

**Truking's Overall  
Solution for Freeze-Dried Preparation**  
楚天冻干制剂整体解决方案

# 让世界制药工业插上智慧的翅膀

Equip global pharmaceutical manufacturing industry with intelligent wings.





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楚天科技股份有限公司成立于2000年，是中国医药装备行业的领军企业，也是世界医药装备行业的知名企业之一。主营业务系医药装备及其整体技术解决方案，并率先推动智慧医药工厂的研究与开发。公司系中国A股上市公司。旗下拥有德国ROMACO集团、楚天华通、四川省医药设计院、楚天飞云、楚天源创、楚天微球、楚天思优特、楚天思为康、楚天华兴、楚天长兴、楚天科仪、楚天净邦、楚天派特、楚天博源、楚天新材料、楚天智能机器人等十多家全资或控股子公司，全球员工总数9000余人，总资产110亿元。

公司已有长沙和德国两大运营总部，建有长沙中央技术研究院、欧洲技术研究院和四川省医药设计院等研发机构。设有国家级企业技术中心，国家级创新基地，博士后科研工作站，院士专家工作站等多个技术与创新平台。截至2023年12月31日，共提出5466项中国专利申请，授权专利4313项，有效专利3090项。另提出54件PCT国际专利申请，在美国、俄罗斯、印度、韩国、德国、印尼、日本、欧洲等多国获得26项专利授权。牵头制订了本系统国家行业产品技术标准20多项。集团产品与服务已累计覆盖180多个国家和地区，国际市场占有率正逐年快速提升。

Founded in 2000, Truking Technology Limited has become a leading pharmaceutical equipment company in China and renowned worldwide. The company specializes in pharmaceutical equipment and integrated solutions and takes the initiative to push forward the R&D of smart pharmaceutical factories. It is a listed A-share company with multiple wholly-owned or holding subsidiaries, such as Germany-based Romaco Group, Truking Watertown, Sichuan Pharmaceuticals Design Institute, Truking Feiyun, Truking Ingenuity, Truking Micro-Sphere, Truking SUT, Truking Gene, Wachine, Truking Changxing, Truking Scientific Instrument, Truking Jingbang Engineering Technology, Truking Pitide Biotechnology, Truking Boyuan Intelligent Technology, Truking New Material, Truking Intelligent Robot etc. Truking has over 9000 employees around the globe, with a total asset of over 11 billion RMB.

Truking has two operational headquarters in Changsha, China, and Germany, with research and development institutions including Changsha Central Technology Research Institute, Europe Technology Research Institute, and Sichuan Pharmaceuticals Design Institute. It has established many platforms for technology innovation, such as the National Enterprise Technology Center, National Innovation Center, Post-Doctoral Scientific Research Station, and Academician Expert Workstation. By December 31, 2023, a total of 5,466 patent applications from China have been submitted, with 4,313 patents granted and 3,090 patents currently in force. Additionally, 54 PCT international patent applications were filed, resulting in 26 patents granted in multiple countries including the United States, Russia, India, South Korea, Germany, Indonesia, Japan, and Europe. The company has led the development of over 20 national industry product technical standards for this system. The products and services of the group have now reached over 180 countries and regions, with its international market share steadily increasing year by year.

## 无菌药品冻干制剂生产整体解决方案

### Overall Solution for Sterile ProductsLyophilization Production

1

#### 制药用水系统 Pharmaceutical Water System

采用最新改进工艺，制水效率高、运行成本低；模块化设计，便于安装、操作及维护。

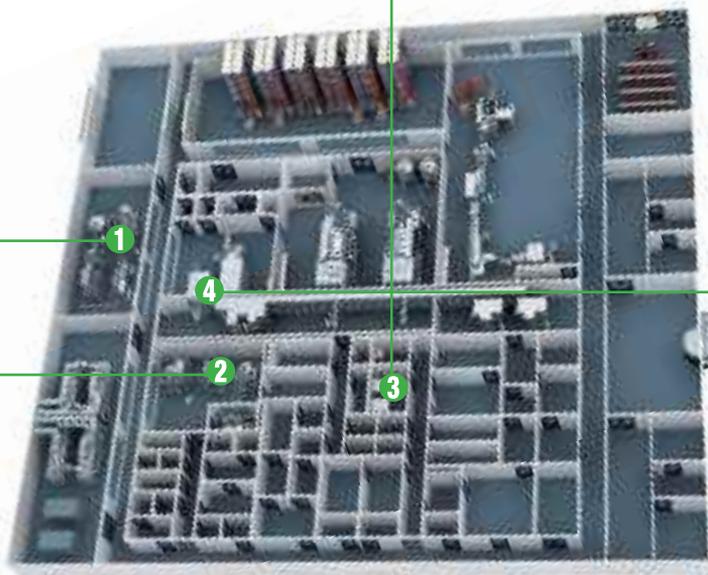
Adopt latest improved process, high preparation efficiency, low running cost and modular design. It is easy for installation, operation and maintenance.

3

#### 灭菌柜 Sterilizer

引进国外先进技术，采用全新设计理念；设备整个工作流程采用全电脑控制，安全可靠，灭菌彻底。

Introduce advanced technology from abroad, adopt new design concept; the whole process of equipment adopts full computer control. It is safe and reliable, with thoroughly sterilization effect.



2

#### 配液系统 Preparation System

按照客户的个性化要求进行设计，采用先进、灵活的模块化工艺管路集成单元，实现与灌装无缝对接。

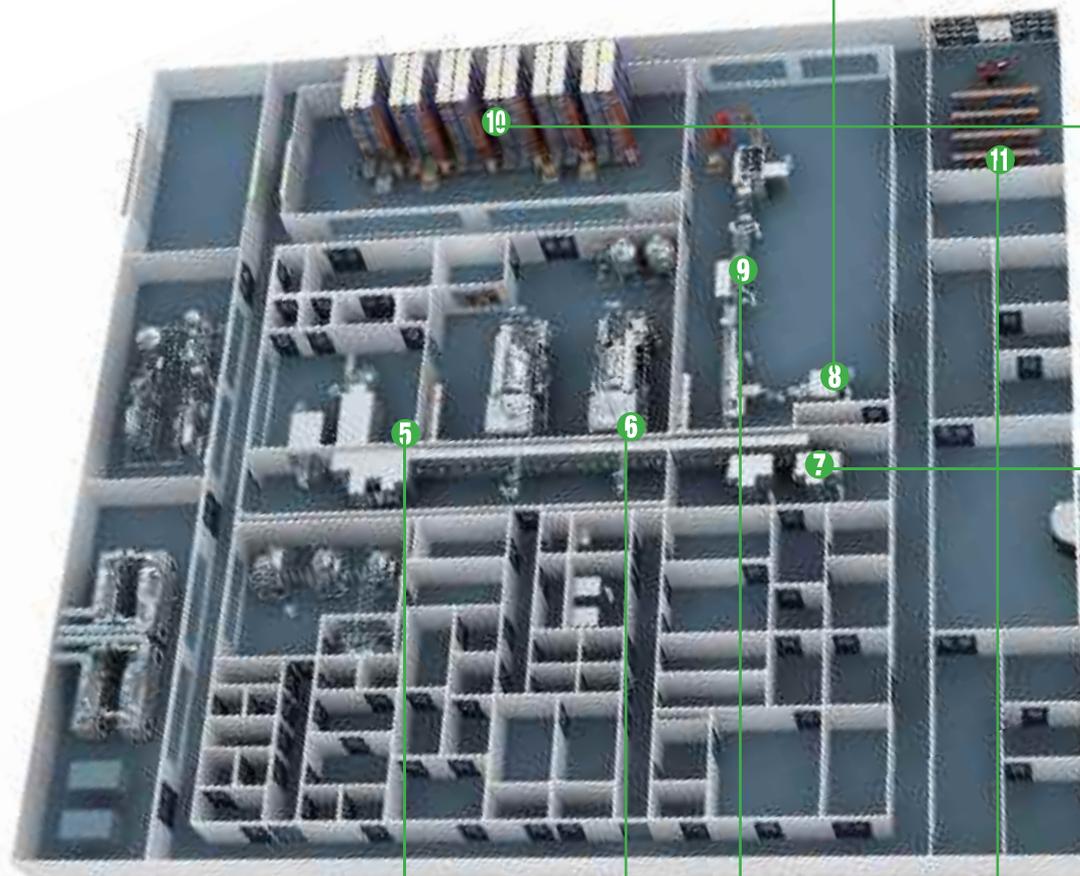
Design as per specific requirement of customer, adopt advanced and flexible modular process piping integrated unit to realize seamless connection with filling.

4

#### 胶塞（铝盖）清洗机 Rubber Stopper (Cap) Washing Machine

采用单臂悬挂内筒旋转、三重清洗与在线灭菌的方式，清洗无死角、清洗效率高。可根据用户生产工艺模式，选配不同的自动密闭出料、无菌转移与输送系统，操作性强、人工干预少、无菌保障水平高

Adopt method of single arm hanging inner cylinder rotating structure, with 3 cycles of washing with SIP. There is no dead angle during washing with high washing efficiency. Auto closed unloading system, sterile transfer and conveying system can be provided as optional according to user's production mode. It has strong operability, with less manual intervention and high sterile security level



5

**洗灌灌封联动线**  
Compact Line For Washing, Sterilizing & Drying,  
Filling & Stoppering, Capping

采用 L 型入墙式结构，单侧操作，有效实现功能分区，降低交叉污染，提高无菌保障水平；可选配 ORABS/CRABS、在线 PC 称重系统和灌装 CIP/SIP 系统，实现隔离化与辅助操作自动化。

Compact line for washing, sterilizing & drying, filling & stoppering, capping: adopts L shape in-wall structure, one-side operation, effectively realizes function division, reduces cross contamination, improves aseptic security level. ORABS/CRABS, on-line IPC weighing system and filling CIP/SIP can be equipped as option to realize isolation and automation of auxiliary operation

6

**冻干机及自动进出料系统**  
Freeze Dryer And Auto Loading  
& Unloading System

完全实现灌装加塞机至冻干机、冻干机至轧盖机之间产品的无菌自动转运；减少无菌室人员、降低污染风险，提供产品无菌保障水平。

Freeze dryer and auto loading & unloading system: realize aseptic auto transferring from filling & stoppering machine to freeze dryer, freeze dryer to capping machine completely, reduce persons in aseptic room, reduce contamination risk, improve aseptic security level.

7

轧盖机  
Capping Machine

根据用户设备放置房间洁净级别的不同，提供不同功能配置的机型；可实现铝屑自动收集装置、轧盖前成像检测系统等功能。

Provide machine model with different function according to different cleanliness class; can realize aluminum particles auto collection, imaging testing before capping and other functions

8

全自动灯检机  
Fully Automatic Inspection Machine

采用设备代替人，提高检测效率及可靠性；占地面积小，生产过程运行成本低；可实现对冻干粉针剂产品的可见异物、外观缺陷及轧盖缺陷的自动检测。

adopts machine to substitute person, improves inspection efficiency and reliability, has small space and low running cost, can realize automatic inspection for visible particle, appearance defect and capping defect in freeze drying products.

10

自动化立体仓库  
Automated Stereoscopic Warehouse

有效地连接生产与库存，自动存取，提高了劳动生产率，降低劳动强度；提高了空间利用率及货物管理质量。

effectively connect production and store, auto storing and retrieving, improve labor productivity, reduce labor

9

全自动包装线  
Fully Automatic After-Packaging Compact Line

采用制托、入托、装盒、三维裹包、装箱、捆扎、码垛流水作业的自动包装生产线，该线的应用可减少大量的操作人员及降低人员劳动强度，提高生产效率和产品的包装合格率

adopts automatic packaging compact line of pallet making, pallet entering, three-dimensional wrapping, packing, strapping, palletizing This line can reduce labor intensity and production cost, improve production efficiency and packing quality rate.

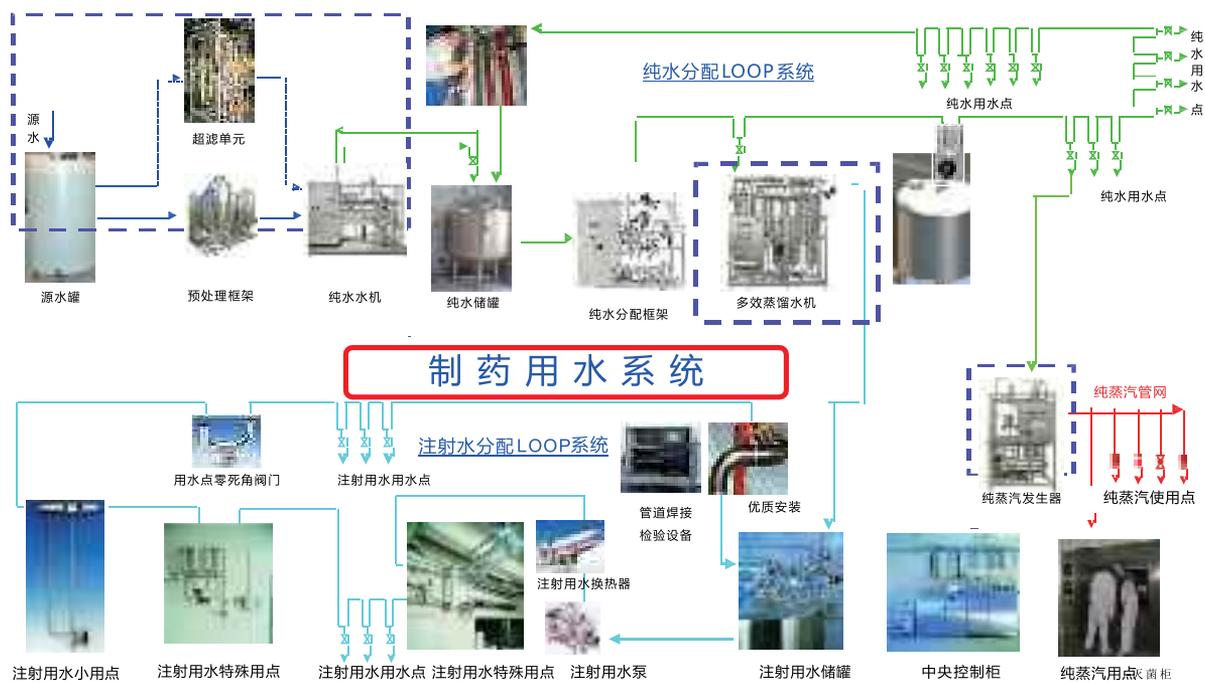
11

生产在线集成监控室  
Automated Stereoscopic Warehouse

实现各系统生产数据采集、人员工作状态采集、设备运维管理的信息化；可与楚天全球客户远程服务测控中心通讯，实现设备预防性维护、远程视频确认故障及指导维修等。

realize production data collection of each system, person working state collection, informatization of equipment operation & maintenance management, can communicate with global customers through remote service measuring and control center, realize preventive maintenance, remote video for trouble confirmation and maintenance guidance

# 制药用水系统 Pharmaceutical Water System



## ▶ 纯化水制备装置 Purified Watergenerator Equipment



### 性能特点 / Features

- ◎ 根据原水水质设计最优的工艺线路，包括多种工艺线路的组合设计
  - ◎ 模块化设计，便于操作及备件更换维护
  - ◎ 改良工艺使系统的制水率可达 85% 以上
  - ◎ 独特的多通道阀门设计，满足零死角要求
  - ◎ 系统可在产水和循环期间自动调节系统的产能，降低能耗
  - ◎ 确保系统的过程检验和监控到最后的验证文件符合客户 GMP 需求
- + Design the most optimal process according to raw water quality, including combinational design of various processes
  - + Modular design, easy for operation and spare parts replacement & maintenance
  - + Improved technology makes water generation rate higher than 85%
  - + Special multi-port valve design, meet requirement of zero dead angle.
  - + Capacity can be automatically adjusted during the cycle, to reduce energy consumption
  - + Ensure from the process inspection and monitoring to final validation documents meet GMP requirement

## 注射用水制备装置 WFI Generation device



### 性能特点 / Features

- ◎ 设备运行可靠性和长时间运营的经济性
  - ◎ 进水喷雾设计，布水均匀、去除不凝性气体
  - ◎ 蒸馏塔胀接工艺，不锈钢材质不受破坏，保护设备运行长久稳定
  - ◎ 三级分离方式，得到高品质的注射水和纯蒸汽
  - ◎ 自灭菌设计原理，充分满足 cGMP 要求
  - ◎ 高标准配置的设备文件和验证文件系统，完全满足 WHO、EUGMP、FDA、cGMP 的验证要求
- + Operational reliability and economics of long-term operation.
  - + Water infeed spraying design, with uniform distribution, and non-condensable gas removing
  - + Distillation column expansion technology, no damage to stainless steel material, with stable running for long time
  - + 3 level separation method, to get high quality WFI and pure steam
  - + Self-sterilization design, fully meets cGMP requirement
  - + High standard equipment document and validation document, meet validation requirements of WHO/EUGMP/FDA/cGMP

## 纯蒸汽发生器 Pure Steam Generator



### 性能特点 / Features

- 对用户产能需求快速响应 (<30S)
  - 纯蒸汽输出压力的稳定性 ( $\pm 5\%$ )
  - 纯蒸汽输出压力范围 2~5barq
  - 产能 PID 比例调节
  - 典型排废比例 2-8%
  - 极低的运行成本
  - 纯蒸汽品质满足 HTM2010(EN285) 所定义的不凝性气体含量、饱和度 (干度)、过热度要求。
- + Quick response to user's capacity (<30s) requirement.
  - + Stability of pure steam output pressure ( $\pm 5\%$ )
  - + Output range of pure steam pressure: 2~5 barg
  - + Capacity PID proportional control
  - + Typical waste discharging rate: 2-8%
  - + Very low running cost
  - + Quality of pure steam meets requirement of non-condensable gas content, saturation (dryness), degree of superheat requirement defined in HTM2010(EN285)

## 水分配系统 Water Distribution System



### 性能特点 / Features

- ◎ 分配泵腔排放阀无死角
  - ◎ 结构紧凑，占地面积少
  - ◎ 全自动运行和消毒系统
  - ◎ 模块化便于 FAT 和 SAT
  - ◎ 纯化水分配可选热水 / 臭氧消毒方式
  - ◎ 注射水分配可选过热水 / 纯蒸汽消毒方式
- + No dead angle in distribution pump chamber discharge valve
  - + Compact structure, with small floor space
  - + Fully automatic running and sterilizing system
  - + Modular design, convenient for FAT and SAT
  - + Hot water/Ozone sterilization method are a option for PW distribution
  - + Hot water/Pure steam sterilization method are a option for WFI distribution

## 全自动配液系统 Fully Automatic Preparation System



### 应用领域 / Application

配液系统是按照客户的个性化要求进行设计，由理念先进的团队和专业的制造、现场施工、验证团队来实施，符合中国新版 GMP、EUGMP、FDA、cGMP 等的要求，可提供两大领域的产品。

The preparation system is designed according to the customer's individual requirements, and has an advanced concept team and a professional manufacturing, on-site construction, and verification team, meets requirement of latest version of GMP, EUGMP, FDA and cGMP. It can provide systems for following two fields

## 生物技术领域 / Biotechnology Field

- ⊙ 上游培养基配液及离心均质设备辅助工艺系统集成
  - ⊙ 下游分离纯化设备辅助工艺系统集成
  - ⊙ 血液制品生产工艺系统集成
  - ⊙ 疫苗制品生产工艺系统集成
  - ⊙ CIP/SIP
- + Upstream medium preparation and centrifugal homogeneity equipment auxiliary system integration
  - + Downstream separation and purification equipment auxiliary system integration
  - + Blood products production system integration
  - + Vaccine products production system integration
  - + CIP/SIP

## 化学制药领域 / Chemical Pharmaceutical Field

- ⊙ 无菌原料药生产工艺系统
  - ⊙ 水针配液系统
  - ⊙ 冻干配液系统
  - ⊙ 大输液配液系统
  - ⊙ 口服液配液系统
  - ⊙ 眼药水配液系统
  - ⊙ 脂肪乳配液系统
  - ⊙ CIP/SIP
- + Aseptic API production system
  - + Injection preparation system
  - + Freeze drying products preparation system
  - + Infusion preparation system
  - + Oral liquid preparation system
  - + Eye drop preparation system
  - + Fat emulsion preparation system
  - + CIP/SIP

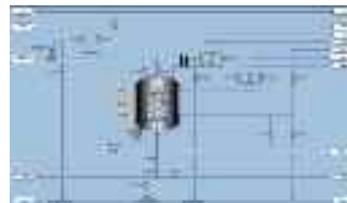
## 控制系统 / Control System

先进的自动化控制系统能优化生产过程的有效性，保证产品质量的稳定性，降低生产成本，增加生产的灵活性。我们有经验的本地电气自动化部门为您的特别需要，量身定做高性价比的自动化控制系统，包括：

- ⊙ 电气设计
- ⊙ 控制柜制作
- ⊙ FDS 开发
- ⊙ 软件编程
- ⊙ 系统测试
- ⊙ 用户培训
- ⊙ 系统调试

Advanced control system, can optimize effectiveness of producing process, guarantee stability of product quality, reduce production cost, increase production flexibility. We have experienced local electrical automation department to provide customized high price performance ratio automatic control system as your special requirement, including:

- + Electrical design
- + Control cabinet manufacturing
- + FDS development
- + Software programming
- + System test
- + User train
- + System commissioning



## 灭菌系统 Sterilizing System

### 脉动真空蒸汽灭菌柜 Pulsating Vacuum Steam Sterilization Cabinet



#### 主要原理 / Main Principles

脉动真空蒸汽灭菌柜是集真空技术、流体技术于一体的机器，它由箱体、门、机架、外钣金、真空系统、进汽系统、排汽系统、压缩空气系统、转运系统、过滤器在线灭菌系统、热风系统、控制系统和其他功能分支系统组成。脉动真空蒸汽灭菌工艺能够有效移除腔室内不凝性气体，从而确保蒸汽能快速有效的穿透至多孔疏松负载内部，并且确保柜内各处温度均匀一致。灭菌后，通过抽真空并补入洁净干燥空气，出去腔内水汽，实现产品干燥。

工艺流程：预热 - 脉动 - 升温 - 灭菌 - 干燥及冷却

Pulsating vacuum steam sterilization cabinet is a machine integrating vacuum technology and fluid technology. It is composed of box, door, frame, outer sheet metal, vacuum system, steam inlet system, exhaust system, compressed air system, transfer system, filter online sterilization system, hot air system, control system and other functional branch systems. The pulsating vacuum steam sterilization process can effectively remove the non condensable gas in the chamber, so as to ensure that the steam can penetrate into the porous loose load quickly and effectively, and ensure that the temperature in the cabinet is uniform. After sterilization, the product is dried by vacuumizing and adding clean and dry air to remove water vapor in the cavity. Process flow: preheating - pulsating - heating - sterilization - drying and cooling

**主要灭菌对象 / Main Sterilization Objects**



器具  
Appliances



织物  
Textile



培养基  
Culture Medium



胶塞铝盖  
Rubber Stopper Aluminum Cover



液体装载  
Liquid Loading

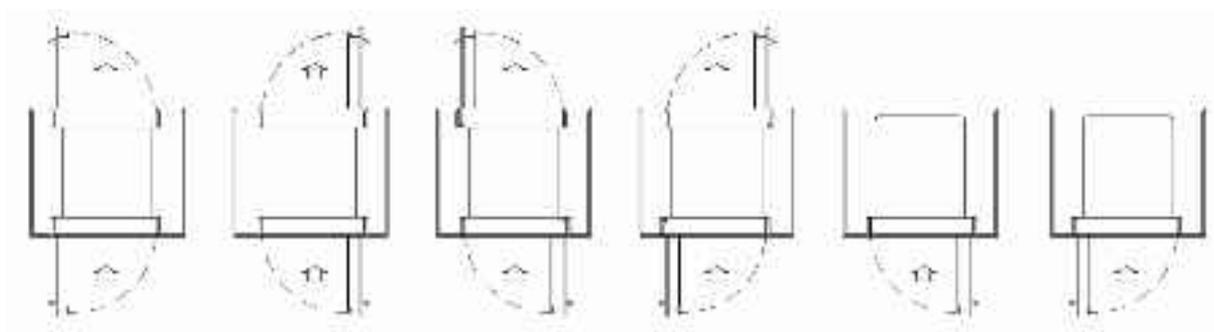


废弃物  
Waste

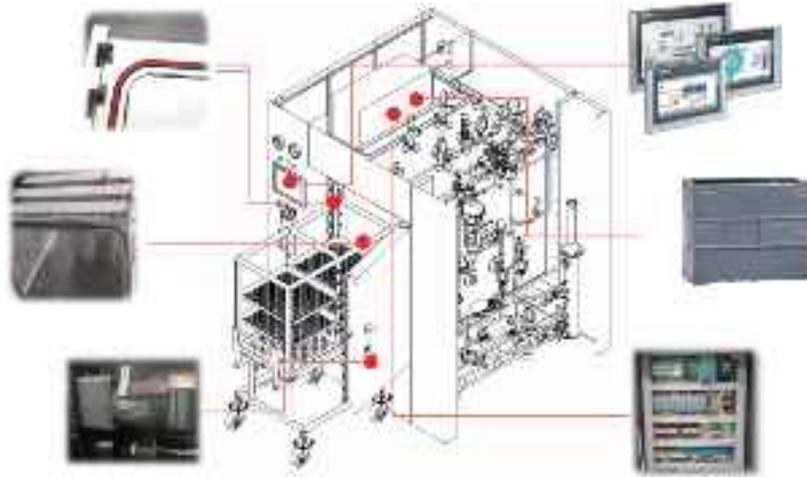
**性能参数 / Performance Parameter**

±0.5℃	≤ 1200L: < 15s/ > 1200L: < 30s	< 0.05KPa/min	< 0.2%
温度均匀性	平衡时间	真空泄露速率	器具干燥增重值

**面向厂房定制化灭菌设备 / Customized Sterilization Equipment for Factory**



◎ 腔可选容器: 0.24 m<sup>3</sup>-6.0 m<sup>3</sup>



- 燕尾结构食品级硅橡胶门密封圈，正负压泄露速率低，且正常使用寿命长，降低维护风险及成本
  - 真空置换辅以热风干燥系统，高效、良好的干燥效果
  - 断气保护系统，断气后可长时间维持密封部位压力，安全可靠
  - 提供单独的过滤器在线灭菌系统程序，并具备稳定低压风干系统，滤芯无吹爆风险
  - 采用西门子 S7-1200 系列 PLC，运行速度快，可扩展的模块多
  - 提供预维护系统，具备关键性能参数趋势图表；
  - 满足 FDA、cGMP 要求，控制系统设计符合 Part 11 和 GAMP5 要求
- + Food grade silicone rubber door sealing ring with swallow tail structure has low positive and negative pressure leakage rate, long normal service life and low maintenance risk and cost
  - + Vacuum displacement assisted by hot air drying system, efficient and good drying effect
  - + The gas cut-off protection system can maintain the pressure of the sealing part for a long time after the gas cut-off, which is safe and reliable
  - + Provide a separate online sterilization system program for the filter, and have a stable low-pressure air drying system, with no risk of blowing explosion for the filter element
  - + It adopts Siemens s7-1200 series PLC with fast running speed and many expandable modules
  - + Provide pre maintenance system with trend chart of key performance parameters;
  - + It meets the requirements of FDA and cGMP, and the control system design meets the requirements of Part 11 and GAMP5



## 验证服务 / Authentication Services

基于客户的灭菌对象及质量要求，提供相关验证服务：

- ◎ 真空泄露测试
- ◎ Bowie-Dick 测试
- ◎ 空载热分布
- ◎ 满载热分布
- ◎ 热穿透测试
- ◎ 干燥度测试

Based on the sterilization objects and quality requirements of customers, provide relevant validation services

- + Vacuum leakage test
- + The Bowie Dick test
- + No load heat distribution
- + Full load heat distribution
- + Heat penetration test
- + Drying degree test



## 器具清洗机 Appliance Cleaning Machine



### 主要原理 / Main Principles

器具清洗机是集器具清洗、干燥一体的工艺设备。在各清洗步段通过清洗温度、压力、时间配合，并针对清洗关键质量参数要求，辅以不同的清洗剂清洗。清洗过程通过洁净增压泵增压，经清洗舱内喷淋球对器具进行 100% 覆盖清洗，经验证的清洗工艺，采用低电导率作为日常监控数据。干燥步段采用风机取风，并经加热器及高效过滤器对管路内部、清洗舱及器具内外表面吹扫烘干。

工艺流程：预洗 - 清洗 - 漂洗 - 淋洗 - 干燥及冷却。

Appliance cleaning machine is a process equipment which integrates appliance cleaning and drying. In each cleaning step, through the coordination of cleaning temperature, pressure and time, and according to the requirements of key quality parameters, different cleaning agents are used. The cleaning process is pressurized by the clean booster pump, and 100% coverage cleaning is carried out by the spray ball in the cleaning chamber. The verified cleaning process uses low conductivity as the daily monitoring data. In the drying step, the fan is used to take the air, and the heater and high efficiency filter are used to blow and dry the inside of the pipeline, the cleaning chamber and the inside and outside surface of the appliance. Process flow: pre washing - Cleaning - rinsing - rinsing - drying and cooling.


**主要清洗对象 / Main Cleaning Objects**


不锈钢器具  
Stainless steel appliances



软管  
Hose



塑料容器  
Plastic container



玻璃器皿  
Glassware



工具  
tool



- 配置低电导率监测，对终洗水进行日常监控，确保清洗效果
  - 配置酸碱罐及自动输送系统，清洗阶段自动混入清洗剂，并配置高电导率检测，可实现清洗剂配比溶度精确控制及记录
  - 独立双路热风干燥系统，风机自动取风经加热器及各级过滤器对管路、清洗舱及器具内外表面吹扫烘干
  - 配置工控机，具备审计追踪、数据报表功能
  - 采用西门子 S7-1200 系列 PLC，运行速度快，可扩展的模块多
  - 满足 FDA、cGMP 要求，控制系统设计符合 Part 11 和 GAMP5 要求
- Equipped with low conductivity monitoring, daily monitoring of final washing water to ensure the cleaning effect
  - Equipped with acid-base tank and automatic conveying system, the cleaning agent can be automatically mixed in the cleaning step, and the high conductivity detection can realize the accurate control and record of the ratio and solubility of the cleaning agent
  - Independent two-way hot air drying system, the fan automatically takes the air, through the heater and all levels of filters to purge and dry the internal and external surfaces of pipelines, cleaning chambers and appliances
  - The industrial computer is equipped with audit tracking and data reporting functions
  - It adopts Siemens s7-1200 series PLC with fast running speed and many expandable modules
  - It meets the requirements of FDA and cGMP, and the control system design meets the requirements of Part 11 and GAMP5

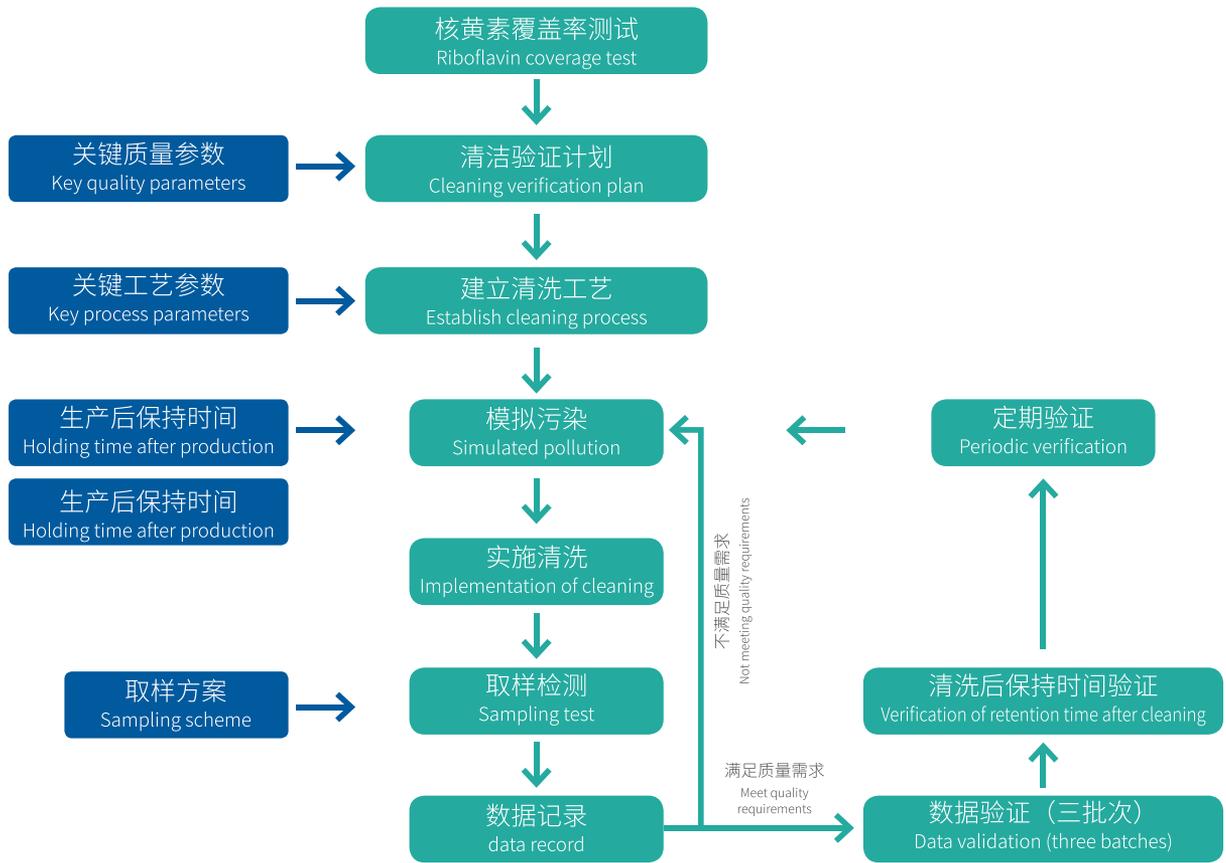
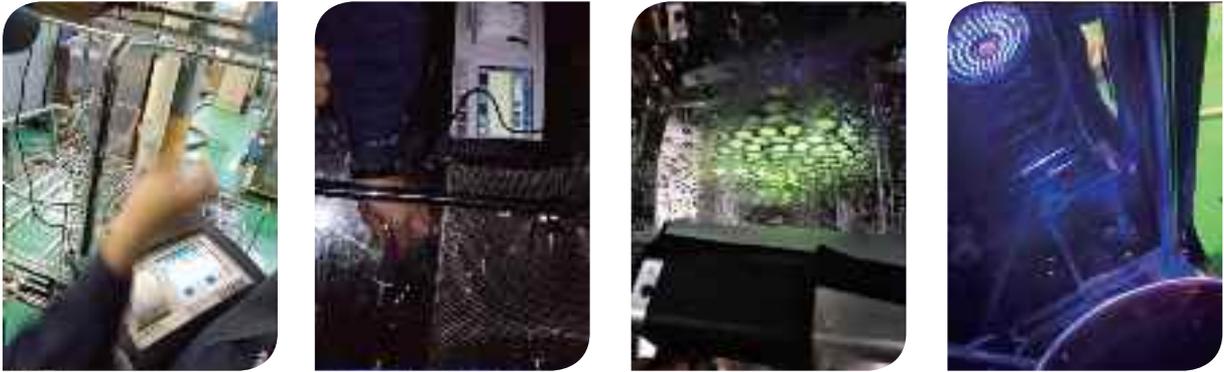
## ▶▶ 定制化清洗架 Customized Cleaning Rack



◎ 根据清洗器具定制化清洗架，清洗覆盖率 100%

◎ The cleaning rack is customized according to the cleaning equipment, and the cleaning coverage rate is 100%

 清洁验证 / Cleaning verification



○ 基于客户的器具及清洗要求，提供相关验证服务

○ Provide relevant verification services based on customer's equipment and cleaning requirements

## 胶塞（铝盖）清洗机 Rubber Stopper(Cap) Washing Machine

### ▶▶ 立式胶塞（铝盖）清洗机 Vertical Type Rubber Stopper(Cap) Washing Machine

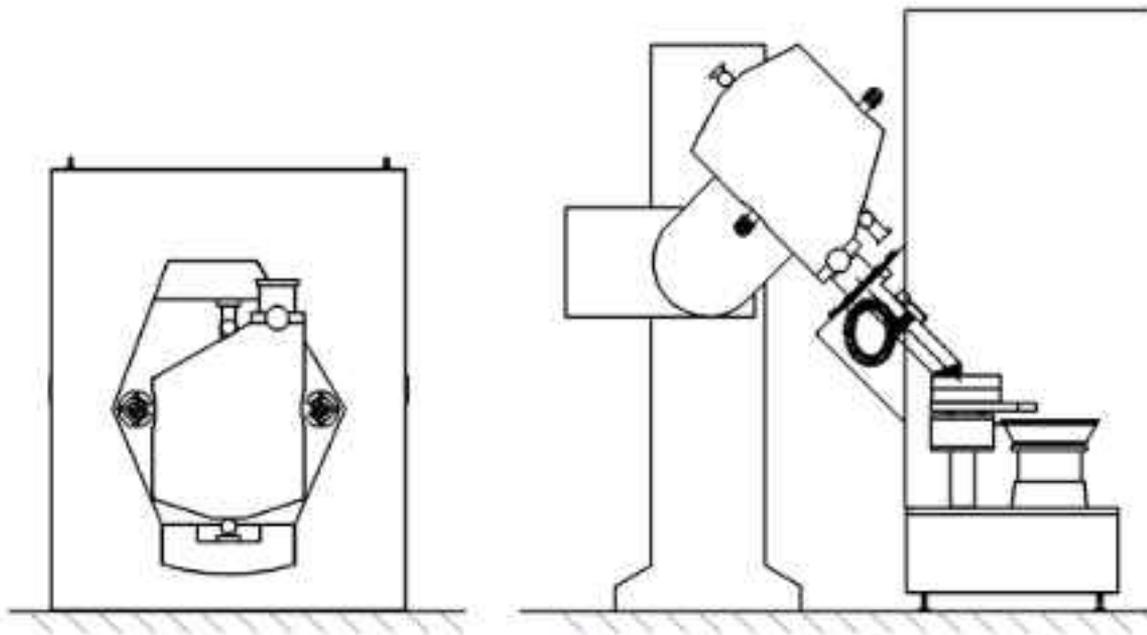


#### 优势特点 / Advantages and Characteristics

- 国内首创基于流体动力学原理的可控脉动悬浮清洗系统；
  - 利用真空脱泡空化效应及水汽悬浮动力对胶塞进行清洗，清洗效果优良；
  - 独立清洗罐设计，内筒与罐体合二为一，无清洗死角；罐体整体转动，内无机械搅拌，不损伤胶塞，无额外颗粒产生；
  - 罐体进出口充气密封，静态密封，无摩擦颗粒产生，泄漏风险低；
  - 腔体有效容积 85%，清洗效率高，能耗更低；
  - 多种出料方案，满足各种无菌转运需求。
  - 可处理两种物料，通过配置胶塞清洗罐和铝盖清洗罐
- + The first domestic controllable pulsating suspension cleaning system based on the principle of fluid dynamics;
  - + The rubber plug is cleaned by vacuum deaeration cavitation effect and water vapor suspension power, and the cleaning effect is excellent;
  - + Independent cleaning tank design, the inner cylinder and tank body are integrated, without cleaning dead angle; the tank body rotates as a whole, without mechanical stirring, without damage to the rubber plug, and without extra particles;
  - + The inlet and outlet of the tank are gasified and sealed statically, without friction particles and low leakage risk;
  - + The effective volume of the cavity is 85%, with high cleaning efficiency and low energy consumption;
  - + A variety of discharging schemes to meet the needs of aseptic transportation.
  - + It can handle two kinds of materials by configuring rubber plug cleaning tank and aluminum cover cleaning tank

机械臂提升胶塞清洗罐与胶塞上料工位对接，如下图：

The mechanical arm lifts the rubber plug cleaning tank and butts with the rubber plug feeding station, as shown in the figure below:



RTP 阀转运



## 卧式胶塞（铝盖）清洗机 Horizontal Type Rubber Stopper(Cap) Washing Machine



### 优势特点 / Advantages and Characteristics

- ◎ 国内首创基于流体动力学原理的可控脉动悬浮清洗系统；
  - ◎ 利用真空脱泡空化效应及水汽悬浮动力对胶塞进行清洗，清洗效果优良；
  - ◎ 独立清洗罐设计，内筒与罐体合二为一，无清洗死角；罐体整体转动，内无机械搅拌，不损伤胶塞，无额外颗粒产生；
  - ◎ 罐体进出口充气密封，静态密封，无摩擦颗粒产生，泄漏风险低；
  - ◎ 腔体有效容积 85%，清洗效率高，能耗更低；
  - ◎ 多种出料方案，满足各种无菌转运需求。
  - ◎ 可处理两种物料，通过配置胶塞清洗罐和铝盖清洗罐
- + The triple cleaning system is designed to ensure the cleaning effect, the primary cleaning cycle cleaning, the saving of cleaning water, and the fine washing and rinsing;
  - + Quantitative silicone oil filling process makes the silicification effect more uniform;
  - + The fixed discharge valve has no risk of friction particles and secondary pollution, and can be cleaned and sterilized online;
  - + The door of the chamber is designed to be opened backward, and the maintenance work is carried out in the equipment room; the sealing ring of the door is statically sealed, and the risk of leakage is low;
  - + The vacuum pump cooling system, with fast cooling speed and adjustable capacity, can reuse the cooling water and spray cooling the hot drainage steam;
  - + Design of vacuum breaking filter module for online sterilization and filter integrity detection;
  - + Backflow prevention device for steam water separation at outlet: air partition and water seal structure are adopted, with steam pressure relief outlet to prevent pollution risk caused by floor drain backwash;
  - + The temperature and pressure are monitored in real time, and the curves are printed and recorded in real time to form a complete electronic data report;
  - + The portal automatic control system fully meets the requirements of GAMP5 and 21cfrpart11;
  - + A variety of discharge schemes to meet the needs of aseptic transportation.

## 西林瓶洗烘灌封联动线

### Vial Compact Line for Washing, Sterilizing & Drying, Filling & Stoppering, Capping



#### 主要用途 / Main Application

主要用于制药厂西林瓶水剂或冻干粉针剂的生产，联动生产时可自动完成瓶子的清洗、预热、烘干灭菌、去热源、冷却、灌装、加塞等二十多个工序。

Mainly used for the production of vials or freeze-dried powder injections in pharmaceutical factories. During the linkage production, it can automatically complete more than 20 processes such as bottle cleaning, preheating, drying and sterilization, depyrogenation, cooling, filling, and stoppering.

## ▶▶ 立式超声波清洗机 Vertical Ultrasonic Washing Machine



### 优势特点 / Advantages and Characteristics

- ◎ 机架整体加工成型
- ◎ 金属烤漆处理
- ◎ 集中供油系统
- ◎ 提供管路材质证明、焊接记录及内窥镜检查报告
- ◎ 可增加注射用水降级水清洗工艺
- ◎ 选配压缩空气排空系统
- + Integral processing of the frame
- + Metal paint treatment
- + Centralized oil supply system
- + Provide piping material certification, welding records and endoscopy inspection report
- + Can increase WFI degraded process
- + Optional compressed air evacuation system

## ▶ 隧道式灭菌干燥机 Sterilizing & Drying Tunnel



### 优势特点 / Advantages and Characteristics

- ◎ 多路 PID 温控技术
  - ◎ 分风框及模块化回风框结构
  - ◎ 负压密封
  - ◎ 风压自动平衡系统
  - ◎ 停电系统
  - ◎ 网带 CIP 欠载
  - ◎ 灭菌模式
  - ◎ 冷却段冷却方式：风冷 or 水冷
- + Multi-channel PID temperature control technology
  - + Air distribution frame and modular air recycling structure
  - + Negative pressure sealing
  - + Automatic wind pressure balance system
  - + Power-off protection
  - + CIP for the belt
  - + Sterilization mode
  - + Cooling method of cooling section: air cooling or water cooling



## ▶▶ 灌装加塞机 Filling & Stoppering Machine



### 优势特点 / Advantages and Characteristics

- ◎ 采用直线或 L 型设计
  - ◎ 全伺服控制，确保运行稳定性和精度
  - ◎ 无瓶不灌、无瓶不加塞
  - ◎ 自动剔废
  - ◎ 选配在线称重系统
  - ◎ 选配 CIP/SIP
  - ◎ CRABS/ISOLATOR
- + Adopt straight line or L-shaped design
  - + Full servo control to ensure running stability and accuracy
  - + No bottle no filling, no bottle no stoppering
  - + Automatic rejection
  - + Optional online weighing system
  - + Optional CIP / SIP
  - + CRABS / ISOLATOR

## 自动进出料系统 Auto Loading & Unloading System



### 固定式进出料系统 Fixed Feeding and Discharging System



#### 主要原理 / Main Principles

冻干机进出料是运用自动化技术，在满足法规的前提下，完成半加塞西林瓶从灌装机到冻干机，冻干机到轧盖机的一种全自动衔接设备。具有自动化程度高、重复性好、容易验证，可以保证产品的质量稳定可靠，能最大限度地减少产品的污染等优势。根据不同的实现形式可分为：固定式自动进出料系统和移动式自动进出料系统。

The feeding and discharging of freeze-drying machine is a kind of fully automatic linking equipment which uses automation technology to complete the semi stoppered vials from filling machine to freeze-drying machine, and from freeze-drying machine to capping machine on the premise of meeting the regulations. It has the advantages of high mobility, good repeatability, easy verification, stable and reliable product quality, and minimizing product pollution. According to different implementation forms, it can be divided into fixed automatic feeding and discharging system and mobile automatic feeding and discharging system.

## 优势特点 / Advantages and Characteristics

- 适用 1-100ml 规格西林瓶，可单双排布局；
  - 进料速度 300-600VPM，倒瓶率 0.03%，碎瓶率 0.01%，出瓶速度 600-1000VPM；
  - 冻干与水针可兼容使用；
  - 可集成 ORABS、CRABS、ISOLATOR 系统
  - 采用集成控制系统，实现进出料与冻干机、灌装机和轧盖控制互锁，动态速度匹配；
  - 可靠的数据分析与报警功能，人性化操作界面，可编辑配方功能，完整的操作记录追溯功能；
  - 智能诊断与预维护功能，最大限度的减少生产过程中故障的产生；
  - 满足 FDA、cGMP 要求，控制系统设计符合 Part 11 和 GAMP5 要求
- + It is suitable for 1-100ml vials with single and double row layout;
  - + The feeding speed is 300-600vpm, the bottle pouring rate is 0.03%, the bottle breaking rate is 0.01%, and the bottle discharging speed is 600-1000vpm;
  - + It can be compatible with water needle;
  - + It can integrate orabs, crabs and Isolator systems
  - + The integrated control system is adopted to realize the interlocking control of feeding and discharging, freeze-drying machine, filling machine and capping, and the dynamic speed matching;
  - + Reliable data analysis and alarm function, humanized operation interface, formula editing function, complete operation record tracing function;
  - + The intelligent diagnosis and pre maintenance function can minimize the occurrence of faults in the production process;
  - + It meets the requirements of FDA and cGMP, and the control system design meets the requirements of Part 11 and GAMP5



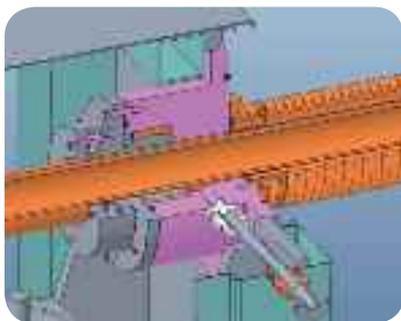
100% 倒瓶剔除防碎瓶  
100% pour bottle to remove anti broken bottle



双排进料 (550pcs)  
Double row feeding (550pcs)



双排蛇形缓冲  
Double row snake buffer



波纹管在线完整线检测  
On line complete line inspection of bellows



星形轮过载保护  
Star wheel overload protection



Crabs 腔体穿越伸缩网带  
Crabs cavity passing through telescopic mesh belt

## 阿尔法 (α-ALUS) 系列自动进出料系统 (α-ALUS) Series Automatic Feeding and Discharging System



### 主要原理 / Main Principles

阿尔法 (α-ALUS) 系列自动进出料系统是一种面向未来的冻干机进出料解决方案。它不仅具有占用空间小、布局灵活、无菌符合性好、可智能化高效进料等特点，而且可搭配 LYOTK 型工业型、中试、小试型冻干机及不同的 rabs 形式组成冻干整体解决方案。它可有效的降低设备的投入成本，最大的实现整线的使用价值。

Alpha ALUs series automatic feeding and discharging system is a solution for the future. It not only has the characteristics of small space occupation, flexible layout, good aseptic compliance, intelligent and efficient feeding, but also can be combined with lyotk industrial, pilot, small-scale freeze-drying machines and different Rabs forms to form an overall freeze-drying solution. It can effectively reduce the input cost of the equipment and maximize the use value of the whole line.



阿尔法系统配套隔离器 Isolator for alpha system



## 优势特点 / Advantages and Characteristics

### 灵活的布局解决方案

- ◉ B 级区面积减少 70%，降低运营成本
- ◉ 开阔的人流、物流通道
- ◉ 能满足单台或多台冻干机进料需求
- ◉ 适用于 LYOTK 型工业冻干机、小试、中试冻干整体解决方案
- ◉ 可集成 ORABS、CRABS、ISOLATOR 系统

### 无菌符合性

- ◉ 嵌入式进料推杆模块
- ◉ 无推杆波纹管设计
- ◉ 关键区域的洁净控制

### 高效稳定进料模式

- ◉ 进料速度：600VMP
- ◉ 不间断连续推料模式
- ◉ 双推设计，单排推料与整板进料分工协同
- ◉ 大星型轮设计，提高数瓶效率

### Flexible layout solution

- The area of grade B area is reduced by 70%, and the operation cost is reduced
- Open flow of people and logistics channels
- It can meet the feeding demand of single or multiple lyophilizers
- It is suitable for lyotk industrial freeze-drying machine, small-scale and pilot scale freeze-drying overall solution
- It can integrate orabs, crabs and Isolator systems

### Aseptic compliance

- Embedded feed push rod module
- Design of bellows without push rod
- Clean control of key areas

### Efficient and stable feeding mode

- Feeding speed: 600vmp
- Continuous pushing mode
- Double push design, single row pushing and whole plate feeding work division and cooperation
- Big star wheel design to improve the efficiency of bottle counting

## ▶▶ 移动式RGV进出料系统 Mobile RGV Feeding and Discharging System



### 主要原理 / Main Principles

移动式 RGV 进出料系统是采用 RGV 技术，将集瓶工位、转运工位以及出料工位进行拆分。通过 RGV 小车完成对冻干机进料与出料动作。系统包括理瓶整列进料系统、移动装卸料小车系统、移动轨道及供电系统、出料系统、RABS 层流系统等；

Mobile RGV feeding and discharging system adopts RGV technology to separate bottle collecting station, transfer station and discharging station. Through RGV car to complete the freeze-drying machine feeding and discharging action. The system includes the whole line feeding system, mobile loading and unloading trolley system, mobile track and power supply system, discharging system, Rabs laminar flow system, etc;



## 优势特点 / Advantages and Characteristics

- ◎ 布局灵活，限制性小，能够满足多台冻干机的进出料需求；
  - ◎ 单台 RGV 小车可以配置多个进料平台，实现高速集瓶进料；
  - ◎ 一块板层可一次性完成装载与卸料动作；
  - ◎ 可集成 RABS 系统，实现无菌对接；
  - ◎ 区域扫描技术，智能防撞设计；
  - ◎ 采用集成控制系统，无线光通讯技术；
  - ◎ 可靠的数据分析与报警功能，人性化操作界面，可编辑配方功能，完整的操作记录追溯功能；
  - ◎ 满足 FDA、cGMP 要求，控制系统设计符合 Part 11 和 GAMP5 要求
- + The layout is flexible and the limitation is small, which can meet the demand of multiple freeze-drying machines;
  - + Single RGV trolley can be equipped with multiple feeding platforms to realize high-speed bottle feeding;
  - + One board layer can complete loading and unloading at one time;
  - + It can integrate Rabs system to realize aseptic docking;
  - + Area scanning technology, intelligent anti-collision design;
  - + Integrated control system and wireless optical communication technology are adopted;
  - + Reliable data analysis and alarm function, humanized operation interface, formula editing function, complete operation record tracing function;
  - + It meets the requirements of FDA and cGMP, and the control system design meets the requirements of Part 11 and GAMP5



进料平台  
Feeding Platform



RGV 小车  
RGV car



出料平台  
Discharge Platform

## 无推杆进出料系统

## No-pushrod Loading and Unloading System



### 主要用途 / Main Principles

主要用于托盘原料药冻干自动进出料，尤其适用于高端生物冻干原料药等具有批量小，附加值高，且具有生物活性等特点的产品，通过采用 RGV 技术与托盘升降结构结合，实现无推杆自动进料。

Mainly used for automatic loading and unloading of lyophilized APIs in trays, especially suitable for high-end biological lyophilized APIs and other products with small batch, high added value, and biological activity. The RGV technology is combined with the tray lifting structure to realize automatic loading without push rods.

## 优势特点 / Advantages and Characteristics

- 结构简单，便于清洁；
  - 占地面积小，操作简单；
  - 无前推波纹管，无菌风险小；
  - 配合托盘输送机构，可实现全自动化进出料。
- + Simple structure, easy to clean;
  - + Small size, easy cooperation;
  - + Design of bellows without push rod, sterile and low risk;
  - + Tray conveying mechanism, realizes fully automatic loading and unloading.

## 产品参数 / Product Parameters

N——LALUTK 系列 N-LALUTK Series		
外型尺寸 Dimensions	根据布局图 &GA 图纸 According to layout & GA design	
设备工作重量 Working Weight	1500kg	
主要技术参数 Technical Parameters	适应冻干板层 Adapt to freeze-dried layers	LYOTK 5 ~ LYOTK 45
	进料产能 Loading Capacity	5min ~ 18min/ 每个板层 5min ~ 18min/layer
客户公用工程参数 Project Parameters	主电源 Main Power	10kW, AC380V±10%(50Hz) - 三相五线制 Tri-phase
	注射用水 WFI	管径 Pipe diameterφ25.4mm, 卡盘 Chuckφ50.4mm; 0.6m <sup>3</sup> /h(0.2MPa ~ 0.3MPa), 推荐 recommend40°C -60°C
	洁净压缩空气 Clean Compressed Air	管径 φ25.4mm, 卡盘 Chuckφ50.4mm; 35m <sup>3</sup> /h(0.6MPa)

## 真空冷冻干燥机 Vacuum Freeze-Dryer



### 主要用途 / Main Application

主要用于生物制品、化学制品、瓶冻（冻干注射剂）、盘冻（原料药）、天然药物、热敏性药物、抗菌素、口服冻干片剂等制药领域和食品、保健品领域，实现冻干过程，达到干燥目的。

Mainly used in the fields of pharmaceuticals, food and health care products such as biological products, chemicals, bottle freeze drying (lyophilized injection), plate freeze drying (raw material), natural medicine, heat-sensitive medicine, antibiotics, oral freeze-dried tablets, realizes freeze drying process.

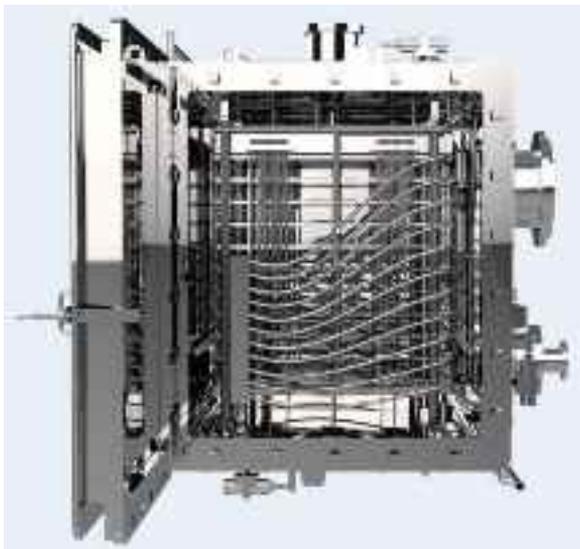
## 真空冷冻干燥机 / Vacuum Freeze-Dryer

**箱体：**一次加工成型，减少泄漏风险。箱体采用方形结构，箱体所有被加工面和孔采用先进加工装备一次成型，达到当前国际先进水平；采用 R>50mm 的大圆角结构；箱体底部单角倾斜更有利排水；所有内部材料采用 316L 材料；内表面抛光至镜面 <0.4umRa。

**板层：**板层由 316L 不锈钢制成；采用真空钎焊，保证良好的板层平整度及密封性；采用带编织网的 316L 不锈钢软管；表面抛光至 <0.4 umRa 并做钝化处理，单板及板层组件的氦质谱泄露测试以保证无泄漏

**Chamber:** Formed at one time to reduce the risk of leakage. The chamber adopts square structure, and all processed surfaces and holes are formed by advanced processing equipment at one time, reaching the current international advanced level; Adopts large rounded corner structure of R> 50mm; the single-angle tilt of the bottom is more favorable for drainage; 316L material for all inner material; inner surface polished to mirror surface <0.4umRa.

**Product shelves:** The shelf is made of AISI 316L stainless steel; Adopts vacuum brazing to ensure good flatness and sealing of the shelf; 316L stainless steel hose with braided mesh is used; the surface is polished to 0.4umRa and passivated, and adopts the helium mass spectrometer leak detection to ensure no leakage



**冷阱：**冷阱可以设计为立式或卧式，并可被安装在箱体的侧部、后部或底部；采用蘑菇阀设计以达到最佳的水蒸气流动及捕冰均匀性；所有内部材料采用 316L 材料；内表面抛光至 <0.6umRa。冷阱盘管表面积与板层面积 1.1:1，以保证在大量升华时冷阱的强有力运行。保证在大量升华时冷阱的强有力运行。

**Condenser:** The Condenser can be designed as a vertical type or a horizontal type, also it can be placed on the side/back/bottom of the chamber; Mushroom valve design for best vapour flow and ice distribute; 316L material for all inner material, inner surface polished to <0.6umRa. Condenser coil surface area design based on 1.1:1 with the shelf area.



**箱门：**特殊的铰链设计保证主门的轻松开启，并装有 D 型密封圈保证密封良好。

**Chamber door:** Special hinge design to ensure the Main door move easily, and equipped with D-form gasket for good sealing

# 冻干实验室 Lyophilization Laboratory



冻干显微镜  
Freeze Drying Microscope





实验型冻干机  
Laboratory Freeze Dryer



## 提供的服务 / Service Can Be Provided

工艺开发：帮助客户开发冻干曲线。

处方设计：帮助客户开发药品冻干的处方。

工艺放大：为需要从小规模生产或实验小试转变为大规模生产的客户提供帮助。

工艺优化：帮助已拥有原始工艺曲线且需要进一步完善的客户，优化工艺曲线，提升药品冻干速率，缩短冻干周期。

Process development: Help user to develop freeze drying curve

Recipe design: Help user to develop recipe of freeze drying product

Process Scale up: Offer help to user who need to transform from small scale

production or laboratory to large scale production

Process optimization: Help user who has original process curve, but need to optimize, to optimize the process curve, improve freeze drying speed, and reduce freeze drying cycle.

# 轧盖机 Capping Machine



## 主要用途 / Main Application

主要用于制药厂西林瓶的轧盖封口，采用旁置单刀柔性滚压轧盖结构，自动完成输瓶、上盖、轧盖等工序。

根据新版 GMP 要求，轧盖操作可选择在 B 级、C 级或 D 级背景下的 A 级送风环境中进行；轧盖设置在 C 级或 D 级背景下时，轧盖钱需自动检测胶塞余瓶口的密封度。

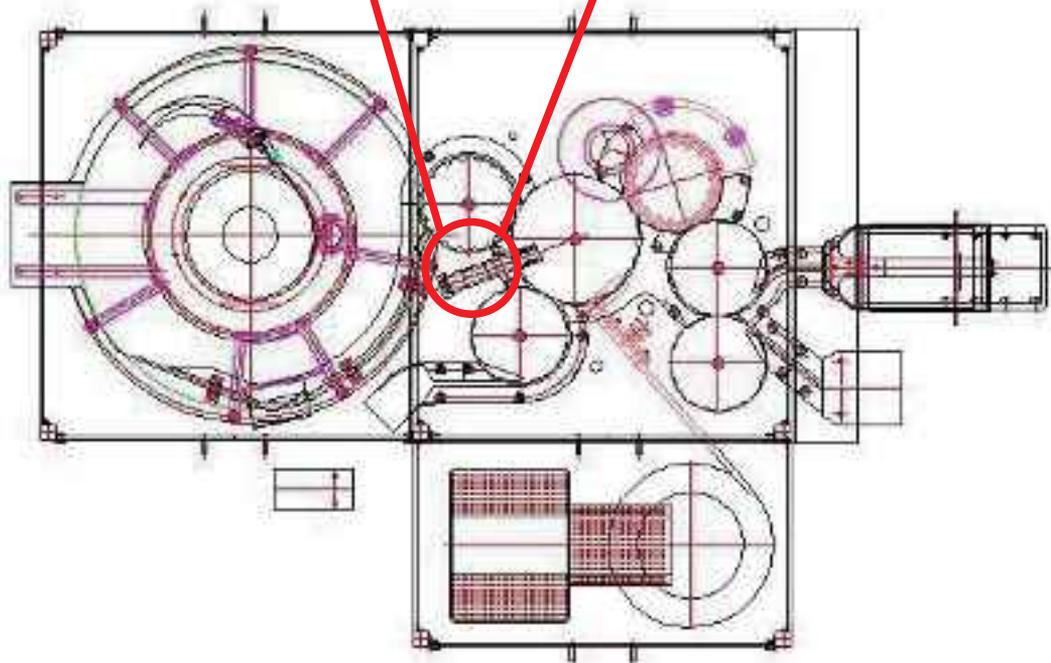
Mainly used for capping of vials in pharmaceutical factory. It adopts side-placing singleroller sealing structure, can complete the following process automatically: vial infeed, cap infeed, capping. As per requirement of new version GMP, capping can be made in A grade ventilation condition under B, C or D grade background. When capping in C or D grade background, it needs auto detection of sealing for stopper and vial mouth before capping.



光纤检测  
Fiber Inspection



视觉检测  
Visual Inspection



# 全自动灯检机 Fully Automatic Inspection Machine



## 主要用途 / Main Application

主要用于制药厂西林瓶冻干粉针剂产品的可见异物、外观缺陷及封口缺陷的自动检测。

Mainly used for automatic inspection of visible particle, apparent defect and sealing defect for vial freeze drying products in pharmaceutical factory.

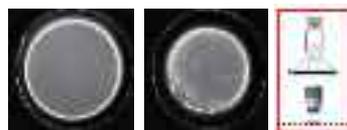


## 产品特点 / Product Features

- ◎ 产品缺陷: 冻干块上表面、下表面以及侧表面的异物, 如玻璃、纤维、黑块、装量过高、过低或者空瓶冻干块萎缩、液化、粉化, 冻干块歪斜或倾倒。
  - ◎ 封口瑕疵: 有无胶塞、轧盖(铝盖)位置, 有无刮痕, 弯曲或者凹痕、有无塑料盖、塑料盖是否破损、有无黑点。
  - ◎ 瓶身瑕疵: 玻璃有无划痕、裂纹或结石瓶身上是否有污点。
- + Product defect: Foreign bodies on the upper, lower and side surfaces of the lyophilized block, such as glass, fiber, black block, filling volume too high, too low, or empty bottle, lyophilized block shrinking, liquefied, powdered, inclining or dumping.
  - + Sealing defect: Whether there is stopper, cap position, whether there are scratches, bends or dents, whether there are plastic covers, whether the plastic cover is damaged, and whether there are black spots
  - + Vial body defect: Whether there are scratches, cracks or stone on the glass, whether there is dirty spot

### 工位一: 冻干块下表面检测

Station 1: lower surface inspection of freeze-dried block



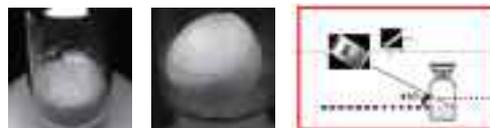
### 工位二: 冻干块侧表面检测

Station 2: side surface inspection of freeze-dried block



### 工位三: 冻干块上表面检测

Station 3: upper surface inspection of freeze-dried block



### 工位四: 瓶身玻璃瑕疵的检测, 瑕疵主要包括瓶身刮痕、裂纹等

Station 4: inspection of vial body defects, including scratch, crack etc



### 工位五: 瓶盖的检测之动态检测

Station 5: dynamic detection of caps



### 工位六(可选): 瓶盖检测之静态检测(塑料盖顶检测)

Station 6(optional): static detection of caps(detection for cap top)



## 机器人自动包装生产线 Robot Automatic After-Packaging Compact Line



### 主要用途 / Main Application

主要用于安瓿水针剂，西林瓶水针剂、粉针剂、冻干粉针剂，口服液，大输液，片剂、胶囊等药品，以及化妆品、食品等各类物品灌装封口完成后的包装，可自动完成灯检、贴标、制托、入托、装盒、裹包、装箱、捆扎、码垛机监管码管理等工序。

Mainly used for package of ampoule injection, vial injection, powder injection, lyophilized powder injection, oral solution, large infusion, tablets, capsules and other medicines, as well as cosmetics, food and other items after filling and sealing. Can automatically complete the process of light inspection, labeling, pallet making, loading, boxing, wrapping, case packing, bundling, palletizer supervision code management and others.

# 生产制造与质量保障 Manufacturing and Quality Assurance



## 加工能力 / Processing Capability

- 优秀的机加水平 + Excellent processing level
- 洁净的制造环境 + Clean manufacturing environment
- 先进的检测工具 + Advanced test tools



数控加工中心  
Cnc Machining Center



机器人自动焊接  
Robot Auto Welding



抛光机  
Polishing Machine



总装车间  
Assembly Workshop



仓库管理  
Warehouse Management



Top 车间  
Top Workshop



内窥镜  
Endoscopy



表面粗糙度检测仪  
Surface Roughness Detector

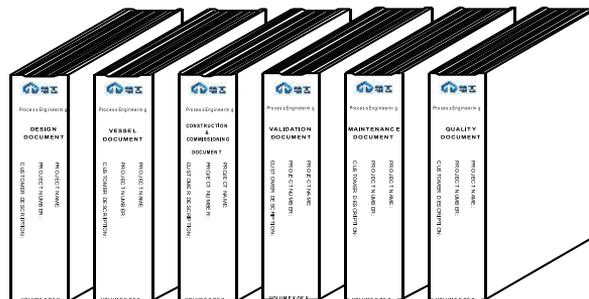
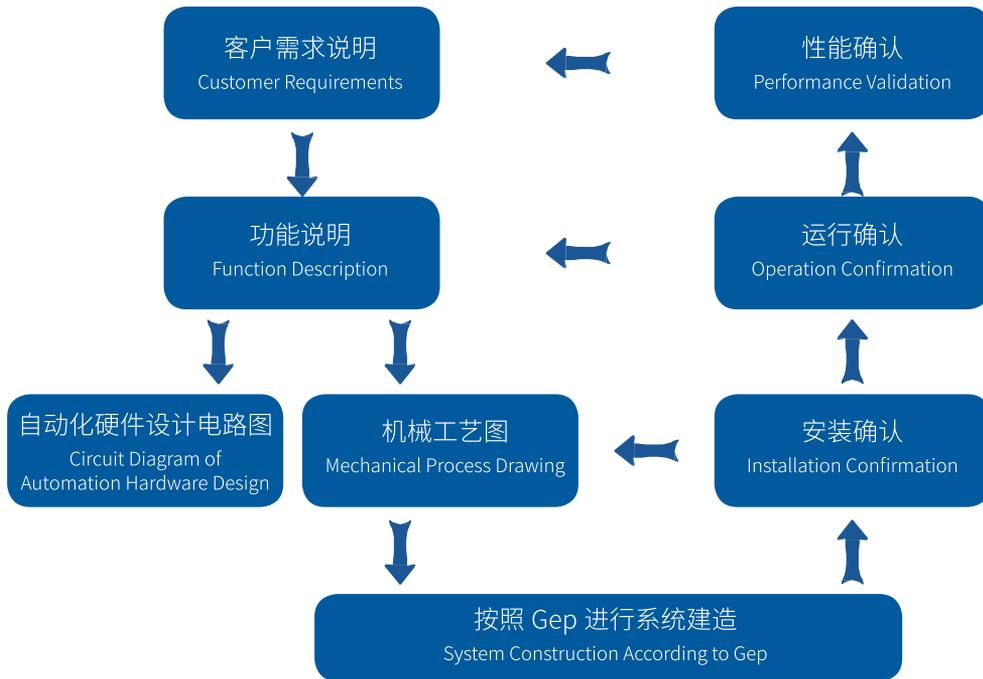


材质检测  
Material Test

 验证及文件 / Validation and Document

水系统作为药厂的关键公用工程，从规划到运行都遵循 V 模型，文件符合验证要求，自动控制系统可满足 GAMP。

As a key public project of the pharmaceutical factory, the water system follows the V model from planning to operation, the document meets verification requirements, and the automatic control system can meet GAMP





## 售后服务体系 / After-Sale Service System

### ◎ “管家式”服务

丰富的项目管理经验  
强大的项目管理团队  
专业雄厚的人才储备。

### ◎ 贴心的售前服务

客户需求产品整体解决方案设计  
客户工厂整体解决方案设计咨询  
免费的专家技术培训。

### ◎ 专业的售中服务

客户需求产品再优化设计调整  
客户员工操作培训、指导  
整体设备安装、调试及现场操作培训

### ◎ 负责的售后服务

设备故障 24 小时咨询服务  
方便、快捷的 24 小时内现场服务  
设备改造、技术升级服务

### + “Housekeeper” service

Rich experience on project management;  
Strong team for project management;  
Professional & Abundant talent reserve

### + Intimate pre-sale service

Overall solution design as per user' s requirement  
Consulting for overall solution of user' s factory  
Free technical training from experts

### + Professional sales service

Re-optimization design adjustment for customer required product  
Operator training, guidance  
Installation, commissioning and site training

### + Responsible after-sales service

24-hours consulting service  
Convenient and quick on-site service  
Equipment and technology upgrading service



秉承“一切为客户着想，为一切客户着想，为客户着想一切”的理念，以“为客户创造价值”为己任，楚天专注于打造一流的研发、设计、销售、制造、服务团队及服务管理体系，为客户提供高效、优质的产品与服务。



### ◎ 项目规划支持

楚天拥有系列专业医药设计院、产品研究院，一批行业资深科研技术人员，无菌制药工艺的验证专家、教授等，为客户的项目提供科学、有效的技术规划支持。



### ◎ 过程保障服务

楚天推出的医药装备整体解决方案，实现药品生产过程的全自动化、无菌化，智能检测、分选，以及计算机验证保障，生产出让市场“放心”的产品。



### ◎ 走进园区服务

楚天作为设备供应商，不仅仅将行业法规标准融入到产品设计、制造中，还让法规标准以讲座、交流的形式走进园区，与药企的工艺、生产形成互动与融合。



### ◎ 设备管理咨询服务

楚天致力于满足客户效益最大化需求，提供一揽子的设备管理模式，协同药厂实现投入最小化，产出最大化。

◎ 坚持“以客户为中心”，以匠人之心打造极致服务体验，为客户创造更多价值

**34** 全国 34 个省（市）

**365** 全年 365 天

**7x24** 7X24 小时服务时间

◎ 我们随时待命为客户单位设备正常运行保驾护航

- + 现场安装、调试、验收
- + 设备工艺、操作、维护等相关培训
- + 周期性的定期上门维护与回访
- + 设备各部件性能的检测与保养
- + 备品备件的及时供应
- + 产品技术升级与技术二次开发
- + 设备大修



## Service Concept

400-9988-900



Adhering to concept of “all for customers, for all customers” , and with the mission of “creating value for customers” , TRUKING focuses on building first-class R&D, design, sales, manufacturing, service teams and service management system to offer high-efficient and high-quality products and services for the customers.



### ◎ Project Planning Support

TRUKING has a series of professional medicine and pharmacy design institutes, product research institutes, a group of senior scientific research and technical personnel, aseptic pharmaceutical process verification experts, professors, etc., to provide scientific and effective technical planning support for customers' projects.

### ◎ Process Assurance Service

TRUKING launched the overall solution for medical & pharmaceutical equipment realizing the full automation and aseptic production process, intelligent detection and sorting of the drug, as well as computer verification assurance so as to produce assured products for the market.

### ◎ Service In The Park

As an equipment supplier, TRUKING not only integrates industrial regulations and standards into product design and manufacturing, but also introduces the industrial regulations and standards into Truking industrial park in the form of lectures and exchanges to interact and integrate with the technology and production of pharmaceutical enterprises.

### ◎ Equipment Management Consultation Service

TRUKING aims to satisfy the maximum benefited demands of the customer and to provide a package of equipment management services to realize minimization investment and maximization production output together with pharmaceutical factories.

◎ Adhere to the philosophy of "customer-centric", TRUKING creates the extraordinary service experience with the spirit of the craftsman, to create more value for customers.

◎ We are always ready to escort the normal operation of the customer's equipment.

- + Onsite equipment installation, commissioning, acceptance
- + Training for equipment process, operation and maintenance
- + Periodic door-to-door maintenance and return visit
- + Performance test and maintenance for machinery parts
- + Timely supply of spare parts
- + Product technology upgrading and secondary development
- + Equipment overhaul





[www.truking.com](http://www.truking.com)



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