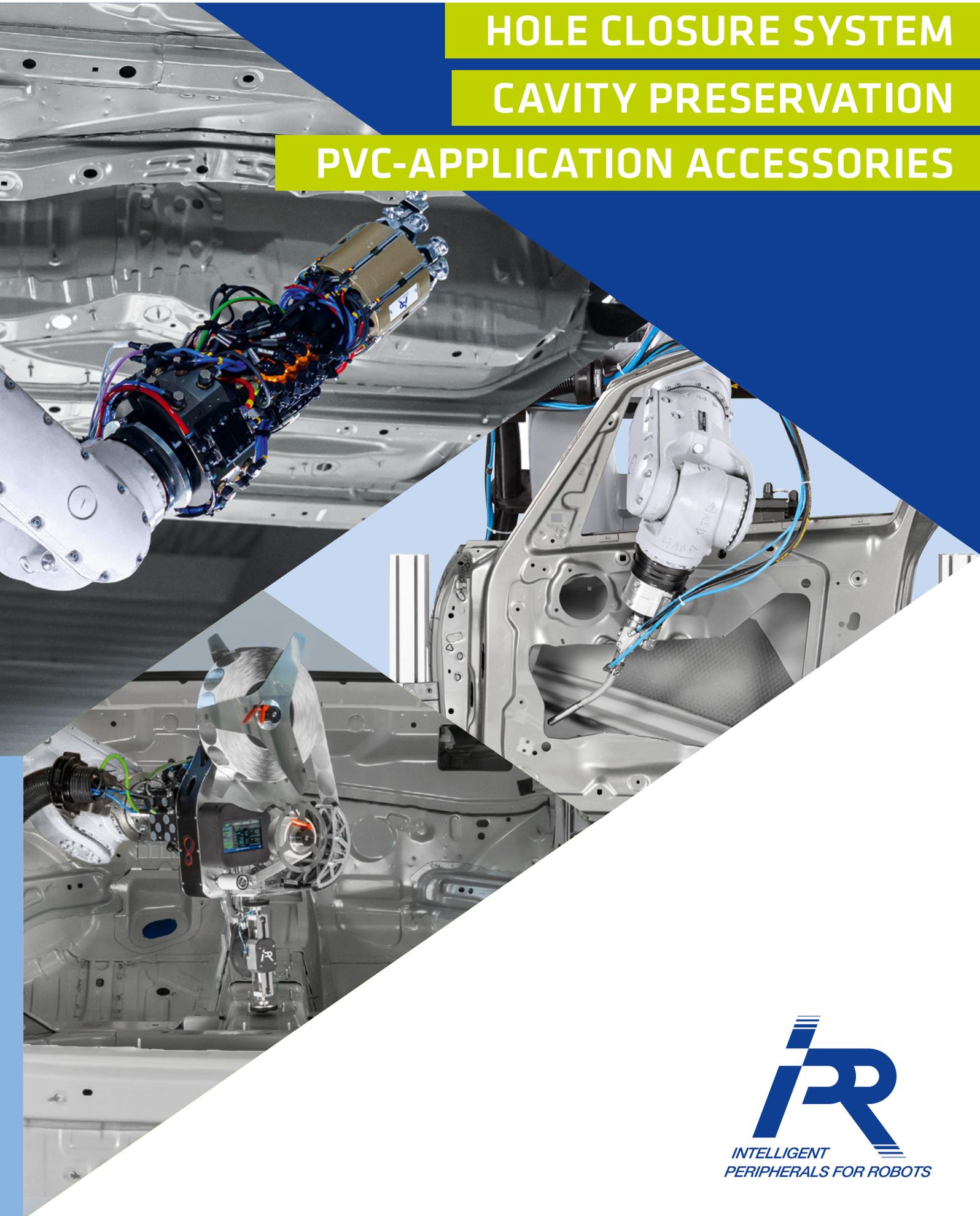


SYSTEMS: AUTOMATION

HOLE CLOSURE SYSTEM

CAVITY PRESERVATION

PVC-APPLICATION ACCESSORIES

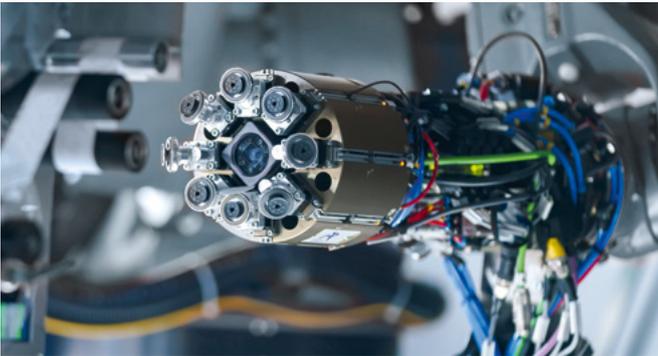


Industry-specific solutions for robot applications and automation systems

We combine innovation and quality in order to provide individual solutions for your applications

In the field of automation, assembly and handling technology, we have been supplying customized components, systems and automation solutions for over 30 years in addition to our extensive standard product range. Our customers come from a wide range of industries and rely on our special quality, decades of practical experience in development and production as well as special expertise in work processes.

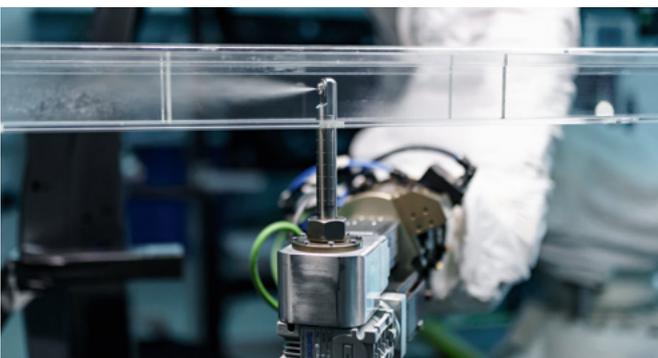
Technologies



Hole closure system

To protect holes from corrosion, we have suitable automation solutions for you: we use an applicator to close the holes with adhesive pads or plugs.

Page 10



Cavity preservation

In the area of cavity preservation, we offer a wide range of innovative technologies to protect your car body from corrosion.

Page 18



PVC-Application accessories

We have developed a quick-change system so that you can use a variety of different nozzles and save costs at the same time.

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Hole closure System



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Cavity preservation



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PVC-Application accessories



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IPR technology center



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Individual consulting



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Changes and errors excepted.
You can find the current version on
the homepage:

en.iprworldwide.com/downloads/flyers/

Our general terms and Terms and
Conditions can be found at

en.iprworldwide.com/terms-purchase-conditions/

IPR – Solutions at hand

Our components make your robot more intelligent, flexible and versatile

Innovation meets top quality

IPR – Intelligente Peripherien für Roboter GmbH is a leader in the development and manufacturing of products related to industrial robots and offers an extensive product range with innovative systems and components for assembly and handling technology. Our parallel and angular grippers, tool changers, joining and compensating systems as well as load limiters, 7th axis for robots and customer-specific solutions are used by customers in many countries around the world.

Companies from all industries trust our products. Quality, technical and industry knowledge are our most important success factors.

We offer you standard products ready for immediate use, but we also support you in special and large-scale projects. Here you benefit directly from the development and manufacturing technologies in our house.



Tool changer solution

Quick-change systems for the transmission of energy, signals and media



Industry-specific solutions

For robot applications and automation solutions

Assembly and handling technology



Machinery loading and unloading



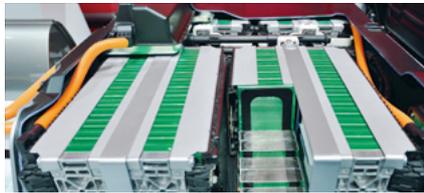
Foundry and forge



Automotive



E-mobility



Medicine and pharmaceuticals



Increased value for your application

IPR components are used in a wide variety of industries. The high variance in the product series combined with the possibility of creating modified standard or specifically designed special products in a short time holds a lot of potential for meeting the requirements of our customers.

Our success is the result of many years of experience in our company. Our employees are professionals in their field and have extensive knowledge around industries and production processes. This is how we continually develop innovative, high-quality and high-performance solutions for each individual project.



Individuality for your application

From standardized to customized

For individual solutions, we combine standardized components with custom-built modules to reduce design and delivery times as well as costs. Our company provides these services for a wide range of industries such as the

automotive and supplier industry, machine tools and plant engineering, intralogistics, electrical industry, renewable energies, medical technology and the aerospace industry.

Example for sand core gripper:

Portal 7th axis with robot incl. tool changer, two compensation modules for x-, y- and z-direction.



IPR offers everything that robots need to do their work

Discover our extensive portfolio of peripherals for robots

Our product range of series-produced automation modules includes a variety of grippers and tool changers, joining and compensation modules, collision protection systems and 7th axis for robots. Within the individual product types, differently graded sizes are available for all load ranges. The excellent quality of our product range ensures high availability as well as smooth use in the production process. We would be pleased to inform you about our components and technologies. Benefit from the many years of experience of IPR consultants.

IPR stands for:

■ Customer proximity

We are always there for our customers with advice and support.

■ Internationality

We are on site worldwide.

■ Innovation

We offer innovative solutions in top quality.

■ Competence

We utilize many years of experience and the know-how of all employees.

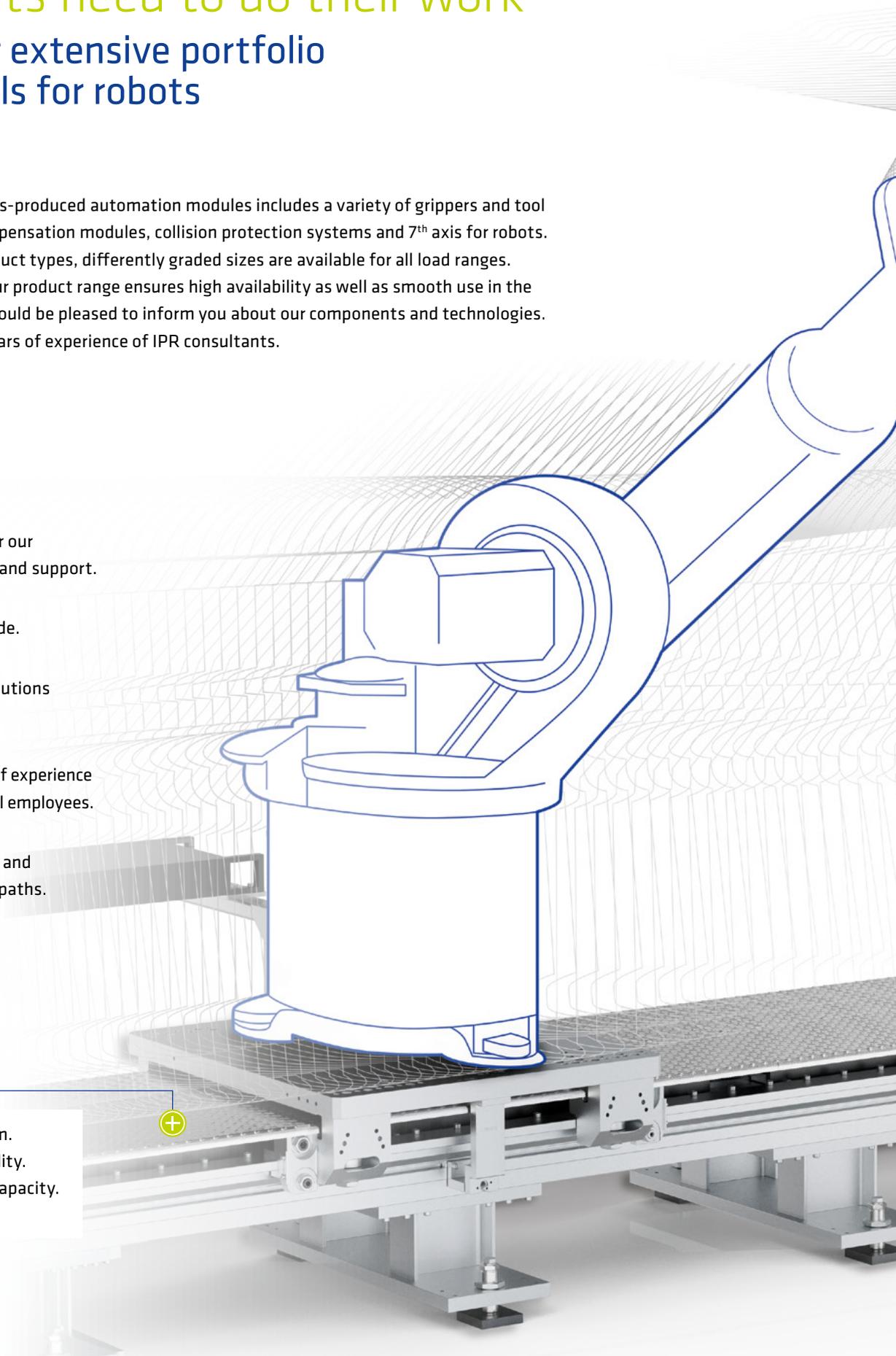
■ Quality and flexibility

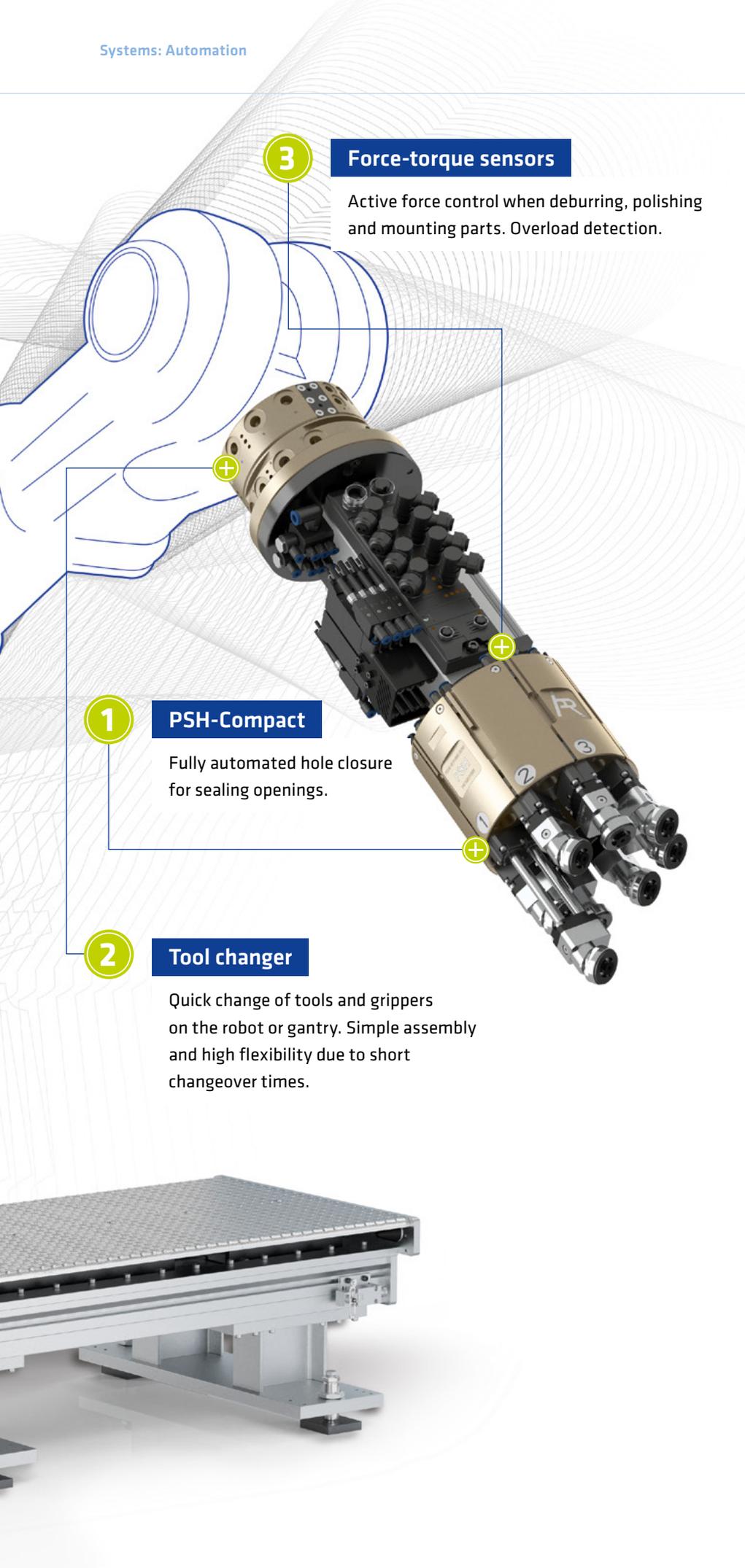
We live lean structures and short decision-making paths.

4

7th axis

Modular system.
High repeatability.
Extreme load capacity.
Long life.





3 Force-torque sensors

Active force control when deburring, polishing and mounting parts. Overload detection.

1 PSH-Compact

Fully automated hole closure for sealing openings.

2 Tool changer

Quick change of tools and grippers on the robot or gantry. Simple assembly and high flexibility due to short changeover times.

1 PSH-Compact



2 Tool changer



3 Force-torque sensors



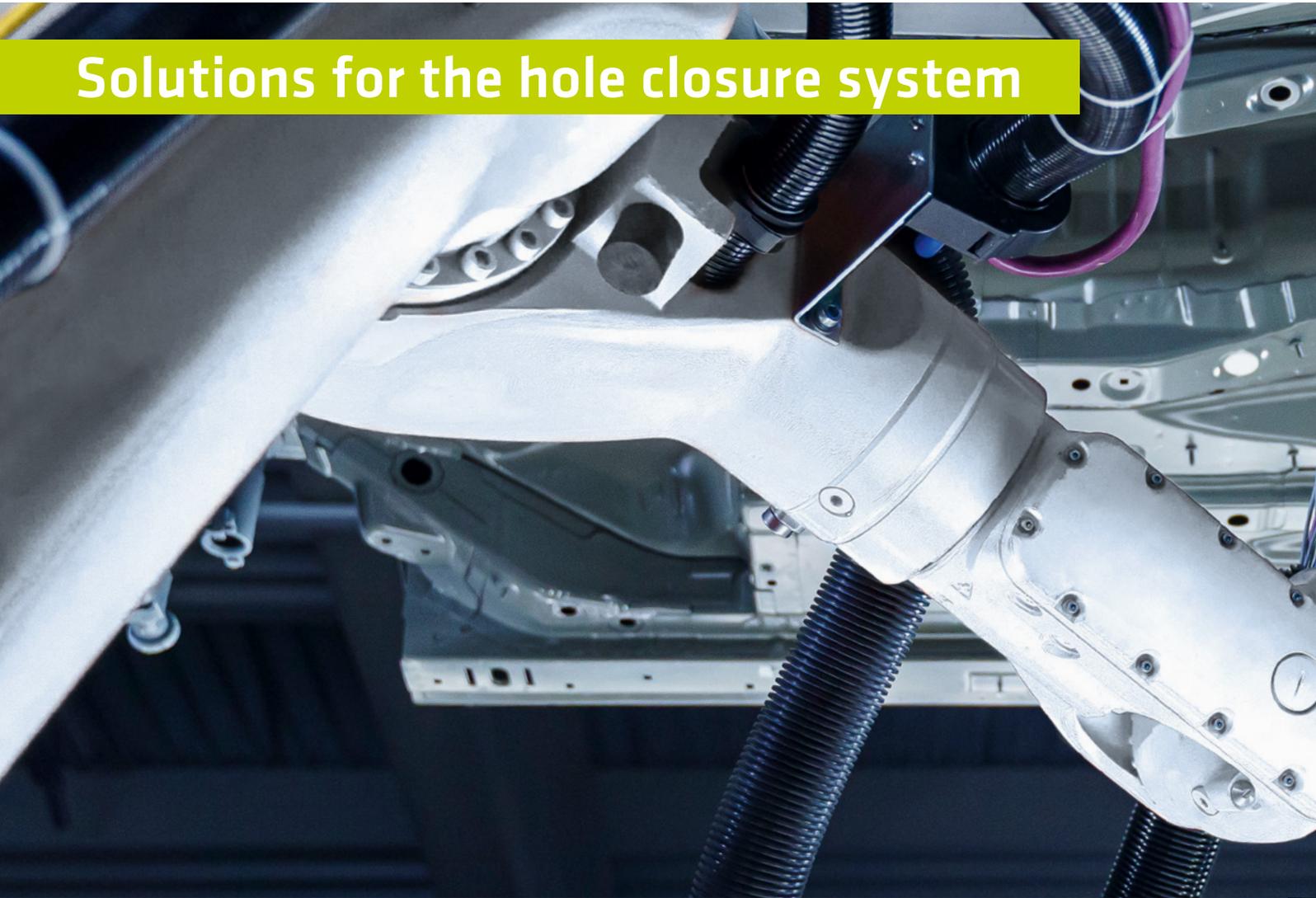
4 7th axis for robots



Fully automated hole closure system

Process overview PSH-Compact

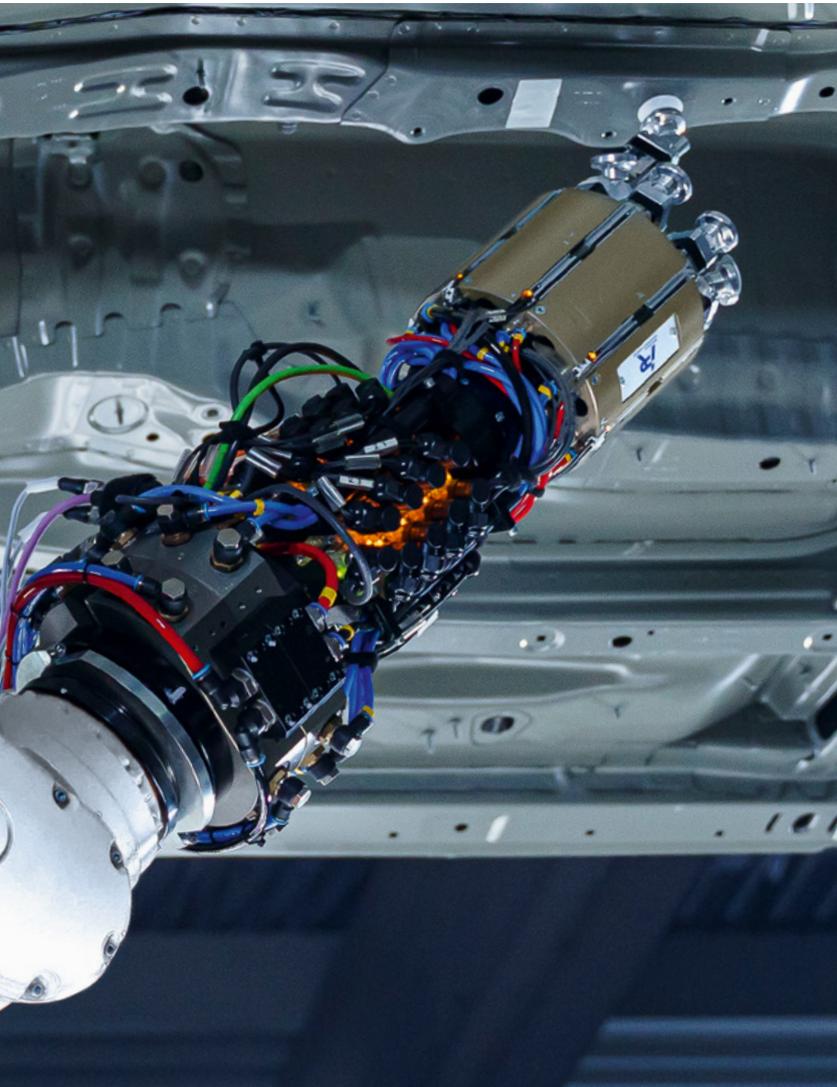
Solutions for the hole closure system



Do you want to protect your car body and need the right technology? We have developed innovative products for you that meet your automation requirements.

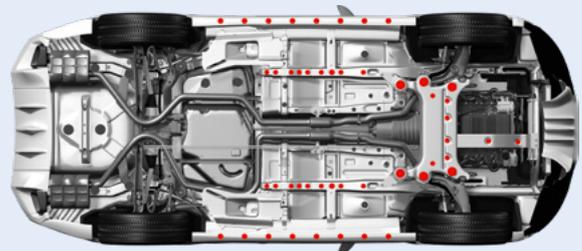
More flexibility and speed thanks to the all-in-one solution for the automotive sector

On average, 200 holes per car body need to be closed to protect a vehicle from corrosion. We have developed an all-in-one solution for you: A fully automated hole closure system. The application seals the openings with a short setting time. To do this, the robot presses individual pads onto the respective holes.



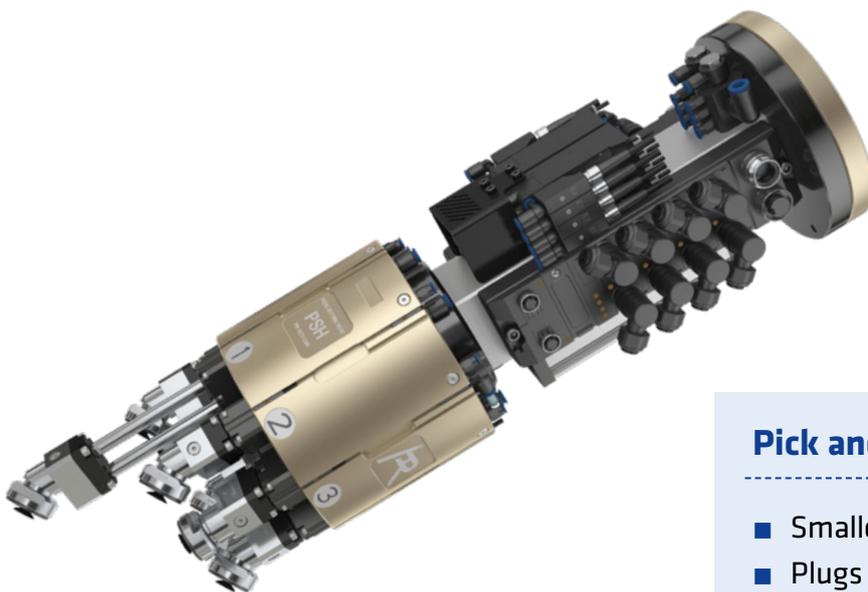
Examples

- Battery housing
- Interior
- Rocker panel
- Underbody



All-in-one solution from IPR

- Fully automated hole closure
- Complete system provider
- High level of automation helps to stabilize process



Pick and place (PSH-Compact)

- Smaller interfering contour
- Plugs and pads
- Individual single suction units

PSH-Compact

With eight suction units

PSH-Compact

Ideal for narrow interiors and different plugs and pad sizes.

- For example, it is possible to apply through window cut-outs in the car body without opening the door.

Accessories PSH-Compact

- Pad dispenser
- Pad dispenser tower 4-fold
- Lifting device pad dispenser
- Test stand
- Vision reference panel
- Test panel

Advantages of the PSH Compact series

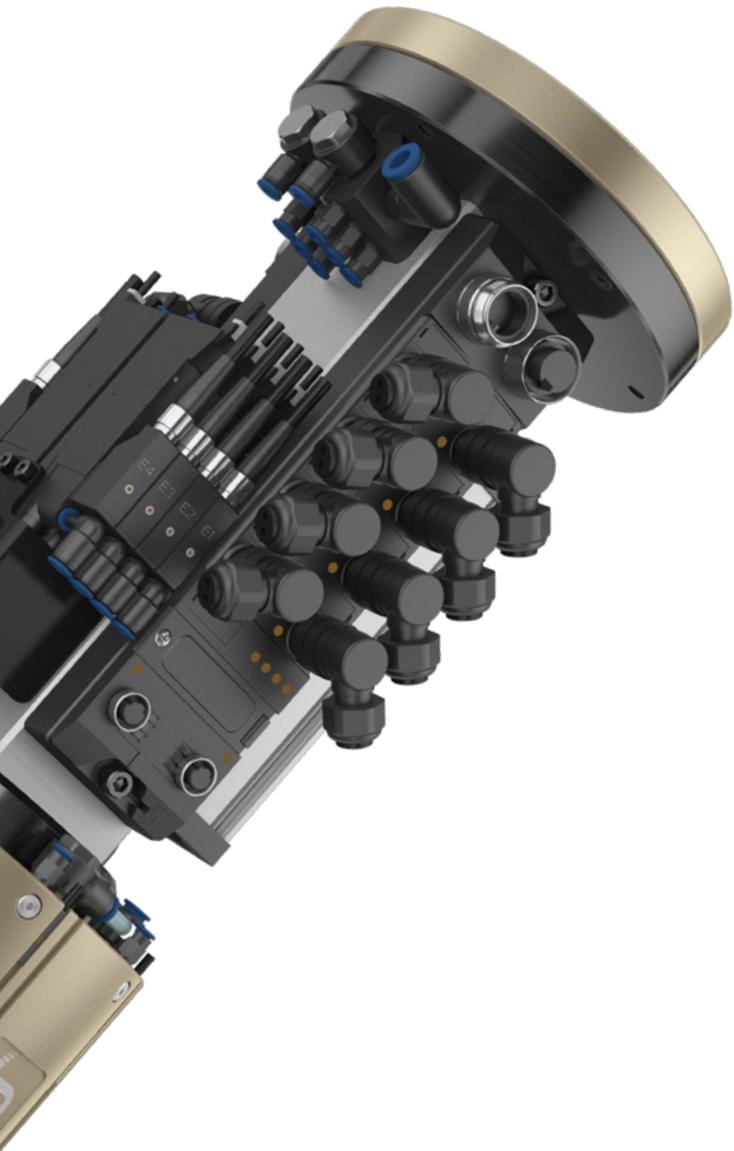
- Pure setting time approx. 2 s (+ orientation times)
- Individual pad/plug units (modular as required)
- Position detection
- Detection of the pressure force
- Wobble function (curved surfaces possible)
- Adhesive pads/heat protection pads
- Different pad and plugs diameters in one process
- 19 kg (with tool changer)
- 8 setting units

PSH-Compact



Technical data

Overview PSH Compact series	
Supply voltage	24 V DC / 4 A
Compressed air supply	Oil-free, dry, 4 – 7 bar
Dimensions (Without tool changer)	160 x 478 x 160 mm (B x H x T)
Weight (without tool changer)	15.5 kg
Cycle time (Without single hole measurement and reloading)	Typically approx. 3 s
Pulling process / feed / rotation (Pad dispenser)	Typically approx. 0.3 s / 1.0 s / 0.4 s
User interface	ProfiNet/ EtherNetIP
Operating temperature range	10 – 40 °C



Why the PSH-Compact?



Pressure monitoring of all pressure zones

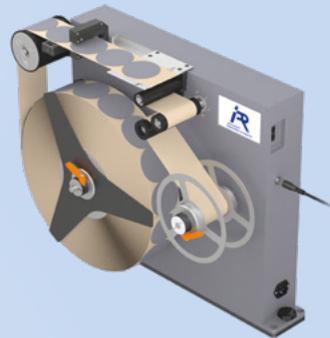
The inlet pressure of the air supply is continuously measured and monitored.



Measurement of contact pressure

During the application process, the force is transmitted (by pressure measurement) via fieldbus. The application process is only continued if the values are correct.

PSH | Pad dispenser



Continuous belt tension

Two servo drives keep the material spools under tension and avoid process risks due to loose consumables.

A dedicated feed drive ensures precise positioning of the punched parts.



Continuous detection

The beginnings and ends of punched parts are detected during the feed.

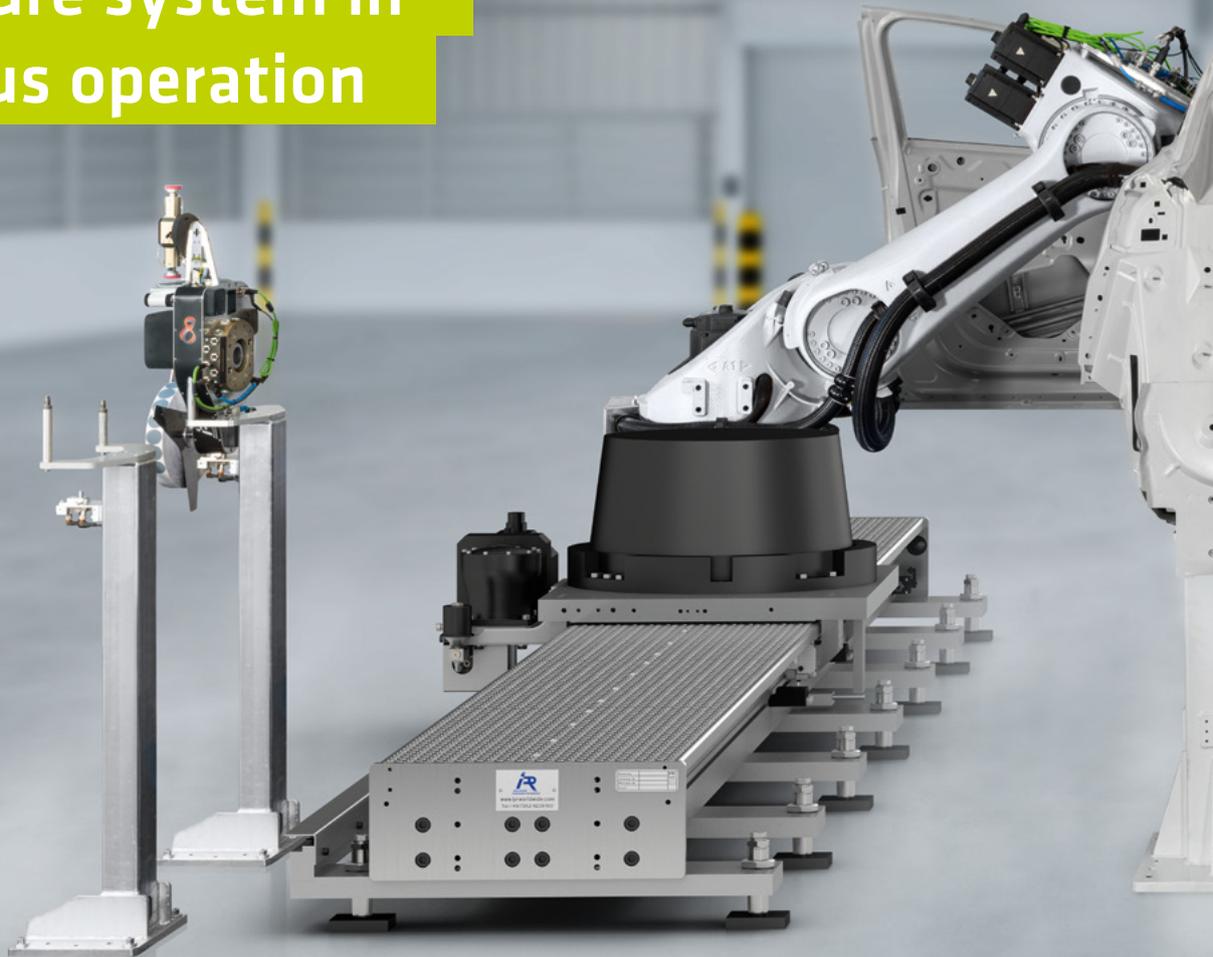
This allows the size and exact position of each punched part to be determined.

Simple belt path enables quick material changes.

Fully automated hole closure system

Process overview PSH-Infinity

Hole closure system in continuous operation

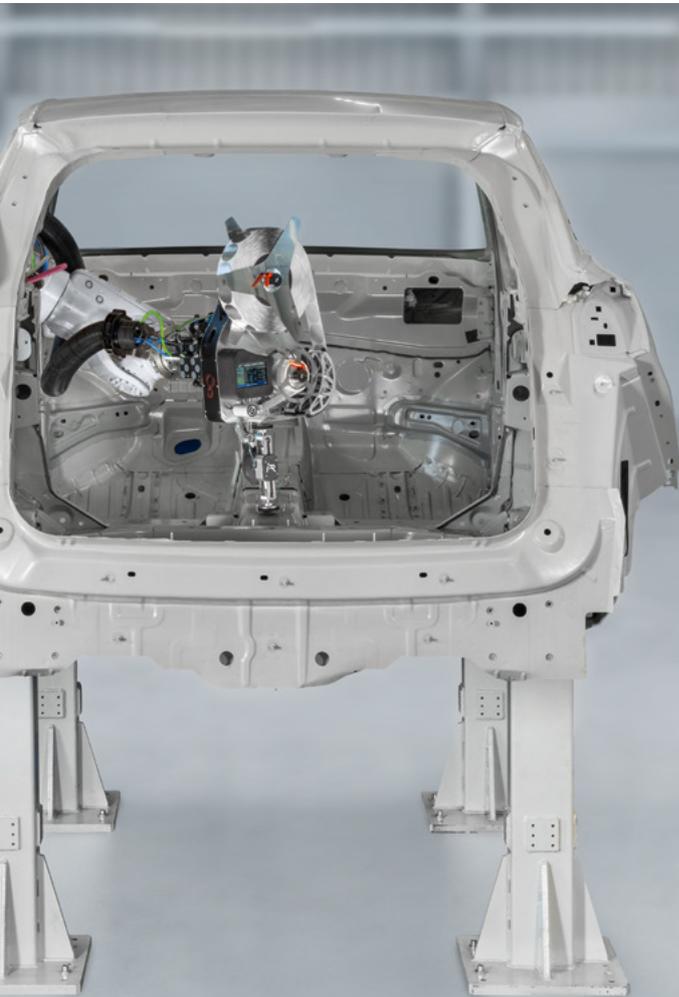


Do you want to get even more performance from your robot and reduce downtime? PSH-Infinity technology makes it possible.

A continuous process and shorter cycle times

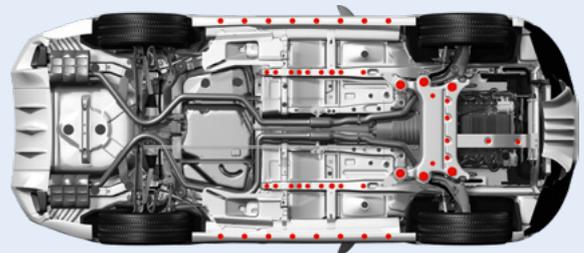
A continuous process is possible thanks to the material supply integrated in the application head. Downtimes are reduced to a minimum and are completely eliminated with a redundant design.

Depending on the pad size, up to 2,000 pads can be applied before a tool change is required.



Examples

- Battery housing
- Interior
- Rocker panel
- Underbody



All-in-one Solution from IPR

- Fully automated hole closure system
- Complete system provider
- High level of automation contributes to the stabilization of process reliability



Integrated material (PSH-Infinity)

- Reduced set-up effort
- Fast cycle time
- Process optimization

PSH-Infinity

Simply reload pads

PSH-Infinity

Now even faster: with the PSH-Infinity pads can be reloaded and applied in one go, including material supply directly on the application tool.

- Reduced set-up time
- Fast cycle time
- Process optimization

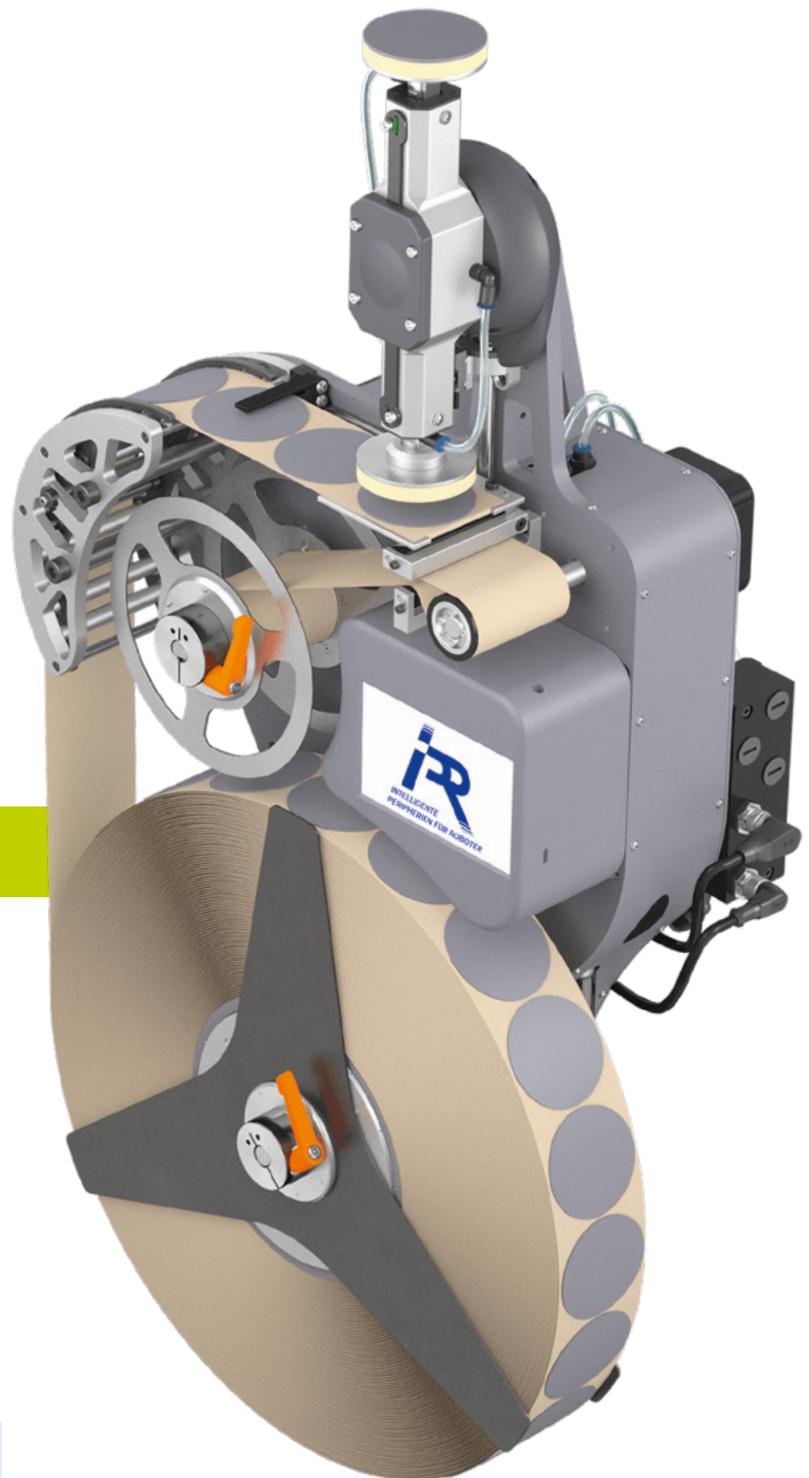
PSH-Infinity

PSH-Infinity accessories

- Single shelf
- Storage bay 2-/4-fold
- Maintenance trolley
- Transport case
- Transport trolley
- Lifting device
- Reference panel
- Test plate

Advantages of the PSH-Infinity series

- Setting time approx. 2s (+ reload time)
- Position detection
- Active belt tensioning
- Various monitoring systems
- IIOT-capable
- Adhesive pads/heat protection pads
- Different pad diameters can be realized
- 26 kg (with tool changer)
- Repeat accuracy ± 2 mm (ISO 9283)



Technical data

Overview PSH-Infinity	
Supply voltage	24 V DC / 4 A, integrated current limiter
Compressed air supply	Oil-free, dry, 4 – 7 bar, max. 30 l/min
Dimensions	420 x 860 x 220 mm (B x H x T)
Weight (without tool changer)	22.5 kg
Cycle time	Typically approx. 3 s
Pull-off process / feed / rotation	Typically approx. 0.3 s / 1.0 s / 0.4 s
User interface	LCD 5" (127 mm), PCAP-Touch, Glass surface
Operating temperature range	10 – 40 °C



Service rack
Workshop version
of the tool rack

Why the PSH-Infinity?



Pressure monitoring of all pressure zones

The inlet pressure of the air supply and the pressure of the secondary pressure zones for contact pressure and blow-off pressure are continuously measured and monitored.



Measurement of contact pressure and application position

During the application process, force (by pressure measurement) and position (by a position measuring system) are measured and transmitted via fieldbus. The application process is only continued if the values are correct.



Monitoring of the suction cup pressure

Detection of lost punched parts and confirmation of the successful application process based on reaching the target blow-off pressure.



Continuous belt tension

Two servo drives keep the material spools under tension and avoid process risks due to loose consumables.

A dedicated feed drive ensures precise positioning of the punched parts.



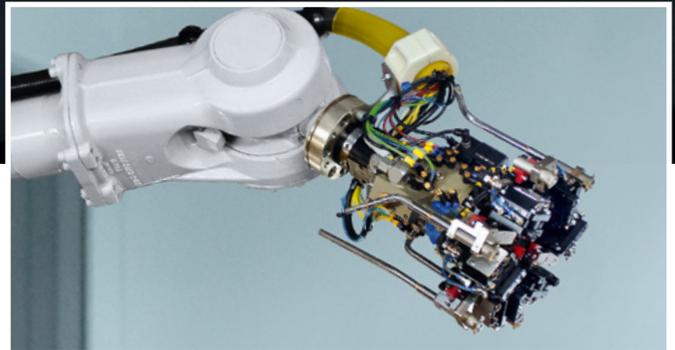
Continuous detection

The beginnings and ends of punched parts are detected during the feed. This allows the size and exact position of each punched part to be determined.

Simple belt path enables quick material changes.

Automation solutions for cavity preservation

The essentials against corrosion



Cavity preservation from IPR

Drainage channels, rocker panel or door interiors – all cavities where water collects and rust forms on the vehicle. Good cavity preservation is therefore recommended in advance. Especially where space is at a minimum and hard-to-reach geometries are used, we achieve the highest quality in the openings and geometries.

Car body

- Spraying
- Fogging

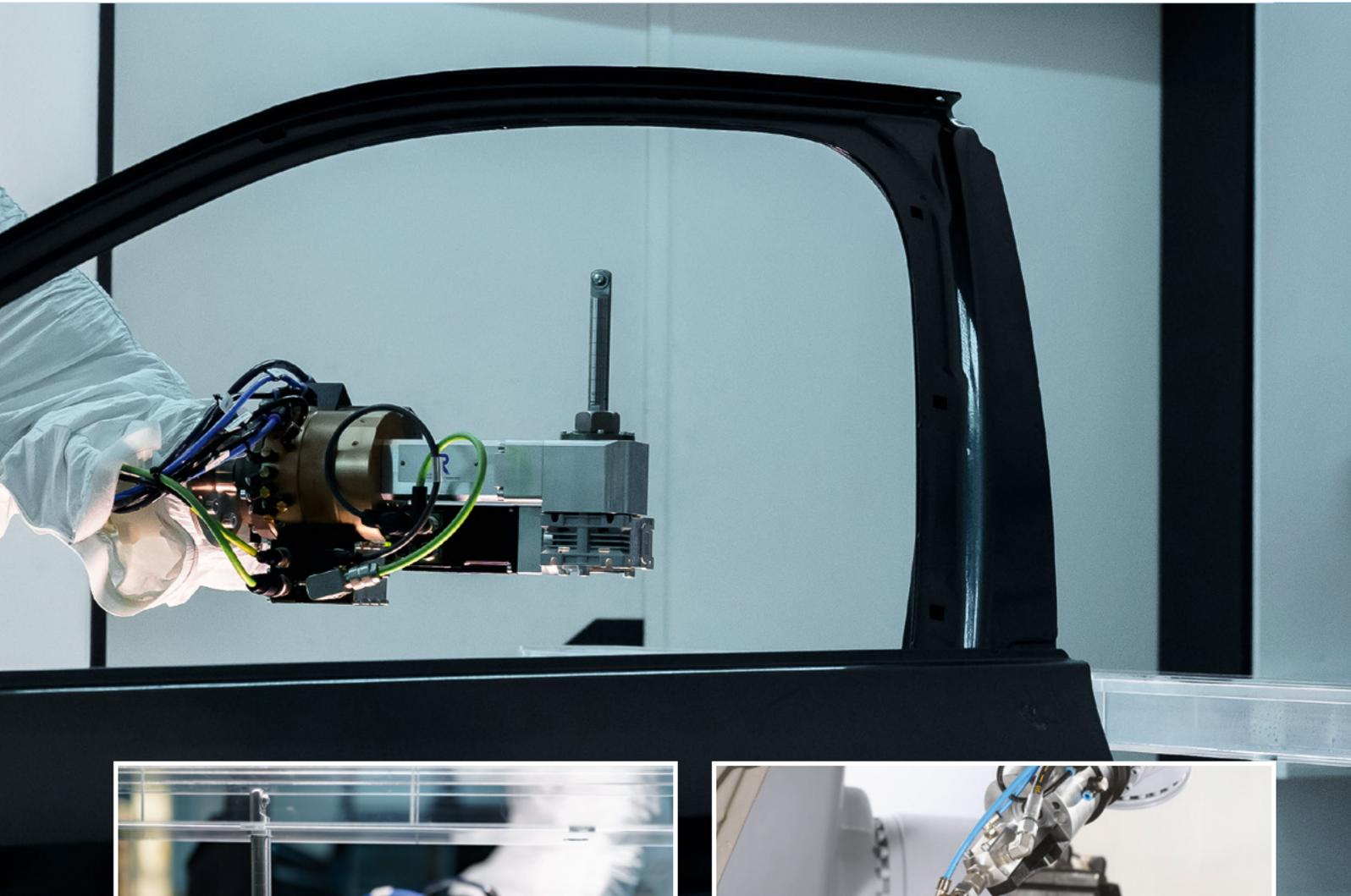
Add-on parts, doors, lids

- Air-Mix/Air-Less process

Spraying process

With the spraying process, we cover the entire range of services for applying the protective wax layers on a spray-treated body. Regardless of whether the cavity preservation is carried out manually, robot-controlled or stationary, the targeted application of the material with various spray nozzles meets all customer requirements for flexibility and ease of maintenance. Thanks to our in-house development and production of the nozzles, we achieve the highest quality openings and geometries. All components are characterized by extraordinary precision and reliability in continuous operation and achieve a perfect coating result.

- High flexibility
- Easy maintenance
- Specific material application
- Cold waxing



Fogging process

With the fogging process, we have developed an innovative atomization technology for corrosion protection of the entire bodywork. Complex and hard-to-reach geometries in particular, such as rocker panel, can be perfectly protected with the new process. The specific droplet size, speed and distribution also allows surfaces facing away from the mist stream – e.g. undercuts – to be coated.

- **Low space requirement**
- **High flexibility**
- **Low material consumption**
- **Cold application**
- **Low investment costs**

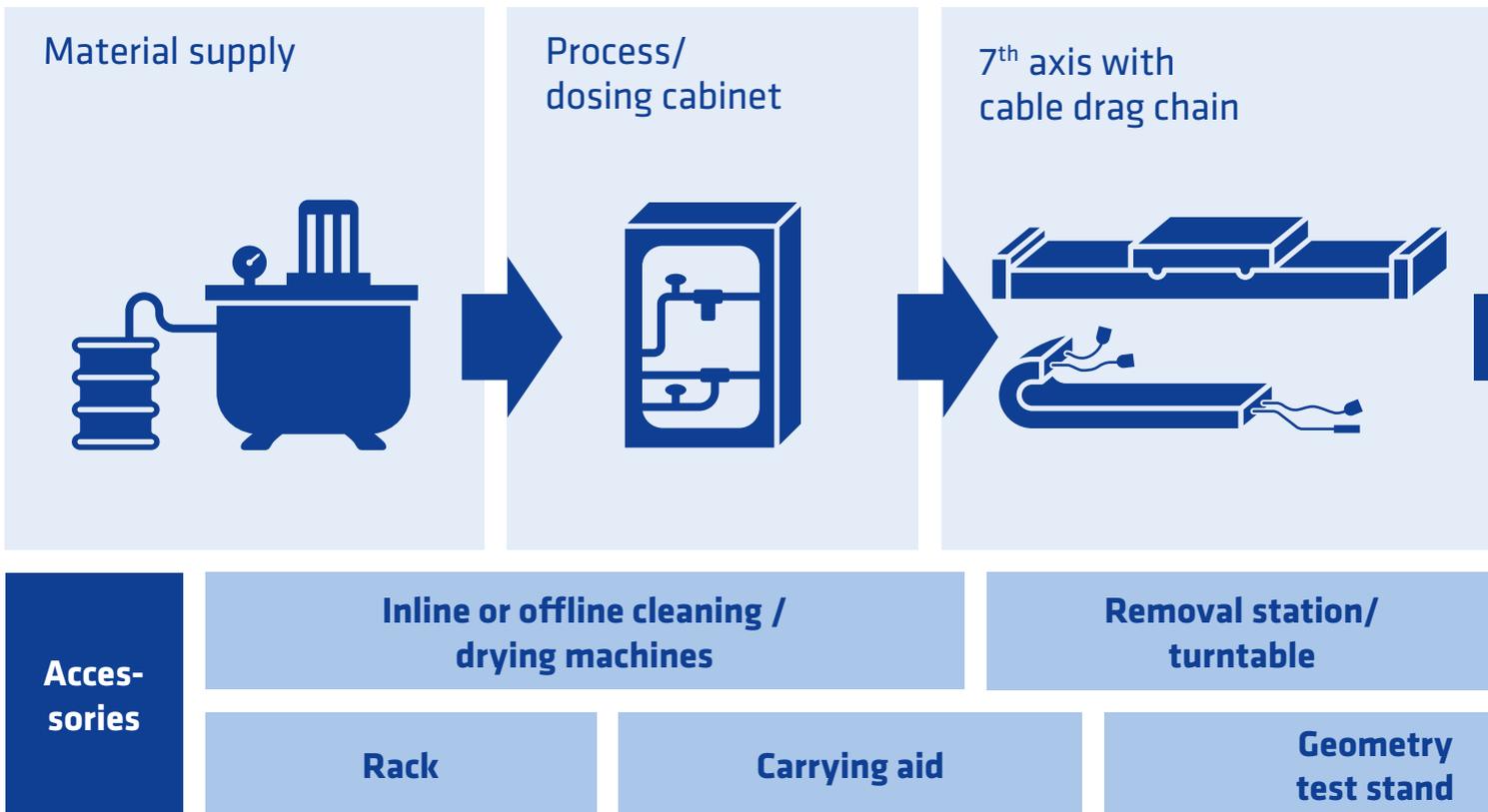
Air-Mix/Air-Less process

In the Air-Mix/Air-Less process, the protective wax coating is applied to add-on parts, doors and lids using a robot. The combined Air-Mix/Air-Less application head achieves “narrow” coverage of welded and soldered seams as well as “flat” coverage of spot welds, double joints and screw connections in a single application, eliminating the need to change nozzles or tools.

- **Specific material application**
- **Seam and surface coating in one process**
- **High-precision wax application**
- **Cold waxing**
- **Low material consumption**

Spraying process

Car body



Details



Nozzle mono head (DMK)

Nozzle head with reduced interference cone to accommodate one nozzle

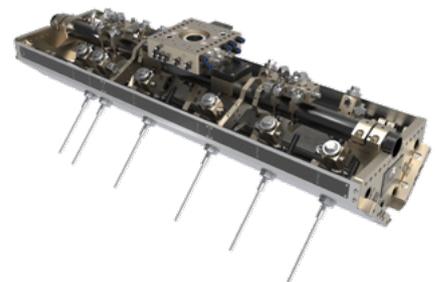
- Spray heads interchangeable with tool changer
- Low pressure applications
- Material pressure: max. 50 bar



Nozzle changing head (DWK)

Replaceable head with swivel holders for 6 or 4 nozzles

- Multiple application with 4/6 nozzles without tool change
- Interchangeable due to tool changer
- Material pressure: 120 bar



Nozzle bar

Robot-supported nozzle bar with up to 14 nozzles (optionally up to 17 nozzles)

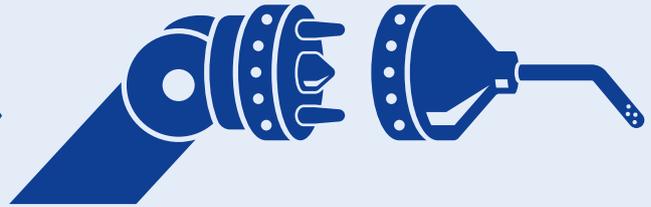
- Specific spray bar depending on body type
- Shortened cycle time
- 1 or 2 rows
- Material pressure: up to 250 bar

*Robot is not part of the scope of delivery

Robot equipment*



Applicator with tool changer



Fully automatic test stand

Bulkhead panels and wall ducts

Function test bench

Collision protection



Hand gun

Airmix gun with nozzle coding

- **Material pressure:** 120 bar
- **Atomizing air pressure:** 4 – 8 bar
- **Optional:** gun with heating element (max. 60° C possible)
- **Additional option:** thumb release (two-handed)

Cleaning devices

Cleaning stations for hand nozzles, nozzle change head and nozzle bar

- **Cleaning with water or solvent**
- **Workstation for manual pre-cleaning**
- **TÜV certified (ATEX)**

Autonomous process units

Compact and autonomous process unit

- **Low production volume**
- **Material supply for various manual guns or robots**
- **Wax supply through**

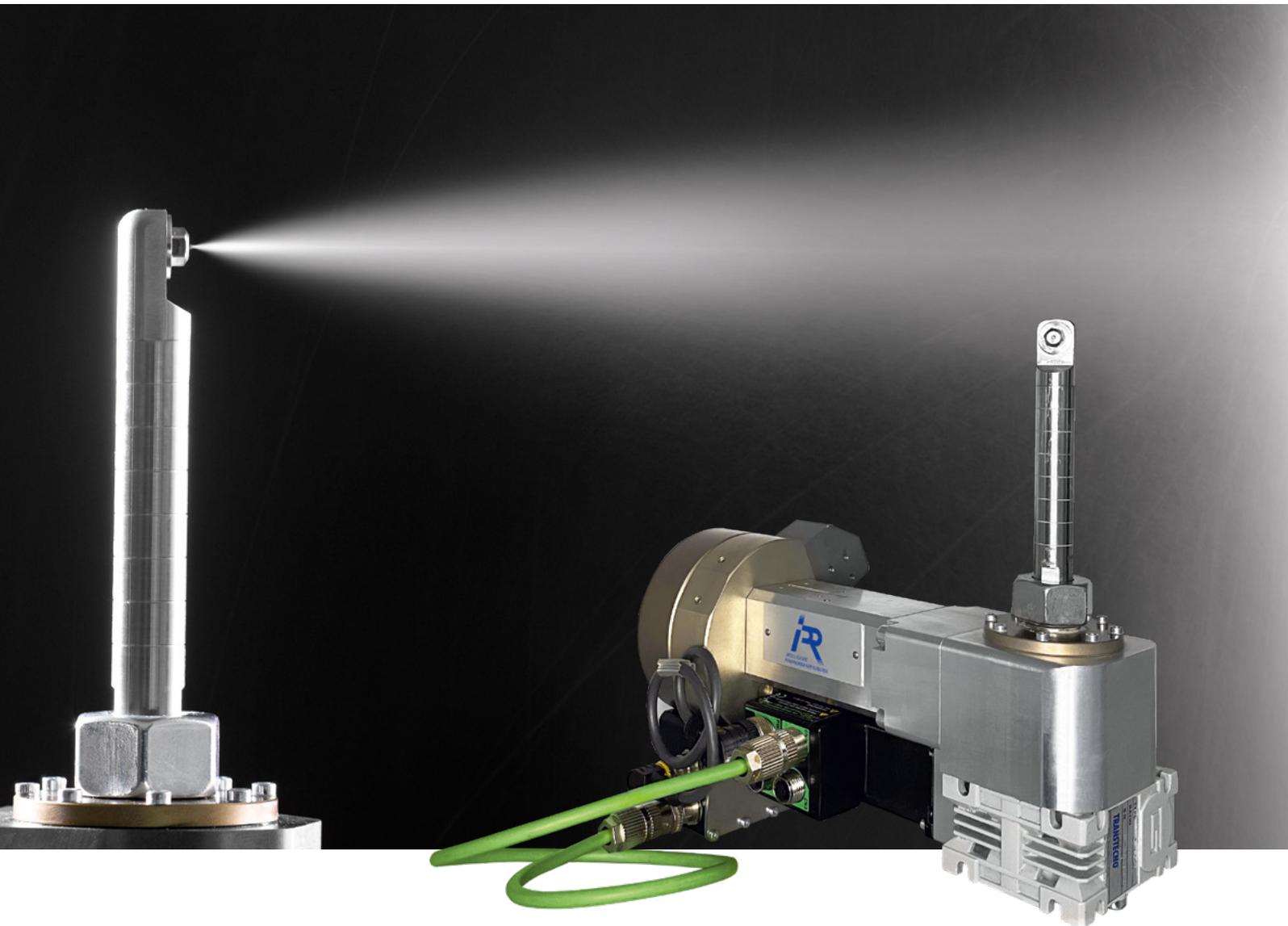
Test benches

Maintenance of the equipment

- **Maintaining the nozzle geometry**
- **Checking the positioning accuracy of the swivel units**
- **General mechanical function test of the nozzle head**

Fogging process

Beams, rocker panel, fender

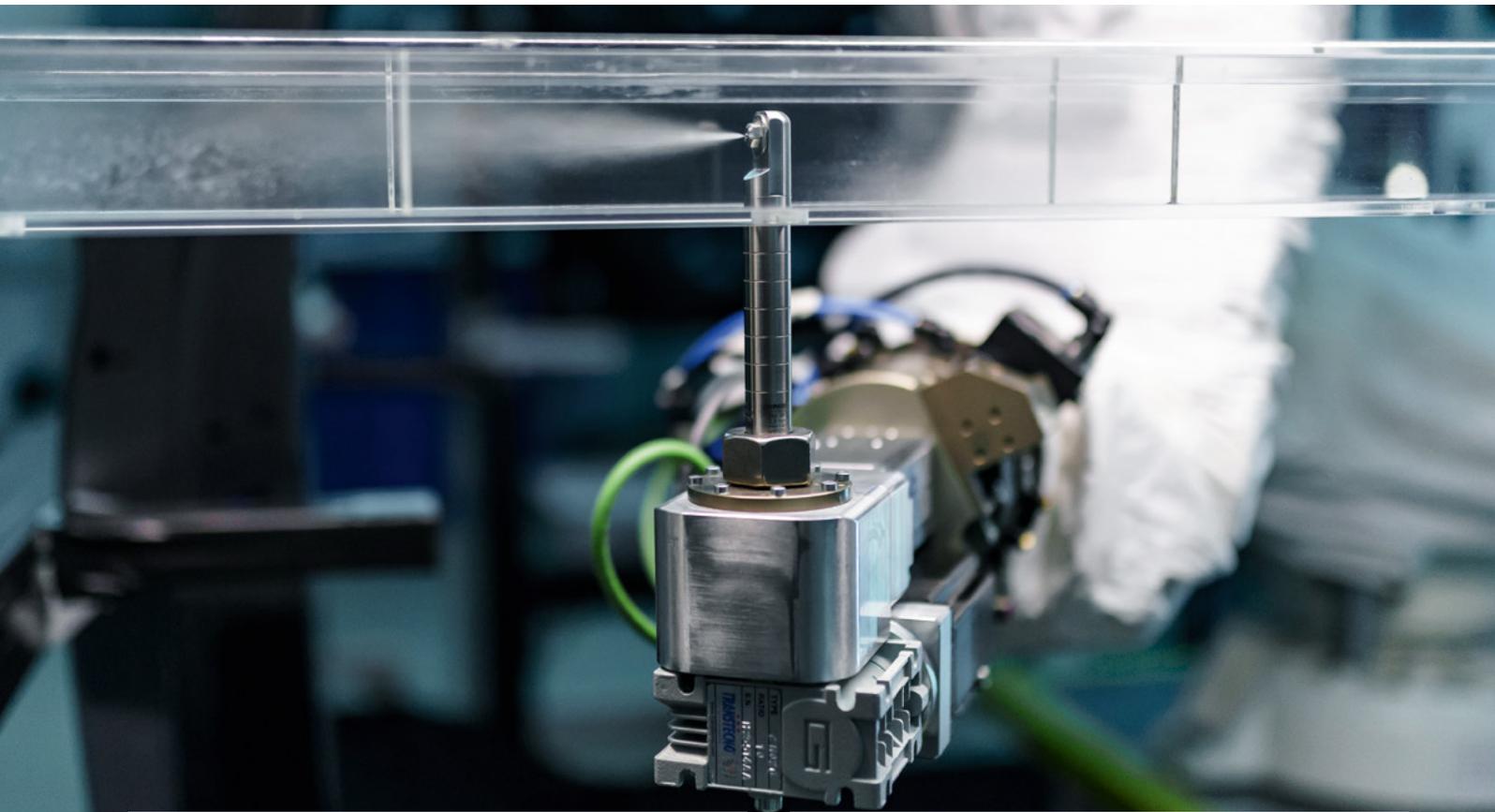


Important data

- Spray mist with a droplet diameter of $< 15 \mu\text{m}$ (volume average D 30)
- Turbulent flow (good for complex geometries)
- Undercuts are completely coated
- Low space requirement
- High flexibility
- Low material consumption
- Cold waxing
- Low investment costs

EDDK

The electric fogging nozzle head is a further development of its pneumatic predecessor. It allows the fogging nozzle to rotate freely through 360°. The angular speed can be programmed dynamically to achieve maximum control over the spraying result.



Pneumatic positioning

- Pneumatic control of the rotary head
- End position via mechanical stops
- Constant speed

Electrical positioning

- Electrical control of the rotary head
- Rotation via servo motor
- Sequential speed possible



IPR fog nozzles

The fog nozzles enable even finer material atomization. Due to their design, the material and atomizing air are only brought together at the outlet, resulting in droplets with a diameter of less than 15 μm .

Important data Metal fog nozzles

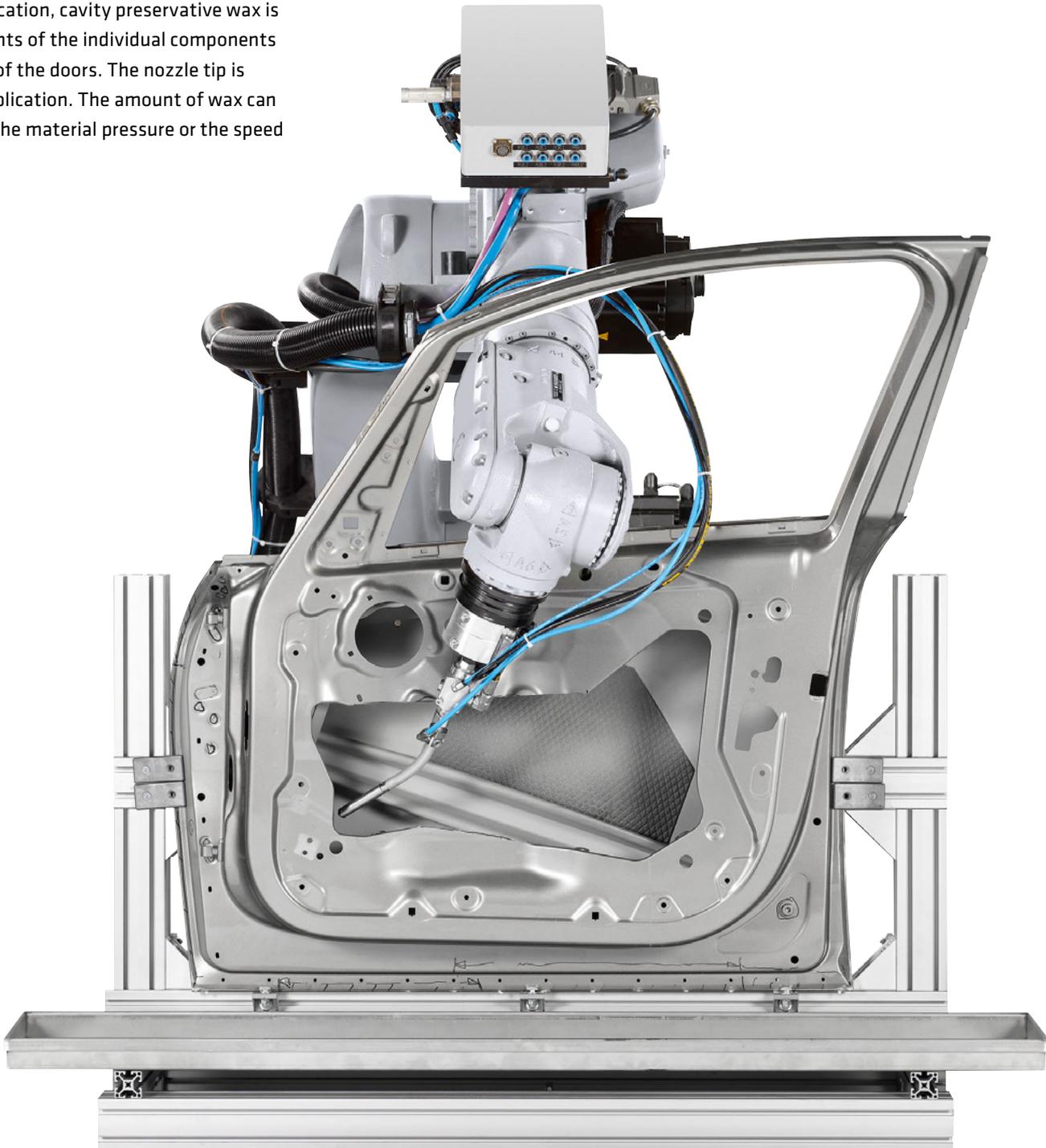
- 17 mm
- 13 mm

Air-Mix/Air-Less process

Add-on parts, doors, lids

Door application

During door application, cavity preservative wax is applied to the joints of the individual components in the inner area of the doors. The nozzle tip is moved during application. The amount of wax can be controlled by the material pressure or the speed of the robot.



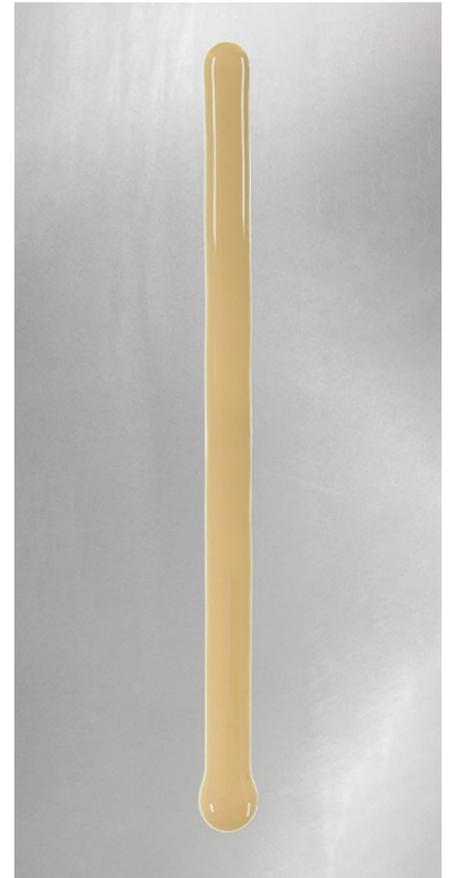
Important data

- Specific material application
- Seam and surface coating in one process
- High-precision wax application
- Cold waxing
- Low material consumption



Airmix

As with the conventional spraying process, the material is atomized to cover a larger area.

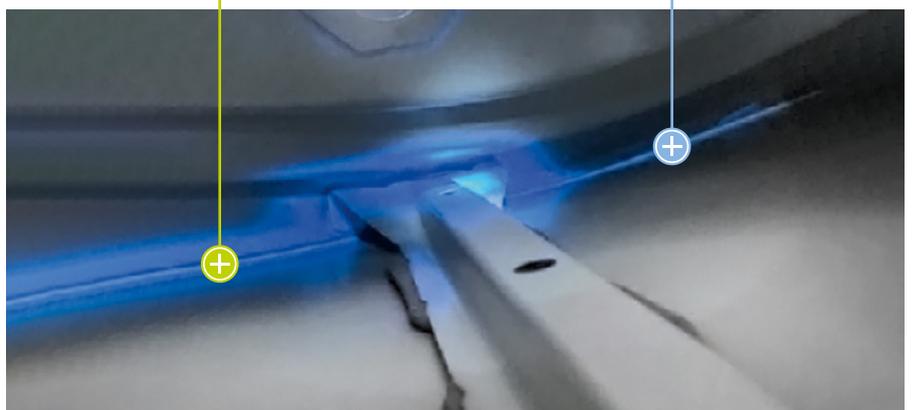


Airless

A thin material jet that reaches hard-to-reach areas and does not produce an over spray.

Airmix/Airless

The special feature of door application is the Airmix/Airless process. Depending on requirements, the wax can be applied either with or without atomization by air.



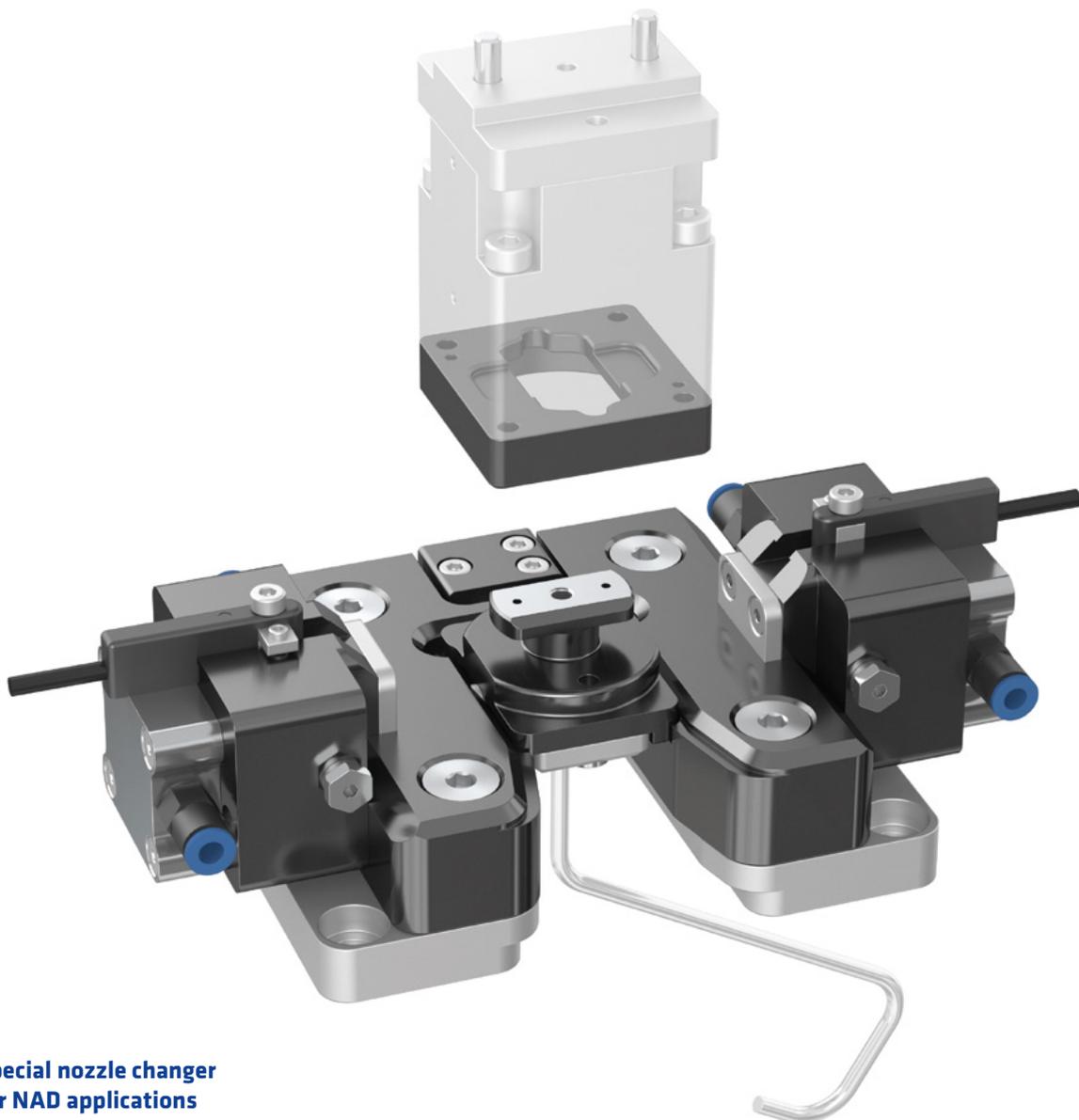
Automation solutions for seam sealing and insulating PVC-Application accessories

Solutions for more flexibility

We have developed an innovative solution to increase the effectiveness of your PVC seam sealing system. Regardless of which applicator you use, our tool changing systems add a nozzle changing function to it, enabling greater flexibility and improved availability. The special feature: our components do this under full application pressure.

Our robot side is attached to the applicator instead of the nozzle; an adapter is not required. Attach the nozzle to our tool side. This is manufactured so that the existing nozzle holder plate can be used.

So that you can place your nozzles safely, we have included a high-quality tray with locking mechanism and feedback signals on the locking status.



**Special nozzle changer
for NAD applications**

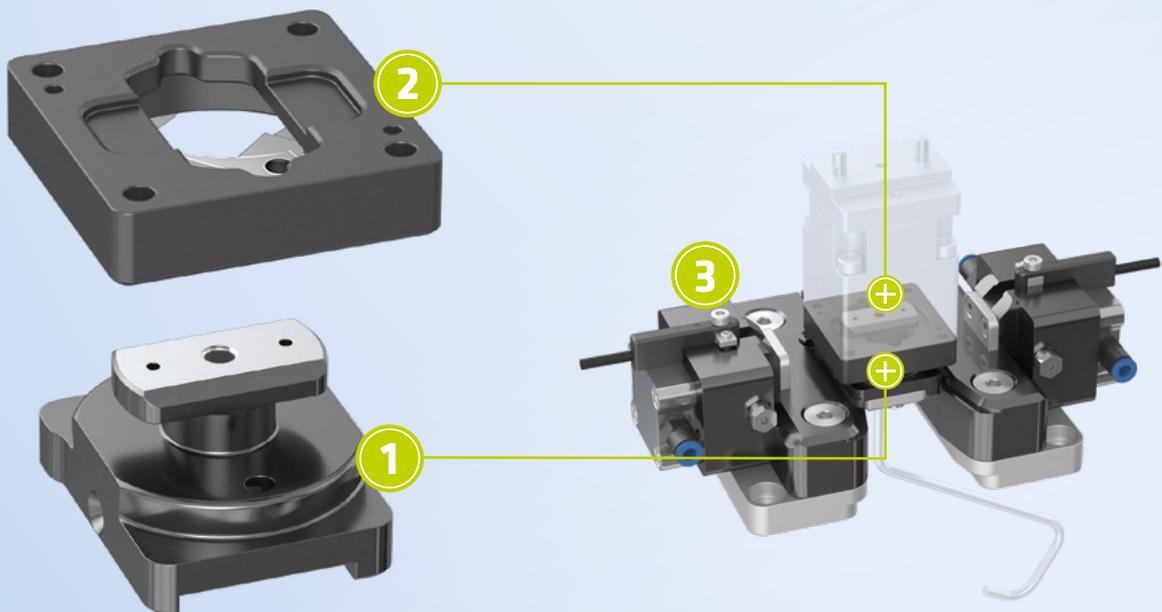
Tools for seam sealing

High-viscosity sprayable materials such as PVC plastisols are used for sealing and preservation, which protect the car body from corrosion and water ingress. The sealing material is applied to the overlapping sheet metal and joints. In this area, we have developed innovative products that make a significant contribution to improving system availability and flexibility.

Nozzle changer

Specially developed system for the frequent changing of application nozzles in seam sealing.

- **With bayonet lock for safe docking and undocking**
- **Automatic changing of nozzles for wide and narrow seams**
- **No downtime**



1

Nozzle changer tool side (without nozzle)

Simply screw the nozzle to the tool side using the existing mounting plate to the tool side.

2

Nozzle changer robot side (depending on manufacturer: possibly with adapter plate for applicator or 3D gun)

Attach the robot side to the applicator and you're ready to go!

3

Tray for nozzles

The tray completes the changing process. A mechanical interlock and a proximity switch are included.

The in-house IPR technology center

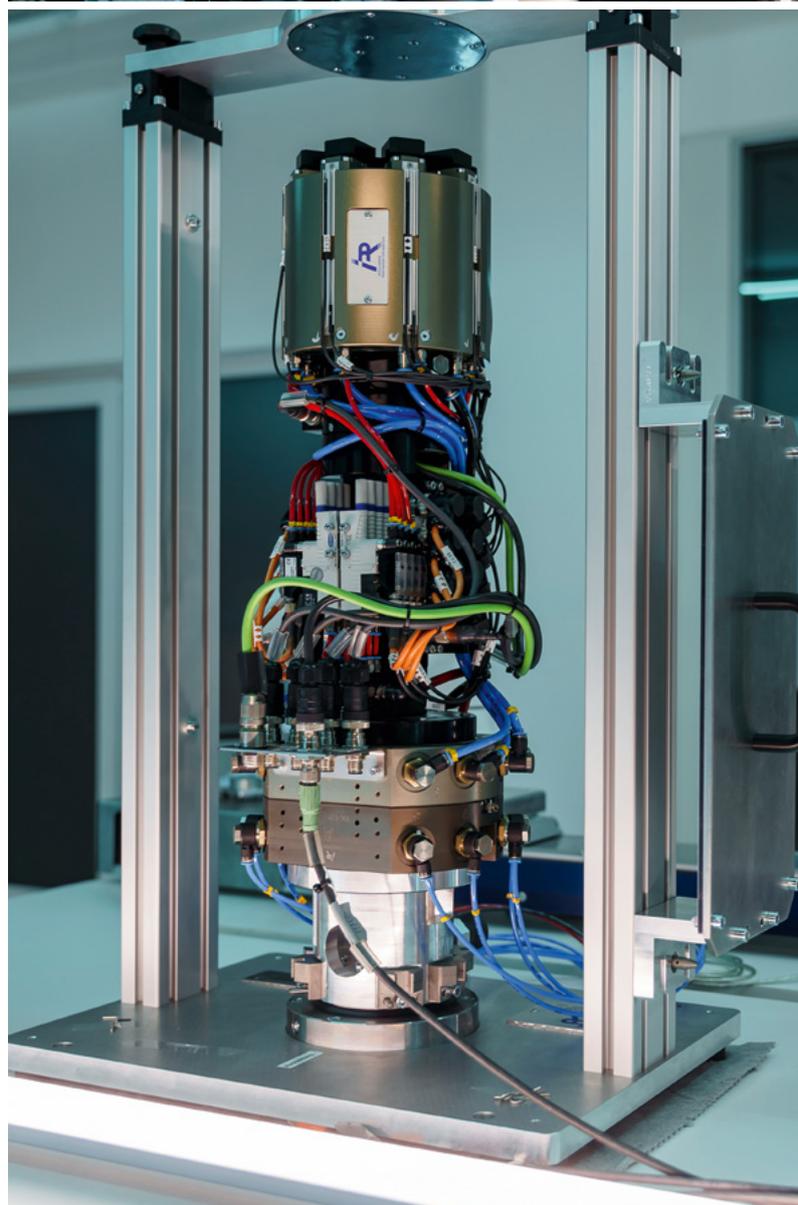
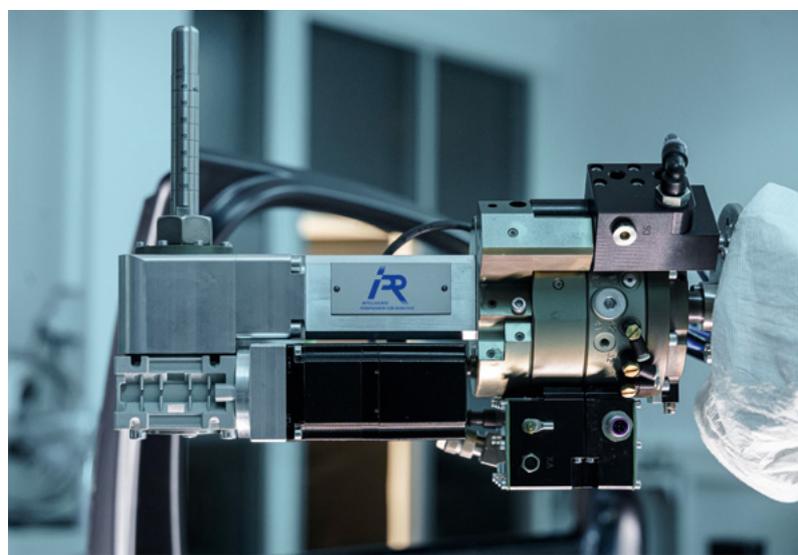
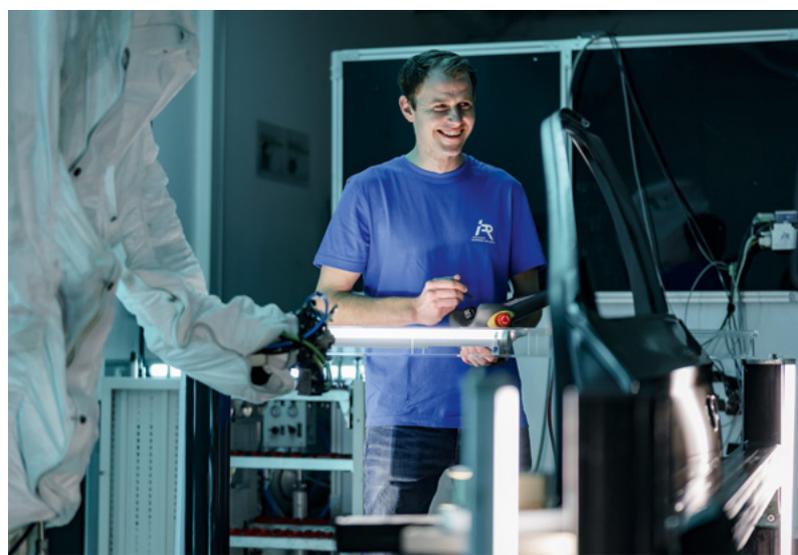
Precision as a driving force



Testing solutions – optimizing processes

Are you looking for the right automation solution for your application and want to ensure that the end product meets your complete satisfaction?

We offer you the IPR technology center for this: In our in-house technology center in Eppingen, we carry out applications under realistic conditions for our customers. After each test, the solution can be evaluated and further optimized if necessary. This is how we ensure a precise and economical solution for you.



Focus on feasibility, quality and cost efficiency:

- Validation and verification of IPR components according to customer requirements:
 - Planning and execution of test series:
Generation of test data
 - Parameter study
 - Responsibility for test equipment management, test planning
 - Processing of initial sample test reports
- **Setting up, preparing and testing test systems** and prototypes in close cooperation with our development department
- **Preparation, implementation and evaluation** of tests and warranty runs in the technical center, as well as with and at our customers (external)
- **Working closely** with our customers and **supporting** our internal departments (Sales, Systems and Development)

Standard is not enough for us

Solution competence made to measure



Our standard components can easily be adapted to customer-specific requirements. Various attachments and accessories are available for this purpose.

For more complex applications, where the modification of standard components no longer offers a sensible solution, we design special components that are precisely tailored to your applications. Many years of experience help us to find a technically and economically fit solution for you – quickly and effectively.

01



CONSULTING

Our expert employees specifically address your wishes and requirements and offer you competent advice on your application. With over 30 years of experience in the production of high-quality components and systems, IPR supports and supplies its customers worldwide, thereby creating valuable customer proximity.

02



QUOTING & PROJECT PLANNING

In the next step, we develop a solution proposal for you and create a project plan in this context. This is followed by a cost-benefit optimization and a feasibility analysis. These include the technical designs as well as constructive tests by our engineering team.



PSH-Infinity test stand



Example: High-pressure material supply with day tank

03



ENGINEERING AND DESIGN

Our engineers and designers are professionals in their field and have in-depth knowledge of all industries and processes. Our specialists implement individual projects professionally and on schedule. Look forward to first-class conception and implementation.

04



MANUFACTURING

A machine park equipped with the latest technologies and processes, great know-how in manufacturing as well as highly trained employees ensure that every single product is manufactured with the highest precision, quality and passion to your satisfaction.

05



SERVICE

We offer you a unique support in every phase – even after commissioning: from maintenance and repair service to spare parts service and customer training on site or at IPR. Our professional services show that customer proximity is very important to us..



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