

Innovative Vacuum for Automation



engineered systems

**Vacuum Gripping Systems**  
Gripping means you get it



## Schmalz – World of Vacuum Technology

Consistent customer orientation and groundbreaking innovations, excellent quality and comprehensive consulting competence make Schmalz the world's leading partner for vacuum technology in the field of automation, handling and clamping technology.

We inspire our customers by showing how vacuum technology can be used to design more efficient production processes. Our in-depth conversations with our customers help us to develop products and solutions that are optimally tailored to their individual requirements.

With our certifications, including ISO 9001 for quality management, ISO 14001 for environmental management and ISO 50001 for energy management, we guarantee our partners internationally standardized and sustainable processes and ensure the highest standards of quality.

## Your Contact at Schmalz

If you would like to find out more about our products or need some help designing your system, please do not hesitate to contact us and we will be happy to help.



### Technical consultation

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www.schmalz.com/gripping-systems

### Your local system consultant

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www.schmalz.com/salesnetwork



## Schmalz Online Shop

www.schmalz.com

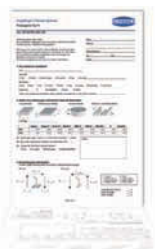


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Questionnaire for fast initial projecting

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**Contact us!**  
We will find the right contact  
for your solution  
[www.schmalz.com/contact](http://www.schmalz.com/contact)



**"Aggressive productivity targets require consistent automation. That is why our customers invest in the latest equipment. The gripping systems often tips the scale for stable processes. Workpiece and gripper must form a logical and coordinated unit and thus secure the functioning of the overall system. Your success is our goal!"**

Peter Gröning  
Head of Business Development and System House, Vacuum Gripping Systems



"Best Innovation System"  
at the "German Industry Innovation Prize 2015"

## Vacuum Gripping Systems from the Global Market Leader

# Vacuum Gripping Systems from the Global Market Leader

## The Highest Standards for Customized System Solutions

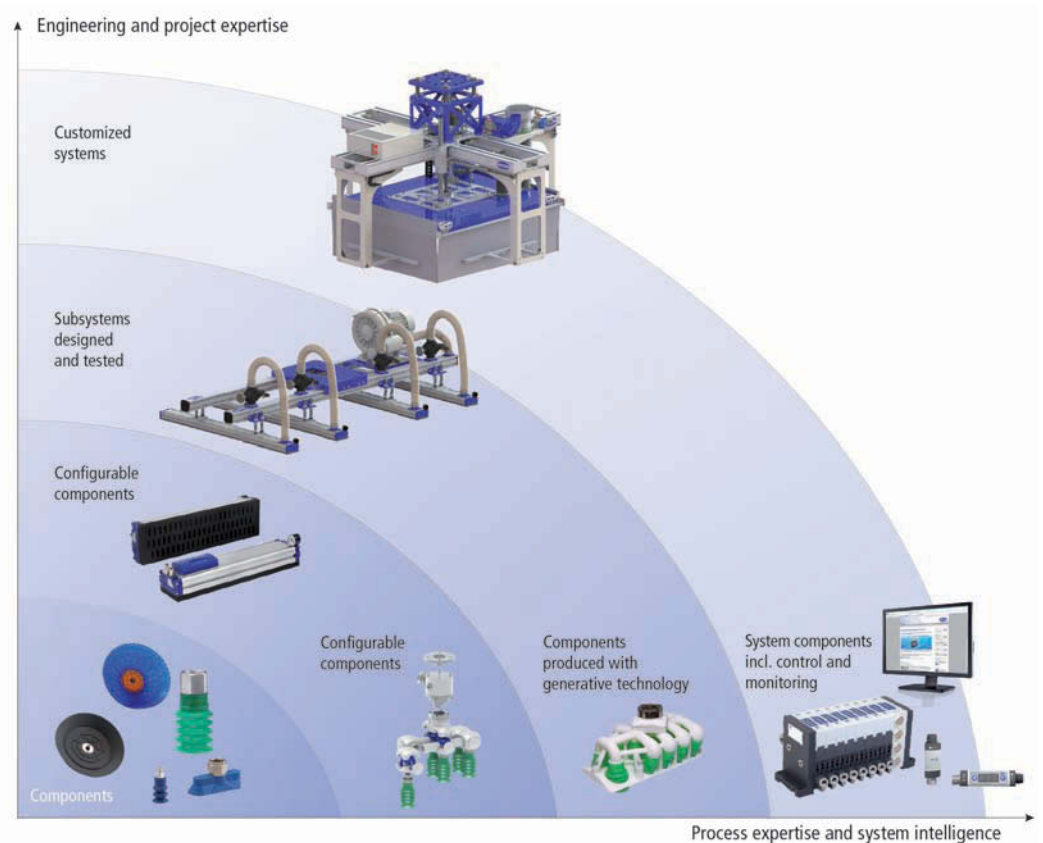
Developing system solutions means identifying customer needs and providing solutions. In order to offer customized solutions, we have to understand the customer's business, identify the optimization potential and speed up processes. From briefing to delivery, Schmalz vacuum gripping systems are based on award-winning innovation and

development processes and an extensive product range of high-quality vacuum components. In addition to gripping system, Schmalz always offers its customers competent support, from project initiation through start of operations. Take advantage of the perfect interaction of know-how, service and high-quality components from its own range.

## Know-how and Components – The Basis for any System Solution

### Systems are more than just assembled components

- Depending on requirements, components are integrated to create complete custom solutions or intelligent modules in complex processes.
- Schmalz systems are developed and produced according to the highest standards for optimum handling processes.
- Standardized interfaces for optimum system coordination between hardware, software and energy efficiency.



Based on simple components, Schmalz offers both intelligent system modules and customized gripping systems.

## Added Value for your Project



- A handling process is only as good as its gripping system. Our systems are based on the process knowledge derived from virtually every industry.
- Completely integrated components, from the gripper through the vacuum generator to the system monitoring
- About 450 registered and granted intellectual property rights demonstrate our high innovation and solution expertise



**“We focus on the benefits and added value for the customer when developing each system. This is not from a static point of view, but depends on the project or situation.”**

Philipp Bohnet  
Vacuum Gripping Systems

## System Procurement with “Added Value”

Customer-Oriented Project Management Provides Solutions that Lower Costs in Everyday Use

**Consultation and system design**

**Design and development**

**System design and tests**

**Procurement and logistics**

**Mounting and installation**

**Start of operations and training**

**Operation and service**

### Consultation and system design

- Qualified consultation with assistance from an experienced project manager
- Detailed recording of application-specific requirements
- Resource-efficient system design

### Design and development

- One stop shop – your design responsibilities are eliminated
- Efficient vacuum technology is equipped with mechatronic functions

### System design and tests

- Service-friendly design of gripping systems
- Use of high-quality and standardized components
- Certified functional reliability through tests with original customer workpieces

### Procurement and logistics

- Complete and safe delivery by a single partner
- Elimination of time required for procurement of individual components and associated logistics

### Mounting and installation

- Complete on site mounting including process integration

### Start of operations and training

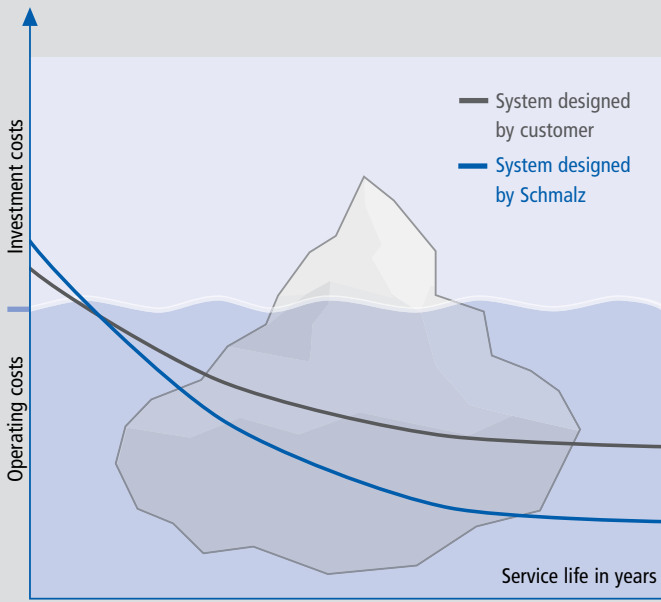
- Delivery of a 100% operational system
- On-site training and documentation for your staff

### Operation and service

- Solutions for simple process monitoring guarantee a smooth operation and high availability
- Fast emergency and spare parts service

# System Procurement with "Added Value"

Customer-Oriented Project Management Provides Solutions that Lower Costs in Everyday Use



Comparison of the total operating costs of a Schmalz system solution with those for a system designed by the customer: Our wealth of experience helps you to optimize productivity and operating costs (e. g. for energy consumption, maintenance and spare parts) throughout the entire duration of operation.

## Economic evaluation for the entire life cycle

When considering cost effectiveness there are significantly more aspects to be taken into account than just the cost of the gripper. Reduction in overall operating costs through optimally coordinated systems means:

- Custom-tailored implementation of your requirements
- High degree of integration by taking over responsibility for the system
- Concurrent engineering generates mutual transfer of knowledge
- Faster start of operations through tested system functionality
- Coordinated systems provide higher processing speeds, and thus faster cycle times and increased productivity
- Coordinated systems ensure lower energy consumption and thus reduce operating costs
- Coordinated systems ensure process reliability and quality

For you this means:

**More time to focus on your core competencies.**

## Make or Buy?

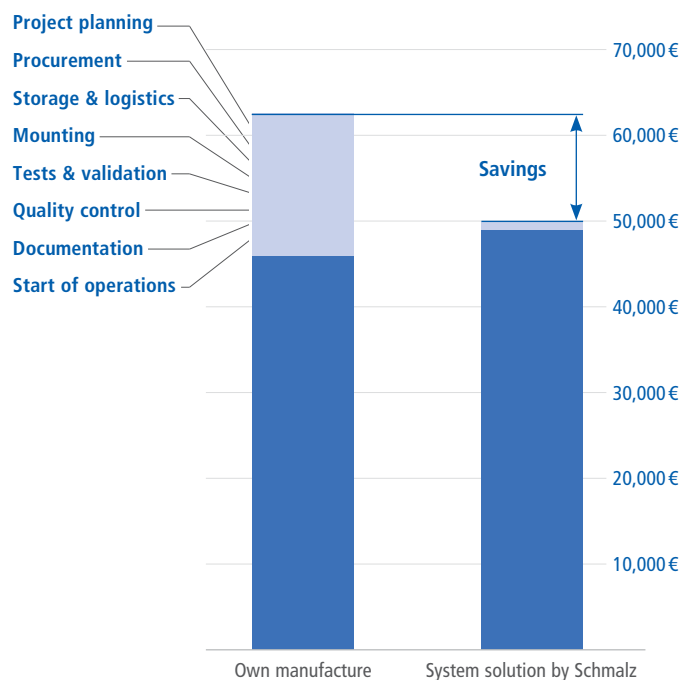
In order to make an investment decision you have to analyze the cost structure in detail. This includes cost drivers such as:

- Project planning and definition
- Design and maintenance costs of own systems
- Sourcing, procurement and logistics expenses
- Production, documentation, testing and start of operations costs

### A system solution by Schmalz

The fact that a Schmalz system solution is cheaper than own manufacture is due to our specialization. Thanks to our extensive expertise and experience in the design of vacuum gripping systems, you save:

- Design and research expenses
- Resources, by avoiding development loops
- Time, due to an efficient start of operations and little reworking
- Procurements costs, because we supply the complete system
- Project responsibility, as we take over responsibility for the system



■ Project costs  
■ Cost for components

System procurement makes sense: The benefits of the Schmalz system solution can be seen in a direct comparison.



**“Through a project-oriented organization and interdisciplinary solutions, we apply the right skills to the project. This way we combine the necessary know-how from engineering to software. In order to achieve this we work hand in hand with the customer.”**

Michael Nübel  
Vacuum Gripping Systems

## Schmalz – The Problem Solvers



# Schmalz – The Problem Solvers

## The Highest Customer Demands Deserve Innovative Solutions

In order to deliver system solutions one needs to understand the customer's processes first.

Project planning starts with the workpiece. In order to develop stable and reliable system solutions, the routine interaction between the right areas of competence is crucial for the project's success.

### Quality assurance already in CAD

Using CAD, our designers ensure quality and reliability already in the computer model:

- Optimized design through CAD supported FEM calculation
- Stable vacuum technical feasibility studies
- CE-compliant documentation according to engineering standards (e.g. process description, creation of wiring and site plans for electrical equipment)

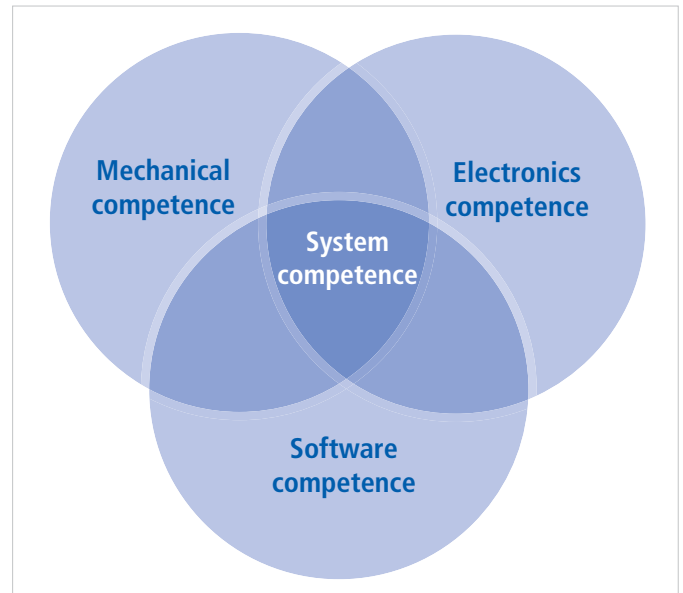
### Software-based control and operation

To make handling processes as efficient as possible, Schmalz equips its systems with the right software:

- Software for teach-in of new products, as well as for the control of gripping processes
- Teach-in of the gripping processes of special workpieces
- Storage options of gripping processes of different workpieces



Integrated software solutions for mechanics, control and operation – from a single source



The interaction of professional competences is key for the success of the project

### Comprehensive tests and test scenarios

To achieve high operational reliability, we test our systems using various test methods:

- Endurance tests and life determination for all gripping systems
- Simulation of handling processes via the articulated robot on the testing ground
- Feasibility studies and functional tests with original workpieces for customer-specific gripping systems



Tests with original customer workpieces are prior to each customer inspection

## Added Value for your Project



- Optimally designed and tested gripping processes for the fast start of operations in the plant
- Software for grippers for the easy management of gripper settings for each workpiece
- Management of complex handling operations (e.g. in palletizing and de-palletizing processes), possible via the supplied software



## Vacuum Layer Gripping Systems SPZ



**For more information**  
Interesting application  
videos on the SPZ can  
be found here.

# Vacuum Layer Gripping Systems SPZ

The Powerful Solution when it Comes to Challenging Palletizing Tasks

Efficient vacuum layer gripping systems for distribution centers in department stores and intra logistics increase production capacity through the automated handling of products and workpieces in many industries. Individually planned systems guarantee optimal process integration and secure fast economic benefits.

## Application

- Palletizing and de-palletizing of the various goods
- Use in department store and intra logistics
- Integration in the periphery via mechanical, energetic and control technology interfaces
- Handling of partial pallets and mixed stock

## Connection

### Flange connection STARR

rigid connection to common robots and gantries



### Flange connection FLEX

spring-mounted connection to common robots and gantries

## Suction box

### Suction box with foam

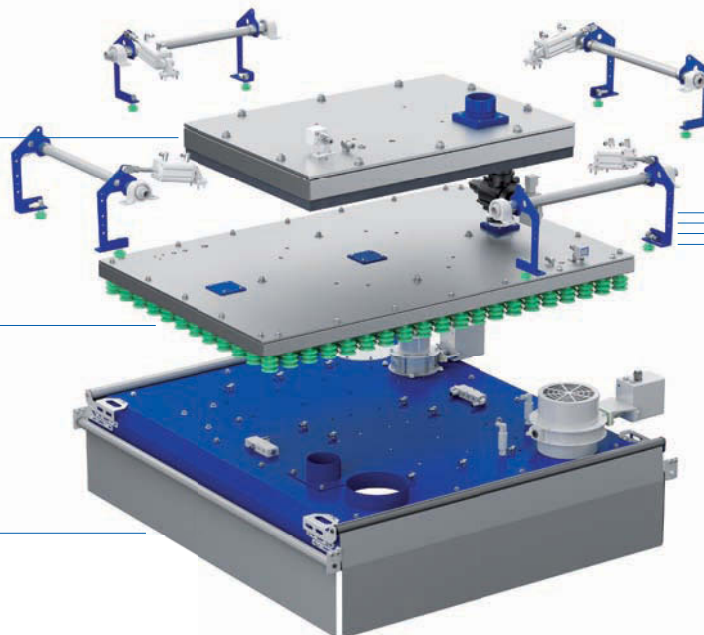
for virtually all workpieces, optionally with zoning

### Suction box with suction cups

for uneven workpieces, optionally with zoning

### Suction box with skirt

for difficult workpieces, with global vacuum chamber



## Gripping modules

with intermediate layer handling

with global vacuum chamber

with position detection

with height adjustment



## Your Benefits



- Safe and damage-free gripping of different layer sizes and layer arrangements
- Higher throughput due to process acceleration (e.g. no retooling when changing products)
- Intelligent mechanical, energy and technical software interfaces
- Innovative gripping concept with mechanical support for additional holding force

# Vacuum Layer Gripping Systems SPZ

Schmalz vacuum gripping systems can be modified with different expansion options for virtually any process-specific requirements. With every design step, more complex functionalities through more gripping principles, for example, are possible. Pneumatic, mechanical and sensory options from the modular system enable handling applications in almost all industries.

## Further information

Technical data and further information on the SPZ can be found here.

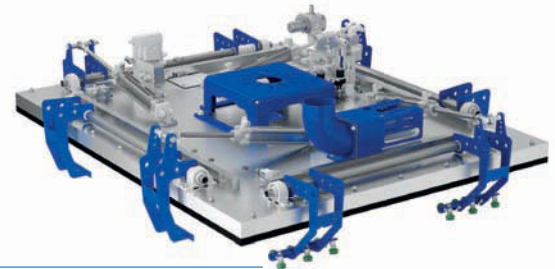


## Configuration examples



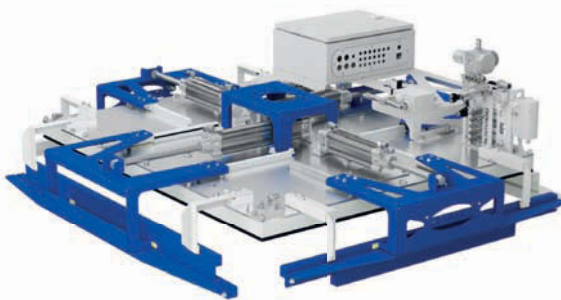
### SPZ

- Suction area (foam or suction cups)
- Configurable size



### SPZ

- Suction area (foam or suction cups)
- Configurable size
- Mechanical gripper support
- Intermediate layer handling
- Pallet clamping



### SPZ-M

- Suction area (foam or suction cups)
- Configurable size
- Mechanical gripper support
- Intermediate layer handling
- Pallet clamping
- Automatic parts monitoring



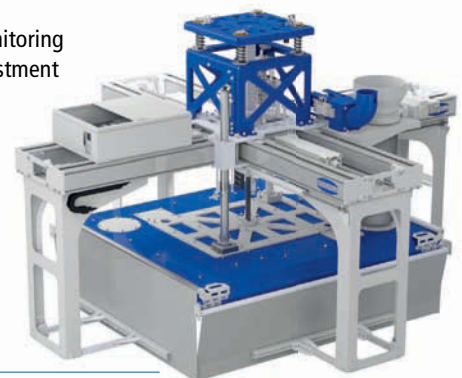
### SPZ-M

- Suction area (foam or suction cups)
- Configurable size
- Mechanical gripper support
- Intermediate layer handling
- Pallet clamping
- Automatic parts monitoring
- Variable height adjustment



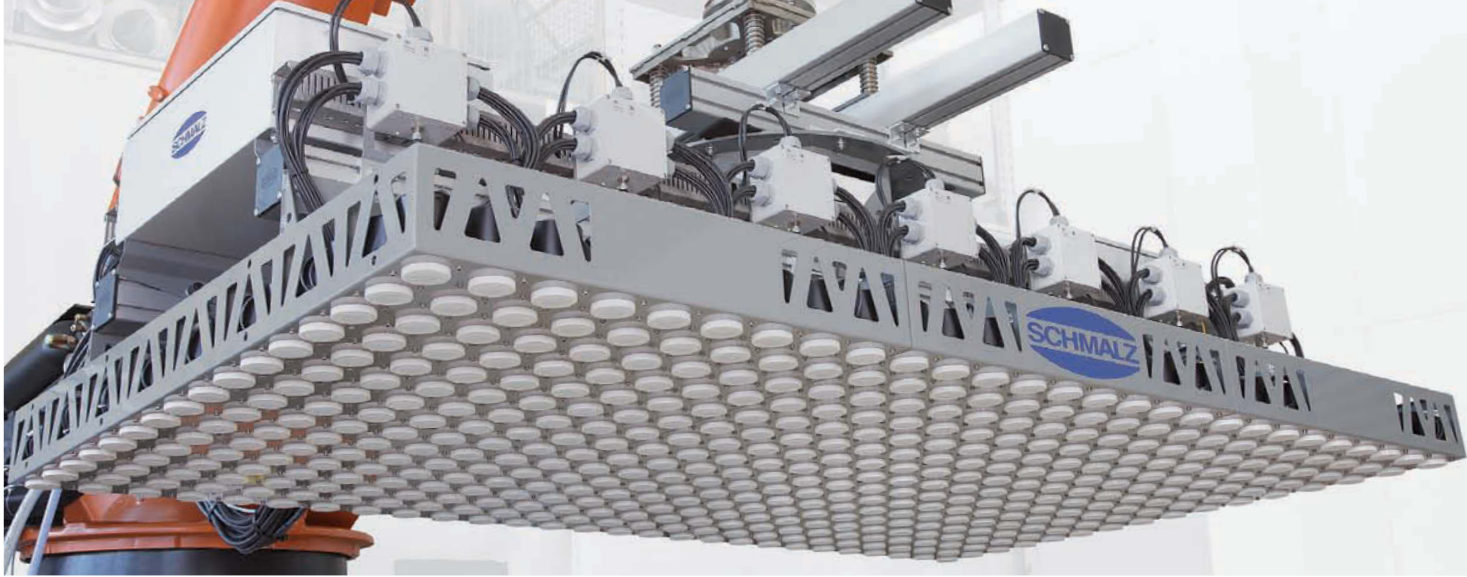
### SPZ-M-C

- Suction area (foam or suction cups)
- Configurable size
- Mechanical gripper support
- Intermediate layer handling
- Pallet clamping
- Automatic parts monitoring
- Global vacuum chamber



### SPZ-M-C

- Suction area (foam or suction cups)
- Configurable size
- Mechanical gripper support
- Intermediate layer handling
- Pallet clamping
- Automatic parts monitoring
- Global vacuum chamber
- Variable height adjustment
- Suitable for freezer environments



**Composites** | Vacuum layer gripping system SPZ for loading and removing CFRP cuts



## Industry Solutions

**From universal to custom – gripper solutions from the SPZ series for virtually any application**

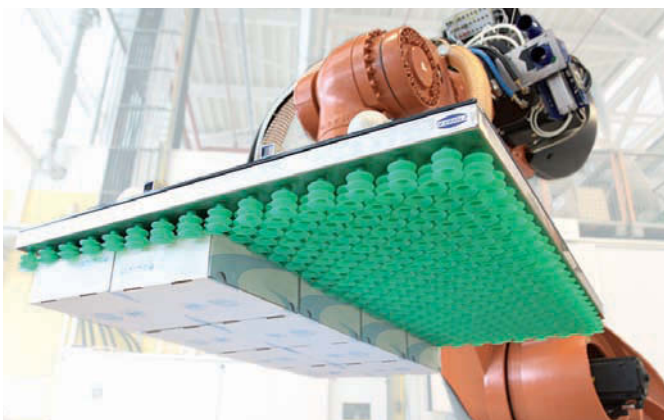
Vacuum gripping systems from Schmalz are used in many industries to ensure flexible and economical automation processes: from versatile universal grippers to custom solutions designed for the specific customer.



**Packaging** | Vacuum layer gripping system SPZ with combifoam for stacking glasses in a bottling plant



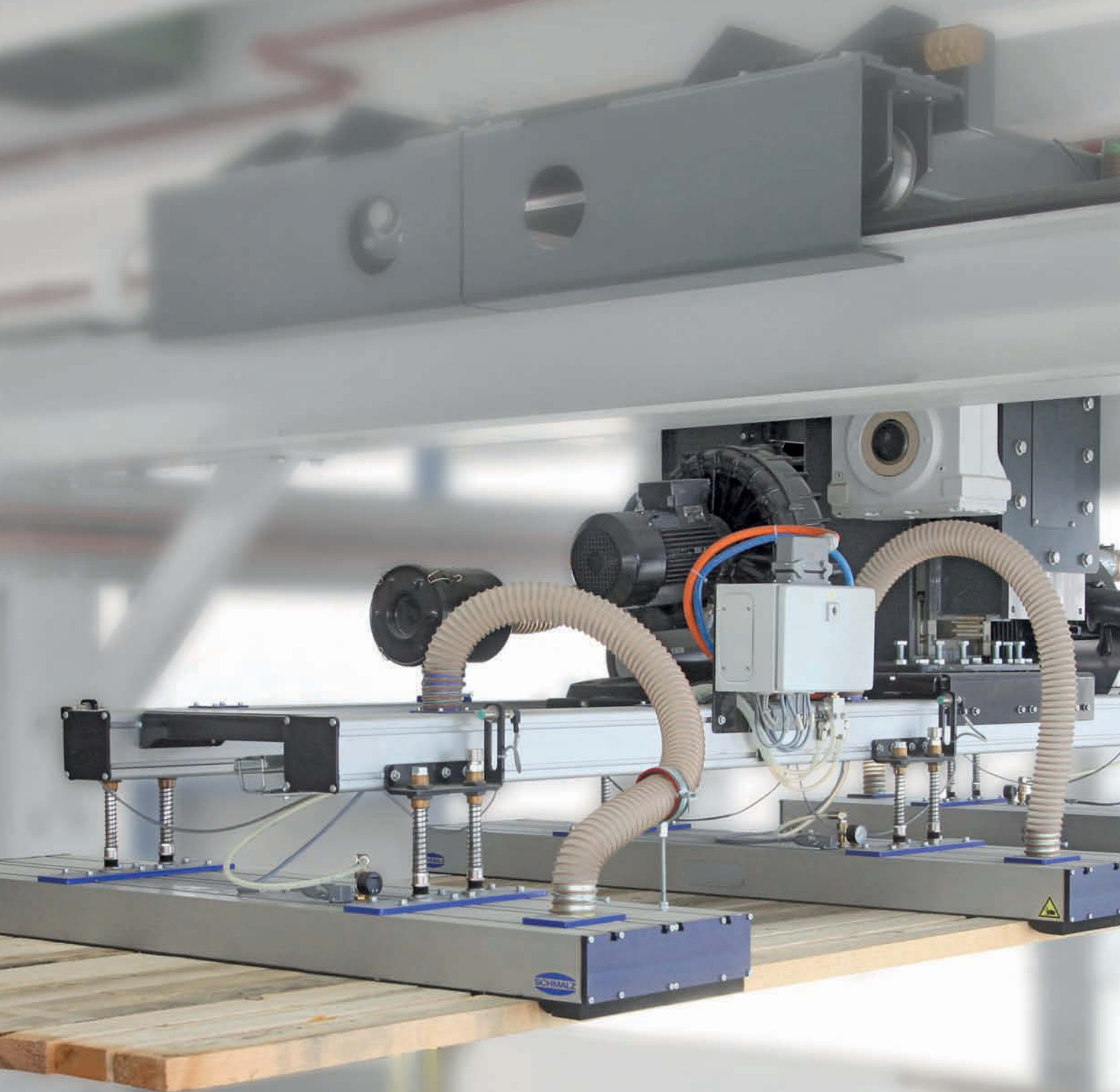
**Intra logistics** | Vacuum layer gripping system SPZ-M-C for the handling of various product layers in department store and intra logistics



**Logistics** | Vacuum layer gripping system SPZ for handling cardboard boxes in layers



**Construction materials** | Vacuum layer gripping system SPZ for the handling of clinker bricks



## Vacuum Suction Spiders SSP



**Further information**  
Interesting application videos  
on the SSP can be found here.

# Vacuum Suction Spiders SSP

## Custom made Handling Solutions with Infinite Variations

Schmalz has built up its gripping technology for all common robots or gantries. With our custom made end-of-arm tooling from a modular system of over 3,500 standardized and optimal coordinated components, our system engineers plan, design and build future-proof gripper solutions to your individual requirements.

### Application

- Automation of manufacturing and mounting processes
- Robot concatenation in presses and bending centers
- Automation of processing machines, wood working centers, water jet, laser and punching machines
- Handling of car body parts, boards, bricks, plate goods

## Interfaces

### Terminal box

Electronic interface



### Vacuum valve

Pneumatic interface



### Flange connection

Mechanical interface for common robots and gantries

## Distributor

### Mounting section

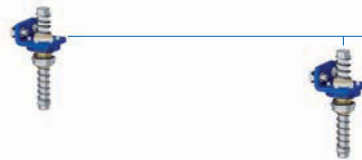
Use as load beam and vacuum distributor



## Connections

### Flexible suspension eye

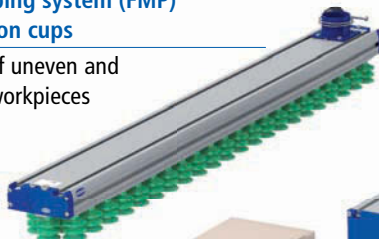
Spring-mounted connection suitable for workpieces with height differences



## Grippers

### Area gripping system (FMP) with suction cups

Handling of uneven and non-rigid workpieces



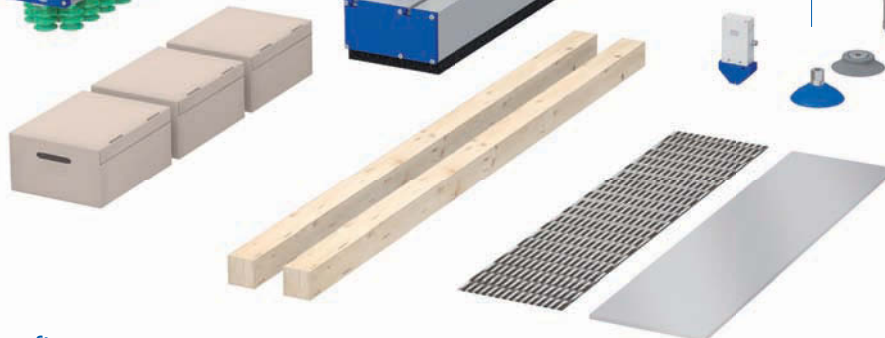
### Area gripping system (SBX) with foam

for the handling of heavy and rough workpieces



### Grippers with different gripping principles

Handling of very different workpieces (e.g. magnetic gripper for the handling of perforated plates or needle gripper for CFRP materials)



## Your Benefits



- Modular system of standardized, optimally coordinated individual components
- Multiple gripping concepts can be combined
- The perfect gripping process for every product
- Low weight through FEM-optimized basic design and consistent lightweight construction



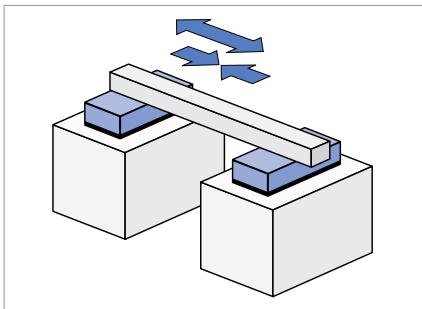
Vacuum suction spider SSP for the layered stacking of wooden boards for the construction of prefabricated houses

## Vacuum Suction Spiders SSP

Custom made Handling Solutions with Infinite Variations

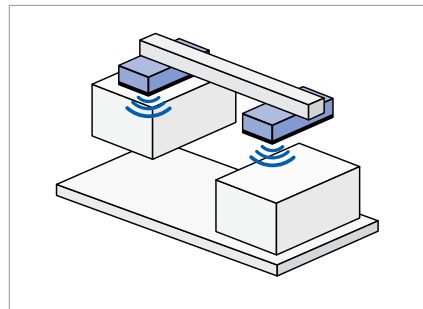
### Further information

Technical data and further information on the SSP can be found here.



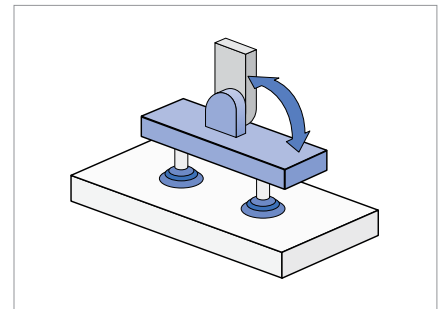
### Gripper adjustment

Manual adjustment option before the gripping process and an automatic adjustment option during the gripping process, for the separation of workpieces.



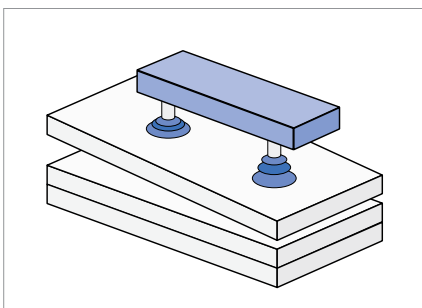
### Parts and weight detection

Sensors for the evaluation including signal transmitter: Has one part been gripped or not? Have several parts been gripped?



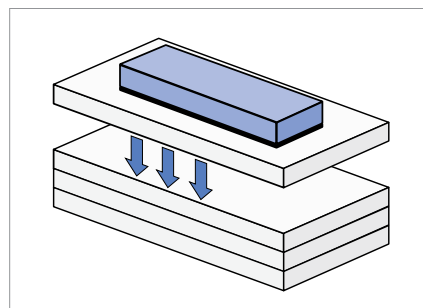
### Pivot bearing for pivoting movements

A pivot bearing enables the inclined picking up and depositing of workpieces at different angles.



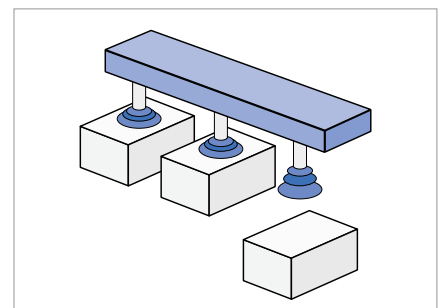
### Separation function

Special equipment for the removal of individual workpieces and the separation of individual layers (e.g. oily sheet metal or plywood).



### Separating function

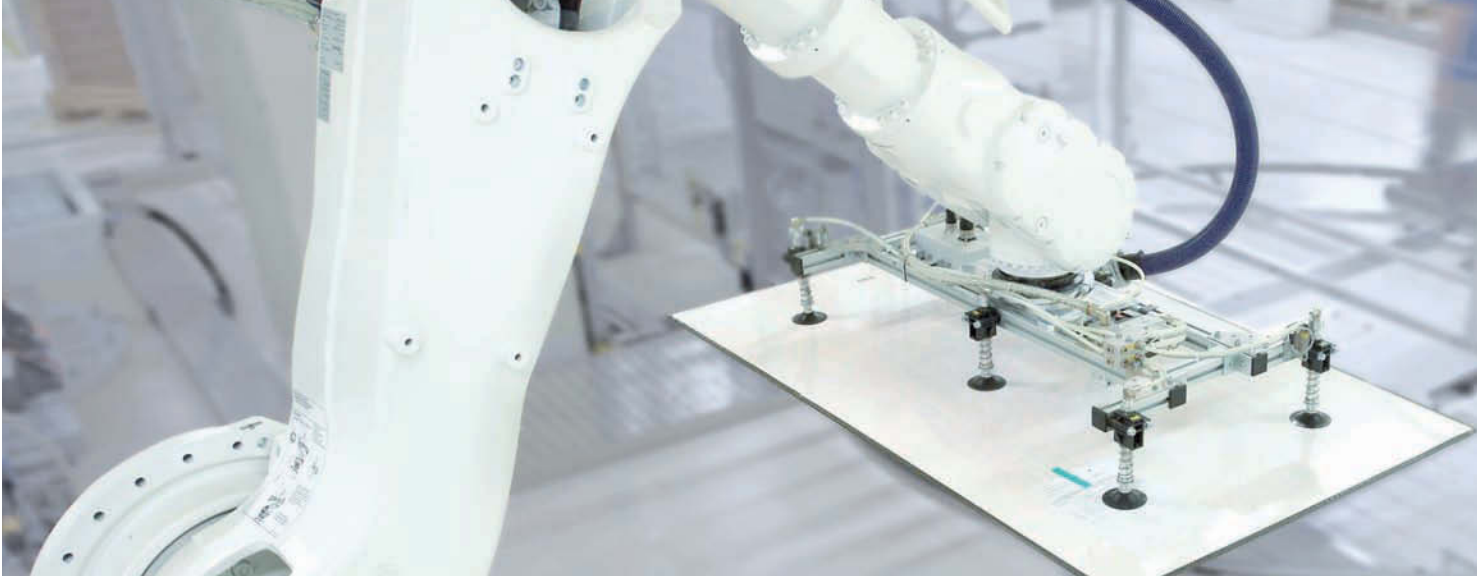
Separation of porous workpieces (e.g. cardboard boxes, MDF or particle boards) when stacking by actively introducing an adjustable compressed air pulse).



### Individually controllable vacuum circuits

Using controllable vacuum absorption circuits, a separate loading and unloading of workpieces is possible (e.g. when handling cuts).





**Solar** | Vacuum suction spider SSP for the handling of modular glass



## Industry Solutions

**Custom made solutions – vacuum suction spiders SSP for very different end-of-arm tooling**

From gentle gripping for furniture parts or composite textiles to a powerful grip of rough sawn planks and oily sheet metal – with the vacuum gripping systems SSP, handling processes in very different industries can be automated according to individual requirements.



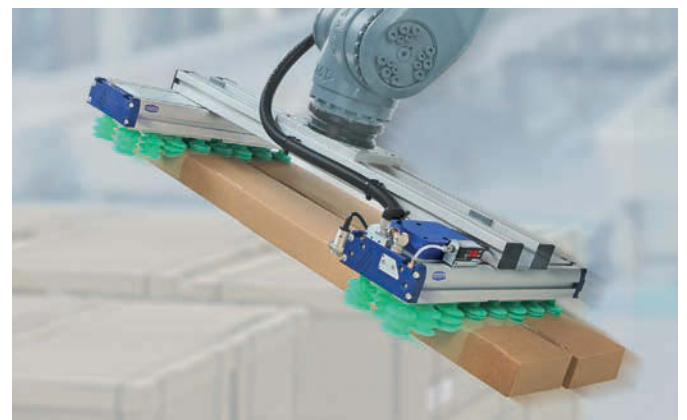
**Car body construction** | Vacuum suction spider SSP for the machine loading and unloading of metal sheet cuts in the agricultural machinery car body manufacturing



**Wood** | Vacuum suction spider SSP on an industrial gantry for handling rough sawn wooden boards



**Composite** | Spider gripper SCG for the handling of pliable composite textiles



**Logistics** | Vacuum suction spider SSP for the layered handling of cardboard



Pharma | Generative manufactured High-Speed-Picker with rotary modules for the handling of medical products

## Special Gripping Systems “High Speed-Picker” and “MRK-Gripper”

Nothing is impossible – handling tasks with very different requirements can be solved by a vacuum. Whether the shortest cycle times or smallest items – almost everything can be moved safely and efficiently. Schmalz engineers will find the right solution even for specific scenarios. In order to achieve this we focus intensively on customer requirements and requests.

### Special design: “High-Speed-Picker”



The High-Speed-Picker functions with individual vacuum absorption circuits

The “High-Speed-Picker”, a customer solution, was designed and built as a generative manufactured gripper with individual vacuum absorption circuits and rotatable suction cups for the handling of medical products. High handling speed and minimum weight was the focus on the development.

The special gripper can also be used in clean room zones.

- Innovative manufacturing process (3D printing) for minimum gripper weight
- Necessary minimum weight for the highest cycle times
- Rotatable suction cup units for targeted positioning of the workpieces
- Individually switchable vacuum absorption circuits

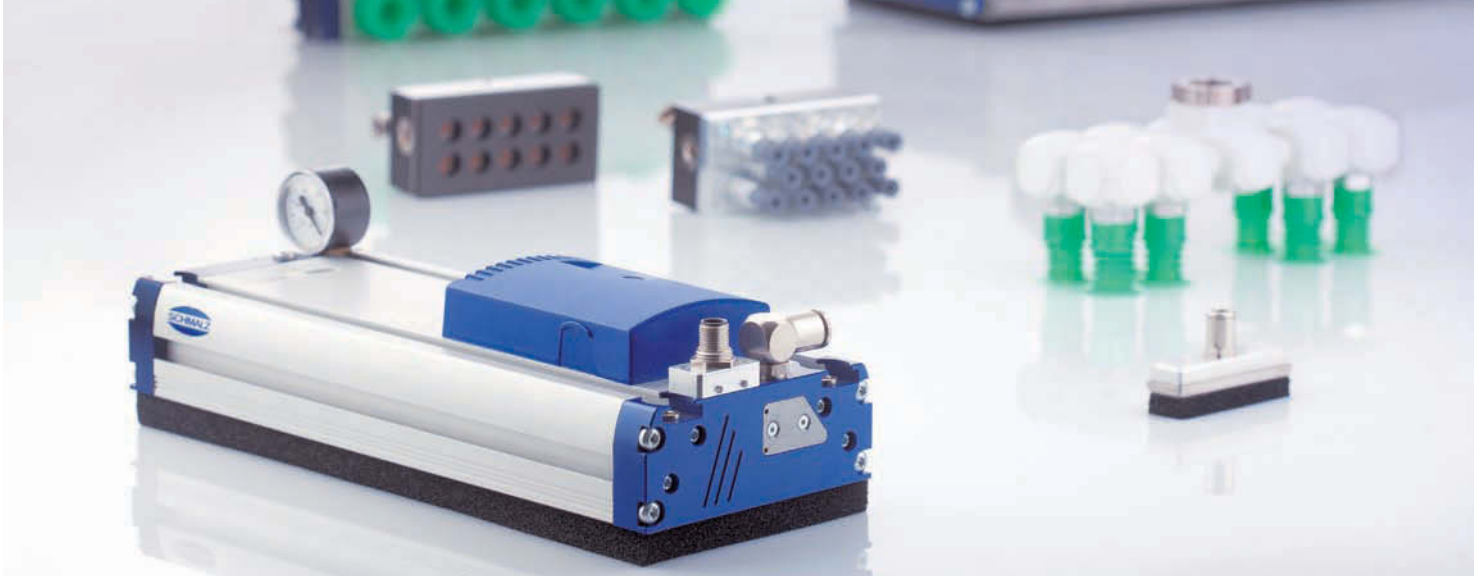
### Special design: “MRK-Gripper”



MRK-Gripper for the handling of logistics goods

The “MRK gripper” (human-robot cooperation) is a completely individual gripper solution. The requirement for the gripper was to fully automatically grip very differently stored box content. As humans and grippers share a work environment, the application is not separated by a protective grille. Therefore a special gripper was designed for safe operation in shared workspace.

- Design and function of the gripper were specifically designed for a safe environment with employees
- The innovative manufacturing process (e.g. gripper casing from 3D printer) produces the sleek and dynamic gripper geometry of the MRK-Gripper



Vacuum area gripping systems enable the use in different industries and scenarios

## Vacuum Area Gripping Systems FXP / FMP and SBX

Everything firmly in grip – the area grippers from Schmalz' FXP/FMP series are truly versatile products that are setting new standards in process reliability, energy efficiency and availability in the area of automated vacuum handling. Schmalz has developed the vacuum area gripping system SBX for particularly rugged applications in the timber and woodworking industry.

### Area Gripping Systems FXP/FMP



Vacuum area gripping systems FXP / FMP for the handling of cosmetic goods

**FXP:** As a unit that is ready for connection, the FXP area gripping system is ready with integrated vacuum generation. With its high flow rate, this ensures high holding force especially in the case of porous workpieces.

**FMP:** The FMP area gripping system has a connection for external vacuum generators and is therefore ideal for operation with high-performance pumps and blowers.

- Universal gripper for handling workpieces regardless of their size, geometry, the material used or their surface
- Handling of workpieces made from various materials such as wood or packaging
- Handling of porous workpieces and workpieces with gaps

### Area Gripping Systems SBX



Vacuum area gripping system SBX on an industrial gantry for handling wooden boards

The SBX area gripping system is an extra robust gripper for the wood industry. It even enables the safe handling of highly warped workpieces. The maximum system pressure is maintained even under partial usage by turning off non-used suction cells.

- Sturdy gripping system for powerful handling of lumber, planed or glued timber, sheet materials, construction timber and pallets
- Handling of naturally grown wood with knots or cracks or with rough surfaces
- Ideal for the rough application conditions in saw mills or in woodworking and furniture construction



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**Vacuum Clamping Systems**  
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Shanghai

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