

TRUKING TECHNOLOGY LIMITED

**COVID-19 VACCINE MACHINERY
COMPLETE SOLUTION**



30+ candidate vaccines for Covid-19 are in the phase of clinical trials. Mass production of these vaccines is expected to come quickly.

172 countries were engaging with the initiative, which is known as the COVAX Global Vaccines Facility declared by the World Health Organization. It hopes to deliver at least 2 billion doses of safe, effective vaccines through its vaccine initiative by the end of 2021.

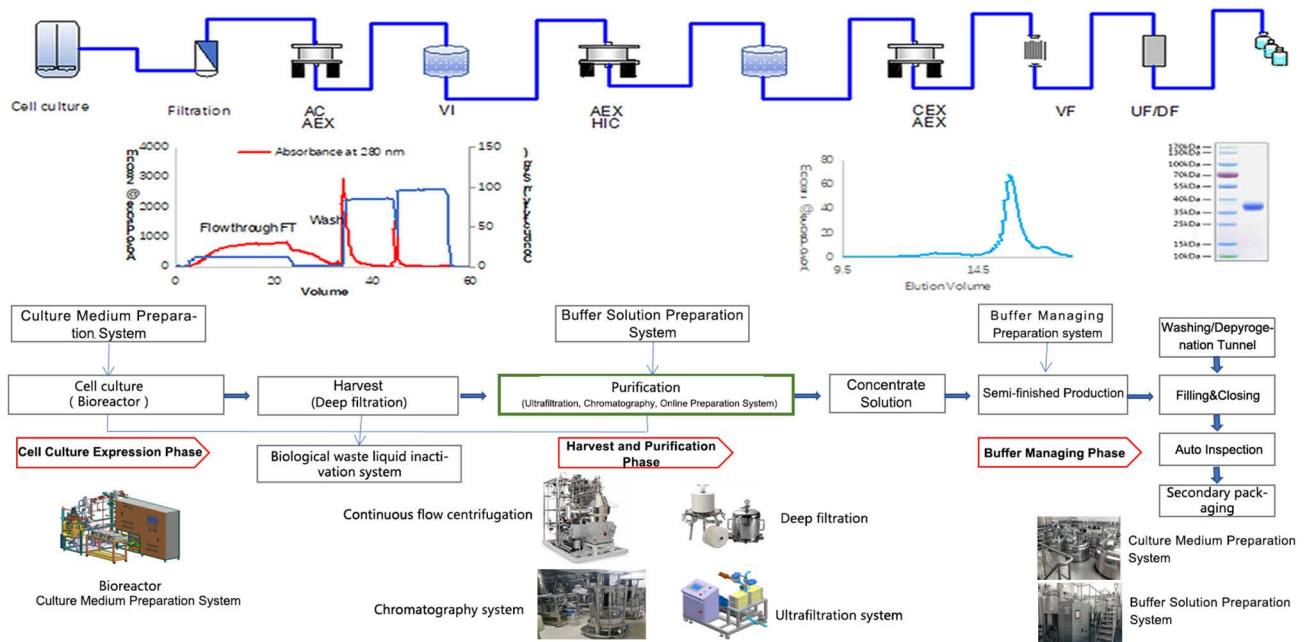
Today, have you been ready for mass production?

TRUKING, as one of the major companies in the pharmaceutical equipment industry, has been committed to providing pharmaceutical equipments and complete solutions for pharmaceutical factories for more than 20 years.

To establish a new benchmark in the industry with Sino-Germany technologies integration. To win time for mankind to defeat the COVID-19 with the strongest production and delivery capabilities. **TRUKING**, together with its subsidiaries Germany ROMACO, TRUKING WATERTOWN and TRUKING INGENUITY, has brought industry-leading technologies, based on high-efficiency and energy-saving process equipments, information system and automated logistics to provide customized equipments and solutions for safe, efficient and high-quality mass production dedicated for vaccines and other biopharmaceuticals.

Technical services for designing, manufacturing, validation, operation and maintenance.

TRUKING provides process technology consultation, plant design consultation, upstream and downstream process fluid system of vaccine production and auxiliary systems, etc. Guided by S88 international standards, supporting computerized systems that meet GAMP5 and GMP requirements to realize the integrated life cycle of the entire production line.



SARS-CoV-2 vaccine production full cycle process: A typical production process of recombinant protein vaccine



Bioreactor:

For bacterial fermentation and cell culture, which can meet the production of vaccines, monoclonal antibodies, genetic engineering and other drugs. With independent intellectual property rights, safe and maintenance-free stirring system, multi-channel feeding and multiple air intake modes for option. Equipped with Siemens automatic high Precision control system (PLC+WINCC or PCS7 system);

Medium preparation system:

Fully-automatic medium preparation system meets the demands of stainless steel or disposable bioreactor culture medium. Fully enclosed feeding preparation prevents cross-contamination. Mixing process analysis ensures the preparation effect. The automatic control program follows the S88 international standard. Provides PLC+WINCC or PCS7 system select;





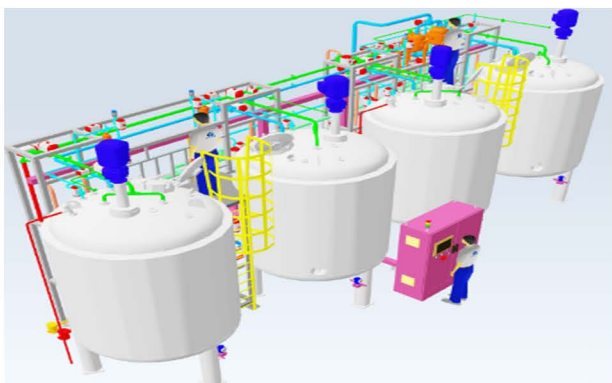
Buffer solution preparation and storage system:
 The fully automatic, intelligent system can meet requirements of a variety of biological product buffer solution preparation, such as vaccines, monoclonal antibodies, genetic engineering, blood products, etc. Providing a variety of special materials preparation system with 316L, stainless steel + tetrafluoro, 904L, 2205, 2507 and titanium alloys material etc.. The automatic control program follows the S88 international standard, and provides a choice of PLC+WINCC or PCS7 system.

Centrifugal and deep filtration system:
 Fully automatic continuous flow centrifugal and deep filtration system, fully enclosed and pollution-free, can be cleaned/sterilized in place, easy to operate, safe and stable;



Detoxification and inactivation system:
 The fully-automatic detoxification and inactivation system can meet the production needs of a variety of biological products such as vaccines, monoclonal antibodies, genetic engineering, blood products, and fully enclosed operations to reduce biological safety risks. It can be CIP/SIP, aseptic sampling, feeding and outfeeding of materials, PH/ High-precision temperature control, deactivated effects can be verified, safe and convenient. automatic control program follows S88 international standard, and PLC+WINCC or PCS7 system options are provided;

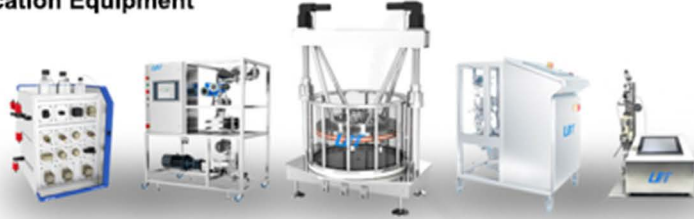
CIP system:
 Fully automatic CIP system, can provide a variety of CIP workstations such as single tank, double tank, three tanks. Standardized equipment, with compact designing and small space occupation, can clean a single target or multiple targets at the same time. Equipped with equipment self-cleaning function.



Provide a fully automatic batch inactivation or continuous inactivation system to meet the inactivation treatment of bacteria, viruses, and cell production waste liquids. It is safe, efficient, and flexible. And can quickly rise and fall in temperature, save inactivation time and reduce energy consumption;

Vaccine Purification System

01 Purification Equipment



02 Purification Medium



03 Process Development



04 Main Component



Features:

Customized system with deep understanding to vaccines manufacturing;
 Updated purification system brings higher purity and lower cost;
 Updated designs to optimize the process and increase the system productivity.
 Covering the capacity from laboratory to scale-up production.

Chromatography System

Laboratory Level Chromatography System



Pilot Scale Chromatography System



Production Level Chromatography System



Easy Chromatography Column



Chromatography Column

Auto Chromatography Column



Filtration Equipment

ATFF System



LTFF System



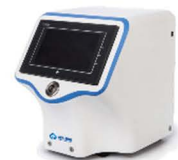
Disposable System



Preparation System



Core Components

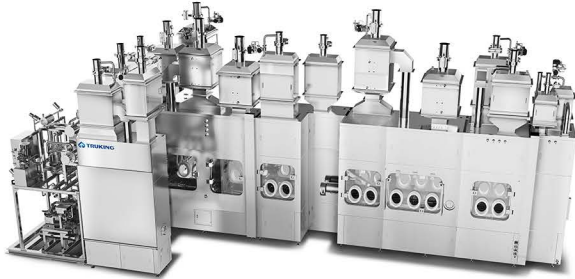


Vaccine filling lines

- Vial filling lines



With CRBAS/ISOLATOR



With ORABS



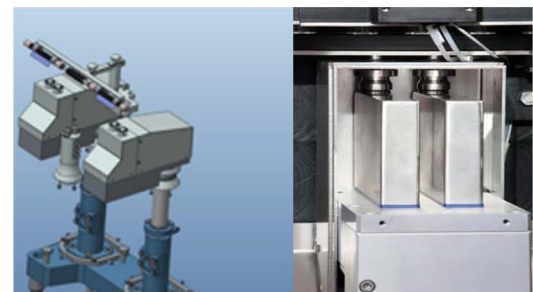
High accuracy filling system



IPC (100% / Statistic)

Features:

Sino-Germany technique fusion on core technology and processings;
 Adaptable for volume range: 2ml - 100ml;
 High output till 30,000 pcs/hr;
 IPC and auto calibration system are built in;
 CIP/SIP is available;
 Auto sampling / rejection are basically included;
 High flexibility for integrating with O-RABS、C-RABS and ISOLATOR.

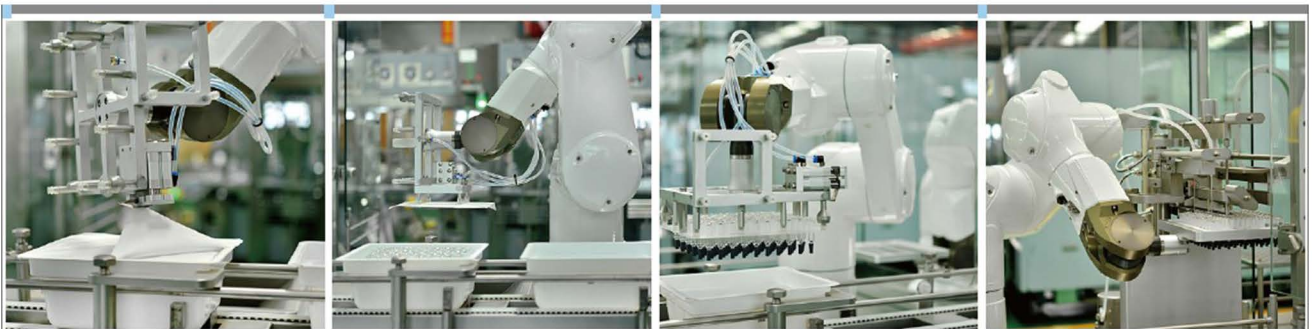


- Pre-filled syringe lines



Features:

- Robotic filling for higher sterility, stability and accuracy;
- Adaptable for volume range: 0.5ml - 3ml;
- Available for pre-filled syringe and vial are combined
- High output till 48,000 pcs/hr;
- Nitrogen protection and vacuum stoppering are adopted to eliminate oxygen;
- IPC and auto calibration system are built in;
- CIP/SIP is available;
- Auto sampling / rejection are basically included;
- High flexibility for integrating with O-RABS、C-RABS and ISOLATOR;



MORE downstream machines and technologies will come soon.....



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