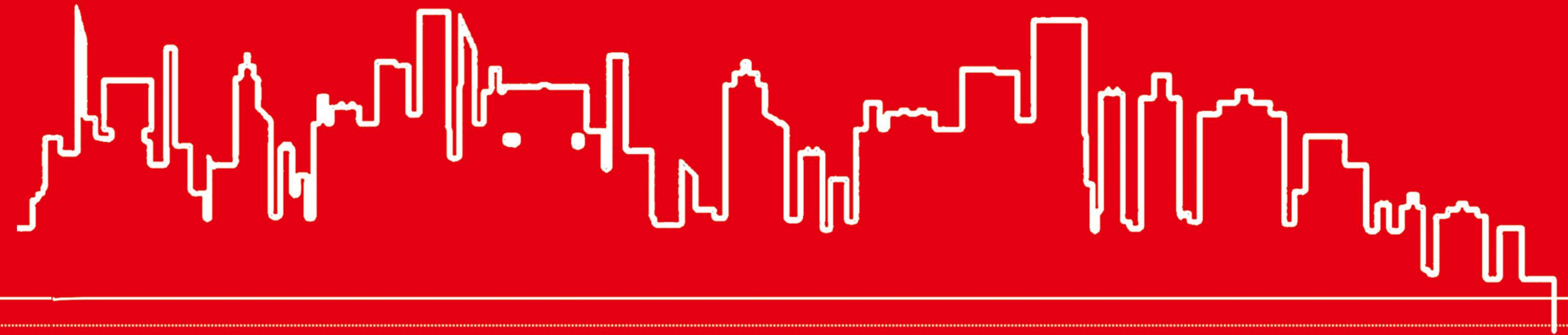


INDUSTRIALISATION OF CONSTRUCTION



SANY CONSTRUCTION INDUSTRY

PC COMPLETE SET OF EQUIPMENT

ABOUT US



SANY

品质改变世界
Quality Changes the World

In 2008, SANY officially marched into the PC industry, and became one of the earliest Chinese companies engaged in research on construction industrialization technology and prefabricated building systems. To date, the national market share of SANY exceeds 50%. SANY has become the the largest PC equipment supplier offering the most complete categories in the world.

01

COMPANY INTRODUCTION



1989



In 1989, SANY Group was founded and became the earliest Chinese manufacturer of construction machinery and equipment.

1998



In 1998, SANY concrete pump successfully built the No.1 height of 300.8m at Shenzhen SEG Plaza, a record high among domestically produced pumps, and since then dubbed as the China Pump King.

1994



In 1994, China's first large-displacement and high-pressure concrete pump was made by SANY.

2005



In 2005, the production and sales volume of SANY truck-mounted pump ranked No.1 in the world.

2006-2010



Overall layout of SANY in new energy development, industrial finance and prefabricated buildings over period of 2006~2010.

2008



In 2008, SANY officially stepped into the PC industry. It was the earliest domestic enterprise engaged in construction industrialization technology research and prefabricated building system.

2014



In 2014, construction industrialization became the key sector of SANY Group. In this year, a PC experimental factory with floor area of more than 20hm² was successfully completed in Changsha, Build our own installation and service teams covering the country.

2015



In 2015, SANY Group became National housing industrialization base. And the same year, an integrated research center of construction engineering technology for new building industrialization has established.

2017



In November 2017, SANY Group was approved as the first batch of national prefabricated construction industry bases. The PC equipment market share of SANY exceeded 50% and realized global sales.

2018



In 2018, Sany Construction Industry became the only company in the industry to provide PC equipment complete solutions, and sold more than 400 PC production lines across the country.

2019



In 2019, we developed intelligent manufacturing solution including professional equipment e.g. PC complete set of equipment, ALC production line, crusher, construction robots, industrial software, and AI.



National Assembly Construction Industrial Base



Research Center for New Building Industrialization Integrated Construction Engineering Technology



National Housing Industrialization Base



Vice Chairman Company SANY Group



Hunan Province Assembly Construction Industrial Base



BIM Talent Training Center

NATIONAL TOP R&D STRENGTH

SANY invests about 7% of its sales revenue in R & D each year. It owns national technology development center and post-doctoral working station. The number of patent applications filed by it ranks No.1 in the industry. We won five national technology awards successively. The sole BIM Talent Training Center in Central China was founded through in-depth cooperation with Nemetschek Group.



INTELLIGENT MANUFACTURING LEAN PRODUCTION

The PC production line equipment of SANY is introduced with the global most advanced lean manufacturing, and implemented with 6σ quality control standards. Each process step gives constant improvement beyond your expectations.



SANY GROUP QUALITY GUARANTEE

SANY Group is a global leading equipment manufacturer, China's No.1 and global No.3 largest construction machinery manufacturer, and also the world largest concrete machinery manufacturer. In 2015, it was evaluated as the first batch of pilot demonstration enterprises of Intelligent Manufacturing in China by the Ministry of Industry and Information Technology.



GLOBAL FOOTPRINT OF MARKETING SERVICES

The business of SANY covers more than 160 countries/regions around the world.

EXCLUSIVE TRAINING

SANY provides total training in production, operation and marketing.



CUSTOMER FOREMOST

The installation team and service engineers owned by SANY offer professional guidance on installation to improve the delivery and customer satisfaction.

SANY
QUALITY CHANGES THE WORLD

TO FOR OPER SAFE

02

PRODUCT OVERVIEW

COMPONENTS PRODUCED BY SANY PRODUCTION LINE

The PC production line of SANY can meet the requirements for production of components e.g. floor slab, facade element, double wall, solid wall, partition wall, filigree slab, air-conditioner panel, staircase, beam, column, balcony, and bay window.



SOLID WALL



DOUBLE WALL



PARTITION WALL



FACADE ELEMENT



AIR-CONDITIONER PANEL



FLOOR SLAB



FACADE ELEMENT



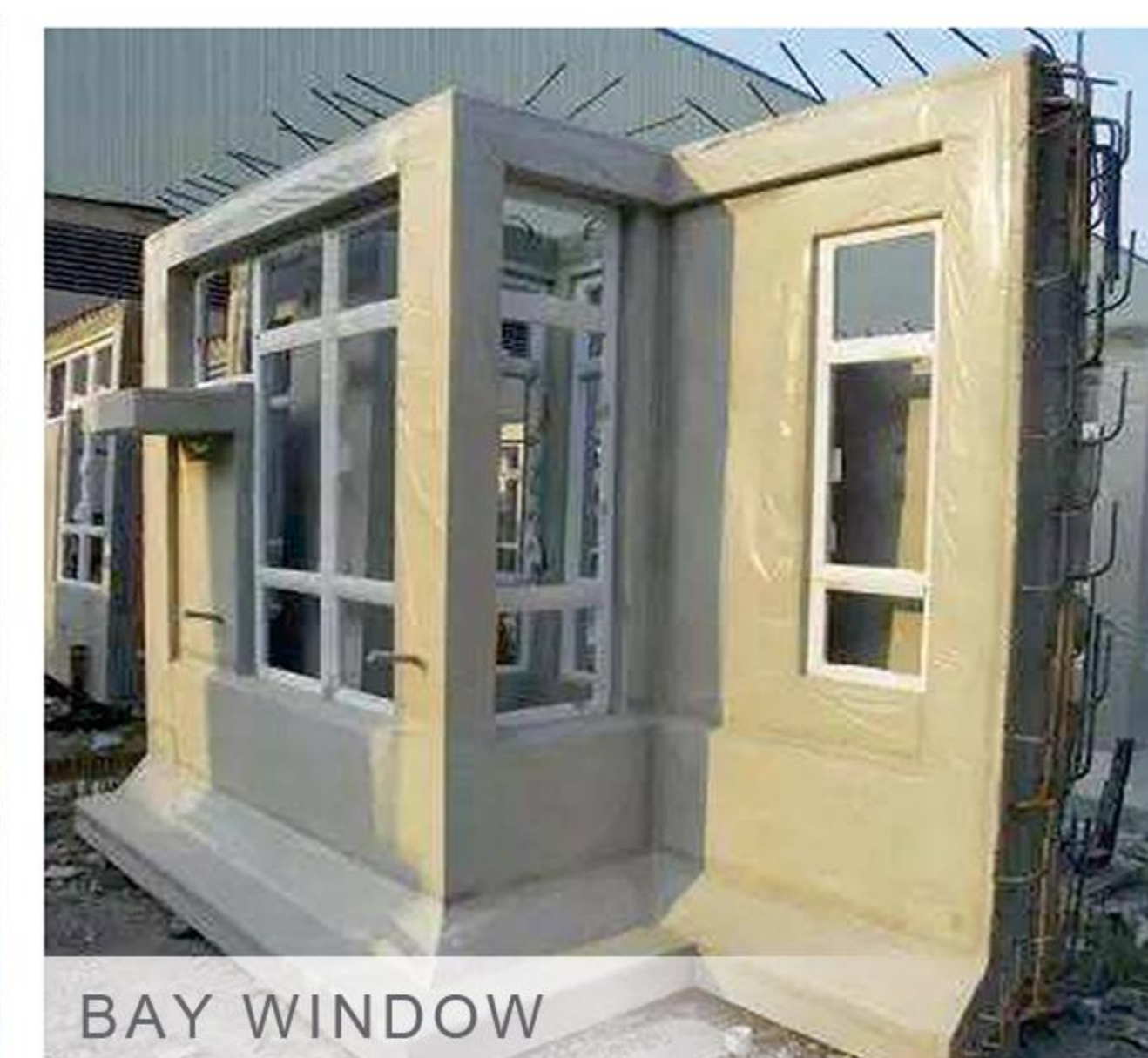
STAIRCASE



BEAM, COLUMN



BALCONY



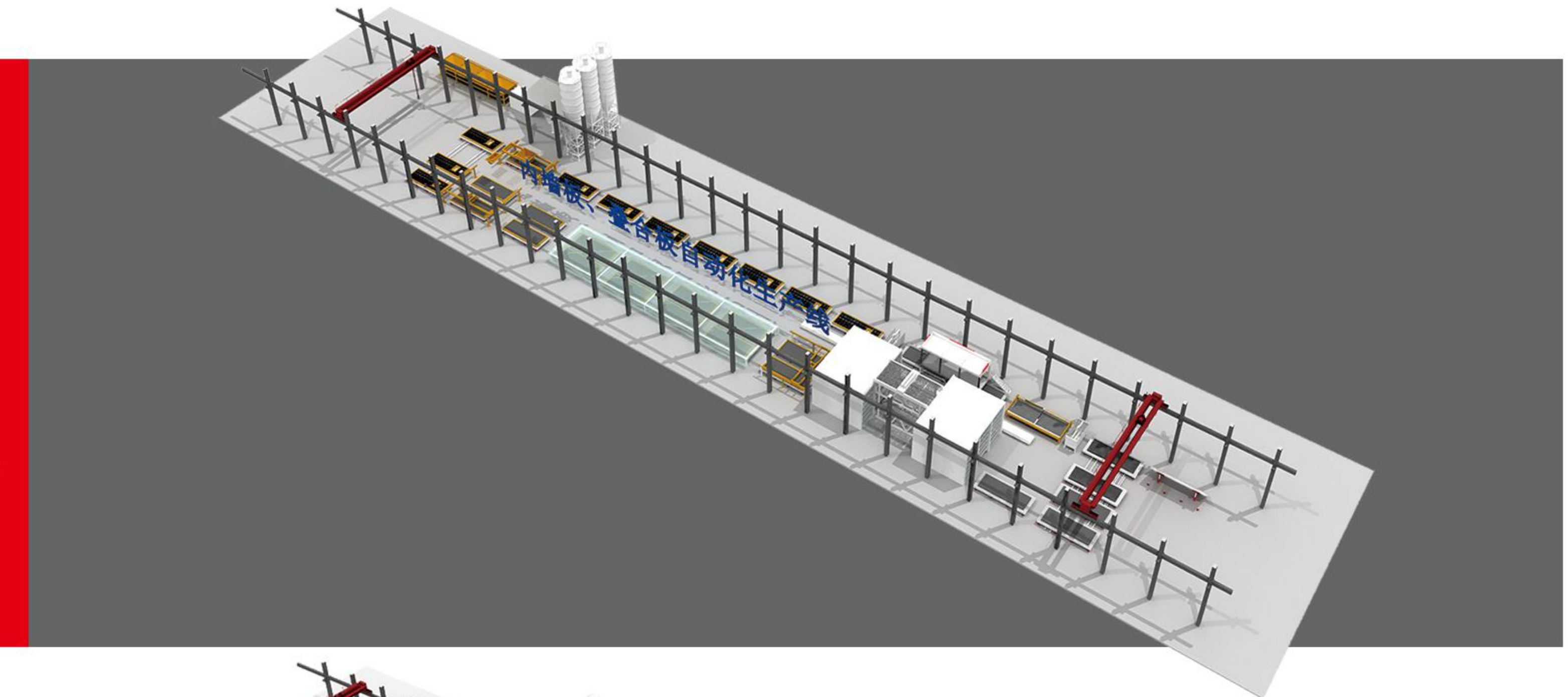
BAY WINDOW

TYPES OF PRODUCTION LINE

Types of production lines can be provided by Sany Construction Industry to meet the requirements for production of components.

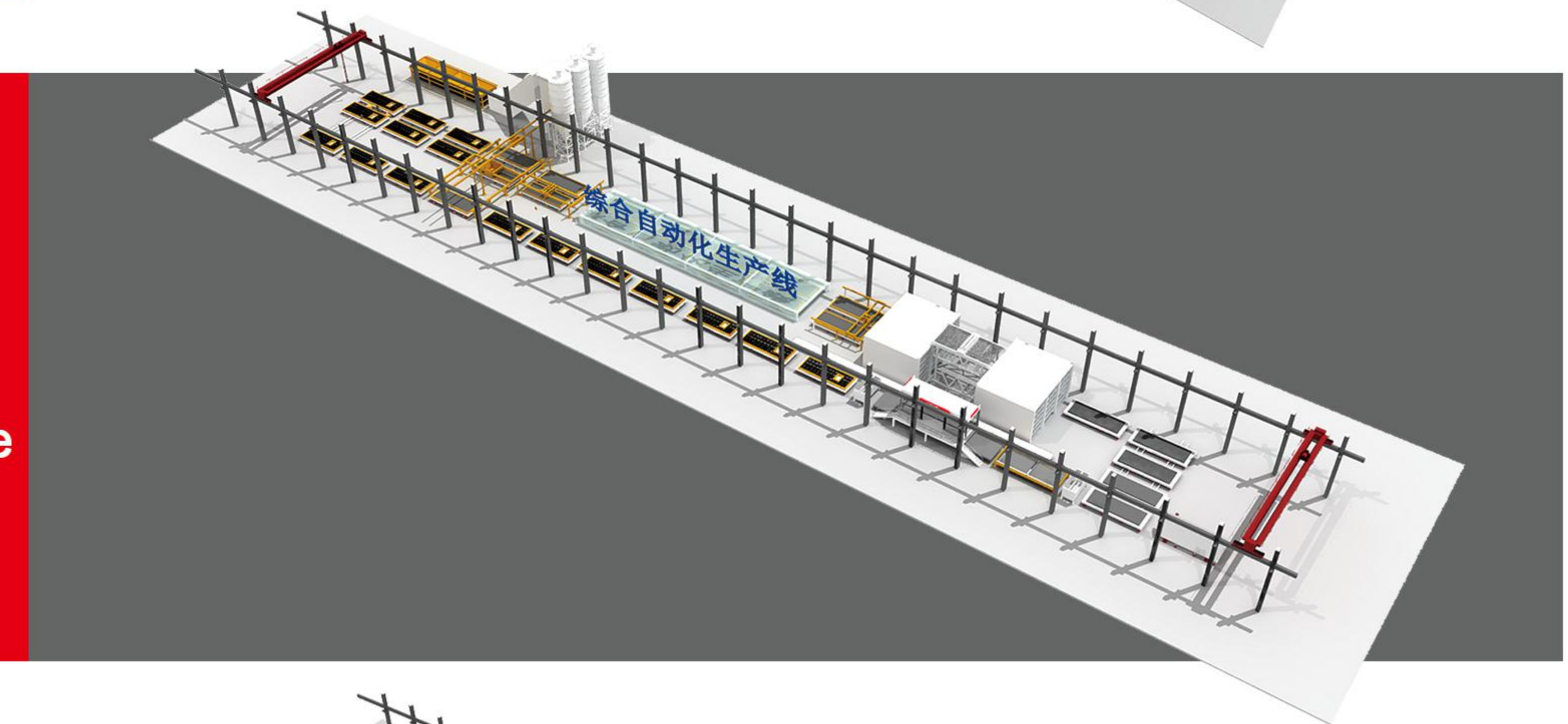
01

Floor slab
Production



02

Multipurpose
Production



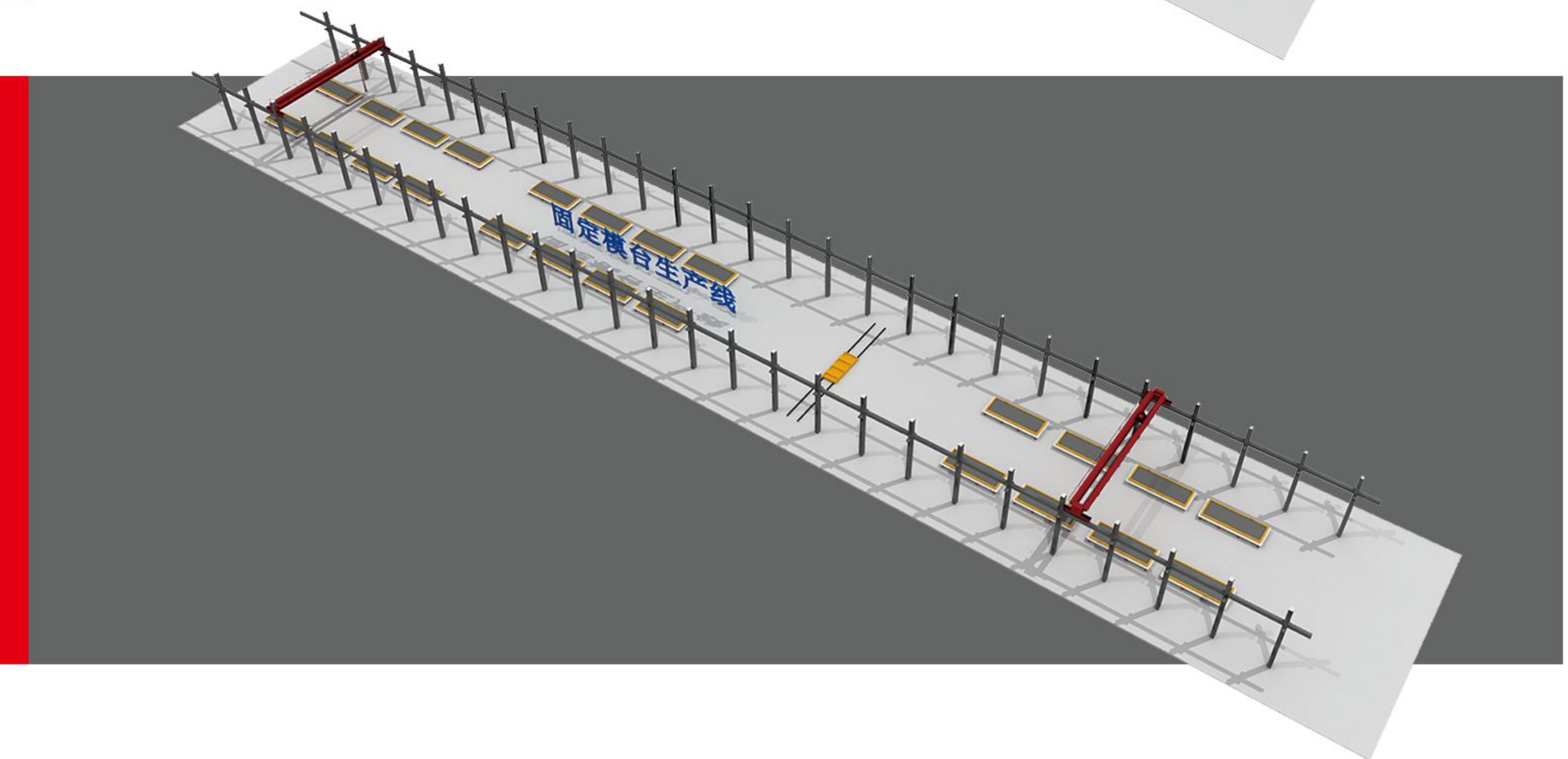
03

Double wall
Production

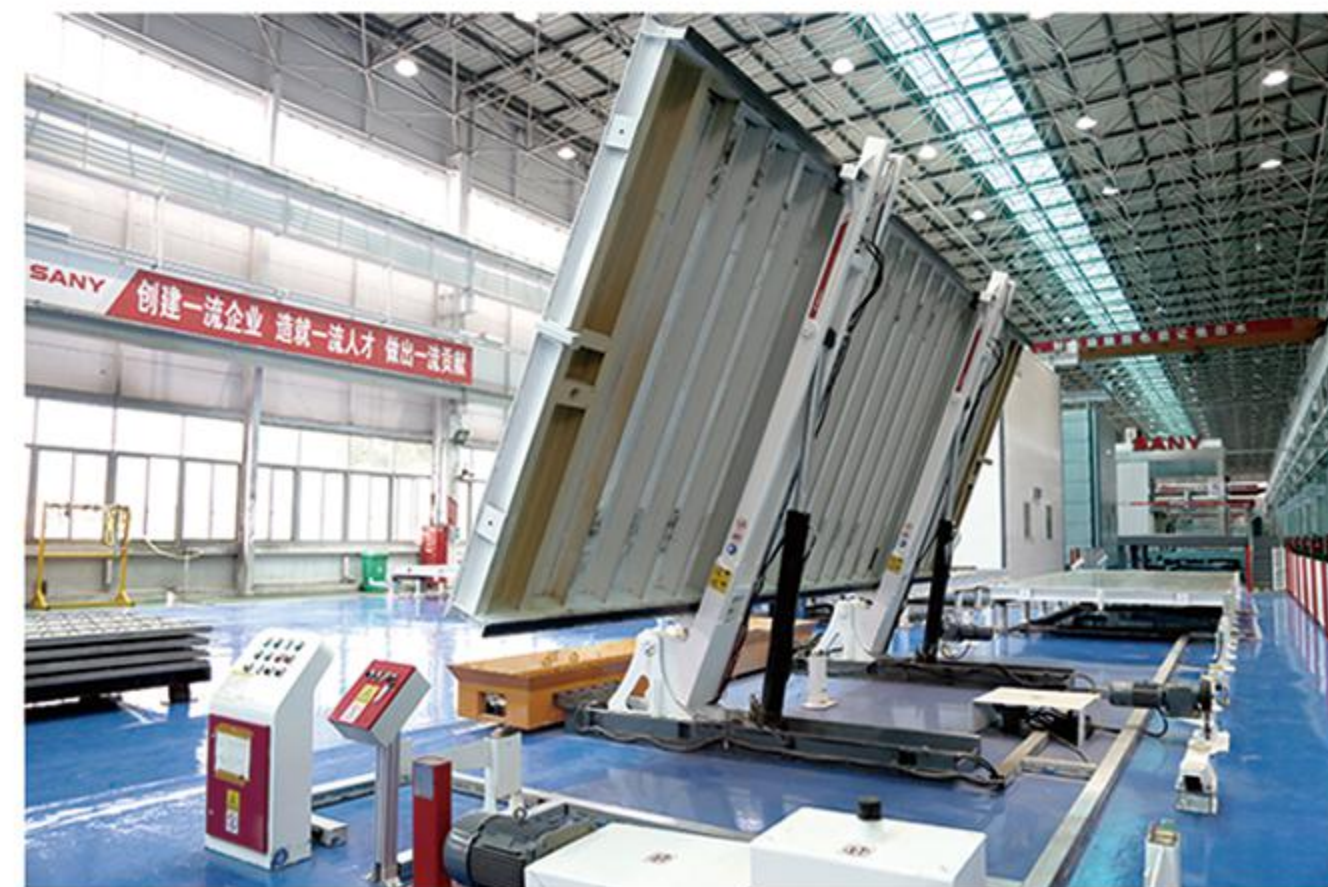
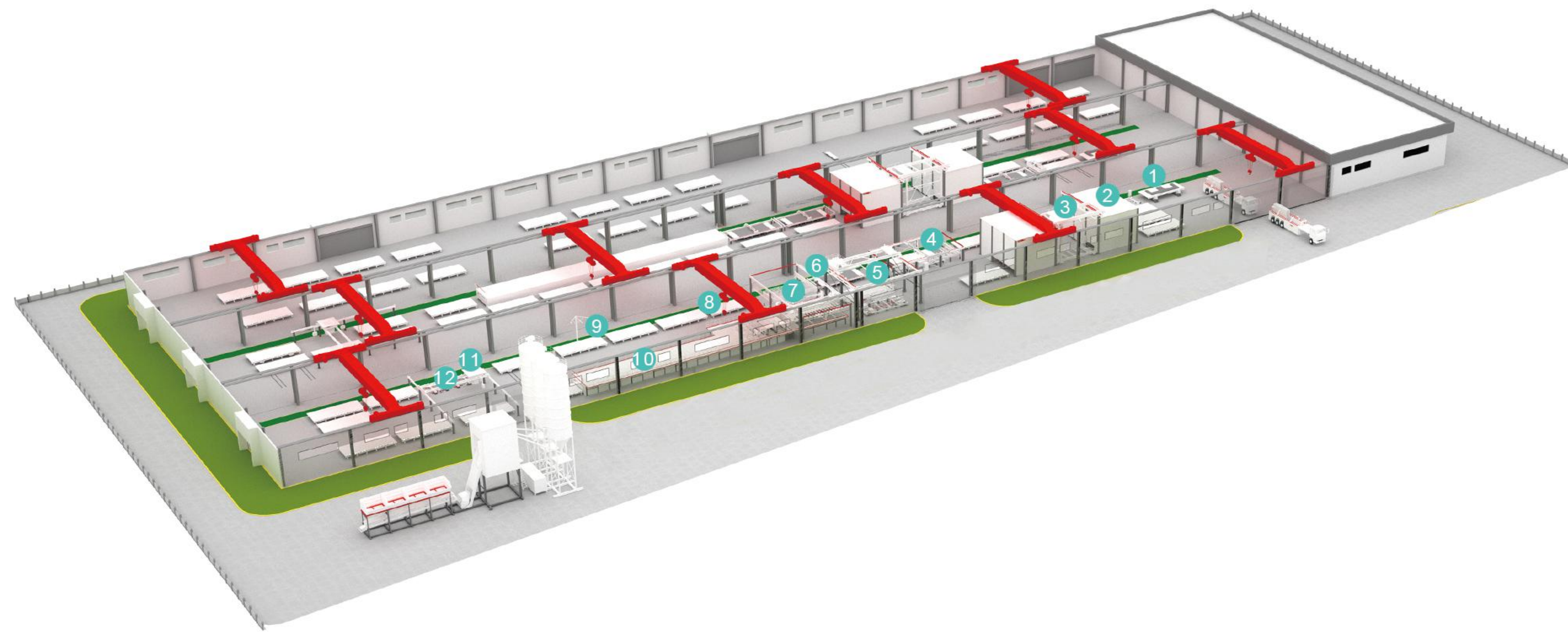


04

Stationary
System



RICH EXPERIENCE AND QUALITY ASSURANCE



1 Tilting machine



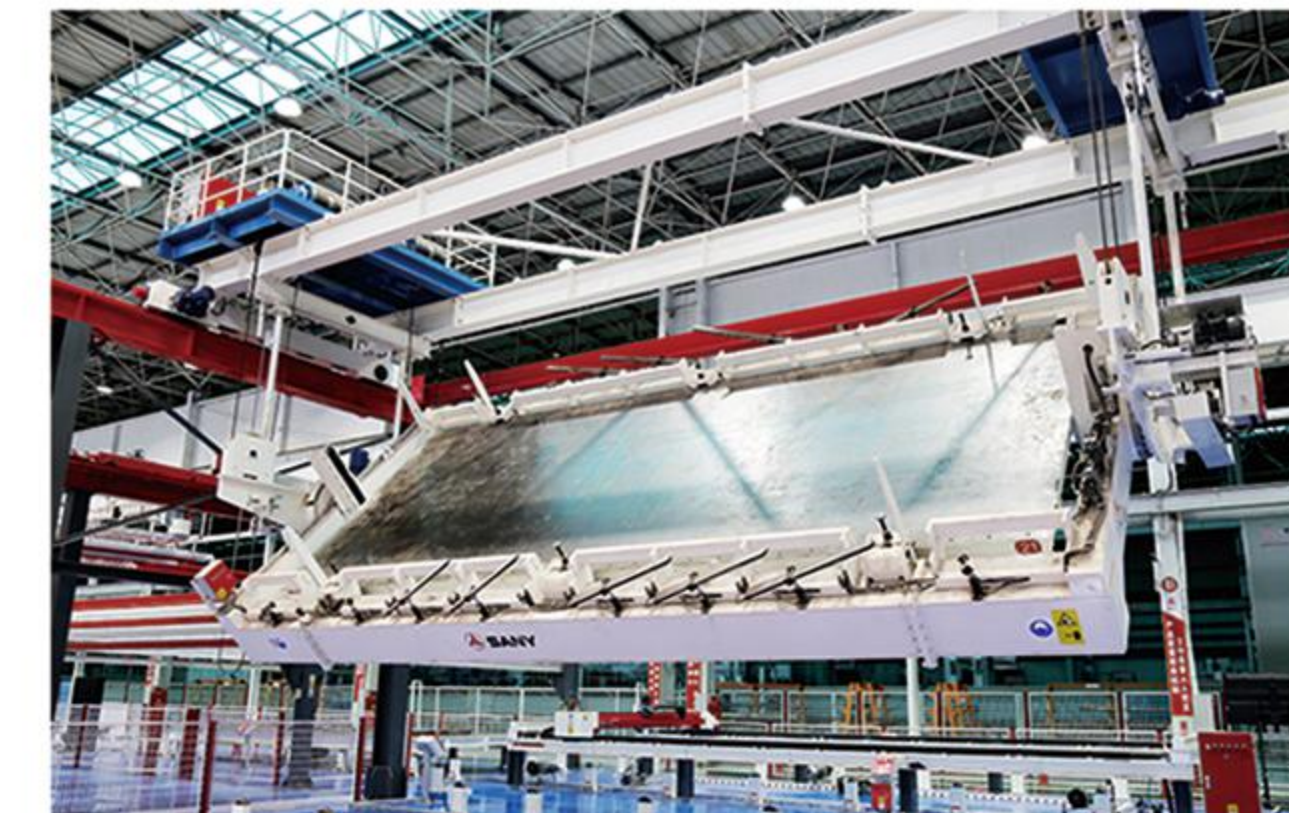
2 Curing chamber



3 Stacker



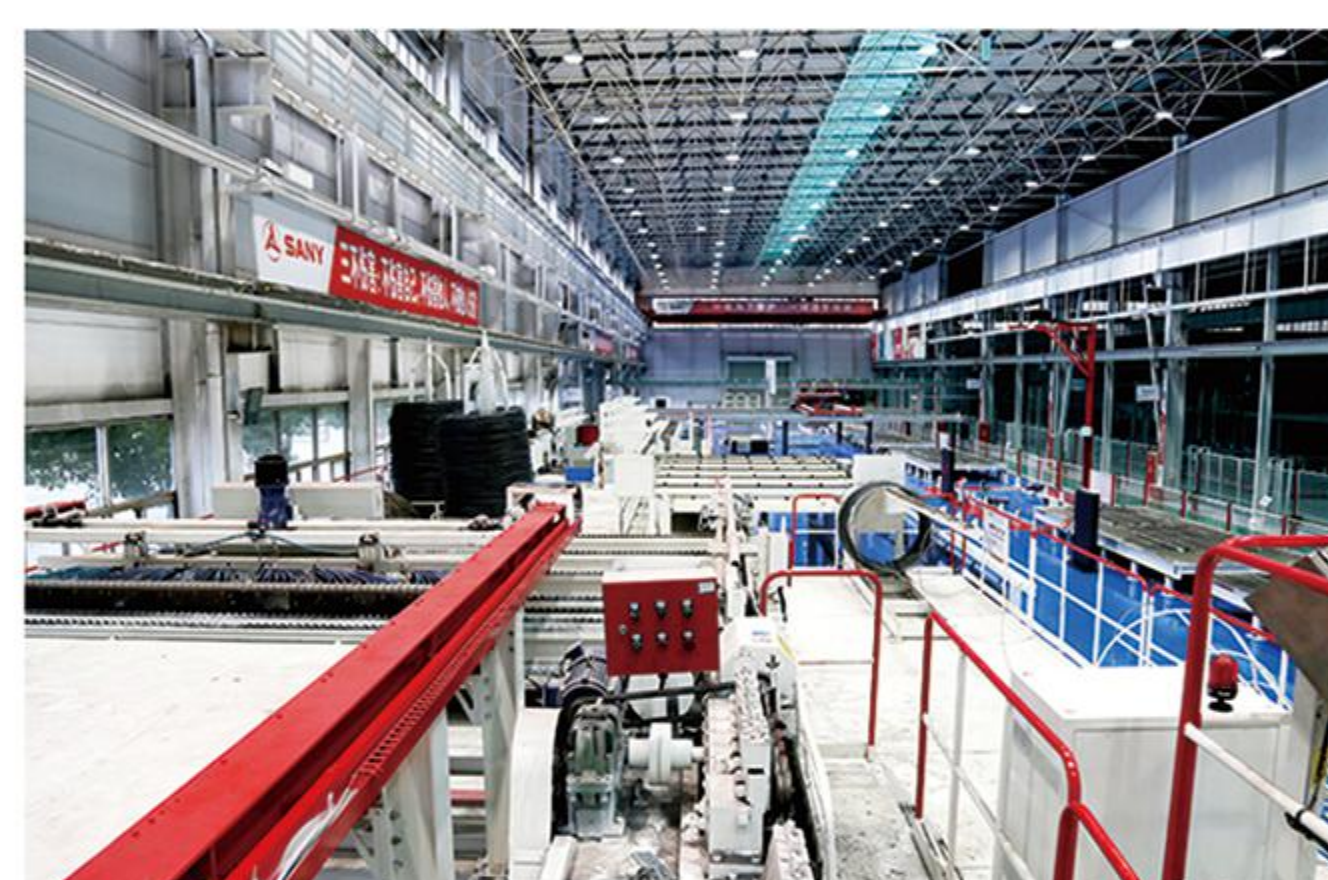
4 Multi-function shuttering robot



5 Overturning machine



6 Plotter



7 Mesh welding machine



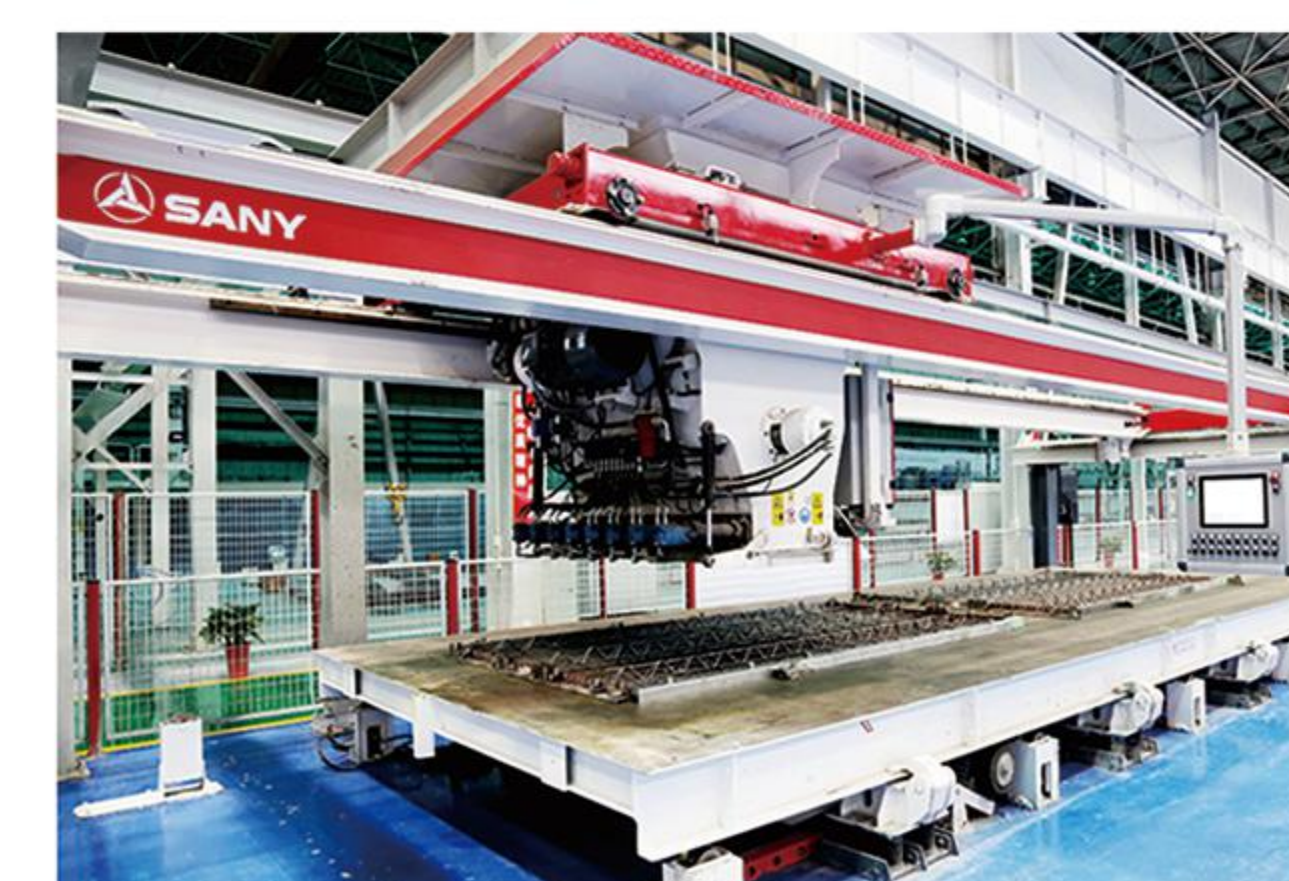
8 Pallet



9 Laser projector



10 Pre-curing chamber



11 Distributor



12 Vibrator

CORE ADVANTAGES OF SANY PC PRODUCTION LINE



INTELLIGENT FACTORY

High integration and automatic matching of PC production lines, PC batch plant and rebar equipment have been realized for the first time in China, and digitally-driven production has been truly achieved. The equipment goes online, runs automatically at specified rate, and monitors the production, shipment and installation of components. Big data analysis on daily, monthly, and annual orders, capacity and costs through the system can help decisions made by operators.



ENERGY SAVING AND ENVIRONMENTAL PROTECTION

Curing insulation between each column inside the curing chamber, steam heating and humidification, forced air circulation in the chamber to ensure constant temperature and humidity, and temperature difference $\leq 5^{\circ}\text{C}$.

The cleaning machine is typically equipped with vacuum cleaner to effectively control the leakage of flying dust. Collecting hopper is typically equipped to collect and easily transfer residues.

The batch plant is environment-friendly constructed. The main building is equipped with efficient dust collector to control the dust removal according to timing sequence. The powder tank is equipped with an environment-friendly bag dust collector, which can collect dust effectively and is easy to maintain.

TIME-SAVING AND EFFICIENT



The continuous and automatic running of PC production line greatly improves production efficiency and substantially reduces the workloads of production operators. Multi-functions are integrated into one, e.g. demolding/molding robots and rebar equipment, saving factory floor space and station operation time.

The program controls the intelligent distributor to realize the distribution flawlessly according to the drawing. Full-automatic loading and unloading mold platen function; using compound motion and anti-shake technology, positions are automatically allocated by the MES system, and the servo system is used for lateral movement for precise positioning. The optimal scheduling and distribution of the concrete multi-production line are achieved through the linkage control and optimal scheduling of the batch plant, conveyer and distributor.



HARDCORE R&D

The R&D team of Sany Construction Industry constitute 50% of the total number of staffs, of which more than 80% are graduates with master's degree or higher. More than 500 applications for construction industrialization-related technology patents have been completed.



QUALITY PLATFORM

Sany Construction Industry has signed strategic cooperation agreements with China National Institute of Construction Standards, Nemetschek Group of Germany, and China State Construction Engineering Corporation, etc., analyzed the drawings of the prefabricated components of the building and directly driven the production of PC equipment through the IT platform of production line.

IT INTEGRATED SOLUTION

MOLD PLATEN CIRCULATION SYSTEM

02

The system consists of pallet, Pallet Transporter, idle wheel, drive wheel, and station sensing device.

All the pallets in this system are automated by MES and some distributed control mode. The equipment information interacts quickly and the operation is safe and reliable. It pioneers synchronous flow method, and enables less labor, high efficiency, multiple control methods, and more convenient operation.

Pallet: working platform for producing prefabricated parts. The length and width can be customized, and four anti-collision buffers are equipped. The structure is sturdy and durable, with maximum bearing capacity up to 650Kg. Finite element optimization design is adopted, featuring strong anti-fatigue performance during vibration and erection, less deformation, and longer service life.



Pallet

Pallet Transporter: Servo motor drive is used, which features high positioning accuracy; SANY SYMC controller is used, which features high synchronization between two machines, with accuracy error $\leq 3\%$; MES system control automatically completes the orbital change operation, featuring stable performance, convenient and safe operation, anti-collision function, and better safety and reliability.



Pallet Transporter

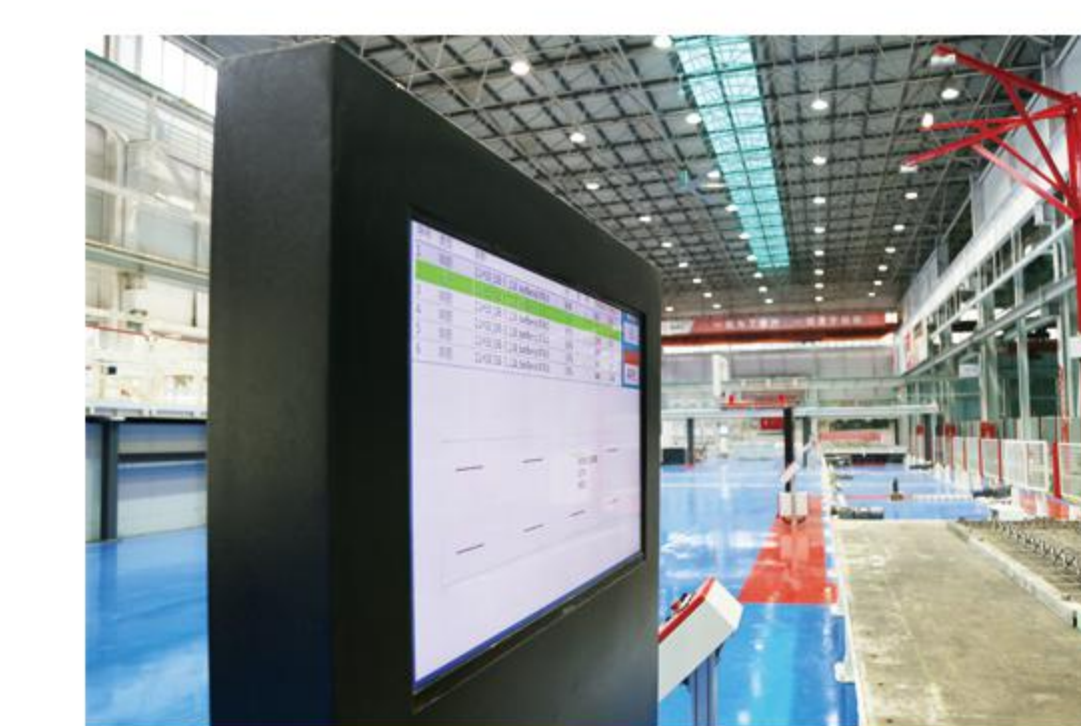
Idle wheel and driving wheel: The idle wheel, the driving wheel and the station sensing device constitute a circulating system of the flow line to ensure smooth circulation of the mold platen.

The idle wheel consists of support frame, support shaft, and idle wheel. The driving wheel mainly consists of driving motor base, adjusting mechanism, driving motor, and friction wheel. SANY special wear-resistant rubber wheels offer greater friction, good wear resistance, long service life, and adjustable height. Ordinary driving wheels, high temperature and humidity resistant driving wheels, and driving wheels with brakes are set according to different stations. The parking station is equipped with driving wheels with brakes so that the mold platen is parked more accurately.



Driving wheel

Station sensing device: Each station on the production line is equipped with station sensing device to detect position and speed of mold platen and realize automatic stop, start and speed change of each station.



Station sensing device

01



As the core of SANY PC production line, IT Integrated Solution provide digital solutions in modules and steps facing different business backgrounds and conditions of the PC factory. It consists of two systems: SPCI system which Equipment online and data-driven equipment module, and SPCM system which business online and data-driven business module.

SPCI system including SPCI-PMES—PC production line management system, and SPCI-CPTS—concrete production transportation management system. It achieves the seamless control of equipment.

SPCM completes the three-level system connection of enterprise operation, factory operation and production execution. It achieves real time data sharing of five core link: orders, Technology, manufacturing, warehousing and shipping.

MOLD PLATEN PRE-TREATMENT SYSTEM

03

Including cleaning machine, spraying machine, plotter, plotting-spraying integrated machine.



Cleaning machine

It removes and cleans the debris remaining on the surface of pallet after demolding. The double roller brush easily cleans the concrete residue and dust on the pallet with higher cleaning efficiency. Vacuum cleaner is equipped to effectively control the leakage of flying dust; the electrical and mechanical double protection design is typically used for lifting system, featuring high level of operational safety; collecting hopper is equipped to collect and easily transfer residues.



Spraying machine

It can spray the release agent evenly and quickly on the surface of pallet. When the pallet goes by, the mold release agent is automatically sprayed to atomize the paint. A wide oil recovery hopper is equipped to facilitate recycling. The entire equipment can achieve automatic operation through the controller.



Plotter

The air compressor is controlled through software program to spray the scribing liquid on the pallet according to the program requirements, and provides accurate installation dimensions for the next station. The travel drive system features high travel accuracy and good reliability by using international famous motors and reducers; Component information is pushed directly by the PMS system without requiring manual programming.



Plotting-spraying integrated machine

Plotting-spraying integrated machine combines the functions of plotter and spraying machine, saving space and improving efficiency.

AUTOMATIC MOLDING SYSTEM

Including multi-function shuttering robot, and shuttering cleaner.



Multi-function shuttering robot

Multi-function shuttering robot: The first robot in demolding/molding in the PC field, which integrates the functions of demolding/molding, conveying and cleaning of edge molds, cleaning of mold platen, scribing, forming, and edge mold storehouse management. It greatly improves the operating efficiency and product quality, reduces the number of workers and labor intensity, and takes a great stride forward in the intelligent field of PC equipment.

Shuttering cleaner: It is composed of edge mold conveyor, shot blasting machine, dust remover and fuel injection device (optional), which automatically cleans and sprays oil to the edge mold. The principle is that steel shots are thrown out of the shot blaster at high speed and collide with the edge mold to remove concrete, mortar, rust spots, etc. from the edge mold.



04

PLACING AND VIBRATING SYSTEM

05

The system consists of high-speed concrete conveyor, distributor, and low-noise vibrator.



High-speed concrete conveyor

Used for concrete conveying from batching plant to spreader. Variable frequency adaptive drive realizes high speed and high efficiency; seamlessly connects the batch plant and production line for fully automated operation; and provides a hand-held wireless remote control for easier maintenance operations. Shock-absorbing tires are equipped to ensure smooth running and low noise; the system is equipped with anti-collision parking mechanism, overload protection and other devices, which can ensure stable performance and smooth operation of the equipment.



Distributor

The concrete transported by the conveyor can be evenly poured into the mold through distributor. The spread or screw mode can be configured according to the type and nature of concrete. Through integrated CAD & Allplan interface, the system can analyze customer component drawings automatically. Distributor places intelligently and flawlessly according to the system. The feeding can realize easy control, suitable for concrete with different slumps. Weighing system is equipped and real-time data display is achieved with minimum error.



Low-noise vibrator

Vibrate and compact the poured concrete, eliminate the air bubbles, and ensure the uniform distribution of aggregate inside the concrete. The unique vibration isolation design is made to effectively isolate the excitation force from being transmitted to the ground. The vibration system adopts zero-amplitude start, zero-amplitude stop, induced vibration, and adjustable amplitude. The system can effectively solve problems of spallation, internal heterogeneity, formation of air pockets, and inconsistent density during the forming process of components. The combined frequency-divided automatic vibration mode enables selection of different combined vibration modes according to the structural form, thickness, and slump of the concrete to ensure that each different component receives the most uniform vibration and compactness.

SURFACE TREATMENT SYSTEM

The system includes smoothing machine, roughing machine and scraping machine.



Smoothing machine

Used to smooth and polish the surface after component pre-curing. The height of troweling plate is adjustable to meet the production needs of prefabricated boards of different thicknesses; the horizontal and vertical travel speed can be adjusted by frequency conversion to ensure smooth operation.



Roughing machine

Mainly used for roughening the surface of floor slabs. The blade has an automatic obstacle avoiding function; the power is powered by an electric pusher (power-off self-locking), and the roughening depth can be controlled.



Scraping machine

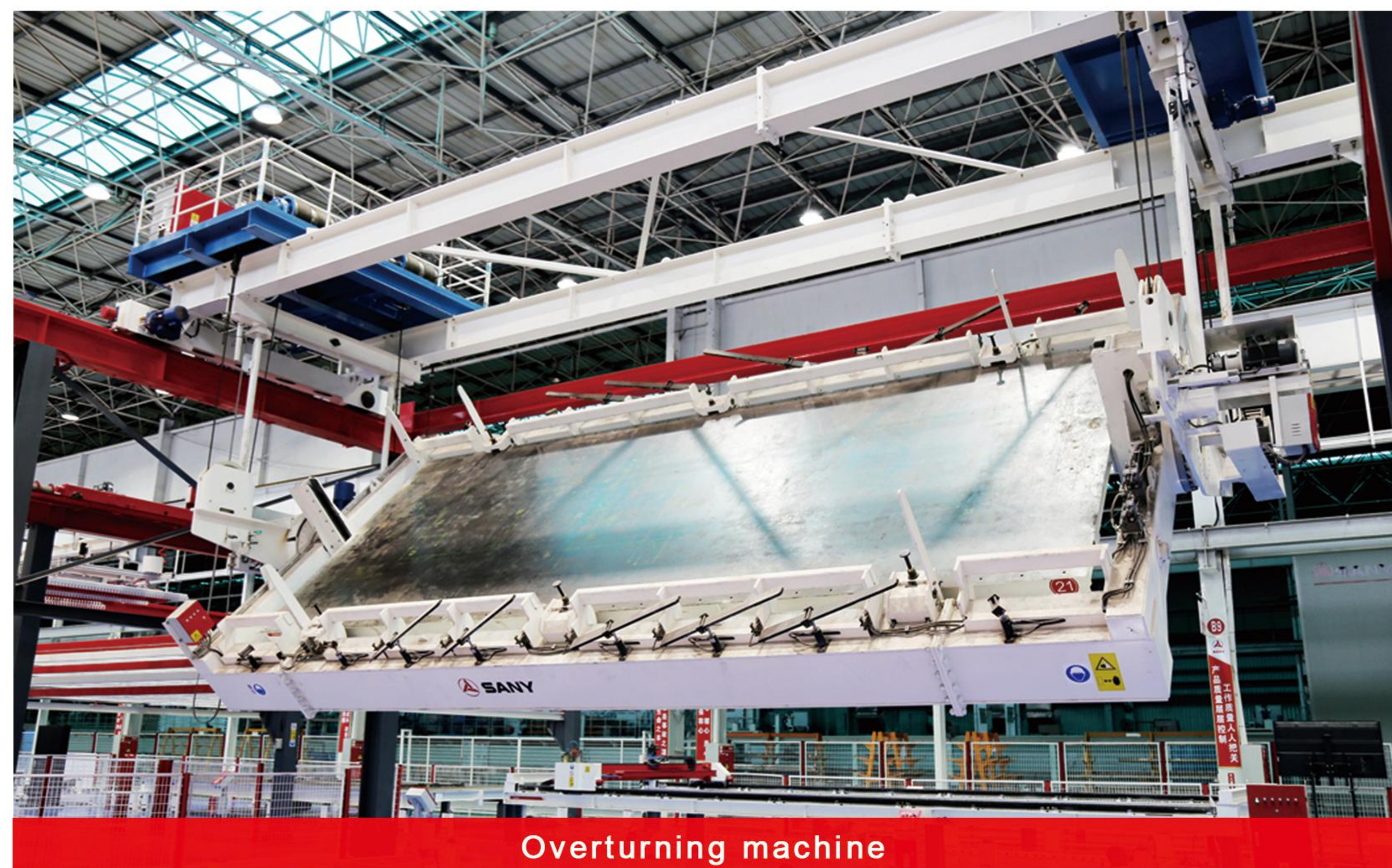
Used for vibrating and tamping the secondary-placed concrete to make it compact, and meanwhile the upper surface is smoothed by vibrating and rubbing rod. The front-to-back rubbing method can be applied to a variety of plate types; two-stage shock absorption is adopted, and rubber shock-absorbing block and rubber pad jointly absorb the vibration, effectively solving the vibration problem between the rubbing rod and the rubbing mechanism. The operation method uses dual mode of fixed operation interface and wireless remote control.

06

DOUBLE WALL PRODUCTION SYSTEM

07

The system consists of overturning machine and vibrator(ramshackle)



Overturning machine

Realize turnover of PC component and pallet by 180°, used to produce double wall with thickness of 200~500mm. SYMC controller independently developed by SANY is used and can be connected with PMS system to realize automatic mold clamping. Good stability and accurate positioning in turnover, traveling and lifting can be realized by using frequency conversion controller. The upper and lower mold platens are positioned and centered with wedge-shaped grooves, and have high accuracy for mold clamping.



Vibrator(ramshackle)

Used for double wall production line, vibrating and compacting the poured concrete, eliminating the air bubbles inside the concrete and using the overturning equipment in combination. Horizontal low frequency vibration is used to tightly combine the concrete and reinforced mesh. The mold platen is used for precise positioning, the mold platen is fixed with pin, and the four vibration units are driven for stable work.

CURING SYSTEM

The system includes pre-curing chamber, curing chamber and stacker.

Pre-curing chamber: Be used to quickly develop the early strength of component after it is compacted and vibrated. It can achieve the hardness requirements of smoothing. The all-steel structure design effectively avoid deformation which caused by temperature changes. The insulation board uses a special sandwich board material to prevent heat loss, and is characterized by both flame retardant and corrosion resistance. It can automatically sense in entering and exiting the pallet to control the opening and closing of door, which can fully reduce heat loss in the chamber, improve efficiency and save energy.



Pre-curing chamber

curing chamber: The MES system realizes paperless record of the temperature and humidity conditions on real-time basis and performs monitoring and automatic adjustment. Partition insulation is performed between each column inside the chamber body, and temperature and humidity are monitored separately. Steam heating and humidification, and forced air circulation in the chamber are used so that the hot and cold air fully interact to ensure constant temperature and humidity, and temperature difference $\leq 5^{\circ}\text{C}$. The requirements for curing components up to 450 mm high can be satisfied.



Stacker

Stacker: The stacker has the function of fully automatic storage and removal of the pallet. The lateral movement of trolley adopts servo and rack-and-pinion drive technology for precise positioning. The lifting of cart uses the hoisting machinery synchronization technology for height mechanical positioning. Interaction with PMS system is enabled to realize automatic assignment of bin positions.

08

DESHUTTERING SYSTEM

GROUPED EQUIPMENT

09



Tilting machine



When a component attains the deshuttering strength, and the side form is removed, the component can be lifted out of warehouse by the tilting machine.

Double cylinders are used to hydraulically lift the pallet for deshuttering, and the hydraulic frequency conversion is synchronized to ensure the rollover synchronization.

Unique safety fixing method of front claw and rear jacking can effectively prevent the workpiece from turning over during standing to ensure safety of man and machine;

SYMC controller independently developed by SANY is used to make the operation process simple and highly reliable.



SANY PRECAST CONCRETE TRANSPORT SEMI-TRAILER

Device parameters



Product Model	SY9401TYC(Standard)	SY9402TYC(Short Shaft)
Gross weight of Semi-trailer	40000 kg	40000 kg
Curb weight of Semi-trailer	10500 kg	9000 kg
Payload	29500 kg	31000 kg
Fifth wheel load	16000 kg	16000 kg
King Pin model	90#	90#
Overall Dimensions (L*W*H)	12310/2550/3260 mm	9800/2550/3260 mm
Cargo Area (L*W)	9000/1530 mm	6500/1530 mm
Ground Clearance of King Pin	1260-1360 mm	1260-1360 mm
Tire Specification	φ385/65 R22.5	φ385/65 R22.5
Quantity of Fixtures	Standard Configuration : 2 Pairs	Standard Configuration : 2 Pairs
Quantity of Customized trays (L*W*H 9.5*1.5*3m)	The quantity can be customized	The quantity can be customized

Advanced in Technology

Simple in operation: The multiple valve is equipped to control the lifting/lowering of vehicle, so that the height of vehicle can be adjusted easily according to the road condition.

Adaptive damping: The electrical-hydraulic-pneumatic suspension system is used to satisfy the vibration damping requirement of the vehicle under any loads, which reduces the bumping in the transportation greatly.

Energy saving and consumption reduction: The load is distributed uniformly among three axles, which extends the service life of the tires. Under unloading condition, the tires on the third axle can be lifted up, which effectively reduces the energy consumption and the tire wear.

High Transportation Capacity

Oversized: The transportation capacity is high as the loading space is 9m (6.5m) (L) × 3.75m (H) × 1.5m (W). It can transport 3.75m high precast elements.

Efficient in handling: The precast elements are handled with the customized tray. The time for handling is not more than 5 minutes per time.

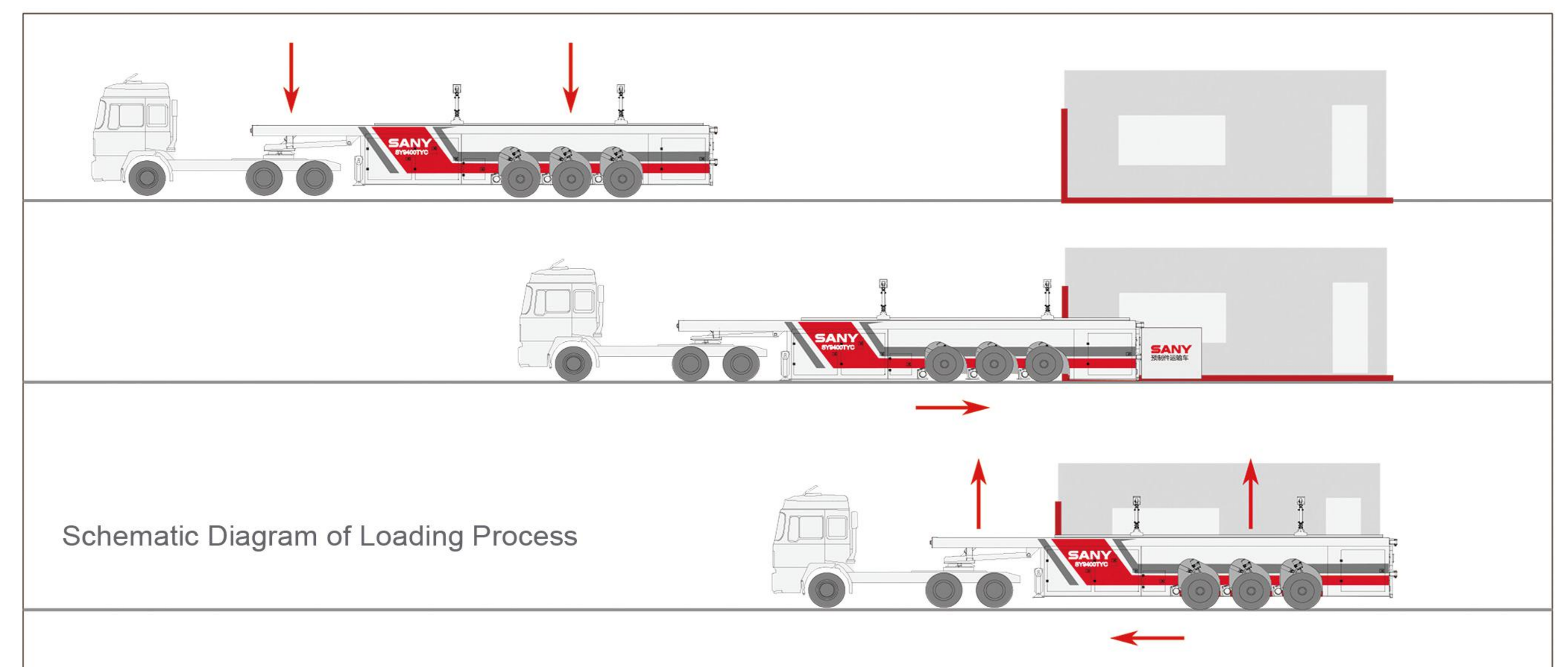
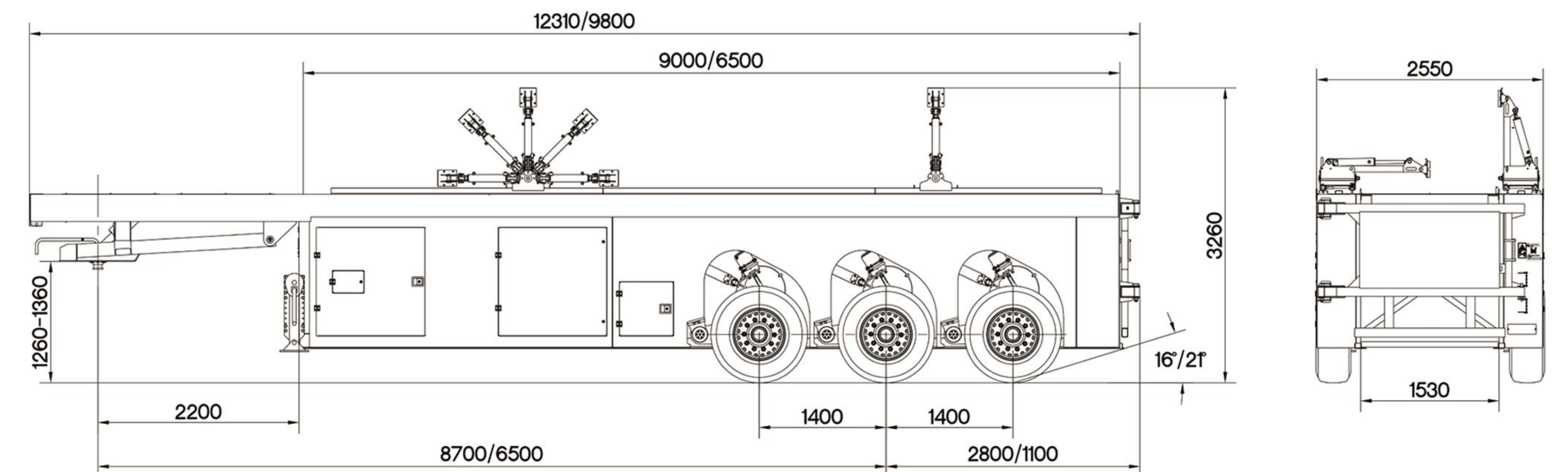
Rapid in fixing: It is equipped with 4 forward-backward movable hydraulic fixtures which can fix the prefabricated members of different sizes rapidly.

Safe & Reliable

ABS system: It is equipped with ABS pneumatic braking system to improve the traveling safety.

Reliable in parking: All three axles are equipped with the parking brakes, more safe and reliable.

Tipping protection: Capable of balancing the left and right axles, it can resist the side-tipping of the vehicle body, thus improves the lateral stability of vehicle during traveling.



PC SPECIAL BATCH PLANT

Small volume measurement with higher accuracy

- 1.High-precision feeding
- 2.Intelligent measurement
- 3.Three-speed measurement mode
- 4.High-performance controller SYMC

Wrapped slurry method mixing and single / double discharge ports with higher efficiency

- 1.Low foam and more even mix during mixing. Compression-resisting strength is 13% higher than that of one-step mixing method.
- 2.Single/double discharge port meets the needs of different PC production lines.

Forced dust removal is more environment-friendly

- 1.The main building is equipped with an efficient forced dust collector.
- 2.The powder tank is equipped with environmental protection bag dust collector.
- 3.Adapt to installation in the factory building.

Intelligent management gives more convenience

- 1.The control center is set in the PC central control room,centralized control and management, and more convenient control
- 2.All-oriented fault diagnosis technology is adopted. The operation interface provides real-time detailed fault display
- 3.The remote diagnosis function of the system



Lower energy consumption due to technological transformation

- 1.Intelligent energy saving. With intelligent process control, the equipment efficiency can be fully utilized so that idling can be avoided and operating energy consumption is reduced by 10%.
- 2.Gravity-type discharge.
- 3.Queue production supports continuous production of different task orders and different mix ratios.
- 4.The wear-resistant parts of the main engine are independently developed by SANY according to the concrete mixing conditions. The material uses high chromium-carbon ratio. Meanwhile, rare elements are added to improve the structure and refine the grains.
- 5.The special shaft end sealing system can automatically compensate and reliably seal.
- 6.Horizontal main engine cutting technology (patented technology)

Worry-free Service



Consultancy on factory construction

- 1.New park planning
- 2.Renovation of old factory building
- 3.Large-scale project planning

Technological design

- 1.Design services
- 2.Free benefits

Professional guidance on installation

- 1.Skilled workers with superb skills
- 2.Tools of superior quality
- 3.Installation manual

Production training

- 1.Theoretical training
- 2.Practical operation
- 3.Factory resident services during component production

Talent fostering

Building platform for industry personnel training and communication, and support transportation operation and management personnel to support the prefabrication building industry.

SERVICE



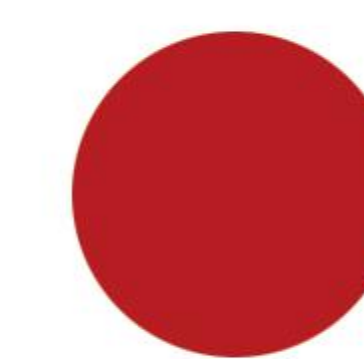
SERVICE

Comprehensive service level leads the industry for five years. Accessory supply and service skills are kept at optimum level. Zero distance with customers and services are achieved using information technology.



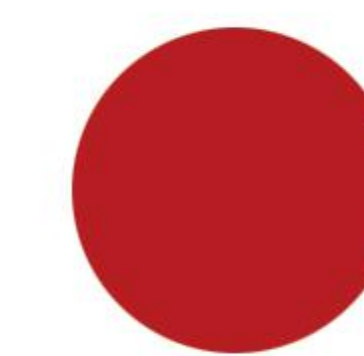
Service concept

Do everything for customers, and create customer value.



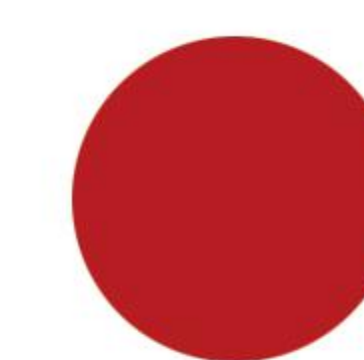
Service Commitment

Your choice of SANY represents lifelong freedom from worries.



Service target

Exceed customer expectations, surpass industry benchmarks.



Service advantage

Set new benchmark in the value chain service era.

CASES



China Construction Third Engineering Bureau Co.,Ltd

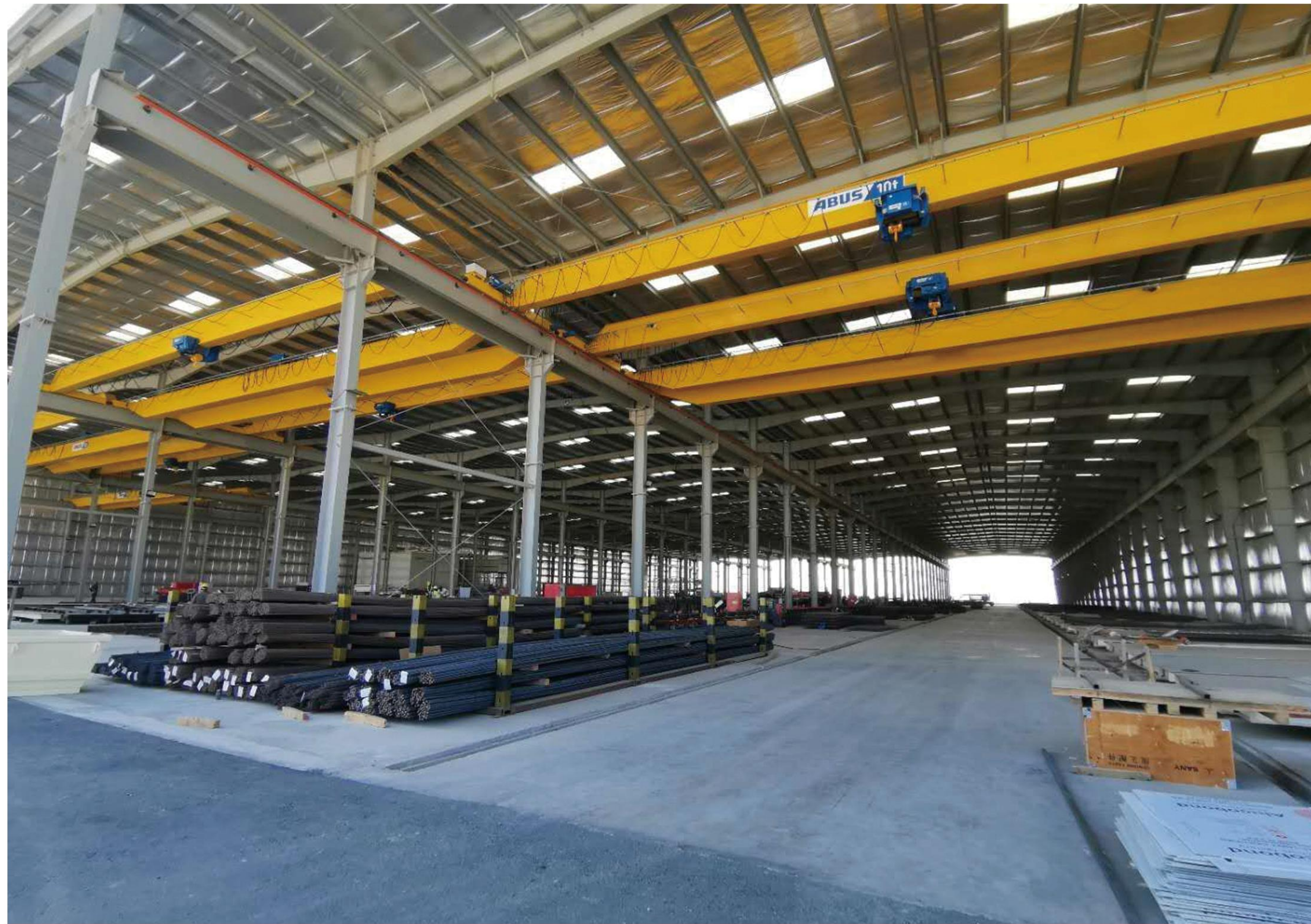


China Eighth Construction



Ren Ming Factory

CASES



Factory in Saudi



China Construction Industry



Factory in Malaysia



Jilin Construction



Fengda

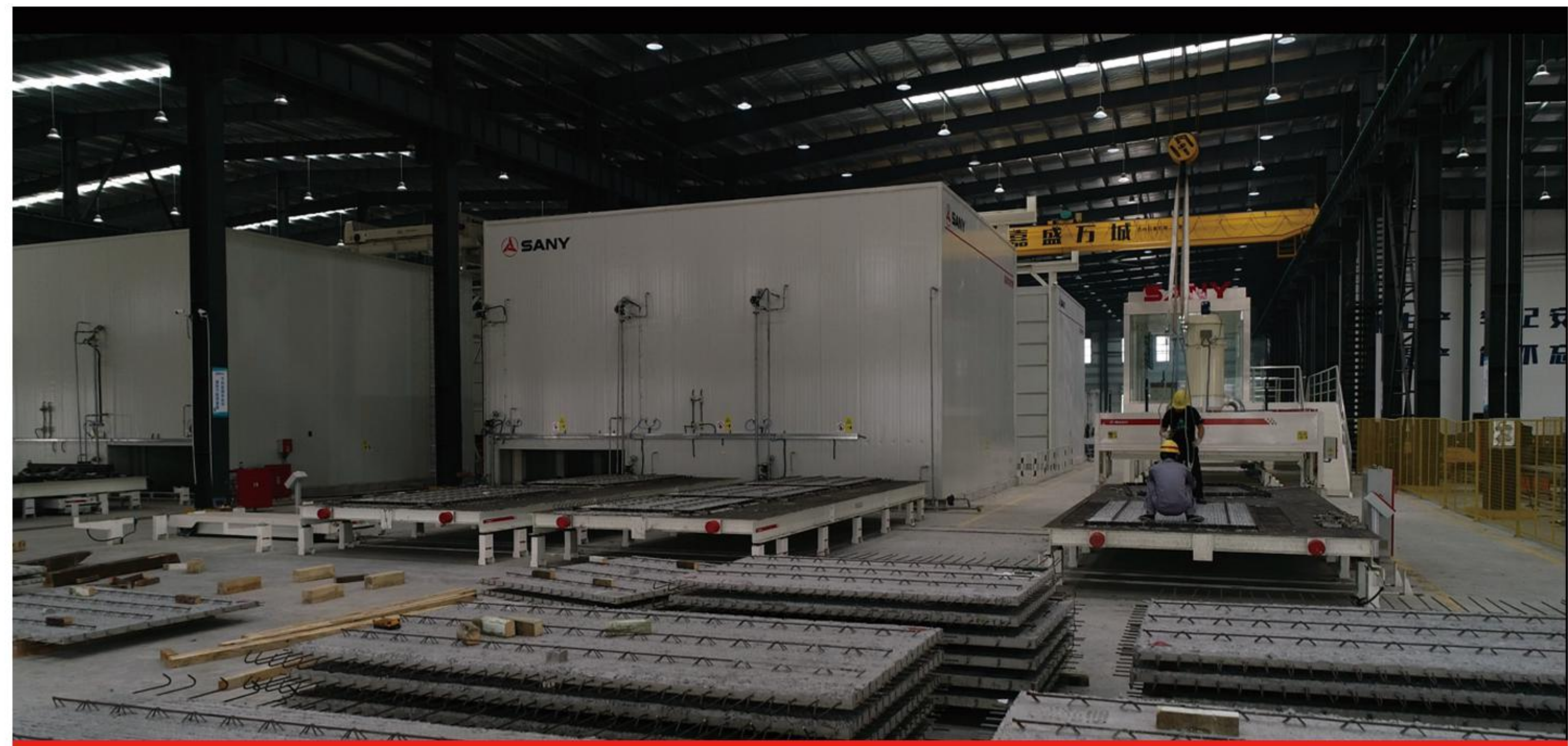
Chongqing Construction Engineering



Fortification assembly



Shandong Ronghua



Jiasheng Wancheng



Anhui Hailong

CASES



Hebei Construction

Thank you for reviewing

We hope that you can trust and choose our production line through the products we present. Not all our products are presented in the manual. If you are interested, please scan the QR code below, or visit Sany Construction Industry website (www.sanypce.com) for more information.

