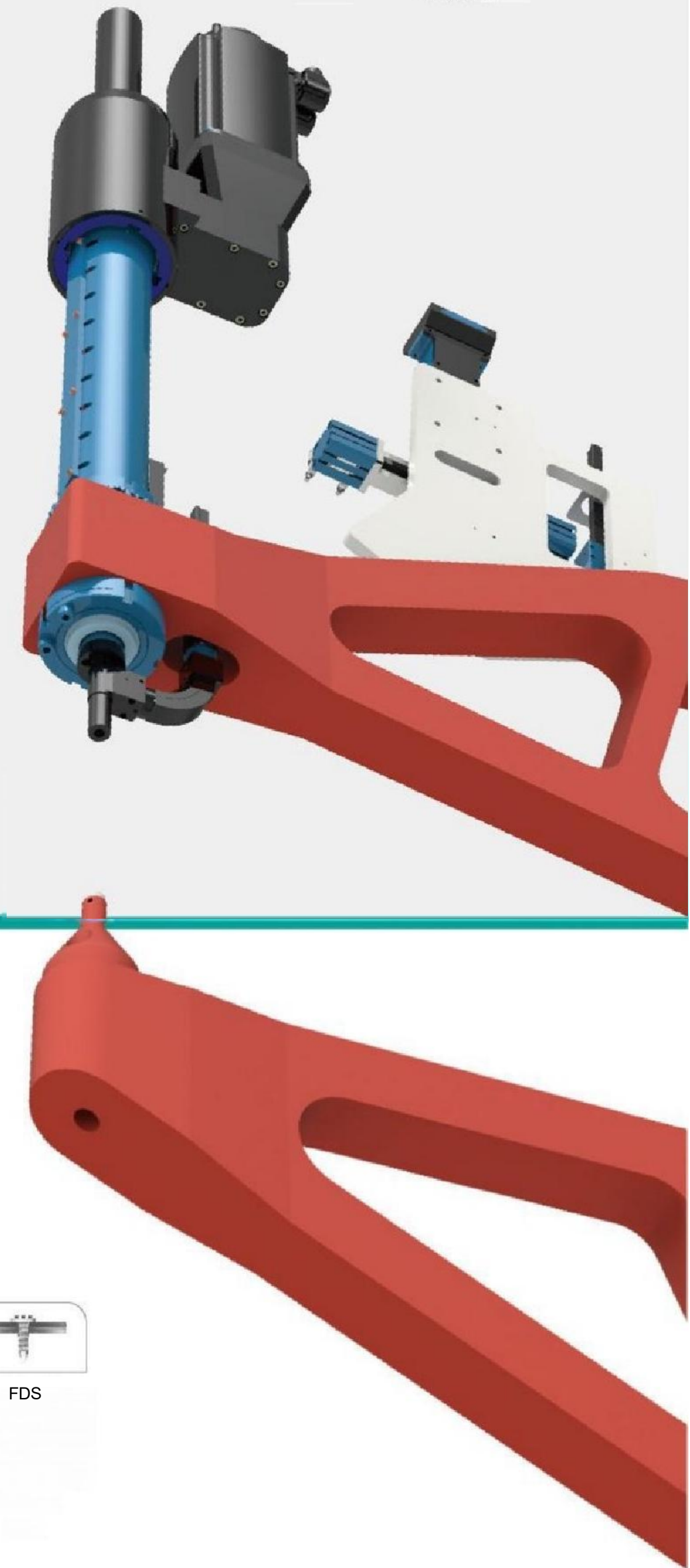


# SIMITCH

## SPR Technologies

成就钣金智能连接之美



Suzhou Simitch Machinery Co.,Ltd

Add: Building 13,18 xinyuan Road,Taicang, Jiangsu, China

Tel.:0512-5310509753105098

Mob.:008613915794760

Email:freda@simitch.cn

Website:www.simitch.com



Clinching



SPR



SPAC



Riveting



FDS

Self-pierce riveting technology

Under the action of external force, the lock rivet penetrates the first layer of material and the middle layer of material, and flows and stretches in the bottom layer of material to form a mutually embedded plastic deformation rivet connection process, which is called a self-piercing connection.

This riveting point has high tensile strength and shear strength, and is called a lock rivet riveting point.



Method and Principle

Self-piercing riveting is an efficient riveting process that directly presses rivets into metal through pressure, without drilling and manual installation of rivets.

Self-piercing riveting machine (SPR for short) can automatically complete the whole process of nailing, pressing and riveting within 2 seconds.

Process



Self-pierce riveting-Advantages

Technical features

- High fatigue resistance
- No drilling required, one-step molding
- Good waterproofness and airtightness
- No heat concentration
- Can connect materials of different thicknesses
- Can connect metal and non-metal materials Can connect multiple layers of materials









Self-pierce riveting-Materials

The various applications of SPR technology also explain their wide range of variants;

SPR technology vary in material, shape, hardness, surface, head shape, shaft length and diameter.

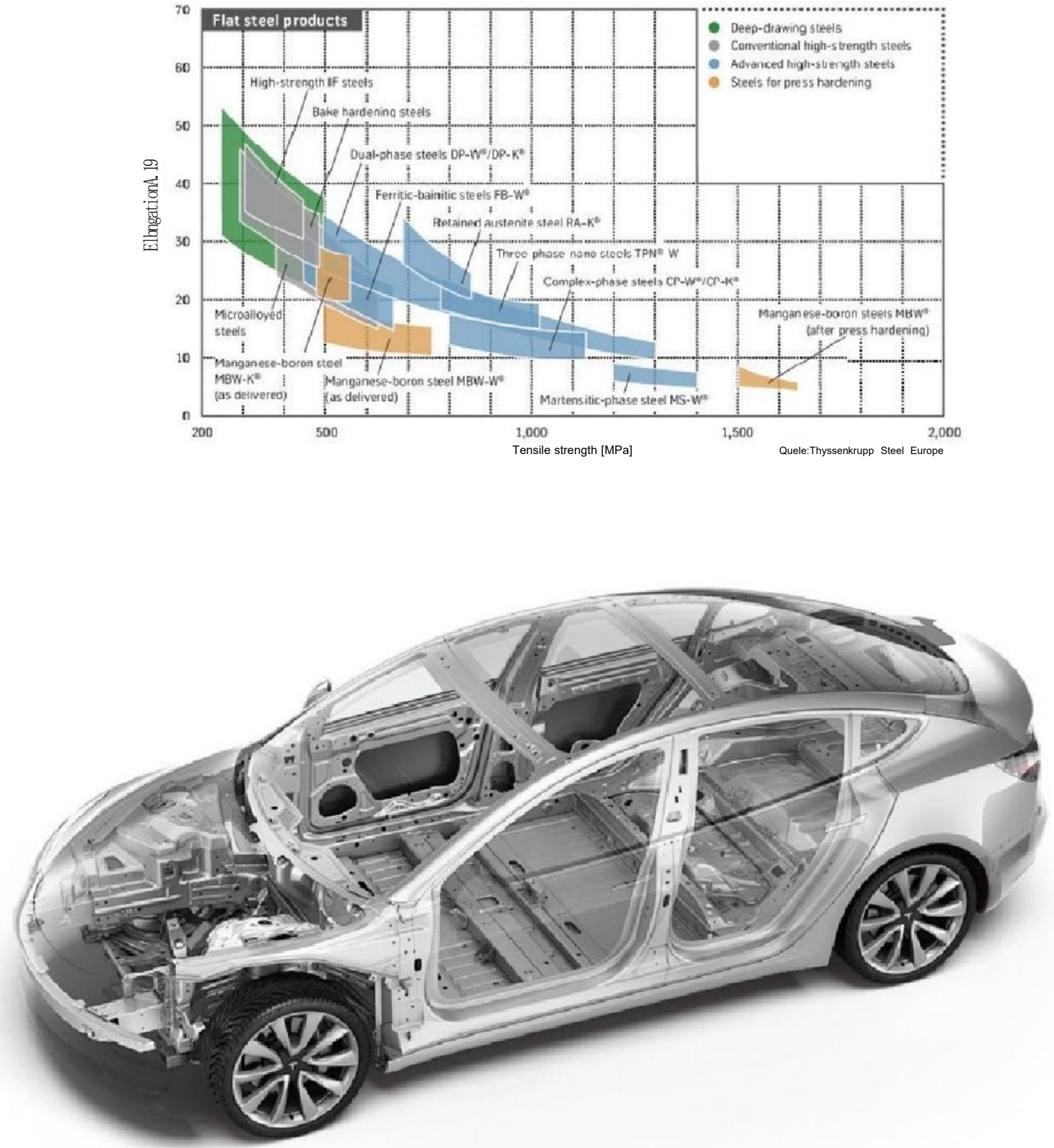
	Steel:1.0mm Steel:1.0mm
	Aluminum:1.2mm Steel:1.0mm Aluminum:1.2mm
	Aluminum:3.0mm Aluminum:3.0mm
	Aluminum:1.2mm Magnesium:1.5mm
	Plastic: 2.0mm Aluminum:2.0mm
	Plastic:3.0mm Aluminum:3.0mm
	Aluminum:1.2mm Structural adhesive Aluminum:2.0mm

Application Trends of Vehicle Body Materials

Application trend of body materials

Composite material design-application of high-strength materials

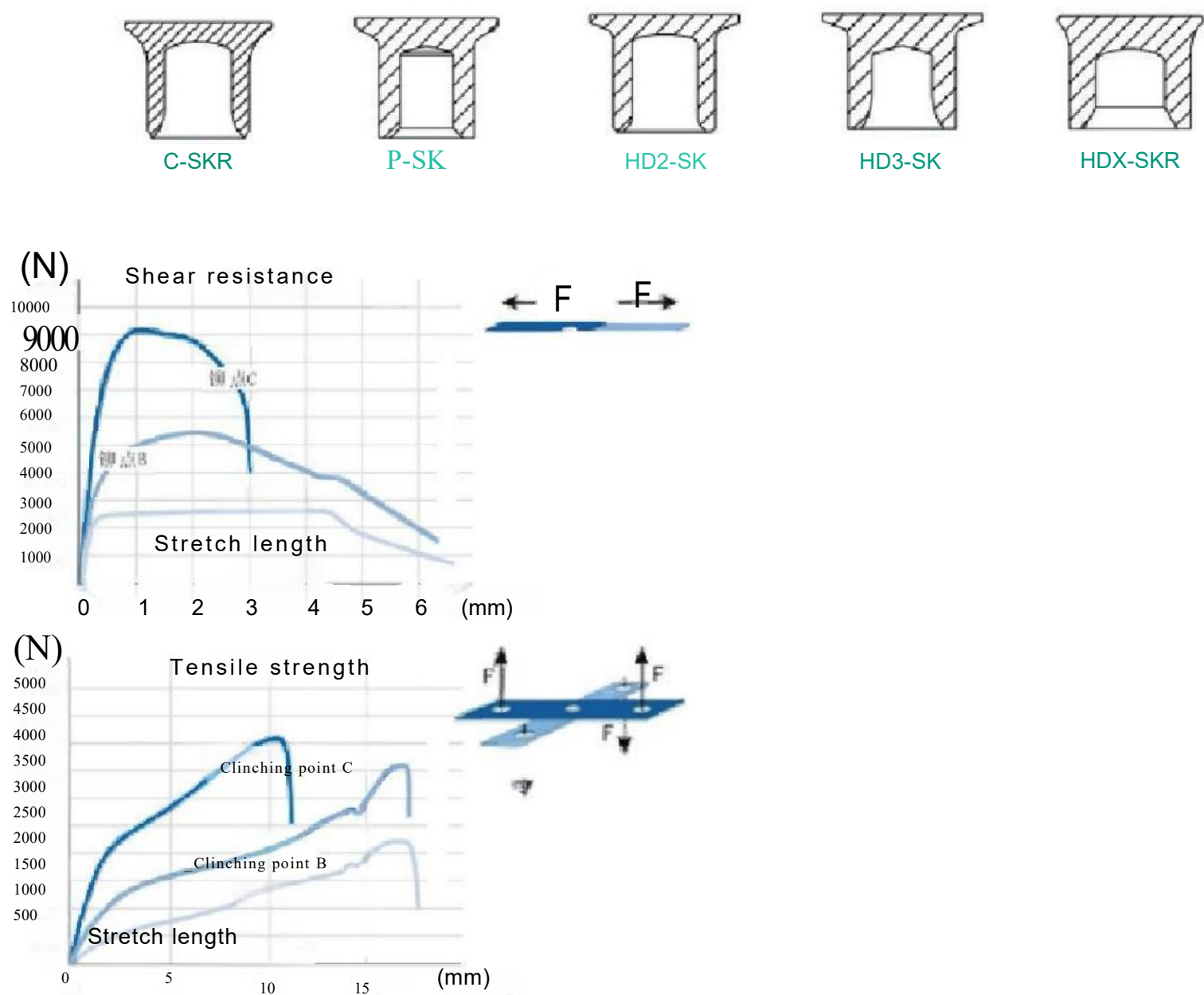
Due to the demand for lightweight, new energy vehicles use a large number of aluminum alloy parts on the body, and there are many SPR steel-aluminum and aluminum-aluminum connections.





Self-pierce riveting-Variants

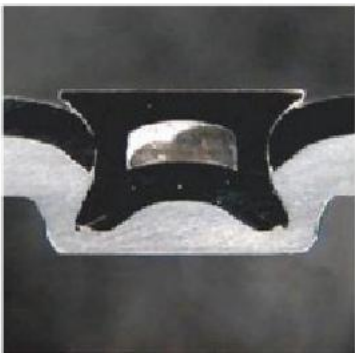
The lock rivet series is a professional and innovative product.  
The production process is 100% inspected according to strict quality inspection standards  
to ensure that it meets the application needs of different customers.



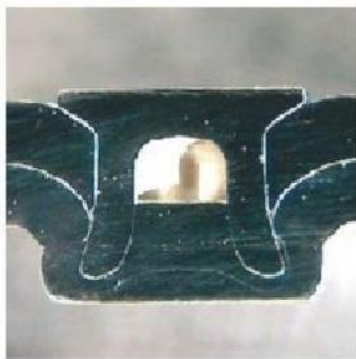
Riveting point strength



Aluminum Magnesium Alloy 1.2mm  
Aluminum Magnesium Alloy 1.2mm



High-strength steel H320: 1.2mm  
Aluminum-magnesium alloy: 2.0mm



High-strength steel H320: 1.2mm  
Deep-drawing steel DCO1: 2.0mm

Self-pierce riveting-Variants

In addition to riveting technology, SIMITCH also provides complete riveting dies for automated manufacturing.

For your use of piercing riveting connection technology, we will provide you with reliable quality assurance and service assurance.

SIMITCH test report

is our quality assurance letter to you. Under the same conditions, the SIMITCH point connection strength of your workpiece is guaranteed to meet or exceed the corresponding technical indicators in the test report.

SIMITCH mold certificate

Each time the mold is provided, relevant matters regarding mold manufacturing and maintenance will be attached.

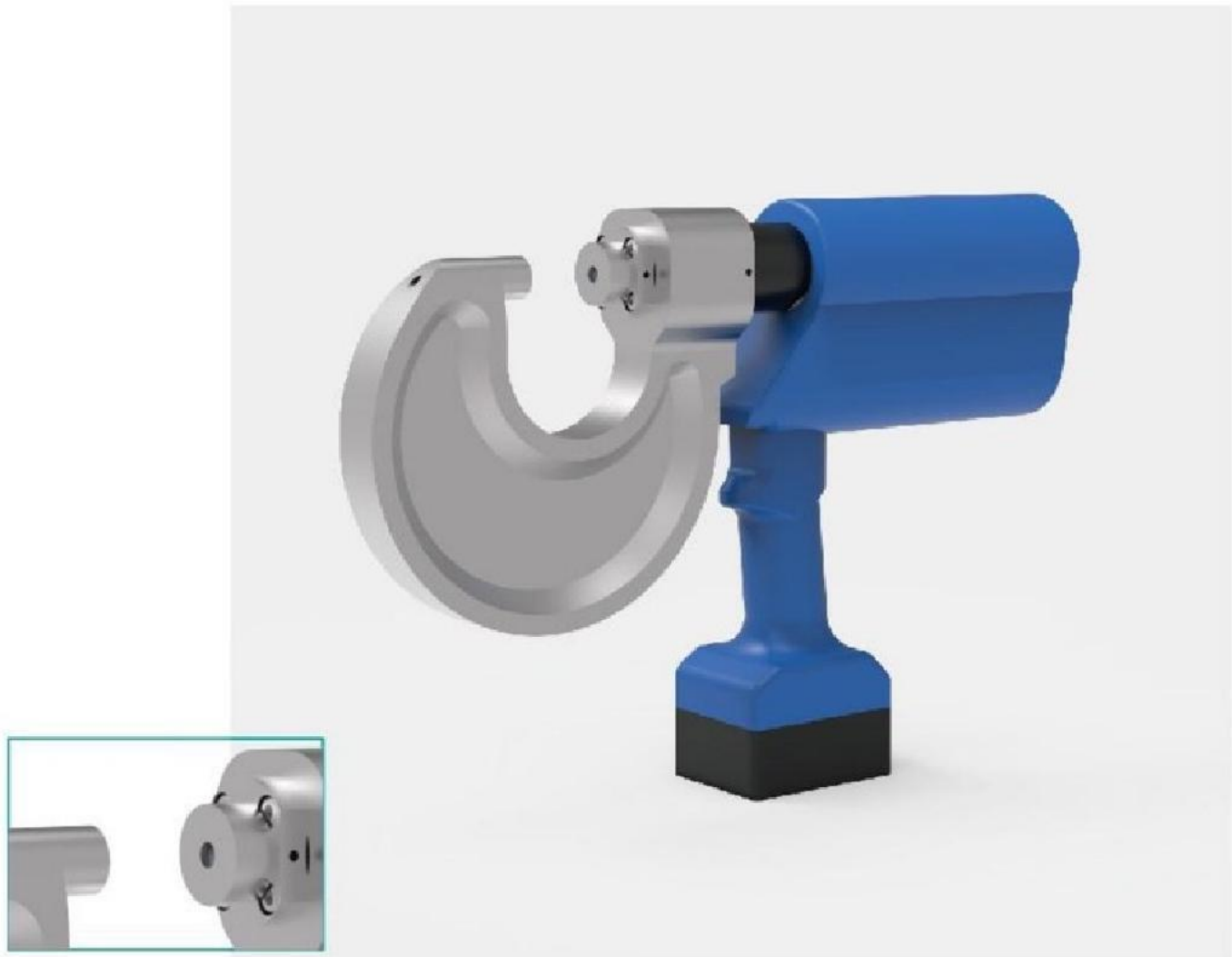
SIMITCH technical file archive computer management system

can dynamically provide you with advice on the use of SIMITCH technology at any time, including comprehensive technical information and technical changes made. This ensures that the technical engineers of our company and overseas offices can provide you with technical advice quickly.



Self-pierce rivets-Variants

SPR - Handheld electrical riveter



**Main parameters**

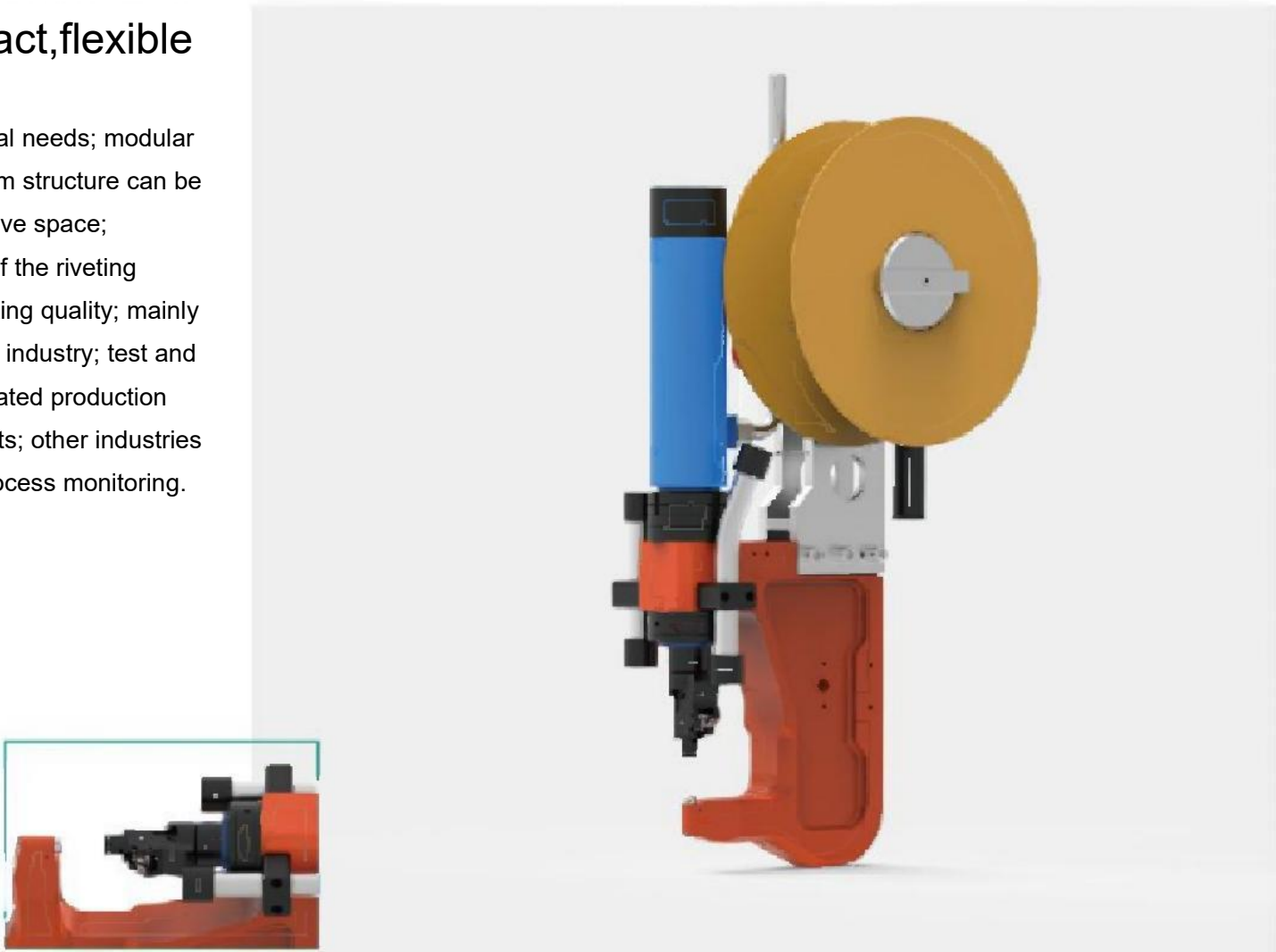
Power source: Electric  
Frame: CRH  
Pressure control: Button control return  
Pneumatic mode: One-hand switch  
Equipment function: Automatic material belt feeding

SPR Connection Unit

SPR connection unit - manual hydraulic belt self-piercing riveting pliers

Strong,compact,flexible

Meet customers' special needs; modular design, compact system structure can be flexibly combined to save space; automatic monitoring of the riveting process to ensure riveting quality; mainly used in the automotive industry; test and trial production; automated production lines; robot riveting units; other industries that require riveting process monitoring.



**Main Parameter**

Main power: Hydraulic station  
Main power: Max. punching force 50/75KN  
Working cycle time: 3s  
Control method: Handle control or foot switch  
Rivet,die model determined according to test  
Feeding:Automatic belt feeding or manual feeding  
Installation : Bracket installation/hanging installation/360° hanging installation

SPR Riveting Unit  
CEC08-01 Self Piercing Machine



**Strong, compact and flexible**  
Meet customers' special needs; modular design, compact system structure can be flexibly combined to save space;  
Automatic monitoring of riveting process to ensure riveting quality;  
Mainly used in the automotive industry;  
Testing and trial production;  
Automated production line;  
Robotic riveting unit;  
Other industries that require riveting process monitoring.



- Main parameters**
- Main power: Pneumatic or hydraulic
  - Main power: Max. press force 50/75KN Working cycle time: 3s
- Control system: Handle control start or foot switch start
- Rivet and die model determined by test
- Nail feeding method: belt type automatic nail feeding or manual nail feeding
- Installation method: bracket installation/hanging installation/360° hanging installation

SPR Riveting Unit  
SPR Riveting Unit—CNC servo drive

**Strong, compact and flexible**  
There are multiple modes: setting mode /riveting mode/maintenance mode to meet different operating needs;  
The touch control screen provides a friendly human-machine dialogue function;  
Automatic monitoring of the riveting process to ensure the quality of riveting;  
Online quality monitoring and data traceability functions;  
Can be freely connected with robots to achieve industrial automation;  
Mainly used in the automotive industry; test and trial production; automated production lines; robot riveting units; other industries that require riveting process monitoring.



- Main parameters**
- Main power: CNC servo drive system
  - Main power: 5T/8T
  - Riveting stroke: 100/200mm
  - Working cycle time: 3s
  - Control system: human-machine interface, online quality monitoring and management system
  - Installation method: bracket installation/hanging installation/360° suspension installation/robot installation

- Compact and flexible self-piercing riveting system**
- Multiple modes: setting mode/riveting mode/maintenance mode to meet different operation needs;
  - Touch screen control provides friendly human-machine dialogue function;
  - Automatic monitoring of riveting process to ensure riveting quality; realize online quality monitoring and data traceability function;
  - Can be freely connected with robots to realize industrial automation;



SPR Riveting Unit Station  
Guide rail riveting machine



Features

- Modular design, compact system structure, flexible combination, space saving;
- Automated production during riveting process;
- Production parameters, process parameters and result data can be stored, facilitating analysis of defect causes and process improvements; Can be freely docked with robots to achieve industrial automation;;

Compact and flexible self-piercing riveting system

- Automatic monitoring of the riveting process
- Production parameters, process parameters and result data can be stored to facilitate analysis of defect causes and process improvements
- Flexible equipment, used in combination with strip rivets

Riveting quality is determined by riveting force, which can be adjusted and set arbitrarily according to the application

- Riveting quality can be tested without damage

SPR Riveting Unit Station  
Manual Self piercing riveting machine



Features

- Modular design, compact system structure, flexible combination, and space saving;
- Automated production during riveting process;
- Production parameters, process parameters, and result data can be stored to facilitate analysis of defective causes and process improvements;
- Can be freely docked with robots to achieve industrial automation;

Compact and flexible self-piercing riveting system

- Automatic monitoring of the riveting process
- Production parameters, process parameters and result data can be stored to facilitate analysis of defect causes and process improvements
- Flexible equipment, used in combination with strip rivets

Riveting quality is determined by riveting force, which can be adjusted and set arbitrarily according to the application

- Riveting quality can be tested without damage

SPR Riveting Unit Station  
Billboard piercing and riveting equipment



Features

- Modular design, compact system structure, flexible combination, space saving;
- Automated production during riveting process;
- Production parameters, process parameters and result data can be stored, facilitating analysis of defect causes and process improvements; Can be freely docked with robots to achieve industrial automation;;

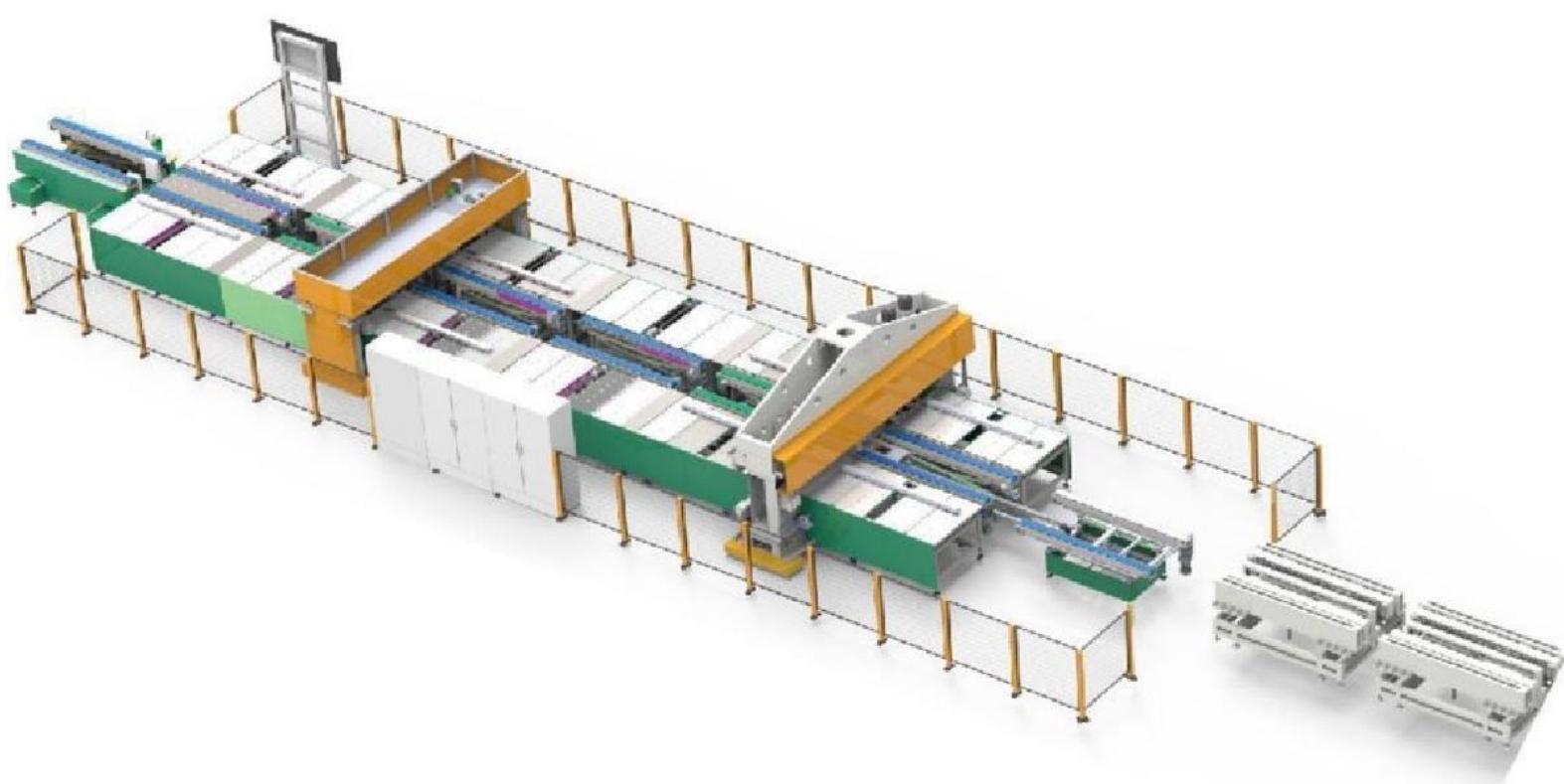
Compact and flexible self-piercing riveting system

- Automatic monitoring of the riveting process
- Production parameters, process parameters and result data can be stored to facilitate analysis of defect causes and process improvements
- Flexible equipment, used in combination with strip rivets

Riveting quality is determined by riveting force, which can be adjusted and set arbitrarily according to the application

- Riveting quality can be tested without damage

SPR Riveting Unit Station  
Elevator automatic SPR machine



Features

- Modular design, compact system structure, flexible combination, space saving;
- Automated production during riveting process;
- Production parameters, process parameters and result data can be stored, facilitating analysis of defect causes and process improvements; Can be freely docked with robots to achieve industrial automation;;

Compact and flexible self-piercing riveting system

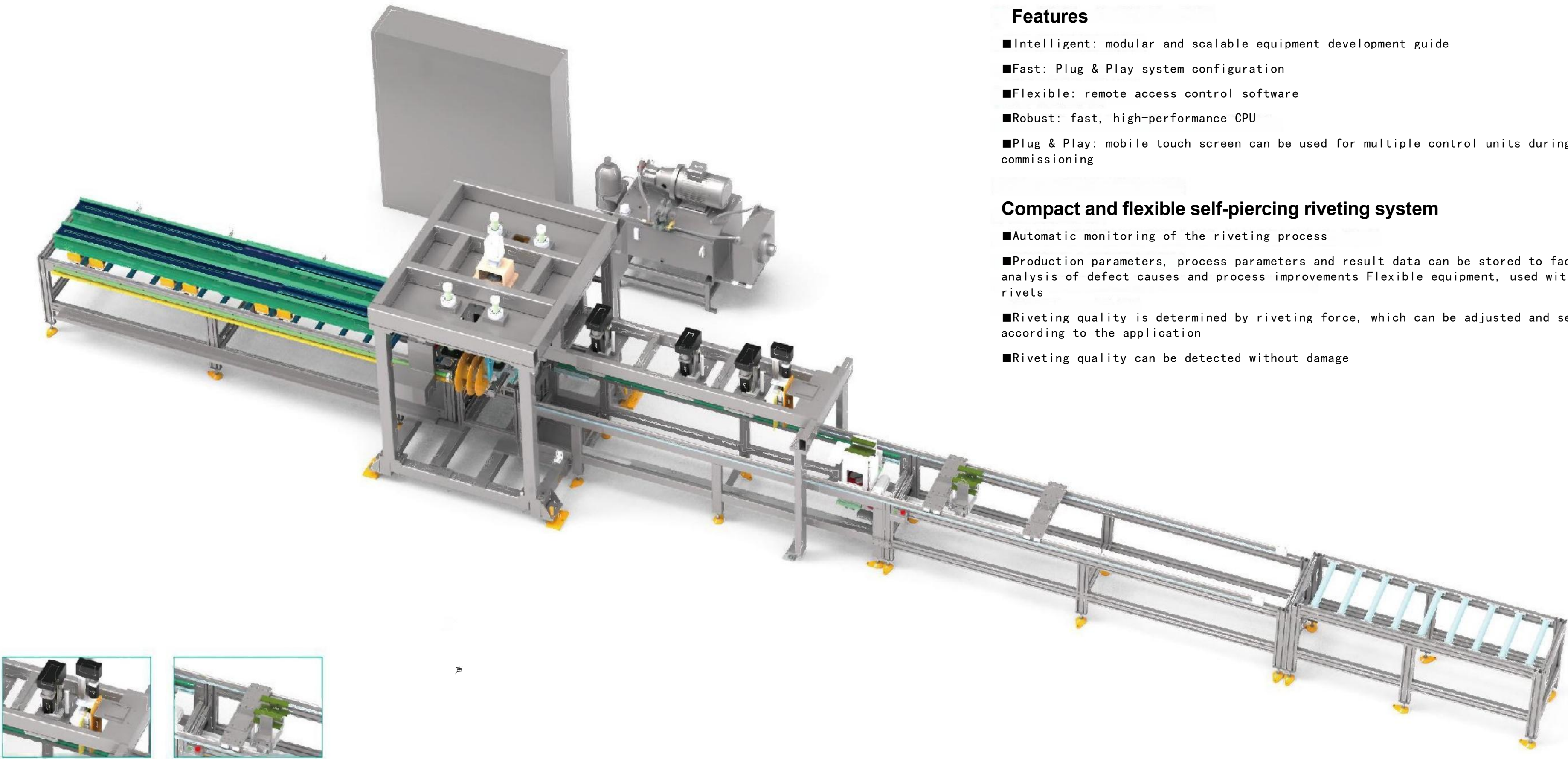
- Automatic monitoring of the riveting process
- Production parameters, process parameters and result data can be stored to facilitate analysis of defect causes and process improvements
- Flexible equipment, used in combination with strip rivets

Riveting quality is determined by riveting force, which can be adjusted and set arbitrarily according to the application

- Riveting quality can be tested without damage



SPR Riveting Unit Station  
Busbar self-piercing riveting machine



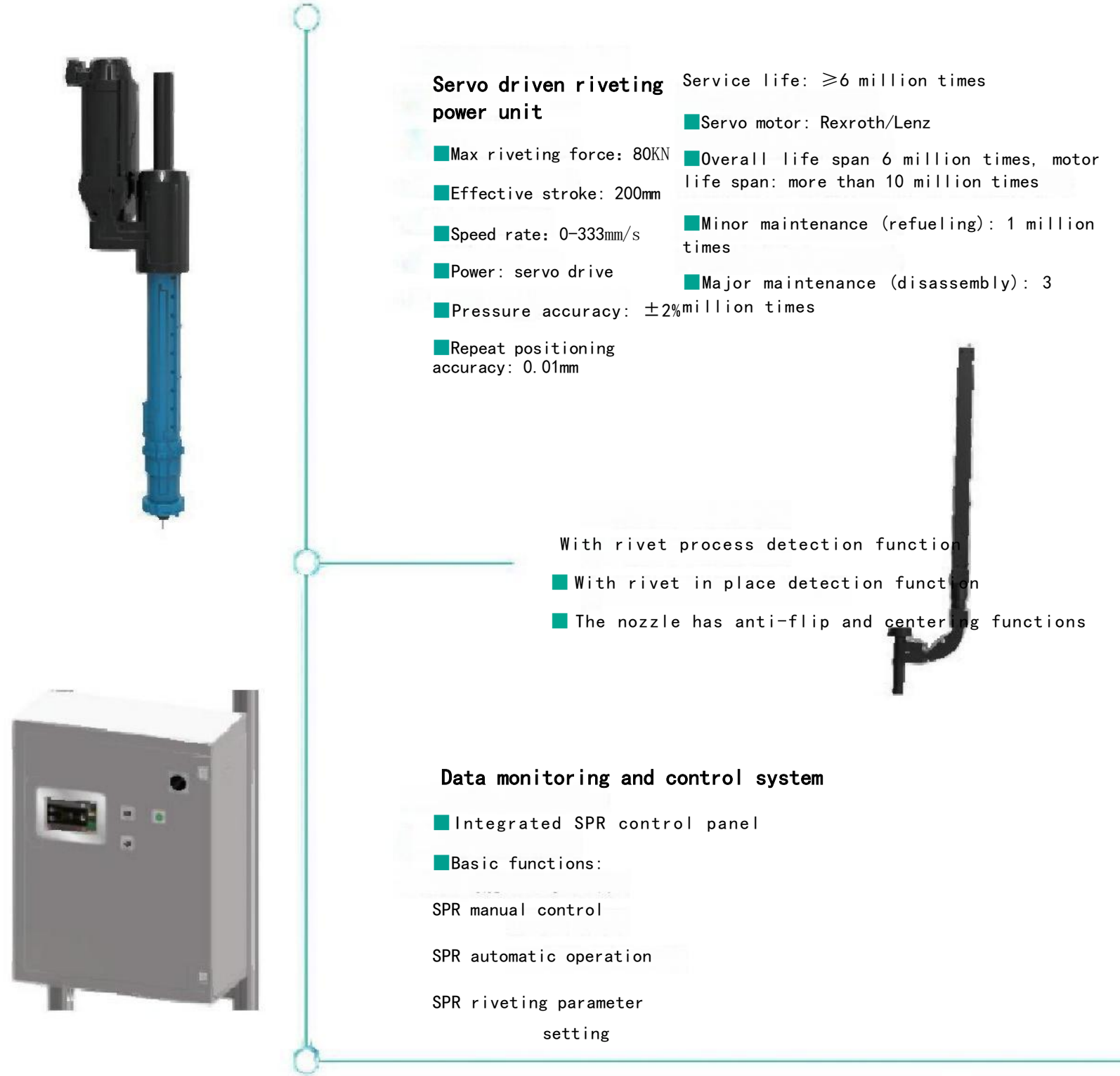
Features

- Intelligent: modular and scalable equipment development guide
- Fast: Plug & Play system configuration
- Flexible: remote access control software
- Robust: fast, high-performance CPU
- Plug & Play: mobile touch screen can be used for multiple control units during commissioning

Compact and flexible self-piercing riveting system

- Automatic monitoring of the riveting process
- Production parameters, process parameters and result data can be stored to facilitate analysis of defect causes and process improvements Flexible equipment, used with strip rivets
- Riveting quality is determined by riveting force, which can be adjusted and set according to the application
- Riveting quality can be detected without damage

SPR Riveting Unit Station  
Automation Module



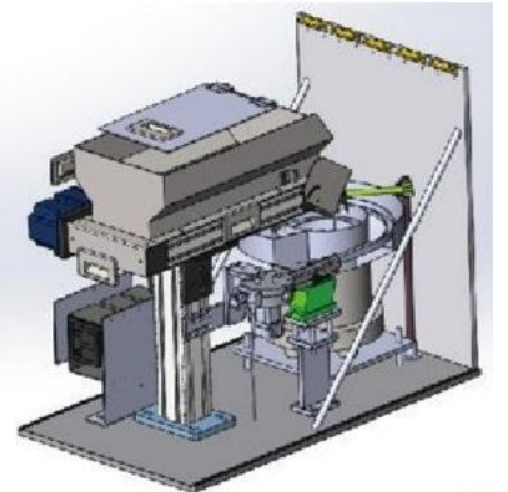
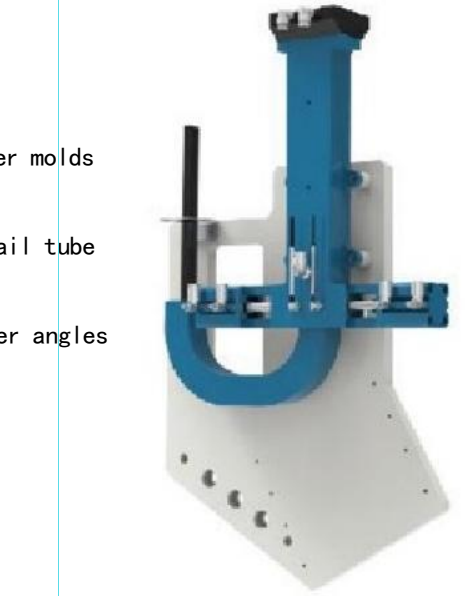
Automatic nail feeding system

- Double row, each row can hold 35 nails, a total of 70 nails;
- Double row magazine cannot blow 3mm and 5mm rivets at the same time, the lower molds of 3mm rivets and 5mm rivets are different;
- There is no magazine with 3mm and 5mm at the same time. Because the elbow, nail tube and gun head are not consistent.
- The magazine installation angle is  $0^\circ$  and  $90^\circ$  standard angles, and the other angles can be customized. .



Used with magazine, it can automatically deliver nails

- Nail capacity: 10,000 or 20,000
- Nail jam rate:  $< 0.05\%$
- Material shortage alarm function
- Beat:  $< 2s/piece$
- Noise:  $< 75dB$
- With nail length detection function, accuracy is  $\pm 0.1MM$
- Rivet specifications can cover the full range of 5mm rivets and the full range of 3mm rivets
- The cutting port has a cylinder with position detection function, which tightens the rivet and tests the actual length of the rivet. The resolution of nail length detection is  $\pm 0.1mm$



Data monitoring and control system

- Riveting process parameter collection.
- Evaluation, force/displacement curve display. Historical data storage.
- Monitor installed on the control cabinet;
- Data acquisition port and permissions;
- Group control software (installed on industrial computer) to meet the needs of intelligent manufacturing. .



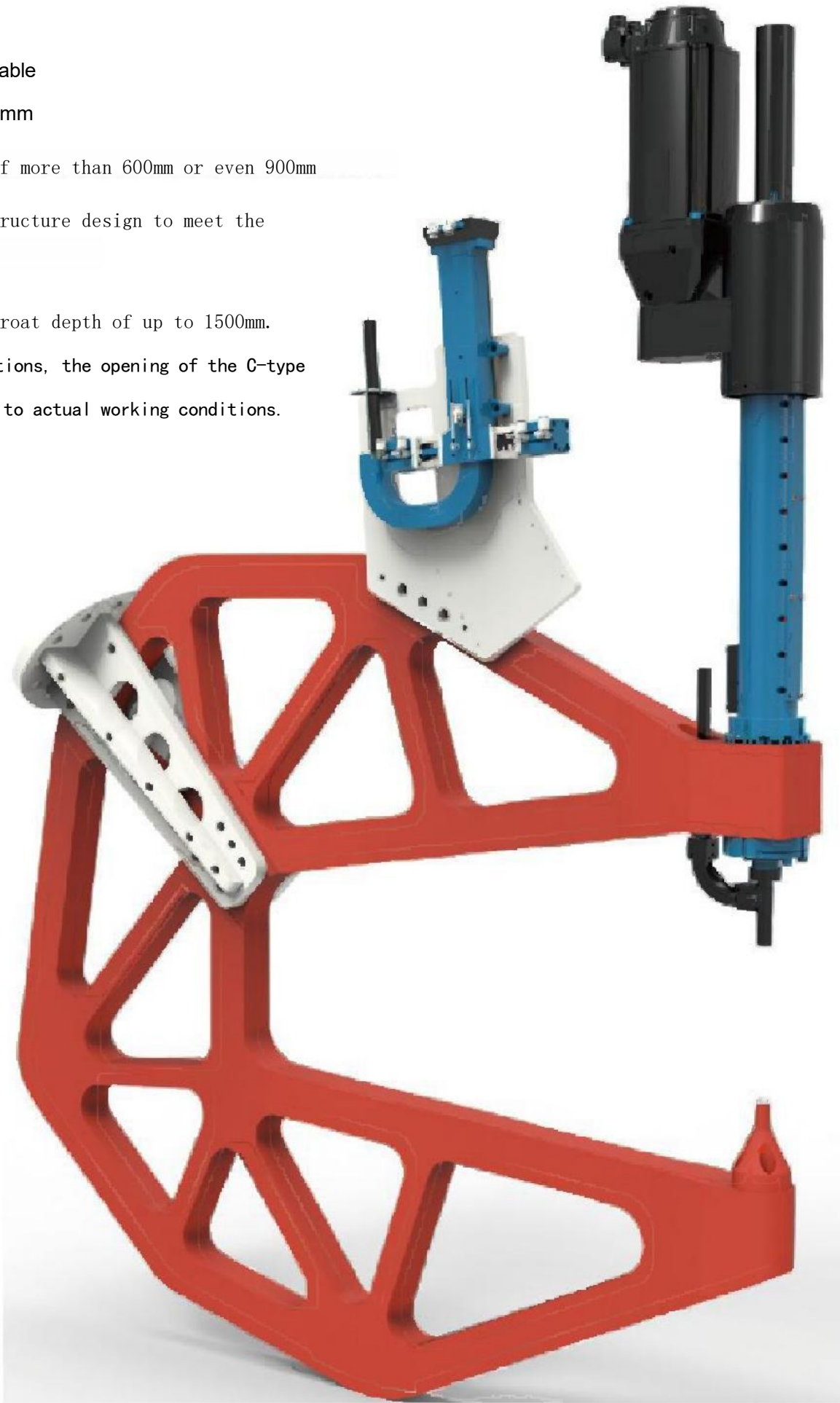


SPR Connection Unit Station  
Various specifications of SPR Riveting Guns

Rich functional experience and flexible usage.  
The combination of max use of the system and min. maintenance is the basis for successful production.

Features

- Capacity: 80KN
  - Throat depth: 100-600mm are available
  - Opening width: 100mm/150mm/200mm
- Rivet guns with a throat depth of more than 600mm or even 900mm also have a lightweight frame structure design to meet the requirements of robot mounting.
- The floor-standing type has a throat depth of up to 1500mm.
- In addition to standard specifications, the opening of the C-type clamp can be customized according to actual working conditions.



SPR Riveting Integrated Equipment  
Integrated Self Piercing Riveting Machine

Performance

- Operation/parameter setting through the control unit, easy to use
- Robot control/process control system installed in the cabinet, reducing the hardware and system footprint
- Integrated power supply for easier operation
- Predefined configuration for easier debugging
- Three-point fast, pre-programmed commissioning, easy replacement:
  - Rivet gun
  - Magazine
  - Mold
- Troubleshoot and ensure quality by checking "Complete Installation" during operation



- 1 Post nail station
- 2 Nail storage
- 3 Robot driven riveting pliers
- 4 Control panel
- 5 Rivet gun nozzle