TYF MACHINERY

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TYF MACHINERY

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01 Company Info

Founded in 1988, Tianjin TYF MACHINERY Machinery System Engineering Co., Ltd. is a time-honored company specialized in manufacturing intelligent rebar processing equipment, artificial intelligence production management software, rebar products, and complete sets of equipment. TYF MACHINERY established overseas branches and subsidiaries in Australia, Singapore, India, and Bulgaria, etc. with its products proudly exported to more than 100 countries globally.

TYF MACHINERY is the business partner of China Railway Construction Corporation (CRCC), China State Construction Engineering Corporation (CSCEC), China Communications Construction Company (CCCC), and China Energy Engineering Group Co., Ltd. TYF MACHINERY' s products have played significant roles in the construction of major projects as Indonesia's Jakarta-Bandung High-Speed Railway, Equatorial Guinea's Bata Port, Argentina's Santa Cruz River Hydroelectric Power Station, and Saudi Arabia's NEOM City, etc.

Rio Olympic venues

Santa Cruz Hydroelectric Power Station in Argentina

Saudi Arabia NEOM

Jakarta-Bandung High-Speed Railway

Karakoram Highway Project in Pakistan

Bata Port Project in Equatorial Guinea

Friendship Port Project in Mauritania

TYF MACHINERY has proudly invented the patented 'stepless mesh welding machine', which ignores the spacing limits between longitudinal bars, enables the user to adjust clearance at will. This great feature, compared with traditional way of mesh binding, saves more than 40 workers while significantly enhances efficiency, making it unique in China and a pioneer in the world.

Collaborated with China Construction Industry Association, CCTC, and Hebei University of Technology, TYF MACHINERY has compiled a prefabricated construction textbook Intelligent Processing Technology of Rebar Products, which is a milestone in the global rebar processing industry and important reference for technicians and managers when selecting equipment.

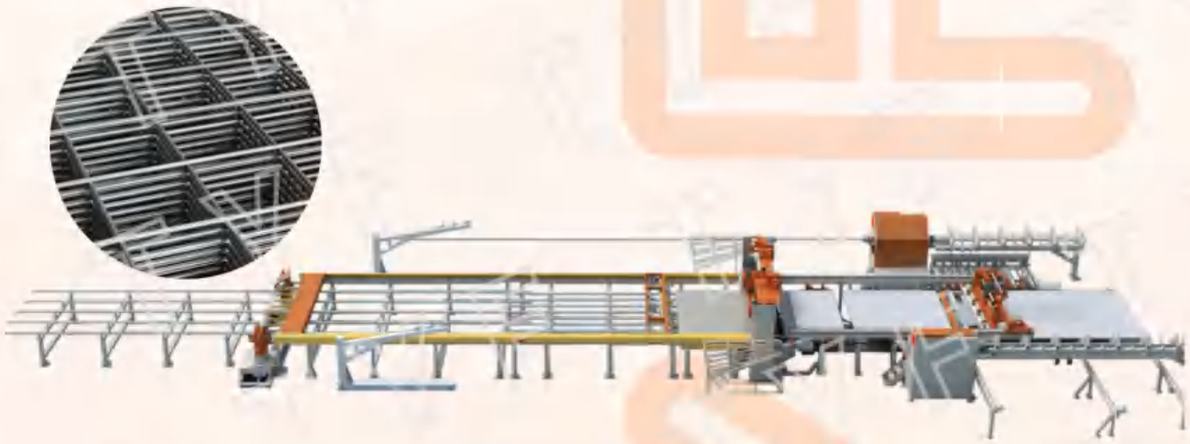
The AI Digital Twin Cloud Platform jointly developed by TYF MACHINERY and Hebei University of Technology can draw information from CAD and transfer it to the equipment for automatic processing, and can swiftly transmit the drawing information to the MES system, saving a lot of manual input work.

With more than 30 years of research and development, TYF MACHINERY has become a leading company in rebar processing industry.

02 Smart Mesh Welding Production Line

The traditional welding machine can only produce one specification each time, and takes 40 minutes for switching, which is too slow for mass production of various specification. Being free from the 50mm-multiple restriction of longitudinal spacing, the Smart Mesh Welding Production Line can freely adjust the spacing and automatically switch mesh specifications according to demand, produce more than 200 meshes in different shapes each shift, fully meeting the mass production needs of prefabrication. With the assistance of the digital twin cloud platform developed by TYF Machinery, it can easily import CAD drawings and automatically export BOM codes, saving a lot of manual efforts of code input, and realizing full-automatic production. After the adoption of this equipment, more than 40 workers of rebar processing, handling and binding can be saved every day, and the equipment investment can be recovered in half a year.

Stepless Mesh Welding Production Line



Item	Data	Note
Mesh Type	Standard, windowed	
Mesh Width	500-4000mm	Standard, windowed
Mesh Length	800-10000mm	Standard, windowed
Transverse spacing	⩾50mm	Stepless adjustment
Longitudinal spacing	⩾50mm	100-300mm Stepless Adjustment
Transverse bar diameter and type	Φ5-16mm	Hot rolled or cold rolled ribbed steel bar
Straightening Mechanism	2-6 unit selectable	Each unit can work for different diameter. High speed straightening.
Feeding Type	rod	
Max. Welding Capacity	16+16mm	
Num. of Welding Heads	7 movable welding heads	Selectable based on actural situation
Max. Working Speed	10-40 row/min	
Welding Method	Med-frequency welding	Conserve 30% more power, no shock for the grid

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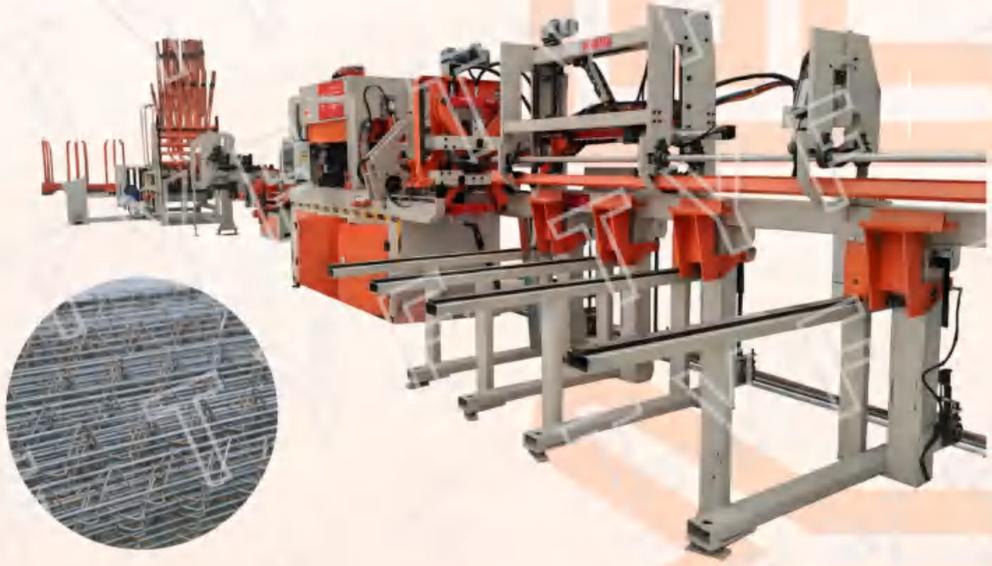
03

Smart Lattice Girder Production Line

Due to the fact that the production of lattice girder is different from the general rebar processing, it requires that the wire feeding, straightening, bending, welding, collecting, and stacking be completed in one go. Traditional manual processing production can no longer meet the demand, so the use of CNC automated lattice girder welding equipment has become the mainstream. The smart lattice girder production line only requires two people to operate, and all the work such as feeding, straightening, bending, welding, collecting, and stacking can be automatically completed. It has been widely used in China's high-speed railways and civil buildings and other fields. The line adopts Innovance electrical control system, which ensures rapid and stable production and meets the precision requirements. The numerical control collection mechanism automatically collects and conveys the products, reducing labor and improving efficiency. Reliable accessories are adopted for other components to guarantee its long service life and stable performance.

Smart Lattice Girder Production Line



Item	Data	Note
Girder Height	70-350mm	No foot when higher than 320mm, still qualified for double-layer wall and prefabricated pipe corridor when higher than 350mm
Girder Width	70-110mm	Max. width
Upper/Lower bar diameter	5-12mm	
Side bar diameter	4-7mm	
Girder Length	2~14m	customizable
Production Speed	≤17m/min	Based on the specification of girder
Shearing Method	Movable shearing	Any size, no subject to multiple of 100
Collecting Method	Stacker	Multi-layer Automatic Stacker
Tracting Method	Hydraulic clamp traction	Durable, automatic tracting length adjustment

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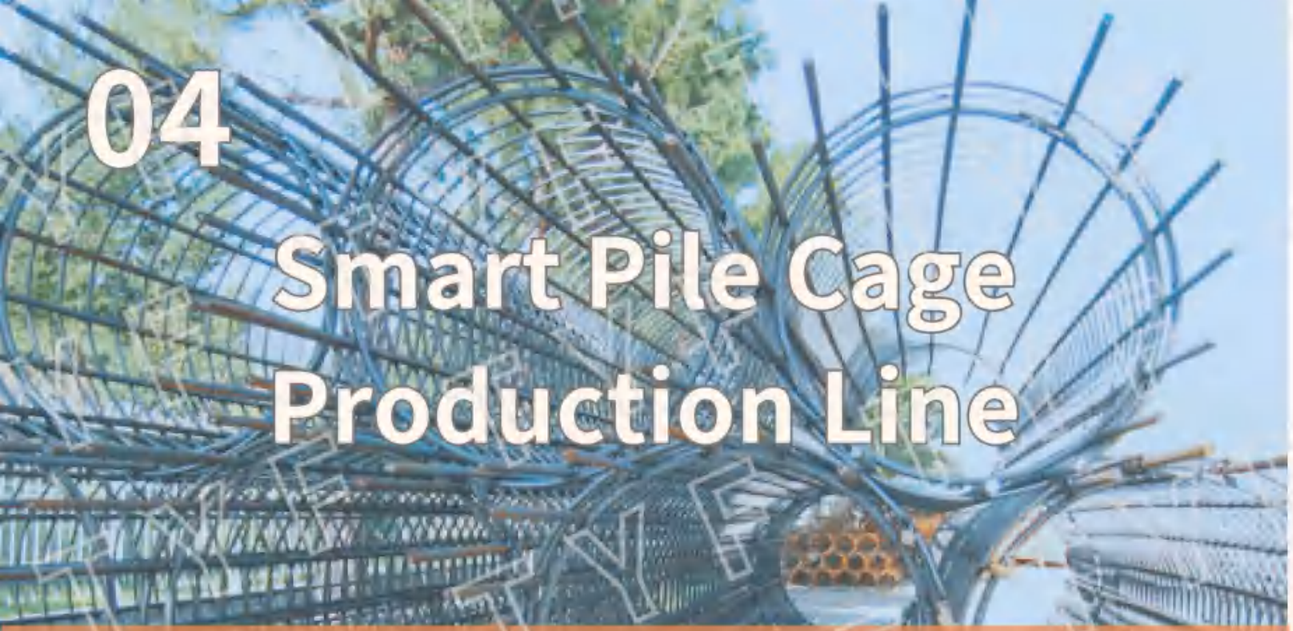
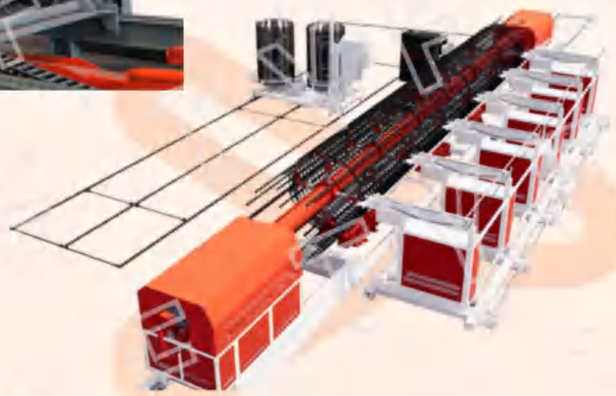


04

Smart Pile Cage Production Line

In the past, pile cages were traditionally made by manual binding or welding. Besides the low efficiency, the most significant drawback was the poor quality and the inconsistent dimensions, which affected the construction period and quality of the whole project. The Smart Pile Cage Production Line can integrate the separate processes in traditional way such as shearing, straightening, cold-drawing reinforcement, bending, welding, and connecting, etc. This enables the production of pile cages to be largely mechanized and automated, reducing the production time and coordination deviations between processes, significantly improving the quality and efficiency of pile cage forming. At the same time, it greatly reduces the labor intensity of operators, creating good economic and social benefits.

Smart Pile Cage Production Line



Item	Data	Note
Cage Diameter	Φ200~2500mm	
Cage Length	3-24m	Adjustable based on requirement
Main Bar Diameter	Φ12~40mm	
Spiral Bar Diameter	Φ6~16mm	
Spiral Bar Spacing	50~500mm	Adjustable at will
Welding Type	Manual/Auto	
Welding Speed	45 welding spot/min	

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05

CNC Smart Stirrup Bender

CNC Smart Stirrup Bender adopts a servo control system and integrates the straightening system, bending system and shearing system into one. It can directly process coil steel bar into stirrup, formed bar, or cut-to-size bar. Another important feature of this machine is that it can quickly switch bar diameters, avoiding the need to consider changing bars compared with the traditional mode of pre-straightening and manual bending, thus improving overall production efficiency. The numerical control and flow production mode only requires one worker to complete the production and processing of various specifications of stirrups, significantly reducing the number of workers and labor intensity, directly lowering production costs and achieving remarkable economic benefits. It is widely used in the construction industry, large steel bar processing plants and other fields.

CNC Smart Stirrup Bender

Item	Data	Note
Single Bar	Φ5 – 16 mm	
Double Bars	Φ5 – 10mm	
Max. Bending Angle	±180°	
Max. Bending Speed	1450 °/s	
Max. Tracting Speed	130m/min	
Length Compensation	± 1mm	
Bending Compensation	± 1°	
Daily Productivity per Unit	8T	
Bending Direction	Two directions	
Other Functions	Power Off Memory	In any case of power failure, it can continue to work from the last stop position

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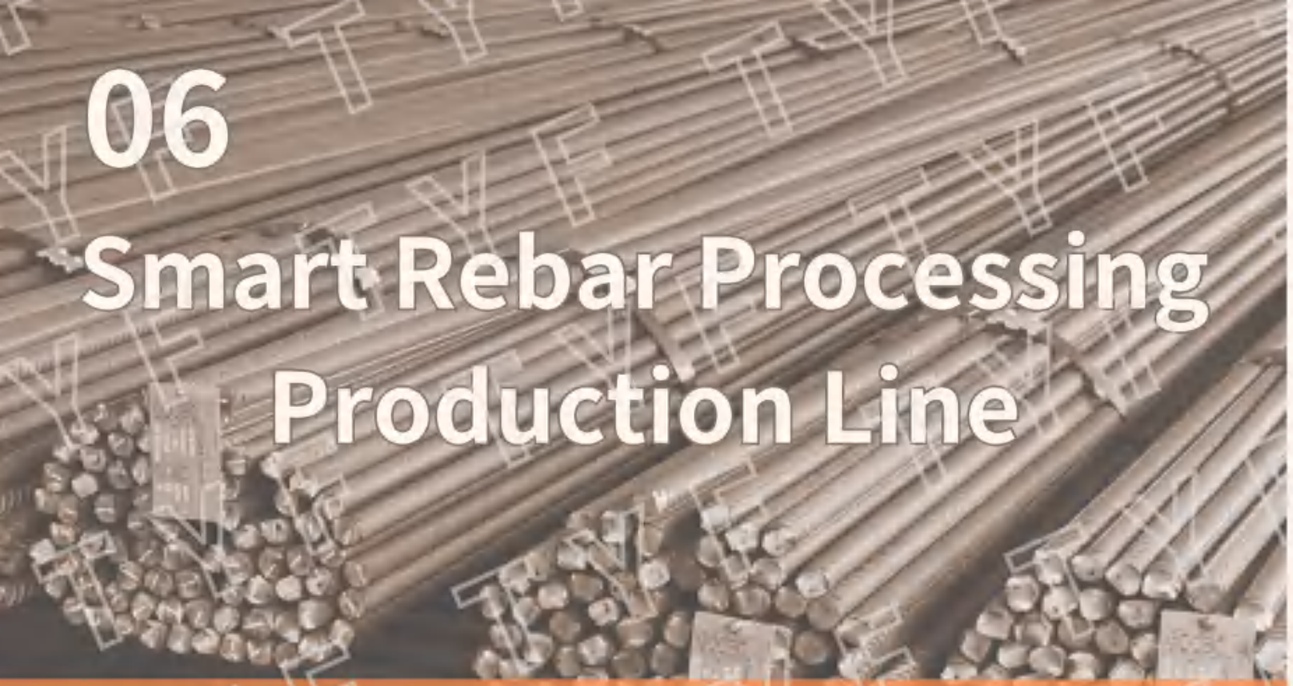
06
Smart Rebar Processing Production Line



Used for shearing, bending and threading of various sorts of straight steel bars. The bending equipment comes in 3 types, inclined, flat and vertical, with the maximum bar diameter reaching up to 60mm. The shearing equipment comes in two types, mechanical and hydraulic, with the maximum bar diameter reaching up to 50mm. The sawing and threading equipment is available in two types: band saw and circular saw, with the maximum bar diameter reaching up to 40mm. The whole set of equipment only requires 1 to 2 people to operate and is widely applicable to projects such as highways, railways, bridges, building construction and nuclear power station, etc.

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Smart Rebar Shearing Production Line

Shearing Strength	1200 [Kn] – 2,000 [Kn]					
Conveyor Speed	40 – 80 [m/min]					
Shearing Tolerance	± 2 [mm]					
Shearing Length	750 – 12,000 [mm]					
Payload of Conveyor	800 [kg]					
Collecting Rack Number	6*2					
Rebar Diameter (mm)	10-14	16-20	22-25	28-30	32	40-50
Shearing Number	20	12	8	4	2	1

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Smart Vertical Rebar Bending Production Line

Bending Capability	Rebar Specification					Bending Angle				
	Φ6-Φ32					+180°-120°				
Diameter	10	12	14	16	18	20	22	25	28	32
Number	6	5	4	3	2	2	2	1	1	1
Moving Speed（m/s)	0.6									
Bending Speed (°/s)	60									
Length Accuracy(mm/m)	±1									
Min. Bending Length(mm)	90									

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Smart Rebar Sawing & Threading & Grinding Production Line

Item	Data
Diameter Φ	12-40mm
Threading Length	65mm (extendable)
Sawing Speed	⩾60m/min
Length Tolerance（mm)	±1mm/m
Conveyor Speed	90m/min
Sawing Length	800-12000mm
Number of Grinding Motors	2 sets

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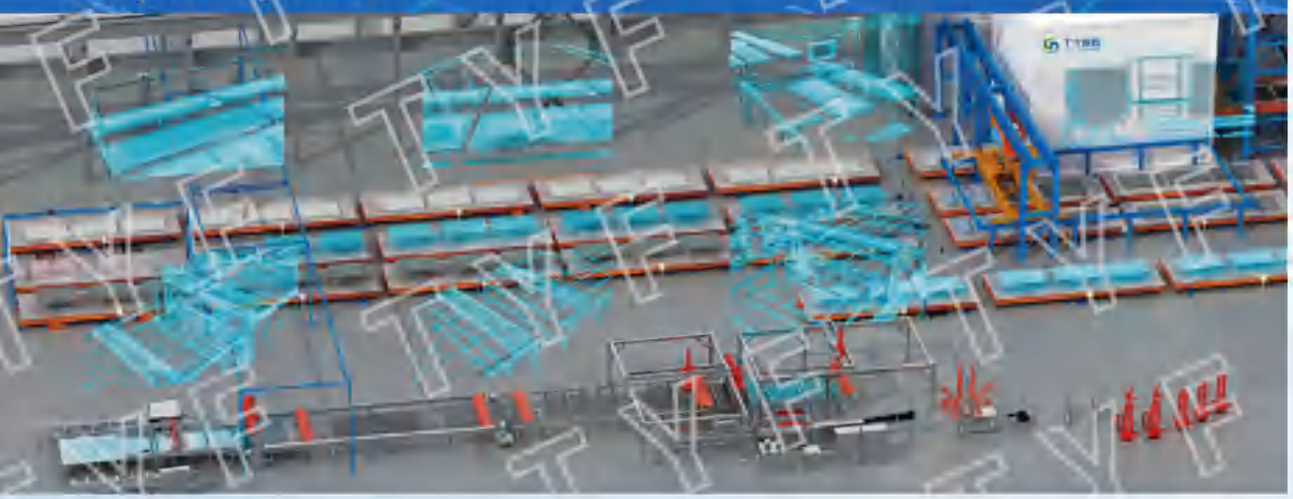
07 Intelligent Plant Managing System

The most used intelligent systems are intelligent identification auxiliary system, digital twin management and control platform, and MES production management system.

The digital twin management and control platform is based on the relevant data of the whole production process of PC components, and applies AI to simulate, evaluate and optimize the entire process. Open up the data barrier between product design and manufacturing, greatly reduce the uncertainty, so as to achieve high quality, high efficiency and low cost.

Thoroughly integrate all factors within the PC components factory. Construct the MES system by leveraging the technology of optimizing the cutting of steel raw materials, along with intelligent production scheduling for large-size components and other relevant technologies as the core, with the characteristics of civil engineering production management, thereby achieving efficient and lean management in PC component production.



Intelligent Identification and Auxiliary System

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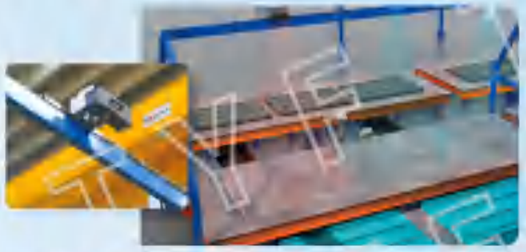
• Laser Auxiliary System

By utilizing projection precision positioning algorithms and target adaptive tracking algorithms, the component design details are dynamically projected onto the formwork platform to create flexible virtual templates or digital inspection tools. It helps achieving rapid and precise placement of molds, junction boxes, and other items.

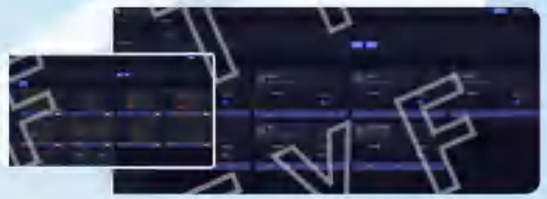


- Automatic mold positioning to improve production standardization
- Mold junction box layout accuracy significantly improved
- Mold junction box layout efficiency increased by more than 50%

• Cloud Identification System

Based on Kernel Density Estimation and Hough Transform algorithms, we developed an innovative drawing recognition technology for reshaping information points, providing production equipment with required DXF files and BOM lists to achieve automatic CAD-to-CAM conversion of reinforcement detail drawings.

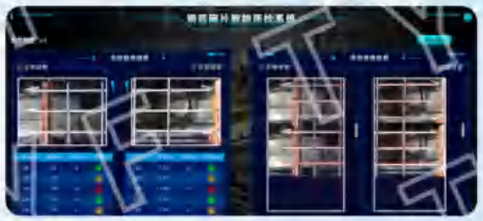
- 97% accuracy rate for the verification and recognition of over 100,000 drawings
- The efficiency of drawing recognition is 10 times higher than human
- 2 persons are saved in each production line



• Cloud Quality Inspection

The Cloud-based Inspection is a quality inspection solution leveraging cloud computing and AI technologies, designed to help enterprises achieve efficient, accurate, and intelligent quality inspection processes. Through digitalization and automation, it enables rapid detection and analysis of quality during production, thereby improving final quality, reducing defect rates, and providing real-time monitoring and analysis of quality data.

- Automatically count and monitor the amount of rebar by using cloud computing
- With cloud computing and image analysis, the automatic detection and evaluation of mold quality is achieved to ensure consistency and accuracy in manufacturing
- With cloud computing and image processing, the automatic detection and quality evaluation of mesh structure are realized



Digital Twin Management and Control Platform

Factory Panorama

Summarize the total production volume, historicaldata and project progress of the factory, easilycontrol the progress and situation, flexibly adjustthe production schedule, and improve efficiency.

Real-time production line tracking

High efficiency and full process transparent traceabilityare realised through real-time monitoring of workingstatus, component information and production processdata, dynamic feedback of mold production details andintelligent process optimization.

Dynamic Rebar Processing

Remote accurate tracking, production transparencyand traceability management are achieved throughrealtime display of the properties and progressdigital twin display of equipment status and processflow.

Automatic Distributing and Vebrating

Using laser or image recognition enables automaticpositioning and CNc distributing. Additionally, it allowsfor real-time monitoring of component information andequipment status. This ensures that the digital twinsystem can accurately reproduce the actual productionscene.

Fine maintenance and temperature control

By using real-time monitoring of the temperature andhumidity of the maintenance kiln, intelligent analysis of datadifferences and changes, dynamic alarm and feedback, itimproves operation efficiency and safety, while reducingcosts.

Efficient Storage Yard Management

The twin management system tracks the storage andprovides detailed information, assisting the manager tovisually_understand the storage status to makereasonable decisions.

MES Production Management System

Work Order Management

Improve productivity andaccuracy throughautomated work order management, real.timeanomaly monitoring and data analysis optimization.

Tast management

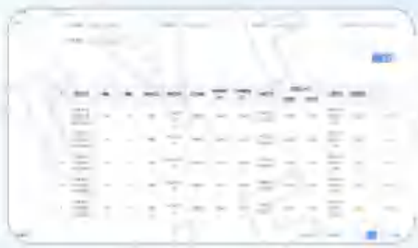
Tasks are assigned based on production plans andresource availability. Dynamic resource optimization,priority_scheduling, and abnormality_handlingmechanismssmooth production and ensureefficiency.

Inventory Management

Monitor production data in real time to quickly resolveproblems and improve equipmentutilization, whileadjusting production schedules, controlling quality andoptimizing material management to ensure planningaccuracy and efficient use of resources.

Quality Management

As an information hub, the integrated hardware andsoftware system can acquire real-time productiondata and rapidly process, supporting supply chaincollaboration, and can flexibly adjust according topersonalized production needs.



Story Yard Management

The system monitors the status of the storage yardthrough real-time data collection to ensure accuratematerial management. The traceability_system isintroduced to achieve full automatic management andquality traceability, optimize resource allocation toimprove efficiency, and support mobile applications toincrease operational flexibility.

Data Analysis and Report

Real-time data upgrades can be displayed on the screen tosupport timely decision making, provide interactivity forusers to customize and explore data, and ensurecompatibility for optimized displays across devices andresolutions.

08
Smart Manufacture Line

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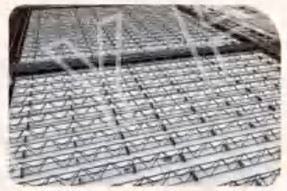
Smart Prefabricated Concrete Component Production Line

Smart concrete prefabrication line is an advanced manufacturing system with IOT and automatic production module as the key parts. Combining rebar processing, concrete distribution, vibration molding and intelligent temperature control maintenance modules, the fully digital production is realized. Combining the digital twin system to optimize process parameters can significantly improve resource utilization, reduce energy consumption and waste rates while reducing manual intervention. It is widely used in prefabricated buildings, municipal engineering and other fields.



Component and application

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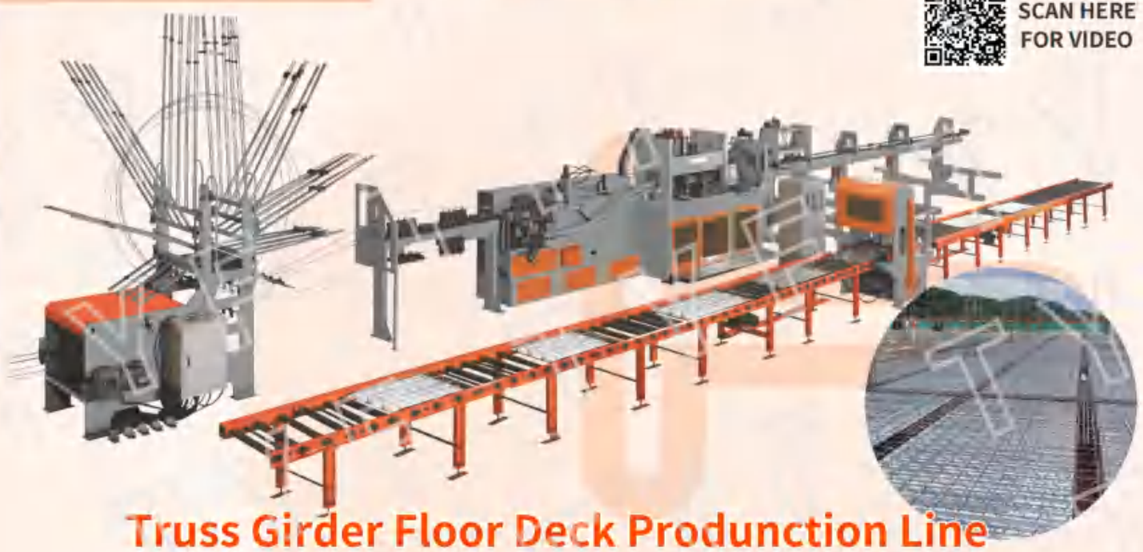

Truss Girder Floor Deck Produnction Line

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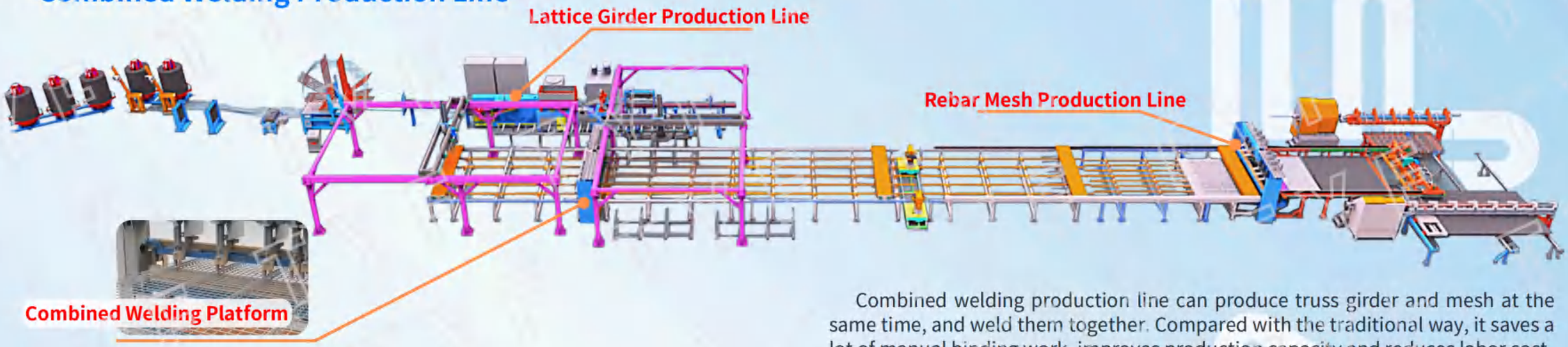
Combined Welding Production Line



Combined welding production line can produce truss girder and mesh at the same time, and weld them together. Compared with the traditional way, it saves a lot of manual binding work, improves production capacity and reduces labor cost.

Main Equipment of Prefabricated Component Production Line


Mold and Mold Base


Concrete Spreader


Trowelling Machine


Smart Palletizing Mechanism


Turnover Mechanism


Concrete Transporting Mechnism


Vibration Platform


Mold Base Moving Mechanism


Smart Curing Kiln


Tilting Platform

Smart Shield Tunnel Segment Production Line

Smart shield tunnel segment line adopts full-auto production, from rebar cage welding, concrete pouring, steam curing temperature control, to release quality inspection, warehousing logistics. Relying on the digital twin system, real-time monitoring of production data and optimization of process parameters, it significantly reduces energy consumption and scrap rate. It can easily satisfy the different engineering needs such as subway tunnels, highway tunnels, and wind power towers, etc.

Application

Main Equipment for Segment

Mold

Mold Cleaning Robot

Mold Opening-Closing Robot

Release Agent Spraying Robot

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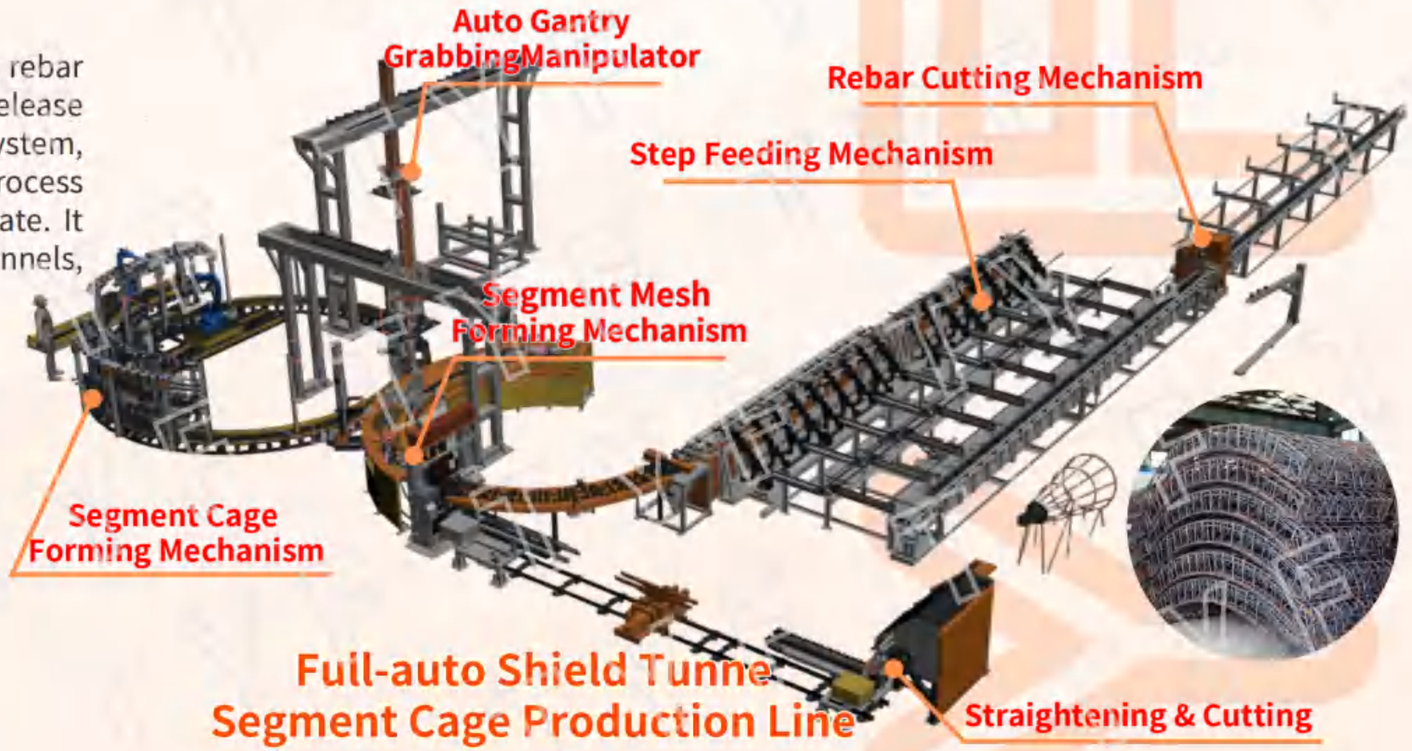


Full-auto Shield Tunnel Segment Cage Production Line

Concrete Pouring Room

Mold Removing Arm

Trowelling Robot

Smart Curing Kiln

Smart Prefabricated Bridge Production Line

Application




Main Equipment


Smart Feeding System


Automatic distributing System

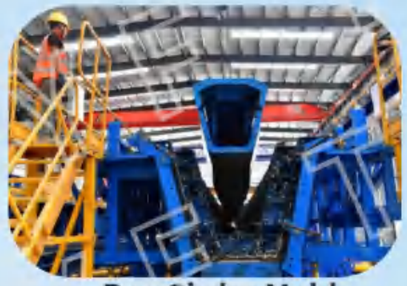

Component Forming System


Auto Open-close Mold System


Component Moving System


Temperature Control Curing System

Prefabricated Bridge Mold


Box Girder Mold


T-beam Mold


Bent Cap Mold


Pier Column Mold


Pier Column Mold


Pier Column Mold

Cases

Smart Steel Structure Production Line

Introduction:

1.Horizontal assembly, auto 4-spot welding in one action, avoid lifting turnover;
2. Multi-channel material transport to the welding station;
3. Multi-head gantry welding, automatic turnover;
4. Automatically transports the workpiece into horizontal correction, and the two flange plates can be corrected at one time.

Application

H-Steel Welding Straightening Machine

Other equipment

Laser/Flame Cutter

CNC 3D Drill