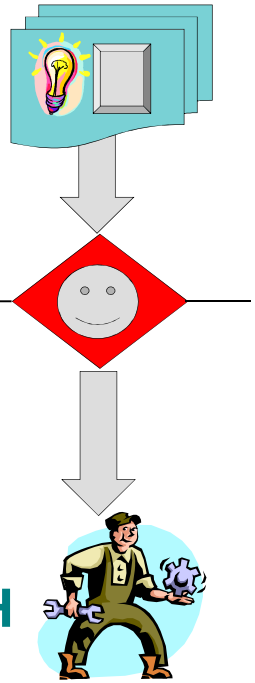
# Materialhandling and Automation

# Divisions + Fields of Activity

Your service provider during the concept development

DR. HAFNER **Beratung und Planung für Automation**



up to the ready realization as system partner

DR. HAFNER **Montage- und Produktionssysteme GmbH**

- **Work Piece Carrier - System LFS**
- **Suspended Railway - System TCS**
- **Conveyor Technology and Special Equipments**
- **Special Machinery and Automation**
- **Robotic+Vision and Measuring+Testing**

**Automation and Handling**
**for assembling, verifying, testing, printing, coating, bending, screwing, punching, riveting, bonding, soldering, welding, ……**
**with integrated work place**

# Work Piece Carrier(WT)- System LFS as one-track-system

- **WT - round**
- **WT - oval**
- **WT - Power & Free**

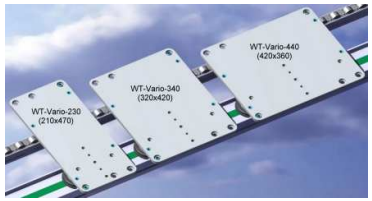
  direction-oriented,

  WT-weight until 20 kg/WT

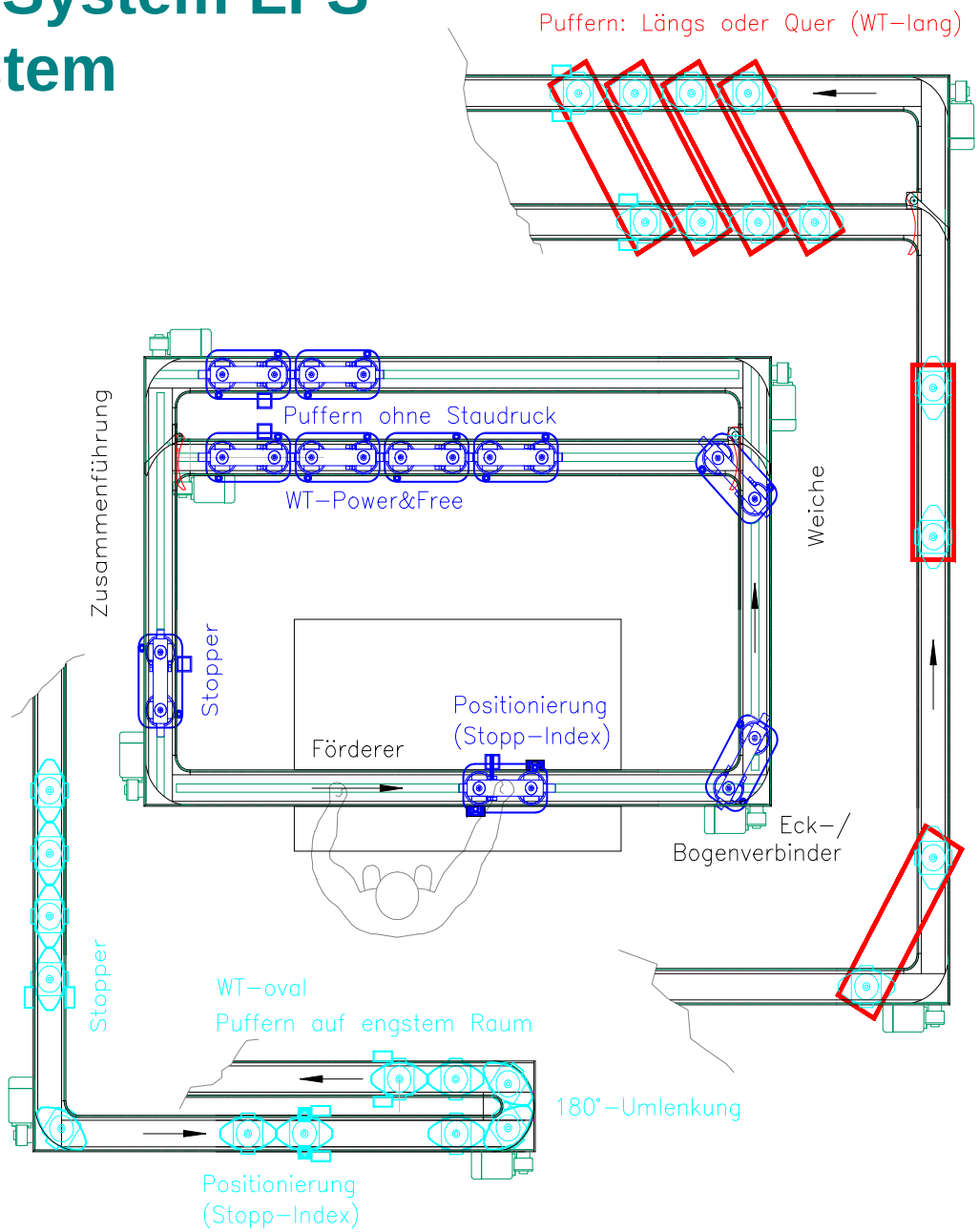
  without line load limit

  pressureless,impact-poor,

  silent
- **WT - long**
- **WT - Vario**



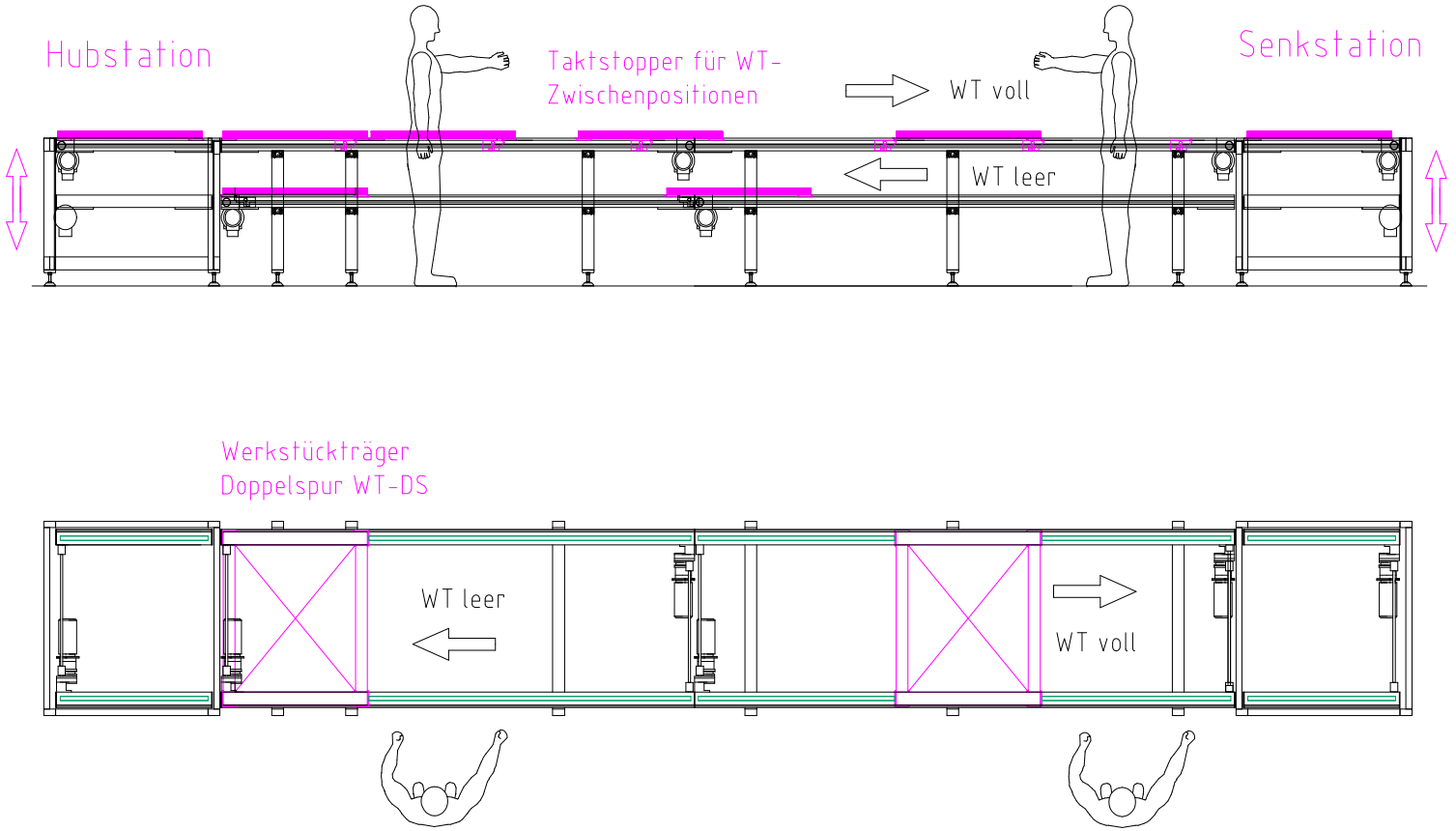

measure-flexibly WT



# Work Piece Carrier(WT) - System LFS as double-track-system

- WT double track

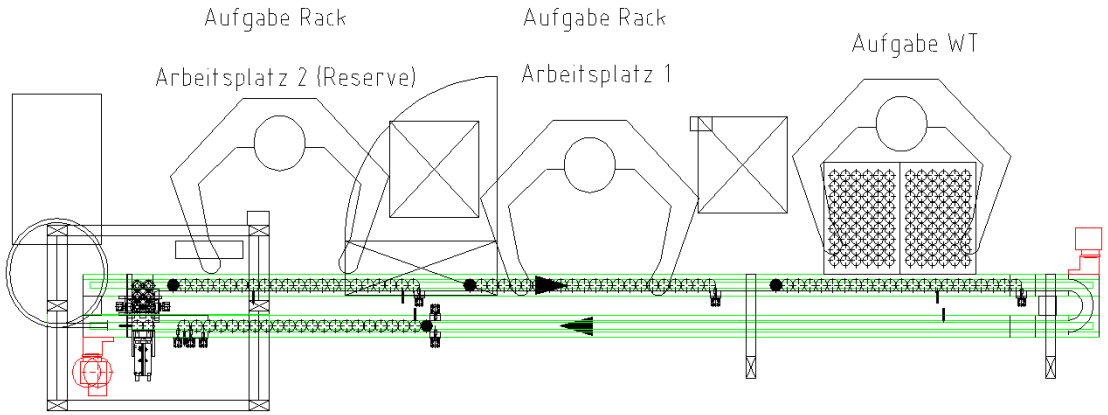
  circulation horizontal and vertical



# Assembling, Pressing, Punching of cylindrical parts (WT round)

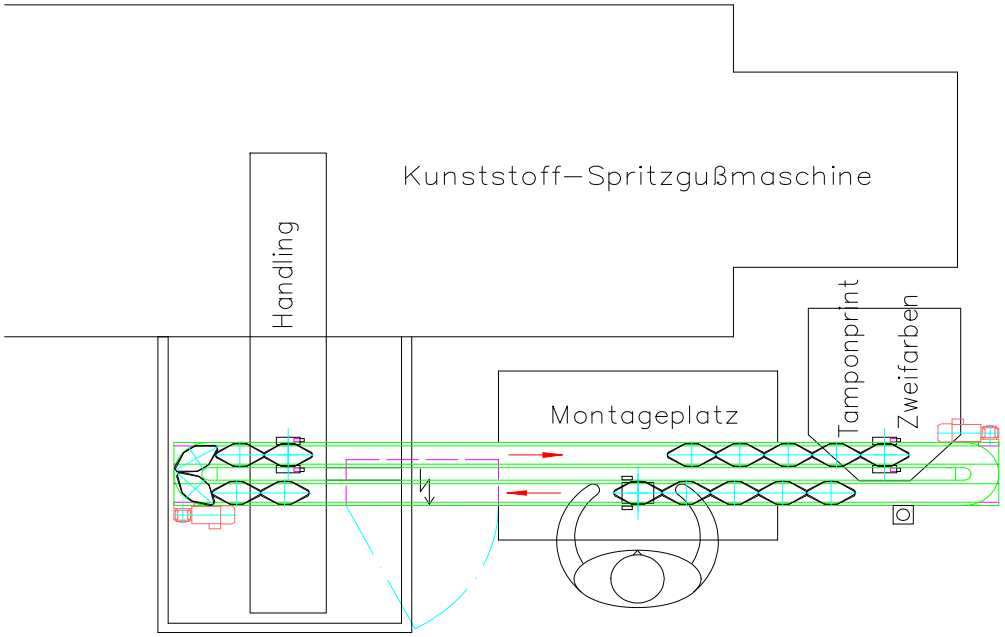
Automat. Montagestation mit Schüttgut-Teile-Bunker, Schwingförderer, Doppel-Vereinzelung, Zuführung mit Maß-Prüfung und n.i.O.-Teile-Ausschleusung

WT - rund zur drehlagerichtigen Transport-Verknüpfung mit platzsparender 180°-Umlenkung



# Automatic link with the moulding machine (MM) processing stations and work places

(ideal inline-solution with optimal degree of automation without surface treatment)

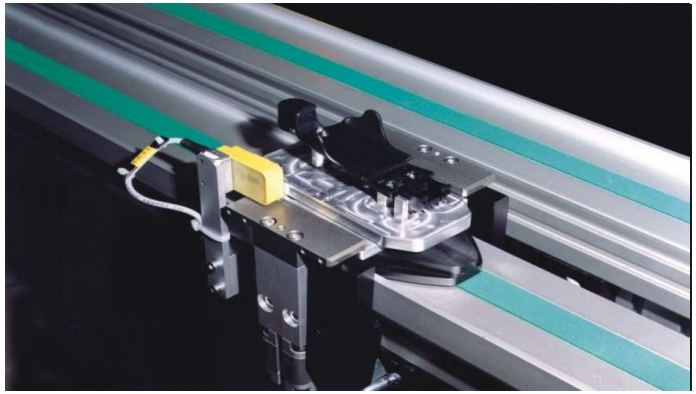



from the moulding machine (MM)

⬇

packed product

- short running time
- low logistic costs and storekeeping
- cost-optimized solutions with small space requirements

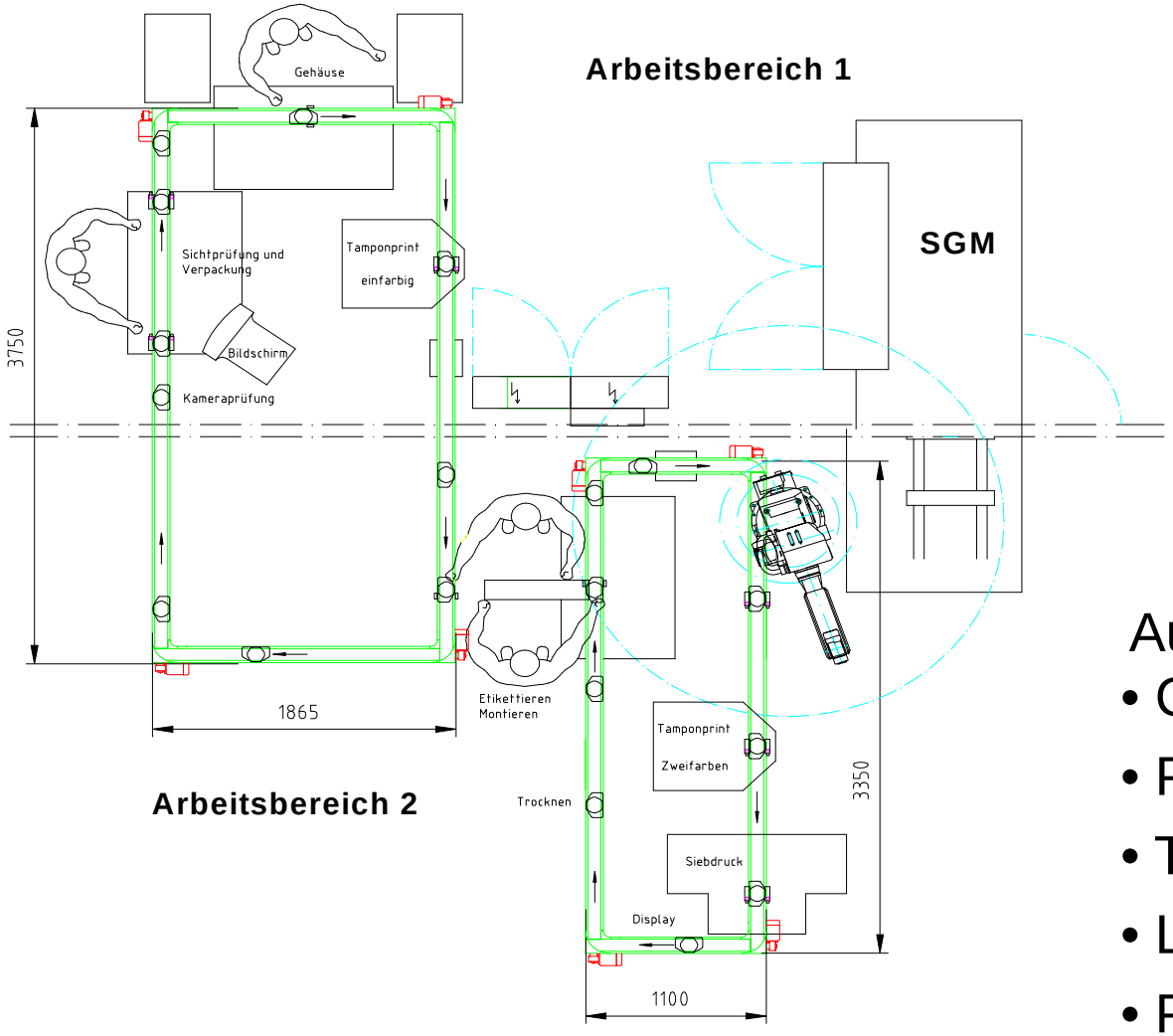


Economically in:

- cycle time MM ~ cycle time further processing
- continuous quantity
- without surface treatment

# Automatic link with the moulding machine processing stations and work places

(ideal inline-solution for complex degree of automation without surface treatment)




The moulding machines are linked over workpiece carrier systems, conveyors or roller races with work places, processing stations up to the packaging and palletization.

Automated:

- Conveying
- Printing
- Testing
- Labeling
- Packing

# Full automation in galvanic as stand-alone automation

Fully automatic machine with
magazine capacity for one shift:

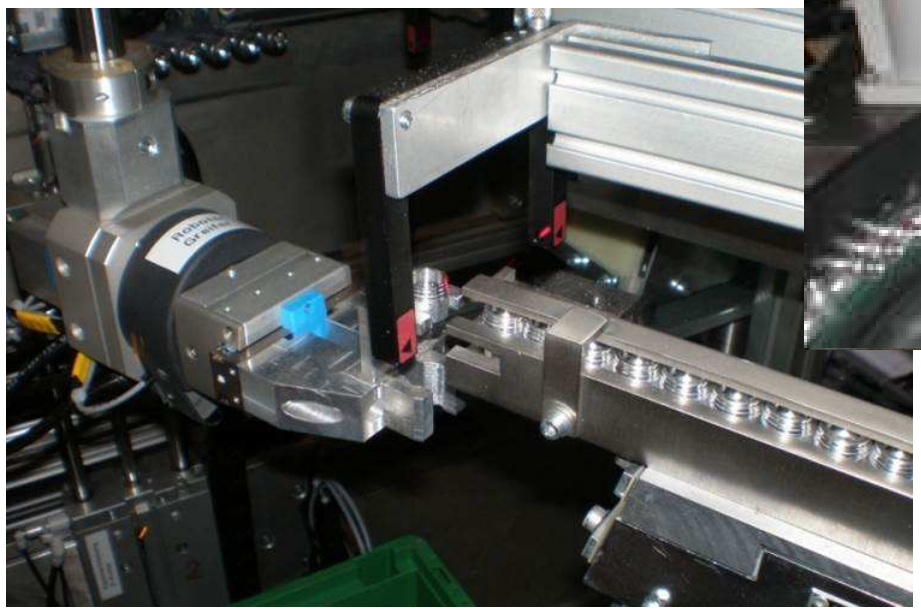
- 1,5 second cycle-time
- several components with feeding pot
- parallel assembly + disassembly on rack

  ( different parts – no gripper exchange)
- 3 cameras for testing
- removal of good and bad parts
- 4 – shift operation
- >> 10 Mio parts per year
- only one worker

# Full automation in galvanic as stand-alone automation

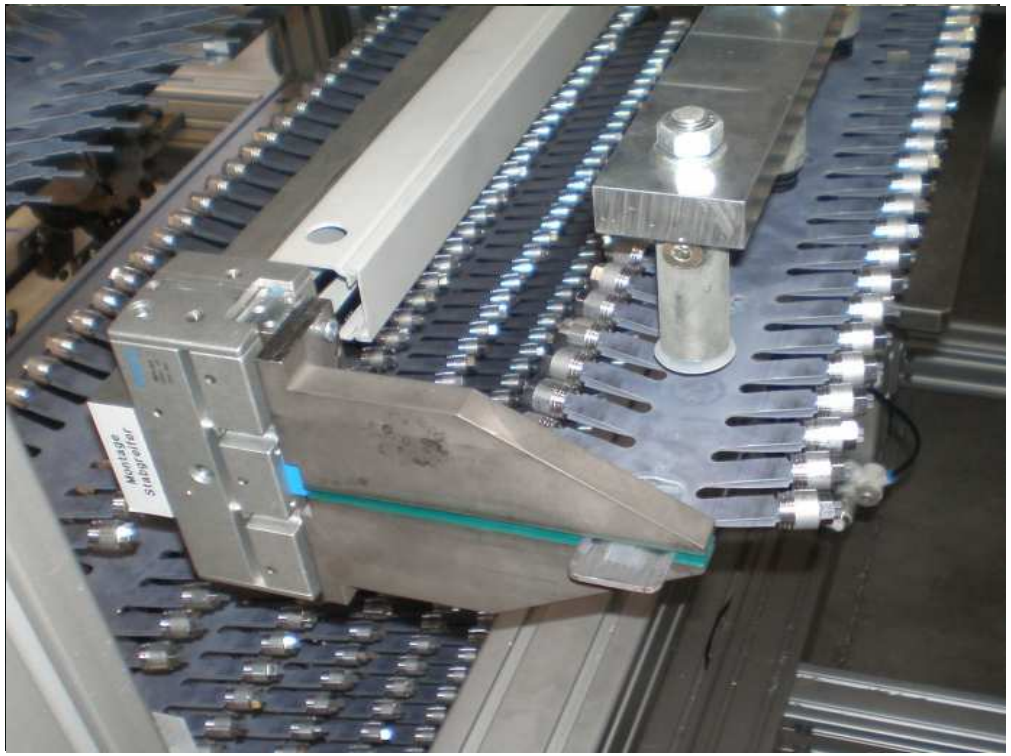
(fully automatic plug-on of the parts)

The parts are isolated by 3 vibration pots and prepared to a robot for clipping the parts to galvanic racks.

# Full automation in galvanic as stand-alone automation

(magazine assembly – high numbers of parts)

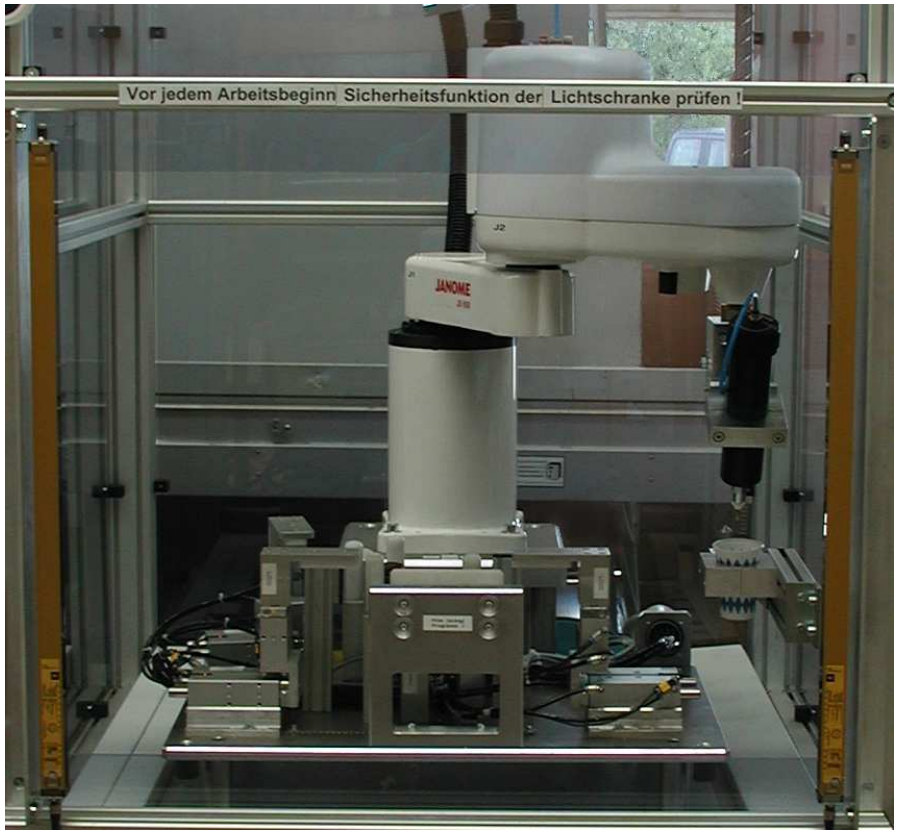


The single mountings are taken out of the magazine and made available, while a further being equipped at the same time.

Simply manual equipment and emptying of the magazine.

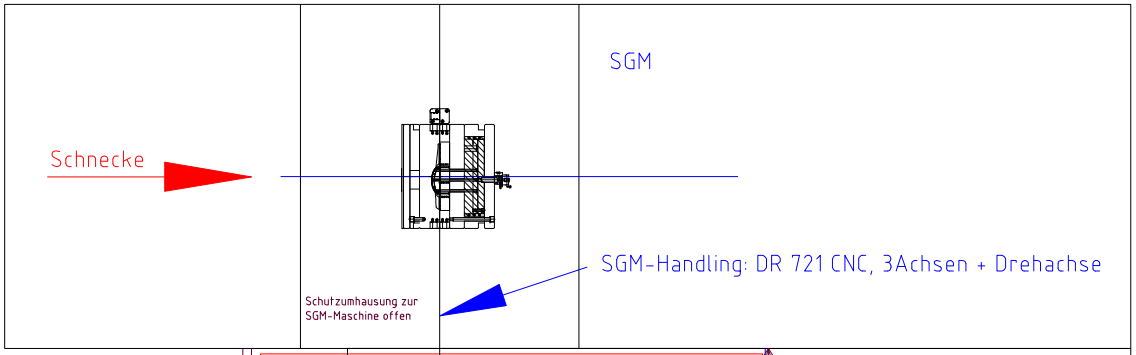
# Bonding with a Scara-robot

(modular upgradeability)




Stage 1:

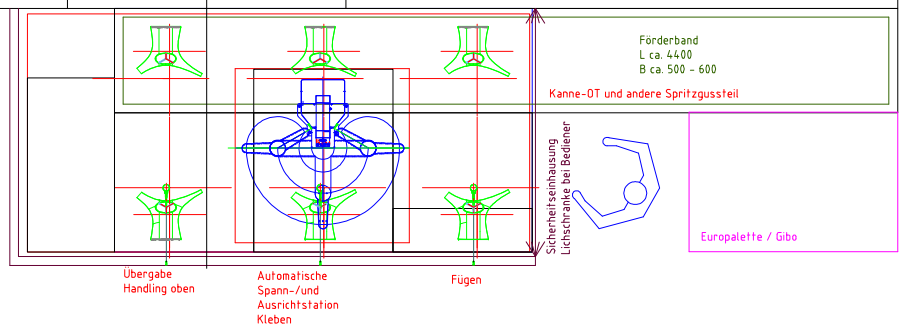
The bonding process is running autonom in a robot station.




Stage 2:

Automatic inline-process up to the finished product.

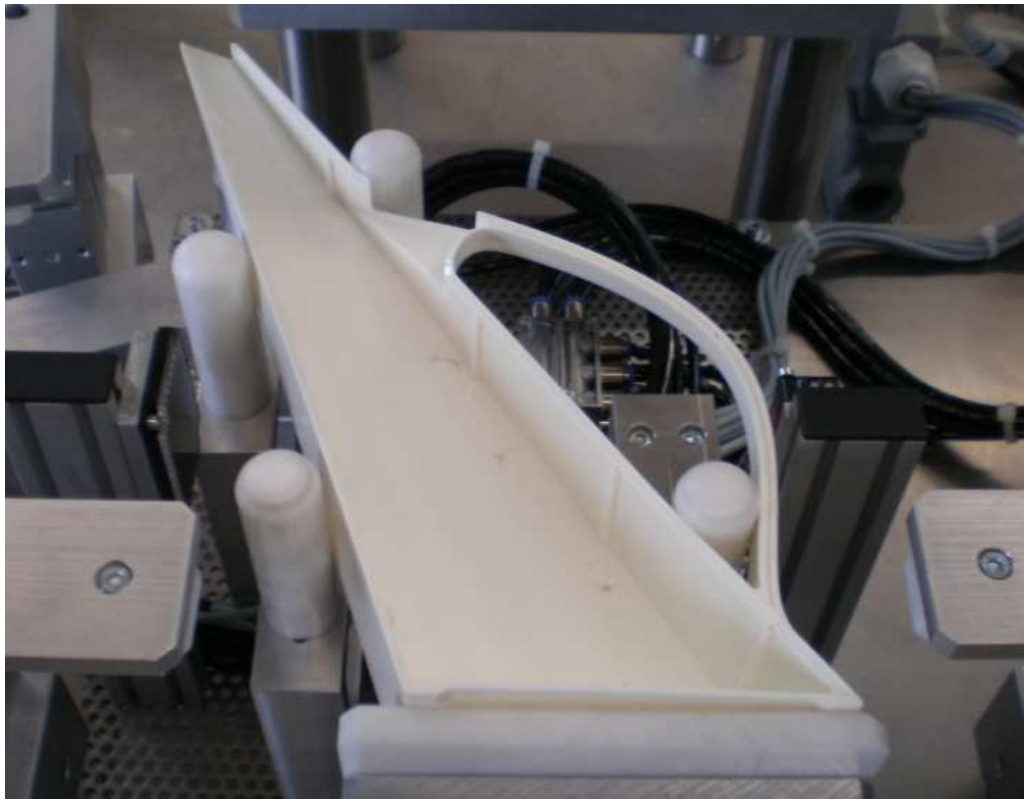
Cycle time < 1 min



# Seal-bonding apply with a Scara-robot

(Flexibility: Individual product of a part-family)

Changeable devices for different product variants. Simply and fast change of the mountings by plug connectors.

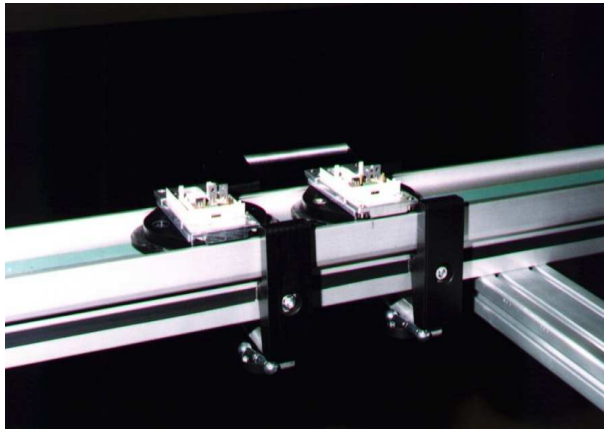


Flat aligning of the workpieces and thin apply of seal-bonding on complexe outlines of half shells.

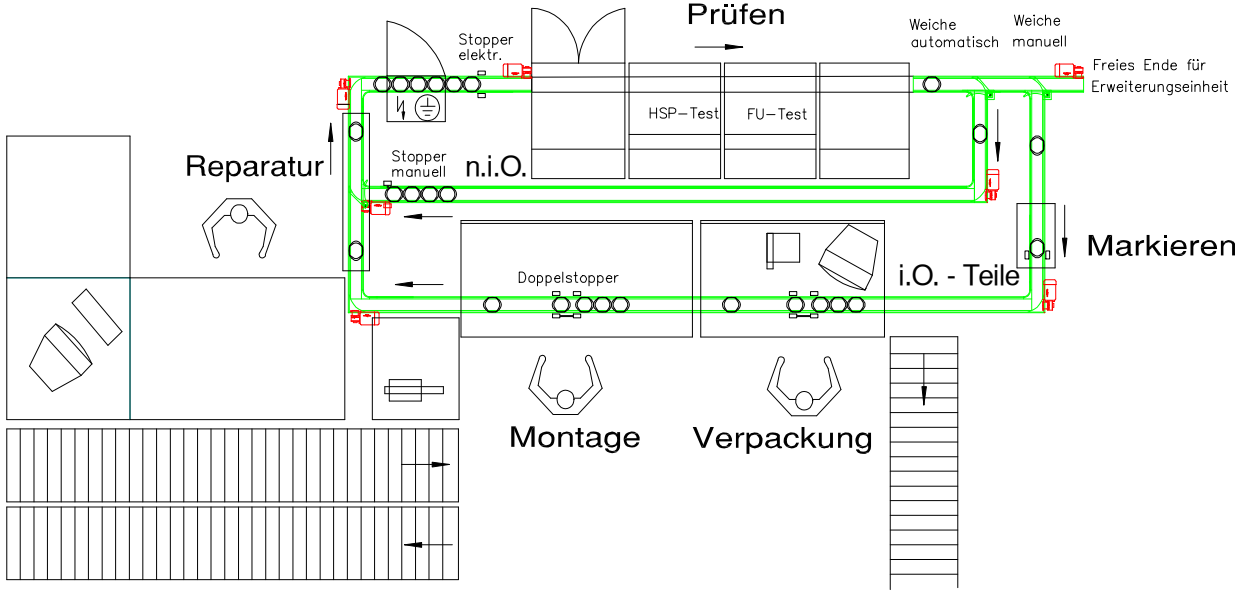
# Assembly and Packaging of multi-variant product families

# Assembly, verifying, testing of electronic parts (WT oval)

Die kompakte Anlage mit Prüfstationen



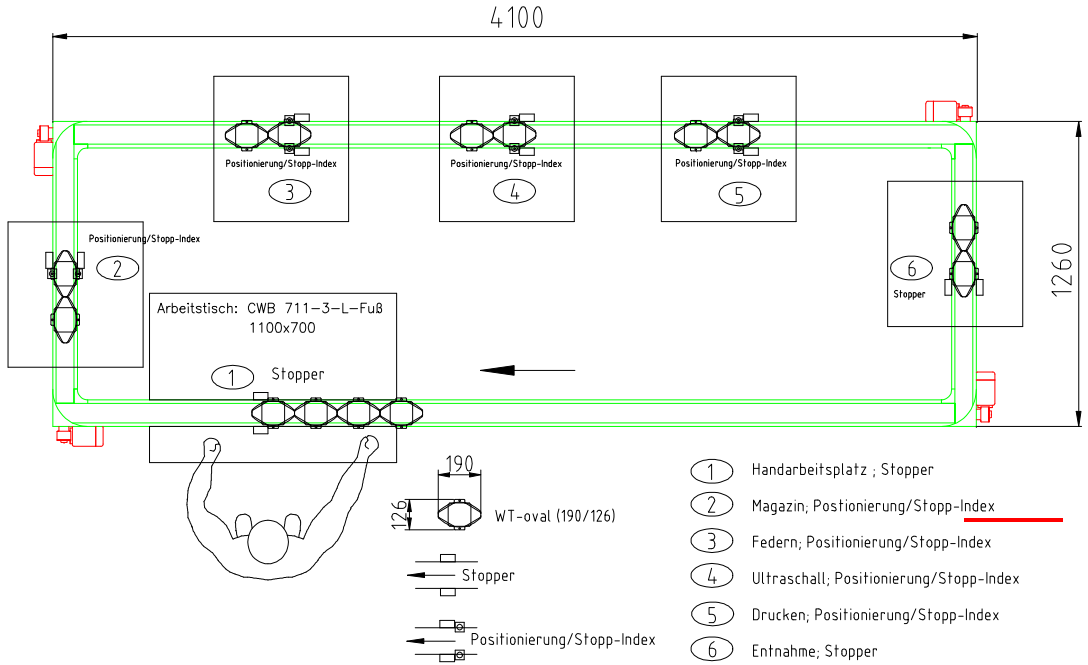
WT - oval an handbetätigtem Doppelstopper zur Vereinzelung am Arbeitsplatz



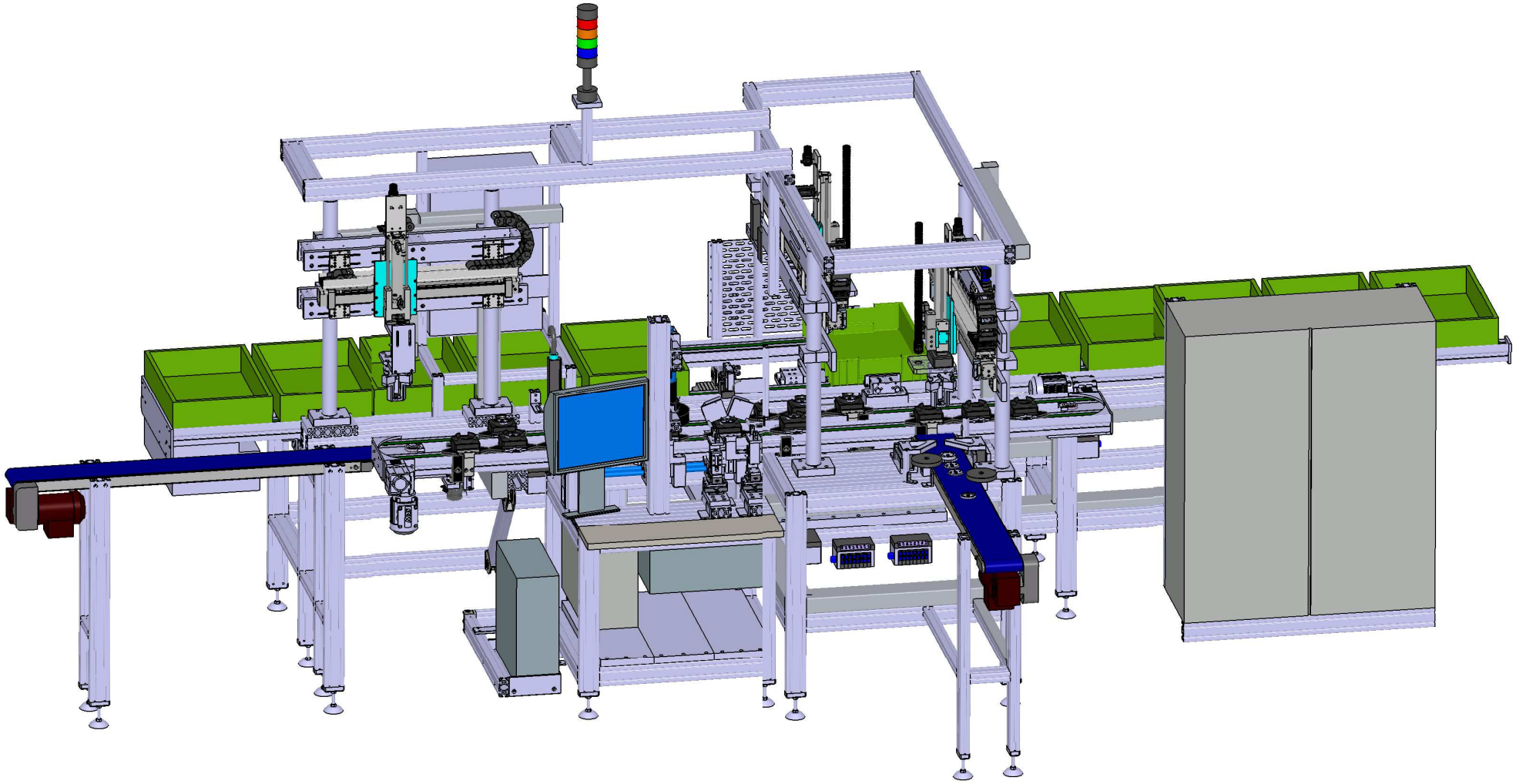
# Assembling, welding, printing, verifying of electronic parts (WT oval)

Die kompakte Anlage mit austauschbaren Automatikstationen zur flexiblen Konfiguration

WT - oval an Handarbeitsplatz. (hier für 2-fach-Handarbeitsplatz-Variante konfiguriert)....



# Verifying, marking, palletizing, transport with LFS 180° and double-track-system



# Laser measurement and camera measuring
# 100 % - Inline-Testing with 6-Sigma measurement


# Marking the parts after testing


After the 100% test of the parts, the good parts will be marked.


# Palletizing of the parts in boxes (KLT)

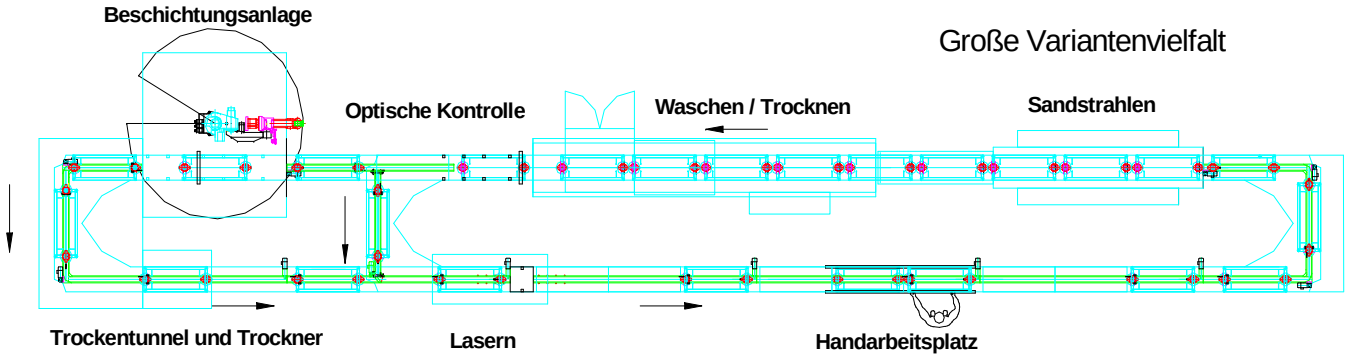
Tested good parts are taken individual from the workpiece carrier and will be multilayer palletized in a box.

The gripper is adjusted on the parts-family, to package several parts without reequipment and to prevent those from damage.

# Sandblasting, washing, measuring, coating, testing of light metal parts (WT long)


Leichtmetall - Gussteile für die PKW - Innenausstattung

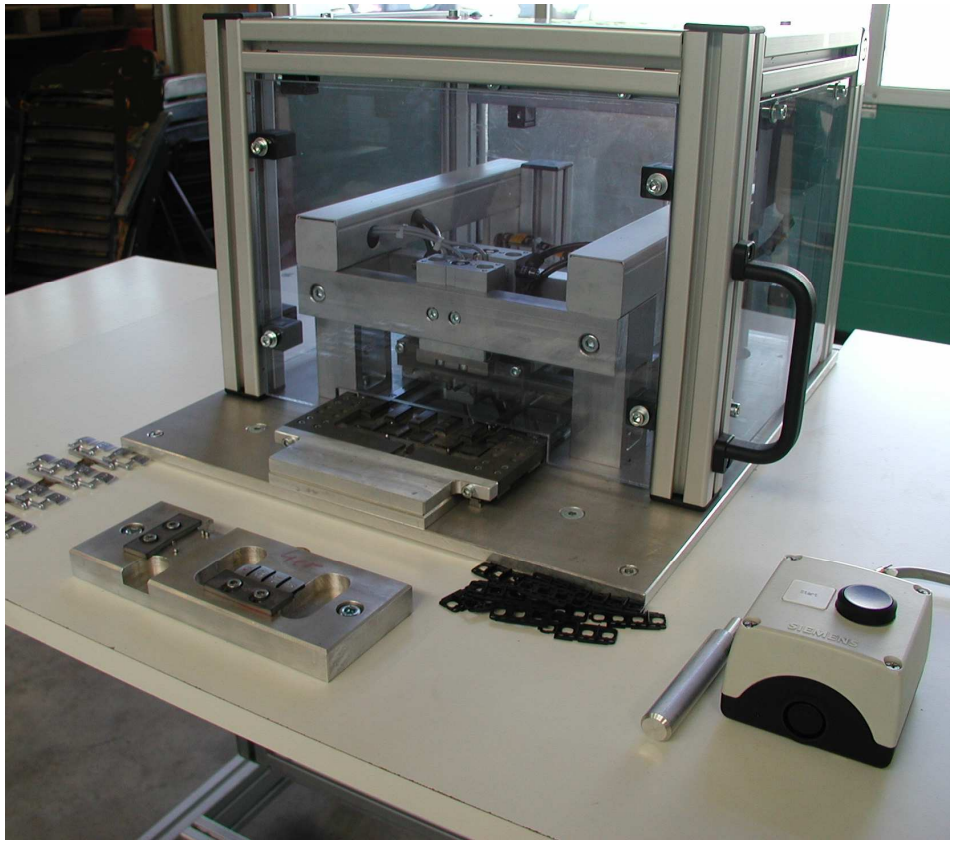
Große Variantenvielfalt



# Workpiece Carrier - System LFS as double track-system for box-palletizing (KLT)

- **WT – double track**
  - **Box (KLT)-supply, buffer**
  - **Box (KLT)-positioning with lift station**
- **Robot-palletizing** of automotive parts from the test station with boxes (KLT) until the complete packaging
- **Box (KLT)- further transport** and supply for the operators

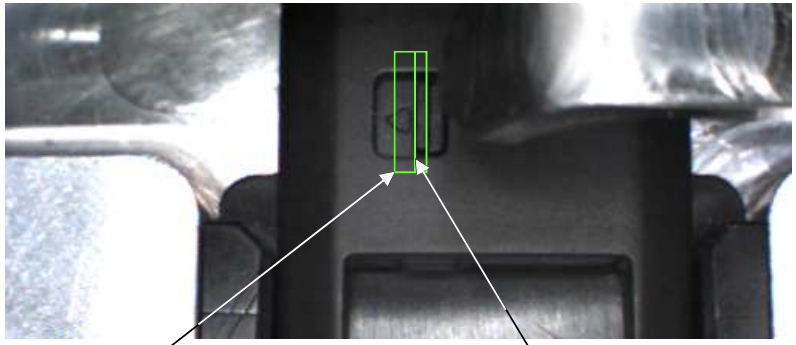
# Single work place with automatic cutting station



For a precisely cut between injection molded parts and the sprue.

# Assembly Testing Automat with workplace and camera testing

(100%-Assembly- and function-testing)



Testfield of the camera

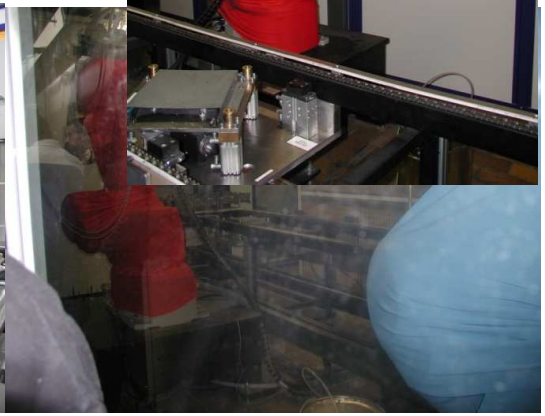
Recognized workpiece edge


The parts will be assembled and inserted in the mounting by an operator. The parts will be pressed (with clip checking) in the automat.The function of the assembly group will be verified and tested with a camera .

# Robot Applications and Complete Systems

Bale-feeding papermachine

As system integrator and official system partner of different robot manufacturers we are able to design and build complete systems.



Painting and powder coating Automotive

Sheet-metal-working Handling and Punching

KUKA OFFICIAL SYSTEM PARTNER

DR. HAFNER

# Special Machines and Assembly Lines

We design and build customized and product-specific special machines as well as assembly lines with testing and packaging in different automation levels.

Full automatic bonding-line with assembly, robot-loading for hardening, printing, testing and packaging.

Hybrid assembly line with vertical work-piece circulation, Kanban-offer and testing (Poka Yoke – Automotive comfort seats)

# *Many thanks for your attention*

## *we are looking forward to your visit*

www.drhafner.de

*[Stop with mouse-click]*

Dr.-Ing. Josef Hafner