Because efficiency is the key

DECKER

Pickling plants

Electroplating

Crack detection

WET CHEMICAL SOLUTIONS

Automation

Cleaning silicon

Plant redesign

Drums

DECKER

WET CHEMICAL SOLUTIONS

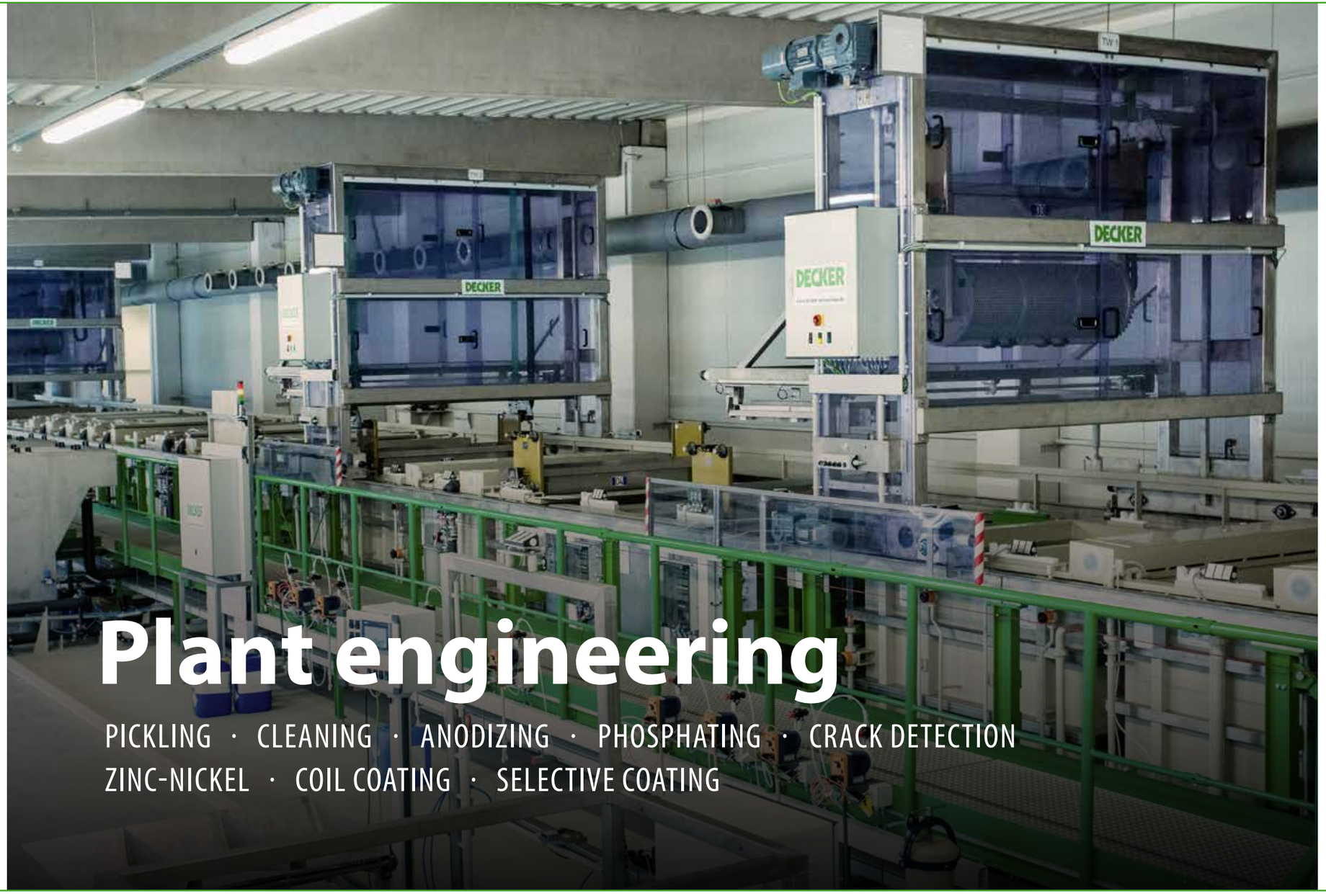
DECKER is one of the leading plant manufacturers for wet chemical and galvanic processes in the international environment. The know-how goes far beyond electroplating: DECKER sees itself as a „one-stop-shop“ partner for the entire user process including crack detection, automation, handling and logistics. This service makes DECKER successful worldwide.

page 4

page 44

page 48

page 54



Plant engineering

PICKLING · CLEANING · ANODIZING · PHOSPHATING · CRACK DETECTION
ZINC-NICKEL · COIL COATING · SELECTIVE COATING

Individually developed and highly efficient.
DECKER has been developing and manufacturing systems for all types of surface treatment for over 60 years. Always individual, tailored to your requirements and your operation.

Place your trust in systems that offer you both the highest operational safety as well as a more economical and environmentally friendly production.

We will show you a selection of plants that we have realized for well-known customers. These are divided according to the respective essential production step:

- Pickling
- Cleaning
- Anodizing
- Phosphating
- Zinc-nickel
- Crack detection
- Coil coating
- Selective coating

Fully automatic plants

Compact plants

Manually operated plants

Supplies

Fully automatic plant

Pickling plant for aluminium parts

An example for DECKER electroplating:
A pickling line for clean surfaces clear of oxides on small components in the automitive industry - with automated supply, absorption system and feed station for all fluids.

Special features:

- Automated transport of parts
- Parts are placed in basket racks
- Palletized portal system for stacking / destacking of baskets
- Ample flexibility achieved by handling of all wire baskets
- Security systems for emergency emptying

Compact plant

Compact pickling line for aluminium parts

Pickling plant with subsequent passivation of aluminium parts for a variety of technical and decorative applications.
A safety system for gas detection is also integrated into the compact plant.

Special features:

- High throughput of goods due to special fully automatic transport system
- Especially compact design
- Plant with enclosure for a clean atmosphere in the production hall
- Efficient energy and exhaust air system

Compact plant

Pickling plant for slabs

Compact pickling line for slabs for an international technology and industrial goods group in modular design.

Special features:

- Particularly ergonomic operation of the loading / unloading station
- Fully automatic transport via integrated transport system
- Compact system with housing to protect personnel and production environment
- Surface cleaning for subsequent material analysis

Kompaktanlage

Pickling line for aluminium castings

Pickling plant optimally integrated into the production process for the pre-treatment of aluminium castings prior to further processing. Partial automation has also enabled operating costs to be reduced.

Special features:

- Fully enclosed system for workplace safety
- Staining with sodium hydroxide solution
- Transport of the goods via automatic transportation system
- Intelligent design of the goods carrier storage station for fast and safe loading and unloading of the system

Manually operated plant

Manual pickling line for steel sinks

Plants for pickling steel sinks as preparation for enamel coating. Much flexibility with little space: The manual pickling line scores with maximum tank size and minimum construction size.
The space-saving assembly in the existing hall was carried out on 25 x 8 m.

Special features::

- Manual transport via overhead travelling crane
- Pickling with hydrochloric acid
- Cost and energy savings due to heating via on-site steam at 180°C
- Reliable preparation of the subsequent enamel coating by comprehensive descaling of the components

Fully automatic plant

Cleaning line for aluminium structure parts

Fully integrated pickling line for aluminium structure parts with fully automatic loading and unloading via robots.
The plant is completely enclosed and could therefore be installed directly in the production area.

Special features:

- Specially developed, fully automatic gripper changing system for handling various components
- Process areas also accessible for maintenance and inspection in automatic mode
- Implementation of intelligent concepts to ensure particularly high operational and process reliability

Fully automatic plant

Cleaning and passivating of aluminium components

A system for cleaning in preparation for welding aluminium parts in vehicle manufacturing. The focus here was on maximum throughput at minimum operating costs. The focus was on smooth process sequences through efficient arrangement of the components in the system.

Special features:

- Consistent quality due to automated process control in the baths, chemical preparation and high circulation rates
- Clean atmosphere as a result of supply and exhaust air system
- Energy and cost savings through heat recovery
- Quality assurance by documenting the entire production process with all process-relevant parameters

Fully automatic plant

Anodizing and polishing of decorative aluminium parts

Large anodizing plant for the automotive supplier industry. Complex plant for decorative coatings with optimum corrosion protection. When coating vehicle trim parts made of aluminium, perfect optics must be combined with long-lasting quality and functionality.

Special features:

- Functional accommodation of all components in the limited space of an existing production hall
- Optimized flow of goods in confined spaces due to solution of loading and unloading via lift stations
- Perfect gloss optics by finely adjustable dosing technology
- Extension of corrosion protection via clever flushing technology

Manually operated plant

Anodizing plant for various chipping parts

Compact manual anodizing plant with modular design for anodic dyeing of a wide range of machined parts for own use and in contract including solutions for water supply and waste water disposal.

Special features:

- Compact design of the plant in squared form
- Manual transport of parts
- Several dyeing basins
- Attachment of work pieces to different fixtures

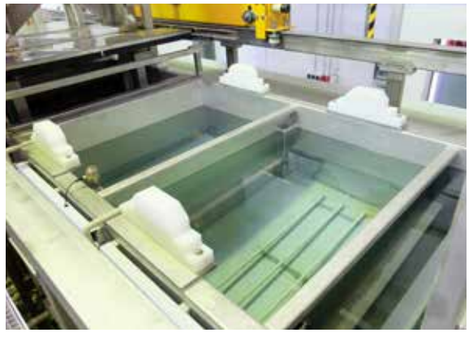
Fully automatic plant

Phosphating of steel parts and nanocoating of aluminium parts

Combined, fully automatic plant for degreasing, rinsing and pickling with subsequent phosphating or nanoceramic coating of components made of different materials.
Intelligent design of the phosphating baths to allow easy cleaning.

Special features:

- Very short delivery time: Six months from receipt of the order
- Combined drum rack system, in which drums and racks can be moved interactively
- Process: phosphating & nanocoating
- Coating of steel & aluminium



Fully automatic plant

Phosphating system for steel sleeves

Fully automatic phosphating system including automatic loading and unloading station. The parts are delivered on conveyor belts and, after the process, marked using embossing units and automatically placed in boxes. The phosphating baths are cleaned fully automatically at definable intervals.

Besondere Merkmale:

- Fully automatic loading and unloading
- Fully automatic filtration and cleaning of the phosphating baths
- Both Processes Zn phosphate and Mn phosphate are possible
- Indirect heating of the phosphating baths
- Minimized waste water production through treatment via evaporator

Fully automatic plant

Plant for phosphating steel parts

Fully automatic plant with automatic loading and unloading, for oiling, phosphating, degreasing and pickling of vehicle functional parts made of steel. Loading and unloading of the product carriers takes place in parallel. Extensive automation has greatly reduced operating costs.

Special features:

- Only one plant operator required for operation of the plant
- Large quantities possible due to parallel, automated loading and unloading
- Especially intelligent construction of the product carriers
- Clean atmosphere in the hall as a result of optimally matched supply and exhaust air system

Compact plant

Manganese phosphating plant

Plant engineering often has to meet individual requirements. In this compact system, for example, these are the degreasing of the entire surface and the formation of a fine-grained homogeneous manganese phosphate layer on the functional surfaces of the treated parts.

Special features:

- No installations in the phosphating bath and thus facilitated pool cleaning
- Indirect heating of the pools
- Minimization of exhaust air volume and energy savings in bath heating
- Longer maintenance intervals due to regeneration system

Manually operated plant

Compact crack testing cabin

Mobile and compact crack testing cabin with separate drying chamber. The components can be conveniently checked in the cabin using a manual crane and a special component holder with rotating units.

Special features:

- Compact design
- Including drying chamber
- Unit transportable as a whole

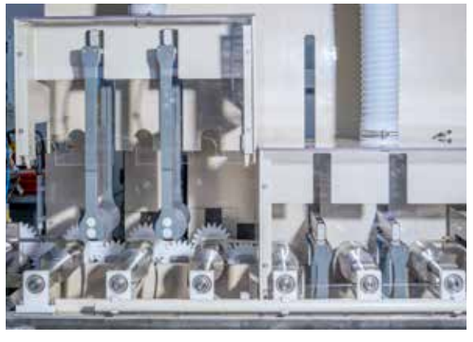
Fully automatic plant

Plant highlight for aviation technology

Fully automatic plant for an innovative coating system in the aerospace industry. Extensive automated process control in the baths as well as chemical preparation and high circulation rates ensure consistent product quality.

Special features:

- Combination of a manual plant for decoating, a manual plant for coating small parts and an automatic machine for coating large parts.
- Media input into the product carriers via special docking system
- Heat recovery saves energy & costs



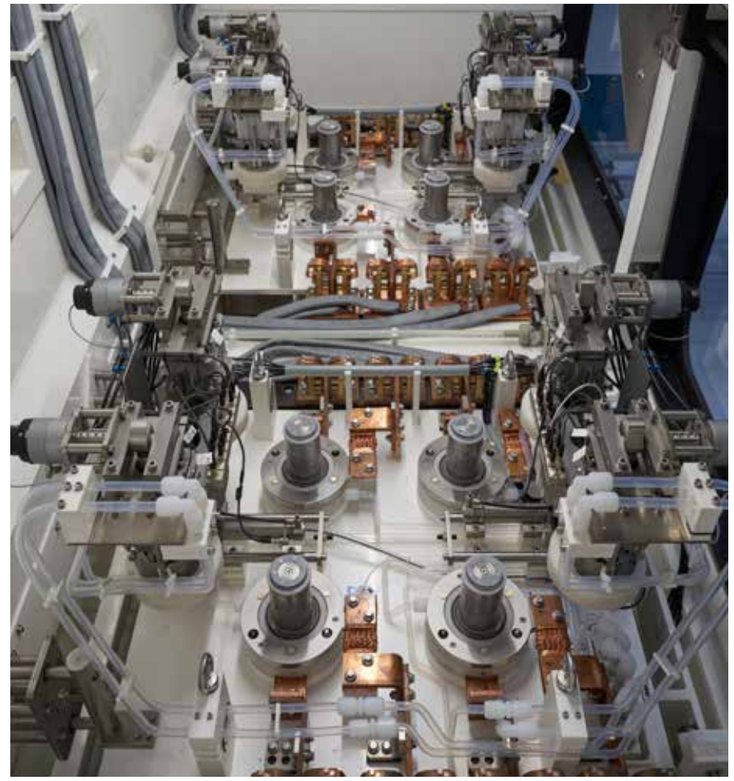
Compact plant

Conveyor system for electropolishing for coating with nanoparticles

Conveyor system for electropolishing thin nickel tungsten belt for subsequent coating with nanoparticles. A special belt guiding system ensures an optimal treatment result. The clamping device prevents the belt from running back.

Special features:

- Greater safety in the loading and unloading areas
- Ergonomic alignment of the system
- Environmentally conscious and cost-efficient handling by minimizing carryover and exhaust air
- Constant treatment results due to automation of the belt processing



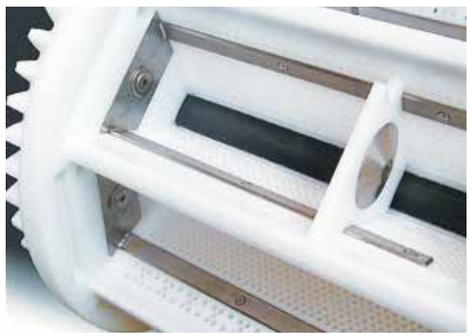
Fully automatic plant

Plant for selective coating of engine blocks and cylinders

Fully automatic coating system for engine blocks and cylinders. Less media consumption and less wastewater and thus significantly reduced operating costs through selective treatment of the necessary points instead of complete immersion. The modular design enables a flexible response to new throughput requirements or parts geometries.

Speacial features:

- Selective coating
- Modular design! Easy capacity expansion!
- Automatic component recognition via DMC code readers
- Very uniform coating results, constant process conditions



Supplies

Electroplating drums and aggregates

DECKER-drums and aggregates are as individual as your requirements.

Our different **drum types** are characterized by:

- **Special adaptation** to your individual plant!
- More internal volume with the same external diameter
- Seamless inner surface prevents parts from jamming
- Reduced carryover due to faster fluid exchange
- Up to three times higher capacity than fan drums
- Excellent electricity transmission due to multiple contacts

Speacial features:

- Optimal mixing of the material by uneven polygon
- Larger perforation/cross section area without loss of stability
- Optimal electrolyte and liquid exchange

Supplies

Drums

- **Drum type** cassette compartment, jumbo drum, multiload
- **Drum shape** 5-corner, 6-corner, 7-corner, round
- **Drum size** can be parameterized freely
- **Perforation** as required (hole, slot, sieve plug)
- **Material** PE 100 to 1000, PP, PVDF, VA and much more
- **Version** stiffened, plugged, welded or combined

Drive and contacts

- **Drive** designed for your application (one-sided)
- Battery, mains connection or frequency-controlled for different speed control
- **Contacting** takeover of the existing contacting or optimization according to your wishes and based on our experience
- Cable contact bulb, strip contacts can be designed individually

Lid systems

- One or two parts
- Brackets
- Plastic rotary handles
- Automatic lid for robots or loading and unloading device

Aggregates

- Types single, double (next or above each other)
- Materials freely selectable, plastic clad, torsion-free
- Can be integrated in rack systems

Etching drum

- Sizes freely selectable, individual drive design
- Various geometries
- Resistant to the most aggressive chemicals

Round drum

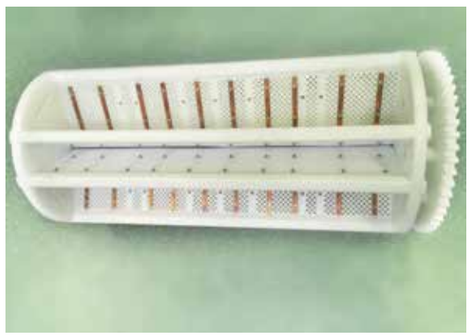
- Different materials PP, PE 100-1000, V4A and much more
- Various variants
- Degree of automation freely selectable

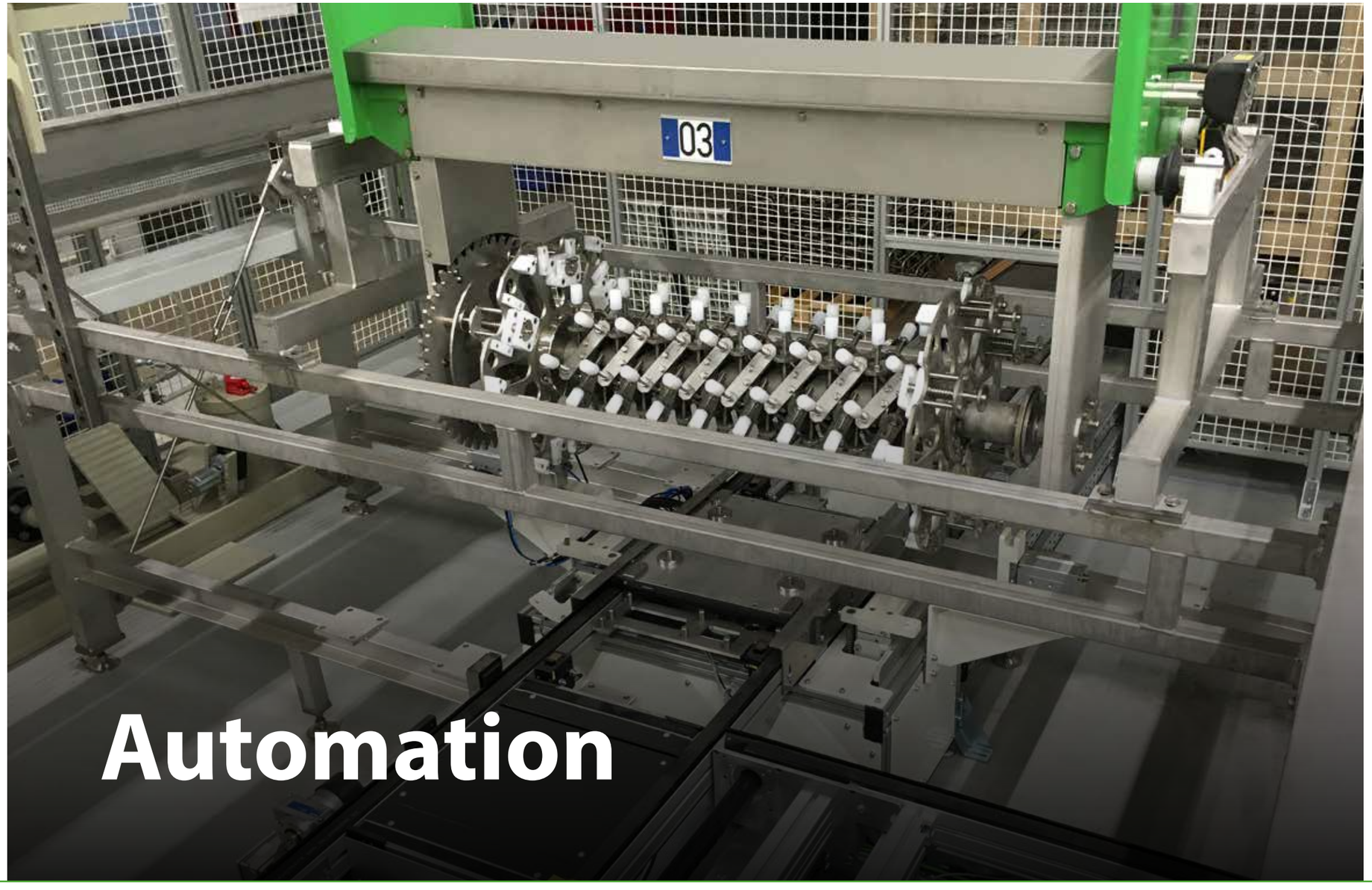
Pickling basket drum

- Designed for customer boxes
- Optimized flow of the goods by rotation
- Optimal fluid exchange
- Very easy to automate
- Ideal for bulk goods
- Large lot sizes / weight

Electroplating drums

Depending on the range of parts, the properties of the drum can be flexibly designed to meet your requirements as pentagonal, hexagonal, and 7-corner drums. The wear properties can be adjusted using different materials. At higher weights, the drums are designed with stiffeners, so the service life of the drum is significantly increased even at higher process temperatures. The contacts are incorporated precisely so that a jam of parts can be prevented.





Automation

The automation of individual process steps or of the entire production offers advantages in many ways. DECKER develops, builds and installs automatic systems for different sectors and requirements.

Your special requirements are our challenges!

We are open to your special needs: From simple manual workstations to automated loading and unloading facilities to fully interlinked high-performance production systems.

- Loading and unloading systems
- Testing and analysis technology
- Wafer separation

Loading and unloading systems

Automatic loading and unloading systems

DECKER designs your entire surface process, not only selected sub-areas. You receive a complete system - plant including loading and unloading unit - with reliable, flowing transitions. With regard to „Industry 4.0“, the automatic loading and unloading of all types of production plants will become an important competitive factor.
Whether as part of the installation of a new plant or as a retrofit to an existing plant.

Testing and analysis technology

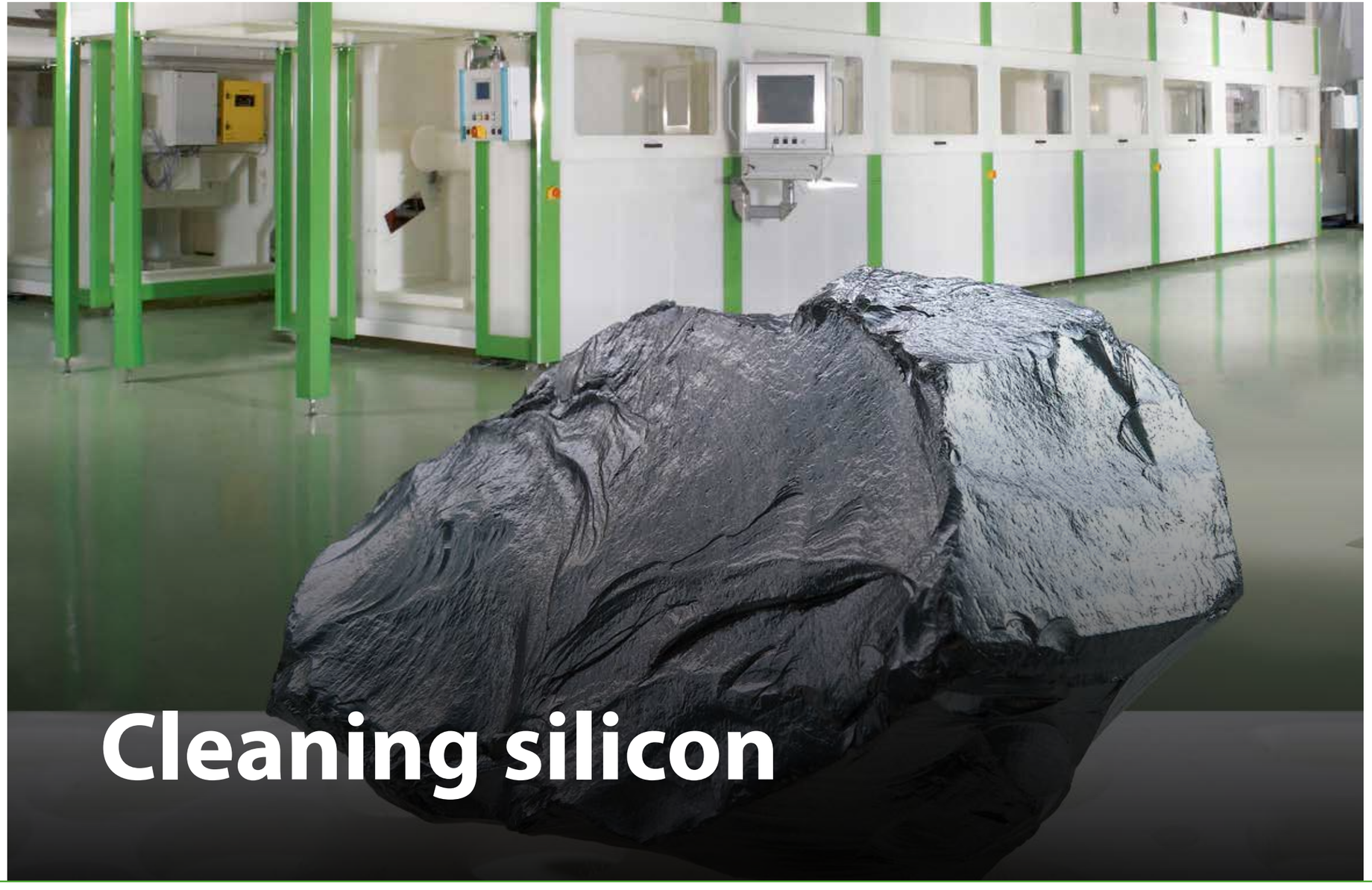
Integrated testing and analysis technology

The possibility of fully automatic bath control or the automated inspection of the components, to mention just two examples, should be considered as early as possible in the conception. Tailor-made high-tech solutions are the impressive result. Depending on your individual requirements, different measuring, testing and process systems are used.

Wafer separation

Plant concepts for wafer separation

The separation of silicon wafers after sawing is one of the most important production steps in the photovoltaic industry. DECKER realizes this process from beginning to end smoothly, resource-saving and cost-reducing. More quickly and more gently than with human work.



Cleaning silicon

Cleaning silicon with the highest degree of cleaning in a way that conserves resources, that is plant construction with maximum efficiency.
We develop and build systems for the most efficient processing of silicon to ensure that your photovoltaic systems achieve the best possible efficiency and at the same time minimise your production costs.

In addition to the separation of wafers, we supply systems for etching all possible silicon forms from 100 µm to 3,200 mm:

- Silicon pieces
- Silicon rods
- Granulate

Silicon pieces

Poly-break etching plant

With the DECKER poly-break etching plant you achieve the maximum possible surface quality of your silicon. In this plant you will find state-of-the-art wet-chemical technologies and concentrated technical know-how. Another decisive advantage of this system is its low consumption of resources:
Save a considerable amount of electricity, water and chemicals – and reduce your operating costs!

Silicon rods

Cleaning of silicon rods

With the particularly flexible rod etching system you can clean all types of silicon rods. An essential special feature of the rod etching system is the rotating, drum-like product carrier, which enables a particularly material- and resource-saving etching process with changing contact surfaces.

Granulate

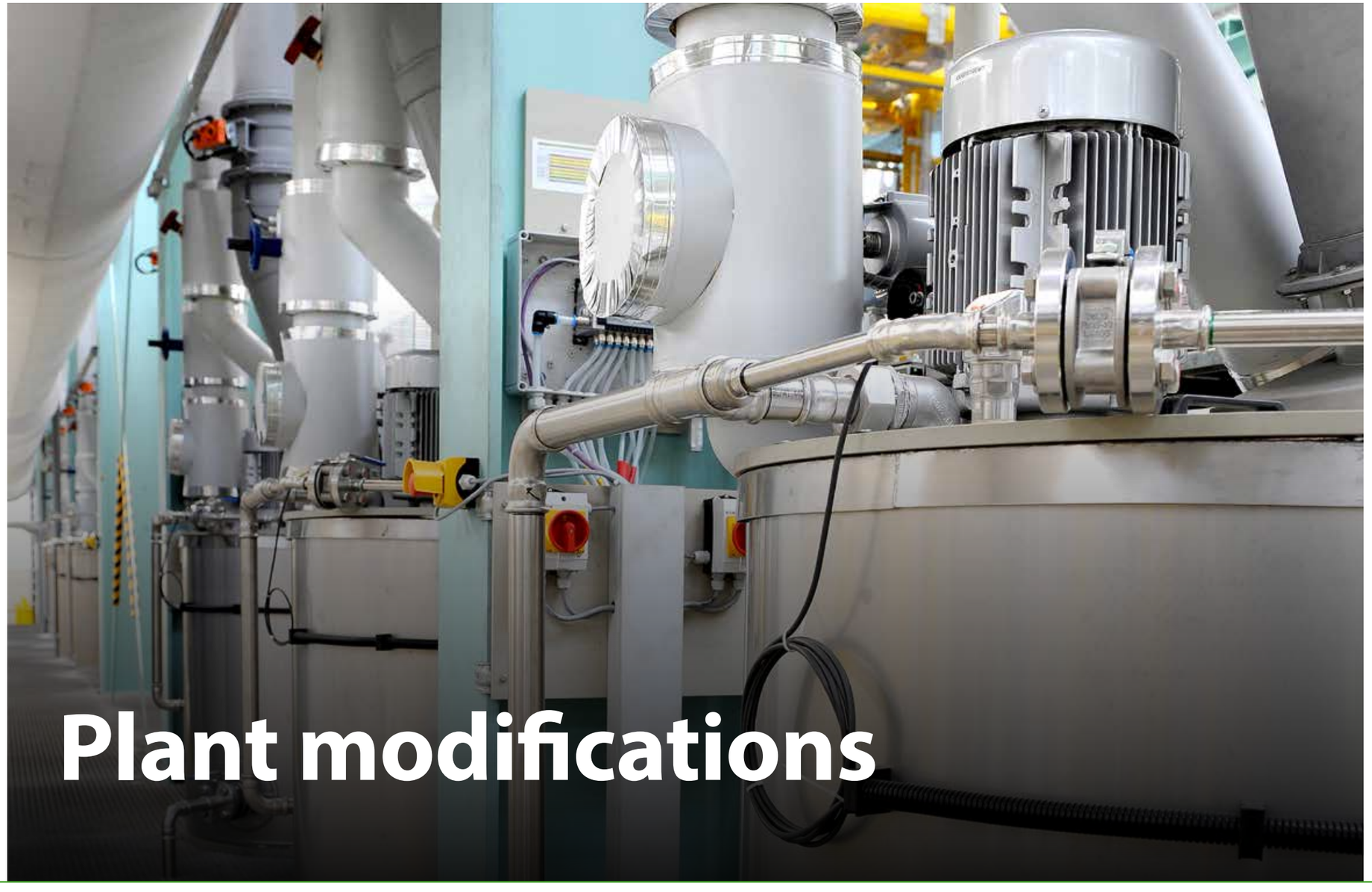
Fine-grain etching plant

During the processing of polycrystalline silicon or during wafer production, a certain breakage can hardly be avoided. With the innovative recycling plant from DECKER, you won't lose a single gram of the valuable silicon! „Old wafers" or broken wafers are shredded and reprocessed with the fine-grain etching plant. The capacity is up to 1.000 tons of recycled granulate per year.

Silicon pieces

Silicon cleaning plant

Semi-automatic system for wet-chemical cleaning and drying of large silicon pieces (sections of monocrystal rods) in baskets with a capacity of 35 kg/h. Completely encapsulated design to separate the process area from the cleanroom environment.



Plant modifications

Your plant is getting on in years? Increases in production require an adjustment of the plant capacity?
Are you planning to relocate your production site?
Your plant technology has to be adapted to new legal requirements?

Then you need a reliable partner who will actively and professionally support you in all areas of your project.

- Relocation of plants
- Modernization of plants
- Plant extension
- Adjustment of documentation files
- Recertification

Relocation of plants

Relocation

The disassembly and reconstruction of sensitive production units and entire plants require perfect planning, time and technical precision work.
Unplanned production downtimes can lead to high additional costs.
We take care of your plant relocation with everything that goes with it - so that you can focus on your core business.
Because you can rely on our qualified specialists.

Modernization

Modernization of plants

If an existing plant is outdated, it does not necessarily have to be replaced by modern technology. A plant overhaul can be a sensible and economical alternative. Because a new purchase is not always the best solution: Many outdated plants and plant components can be brought up to the current state of the art through targeted modernization. Thus they remain in operation for many more years.

Plant extension

Extension

You can never have enough capacity. But what if your existing plant can no longer keep pace with increasing capacity requirements? If you want to map additional procedures or processes?
By expanding your surface technology, you can eliminate bottlenecks and increase your efficiency. Our specialists will be glad to assist you, identify the weak points, make recommendations for optimization and show you which concrete capacity increases can realistically be achieved.

Adjustment of documentation files

Documentation

If you make technical changes to an existing plant, your documentation must also be adapted.
Our experts will do this for you.

Recertification

Recertification

According to the European Machinery Directive, plants must bear a CE marking in order to be put into operation. We will take care of this for you.

About us

DECKER plant construction

DECKER is an internationally leading supplier of innovative and reliable systems for wet-chemical and galvanic processes as well as automation and assembly technology.
Our projects are located in the semiconductor, automotive, electronics and consumer sectors.

Our company has its roots in the foundry trade and can now look back on a successful 125-year company tradition.

Surface treatment

Wet chemical solutions

DECKER has many years of experience in electroplating. As early as 1961, the company started with its own pickling plant production in plant and apparatus construction. Design, production and sales are closely interlinked in our company. And they are the optimal conditions for continuous growth and further development of our diversified product portfolio.

Because efficiency is the key

The cleaning and refinement of high-end products is a challenge for plant manufacturers and producers. Purity, homogeneous process conditions and reliable technology are the elementary design guidelines for every new plant.

Milestones

Outstanding milestones in the long history of the company

- **1891** **Foundation of Gebrüder DECKER KG**
- **1927** Start of electric steel production
- **1956** Start of spherodial graphite iron production
- **1961** **Takeover of the Bäuml pickling lines**
- **1988** Construction of the first wastewater-free pickling plant
- **2000** Development of a contactless bearing system
- **2007** Relocation to new and larger production areas in Berching
- **2007** Sale of a poly-break etching plant to China
- **2011** Awarded with the Intersolar AWARD
- **2012** Construction of an 80 m long anodizing plant
- **2013** Combined pickling and crack detection plant for a supplier of the aviation industry
- **2014** New development of a conveyor system for electropolishing thin nickel tungsten belt for subsequent coating with nanoparticles
- **2015** Fully automatic electroplating plants for international customers
- **2016** **DECKER is 125 years old!**
- **2017** Plant highlight for aeronautical engineering, fully automatic electroplating plant
- **2018** Fully automatic phosphating plants for international customers
- **2019** Selective coating instead of immersion in the pool
- **2020** Silicon etching for the semiconductor industry with extremely high quality requirements

DECKER

DECKER worldwide

It is our aim to offer uncompromisingly good quality worldwide at sustainably low operating costs at the same time. Day after day, this ambitious aim is pursued by our competent team with inventiveness, pragmatism and enthusiasm. For this reason DECKER is an important supplier of plants for all surface treatment processes such as anodizing, burnishing, phosphating, chromating, electroless nickel, zinc, silicon cleaning and several more.
In addition, we are your partner for modifications, modernizations, plant relocations as well as the automation of existing and new plants.

DECKER Anlagenbau GmbH · Wegscheid 1a · 92334 Berching · Germany
phone: +49 (0) 8462 200 617 - 0 · fax: - 11 · mail: info@decker-anlagenbau.de

www.decker-anlagenbau.de