

ROBOT SYSTEMS + AUTOMATION SOLUTIONS









Good reasons for ...





- + More than 25 years of experience with robot system solutions
- + Flexible reaction to specific requirements
- + **Overall consideration:** profitability consideration and customer use analysis
- + 3-D simulation + cycle time analysis
- + Flexible test cell for feasibility tests
- + Certified according to DIN EN ISO 9001:2015
- + Service and remote maintenance
- + **Synergy effects** (assembly, construction, software, start-up) through integration into the Pütz Group



- + Established in 1988, approximately 90 employees
- + Many years of industrial experience
- + Central capital base / local flexibility with the greatest degree of freedom and responsibility



Processing:

Deburring	
Milling	
Grinding	
Stroke filing	
Polishing	



Assembly:

Assembling	
Screwing	
Shrinking	
Pressing	
Glueing	



Handling:

Picking up Stacking Insertion Removal Placing

Sampas + Silvercut GmbH Ernst-Heinkel-Str. 16 71394 Kernen-Rommelshausen GERMANY



Deburring a crankshaft

Your Task = our solution:

The crankshaft is placed on a rotary table. The rotary table has two mounting positions, one on the robot side and the other on the loading side. Each mounting is connected to the robot controls with an NC axis (7th and 8th robot axis). The robot gauges the turning position before the start with the help of a sensor. Now the robot operates the tool station in order to deburr the crankshaft with the corresponding deburring tool.

Step 1: Deburring the edges with the milling spindle

- Step 2: Brushing the transitions on the double big end bearing (spandrel)
- Step 3: Piercing the oil duct with an oil duct piercer
- **Step 4:** Turning the rotary table, the processed crankshaft is then removed from the rotary table using the loader and an unprocessed crankshaft is loaded.
- **Step 5:** The tensioned crankshaft is turned to the robot with the rotary table.

member of www.puetzgroup.de

Tool station



Milling spindle



Piercing the oil duct



ficient robot solutions







Deburring a crankshaft

Technical details:

Workpiece Weight Dimensions of cladding circles Lenghts	Crankshaft 100 kg 260 mm max. 1,100 mm
Cycle time	2 min.
Tools	Milling spindle, Brushes, Oil duct piercer
Tool tray	several locations
Robot	KR 16 with KRC4 controls
Rotary table	2 clamping devices for crankshafts

We provide ready to use robot systems and automation solutions:



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Everything from a single source:

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Pin mounting crankshafts

Task:

Inserting three cylinder pins into a crankshaft. The cylinder pins must protrude by a tolerated residual length.

Our solution:

The crankshaft is inserted into a clamping device either by hand or by a loader and oriented to the pin bearings. The locating holes face upwards. The mounting fixture can be moved longitudinally on an NC axis. The pins are added using a vibration feeder in a standing, correct position. The drill hole is scanned for mechanically by a stylus in order to compensate for production tolerances in the shaft, thus ensuring fault-tolerant joining. Checks are carried out that the pins are present before insertion. A pneumatic processor places the pin in the drill hole. The pin is positioned and held while the insertion unit inserts the pin over the fingers. Then the shaft is moved to the next drill hole and the next pin is placed and inserted.

Inserting station

Vibratory bowl

Your benefits:

Saving personnel costs through automation

Secure handling











Pin mounting crankshafts

Technical details:

Workpiece Length Weight Diameter of drill hole Diameter of pin	Crankshaft 670 mm 20 kg 3.16 mm 3.18 mm	
Dimensions of cell	2,400 x 2,000 mm	
Cycle time	2 min. line time	
Insertion drive	max. 10 kN	
Insertion	pneumatic / hydraulic / optional: force-displacement monitoring	
Vibratory spiral conveyor	automatic sortation and feeding device, single track, Monitoring of present	
Control	Siemens SPS S7	

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Precision deburring cell



Tools:

The carbide pins used by Sampas are precision tools which have been tried and tested specifically in deburring with industrial robots. The application of hard material layers to the cutters results in increased wear resistance, reduced cutting forces and improved chip removal.



Material:

- Light metals
- Aluminium alloys
- Non-ferrous metals
- Steel
- Unhardened, high strength steels
- Hardened steels
- High-alloy steels
- Grey cast iron or cast steel
- Plastics
- Compreg and hard wood

Applications:

- Deburring
- Milling
- Drilling
- Polishing
- Brushing
- Grinding
- Cutting
- Assembly

Your benefits:

- Uniform precision
- Constant quality through direct measurement of displacement and force
- Flexibly adaptable thanks to modular construction
- Fully encapsulated machine
- Simultaneous machining and loading possible
- Individual solutions



Precision deburring cell

Technical details:

Cubicle fully encapsulated

 2 Drawers for manual loa 1 Discharge conveyor* 		
Total space requirement	approx. 2.25 m² – depending on equipment	
Total height of cell	2,085 mm	
Working height	1,100 mm	
Total weight	approx. 825 kg – depending on equipment	
Connected load	1.8 – 2.0 kWh	6
Chip tray volume	60	*custo

*customisable

2 085 r

1 500 mm

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Stacking ceramic plates

Belt-synchronous removal of parts





Task:

A robot (KUKA or other company) equipped with suction pads unloads ceramic plates beltsynchronously from an assembly line and places it down on precisely positioned pallets.



Your benefits:

- Process-safe handling of soft, highly-sensitive, flexible material
- Optimisation of the cycle time
- Staff cost savings thanks to complete automation

 Reduced error rate and quality assurance by using robots



Stacking ceramic plates

Technical details:

Workpiece: Size Weight	soft, highly sensitive, flexible material Width: 120 mm, Length: 600 mm 2 kg
Cycle time	individual
Robot	1 robot e.g. KUKA KR 16/2

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Handling:

Stacking Insertion Removal Placing	Picking up	
Insertion Removal Placing	Stacking	
Removal Placing	Insertion	
Placing	Removal	
	Placing	

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Deburring pump housings





Task: Deburring hydraulic modules.

Our solution:

The deburring cell is equipped with various pneumatic tools such as milling cutters, brushes, files and scrapers. The workpieces are moved with a KUKA robot.







Your benefits:

• Short commissioning and resetting times through advance setup in our factory 80 % savings on personnel costs





Deburring pump housings

Technical details:

Robot	KUKA KR 16
Dimensions (L x W x H)	2,500 mm x 2,000 mm x 2,200 mm
Weight	1,500 kg
Handling capacity	16 kg
Mass of gripper	with workpiece 11 kg
Cycle time	3 min.
Tools	16 different pneumatically driven tools

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Our solution:

AMPA

A robot acts as the central movement element between the lathe and other assembly stations for handling pump housings. The robot has a standard pneumatic long stroke gripper with a stroke of approx. 200 mm for up to five different pump housings.





Pump housing gripper



Your benefits:

- Loading and unloading of three assembly stations and one lathe with just one robot
- Less work for factory workers
- Operation of the feed and discharge belt by one robot in three-shift mode

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- Short loading and unloading times
- Flexible work sequences



SAMPAS

SILVERCUT



Loading and unloading a lathe

Technical details:

Robot	KUKA KR125
Gripper arm stroke	200 mm
Robot weight	incl. gripper arm1,300 kg
Workpiece weight	approx. 20 kg
Machine loading	with approx. 0.5 mm play

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Machining of helmets

Task:

Machining of helmet domes, e.g. motorcycle, firefighting or work safety helmets.

ROKA

- Drilling of holes, openings
- Cutting out the visor section
- Trimming the collar

Our solution:

A robot controls a milling spindle and produces holes of different bore sizes by moving correspondingly. The helmet is placed in the chucking device. The factory worker closes the window by pressing a button and enables the robot for machining. The robot machines the helmet dome. After machining, a pneumatic sliding window is opened by the robot. The factory worker removes the helmet. A second helmet can be machined simultaneously during the loading process.

Your benefits:

- Easy amendment of bore hole positions
 by PC correction interface
- Flexible hole positions and bore diameters
- Any desired contour can be realised
- Complete machining in one or two chucks

Together. Creative > Innovative. Successful.











Machining of helmets

Technical details:

ΤοοΙ	1 HF milling spindle
Weight	2,500 kg
Dimensions (L x W x H)	4,500 mm x 4,000 mm x 2,800 mm
Robot	KUKA KR30/2
Part variance	up to 100 different hole patterns
Maximum cutting speed	2 m/sec.

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Special milling heads

by Sampas + SilverCut









Spindle with flexible mounting

Your benefits:

- Precise milling with consistent quality
- O Minimal rejects
- Cutter deflection monitoring
- Cutter breakage monitoring
- Integrated measurement system
- Flexibly mounted spindle
- Flexibility can be adjusted manually or parameters can be set freely using prop valve



Special milling heads by Sampas + SilverCut

Sample applications:







Motorcycle helmet

We provide ready to use robot systems and automation solutions:



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Screwing	
Shrinking	
Pressing	
Glueing	



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Stacking	
Insertion	
Removal	
Placing	

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QUALITY MADE IN GERMANY

> Special machines for your production

Stacking sheet metal

Task:

A KUKA robot equipped with suction pads unloads sheet metal from an assembly line and places it down on precisely positioned pallets.



Your benefits:

- Enables faster gripper change
- Optimisation of the cycle time
- Reduced error rate and quality assurance by using robots
- Staff cost savings thanks to complete automation



Stacking sheet metal

Technical details:

Workpiece: Seize Weight	Width: 200 mm to 1,500 mm, Length: 500 mm to 3,000 mm 0.5 kg to 105 kg
Taktzeit	11 pieces/min.
Robot	1 KUKA P180 robot

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Deburring
Milling
Grinding
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Screwing
Shrinking
Pressing
Glueing



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QUALITY

IN GERMANY

Special macrines for your production

Automatic pipe-bending and end machining line for exhaust gas pipes

Task:

Several varieties of exhaust gas pipe with different diameters can be manufactured in this fully automated robot cell.

Our solution:

Three ABB robots equipped with double or single grippers feed the fixed pipe blanks to the different processing stations. First, the parts are separated and lined up after longitudinal welding. The weld joint is recognised optically by a colour sensor.



Processing stations:

- Bending machine
- Eccentric press
- End facing machine
- Separating and rolling machine
- Pipe forming machine

Your benefits:

- Production of several varieties with different diameters
- Cost savings
 thanks to complete
 automation

Reduced error rate and quality assurance by using robots



Automatic pipe-bending and end machining line for exhaust gas pipes

Technical details:

Workpiece	Lengths of 1.50 m to 3.00 m can be processed
Cycle time	48 sec./piece
Floor area	11.50 m x 15.00 m
Robot	3 ABB robots
Control	Siemens Simatic S7
Visualisation	WinCC Flexible

We provide ready to use robot systems and automation solutions:



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Deburring	
Milling	
Grinding	
Stroke filing	
Polishing	



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Assembly:	
Assembling	
Screwing	
Shrinking	
Pressing	
Glueing	



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Picking up	
Stacking	
Insertion	
Removal	
Placing	

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Handling of bulk goods by robots with image recognition



Task:

For the automated unloading of forged parts containers and subsequent component separation with the aid of robots, it is necessary to record the location of the unfinished parts and to define a removal sequence.

Our solution:

The QBS (Quotient Image Stereo) process works with (calibrated) stereo cameras and a random strip-light projection with an uncalibrated projector. At least two differently illuminated images are recorded by each camera, then, pixel by pixel, a quotient of both images is formed.

Finding the correspondences (the main problem in stereo analysis) is made substantially easier by the use of epipolar geometry, the linear projection and brightness normalisation of the grey scales resulting from the quotient images. The system achieves an outstanding insensitivity to different surface characteristics such as local slope, roughness, printing, colour, soiling, local gloss and processing traces. Series of images, such as with coded light, are omitted. No mechanical movement is required.

The QBS process delivers reliable height images and recognises the parts to be gripped. Our standardised removal concept is adapted to the following typical forged parts: Drive and output shafts, gear shafts, drive shaft joints and flanges. The parts are then placed on a conveyor belt.



QBS Process with 3-D Visualisation



Handling of bulk goods by robots with image recognition

Technical details:

Robot	KUKA
Camera	VisionTools
Work pieces: Surface Geometry Length Diameter Length/Diameter Ratio	any colouring cylindrical and rotationally symmetrical at least 80 mm (depending on the size of the material container) at least 20 mm at least 3

We provide ready to use robot systems and automation solutions:



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Milling	
Grinding	
Stroke filing	
Polishing	



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Stacking
Insertion
Removal
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Gripping of pipe clamps

Pick & Place-Technology



Task:

A conveyor belt feeds the separated pipe clamps into the robot cell. Orientation, gripping position, prone and supine position are identified by a 2D camera while the conveyor belt is moving. The data are transmitted to the robot.

The robot picks up the components from the moving conveyor belt and places them – according to prone or supine position – on an indexing table where final assembly takes place.



Robot picks up pipe clamps from the moving conveyor belt.

Your benefits:

• Cost savings thanks to complete automation Reduced error rate and quality assurance by using robots • Optimisation of the cycle time Cycle time: less than 1 sec./piece



Gripping of pipe clamps - Pick & Place-Technology

Technical details:

Our services	Robot Programming
Programming	Vision System
Cycle time	less than 1 sec./piece
Robot	1 IRB 360 Flex Picker (ABB)

We provide ready to use robot systems and automation solutions:



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Grinding
Stroke filing
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Screwing
Shrinking
Pressing
Glueing



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Stacking	
Insertion	
Removal	
Placing	

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Bin picking

Crankshafts



Task:

Crankshafts are picked from a pallet cage. A 3D-Laser scanner identifies the part delivering a point cloud to the robot which can be compared to the CAD model. Position (x, y, z) and orientation (A, B, C) are identified. The gripper is equipped with Z-balance and control function. He notices if more than one part is lifted.



Robot picks up crankshaft from a pallet cage.



Robot gripper and pallet cage

Your benefits:

• Cost savings thanks to complete automation Reduced error rate and quality assurance by using robots • Optimisation of the cycle time Cycle time: 50 sec./piece



Bin picking – Crankshafts

Technical details:

Our services	Robot Programming
Programming	Vision System
Cycle time	50 sec./piece
Weight	up to 25 kg

We provide ready to use robot systems and automation solutions:



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Removal	
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Automated deburring with stroke filing processes



Task:

The process is particularly suitable for removing separating edges / particles on die-cast aluminium parts. Automated deburring can be performed with either the **<u>component</u>** or **<u>tool</u>** acting as a guide.

We work with the following robots:

KUKA / ABB / Fanuc / Kawasaki / Motoman / Yaskawa All others on request.



Your benefits:

• High tolerance to:

- Contact pressure
- Contour variations
- in the componentPosition accuracy of the robot
- Processing speeds

Cycle time optimised movements are possible, since up-cut / synchronous movements need not be considered unlike in milling

- Tracking accuracy: good processing of corners and sharp edges
- Safe tool changes without risk of injury
- No harmful vibrations due to automated equipment



Automated deburring with stroke filing processes

Technical details:

File drive	pneumatic or electrical
Applications	stationary or robot guided
Suitable processing materials	steel, cast steel, cast iron, non-ferrous metals
Stroke lengths	2 – 10 mm
Processing speeds	up to 300 mm/sec.

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Contact

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cegger@sampas.de Phone: +49 7151 604033-0 Fax: +49 7151 604033-300

www.sampas.de