



HOLLiAS BATCH CONTROL SYSTEM

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Profile

Founded in 1993, HollySys is a leading supplier of intelligence solutions with more than 4,700 employees and operates in both China and abroad. HollySys is headquartered in Beijing with R&D, production, and service bases in Beijing, Hangzhou, Xi'an, Singapore, and local branches in major cities in China, as well as offices in India, Malaysia and Indonesia, establishing a comprehensive service network across the world.

HollySys business consists of industrial intelligence, transportation intelligence, and food and pharmaceutical intelligence, covering the main industries for the national economy and the people's livelihood. With years of technological accumulation in various fields and continuous capacity building, we can provide customers with customized integrated solutions, stable and reliable products, and full lifecycle services, helping them improve market competitiveness. Over the past three decades, we have served more than 35,000 clients, successfully completed more than 45,000 projects, and gained more than 1,000 new clients each year, making HollySys a world-renowned brand in automation and intelligence field.

The HOLLiAS industrial control platform of HollySys features a series of advanced, practical and reliable industrial automation systems and HollySys automation instrumentations products. The system products include MACS-K, MACS-S industrial control system DCS, professional control systems such as DEH, ETS and SIS, and whole-process information-based software for manufacturing enterprises. Instrumentation products include isolated safety barriers, signal isolators, surge protectors, power transmitters, pressure transmitters, electromagnetic flowmeters, metal tube float meters, magnetic level gauges, radar level gauges, throttling elements, thermal elements, and pressure gauges.

The company's products have been successfully applied to major projects and key equipment, including 1000MW ultra-supercritical thermal power units, 1.2 million tons of urea and 5 million tons of oil refining main units, earning a good reputation in the industry.

Specializing in HollySys Instrumentation and control system engineering and integration, the company can provide both new and brown field projects of enterprises with HollySys proprietary products, as well as comprehensive engineering services such as customized design and construction & commissioning.

HollySys has always pursued continuous innovation and R&D while sticking to its vision "create the most valuable intelligent company through stable and sustainable development" to provide more reliable, secure, and intelligent technology and products for our customers.

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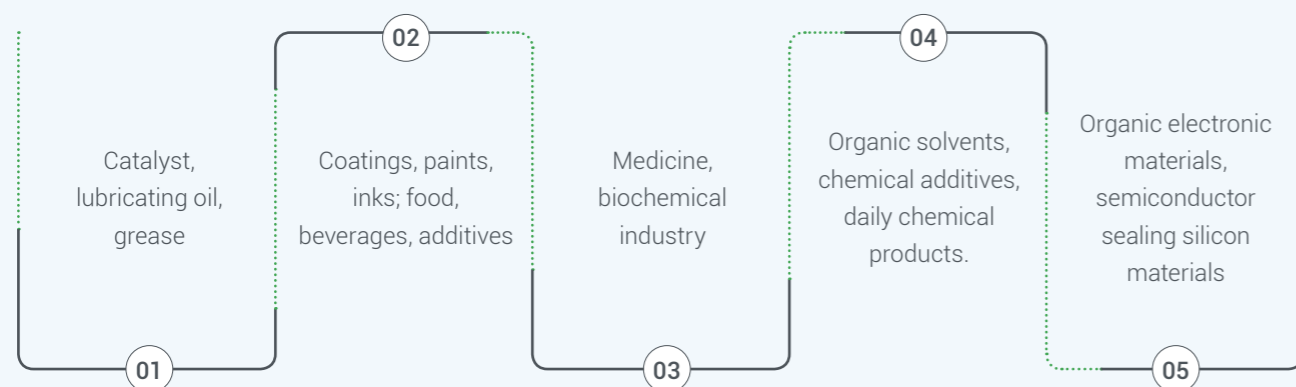
Overview

In this era of transition from the www to the Internet of Things, the industrial focus has also undergone a rapid and fundamental shift. Before Industry 4.0, all innovations were aimed at reducing costs through economies of scale and increased productivity. In the future, the secret of industrial success lies in how to improve productivity while shortening the cycle of products from "design" to "marketing", and how to meet more complex and personalized product requirements. So as to complete the transition from "product manufacturing" to "intelligent manufacturing", for example: production equipment interconnection, transparent and visual control process, flexible and changeable process, rapid switching of new products, multi-product recipe management, product quality traceability, planned production scheduling, etc.

HollySys developed the HOLLiAS Batch software based on above requirements to provide an integrated and intelligent solution for intermittent production process.

The HOLLiAS Batch software combines the characteristics of batch production to model, standardize and simplify the complex process.

Batch control system is primarily implemented in industries with intermittent and batch process:



System Advantage

The HOLLiAS Batch control system brings the following advantages to customers:



Core Competence

With the increasingly fierce global competition and the challenges, HOLLiAS Batch provides an optimal information flow to standardize production process, and reduce the risks of errors and omissions in paperwork transmission.

Design Compliant with International Standards

- ISA S88 standard defined model (physical model, program model, control activity model)
- FDA21 CFR PART11 standard: electronic records and electronic signatures functions

Flexible and Stable Database

- General MS-SQL relational database
- Flexible data storage and query
- Powerful batch report

Powerful Recipe Management

- For different production scenarios, the same master recipe can have multiple parameter schemes
- Up to 200 control recipes running at the same time
- Maximum 50 clients online at the same time

Friendly Human-machine Interface

- Graphical program configuration and display function (CFC)
- Modular software design
- Classic WINDOWS navigation interface style
- Simple guided installation and setup
- Rich online help and guidance

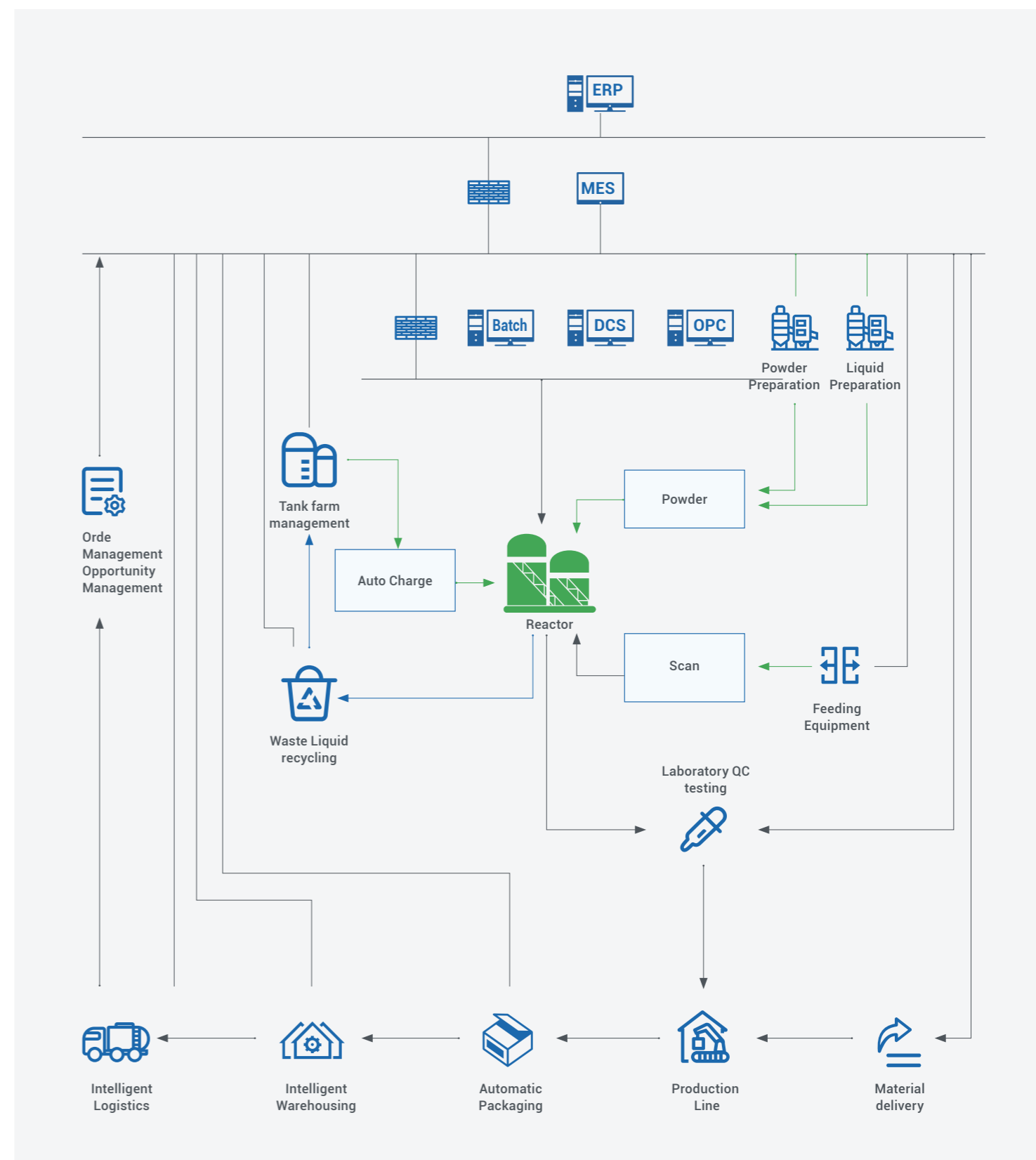
Practical Advanced Analysis and Query.

- Parameter comparison and process analysis between batches or within batches
- Data query such as operation log, alarm information and historical recipe

Reliable, Flexible and Open Platform

- Advanced management functions, such as planning, scheduling, comparison and analysis
- Centralized library management functions (material library, operation library) to improve reusability
- Secure data interchange
- Abundant system alarms and powerful diagnosis
- Open external communication interface
- Reliable manual charge check (bar code scanning, electronic label)
- Complete batch reports and statistical reports
- Flexible production line equipment selection
- Standard user authorization management
- Orderly batch priority management

System Architecture



Production Efficiency Improvement

The visual-based drag-and-drop engineering interface and modular process make everything simple and efficient, from recipe assignment, scheduling to equipment control, from physical model configuration to recipe configuration. HOLLiAS Batch software provides a comprehensive operation management solution and workflow optimization for intermittent production enterprises.

⇒ Planning and Scheduling

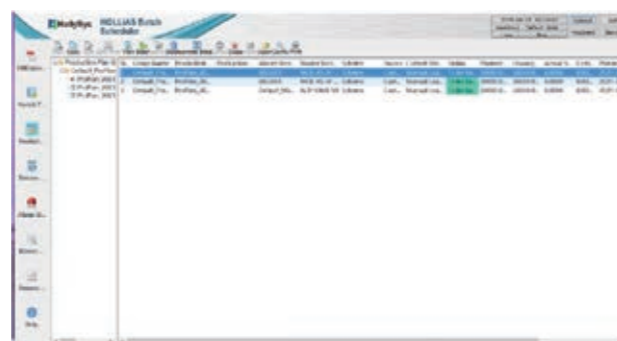
- The orders are broken down production task orders and scheduled to each production line, so that production is more orderly and predictable
- Modify production plan and scheduling information online so that we can quickly and flexibly respond to production line requirements
- Supports third-party systems to release production plans

⇒ Flexible Batch Control

- Equipped with factory intelligent production planning mode to meet the requirements of on-site fully automatic production
- Supports semi-automatic and semi-manual production planning mode, which meets the requirements of complex production conditions on site
- Multiple batches are running at the same time, and the system will automatically run the next batch if any equipment on idle to reduce equipment waiting time
- Intelligent judgment of multi-to-multi device path realizes self-optimization of paths to reduce errors and increase productivity

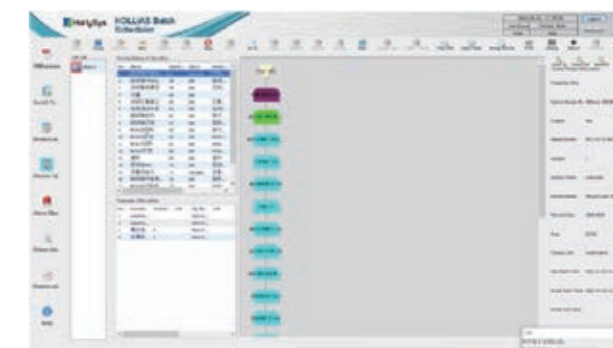
⇒ Production Plan Classification Management

- The production plan creates folders based on process recipes for classified management for easy traceability
- The status of each production plan is clear and orderly, which is c



Product Quality Improvement

- HOLLiAS Batch monitors the production process in real time, and all batches running process are plainly visible.
- Multi-colors indicate different states of recipe program operation, and on-site monitoring and operation are clear at a glance
- The system defines simply process operations such as pause, skip, abandon, interpolate, modifying parameters and other one-key operations



⇒ Flexible Control Mode

- Three Batch control modes: automatic, semi-automatic and manual, in line with on-site operation habits
- The Batch control mode can be used independently or in combination to meet the requirements of the Batch control process

⇒ Rich Process Information

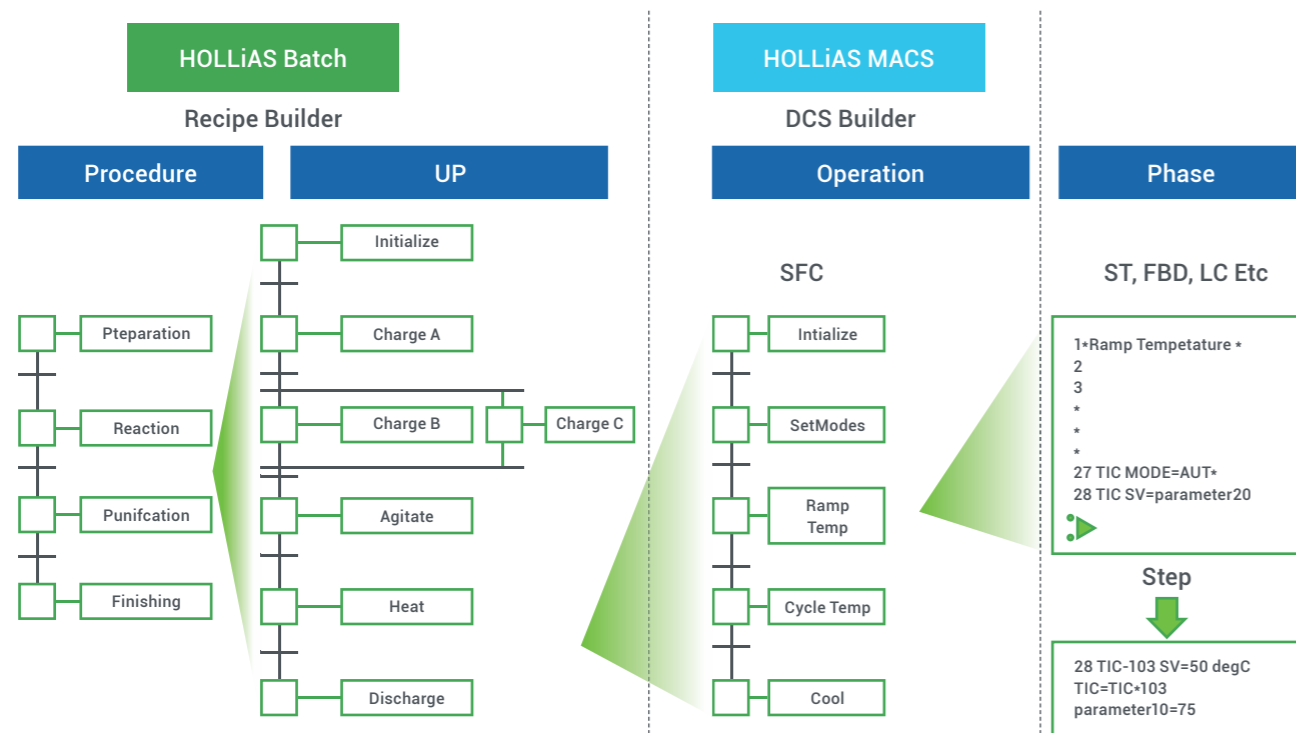
- Batch control generates a wealth of process information, which provides an important basis for production operations and decision-making
- The detailed and orderly human-machine interface information and simply production operation reduce labor intensity
- The historical batch process data after operation facilitates the traceability and optimization of the production process

⇒ Intelligent Resource Strategy

- Multiple batches are alternately proceeded in an orderly manner according to priority, reducing equipment idleness and increasing equipment utilization
- For multi-to-one production process, intelligent resource strategy reduces resource occupation and improves production efficiency
- For multi-to-multi production process, self-optimized path strategy reduces resource conflicts and shortens the production cycle
- The equipment is optional to be exclusively occupied or shared to realize efficient, flexible and simple production and operation
- Manual intervention provides expedient for emergencies to ensure safe and stable production

⇒ Refined Control

- The control models are divided into batch level, unit level and operation level to cover whole process
- The control range is refined level by level, and the different operation instructions are levered to achieve precise control
- Strict operation and monitoring authority management ensures the safety of the production process and the non-disclosure of recipe data
- Step-by-step modularization and refined management improves production management level and product quality



Process Optimization

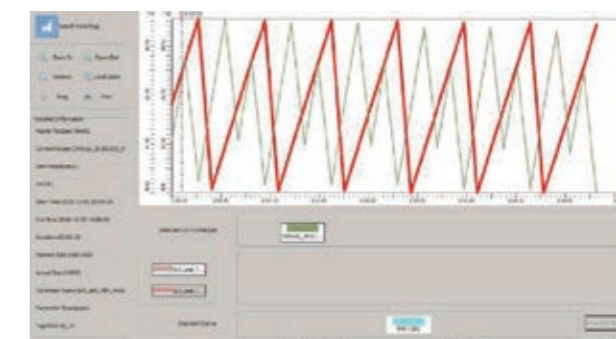
The process analysis of the HOLLiAS Batch software is of great help in optimizing the production process and operation.

⇒ Graphical Display Interface

- Simultaneous comparison of multiple related parameters quickly analyzes the process parameter differences causing quality fluctuation
- Out-of-tolerance alarm reminder help retaining product quality uniformity
- Query of the optimal quality process parameters helps optimizing the control process and parameters to improve quality and efficiency

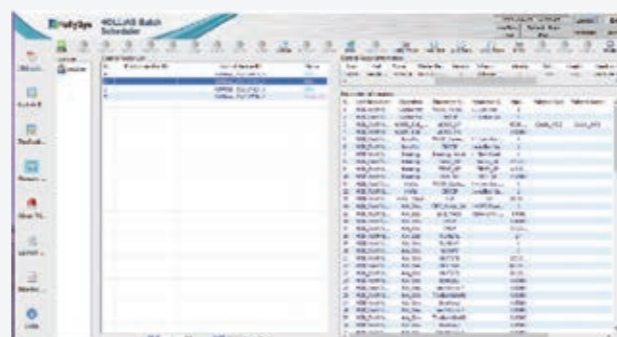
⇒ Add Trend Points Online

Online add parameters for comparison. Easy to use and convenient.



⇒ Instant Online Modification

- Online modification allows fast and timely modification to recipe and other parameters
- All online modification in the batch process will take effect immediately and will not affect existing production process.



Manufacturing Process Traceability

HOLLiAS Batch software automatically records all online operation information and batch running status. HOLLiAS Batch provides reports complaint with the characteristics of intermittent industry:

- Adopts MS Excel configuration for easy use
- Supports flexible customized report function
- Online report query and printing function
- Automatically generates reports, which are unchangeable and independent stored

Operation Log

- Records operation information such as online modification of orders and recipes to ensure production process traceability
- Records all online operation instructions following FDA electronic record requirements to ensure safe and compliant production
- The detailed operation log provides a basis for the assessment and evaluation of production operators

System Alarm

The online alarm of HOLLiAS Batch software includes real-time graphical display, customizing alarm level and multi-function alarm query, etc.

- Important events or abnormalities in the production process will trigger an alarm and corresponding interlock to guarantee production safety
- The record of problem, identification, time, level and type of the alarm facilitates fast locating the fault source
- The alarm information system also provides methods and guidelines for troubleshooting, reducing the system maintenance workload

Alarm setting

- Supports alarm printing, offline storage, convenient for important information archiving and traceability
- Flexible setting of alarm priority adapts the requirements of production process and on-site operation
- Alarm filtering and confirmation functions realize fast production problems querying and handling

Batch Reports

- Whole process and results reports provides data support for process optimization and product traceability
- Automatic generation of reports without manual recording
- Customized batch report templates meets production process requirements
- Reliable and unchangeable data complies with FDA electronic signature requirements

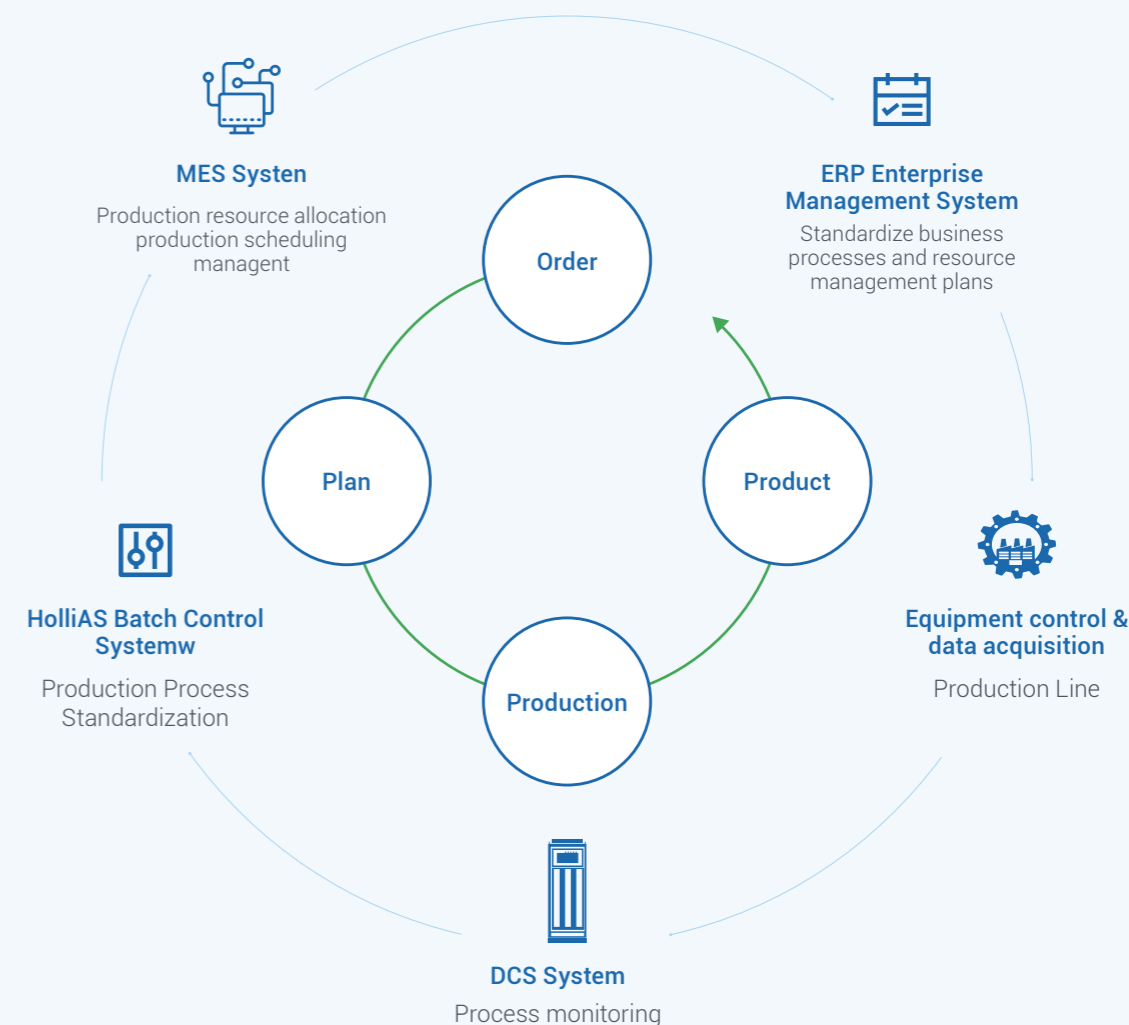
Statistical Reports

- Daily, weekly and monthly reports provide a basis for raw material and energy consumption analysis
- Analysis of peaks and valleys of various raw materials based on historical data of the statistical reports for process optimization

Operation & Management Integration

The warehouse management function provides accurate and abundant material information for production. Flexible building of a warehouse management model realizes efficient and convenient management of material warehousing and batch operations. Real-time connection with third-party warehouse management systems such as ERP/MES, and timely update of material inventory and other information.

- Material and batch query.
- Barcode for scan verification, code printing and query.
- Material preparation management.

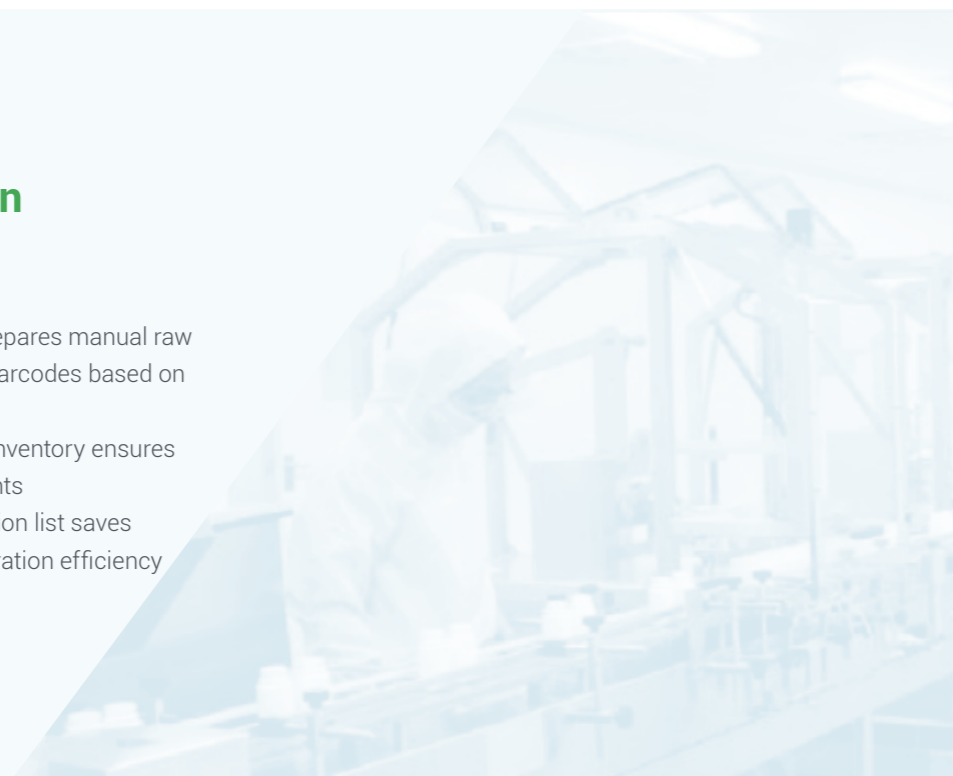


Warehouse Management

- The outbound and inbound operation seamlessly integrates with batch production process, making the batch charge process more efficient
- Automatically generates picking lists, only need simple operations to complete material library management and update
- Powerful warehouse management function facilitates daily material management and cost accounting
- Optional barcode scanning or third-party release of material information avoids the inefficiency and high error rate of manual input

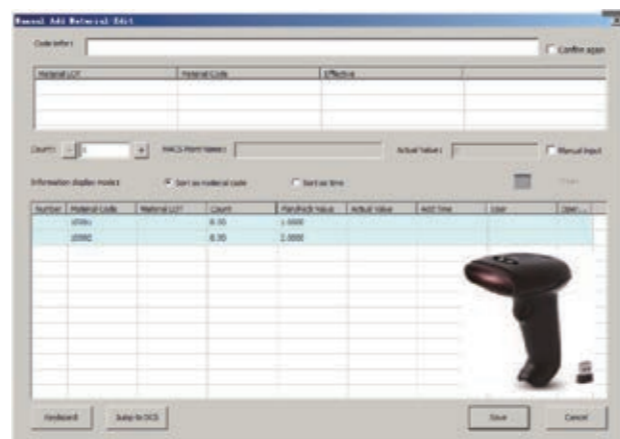
Material Preparation Management

- Material preparation management prepares manual raw materials in advance and generates barcodes based on batch numbers and recipes
- Timely update of the actual material inventory ensures that meets the production requirements
- The auto generated material preparation list saves preparation time and improves preparation efficiency



Barcode Management

- Material barcode scanning and verification prevents omission, mistaken charge and overcharge
- Barcode scanning to check the equipment, step sequence, material code, charge amount and other information ensures the accuracy of the material
- For online manual charge, it supports both manual input and scanning of barcode, which are easy to operate
- The barcode format can be configured or from a third part



Major References

| Pharmacy(Chinese/Western Medicine) | | Pesticide | | Lubricant/Grease | |
|--|---------------------------------|--|-----------------------------|-------------------------------|-------------------------------|
| Product/ Equipment | Typical References | Product/ Equipment | Typical References | Product/ Equipment | Typical References |
| Chinese medicine extraction | E-fong Pharmaceutical Guangdong | Pesticide formulations | BASF Plant protection agent | Lubricant | Sinopec Lubricant Branch |
| | E-fong Pharmaceutical Longxi | | Shanghai Xianglin Mefront | | PetroChina Lubricant Branch |
| | Chia Tai Youth Bao | | Shenzhen Noposion | | Shanghai Naco Synthetics |
| Original drug synthesis | Kanglong Chemical | Pesticide Intermediate | Guangzhou Greatchem | Grease | Shandong Fangyu |
| Medicinal preparations | Liaoning Cynda | | Tomie Benzene Satoshi | | Sinopec Lubricant East China |
| Pharmaceutical intermediates | Suzhou Fujilai | | Limin Chemical BM | | Sinopec Lubricants Wuxi |
| Organic electronic materials silicon materials | | Resin | | Catalyst/polyether/surfactant | |
| Product/ Equipment | Typical References | Product/ Equipment | Typical References | Product/ Equipment | Typical References |
| Cathode material | Guangzhou BYD | Acrylic | Hubei Huyi Chemical | Exhaust gas catalyst | BASF Catalyst Jinqiao |
| | HEC Lithium Iron Phosphate | | Shanghai Baolijia | PGM | BASF PGM |
| Lithium battery materials | Ningde Kaixin Battery Materials | Furan resin | Suzhou Xingye | Microspheres/ Molecular Sieve | PetroChina Changting Catalyst |
| liquid crystal Isoelectronic materials | Zhejiang Yongtaitech Chemical | Phenolic Resin | Shandong Shengquan | Polyether | Hangjin Technology Polyether |
| Silicone materials | Wynca Chemical | Unsaturated resin | Jiangsu New Solar | Surfactant | Sanjiang Chemical Surfactant |
| Fluorosilicon material | Shandong Dongyuechem | | Changzhou Tianma Ruisheng | | Zhuhai Solvay |
| | | PU/PE Resin polyester | Shanghai Huide | | Yangzhou Sixin Chemical |
| Daily chemical | | Paint/Coating | | Paint/ink | |
| Product/ Equipment | Typical References | Product/ Equipment | Typical References | Product/ Equipment | Typical References |
| Laundry detergent | Bluemoon Guangzhou | Architectural paint | Shandong Puntium Paint | Wood paint | Nippon LRF |
| | Bluemoon Kunshan | | Zhiqiang Paint | Anticorrosive paint | Qingdao Haiyangchem |
| Essence | Hangzhou Grascent | | Shanghai Bauhinia | Varnish/tablet/ gravure | Hangzhou Hhink |
| Spices | Hangzhou Youbang Spices | Real stone paint/ imperial paint/latex paint for exterior wall | Shanghai Asia-paint | Flat ink | Tongxiang Bauhinia Ink |