



High Purity
Next level
cleaning

High Purity Cleaning – because every detail counts.

In the semiconductor, optics, medical technology and precision engineering industries absolute cleanliness determines performance and reliability. When components with complex geometries need to be cleaned of particles down to 0.5 µm particle size and residue-free at the molecular level, standard technology is not enough. At BvL, we combine process and material expertise with precisely tailored system technology, aligning the cleaning process exactly with your requirements.

In our technical center, results are verified under real-life conditions. Test runs with original components – including UV-A inspection in our in-house darkroom and particle measurement (PMC) – provide reliable evidence of cleaning performance.

Our technical consulting and BvL's global service support you, whether as a clean service provider or as a manufacturer, on the path to stable and traceable processes.

Your key advantages at a glance:

High Purity – cleanliness at the highest level:

We achieve component cleanliness down to 0.5 µm particle size and residue-free at the molecular level.

Verifiable process reliability:

Our processes are fully documentable – with seamless traceability.

Expertise in materials and geometries:

We clean with ultrapure water (UPW), ultrasound, and vacuum technology; compatible with sensitive materials such as titanium, aluminum, and PEEK – even with complex geometries.

Your requirements:

Cleanliness up to grade 1 – process-reliable, validatable, seamlessly integrable

- ✓ Increasing demands on particulate and molecular cleanliness – for example, for Grade 1 components
- ✓ Reliable cleaning of complex geometries and delicate microassemblies
- ✓ Validatable processes that are thoroughly documented and reproducible
- ✓ Integration into existing production environments or cleanrooms
- ✓ Removal of residual organics and residual moisture, as well as compliance with atomic/molecular limit values

Semiconductor industry:

Cleaning of complex ultra-high vacuum (UHV) components, parts for EUV and DUV lithography, housings, carriers and wafer handling systems

Requirements:

Extremely low particle count down to 0.5 µm, controlled outgassing of H₂O and hydrocarbons, HIO elements in low atomic percentage ranges

Optics industry:

Precision cleaning of lenses, prisms, filters, housings, optomechanical assemblies

Objective:

Residue-free surfaces prior to coating or assembly, maximum cleanliness for sensitive materials

Precision engineering:

Cleaning of micro assemblies, bearings, springs, sensors, components with tight tolerances

Focus:

Safe removal of machining residues such as coolants lubricants, oils, and particles – without affecting the material

Our solution:

Flexibly configurable precision cleaning systems

For the highest demands, with measurable cleanliness and reliable support in all project phases. The modular systems can be precisely adapted to customer-specific processes. The range of applications extends from oil- and grease-free pre-cleaning to qualified final cleaning in accordance with grades 1–4.

At BvL, we are developing the next stage of industrial precision cleaning – precise, reproducible, and tailored to your application.



Possible processes:

Vacuum impulse technology (VIT)

Deep cleaning using implosion power: innovative pressure-change process for improved media exchange and enhanced contaminant removal. Ideal for components with complex geometries, narrow channels, and blind holes. The VIT process can be integrated into any **Niagara** series system and also into the **Atlantic** immersion cleaning system.

Ultrasonic cleaning

e.g., 40, 80, and 132 kHz, multi-frequency systems, ultrasonic generators with sweep function for delicate geometries.

Spray/flood cleaning

Powerful all-round cleaning through special nozzle frames and flooding of the cleaning chamber (continuous partial flooding, full/vacuum flooding, recirculating flooding)

Immersion cleaning

Perfectly coordinated combination of different cleaning processes in a multi-stage system. The treatment processes and number of tanks can be individually adapted.

Drying

Vacuum drying, recirculating air and hot air drying with HEPA filter, air blow-off, infrared drying – used alternatively or in combination

Our systems:

Configurable to your needs – perfectly matched to your component and your process



NiagaraUP

Basket cleaning system with Vacuum Impulse Technology (VIT)

The **NiagaraUP** combines a compact design with high process depth for top-level cleanliness. All process steps are carried out in a single chamber saving space.

The system design prevents recontamination and cross-contamination. Amongst other things through, electropolished surfaces and a rounded chamber design, as well as special processes such as chamber cleaning with UPW (ultrapure water), rapid complete draining, etc.

Process

The key feature here is Vacuum Impulse Technology (VIT), which reliably removes residues even in capillaries, boreholes, and cavities. In addition, spray and flood cleaning (stepless partial flooding, full/vacuum and recirculating flooding) as well as HEPA-filtered hot air and vacuum drying extend the process into a complete solution for high purity requirements. All processes are individually configurable.



AtlanticTR

AtlanticTR immersion cleaning system

The **AtlanticTR** multi-chamber immersion system is an optimal inline solution for the highest cleanliness requirements with high throughputs.

Components are immersed by means of an automated portal transfer system into sequentially arranged tanks with different treatment stages. The number of tanks can vary.

Process

Immersion cleaning, Vacuum Impulse Technology (VIT), phosphating, spraying, injection cleaning, ultrasonic cleaning (optional), rinsing, passivation, and optional drying are available. This wide range allows precise configuration of the cleaning process.

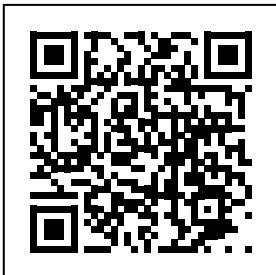
Shared strengths:

- ✓ Vacuum Impulse Technology (VIT)
- ✓ Modularity: multiple tanks and chambers possible
- ✓ Freely configurable program sequence: The order, number, and combination of all cleaning steps can be selected completely individually.
- ✓ Seamless traceability of process parameters: documentable, audit- and validation-capable.
- ✓ Reliable integration into production processes and cleanrooms.
- ✓ Use of DI and ultrapure water (UPW) with low conductivity and TOC values
- ✓ Drying options: HEPA-filtered recirculating air and hot air drying, infrared and vacuum drying
- ✓ System quality (made in Germany), high-quality and durable materials, electropolished surfaces, stainless steel in V4A quality
- ✓ Usable as a pre-washer and final washer



We will find the optimal solution for your high-purity application

On our website, you will find videos of our systems and can get in touch with us - for example, to have components tested in our in-house technical center.



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