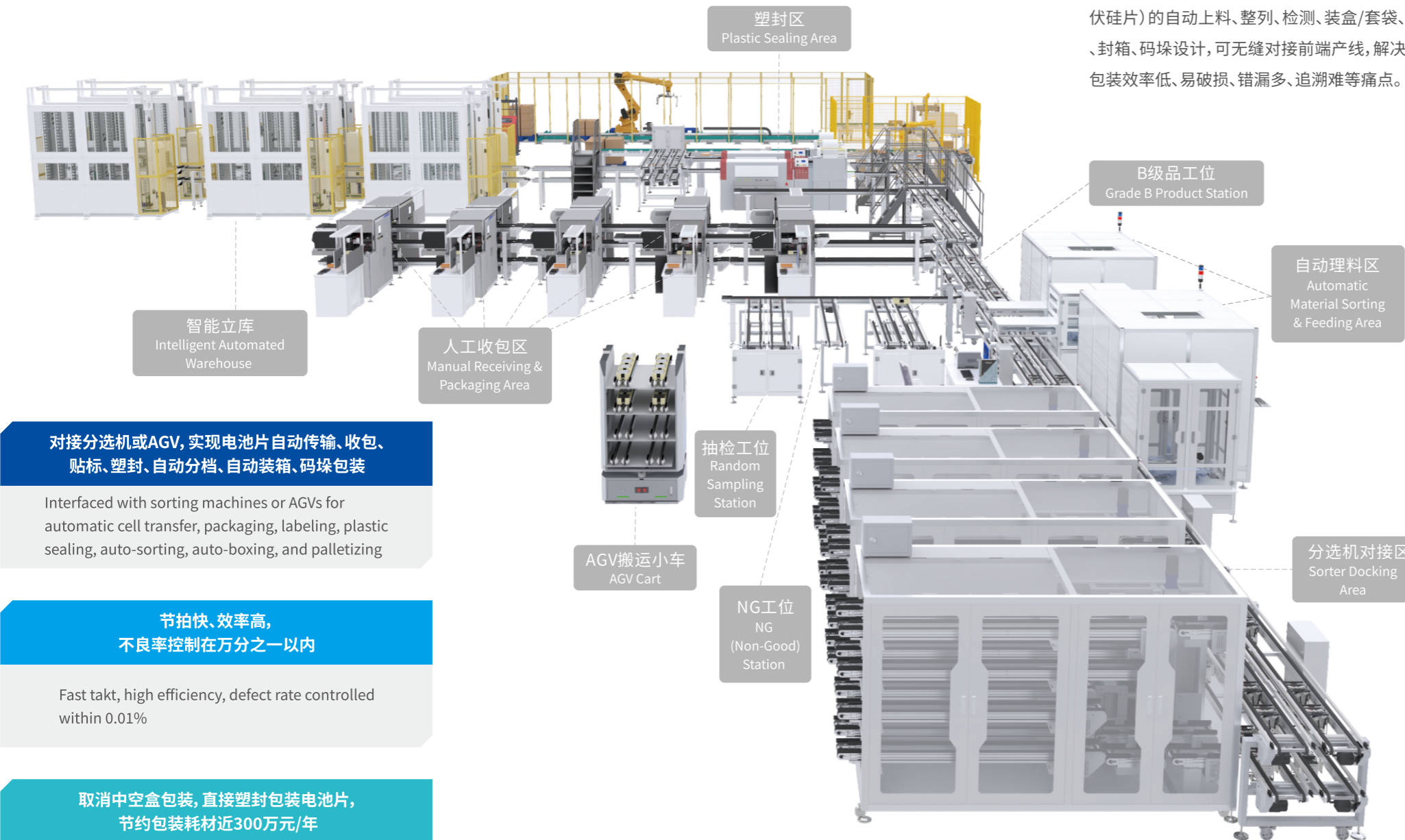
电池片自动化包装线

Solar Cell Automated Packaging Line

产品概述 Product Overview

电池片自动包装线是光伏行业实现全流程无人化、标准化、高效化的智能包装系统，专为电池片（光伏硅片）的自动上料、整列、检测、装盒/套袋、贴标、封箱、码垛设计，可无缝对接前端产线，解决人工包装效率低、易破损、错漏多、追溯难等痛点。

The solar cell automated packaging line is an intelligent packaging system for full-process unmanned, standardized and efficient operation in the photovoltaic industry. Specially designed for automatic loading, alignment, testing, cartoning/bagging, labeling, sealing and palletizing of solar cells (photovoltaic wafers), it seamlessly connects with front-end lines and solves pain points such as low efficiency, easy damage, frequent errors and difficult traceability in manual packaging.



对接分选机或AGV, 实现电池片自动传输、收包、贴标、塑封、自动分档、自动装箱、码垛包装
 Interfaced with sorting machines or AGVs for automatic cell transfer, packaging, labeling, plastic sealing, auto-sorting, auto-boxing, and palletizing

节拍快、效率高, 不良率控制在万分之一以内
 Fast takt, high efficiency, defect rate controlled within 0.01%

取消中空盒包装, 直接塑封包装电池片, 节约包装耗材近300万元/年
 Eliminates hollow box packaging, uses direct plastic sealing, saving approximately USD 450,000 per year in packaging materials

配套WMC&WCS系统, 实现智能调度和信息上传MES
 Integrated with WMC&WCS for intelligent scheduling and MES data upload

产品参数 Product Specifications

项目 Item	内容 Specification
正常运行时间 Uptime	≥99%
碎片率 Breakage	≤0.01%
传输节拍 Transfer takt	≤4.2s/盒 (box)
装箱节拍 Boxing takt	≤55s/箱 (case)
码垛节拍 Palletizing	≤25min/托 (pallet)
硅片尺寸 Wafer Size	Full-Cell 182×182mm / 210×210mm; Half-Cut 182×91mm / 210×105mm
电池片库位 Cell storage	≥3780包 (packages)
码垛库位 Palletizing	≥24托位 (torus)

产品应用 Product Applications

新能源行业: 光伏产业链、锂电、风电
 3C电子与半导体: 晶圆/芯片/电路板
 高端装备制造: 半导体

New Energy: PV industry chain, lithium battery, wind power
 3C Electronics & Semiconductors: wafers, chips, PCBs
 High-end Equipment Manufacturing: Semiconductors

组件自动化包装线

Module Automated Packaging Line

对接叉车上料、传输、人工套围板、自动打带&放护角、自动扫码贴标、自动缠膜&覆膜

Forklift loading, conveying, manual corner board installation, automatic strapping & corner protection, auto barcode scanning & labeling, auto stretch & shrink wrapping

可选配AGV上料、下料以及叠托包装等功能

Optional AGV loading/unloading and stacked pallet packaging

配套WMC&WCS系统，实现智能调度和信息上传MES

Integrated with WMC&WCS for intelligent scheduling and MES data upload

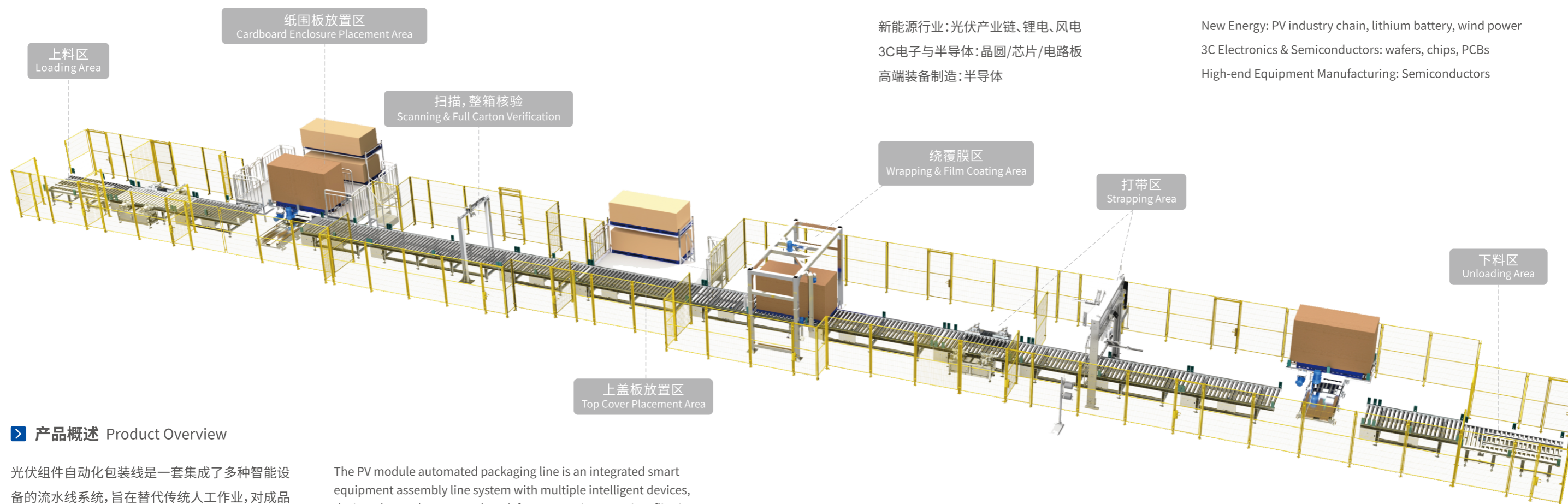
产品参数 Product Specifications

项目 Item	内容 Specification
正常运行时间 Uptime	≥99%
节拍 Takt	≤90s/托 (pallet)
传输速度 Speed	≥12m/min
兼容组件规格 Module size	2600×1150×1500mm
兼容重量 Weight	1500kg/托 (pallet)
输送线高度 Line height	600mm±50mm
控制系统 Control	PC+PLC

产品应用 Product Applications

新能源行业：光伏产业链、锂电、风电
3C电子与半导体：晶圆/芯片/电路板
高端装备制造：半导体

New Energy: PV industry chain, lithium battery, wind power
3C Electronics & Semiconductors: wafers, chips, PCBs
High-end Equipment Manufacturing: Semiconductors



产品概述 Product Overview

光伏组件自动化包装线是一套集成了多种智能设备的流水线系统，旨在替代传统人工作业，对成品太阳能光伏板进行自动输送、翻转、检测、覆膜、贴标、装箱和码垛。

The PV module automated packaging line is an integrated smart equipment assembly line system with multiple intelligent devices, designed to replace manual work for automatic conveying, flipping, testing, film coating, labeling, boxing and palletizing of finished solar panels.

MACHINE VISION SYSTEM

智能视觉系统

系统适用于高速生产场景，具备微米级精度、稳定工业化部署能力以及实时智能数据管理能力。

Designed for high-speed photovoltaic and energy storage production lines, the system delivers micron-level accuracy, stable industrial deployment capability and real-time intelligent data management.

面向光伏与储能自动化的 AI视觉系统

AI-Powered Vision System for Photovoltaic & Energy Storage Automation

核心能力 Core Capabilities

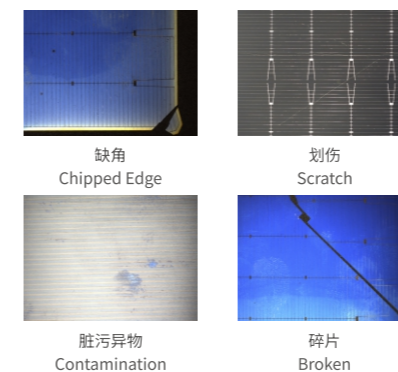
AI缺陷检测 AI Defect Inspection	视觉引导 Vision Guidance	高精度测量 Precision Measurement
多相机视觉系统 Multi-Camera System	MES数据互联 MES Connectivity	智能生产数据分析 Intelligent Production Data Analytics

高精度上料摆盘系统 High-Precision Feeding & Tray-Arranging System

柔性化程度高 High Flexibility	多规格快速换型 Fast Changeover	二次视觉校正 Vision Correction	一体化交付 Turnkey Delivery
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核心检测指标 Core Specifications	
上料摆盘速度 / Feeding Speed	≥ 3000 pcs/h
上料准确率 / Feeding Accuracy	≥ 99%
视觉定位精度 / Vision Accuracy	±0.01 ~ ±0.1 mm
重复定位精度 / Positioning Repeatability	±0.1 ~ ±0.5 mm
适配工件尺寸 / Workpiece Size	φ2 ~ φ100 mm
多品类换型时间 / Changeover Time	≤ 5 min

01 AI智能检测

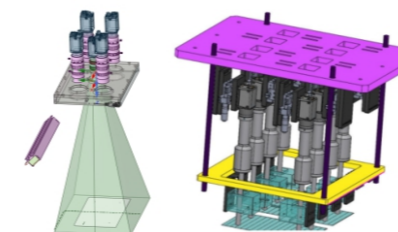


AI Inspection

≤0.02% 漏检率 Leak Rate

深度学习缺陷检测	Deep Learning Defect Detection
裂纹 / 划伤 / 脏污检测	Crack / Scratch / Contamination Inspection
多类型缺陷智能分类	Multi-Type Defect Classification
最小缺陷检出 ≥0.04mm	Minimum Defect Size ≥ 0.04mm
支持持续自学习优化	Continuous Self-Learning Optimization

02 视觉定位与引导



Vision Guidance

≥99.5% 抓取良率 Grabbing Yield

2D / 3D 视觉引导	2D / 3D Vision Guidance
全维度位置补偿	Full-dimensional position compensation
多域并行全域联动	Multi-domain parallel global linkage
360°角度补偿	360° Angle Compensation
高速动态定位	High-Speed Dynamic Positioning

03 生产数据与MES管理



Production Data & MES

支持 ISO9001 质量追溯
Supports ISO9001 Traceability

实时生产监控	Real-Time Production Monitoring
OEE / 良率 / 报警统计	OEE / Yield / Alarm Analytics
OPC UA 协议对接 MES	OPC UA MES Connectivity
生产数据追溯	Production Traceability
智能数据报表	Intelligent Data Reporting

兼容硬件生态

Compatible Hardware Ecosystem

工业相机品牌兼容 Camera Brands

海康 / Basler / IDS / 大华
Hikvision / Basler / IDS / Dahua

PLC 与运动控制兼容 PLC & Motion Control

西门子 / 倍福 / 欧姆龙 / 三菱
Siemens / Beckhoff / Omron / Mitsubishi

工业通信协议 Communication Protocols

OPC UA / Modbus / TCP-IP / MES

应用场景

Application Scenarios

- 光伏电池制造
Photovoltaic Cell Manufacturing
- 储能 PACK 自动化
Energy Storage PACK Automation
- 锂电池生产
Lithium Battery Production
- 半导体与精密电子
Semiconductor & Precision Electronics
- 智能机器人制造
Intelligent Robotic Manufacturing
- 工业自动化产线
Industrial Automation Production Lines