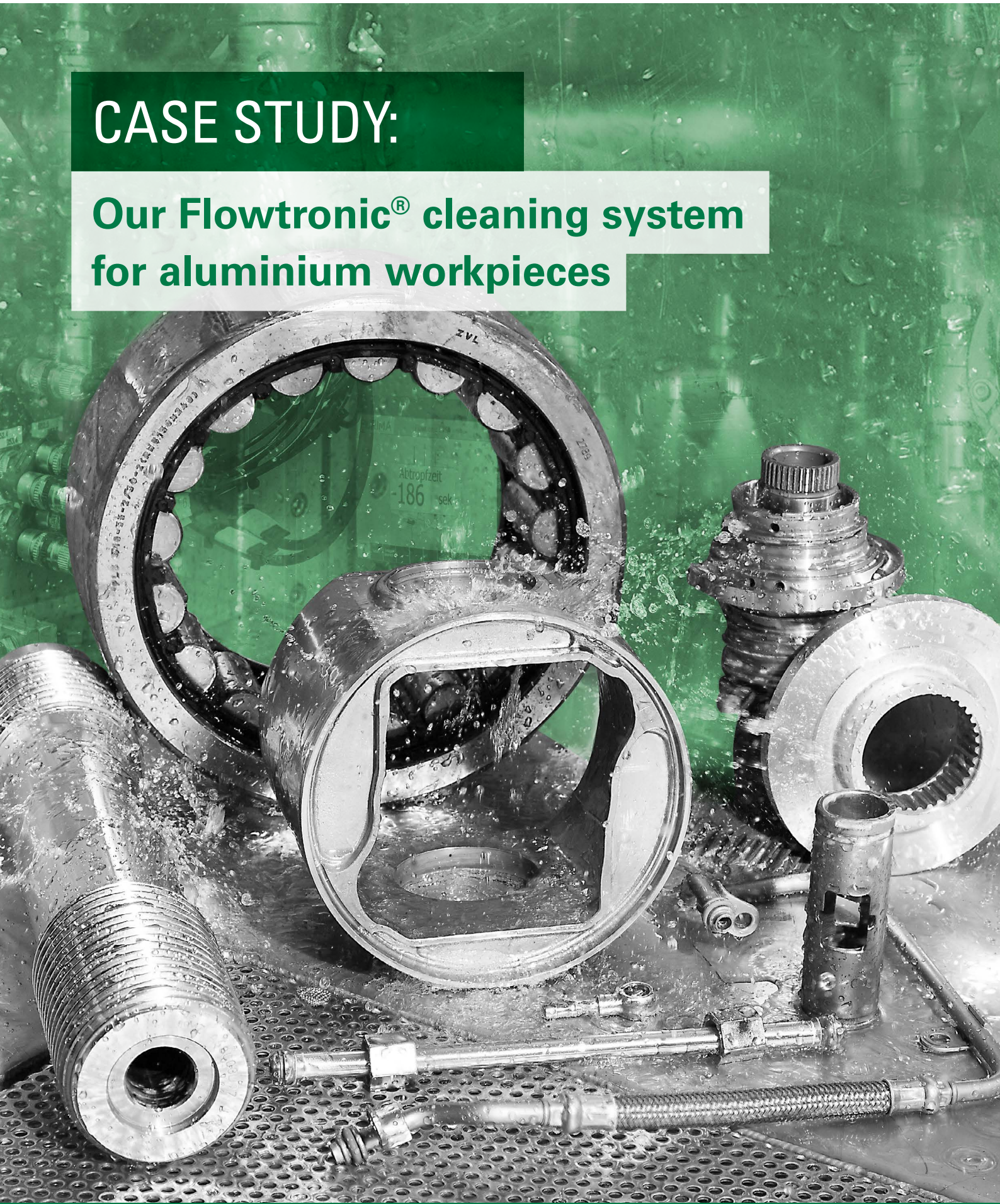
PURIMA®

CASE STUDY:

Our Flowtronic® cleaning system for aluminium workpieces



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CLEANING TECHNOLOGY IS IN OUR BLOOD

PURIMA® is the industrial parts cleaning specialist. For over 30 years our passion has been developing and manufacturing innovative and custom system solutions, while working closely with our customers.

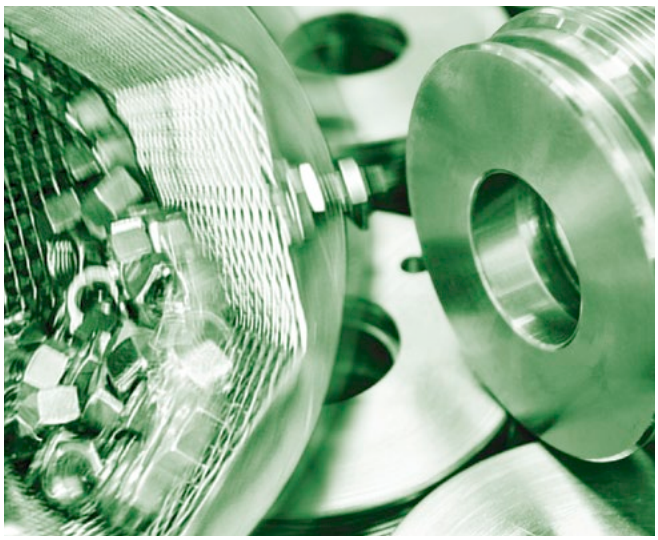
Every day, our equipment is used by satisfied customers around the world in a range of industries, especially in the automotive, space and aerospace, rail and traffic engineering fields and also metals and plastics. We work together with our customers to ensure the required cleanliness standards are met using the right process from our own in-house technology range.

People make machinery

Our specialists are available to help customers with advice and expertise: they are our greatest asset - highly qualified experts working consistently to implement the highest quality PURIMA® technical solutions. Innovative cleaning technologies such as ultra-sound, spray cleaning, pressure flooding, injection flooding or high pressure water cleaning form the basis of our designs.

Global – International

To help meet the requirements of our global customer base, we have selected the DENIOS Group as a partner. This means we have access to a wide network of branches in Europe, the USA and Asia.



SECTORS

We work with customers from various industries:

Engineering and plant construction

Automotive

Maintenance | Workshop

Pharma | Biotech | Medicine

Aviation

Food

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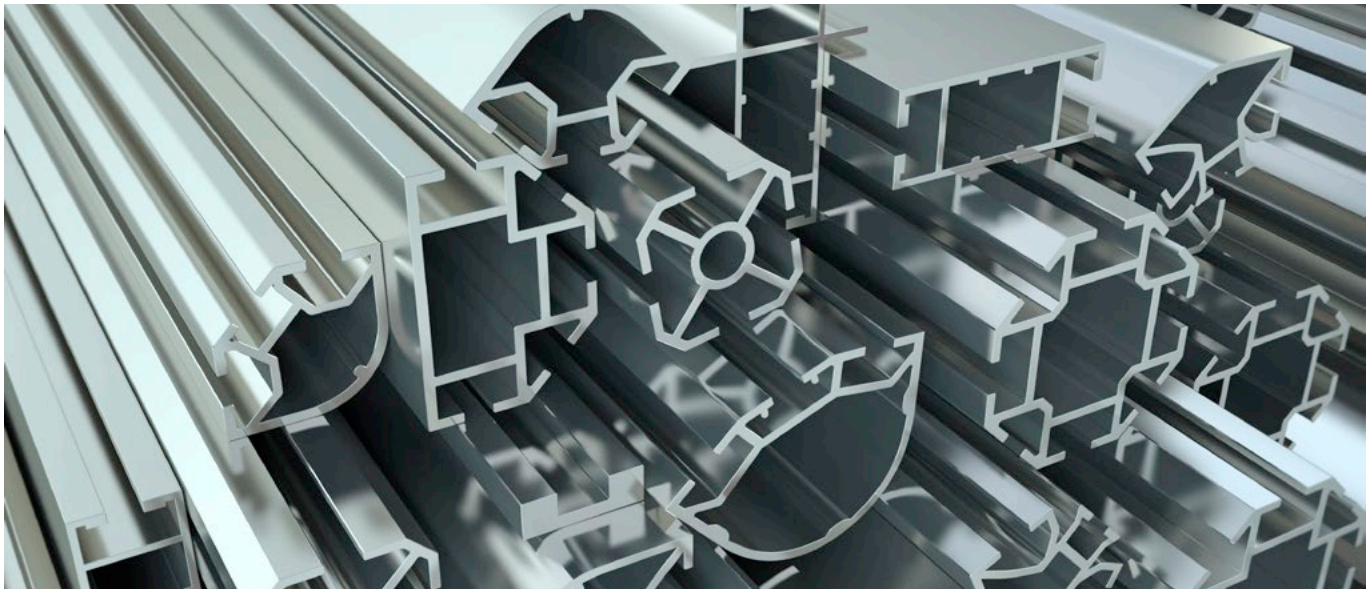
ALUMINIUM:

Professional cleaning is essential.

Aluminium is an increasingly important material for industry. In particular, properties such as its lightness and stability, or the ability to recycle it almost without loss, make it attractive for many sectors, such as the automotive industry, engineering and plant construction, the packaging industry and transport. This makes it all the more important to clean the aluminium efficiently and reliably during ongoing production before it can be transferred to the finishing department.

CHALLENGING WORKPIECES - CLEAN RESULTS

To help ensure that the right cleaning processes can be carried out seamlessly and efficiently as part of your infrastructure, we have specialised for many years in developing individual cleaning systems for every industry - including fully automatic systems. In this case study, we present an application for cleaning complex aluminium workpieces for the **automotive industry**: our 'clean' results speak for themselves!



THE CHALLENGE:

Complex parts require well thought-out cleaning process details

For a major customer in the automotive industry, we developed a fully automated cleaning system to be integrated into the customer's infrastructure for the geometrical cleaning of complex aluminium workpieces for battery trays. The manufacturer installs these parts as fixed components in their e-vehicles. The cleaning process had to remove both traces of oil residue and chips. After cleaning, all cleaned components are seamlessly transported on for welding.

The implementation of the cleaning project involved many challenges for which tailor-made solutions had to be developed:

- The customer's requirements for the cleaned goods included **freedom from chips and stains**, **complete drying** of the cleaned goods, **a surface tension of at least 36 mN/m** and a **short cycle time**
  (1 cleaned product carrier every 100 seconds).
- The aluminium battery tray components **vary greatly in size and shape**: from small parts to elongated hollow chamber profiles and large dimensioned base plates. We had to ensure that all parts could be reliably transported through the cleaning system.
- To make sure that the correct cleaning programme is activated in the cleaning system in a targeted manner, **the machine had to automatically recognise** which parts were being transported into the system for cleaning.
- **Safe access and simple operation were also part of the requirement profile.**
- Wastewater had to be treated so that it could be discharged into the **public drainage system.**

IMPLEMENTATION:
PURIMA 30 metre long cleaning system

For the implementation of this challenging task, we chose to design a FLOWTRONIC® H-V-HD system. This fully automated cleaning system is made entirely in stainless steel and processes the material to be cleaned along a horizontal conveyor line through five aqueous process chambers and three drying zones. As soon as a product carrier has passed through all treatment stages, it must be transferred to the unloading station and fed into the customer's welding process.

Full automation on a grand scale: PURIMA's FLOWTRONIC® H-V-HD system measures 30,000 x 5,500 x 5,000 mm.

- We developed a **universal product carrier** for all the tray parts. A robot places them in a defined position on the product carrier with ± 1 mm precision before they pass through the full production cycle.
- In all cleaning stages, the **spray bars are optimally aligned with the product carrier**. This ensures that the entire component surface and any hollow parts are fully treated with the cleaning medium.

Just a part of the bigger picture: the large dimensions of the cleaning system conceal a high degree of technical sophistication.

- The **PLC control system** also guarantees that the product carriers are optimally positioned within the treatment zones.
- With the size of the goods to be cleaned, the specialised cleaning chambers and drying zones, the resulting plant has a **total size of 30,000 x 5,500 x 5,000 mm.**
- The design has two levels and the top can be accessed, subject to work safety considerations.
- **RFID tag reading** at the entrance to the system enables automatic recognition of the component type. This allows information about the goods to be cleaned to be processed directly in the controller and transferred to all cleaning stages.
- All waste water from the cleaning system is treated in a **separate water treatment plant.**
- All process chambers in the cleaning system are separated from each other by **tightly-closing lifting doors** to prevent the process liquids from being carried over into subsequent chambers.

Secure access to the top of the plant ensures it can be fully serviced.

A separate water treatment plant ensures that the waste water is chemically and physically treated so that it can be discharged into the public drainage system.

THE RESULT:

Perfect trio of automation, cleaning efficiency and easy handling

Thanks to our expertise, we were able to **professionally clean and dry** our customer's multifaceted goods, even in hard-to-reach areas.

PURIMA's engineers have also developed a tailor-made Flowtronic® system, which can maintain the **short cycle times** required in ongoing production without issue. In designing the plant, great attention was also paid to ensuring **simple operation** and **occupational safety**: employees can not only **maintain the plant at any time without interrupting production, but can also view process parameters.**

In order to make operation of the plant as **cost-efficient** and **sustainable** as possible for our customer, we ensured that **heating costs are reduced** by minimising heat losses and that **waste water can be treated and discharged in an environmentally friendly manner**.

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INDIVIDUAL. PERSONAL. COMPETENT.

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