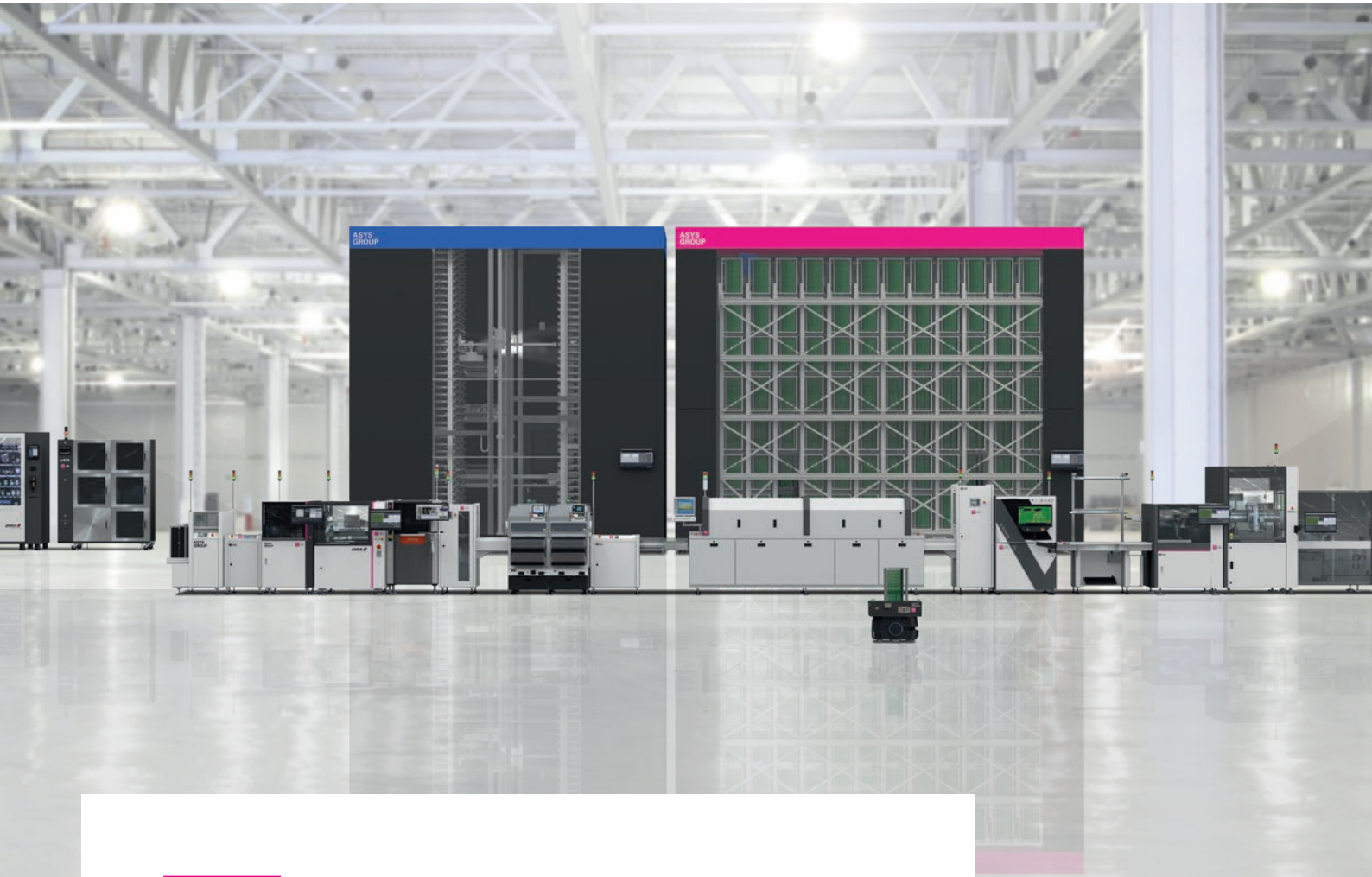
ASYS GROUP

Transforming Ideas

Automate, Digitalize & Connect



Discover Our Unique Product Portfolio

The ASYS Group is a Strong Player in the Electronics, Life Science and Energy Industries

PREVIEW

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PULSE PRO Software Suite
Discover the new compact software solution from ASYS to optimize your production. PULSE PRO offers seven software modules that will help you to control automated material flows in the shop floor ...

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More Transparency & Efficiency on the Shop Floor
In order to enable the entry into Smart Factory, ASYS offers turnkey material logistics solutions for different levels of automation. These can be modular, scalable and individually tailored ...

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Automation Solutions for Life Science Industries
We are your competent partner: from the initial idea up to the finished production line for the manufacture of medical technology products ...

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Research & Development Projects
ASYS is involved in leading industry 4.0 projects, which are funded nationwide and EU-wide. The cooperation with strong partners from the university and industrial environment results in ...

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The ASYS Group – Automation in highest perfection

We have always been committed to innovations that focus on customer needs. In doing so, we move with the times. We link our core business – automation – with two other dimensions: Digitalization and connectivity. We work on unique solutions with vision. The challenges of the future are our strongest driver.

Werner Kreibl | Klaus Mang | Jürgen Ries

Management: Klaus Mang, Jürgen Ries, Werner Kreibl

ASYS GROUP

The ASYS Group is a global technology company and leading supplier of machines for the electronic, life science and energy industry. The ASYS brand guarantees the same high standards of quality and processing standards all over the world.

Business Areas

Business Unit **Electronics**

Business Unit **Life Science**

Business Unit **Energy**

Companies

ASYS Automatisierungssysteme GmbH, the holding company of the ASYS Group, develops and manufactures handling systems and process tools for marking, depaneling and testing as well as customized solutions.

EKRA Automatisierungssysteme GmbH is a specialist for high-end screen and stencil printing systems as well as services and products related to the entire printing process.

ASYS TECTON GmbH develops and manufactures high-end tray handling and transfer systems for standard and customized solutions.

ASYS Prozess- und Reinraumtechnik GmbH develops and produces cleanroom solutions, dry storage systems and special solutions for climate control and conditioning of process machines.

Botest Systems GmbH develops and manufactures test and measurement systems for the electronic industry and for organic semiconductors.

TOTECH Europe BV deliveres globally to the world's top tier OEM and EMS companies for ultra-low humidity storage systems.

motives software GmbH develops complete software solutions in the MES environment in the field of industrial automation with a focus on material logistics, monitoring, order management and customer-specific solutions.

Brands

ASYS LIFE SCIENCE

ASYS SOLAR

Suppliers within the ASYS Group

ASYS Metall GmbH manufactures custom metal frames and complex machine housings.

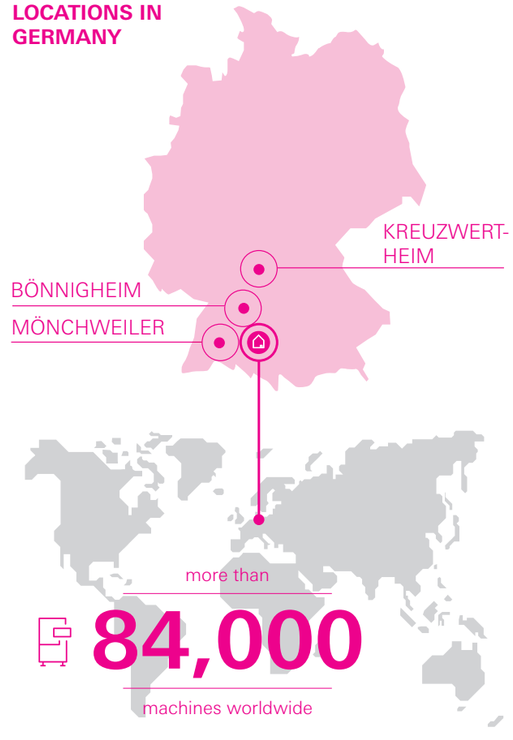
MEVO Pulverbeschichtung GmbH specialists in powder coating of steel and non-ferrous materials.

"German Engineering" and Manufacturing

The corporate headquarters in Dornstadt near Ulm coordinates activities across five continents and guarantees highest standards in quality and service. The ASYS Automatisierungssysteme GmbH is the holding company for all the activities of the overall corporate group. It benefits from a powerful, modern infrastructure: all instances from machine frames to surface finishing and machine equipment are located at the site in Dornstadt, Germany.

ASYS Group has installed more than 84,000 systems worldwide. ASYS invests continuously in state-of-the-art production processes at its worldwide sites. The production space at the headquarters in Dornstadt is constantly increasing and currently amounts to more than 27,000sqm.

LOCATIONS IN GERMANY



Made in Germany

ASYS products exemplify the prestigious "Made in Germany" trademark: precise, high quality systems and machines that are intuitive to use and offer best functionality.

ASYS PRECISION LABEL 6σ APPROVED

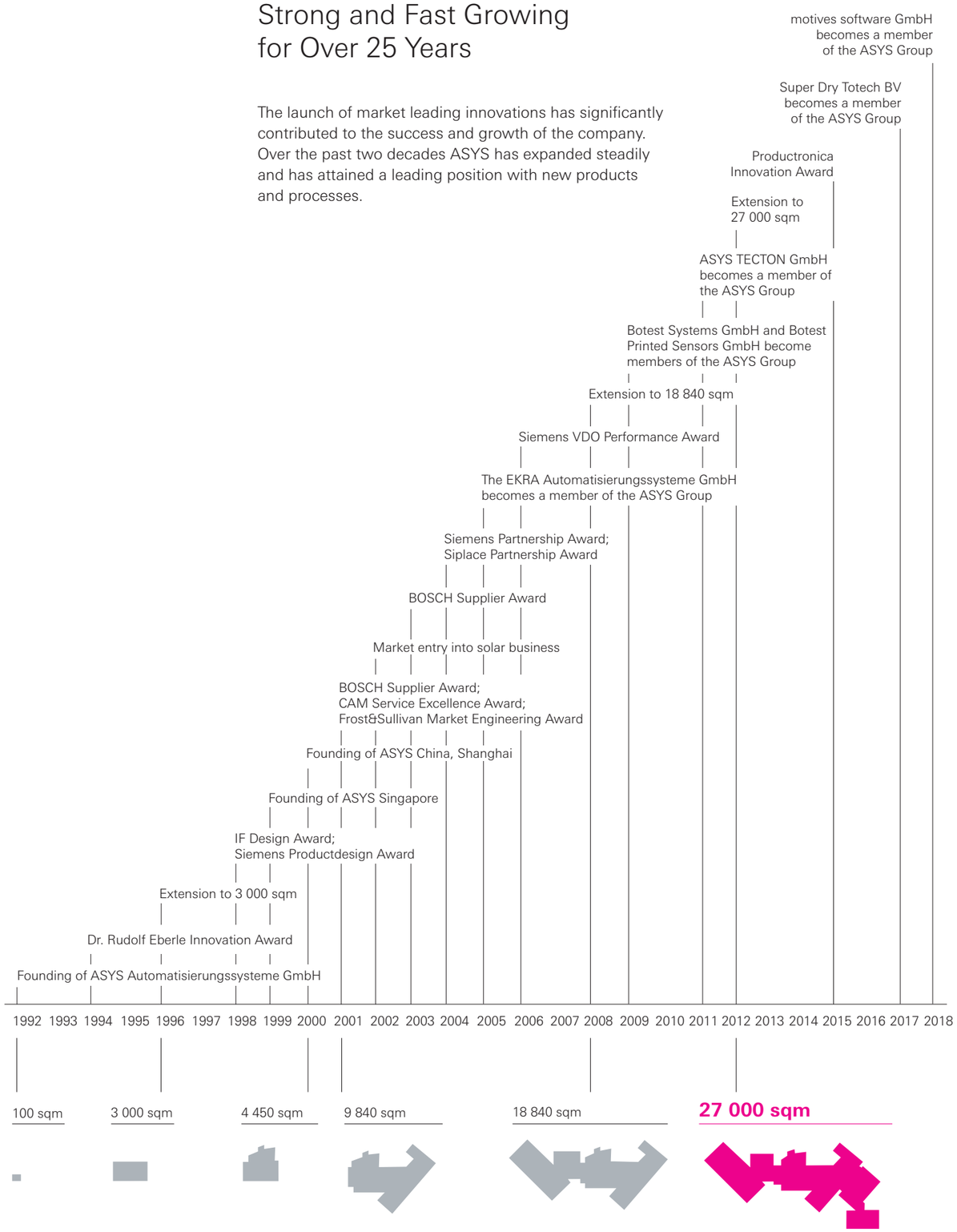
6 Sigma Quality Standard
Screen printers of EKRA and ASYS SOLAR provide high precision for all production demands. 6σ (sigma) is a standard that guarantees maximum quality in manufacturing. The sigma rating is an indicator for the percentage of mispositioned prints resulting from the machine alignment capability. For the purposes of illustration: 3 sigma means that one part out of 370 parts is misaligned. 6 sigma means that one part out of 500,000,000 parts is misaligned.

EQ ZERT DIN EN ISO 9001 ISO 9001 Reg.-Nr. QM 25 0841 ZERTIFIZIERT zertifiziertes Qualitätsmanagementsystem

ISO 9001
ASYS Automatisierungssysteme, EKRA Automatisierungssysteme and ASYS TECTON are ISO 9001 certified, which emphasizes the commitment to quality. The standard guides the definition of processes within ASYS – covering the entire product life cycle, from market development, design and manufacture of equipment to decommissioning.

Strong and Fast Growing for Over 25 Years

The launch of market leading innovations has significantly contributed to the success and growth of the company. Over the past two decades ASYS has expanded steadily and has attained a leading position with new products and processes.



Our Success Factor: Dedicated People

The success of the ASYS Group is based on the qualification and personal commitment of more than 1200 employees. Inspired and dedicated people are the key to developing and providing first-class products.

Worldwide	America	Rest of Europe	Germany	Asia
1200	33	43	1122	72

Our Promise:

Transforming Ideas

We are moving with the times: this is reflected in our product innovations, our way of working and our way of thinking. Last but not least, we send this message with our new slogan: Transforming Ideas. That is our promise. Short, concise and to the point.

Automate – Digitalize – Connect. Our drivers, then and now, always originate from an idea at the very beginning.
An idea that sets no limits, that may be unconventional, crazy and daring. An idea which we pursue, whose thoughts we follow, which we spin on and which we turn into something tangible. To ultimately offer you products, solutions and services that make a real difference.

Ideas could fail, they just shouldn't be missing. Ideas are our key to success. Transforming Ideas – implementing ideas is what we do, short and concise. We include every area of our business: be it products, solutions, research & development or creative processes. Day after day we dedicate ourselves to these ideas. That is our promise.

ASYS GROUP

Transforming Ideas

Automate, Digitalize & Connect

"We constantly open up markets with new, unique solutions that no one else has considered before. Because we allow ourselves to pursue ideas in any direction, we are one step ahead. This has enabled us to achieve a pioneering position. We are proud of this, it drives us forward."

Werner Kreibl, Founder and Managing Director of ASYS Group

"We can only achieve progress if we reinvent ourselves again and again. Every idea is worth a closer look, because it means growth. No matter in which direction it ends up. In this way, we remain dynamic and agile."

Jürgen Ries, Managing Director of ASYS Group

"With a good idea, we went into business for ourselves back then. We combined standard processes in electronics production with our handling modules, revolutionizing and automating electronics production. And we continue to adhere to this approach. We are advancing with our ideas and have therefore been able to grow so quickly and successfully."

Klaus Mang, Founder and Managing Director of ASYS Group

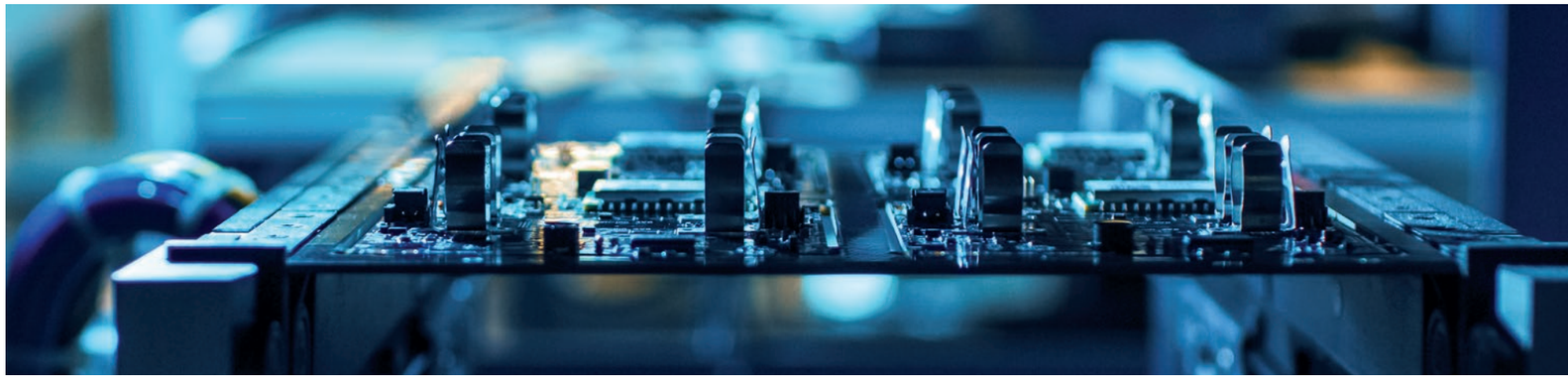
Our Mission:

Automate, Digitalize & Connect

Three words that describe what we do. Three words that express our claim to our products and solutions. Three words whose combination makes us unique in the industry. They express our competence as a company. They are a promise that is understood and carried by customers, partners and employees all over the world.

AUTOMATE...

... is part of our identity as a company. This is where we come from and this is the path we continue on. It stands for our solution and performance competence – with all employees worldwide. We have started with the automation of individual processes. We have expanded this knowledge. By automating the entire line, we have arrived at the automation of an entire factory.



DIGITALIZE...

... is the inspiration behind every innovation. Every new ASYS solution takes our customers one step further on the way to digital manufacturing. In the context of industry 4.0, we rely on our comprehensive software solutions. They lay the foundation for linking processes at factory level. Our self-understanding is to accompany and support our customers in this development and change process.

CONNECT...

... describes the way we think. The focus is on openness. We share our knowledge, connect it and let new things emerge from it. We connect machines with machines, machines with software, machines with people and people with people.

ASYS GROUP GENERATION SMART

Together with you, we develop scalable, smart solutions that adapt to your needs. From automatic product changeover to the "digital twin", all the way to the fully autonomous factory.

ACC 3 SS 60° + 24 7 365 + CARE 0

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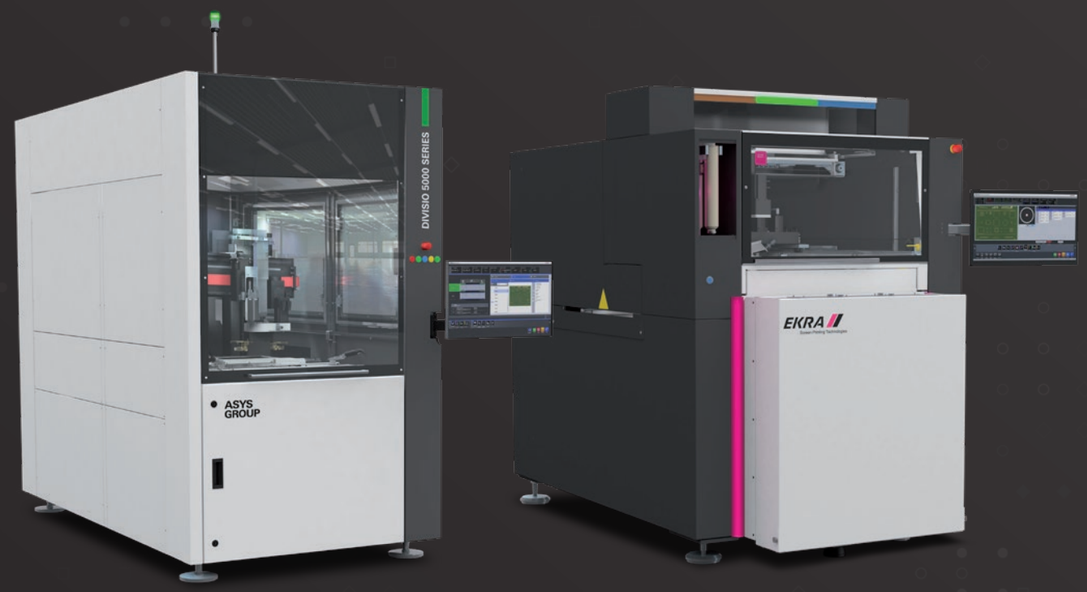
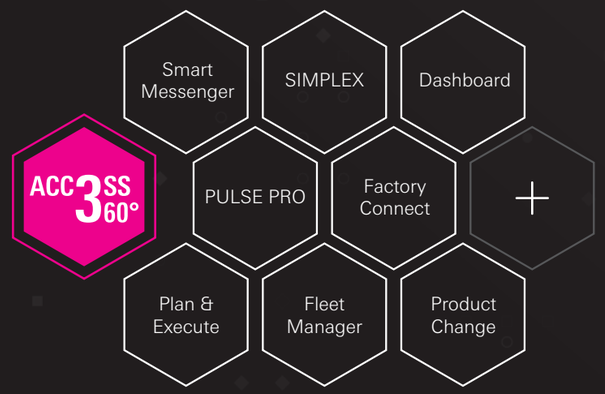
ASYS GROUP
GENERATION SMART



Networking

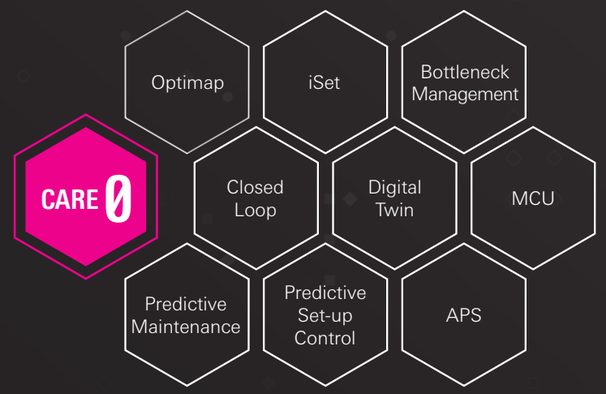


Access 360°
Connections and information exchange in all directions

Continuous Production

24 / 7 / 365
Operatorless work around the clock

Intelligence



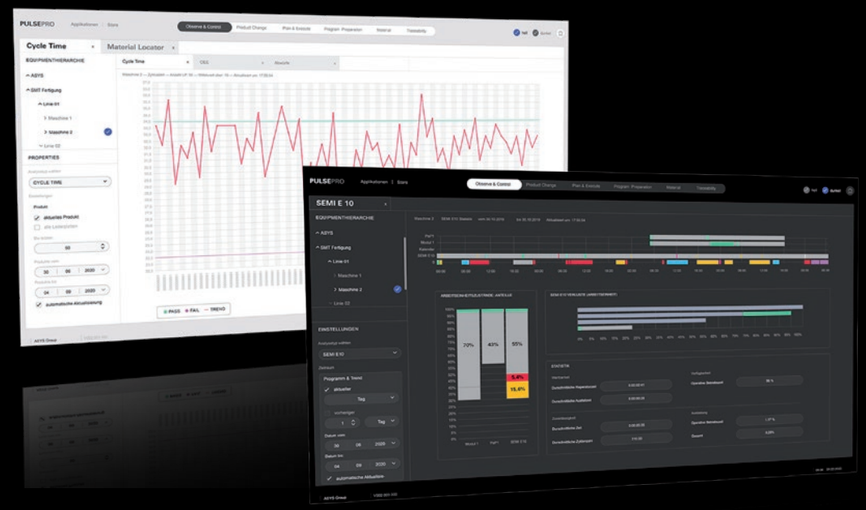
Care Zero
Autonomous process optimization in a closed-loop principle

Generation Smart Features

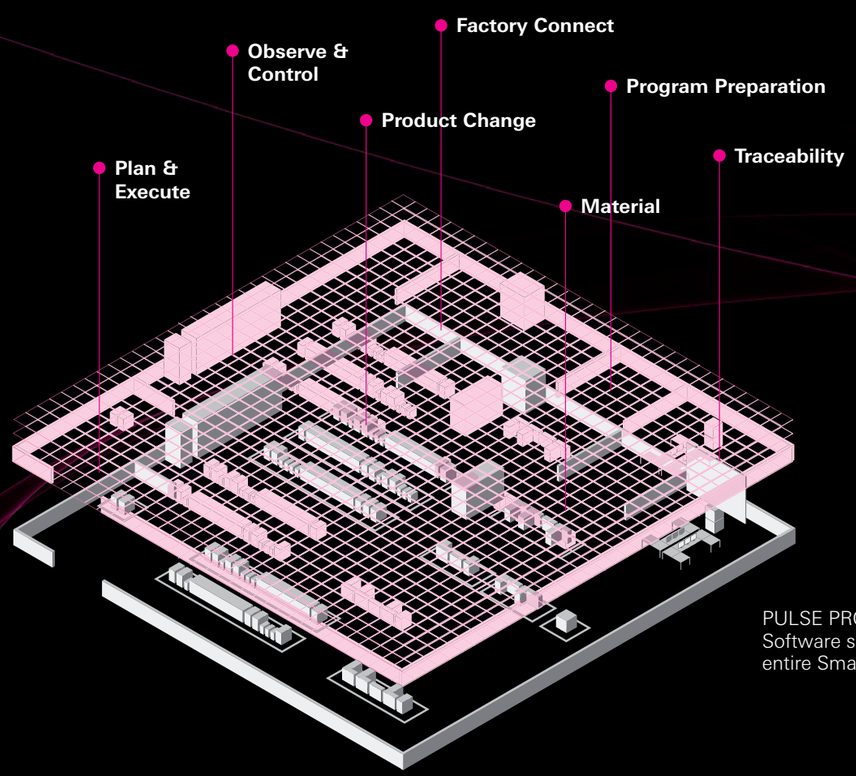
PULSEPRO

The new ASYS Software Suite

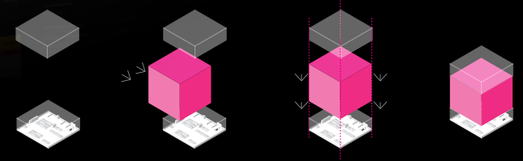
Discover the new compact software solution from ASYS to optimize your production. PULSE PRO offers seven software modules that will help you to control automated material flows in the shop floor, to achieve a dynamic just-in-time supply for each production step and to track all data flows. PULSE PRO is easily operated via a cockpit and meets the highest demands for simple handling. The high quality usability is based on the tasks of the operators. Even with complex contents and functions, the users find their way to their goal quickly and easily.

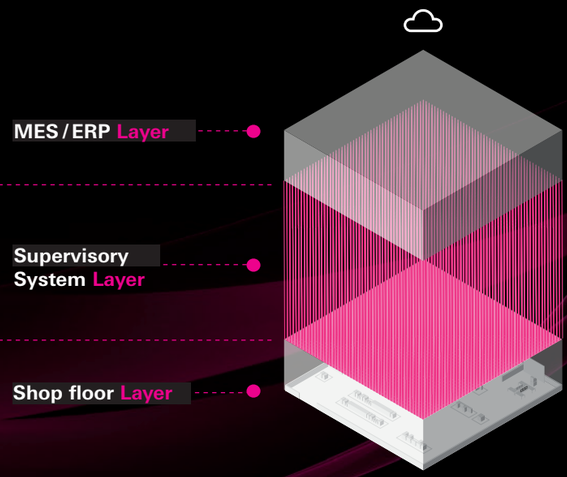


Smart Factory Software Layer



PULSE PRO
Software solutions for the entire Smart Factory.





MES / ERP Layer

ASYS Software Suite
The Control Center of the Smart Factory

Supervisory System Layer

Shop floor Layer

Closing the Gap between Shop Floor & MES/ERP

With PULSE PRO, the operator has the production in sight and can achieve an optimum of productivity. In this way, the faster growing complexity becomes manageable. PULSE PRO Software Suite is the control center of the Smart Factory and offers solutions on all layers with the multiple Apps. This closes the gap between the shop floor and the MES/ERP systems. PULSE PRO easily switches between existing systems and complements the functions that are still not or only in parts considered. The integration into a production line can be done in several steps if desired due to modularity and easy scalability.

Open Interfaces & Connections to all Systems

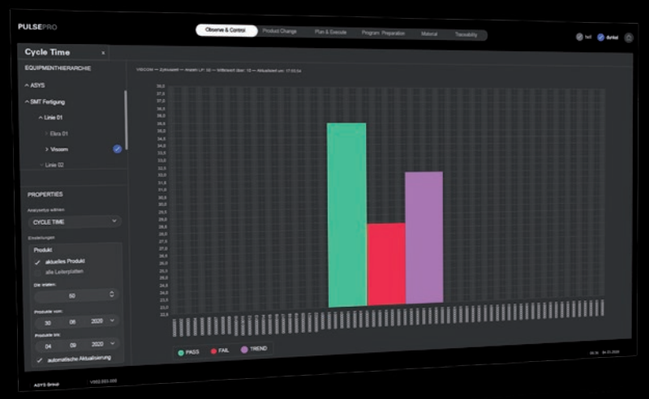
The base of a Smart Factory is an overall connection of the entire shop floor. All systems have to be connected to achive a real added value. ASYS is an expert in implementing connections and interfaces between different systems and offers the right software solutions. The own powerful “ASYS Standard Interface“ is used for the connection of machines of different manufacturers. In addition, control systems can be networked with interfaces such as IPC/CFX or SEMI SMT-ELS.

Additionally, the PULSE PRO software solutions are able to connect to MES and EPR systems. ASYS has already implemented more than 5,000 connections to all common systems and orchestrates the shop floor with smart apps from the PULSE PRO Software Suite.

Software Modules

The PULSE PRO Software Suite consists of seven modules, which contain various smart apps. These can refer to single machines, a whole line or the complete factory.

PULSEPRO



Observe & Control

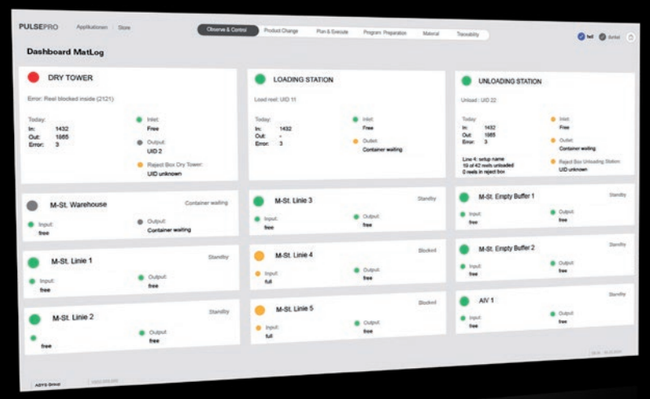
The PULSE PRO module “Observe & Control“ offers a variety of monitoring possibilities to keep the overview of all connected machines. The operator always knows what is going on in every situation. The data is put into relation and is summarized according to standardized specifications. The tool maps the performance of the entire shop floor. Interrelationships become clearer, bottlenecks and downtimes are clearly visualized and can be effectively addressed or even avoided with foresight. Always following the goal of keeping production running and increasing productivity.

Plan & Execute

All orders on the entire shop floor are precisely planned in the PULSE PRO module “Plan & Execute“. The orders and production times are clearly displayed in Gantt diagrams. The automatic planner distributes selected production orders on n-SMD lines and can be optimized manually. The result is influenced by the planner by parameters (e.g. weighting of the delivery date, number of setup changes, etc.). The different simulation results can be created, deleted and compared. The best simulation result is transferred to the live planning.

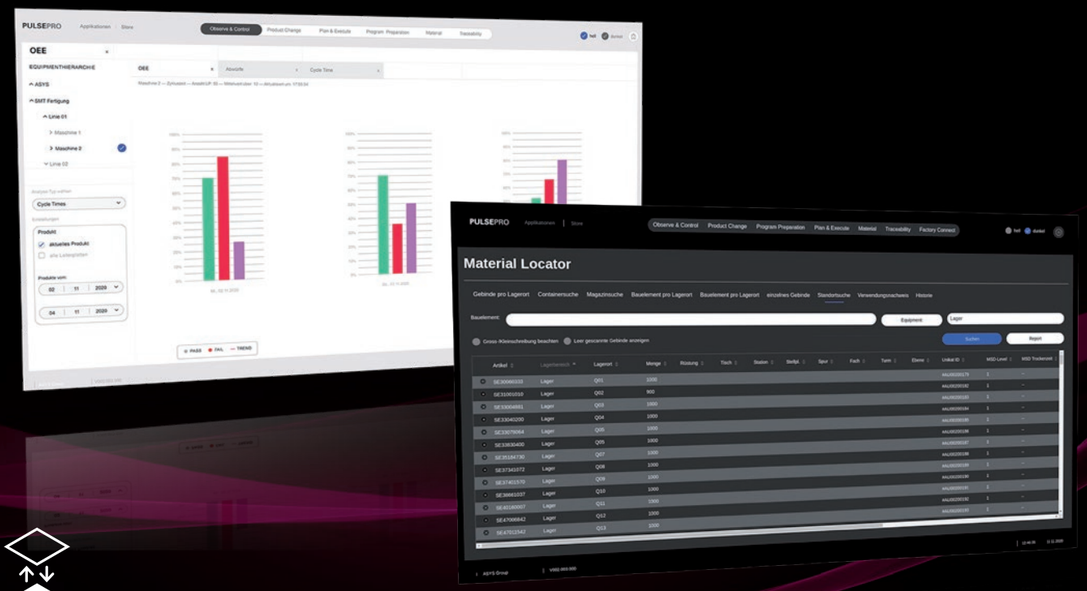
Product Change

In the PULSE PRO module “Product Change“ the product change at the line is triggered by only one click. The parameters are sent to all machines of the line and all settings are stored in a global database. These can be checked, changed and duplicated at any time. This results in a faster NPI (New Product Introduction) compared to programming on single systems. All ASYS Group machines as well as third party systems can be integrated.



Program Preparation

With the offline programming tools in the PULSE PRO module “Program Preparation“, the machines can be programmed at a PC workstation while another program is running. This reduces the downtimes significantly.



Factory Connect

In the PULSE PRO module “Factory Connect“ data can be exchanged with an ERP/MES interface. The order data and material data (UID and RFID) can be imported from a superior system for detailed order planning. For a timely and optimal disposition, production accounts in the ERP system are adjusted and changed depending on the material movement in the production. Status and error messages from machines can also be automatically transferred to a higher-level system via the CFX interface (PULSE interface). Furthermore, an interface is provided for synchronizing a higher-level factory calendar.

Material

The quantities and states of all materials on the entire shop floor are clearly documented in the PULSE PRO module “Material“. All component reels, trays and PCBs are managed on the basis of Unique ID (UID) and the replenishment of material is controlled autonomously, which reduces the operator’s workload. Furthermore, the floor life time of moisture-sensitive components is monitored. Based on the order planning, full or empty magazines are autonomously controlled within the entire shop floor between lines and storage locations. Therefore all modules are integrated and connected for autonomous transport.

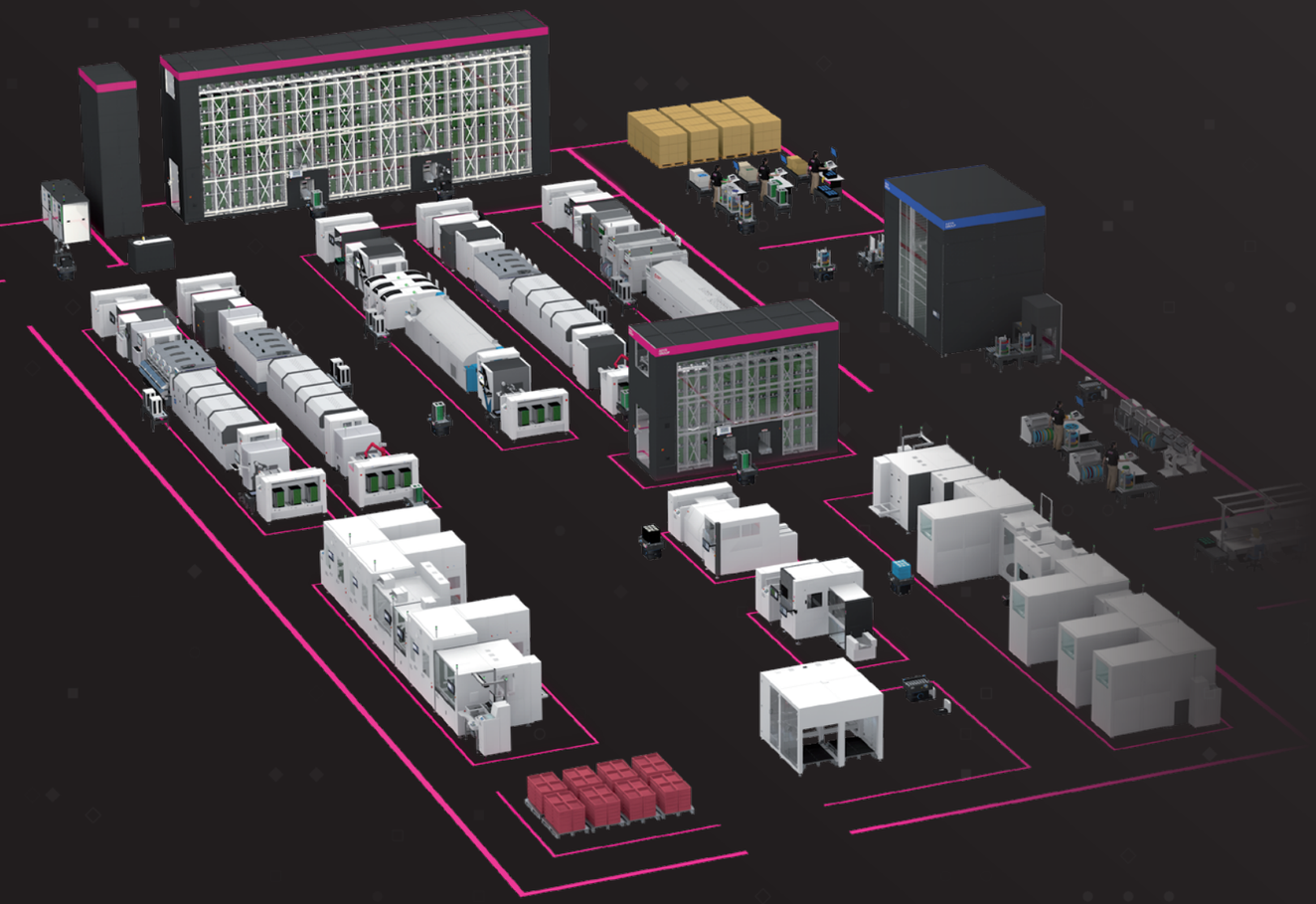
Traceability

The PULSE PRO module “Traceability“ offers the possibility to trace various product data on the entire shop floor. The system records which material with which UID was installed on a certain printed circuit board at the exact time. Different data sets per order or PCB can be generated depending on the software and hardware requirements. The recorded traceability data is stored in an internal database and can be visualized at any time.

MATERIAL LOGISTICS
More Transparency and Efficiency on the Shop Floor

In order to enable the entry into Smart Factory, ASYS offers turnkey material logistics solutions for different levels of automation. These can be modular, scalable and individually tailored to the respective requirements. Thus, the first step towards the production of the future can be started today.

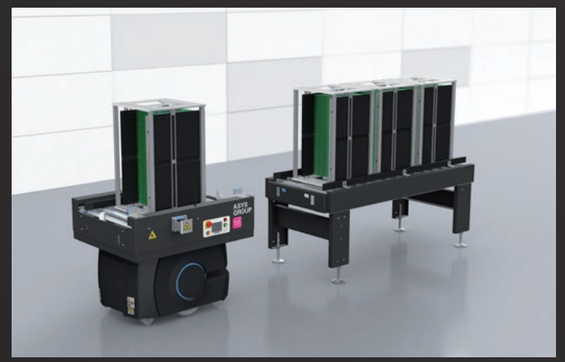
The Smart Factory consists of the five central processes – material inbound, storage, line setting, line support and transport. For this purpose ASYS offers complete solutions in the field of MATERIAL LOGISTICS, starting with incoming goods, through individual production processes up to outgoing goods, which cover the different requirements on the shop floor.

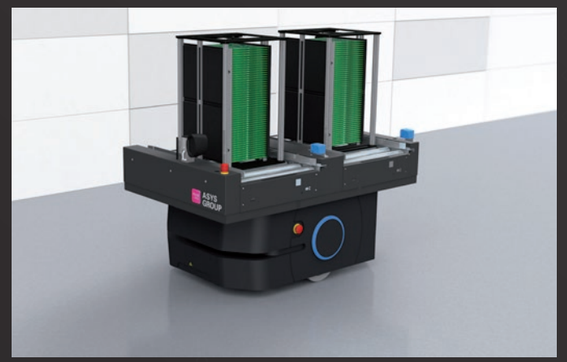


Transport Solutions

In production, all materials, such as PCBs in different production states, components in form of component reels, JEDEC trays or sticks as well as consumables, for example for the printing process, must be considered. ASYS supplies standardized and automatable containers for their autonomous transport. The material is distributed via autonomous transport systems – the ASYS AMRs.

Thanks to various platforms, they can realize any material transport as required. An important task here is to provide the line with the material "just-in-time". The goal is to reduce line stops to a minimum and maximize process efficiency. Once the factory layout has been programmed into the software, the transport robot moves fully autonomously.





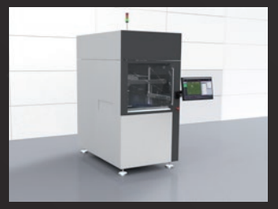
Material Inbound

ASYS offers a material inbound solution which, due to an integrated, fully automatic Scan&Label station, allows materials such as consumables, raw PCBs or component reels to be traced right from the start. Other materials are possible on request. The ASYS material inbound scenario for component reels includes a component counter, which counts the existing components on a reel and feeds exact values into any existing inventory database. It is also possible to insert scaled-down component reels. This ensures a valid and coordinated process that eliminates the need for manual inventory of the component reels.

Loading/Unloading

Component Counter

M-Station Reel



Scan&Label

Automated & centralized storage solutions for the shop floor

Fully automated storage systems such as the ASYS Material Warehouse for PCB magazines, KLT boxes and trays and the Dry Tower for component reels are available for the storage of various materials. Buffer solutions in the form of M-Stations can be used for temporary storage.

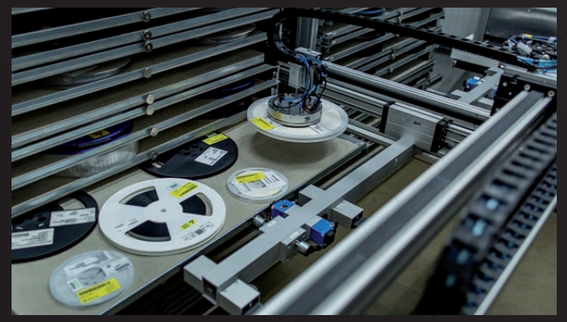
Material Warehouse

In the Material Warehouse, printed circuit board magazines or other materials are automatically stored in KLT boxes in a shelf system according to a chaotic storage concept and can be retrieved at any time. Thanks to clear identification, each magazine is completely traceable.

Optionally, the storage conditions can be adapted to the respective requirements of the stored material, e.g. temperature or humidity can be regulated to meet MSD requirements.

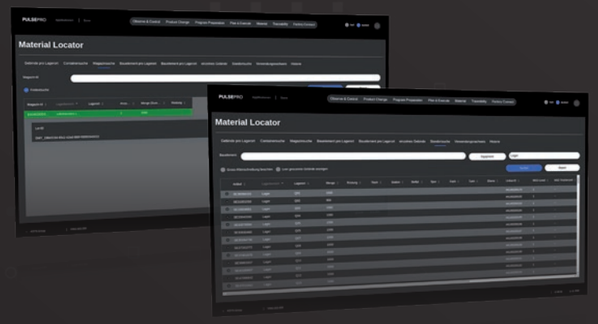
Dry Tower

The Dry Tower from ASYS/Totech is a fully automated system for the storage of component reels and JEDEC trays and enables autonomous material handling without operator interaction. The system has a proven and advanced drying technology and offers the possibility of controlled storage as well as active re-drying of moisture-sensitive MSL components. Furthermore, due to its consistently modular design, it can be adapted to a wide variety of requirements in terms of size and storage needs. Starting with the storage of the components in the system up to the removal for production, all relevant data of the component processing are stored in a database. This results in a fully automated and reliable storage system that is customized for intelligent SMT electronic manufacturing.

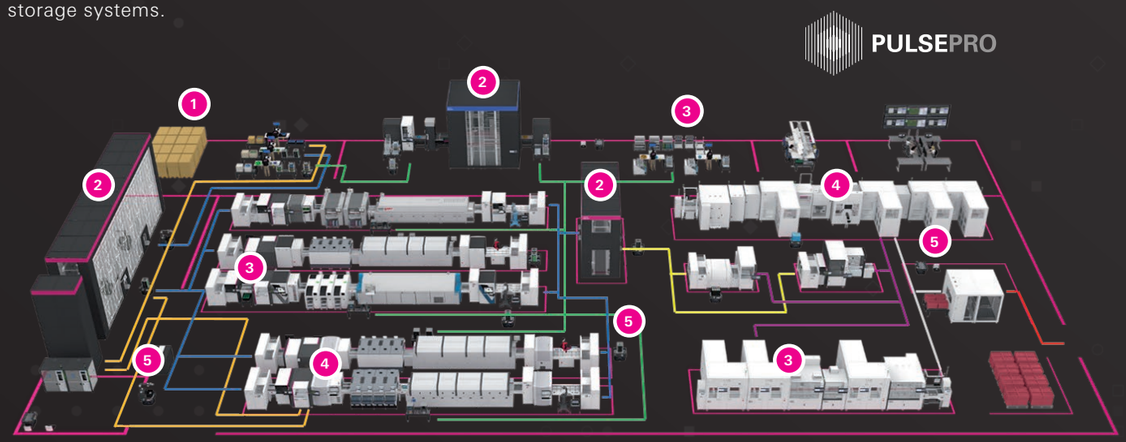


PULSE PRO – Automate, Control, Trace all Material Flows & Types

The quantities and states of all materials on the entire shop floor are clearly documented in the PULSE PRO module “Material”. All component reels, trays and PCBs are managed on the basis of Unique ID (UID) and the replenishment of material is controlled autonomously, which reduces the operator’s workload. Furthermore, the floor life time of moisture-sensitive components is monitored. Based on the order planning, full or empty magazines are autonomously controlled within the entire shop floor between lines and storage locations. Therefore all modules are integrated and connected for autonomous transport.



The broad product portfolio of the ASYS Group offers solutions for a wide variety of applications and use cases. From the connection of inbound goods to multi-level storage concepts, line supply with PCB magazines or the separation of frontend and backend by using flexible storage systems.



1 Material Inbound
2 Storage / Buffer
3 Line Setup
4 Line Support
5 Transport

INVENTUS
Customized Solutions
FINAL ASSEMBLY

When it comes to intelligent and high-efficient manufacturing solutions, the unique portfolio of the ASYS Group offers the perfect toolbox for the configuration of automated solutions. Whether it is a single system, island solution or interconnected line network, ASYS is the partner from the initial idea to the turnkey solution.

Efficient Solutions Through Know-how and Collaboration

To create a demand-oriented and economical solution, we rely on close collaboration with our customers from the very beginning.
According to the project requirements we use the knowledge of experts from our divisions and process department. Tests to ensure the product quality and validate the solution are also part of our diverse repertoire. For this purpose, our laboratories for image processing, laser application, process development and investigation, as well as our partners are available. In addition, we use our simulation programs to analyze motion sequences and connected systems at an early stage to ensure the planned performance. FMEAs and Ishikawa diagrams, as well as passing through our internal quality gates, performance and stress tests are part of our routine procedure.

Cross-divisional Synergies

Processes are the central and value-adding elements of every automation solution. Due to this, we focus on the specific requirements of the corresponding process and combine or complete them as needed. Thereby, we make use of our standardized toolbox, which makes flexible and individual solutions possible. Through this approach we ensure maximum reliability for the overall application.

Joining via force-locking, form-locking and material-locking processes

Dispensing of adhesives, thermal pastes or greases

Cleaning through laser, plasma or pressure / vacuum

Marking with laser, label or ink

Separating using router bit, saw or laser

Printing by stencil, screen or tampon

Our modular assembly platforms allow, apart from best accessibility, flexible planning and scalable solutions.

INVENTUS
Customized Solutions
FINAL ASSEMBLY

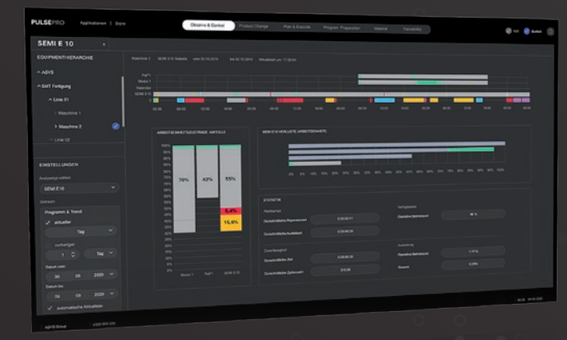
Test and Verification

To ensure product quality, every process requires appropriate testing. For this, our toolbox also provides the right solution. Our modules can be integrated directly into the process unit or, depending on the requirements, carried out afterward.

- Electrical testing such as in-circuit tests, frequency tests or the principle-related flashing
- Two- and three-dimensional measurements for the inspection of surfaces and complex shapes
- Physical measures for the determination of forces, distances, masses or leak detection

Real-time Data and Traceability

With our Software Suite PULSE PRO, we also have the perfect elements to configure demand-oriented and specific solutions. This includes that the operating personnel receive all relevant messages, sorted by priority, and are informed in advance about the material fill levels, besides further features. In addition, production planning and management can centrally analyze and asses the real-time data and performance history of the connected systems. For ASYS the complete data collection and traceability, of the individual components or batches as well as process and test values, is for granted.



- PULSE PRO Software Suite for analysis, evaluation and traceability
- SIMPLEX User Interface

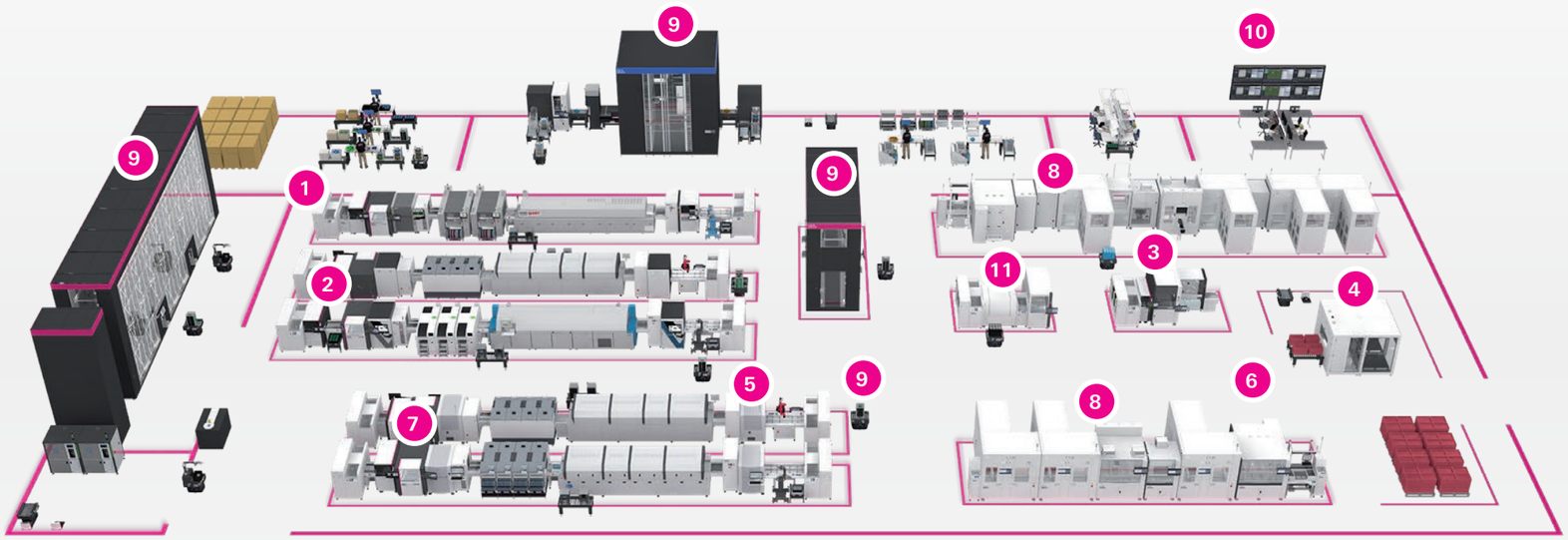
Over the past 20 years, ASYS has realized over 200 assembly projects with more than 2,000 individual tasks.

Automation solutions for the electronics industry

The roots of the ASYS Group are in automation. The initial idea of offering standard systems for handling in electronics production marked the beginning of a steep success curve.

In the meantime, the ASYS Group covers 75 percent of an electronics production with its products. The initial urge to automate is becoming established in all product developments.

PULSEPRO
ASYS Software Suite



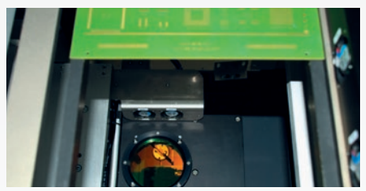
1 VEGO
Handling

VEGO Compact
Standard handling systems using proofed ASYS technology

VEGO Dynamic
High-end handling systems for highest demands

VEGO Hybrid
Handling systems for fragile substrates

2 INSIGNUM
Marking & Verifying



INSIGNUM Laser
Laser Marking Systems

INSIGNUM Label
Label Application Systems

INSIGNUM Variety
Marking and cutting labels by laser

INSIGNUM Scan
Reading Systems

3 DIVISIO
Depaneling

DIVISIO Router
Automatic and semi-automatic routing systems, perfect for cutting freeform contours

DIVISIO Saw
Highly efficient depaneling systems ideal for V-scored PCBs

DIVISIO Lean Production
Process Integration

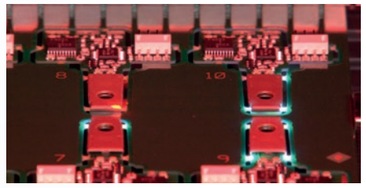
DIVISIO Drill
Drilling of holes for the assembly of LED-optics

4 TECTON
Tray Handling & Transfer

TECTON PARIO
Modular designed tray handling systems

TECTON MOTUS
Multi-purpose transfer systems for reliable process interconnection

5 POLYPHOS
Laser Solutions



POLYPHOS DP
Laser Depaneling

POLYPHOS CT
Laser Cutting

POLYPHOS MK
Laser Marking

POLYPHOS WL
Laser Welding

POLYPHOS CL
Laser Cleaning

POLYPHOS SL
Laser Soldering

POLYPHOS MM
Laser Micro Machining

6 ASYS CLEANROOM

LAMINO
Laminar Flow Systems

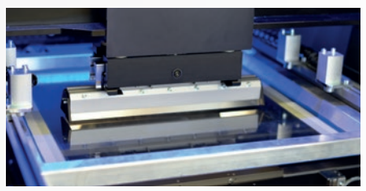
MOVEO
Storage Lift Systems

CLEANUM
Cleanrooms

CONSIDUS
Dry Storage Systems

VERDICO
Climate Module

7 EKRA
Printing



SERIO
Screen and Stencil Printing

HYCON
Special and Thickfilm Printing

S10 SERIES
Consumables and Accessories

UPGRADE OPTIONS
Upgrades for increased print efficiency and for changes in future production requirements

8 INVENTUS Final Assembly

9 MATERIAL LOGISTICS

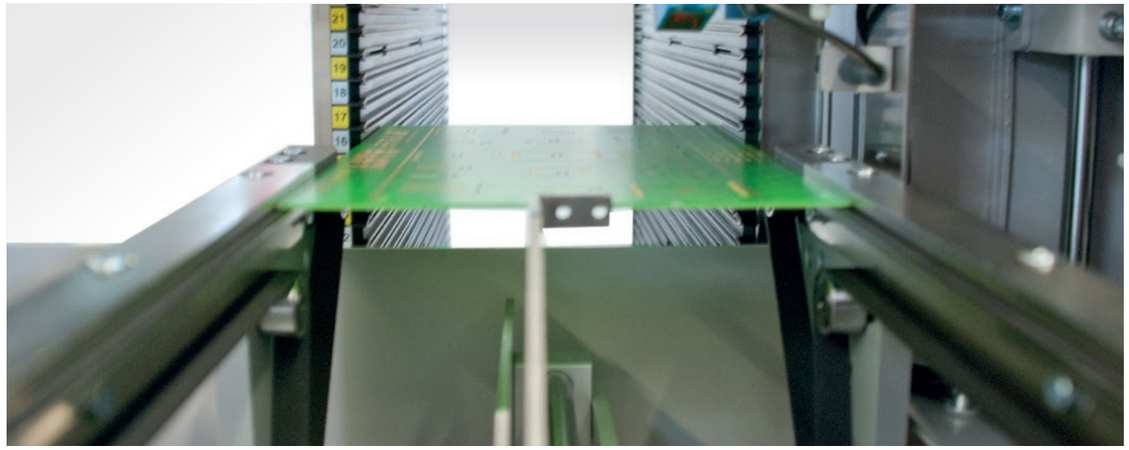
10 PULSE PRO Software Suite

11 Testing

VEGO
Handling

The VEGO series offers the highest reliability and maximum flexibility for SMT, THT, hybrid and other products.

Operate your **VEGO Module via PULSE!**



STANDARD HANDLING

VEGO Compact

› “Efficient & affordable“: modular design with high quality components
› “Economic“: easy maintenance and operation
› Proven and reliable technology

HIGH-END HANDLING

VEGO Dynamic

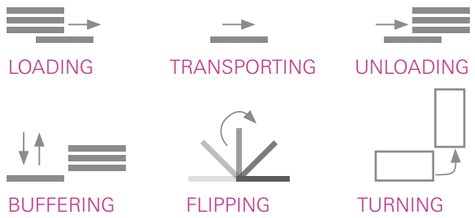
› Highest flexibility and customized solutions
› For a wide range of materials and weights
› Different machine sizes
› Fully automatic product changeover
› Traceability
› Autonomous material supply
› Mobile monitoring and operation

FRAGILE SUBSTRATES

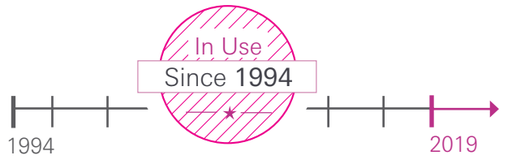
VEGO Hybrid

› Compact design, smallest footprint
› Cleanroom-compatible
› Shortest cycle times up to 3s
› Specially designed conveyor for ceramics
› Gentle transport for fragile substrates

+ FOR DIFFERENT **HANDLING TASKS**



+ **DURABLE!** 20 YEARS AND MORE



Oldest ASYS handling system in use since 1994

+ CONNECTED TO PULSE PRO

INSIGNUM
Marking & Verifying

The INSIGNUM series offers a comprehensive product portfolio of traceability systems to meet the ever-increasing demands of traceability. High-precision marking in the smallest space, in order to cope with the highest cycle time requirements, up to the reading of multipanels in the shortest time, are part of the tasks of our systems. The realization of customized connections or the implementation of standardized solutions complete our portfolio.

HIGH ACCURACY

SHORT CYCLE TIME * OPTIMAP

STANDARDIZED MES CONNECTION

LASER MARKING

INSIGNUM Laser

› Flexible laser solutions for any required application: Standard: CO_2-laser and fibre-laser
› Marking area: up to 610 x 460 mm
› Module size down to 3 mil
› Integrated flip-station

LABEL APPLICATION

INSIGNUM LABEL

› Up to two printers
› Marking area 460 x 460 mm
› Module size down to 7.5 mil
› Different label sizes can be placed in one operation

READING

INSIGNUM SCAN

› Scan area up to 460 x 460 mm
› Module size down to 5 mil
› Different scan systems can be integrated
› Scanning from above/below

LABEL APPLICATION WITH INTEGRATED LASER

INSIGNUM Variety

› Marking and cutting of labels by laser in one step
› Flexible nozzle quick-change system
› Different label sizes can be placed in one operation
› Applies labels to components up to 40 mm high

+ PRODUCT POOL

Quick access to product data of any machine. Programming times are reduced.

+ ASYS MES CONNECTION

Standardized and easy to implement.

+ OPTIMAP

Significant cycle time reduction by combining code positions. Labeling and verification take place in just one process step.

+ OFFLINE PROGRAMMING

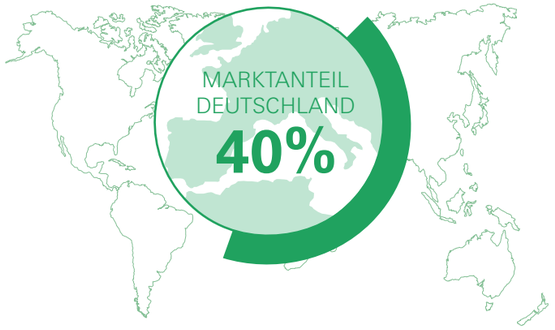
Programming of the plant without machine stop.

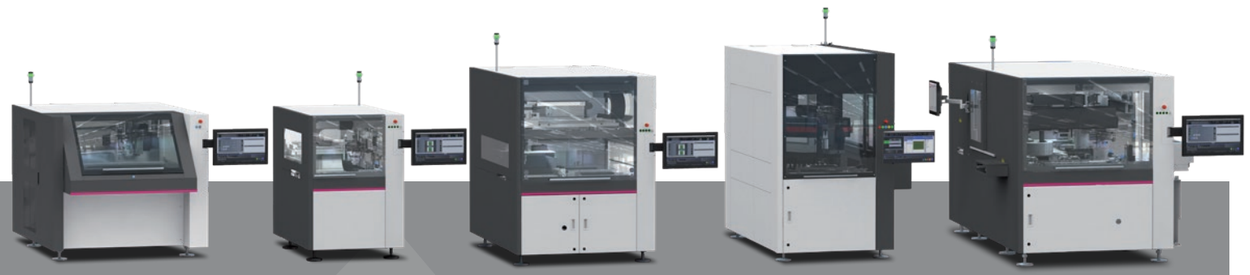
+ SI SIMPLEX
User Interface

+ CONNECTED TO PULSE PRO

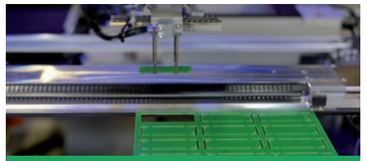
DIVISIO
Depaneling

Every DIVISIO depaneling system has equipped the lastest linear motor and carbon technology. Intelligent sensors ensure an automatic process optimization. Thanks to a smart tool management and “predictive maintenance” the production capacity will increase to 20.5 shifts.





ROUTING



DIVISIO Router

Automatic and semi-automatic routing systems perfect for cutting freeform contours

› Panels up to 720 x 500 mm
› Routing from top or bottom
› Fully monitored tool management
› Predictive maintenance

Different models available:
semi-automatic or fully automatic inline and offline systems

SAWING

DIVISIO Saw

Highly efficient depaneling systems ideal for V-scored PCBs

› Panels up to 460 x 460 mm
› Sawing from top or bottom
› Five times faster than routing

Different models available:
semi-automatic or fully automatic inline and offline systems

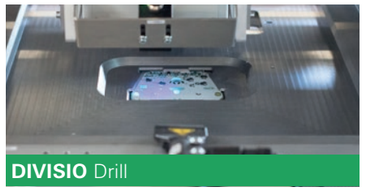
PROCESS INTEGRATION

DIVISIO Lean Production

Efficient DIVISIO depaneling system with various integrable production processes

› Short cycle times
› Safe and tested assemblies production
› Direct interlinking with downstream processes
› Additional product handling not required

OPTO DRILLING



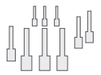
DIVISIO Drill

Drilling of holes for the assembly of LED-optics

› Materials: FR4, IMS aluminum, copper
› Granite base, high resolution axes
› High resolution camera system for object recognition: LED, physical and synthetic fiducial, COB (chip on board)

+ EQUIPPED FOR EVERY CHALLENGE

One adapter set for all products thanks to magnetic pins



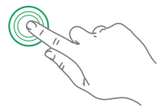
+ TORNADO EFFECT

Highly efficient suction for an almost dust-free environment

+ SELF-OPTIMIZING

Process control and optimizing due to intelligent sensors

+ SI SIMPLEX User Interface



+ CONNECTED TO PULSE PRO

EKRA
Screen Printing Technologies

EKRA
Printing

The EKRA brand is characterized by decades of experience in the development of state-of-the-art printing systems and processes.

FOUNDING EKRA
1946

PRINTING SYSTEMS
SINCE 1976

SCREEN AND STENCIL PRINTING

SERIO

Under the SERIO product range, we offer stencil printers for standard to high-end applications. Each SERIO printer is individually scalable and can be retrofitted in the field at any time. This allows our customers to adapt to short-term changes in the market in a very flexible and uncomplicated way.

SPECIAL AND THICK FILM PRINTING

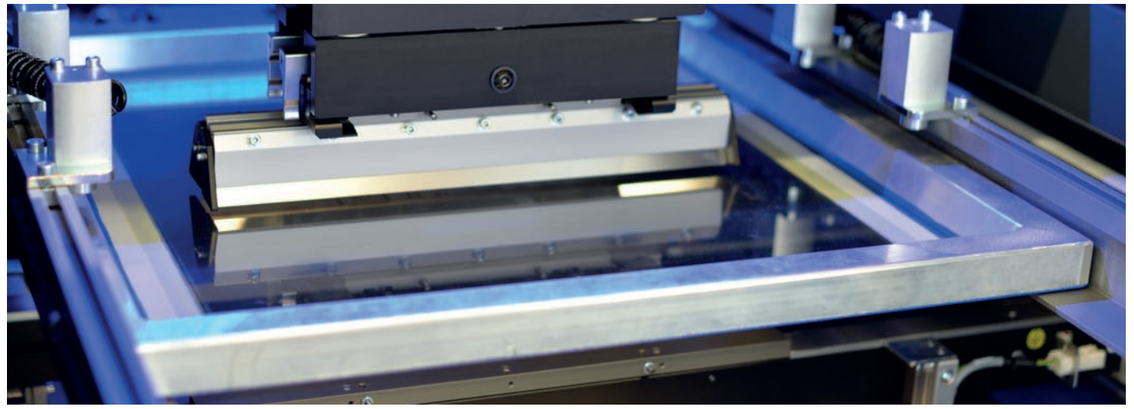
HYCON

In the HYCON product area, we bundle our many years of experience in thick-film technology. With special machines developed for the screen printing process, we can implement any special printing solution with our customers.

CONSUMABLES AND ACCESSORIES

S10 SERIES

We offer our customers an extensive range of consumables, accessories and spare parts, which can be ordered at any time in our online store.



SERIO
Screen and stencil printing

In times of miniaturization and increased performance, electronic products are becoming more and more complex in design – we respond to this with innovative options that are technologically at the highest level. We focus on quality that is transferred to our customers' products.

› High-performance screen and stencil printing systems for economical electronics production

› The scalable platform for integrating a wide range of options

› Grows with requirements: Field retrofits for flexible manufacturing

Different levels of automation:
From prototype and pre-series development to high-mix/low-volume and high-runner production. Manual, semi-automatic and fully automatic inline printing systems.

AUTONOMOUS PRINTER

The SERIO 6000 is the first fully automatic printer worldwide. The system offers automation in stages – adaptable to the automation level of the existing production. With the smart autonomous printer, squeegees and stencils can be set up asynchronously, for example. Set-up can be done manually by an operator or autonomously via a Cobot.

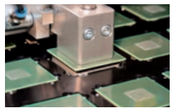
SERIO 6000

UPGRADE OPTIONS

MultiClamp – 3 in 1 Transport System
Reel transport with retractable top clamp and switchable side clamping for optimum fixation of any substrate variants.

APS – Automatic Pin Setting
Fully automatic setting and clearing of support pins. Including cyclic control and correction of pin positions.

iPAG – Dispense modules for Paste and Glue
Additional material can be applied to increase the size of the solder deposit or to fix heavy components.



Optilign – align individually and print together
Individual optical alignment of multiple substrates shortens cycle time and increases accuracy. Fluctuations in substrates and printing form are compensated.

+ PROCESS DEVELOPMENT & EVALUATION

We ensure the perfect printing process!

+ SIMPLEX User Interface

+ CONNECTED TO PULSE PRO

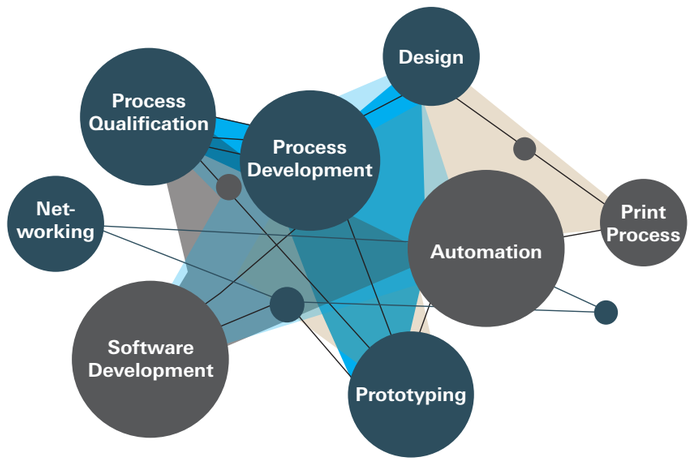
HYCON

We apply different paste systems to a wide variety of substrates with the highest precision. Together with our customers, we develop the right solution for any application – from paste selection to the production line. Our expertise extends beyond the printing process: Among other things, we also develop handling and drying solutions.

› Process development for various applications
› Integrator of third-party processes for customer-specific line solutions
› Cooperation with research institutes and universities

The right machine concept depending on the area of application:
From single-table semi-automatic machines in laboratory environments to multi-stage inline solutions in fully networked shop floors.

SPECIALISTS IN NETWORKING FOR TOP SOLUTIONS

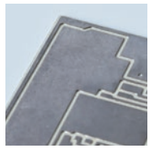


PRINTING PROCESS CONSULTING

We support and advise our customers in all aspects that contribute to a stable printing process and output at the highest quality level:

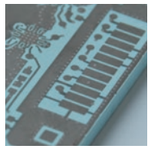
- Specially trained printing engineers as process consultants
- Highly functional coating systems
- Coordination of materials, such as screens, squeegees and pastes
- Identification and validation of the correct process parameters

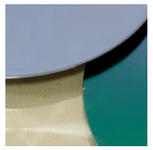
Specialists for different applications and processes

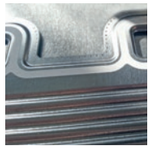

DBC/DCB


Sealing Print


Hybrids

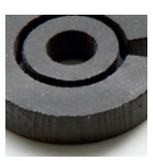

LTCC/HTCC


Wafer


Fuel Cell


Glass


Foils


3D Print

and more...

S10 SERIES
CONSUMABLES

The S10 Series product range takes us a step further to provide customers with solutions that go beyond printing. We offer an extensive range of consumables, accessories and spare parts, which can be ordered at any time in our Online-Shop. The materials are perfectly matched to our printing systems so that optimum process quality is always achieved. It is possible to obtain all necessary materials directly from the system provider and save time-consuming searching and time.

› Consumables, accessories, supplementary products and spare parts for all areas relating to the printing process
› Cleaning rollers, special squeegees, mobile set-up and storage systems

S10 CABINETS

In our S10 Cabinets, customers can store all process materials compactly, intelligently and as needed.

S10 SELECT

We offer an intelligent material storage system for consumables in manufacturing:

› FiFo Withdrawal
› Traceability
› Personalized, controllable material output
› Smart Factory ready
› and many more

+ www.s10series.com

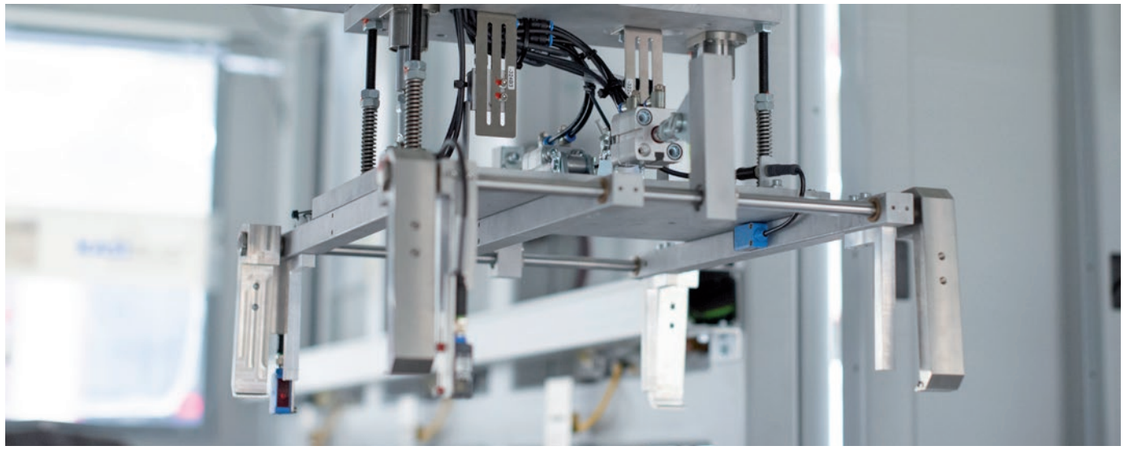
Easy Order
1. Direct purchasing OR
2. Select the required goods › download the order as a pdf file and send it to EKRA

+ ESD conform according EN 61340-5-1

TECTON | *Tray- and Transfersystems*

TECTON
Tray Handling & Transfer

ASYS TECTON develops and produces high-quality handling and transfer systems. The solutions cover all applications from the smallest trays to Euro pallets. ASYS TECTON has been a partner of companies in industries such as life science, automotive or electronics for over 20 years.



TRAY HANDLING

PARIO

Tray and component handling from the smallest trays trays up to Euro pallets, the PARIO PARIO machine series covers all application areas. As a stand-alone system, integrated in automation lines with MES connection and/or adapted to the customer's logistics concept, with autonomy extensions, AIV connection or customized tray transport.

- Tray changing time under 4 seconds
- Easy tray configuration with the intuitive SIMPLEX user interface
- Handling of different tray sizes and types
- Many years of experience in the development of industry-specific grippers
- Homogeneous surface and stainless steel versions for life science and clean room applications
- All systems basically in ESD design

TRANSFER SYSTEMS

MOTUS

MOTUS transfer and puck systems are the right choice for fully automatic assembly systems. Thanks to standardized modules, complex requirements can be optimally implemented even in the smallest production areas. The transfer systems are constructed, for example, with 90° or 180° curves, as a square or with lifts in underfloor technology. The orientation of the goods carrier always remains the same.

- Modular building block transfer system
- ESD and clean room version
- Traceability guaranteed thanks to workpiece carriers with RFID tags
- Direct connection to MES/ERP

+ FLEXIBLE CONNECTION
(vertical & horizontal)

+ INDUSTRY-SPECIFIC OPTIONS
(ESD design, clean room, etc.)

+ SI SIMPLEX
User Interface

+ CONNECTED TO PULSE PRO

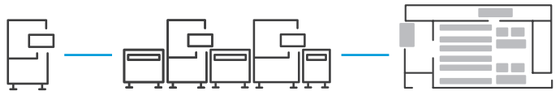
+ FOR VARIOUS **HANDLING TASKS**

PROVIDING · DESTACKING · COMPONENT HANDLING · TRANSFER · STACKING

ASYS Cleanroom Technology

ASYS CLEANROOM
Process & Cleanroom Technology

Optimized for technical cleanliness: from equipment testing to the realization of defined requirements, the specialists from ASYS Process and Cleanroom Technology accompany customer projects with particlesensitive products.



For machines, production lines and production floors

LAMINARFLOW

LAMINO

The laminar flow systems LAMINO from ASYS create a restricted clean working area that flexibly adapts to every requirement.

Cleanroom classes ISO 5 – ISO 8 and freely plannable dimensions are only some of the extensive possibilities of this product range.

DRY STORAGE

CONSIDUS

CONSIDUS dry storage systems can be used for several products ranging from electronic components and printed circuit boards to foils, wafers and finished parts with oxidation-sensitive surfaces.

✚ RELATIVE HUMIDITY IN <1 MIN

< 3% within one minute after closing the dry storage door

✚ CONNECTED TO PULSE PRO

+ WAREHOUSE MANAGEMENT
+ MES CONNECTION
+ CDC CONNECT

STORAGE LIFT

MOVEO

The MOVEO storage lift system from ASYS meets all requirements for temperature and relative humidity with the largest possible storage volume at the same time. If the products are stored in a cleanroom environment, ASYS also implements the storage lift systems in various cleanroom classes.

CLIMATE MODULE

VERDICO

VERDICO modules for process machines make it possible to carry out demanding manufacturing or assembly processes under precisely measurable and controllable ambient conditions – independent of the surrounding production area.

› VERDICO Clean:
Cleanroom classes ISO 5–8

› VERDICO Dry:
Humidity range 3–60 %

› VERDICO Clima:
Temperature range 20–50 °C

› VERDICO Combi:
Combination of systems

CLEANROOM

CLEANUM

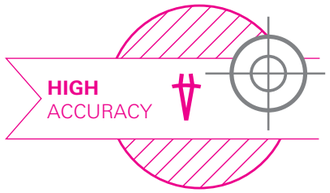
Cleanrooms from ASYS are elementary cornerstones in a clean production environment.

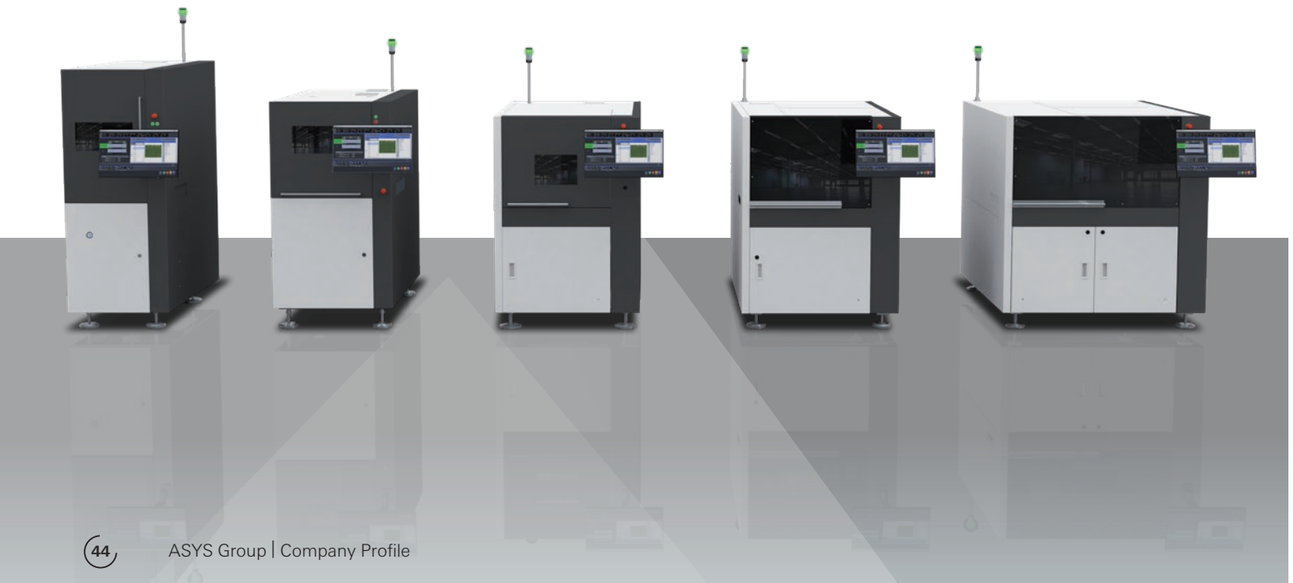
The individual requirements for air conditioning, ventilation and cleanroom technology as well as for the wall and ceiling system are competently and effectively solved by ASYS.

From the first idea to a turnkey cleanroom including cleanroom equipment, everything from a single source.

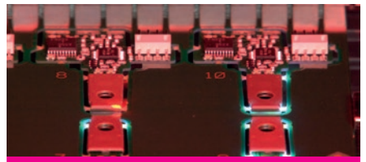
POLYPHOS
Laser Solutions

In the POLYPHOS product group we offer you solutions for material processing by means of laser technology. Materials such as FR4, polyimide, metal, ceramics, cSi solar cells, etc. can be processed with a variety of laser processes. From laser marking for traceability during the SMT process, processes to increase the efficiency of solar cells, joining processes such as soldering and welding, to micro material processing. Depending on the requirements, the laser system can be configured individually.





LASER DEPANELING



POLYPHOS DP

Sets new standards in depaneling rigid and flexible printed circuit boards.

› High cutting accuracy
› High throughput
› State-of-the-art laser beam source and optics for improved cutting results

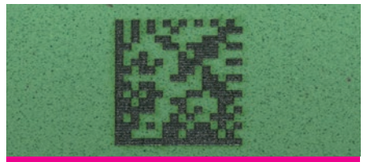
LASER CUTTING

POLYPHOS CT

Laser direct cut process for IMS and ceramic substrates.

› CNC controlled
› Low maintenance fiber laser
› Precision cutting head with on-axis camera.

LASER MARKING

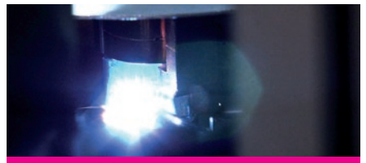


POLYPHOS MK

The individual solution for metal, plastic and ceramic direct marking.

› Product-specific beam sources and automation

LASER WELDING



POLYPHOS WL

Laser plastic welding as an integrated process. Aluminum laser welding as fully integrated process.

› Hermetic seal welding of aluminum housings.
› CNC welding head
› Remote welding with galvo scanner
› On-axis camera
› Fiber lasers from 100W to multi-kW

LASER CLEANING

POLYPHOS CL

Surface pretreatment of sealing and bonding surfaces.

› Aluminum die casting
› Plastic injection molding
› Selective cleaning of bond surfaces
› Process-specific beam sources

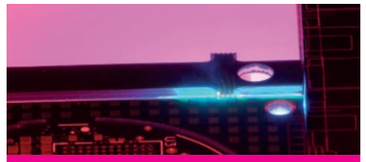
LASER SOLDERING

POLYPHOS SL

Selective laser reflow of temperature-sensitive components.

› Li-batteries
› Medical sensors

MICRO MACHINING



POLYPHOS MM

Customized solution for micro material processing, such as scribing, ablation, drilling, etc.

› Metal, silicon or ceramics
› Product-specific beam sources and automation

+ SIMPLEX User Interface

+ CONNECTED TO PULSE PRO

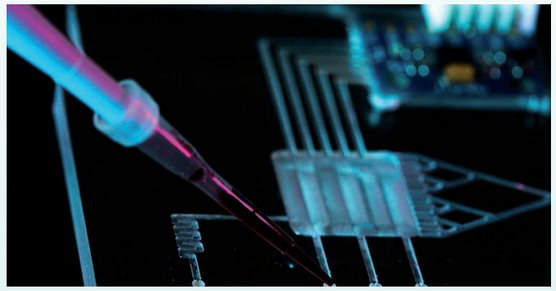
ASYS Applications in the Life Science Industry

Increasing life expectancy combined with new possibilities of diagnostics and therapeutics offers new opportunities to help patients worldwide. Automation in the Life Science industry is the key lever to reduce costs while increasing quality. We offer comprehensive and GMP-compliant machine and process solutions from one source.

MEDICAL ELECTRONICS

We have already developed and built systems for the continuous monitoring of blood glucose levels, sensor technology for blood gas analysis at the point of care or the production of sensors for blood pressure monitoring. We have also realized test systems for medical devices or the production of control units for hospital equipment.

DIAGNOSTICS



Fast and reliable test cartridges are required for the comprehensive diagnosis of viruses, bacteria and germs, not only since COVID 19. We supply efficient and reliable production systems for manufacturers of rapid in-vitro diagnostic tests at the point of care (POC), who are required to manufacture these in accordance with ISO 13485 or FDA 21 CFR Part 820. On our ASYS systems, we produce sophisticated consumables in a matter of seconds.

CELL THERAPY

In cell and gene therapy for the research and treatment of cancer, components for cell sorting and separation are required. Manufacturers in this rapidly growing and demanding industry rely on our many years of automation expertise.

IMPLANTS

Implants, mostly class III medical devices, require special care in their manufacture. Components for pacemakers or hearing implants, for example, are produced and tested on our ASYS systems. Our systems are also used to package class IIb medical products, such as knee joints or ceramic hip joints, or to mark them with a Unique Device Identification (UDI).

WOUND CARE

In wound care, there are challenging tasks. The printing of silicone strips on variable wound pads is one of them. Due to our handling and thick-film printing competencies, companies in this market segment trust us. We automate your processes around the production of high-end wound pads.

IMAGING DIAGNOSTICS

The production of imaging diagnostic devices is not characterized by high volumes. Nevertheless we are a supplier of components for this challenging niche. With our printing systems for the finest 3D structures, we contribute to a significant improvement in imaging resolution. Here the flexibility and precision of additive manufacturing pays off.

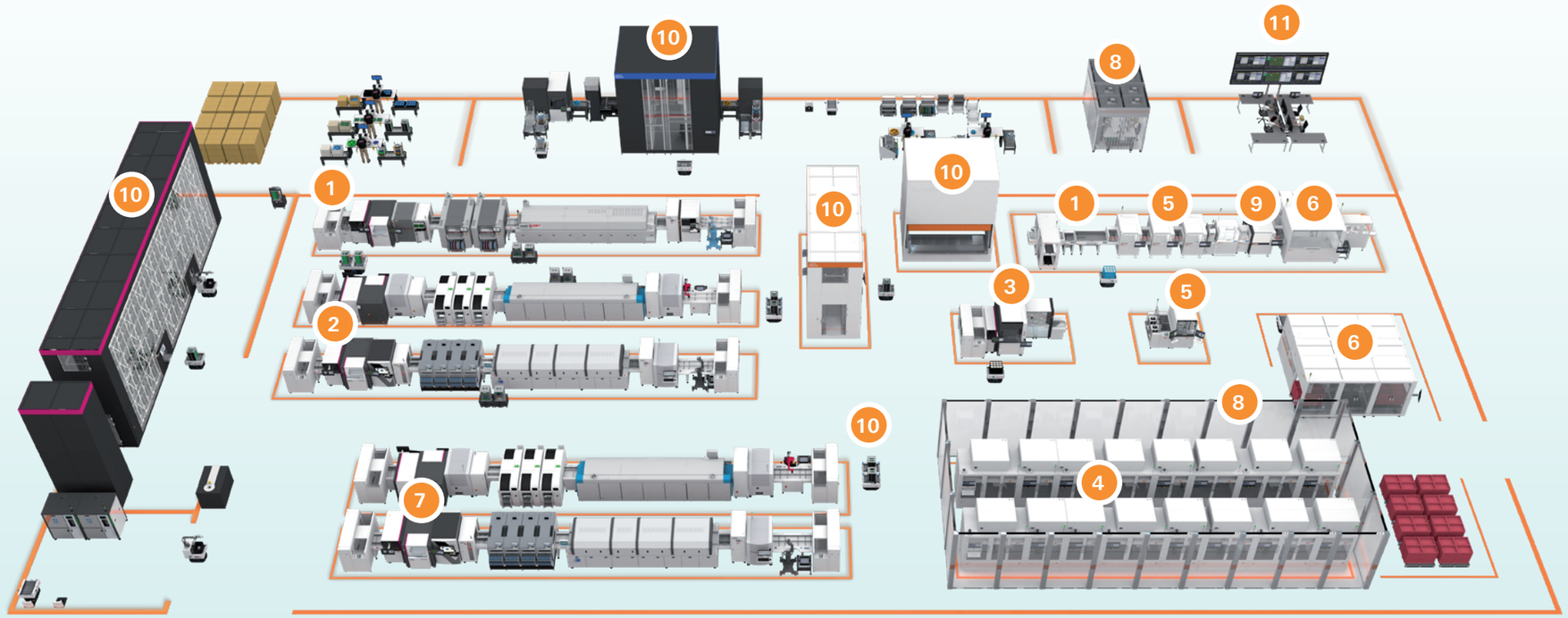
PHARMACEUTICALS

The automation of the production of pharmaceuticals – we also realize this with our ASYS systems. This starts with handling tasks in the loading and unloading of containers and trays, continues with stacking for pasteurizing injection solutions in glass vials and continues with the production, labelling and palletizing of combination packs.

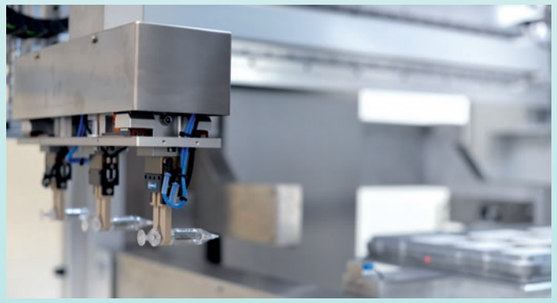
PULSEPRO
ASYS Software Suite

Automation Solutions for the Life Science Industry

On our way to the Smart Factory, we offer solutions for all branches. This also includes the automation of products for the Life Science industry. Whether individual standard machines, customized solutions or turnkey lines for assembly, handling and packaging processes – we are your competent partner: from the initial idea up to the finished production line for the manufacture of medical technology products.



1 Handling



We handle components as well as assembled parts or packaged products. We transport or stack them in controlled or clean rooms. In this way we reduce distances, personnel costs and increase quality and production volume.

2 Marking & Verification

To this day, we have already supplied thousands of standard and special solutions to various industries. On this basis we are constantly expanding our customer segments and therefore we also offer you our competence in marking and verification for your challenges in the Life Science industry.

3 Depaneling

In the Life Science sector, laser depaneling has proven itself in many projects. The avoidance of mechanical stress, the accuracy, the cleanliness but also the high output capacity makes it the ideal solution for the demanding field of medical technology and diagnostics.

4 Assembly Solutions

We have newly developed Life Science assembly platforms and tailored them specifically to the requirements of the regulated industry. We use modules from all business units. This helps us to provide a process-safe and GxP-compliant solution at short notice.

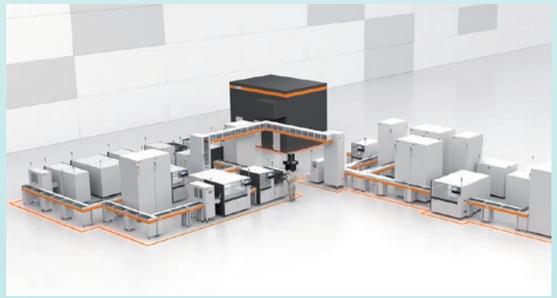
5 Testing

Originally started with the integration and automation of test adapters for printed circuit boards, today we develop and integrate a wide variety of tests for the manufacturing processes, optical checks, leakage tests or functional tests. If required, the whole thing can also be 21 CFR Part 11 (ER/ES) compliant.

6 Trayloading & Palletizing

We use our expertise in handling components, trays and pallets on a daily basis to further perfect the automation process. In doing so, we build on our standard product PARIO from ASYS TECTON, but we are happy to adapt it to your process.

7 Printing

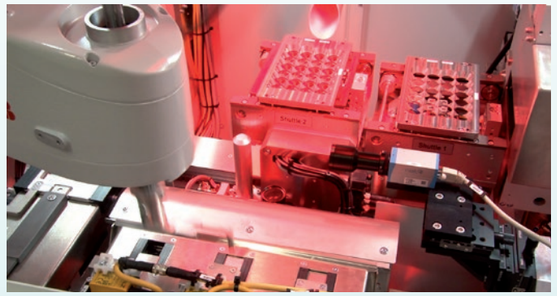


The ASYS subsidiary EKRA offers standard printing systems and customized solutions for thick film applications. Further areas of application are the printing of fine structures, three-dimensional bodies (3D printing) or functional layers on various materials such as glass, ceramics, LTCC/HTCC, foils, metallic tubes or wafers.

8 Cleanroom Solutions

From the first idea to the turnkey clean room – ASYS Prozess- und Reinraumtechnik develops individual solutions from clean workplaces, laminar flow units to drying storage cabinets and dynamic storage systems. With our solutions you protect your products in production according to GMP, ISO and VDI.

9 Laser Solutions

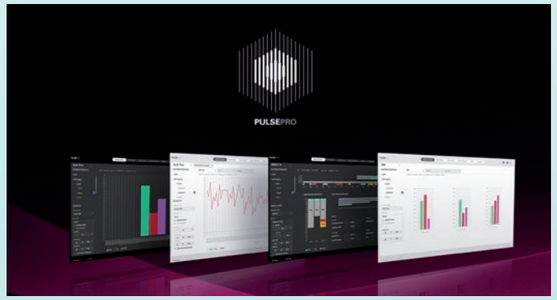


Laser processes enable the highest precision and reduce mechanical stress to a minimum. Thanks to our technological know-how from the POLYPHOS product area, we can process almost all conceivable materials using a wide range of laser processes.

10 Material Logistics

We automate your entire shop floor thanks to our unique product portfolio of warehouse, logistics and transport systems, software solutions and connections.

11 PULSE PRO Software Suite



The ASYS PULSE PRO Software Suite offers seven software modules that will help you to control automated material flows in the shop floor, to achieve a dynamic just-in-time supply for each production step and to track all data flows.

Services & Qualifications

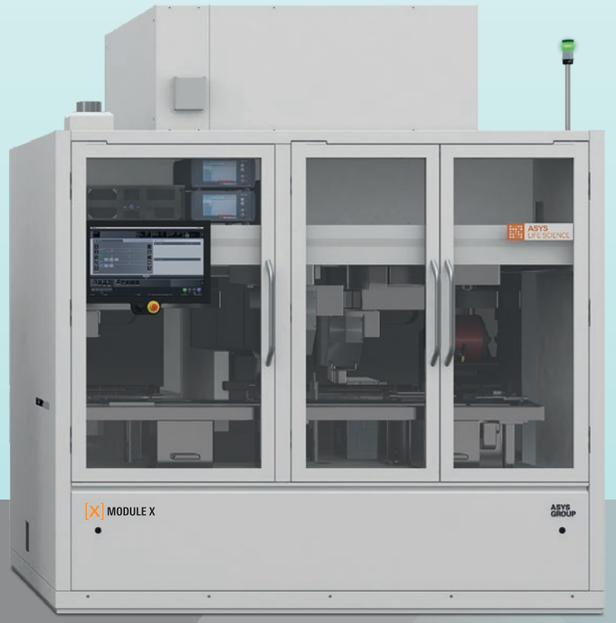
We are available around the clock worldwide to provide you with prompt support. Our teams are made up of experienced specialists who provide you with optimum support in their respective product areas. Please contact us, we will be happy to help you.

[X] MODULE X

The assembly platform, was developed in close cooperation with customers from the medical technology sector and meets the GxP regulations for production in the environment of both 21 CFR Part 820 and ISO 13485. Through the deliberate modular design, the highly flexible platform, allows customized automation solutions, in short project durations. The frames are pre-configured in lengths of 1.5 / 2.0 and 2.5 meters and can be function as individual cells or as part of complete assembly lines. The process components (robotics, testers, laser applications, handling, etc.) are mounted on the base plates and aligned with the highest precision: accuracies of < 10µm @ 6 sigma and greater can be achieved.

ASSEMBLY PROCESSES

- Laser Marking
- Labeling
- Testing
- Depaneling
- Tray Load/Unload
- Press-Fit
- Feeder Solutions
- Screwing
- Tray Handling
- Riveting
- Plasma Cleaning
- Dispensing/ Potting
- Resistance Welding
- Transport
- Laser Cutting
- Laser Welding
- Laser Reflow Soldering
- Laser Depaneling
- Laser Cleaning

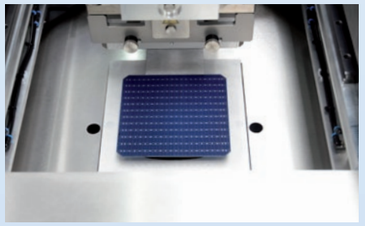


ASYS ENERGY

In the Energy division, we combine the business areas of solar, fuel cell and battery technology, which make a significant contribution to securing the future of energy supply in a sustainable manner. We work for and with well-known manufacturers from the energy industry. Cooperations with strong partners in the field of research emphasize our ambition to find the best, innovative solutions for our customers.

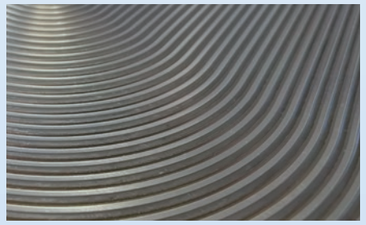
Our strategy is to apply our technological and mechanical engineering expertise across all industries. In addition to a high degree of flexibility, this transfer of know-how also provides flexibility for the company and forms a future-proof platform.

SOLAR



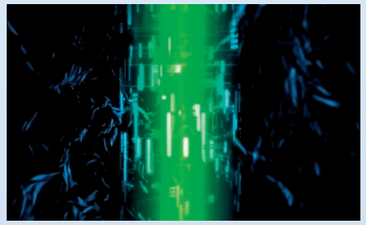
We specialize in the metallization of solar cells in the solar sector. Our range of services includes screen printing systems, optical breakage and automatic post-print inspection systems, dryers, buffer systems, handling systems, laser edge isolation, cooling stations, cell testers and cell sorters.

FUEL CELL

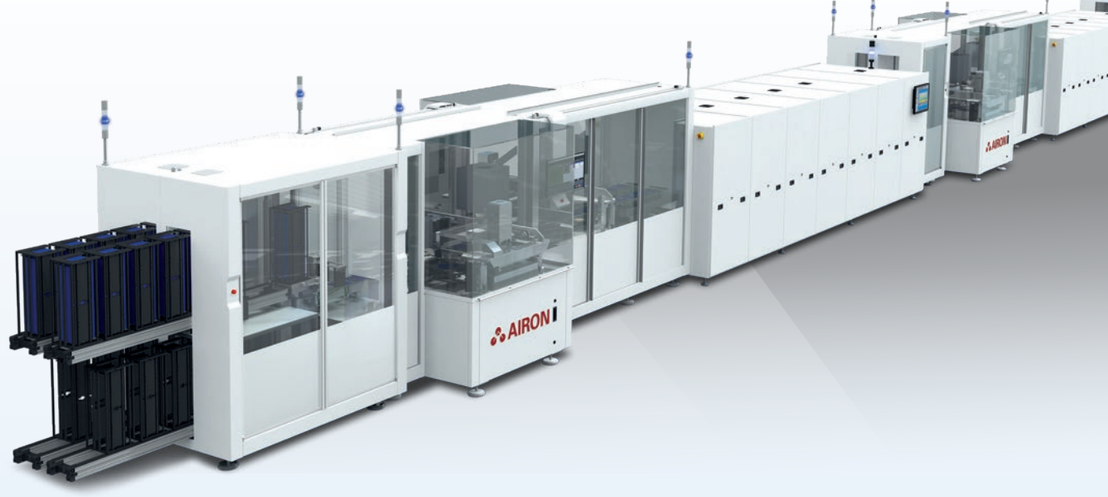


We supply high-performance overall concepts for the production of fuel cells. As an established provider of production automation, we combine expertise in material logistics, stencil printing, laser technology and customized assembly solutions.

BATTERY



In the field of battery, we are currently in the elaboration phase. As innovation drivers, we see our field of application primarily in the area of printed electronics and battery. Thanks to our broad portfolio and know-how, we are also able to tap into the assembly of battery storage systems.



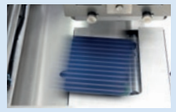
SOLAR

Our systems are Made-in-Germany in the best sense. We have customers who have been using our solar machines for more than 10 years. This is only possible because we have always attached importance to scalability and upgradeability. With the AIRON systems we go one step further.

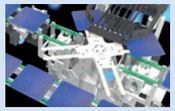
AIRON – METALLIZATION REDEFINED

The AIRON printer applies metallization paste so fast that the eye can no longer follow. Every second, a finished processed solar cell leaves the line. The line has a throughput of 7,200 cells per hour. It is also the market leader in terms of alignment repeatability: ± 12.5 µm at 6 sigma. The patented Air-Spin system sets new standards in gentle cell handling. Users are enthusiastic about the low cell breakage rates. The complete metallization line is optimized in terms of ergonomics and usability and grows with emerging demands, such as new cell technologies or line extensions.

HIGHLIGHT FEATURES



Revolutionary Printing Technology
Patented process for high-speed printing with highest accuracy



Test and Sort
Uniquely fast and gentle: EL test and electrical test in a single contacting process

Merged Machine Modules
Handling, inspection and printing processes integrated in one machine platform

INDUSTRY 4.0 READY – AUTOMATE PV PRODUCTION

Combined with high throughput rates, automation of the material flow is becoming an essential requirement for PV manufacturers. This is where we come in with our Industry 4.0 approach. With the PULSE PRO software solution, we have already set the course for automation in terms of operator work. As a pioneer in material logistics and supply automation in the electronics industry, we are also adapting our know-how to the solar industry.

AIRON

1.0 s cycles &
172,800 cells per day

Like on Air!
Soft and fast cell transport

New Patented Air-Spin Transport

INDUSTRY 4.0
Software and Robots in the PV Production

+ SIMPLEX User Interface

+ CONNECTED TO PULSE PRO

FUEL CELLS

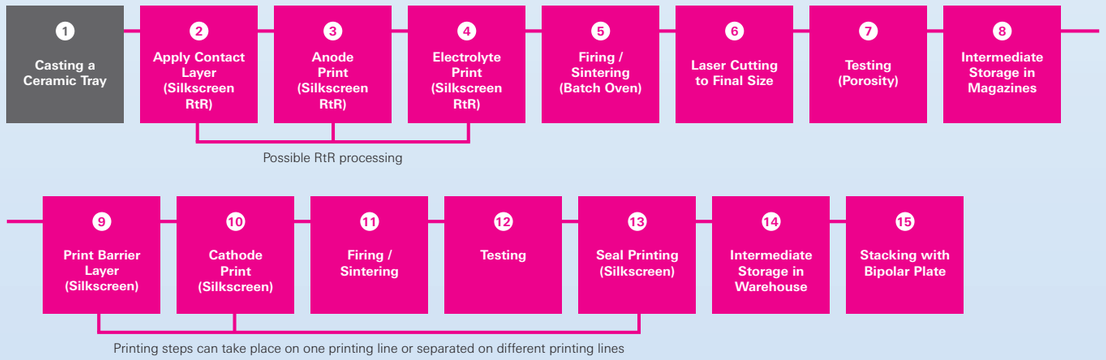
We supply high-performance holistic concepts for the production of fuel cells. As an established provider of production automation, we combine expertise in material logistics, stencil printing, laser technology and customized assembly solutions.

STRUCTURE AND TYPES OF FUEL CELLS

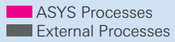
A fuel cell usually consists of a membrane electrode assembly (MEA), which is enclosed by two metallic pole plates (bipolar plates). A broad differentiation of fuel cells is based on the operating temperature. While “low temperature“ fuel cells usually operate in the range of <100°C, the operating temperature of a “high temperature“ fuel cell is in the range of 700°–1000°C. High-temperature cells are currently based on ceramic membrane materials (SOFC) or metallic membrane materials (MSC).

With our solution expertise, we cover almost the entire process of fuel cell production.

SOLID-OXID FUEL CELLS (SOFC)



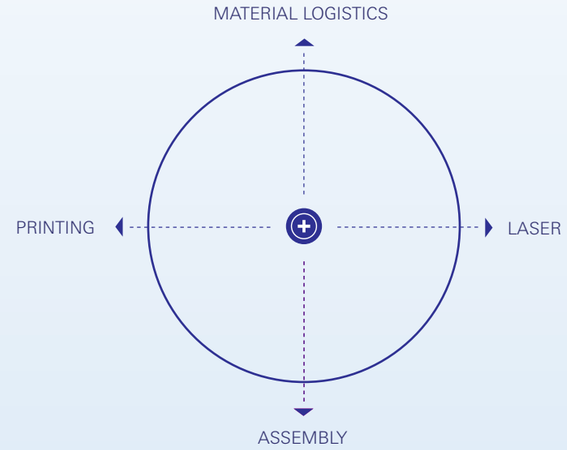
POLYMER-ELEKTROLYT-MEMBRAN FUEL CELL (PEMFC)



1. **Forming (Integration / Embossing / Punching)**
2. **Cleaning**
3. **Transport, Stacking and Storage**
4. **Automation & Laser Welding**
5. **Leak Testing**
6. **Intermediate Storage in Stacks**
7. **Cleaning**
8. **Coating / GDL**
9. **Intermediate Storage in Stacks**
10. **Plasma Cleaning**
11. **Sealing Apply (Silkscreen)**
12. **Intermediate Storage in Trolleys**
13. **Stack Assembly with MEA**

CORE COMPETENCE: PROCESS INTEGRATION

The manufacturing process of the individual membranes and their following stacking to a powerful fuel cell module requires specific process know-how. Individual process steps are linked to a powerful overall concept. As an established supplier for production automation, we combine the expertise from the different areas with reliability and precision.



PARTNERSHIP AND KNOW-HOW EXCHANGE

In addition to the comprehensive process solutions for fuel cell production, we are the only manufacturer to offer holistic software solutions. They cover all processes from incoming goods to the assembled end product on the production line, spanning the entire factory.

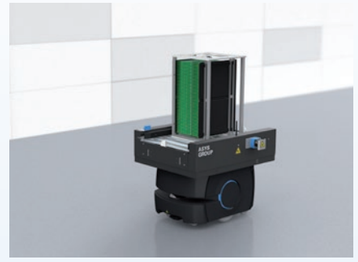
In addition, interface implementation is one of our other core competencies. Sharing knowledge is our path to success in each of our business areas.

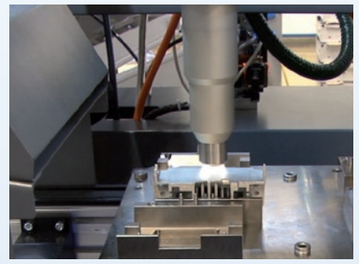
We put our customers' requirements first and are open when it comes to integrating third-party processes into our solutions. Networking our own processes with third-party machines is a matter of course for us. We rely on know-how exchange to achieve the best results.

BATTERY

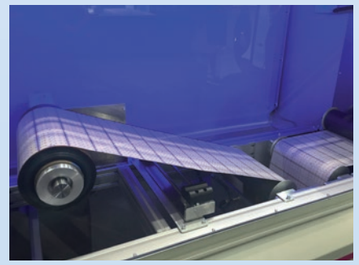
In the field of battery technology, we are currently in the elaboration phase. As innovation drivers, we see our field of application primarily in the area of printed electronics and battery. Thanks to our broad portfolio and know-how, we are also able to tap into the assembly of battery storage systems.

One field of application, for example, is the coating of electrodes. In this process, paste-like material is applied to the electrically conductive carrier film. There are different coating options: continuous and intermittent coating. For both processes, we can draw on the well-founded know-how from our special machine construction. Solutions from the HYCON product range are predestined for these applications. Here we apply our experience in the reel-to-reel process, in which pastes are applied to flexible film tapes.





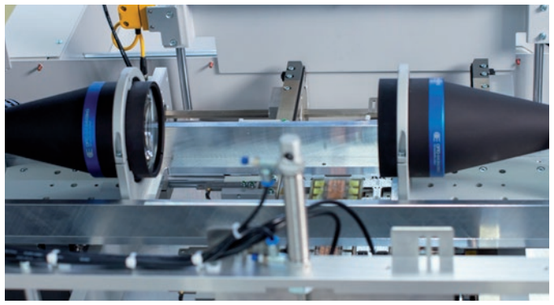
Images from top to bottom: Autonomous Intelligent Vehicle (AIV); plasma cleaning; membrane printing; stacking

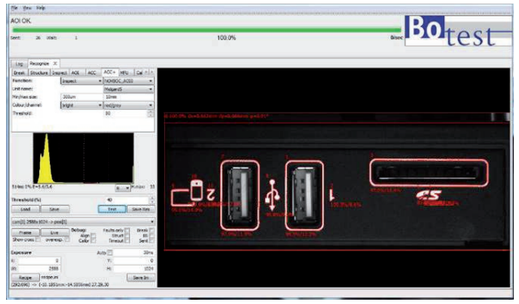


Botest Systems
Services and Developments for Complex Testing Challenges

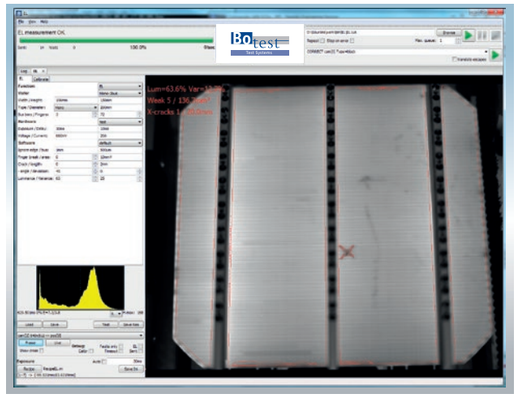
Botest offers a complete range of solutions and development services for testing, measurement and image analysis. The team consists of engineers and scientists from different disciplines such as electronics, information technology, mechanical engineering and physics. Core competences include machine vision, physical modelling and advanced algorithm design as well as software and electronic engineering for high accuracy, high speed applications. Main application fields are automotive, life science, solar and lighting. By close cooperation Botest can offer customized solutions even for the most challenging tasks.

Optical Inspection and Measurement Solutions





IV Unit Developed for ASYS SOLAR Testers



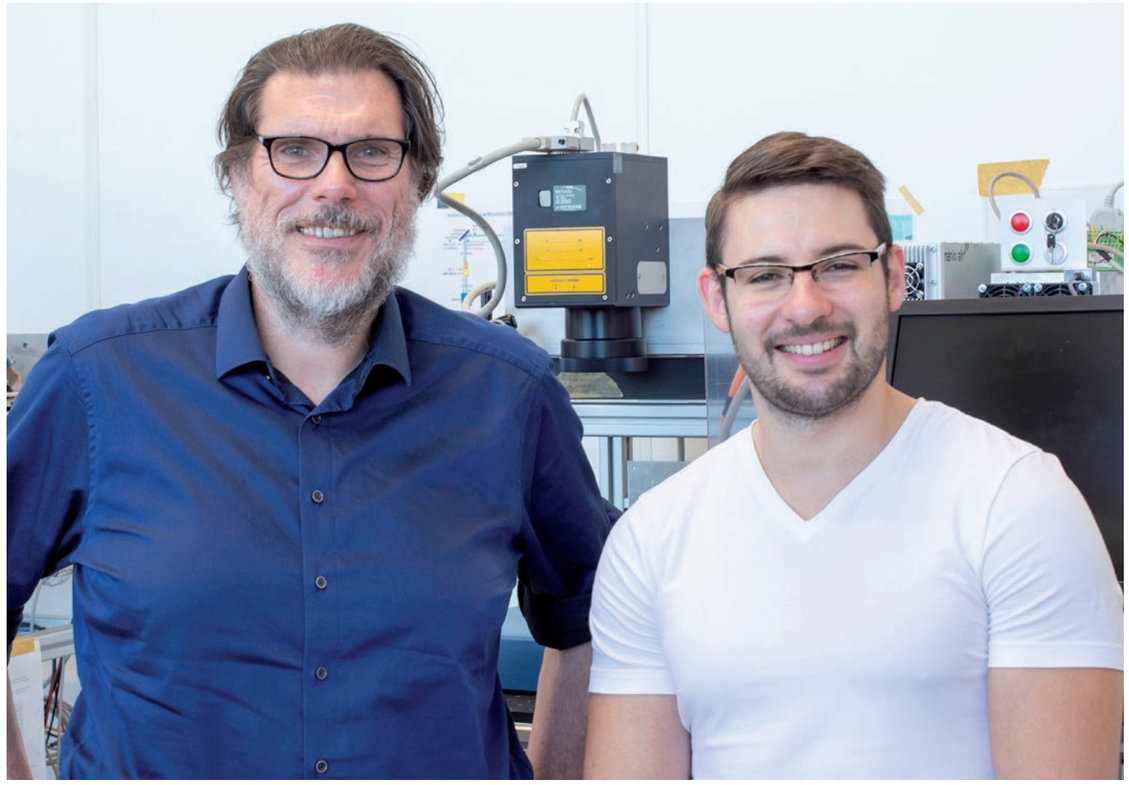
Technology specifically designed for high efficiency cells

Test Solutions

- Electrical Characterization
- Defect Identification
- Lifetime Testing
- Optical Inspection
- Quality Control
- Production

Development & Application
Making Future Technologies Available Today

ASYS does not only want to satisfy our customers, we want to inspire them – with specialized test equipment and new solutions. More than 100 employees worldwide work for ASYS in research and development. Particularly in the areas of process technology, the experts offer unique know-how to draw on the latest manufacturing methods and processes.



ASYS is involved in leading Industrie 4.0 projects that are funded throughout Germany and the EU. Promising synergies and solution approaches result from the cooperation with strong partners from the university and industrial environment. They can accelerate the progress of developments and serve as a basis for opening up new markets.

KOSMoS – Smart Contracting Platform for Digital Value Creation Networks

Today, manufacturing companies use the data they collect to control their production processes and optimize internal production. KOSMoS wants to show what can be possible or what is already possible, if it succeeds in exchanging production data not only internally but across company boundaries. The main obstacle to this is a lack of trust, because data collected at the machine level travels through a large number of internal systems (controllers, gateway, edge, MES, etc.) before it is actually transmitted. For a recipient, it has been impossible to track whether the data has been manipulated along the way.
By using blockchain technology, KOSMoS overcomes this challenge and enables the development and implementation of new business models. However, KOSMoS not only ensures the proper and unalterable transfer of sensitive data, but also provides a platform with ready-made software components, source code and tools. This allows in-house software and IT infrastructure to be integrated into the platform, which greatly facilitates the implementation of new business models. There are also integrated analysis and AI functions for storage, data pre-processing, aggregation, filtering, enrichment with meta-information, monitoring and alerting components. Additionally, there is the possibility to extend KOSMoS with cloud applications.
Through the cooperation of companies via KOSMoS, everyone gains an advantage, which can be reflected, for example, in lower maintenance requirements, increased product quality or more favorable prices.

Our Partners: Institut für Steuerungstechnik der Werkzeugmaschinen und Fertigungseinrichtungen (ISW) | Datarella GmbH | Frankfurt School of Blockchain Center | Hochschule Furtwangen | Inovex GmbH | Ondics GmbH | Alfred H. Schütte GmbH | Schwäbische Werkzeugmaschinen GmbH

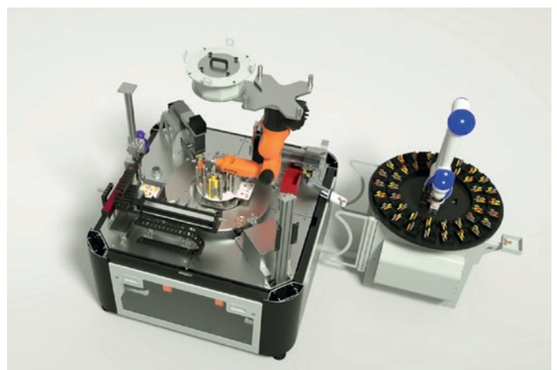
www.isw-sites.de/kosmos/

DEVEKOS – Revolution in Engineering

How can the efficiency of the engineering process be optimized? An intelligent modular principle is designed to solve the challenge. The aim is to enable developers and plant manufacturers to concentrate fully on their processes and pay less attention to the hardware components. At DEVEKOS, a new type of machine architecture is to be developed that makes it possible to generate independent modules from components. In addition, capabilities of the modules will be defined so that they can be used independently of manufacturers. Finally, a machine will only be configured from the modules, which not only speeds up engineering, but also makes the machine maximally changeable. To optimize the engineering process, software is also being designed in which systems can be simulated in advance. By means of digital twins, machines and plants can be virtually commissioned and tested.

Our Partners: Afag Holding AG | CODESYS Group | elrest Automationssysteme GmbH | eps GmbH | Festo Vertrieb GmbH & Co. KG | fortiss GmbH | Häcker Automation GmbH | Harro Höfliger Verpackungsmaschinen GmbH | inIT – Institut für industrielle Informationstechnik | ISW – Universität Stuttgart | NewTec GmbH | Schaeff Maschinen GmbH & Co. KG | Softing AG

www.devekos.org



DEVEKOS Demonstrator

Selected Research & Development Projects

Rock-it – Development of a Solar Metallization Line for High Throughputs

Based on the Rockstar rotary printer, handling and drying are now being further developed. ASYS and Botest are jointly developing an ultra-fast dryer that enables solar cells to be dried within just 100 ms.

Our Partners: ContiTech Elastomer-Beschichtungen GmbH | FMP Technology GmbH | Namics Europe Gmbh | HighLine Technology GmbH | Fraunhofer ISE e.V. | Gallus Ferd. Rüesch AG | Heraeus Holding GmbH

GEFÖRDERT VOM
Bundesministerium für Bildung und Forschung

BIG – Passivation of a Solar Cell During Laser Cutting

Within the photovoltaic industry there is a trend towards larger solar cells. However, the area of a solar cell is proportional to its current intensity. Since a high current leads to large ohmic losses, it makes more sense to divide the cells and connect them in series. The conventional process is laser scribing and mechanical breaking. However, the new surfaces created by this process correspond to a defect within the crystal lattice, since an adjacent atom is missing. This defect is also known as dangling bonds and leads to recombination losses and thus to a decrease in the efficiency of the solar cell. If a foreign atom, e.g. hydrogen or aluminum oxide, is added, the defect is passivated and the efficiency is increased. Passivation of a solar cell while it is being separated using laser technology is the goal of BIG.

Our Partners: TAMURA ELSOLD GmbH | ISC-Konstanz e.V.

Guten Morgen – Solar Cell Tester Based on LED Technology

Photovoltaics is striving towards larger cell formats (see BIG). To keep the ohmic losses within a solar module low, the solar cells are connected in series. This approach has the disadvantage that the cell with the lowest current limits the current of the entire module. For this reason, each cell is tested and classified after metallization so that only similar cells are installed in a module. Within the project Guten Morgen ASYS is developing a solar cell tester based on LED technology which can characterize cells up to a size of 210 mm. The LEDs allow a better adjustment of the spectrum with increased energy efficiency and lifetime.

Our Partners: Fraunhofer ISE e.V. | M10 INDUSTRIES AG | AxSun Solar GmbH & Co. KG | WAVELABS Solar Metrology Systems GmbH | Plasma electronic GmbH | DELO Industrie Klebstoffe GmbH & Co. KGaA | InnoLas Solutions GmbH | Highline Technology GmbH

Rock-Star – Rotary Printing Process Si Solar Cells

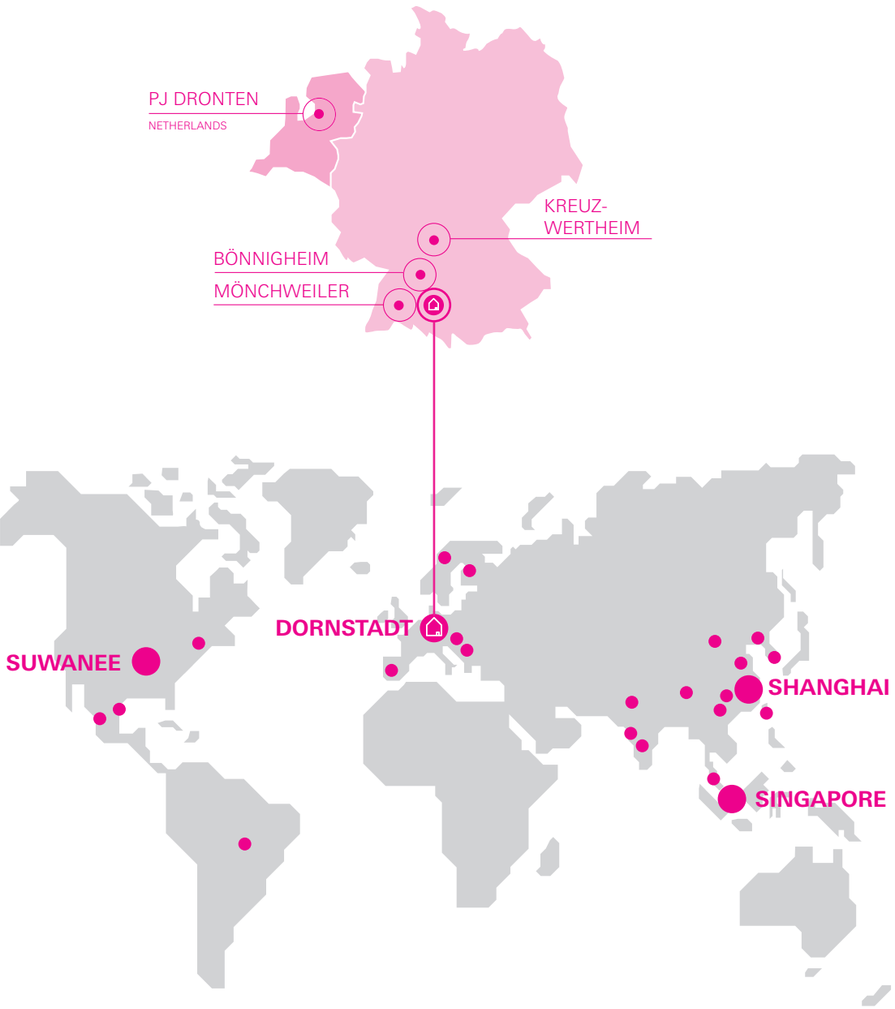
The Rock-Star project, funded by the Bundesministerium für Bildung und Forschung (BMBF), was successfully completed. The project objectives focused on the development of rotary printing processes and innovative equipment concepts for the cost-effective metallization of highly efficient Si solar cells.

GeniusTex – Smart Textiles

EKRA and ASYS have dedicated themselves to the topic of “Possibilities of flexible materials” in the GeniusTex project. In cooperation with Ottobock, the Institute for Textile Technology at RWTH Aachen University and other partners, a line for the production of prototypes for smart orthoses made of textiles has been developed.

German Quality Across Five Continents
Worldwide Sales and Service Centers

The Group's business activities in more than 40 countries are controlled from the company's headquarters in Dornstadt near Ulm, Germany. A broad global network with local service centers in Asia and the Americas ensures a customer-focused service support. Worldwide service teams guarantee best response and spare parts availability.



24 Hour Availability
for Service and Support

Service has a high priority at ASYS Group. More than 80 service engineers worldwide are at the service around the clock. Customer satisfaction is the ultimate goal. To achieve this, ASYS installed a systematic feature to track service calls.

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