BvL
Oberflächentechnik

CLEANING SYSTEMS FOR VEHICLE ENGINEERING: CARS, COMMERCIAL VEHICLES AND AGRICULTURAL MACHINES

Your specialist for cleaning processes in powertrain engineering

A solid foundation for three strong pillars

BvL Oberflächentechnik GmbH is one of the leading suppliers of industrial cleaning systems. Since its foundation in 1989, the company has been offering integrated services: from compact cleaning systems, filtration and automation solutions to complex large-scale projects. The owner-run company structure ensures the fast and creative development of cleaning solutions. Three strong pillars have emerged from this solid basis:

1. **Individual cleaning systems for high efficiency**
2. **System components – customised for your requirements**
3. **Service – Personal. Flexible. Competent.**

High vertical integration

- Own production (made in Germany)
- Own development and design
- Own control cabinet manufacturing
- Own programming
- Spare parts stock
- Qualified consulting and planning
- Own maintenance / service
- System modernisation

Know-how & quality

The core competences of our company, longstanding industry experience and our employees' know-how provide reliability in all project phases. Independent certifications confirm our high standard of quality.

Sustainability

In addition to optimum component cleanliness, **BvL** also focuses on careful use of resources. Our cleaning systems therefore feature a high level of energy efficiency.

Pure Technology.

"As a forward looking company, we are driven by our own curiosity and our spirit of innovation so we can offer you the best cleaning solutions."

Bernhard Sievering, Managing Partner

Innovative cleaning solutions for the highest cleanliness requirements

Easy integration into your process chain for a smooth production flow

Selection of the system technology to meet individual requirements

Expert consulting and worldwide support for your process reliability

Highest technical cleanliness for your components and your individual requirements

The requirements for technical cleanliness increase with each new generation of vehicle engineering: performance densities grow, tolerances decrease, manufacturing speeds increase and more sensitive materials are used. Even low levels of contamination can cause far-reaching damage.
We use our longstanding industry experience to determine the optimum cleaning process for you – always with a focus on your component and your cleanliness requirements.

In-house factory standard

Your performance specification and specific requirements are the foundation for our system concept.

Tried and tested cleaning

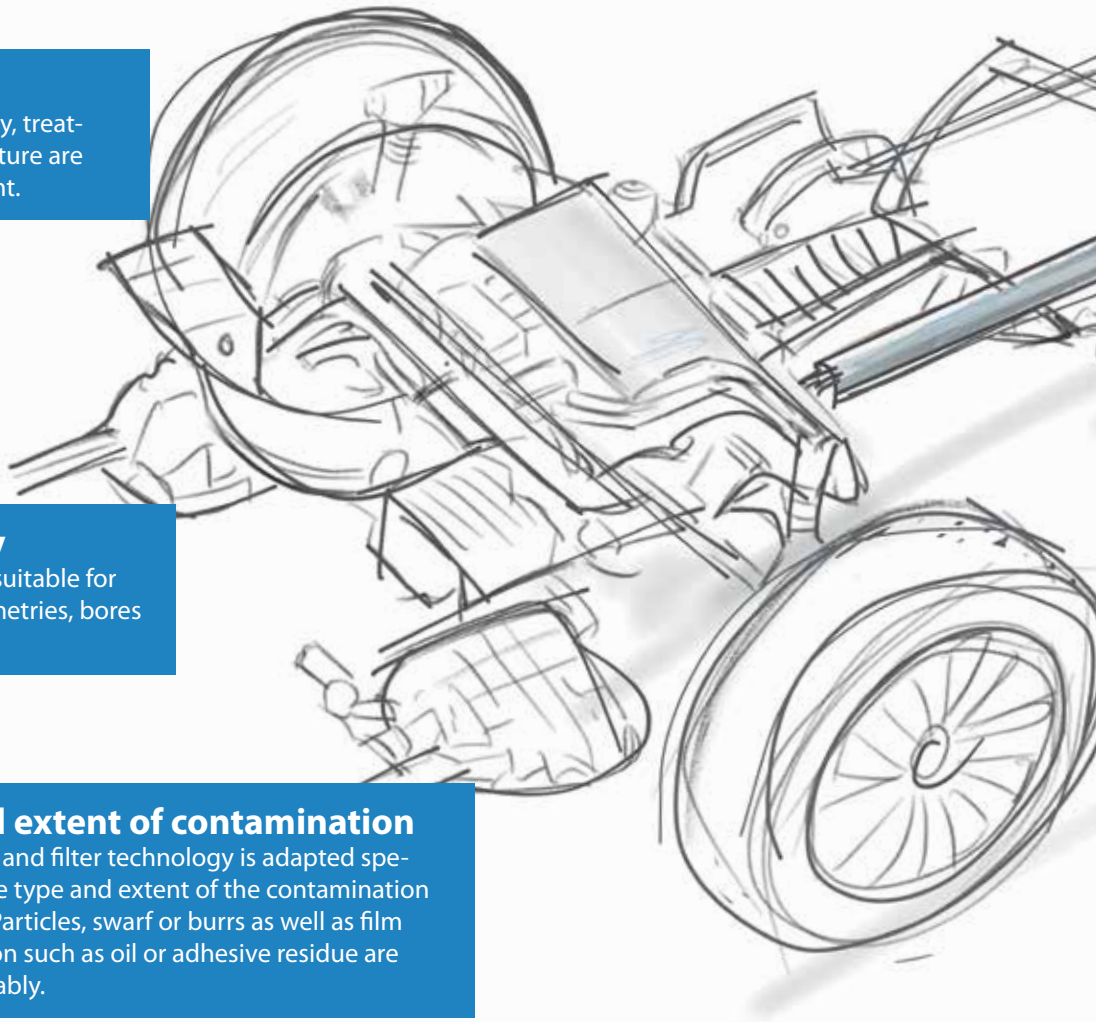
We conduct cleaning trials under realistic conditions at our in-house Technology Centre to determine the optimum cleaning system for you. Our comprehensive cleanliness tests and analyses meet the standard as per VDA 19/ISO 16232.

Technical cleanliness

The most important criterion for our system design is verifiable cleanliness according to your limit values.

Material properties

We ensure that cleaning technology, treatment time, chemicals and temperature are adapted to your specific component.



Component geometry

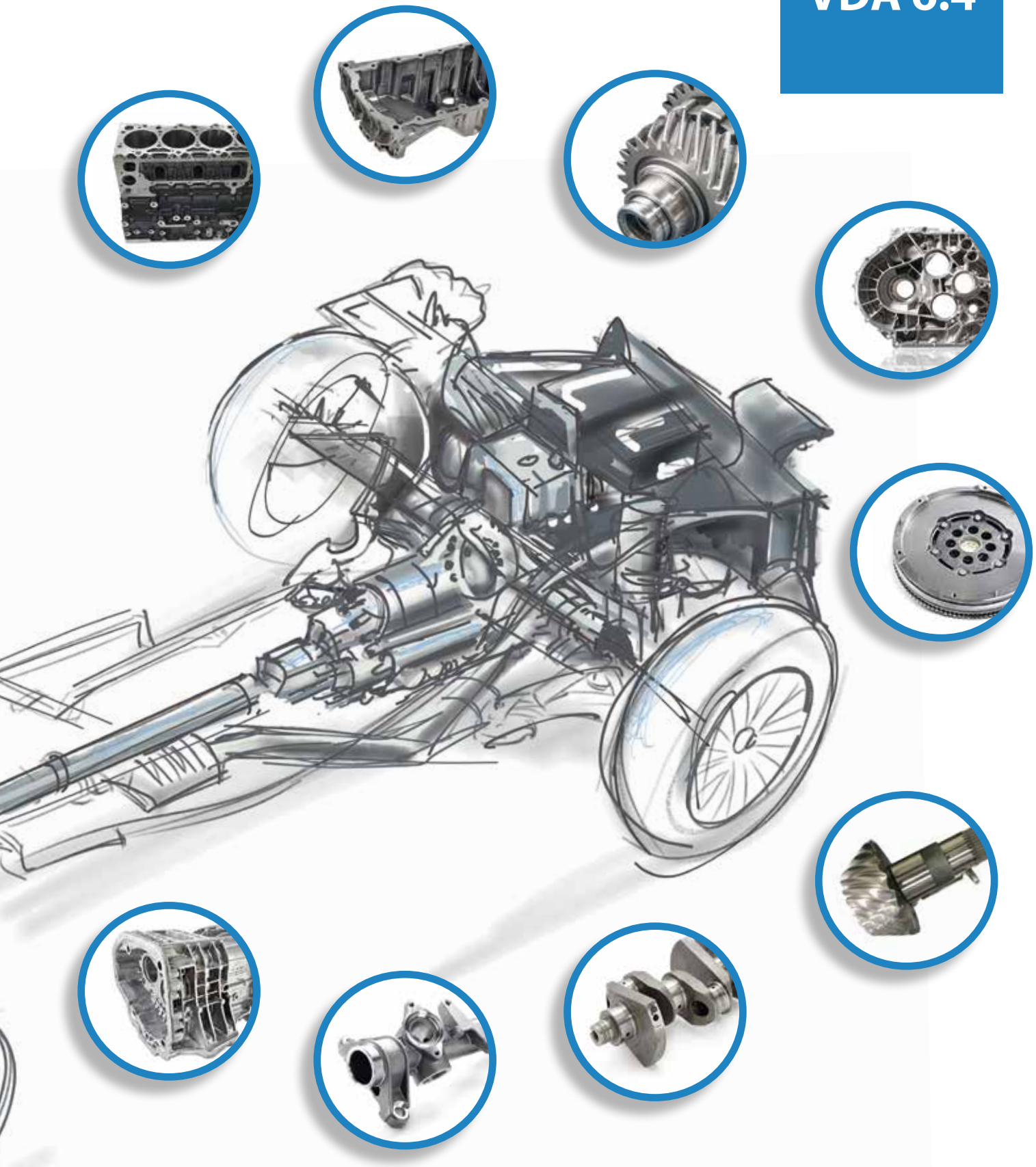
Our cleaning processes are also suitable for components with complex geometries, bores or undercuts.

Type and extent of contamination

The cleaning and filter technology is adapted specifically to the type and extent of the contamination introduced: Particles, swarf or burrs as well as film contamination such as oil or adhesive residue are removed reliably.

certified to

VDA 6.4



Future-proof technology

We also develop special cleaning systems for modern drive systems, e.g. e-mobility.

We keep an eye on your production process

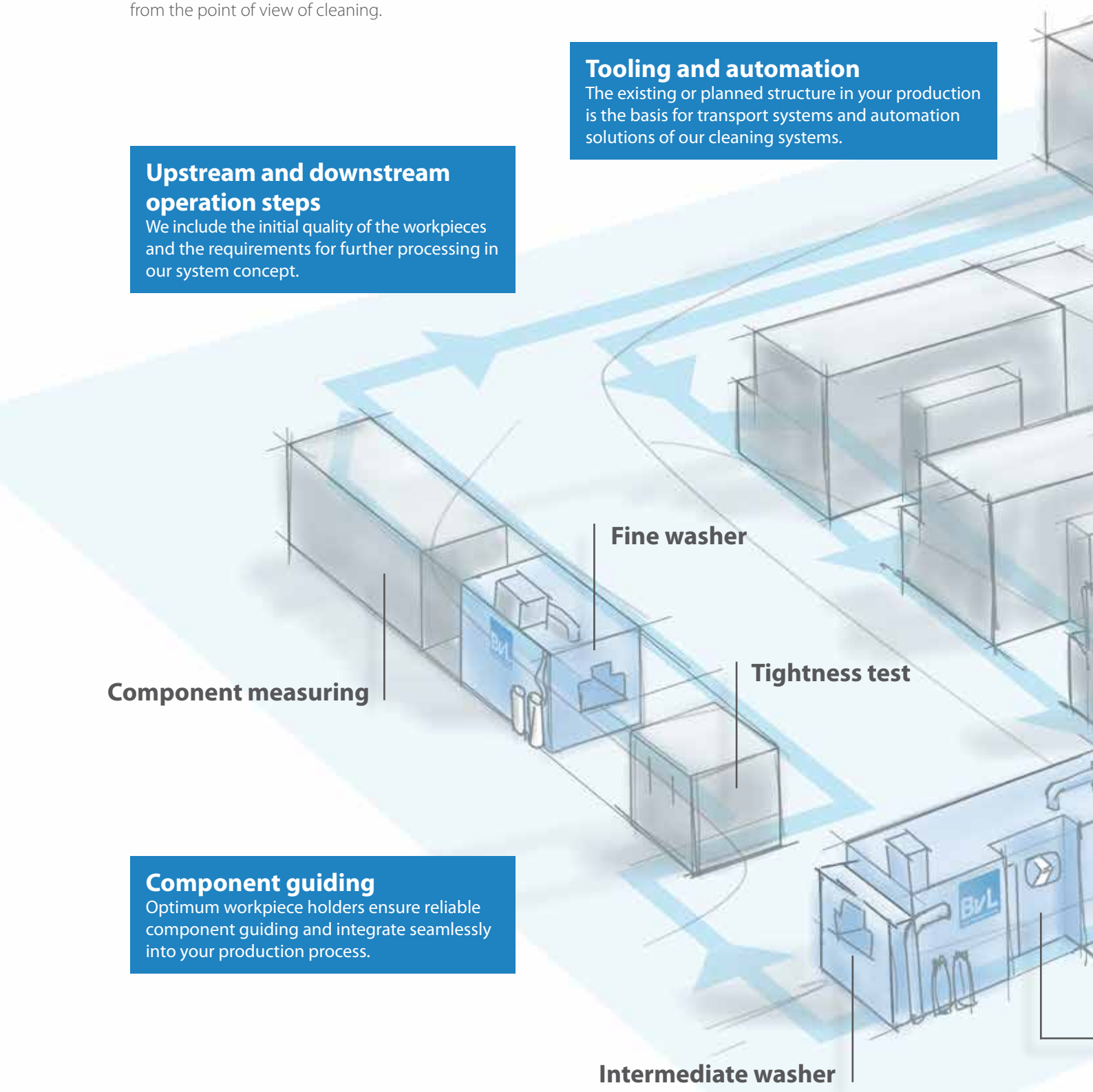
Our cleaning system can be ideally integrated into your production flow and is perfectly adapted to your production-oriented conveyor technology. Whether as island or inline solutions: your internal processes determine the configuration of the system. At the same time, **BvL** attaches the greatest importance to the health and safety of their system operators.
On request, we can also examine your entire production process and provide advice on optimising it from the point of view of cleaning.

Tooling and automation

The existing or planned structure in your production is the basis for transport systems and automation solutions of our cleaning systems.

Upstream and downstream operation steps

We include the initial quality of the workpieces and the requirements for further processing in our system concept.

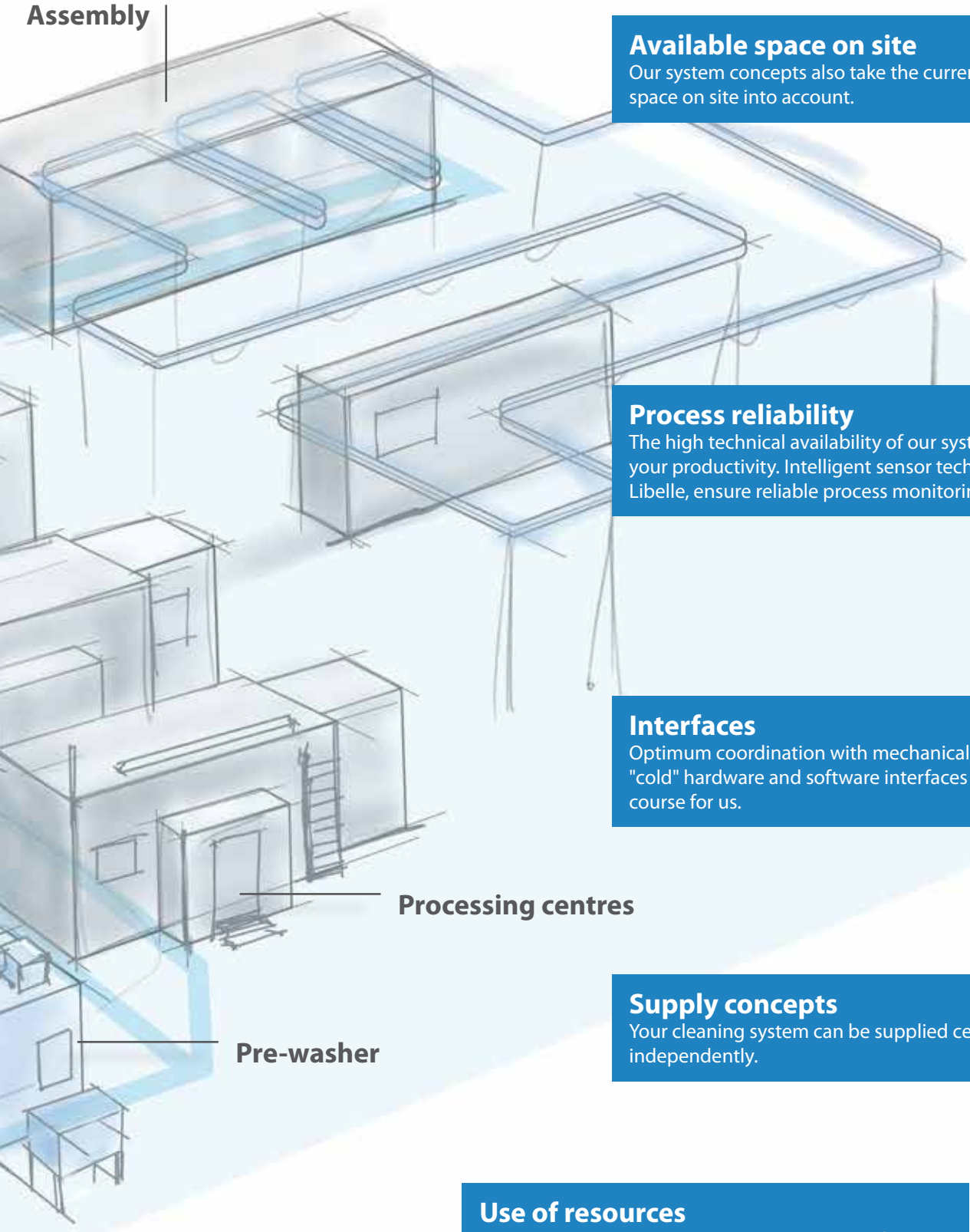


Component guiding

Optimum workpiece holders ensure reliable component guiding and integrate seamlessly into your production process.

Illustration of a possible production line:
The cleaning system can also be integrated into other processes.

Cycle time and throughput
Our system planning always takes into account your specifications for time and volume.



Available space on site
Our system concepts also take the current available space on site into account.

Process reliability
The high technical availability of our systems ensures your productivity. Intelligent sensor technology, e.g. Libelle, ensure reliable process monitoring.

Interfaces
Optimum coordination with mechanical, electrical and "cold" hardware and software interfaces are a matter of course for us.

Supply concepts
Your cleaning system can be supplied centrally or independently.

Use of resources
Our systems support your sustainability with efficient solutions for energy saving, efficient use of resources and environmental protection.

Yukon

Performance parameters:

- **High throughput**
- **Continuous material flow**
- **Inline solution**

Yukon
continuous cleaning system.

Yukon is an individually tailored spray cleaning system for continuous material flow. The parts pass through the successive treatment zones continuously (synchronised if required). Cleaning is carried out by guiding the parts past the fixed nozzle systems.

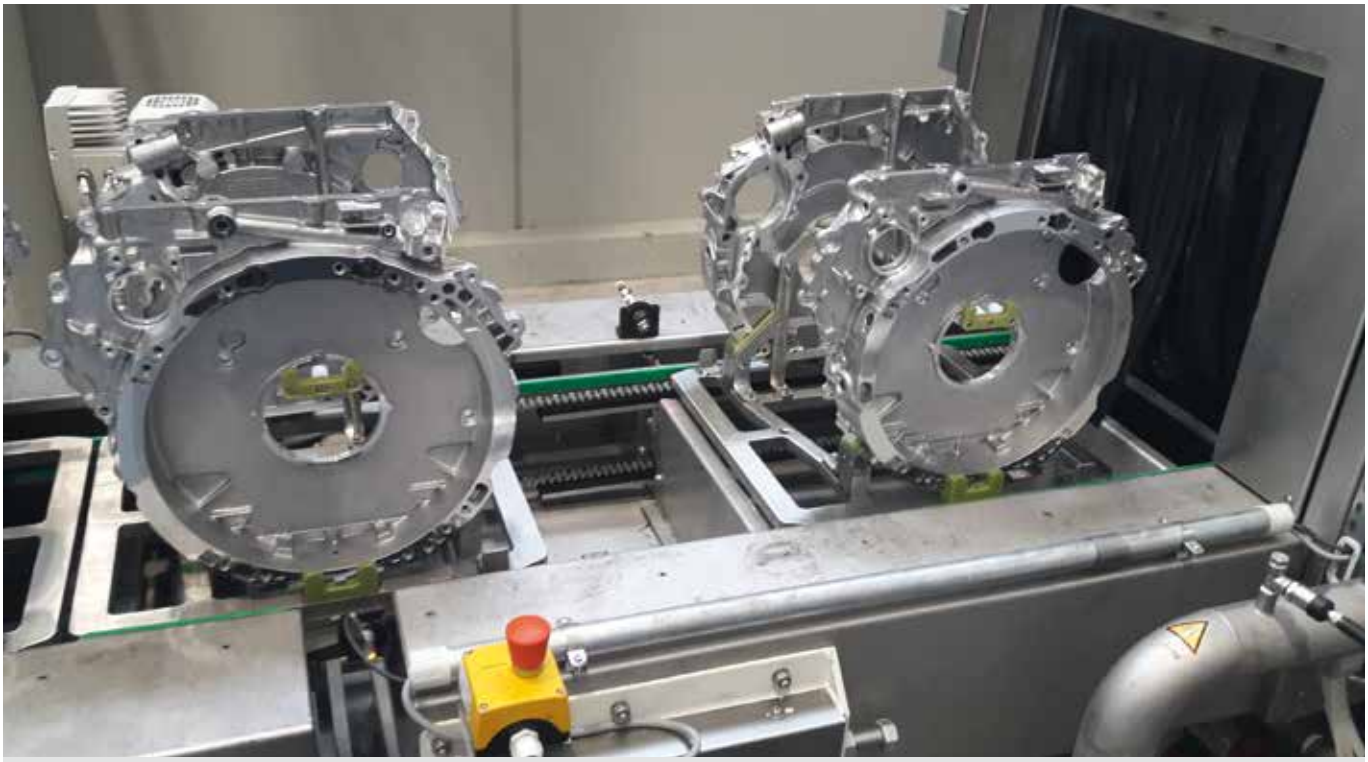
Cleaning technology

- Surrounding nozzle frame, offset nozzle arrangement allows cleaning from all sides
- Nozzles and nozzle frames adapted to the component
- Adaptation of useful dimensions, load capacities and pump capacities possible

Options and additions are selected specifically for your requirements.

Maximum cleanliness of a gearbox housing made of a magnesium alloy in line production (one-piece flow)
The vacuum drying integrated into the cleaning process allows optimum leak testing in the next production step.

No original components are shown. All images have been retouched.



Efficient cleaning of cast aluminium components with complex geometries
Targeted stopping of the parts carriers in the washing zone and the customised nozzle arrangement ensure all-round cleaning of the components, including in the oil channels.

Fast and economical cleaning of cylinder head covers after mechanical processing
Positioned-oriented component alignment on the parts carrier allows targeted cleaning of complex geometries. The cleaning system ensures a high throughput.

Efficient cleaning of converter components
The washing unit seamlessly integrates into a line production (one-piece flow) with component feeding on several lanes which can be independently operated at different speeds.

Thorough cleaning of different types of countershafts
An adjustment option on the parts carriers allows components with different lengths to be treated without changing the setup.

Cleaning of high-quality gearbox components without residue in customised baskets
The exact interface coordination determines the optimum integration of the cleaning system into the production process. A specially positioned roller conveyor ensures the material flow from upstream and to downstream processes.

Niagara

Niagara basket washing system.

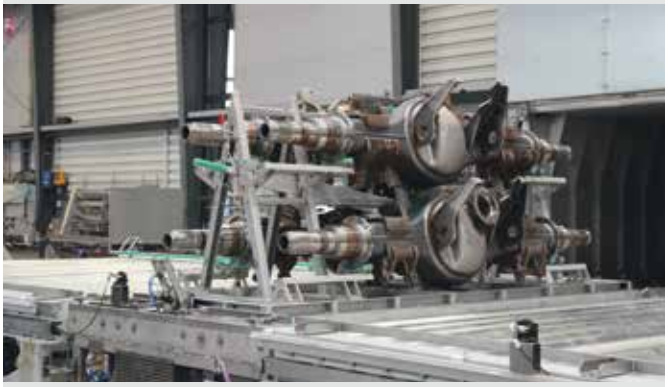
Niagara are our model variants for front-loaded basket washing systems. The processing is carried out with a spraying / flooding process, supplemented by a swivelling or rotating fixture system.

Cleaning technology

- Holding fixture revolves or swivels around the horizontal axis
- Nozzles and nozzle frames can be adapted to the component
- Adaptation of useful dimensions, load capacities and pump capacities possible
- Counter-rotating nozzle systems (optional)
- Ultrasonic cleaning (optional)

Options and additions are selected specifically for your requirements.

Cleaning of hybrid housings in one washing process
The positioning of the parts on workpiece holders ensures that the cleaning flow reliably reaches the components. The integrated vacuum drying in the cleaning chamber allows ideal further processing.

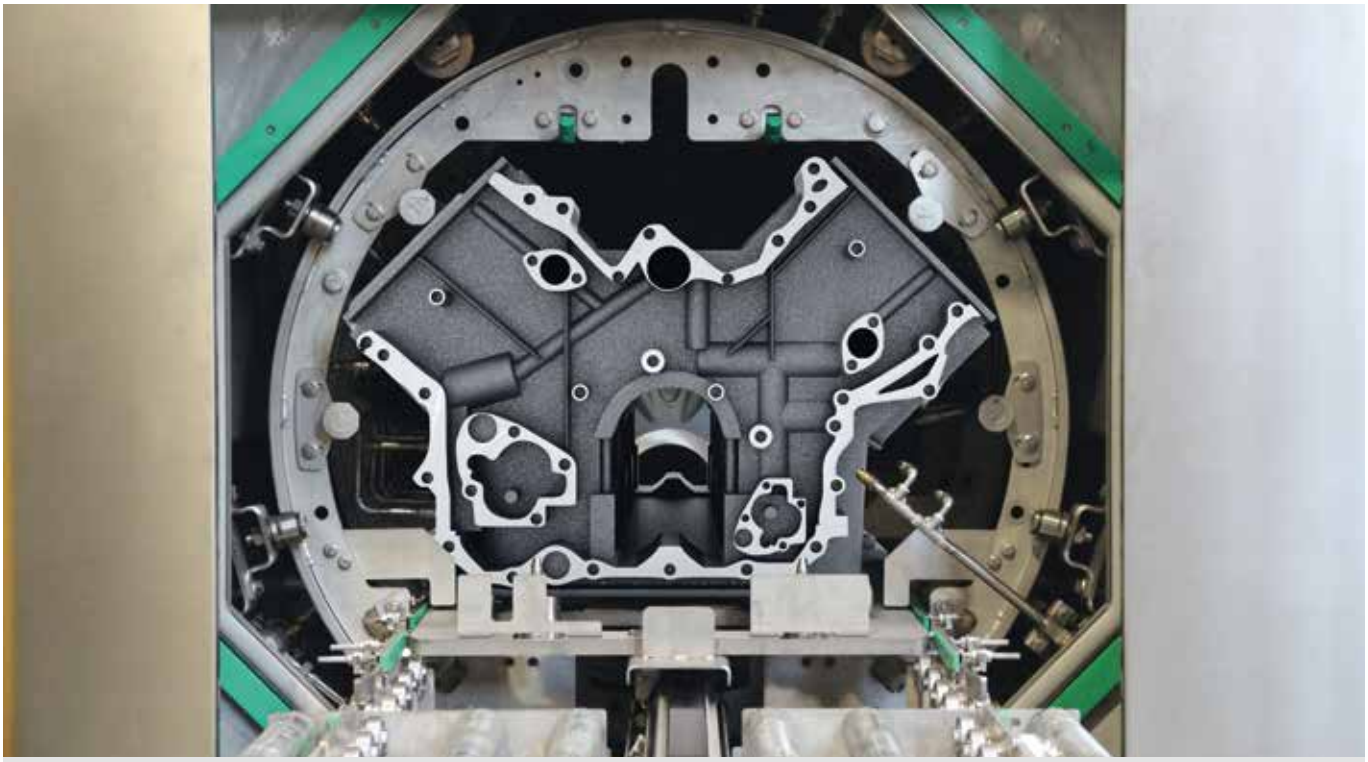


Cleaning of axle bridges
A specially designed parts carrier allows cleaning of the axle bridges from the outside. The hard-to-reach inner channels of the components are cleaned and rinsed with a targeted nozzle system in the washing chamber. After cleaning, a fully automated roller conveyor transports the axle bridges to an external vacuum dryer.

No original components are shown. All images have been retouched.

Performance parameters:

- **High cleanliness requirements**
- **Components with complex geometries**
- **For small parts in baskets or large, heavy individual parts on workpiece holders**
- **Use of e.g. Euro cage pallets**



Targeted external and internal cleaning of cylinder blocks and cylinder heads
Different components with deep-seated, hard-to-reach bores and fluid sections (oil, air, water and fuel channels) can be cleaned in one washing chamber. The parts carriers are scanned using barcodes and the corresponding washing program is selected automatically. The vacuum drying integrated into the washing chamber and the subsequent external cooling ensure smooth further processing in downstream production processes.

Cleaning of different engine components in one system
Fine swarf, dust and other contaminations adhering to bores, joints and blind holes are thoroughly removed from crank housings and crankshafts, connecting rods, ring gears and cylinder heads.

Automated cleaning of planetary carriers in a line production with robotic loading
The efficient loading concept using two workpiece holders allows the second workpiece holder to already be loaded and unloaded again during the washing process.

Cleaning of clutch housings with complex component geometry
Interface coordination with the upstream machining centres and feeding of the components to downstream leak testing. The double chamber design ensures a high throughput; short cycle times are achieved by using six parts carriers on the surrounding conveyor.

All-around cleaning of gearbox housings
Optimum integration of the cleaning system into the production process is ensured by the smooth communication between the external gantry crane for loading and a robot for unloading. An effective washing program with targeted positioning of the spray nozzles ensures an extremely short cycle time.

Geyser

Performance parameters:

- **High-pressure cleaning and deburring**
- **High pressure range**
- **Variable systems such as robot or lance technology**
- **Suitable for integration into other cleaning systems**
- **No thermal or mechanical strain on the components**

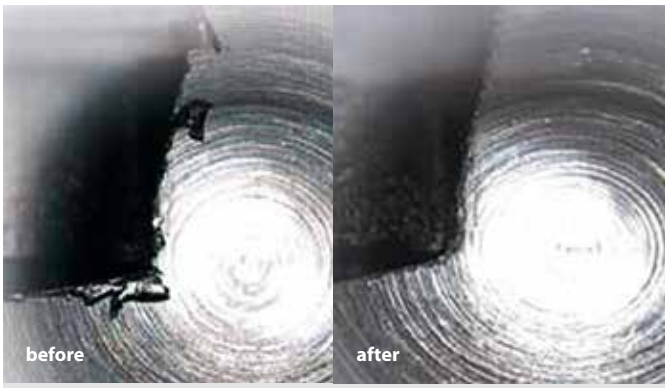
Geyser high-pressure system.

The ***Geyser*** uses a high-pressure water jet for cleaning and deburring. The pressure range from 100 to 3000 bar can be adjusted to match component, material and requirements.

Cleaning technology

- Equipped with water tools with multiple rotating nozzles or individual lances
- Changeable tools, lances and nozzles for different applications
- Multiple robots operating in parallel possible (optional)
- Use of high-pressure lances for targeted cleaning of bores (optional)
- Can be combined with pre-cleaning, subsequent fine cleaning, drying and cooling
- Integrated workpiece holder cleaning (optional)

Options and additions are selected specifically for your requirements.



Targeted removal of a variety of different contaminations
The high-pressure technology removes burrs, swarf, oil and cutting fluids in even the finest oil channels, water channels or tappet bores which could cause far-reaching malfunctions in the production process.

Deburring, washing and rinsing of a cylinder head without residue
Fine oil channels, tappet bores and areas in contact with water are cleaned thoroughly and reliably.

No original components are shown. All images have been retouched.

Efficient integration of several process steps in a complex system
The cleaning process consists of high-pressure deburring, cleaning of the oil channels and areas in contact with water and spray/flood cleaning on a rotating component. This is followed by drying and cooling. The conveyor system allows fast and automatic processing of a high number of batches without parts carriers.

Deburring and cleaning of an entire engine block
Even entire engine blocks including areas in contact with water and oil channels can be cleaned and then transported to leak testing and assembly without residue.

Targeted deburring of oil and water channel holes
High-pressure lances with linear guiding, which move into the engine block at different speeds, allow systematic deburring.

Robot-assisted component guiding to a permanently mounted nozzle system
Rotating water tools guide the high-pressure water jet specifically to the critical component areas. This ensures thorough removal of machining burrs, casting flakes and swarf.

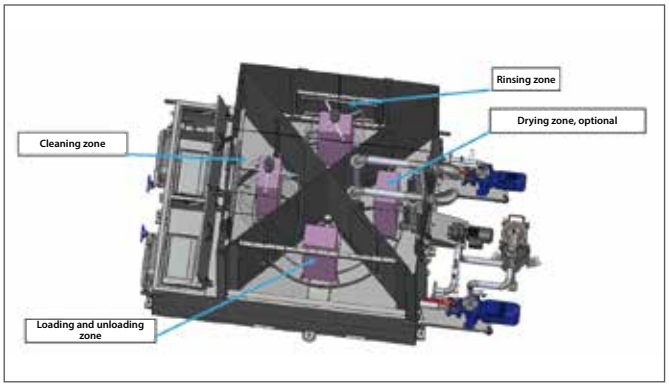
Prevention of re-contamination
The workpiece holder is cleaned in an integrated treatment zone. The deburred component is placed on the cleaned workpiece holder and therefore remains clean.

Our solutions for other tasks

The right solution for each application: Your customer adviser selects the optimum processing technology for your application. Our wide range of products offers a range of other versatile options.

Twister
rotary indexing system.

- Parts conveying to the individual processing stations with rotary indexing
- Loading and unloading are arranged in the same position
- Number and type of the different processing stations for spray cleaning, rinsing and drying are designed depending on the requirements
- Use of, for example, robot-assisted individual parts cleaning with short cycle times, often in manufacturing cells



Ocean
turntable system.

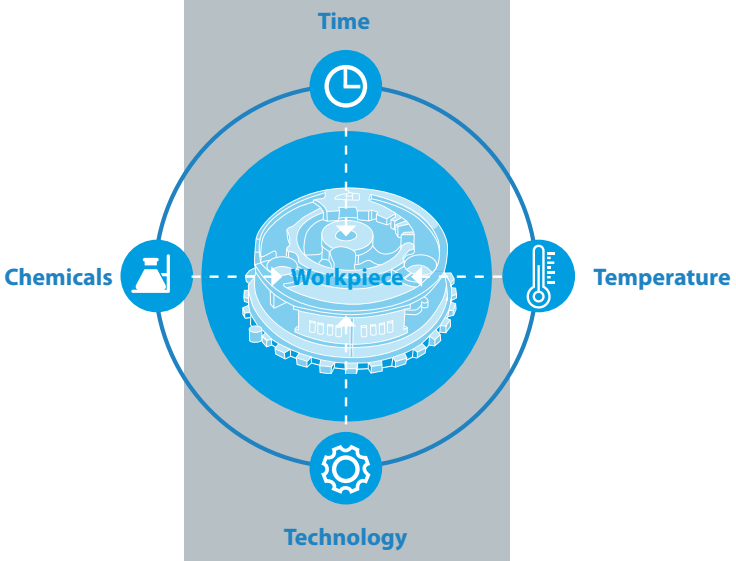
- Universal spray cleaning system with different model variants
- All processing steps are carried out in one chamber
- Ensures all-around, thorough cleaning through rotation of the parts carrier using the U-shaped special nozzle system

Pacific large-parts system.

- Large-volume spray cleaning system
- Cleaning in an oscillating special nozzle system in one chamber
- Ideal for large, heavy components which are difficult to handle

Cleaning factors

The four parameters treatment time, temperature, technology and cleaning chemicals determine the success and the effectiveness of a cleaning process. Optimum cleaning results with maximum economic efficiency can only be achieved with the right combination.



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Transport systems & automation solutions

Our transport systems are tailored to your production process and with the intelligent control of the systems ensure an efficient material flow.

Modern automation concepts relieve users of many steps. This is crucial for stabilising or even increasing throughput and product quality in the long term.

Your advantages

- Increasing productivity through improved material flow
- Optimisation of processes and quality through safe component guiding
- Reduction of ancillary system times
- Intelligent control through use of identification systems
- Unmanned operation possible

Portal solutions

Floor roller cleaning integrated into the process

No original components are shown. All images have been retouched.

Roller conveyor

Hinged belt conveyor

with demagnetising station

Surrounding conveyor

Robot system

Pallet conveyor

No original components are shown. All images have been retouched.

Overhead conveyor

System components

Customised – we adapt the equipment to your individual requirements. The right options and system components are the ideal supplement for making the system a top performer in your production line. You as the user determine which focus you require.

Libelle

Process reliability

Process monitoring and quality control

- Monitoring bath contamination
- Measuring oil content in the medium
- Measuring the cleaner concentration with automatic top-up
- Documenting process parameters
- Guide value monitoring

Nevada

Drying

Variable drying

- Circulation drying
- Hot air drying
- Infrared drying
- Compressed air impulse blowing device
- Medium / high pressure blowing devices, heated and unheated
- Vacuum drying integrated / external
- Heating systems & heating tunnels

Arctic

Cooling tunnel

Targeted temperature management

- Air cooling
- Water / air cooling
- Cooling unit

Saturn

Central supply

Space saving cleaning

- Central supply of cleaning systems with pump / filter systems & bath treatment
- Multiple cleaning systems with small footprint in production are supplied centrally.
- Reduction of operating costs
- Central maintenance and service points
- Redundant design of critical units

Smart Cleaning

Intelligent cleaning technology and augmented reality support service and preventive maintenance

Smart Cleaning is our term for intelligent cleaning monitoring and control. Intuitive apps provide a clearly structured overview of the system status of your cleaning system. This makes changes immediately invisible. The intelligent system reacts independently when system conditions change, ensuring optimum steering of processes.

Predictive maintenance

Real time data allow predictive maintenance. Machine learning is used to detect required maintenance measures much earlier, allowing the corresponding tasks to be scheduled more efficiently. This allows you to achieve more efficient production planning and coordination as well as a longer service life and increased availability of the machines. Unplanned and costly downtimes of the machine are prevented and you can optimise your maintenance plan and personnel schedule.

Augmented reality solutions visualise the information from the machine. This makes worldwide service tasks much easier.

BvL Smart Cleaning apps

- Data logger
- Workpiece identification
- Exhaust air management
- Cleaner management
- Drying control
- Bath change timer
- Vacuum maintenance
- Filter condition monitoring

Your advantages:

- Preventive maintenance
- High system availability
- Time-efficient and cost-efficient
- Quality control
- Energy savings
- Simple operation
- Remote maintenance

Worldwide service

BvL offers the complete service package for your system. We ensure smooth processes: from transport, assembly and maintenance to retrofitting and conversion of your machine.

We also offer local support for international projects: Our worldwide sales and service points ensure optimum implementation and efficient customer support.

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