



LEVITRONIX® The Company
Ultrapure Materials Handling





About LEVITRONIX®

Levitronix® is the worldwide leader in magnetically levitated Bearingless Motor technology, specializing in supplying ultrapure fluid handling devices for Microelectronics, Life Science and Industrial Applications.

Our patented technology permits the motor and magnetic bearing to be combined into a single unit with products that achieve maximum reliability, long life, and the ability to convey precious fluids in the harshest of environments.

Levitronix® offers the ideal solution for those applications that demand contaminant-free pumping, mixing or fluid control for extended periods in a highly reliable fashion.

SWISS QUALITY from Zurich, Switzerland.

Semiconductor



Life Science



Market Specific Solutions



Improve Yield & Reduce Cost with LEVITRONIX® Bearingless Pumps!

The Levitronix® design has a single motor/bearing unit that provides drive and magnetic bearing functions at one and the same time, and is capable of stabilizing the six special degrees of freedom of the pump impeller magnetically and without contact through the walls of the pump housing.

Compared to conventional canned motor pumps, much larger magnetic gaps can be realized with this technology and there is more room

for the canning between the rotor and the motor stator. The canning is made of plastic materials and form a portion of the pump housing. This makes the pump itself a very simple design comprising only three parts: an impeller containing an over-moulded magnet ring, a lower housing and an upper housing.

The pump component can be simply detached from the motor/bearing stator enabling it to be cleaned very easily.

LEVITRONIX® Pumps are designed for highly demanding Applications

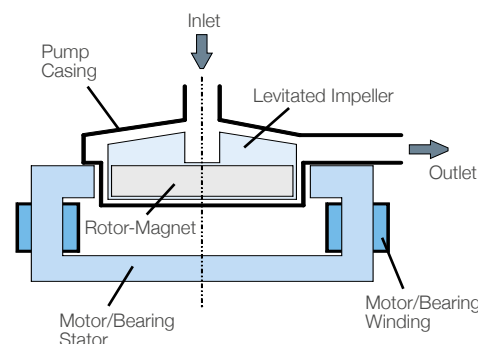
The Levitronix® pump systems are designed for highly demanding fluid applications where extremely low particle shedding & metal contamination, low shear force requirements, controllability or simply high reliability is required. All wetted parts of the Levitronix® pumps are made from high-performance plastic resins such as PTFE, PFA, ECTFE, PVDF, PP.

Due to its unique construction, the Levitronix bearingless canned motor pump has several outstanding features. Simply put it combines all the advantages of conventional canned motor or magnetic coupling pumps but avoids the problems related to the process-lubricated bearings. There are no narrow gaps and fissures and the pumps do not generate any particles. They can be oper-

ated even with such critical fluids as ultra-pure chemicals, CMP slurries, living cells or Active Pharmaceutical Ingredients (API).

Since there is no mechanical coupling of the impeller and the pump casing, the pump produces virtually no vibrations thus the bearingless pumps are very quiet. The absence of any mechanical contact between rotating and stationary parts leads to a virtually wear-free product. In addition, due to its variable speed, the Levitronix® pump allows precise control of flow or pressure and a wide operating range.

With just one pump model, a whole range of conventional fixed frequency pumps can be replaced and saving footprint due to the very compact design characteristics.



Your benefits.

- » Extremely low particle generation due to the absence of mechanically contacting parts.
- » Reduced risk of contamination due to the self-contained and hygienic design with magnetic bearings.
- » Very gentle to sensitive fluids due to low-shear design.
- » Electronic speed control allows smooth, continuous flow without pressure pulsation.
- » Long-term proven technology in high-tech industries.

Semiconductor

At Levitronix® we realize that your Semiconductor-, Photovoltaic-, Storage Media- or Flat Panel Display High Tech Factory runs 24/7. Having dependable, safe components that consistently deliver critical process fluids is a must. Avoiding unnecessary shutdowns is a goal that we share. Our highly reliable flow control components, pump-systems, mixers, flowmeters and flow controllers coupled with our dedicated and knowledgeable staff has kept factories like your own running 24/7.

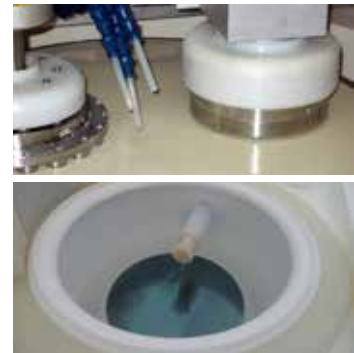
CMP Slurry. Conveying slurries high shear forces caused by Diaphragm- or Bellow pumps result in particle agglomerations. Microscratches originated by these oversized particles or particle agglomerations are one of the most important causes of defectivity during CMP. Due to the low shear force design Levitronix® pumps can reduce Microscratches in CMP applications by up to 80% and therefore significantly increase your yield!

Surface Preparation. Ultimate low particle generation and continuous flow requirements are required and define process yields for Single Wafer- as well as for Batch Processing. Levitronix® pumps create significant fewer particles than other state-of-the-art pumps and therefore will help to decrease particle defect on the wafer. Due to the highly accurate continuous flow and pressure capabilities and the electronic control

functions, Levitronix® pump systems can be ideally facilitated as a dynamic flow controller for online blending purposes.

Plating - Electro Chemical Deposition (ECD). Uniformity and underplating is of great concern to the plating process on silicon wafers. It is important that the overplating is kept to a minimum, as the CMP process following the metal deposition is very cost intensive. Levitronix® pump systems provide a very consistent electrolyte flow which is one of the key drivers for the plating uniformity. By doing so, the plating process can be controlled in a very narrow process window and costly overplating can be reduced or eliminated.

Also undesired outplating effects are eliminated due to Levitronix's "Big Gap" design and specifically suited materials of construction.



LEVITRONIX® Pump Series



BPS-Series

UPW. The quality of Ultra Pure Water (UPW) is defined by its cleanliness, since contamination as particles are highly critical to the process and directly linked to production yield. Levitronix® pump systems create significant fewer particles than other state-of-the art pumps and therefore will help to decrease particle defects on the wafer.

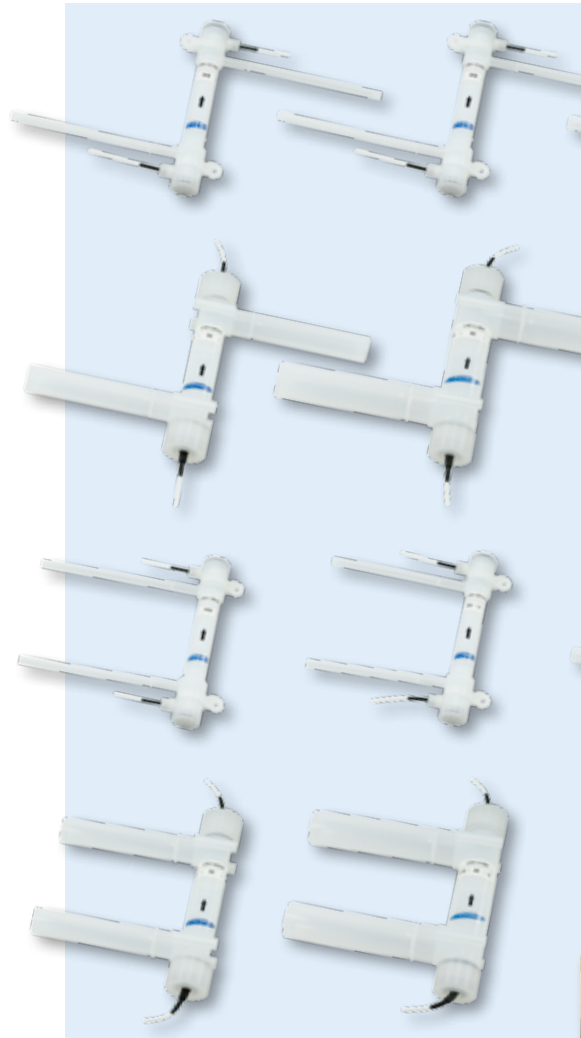
In addition the linear flow characteristics of Levitronix® pumps combined with a flowmeter or pressure sensor results in a highly dynamic and accurate flow controller providing very constant pressure or flow independent from supply source fluctuations.

Other Microelectronic Applications. Beside the application specifically mentioned there are many other demanding Semiconductor/Micro-electronic processes that include

- **Bulk Chemical Delivery**
- **Batch Tool Recirculation**
- **Post CMP Cleaning**
- **Immersion Lithography**
- **Photo Resist Delivery**
- **Developer Recirculation**

The common denominator of all these application is their high demand in terms of cleanliness, low particle numbers, continuous flow requirements or the need for gentle conveyance of the corresponding media.

LEVITRONIX® Flow Sensors



»The revolutionary centrifugal pump of Levitronix® offers a highly reliable and low cost of ownership solution.



Life Science

In today's Life Science Industries the demands are constantly increasing with state-of-the-art companies setting new standards in terms of hygiene aspects, product quality and consumer safety. The suppliers to these industries need to scope with increased technical and ethical standards.

Levitronix® offers a wide range of fluid handling solutions as hygienic pumps, mixers and ultrasonic flow sensors scoping with the industry demands from today and tomorrow.



Pharmaceutical Production.

Levitronix® hygienic pumps offer a worldwide unique bearingless design which addresses some of the most critical issues in modern pharmaceutical liquid processing:

No risk of contamination:

True hygienic design - no narrow gaps and fissures where particles or micro-organisms could be entrapped.

No risk of particle generation:

By design due to the absence of mechanically contacting parts and high pure materials of construction.

Easy to Clean:

Wide open design for an efficient and thoroughly CIP and SIP process.

Biotechnological Processing.

Fluid handling of animal- or plant cells and proteins is explicitly sensitive to external influences. Levitronix® offers dedicated pumps, mixers and flow sensors which fits the need of today's high-tech bioprocessing.

No risk to sensitive media:

Very gentle conveyance due to low-shear design.

Easy to control:

Smooth, continuous flow without pressure pulsation by electronic speed control.

Easy to implement:

Pumps can be easily integrated and controlled via PLC.





Market Specific Solutions

Safe, reliable efficient and cost effective conveyance of sensitive or corrosive media is key for many Industrial market segments. Levitronix® has developed dedicated market specific pump systems where industry demands and typical challenges can be addressed in a unique way.

Chemical Process Industry.

Levitronix® Chemical Pumps with the innovative bearingless and seal-free design as well as extremely corrosion resistant materials of construction for the wetted areas combined with long lasting coating for outer surfaces set new standards for Chemical Process pump systems.

Nanotechnology. Levitronix® pump solutions for gentle conveyance of Nanofluids with low shear force design pump heads. Beside agglomeration problems companies face challenges with Nanofluid blending, dilution and dosing as well as filtration difficulties. Also particle contamination is influencing Nanofluid production yields significantly. The choice of the right pump systems becomes a success factor and is one of the most crucial design elements.

Further High Purity Markets. What one can find within these various

industries is often a high demand in terms of cleanliness, low particle numbers, continuous flow requirements or the need for gentle conveyance of the corresponding media. The revolutionary centrifugal pump of Levitronix® combines all these properties and offers the customers a highly reliable and low cost of ownership solution to support these different needs:

Ink and Paint Industry – no pigment agglomeration, clean working media and constant process flow.

Optical Industry and Industrial Polishing – no agglomeration of polishing slurries, high abrasive resistivity of wetted pump components, no scratches, high yield and long component lifetime.

Private Label Products - specifically developed products to fit unique customer needs and tuned for a perfect system integration.

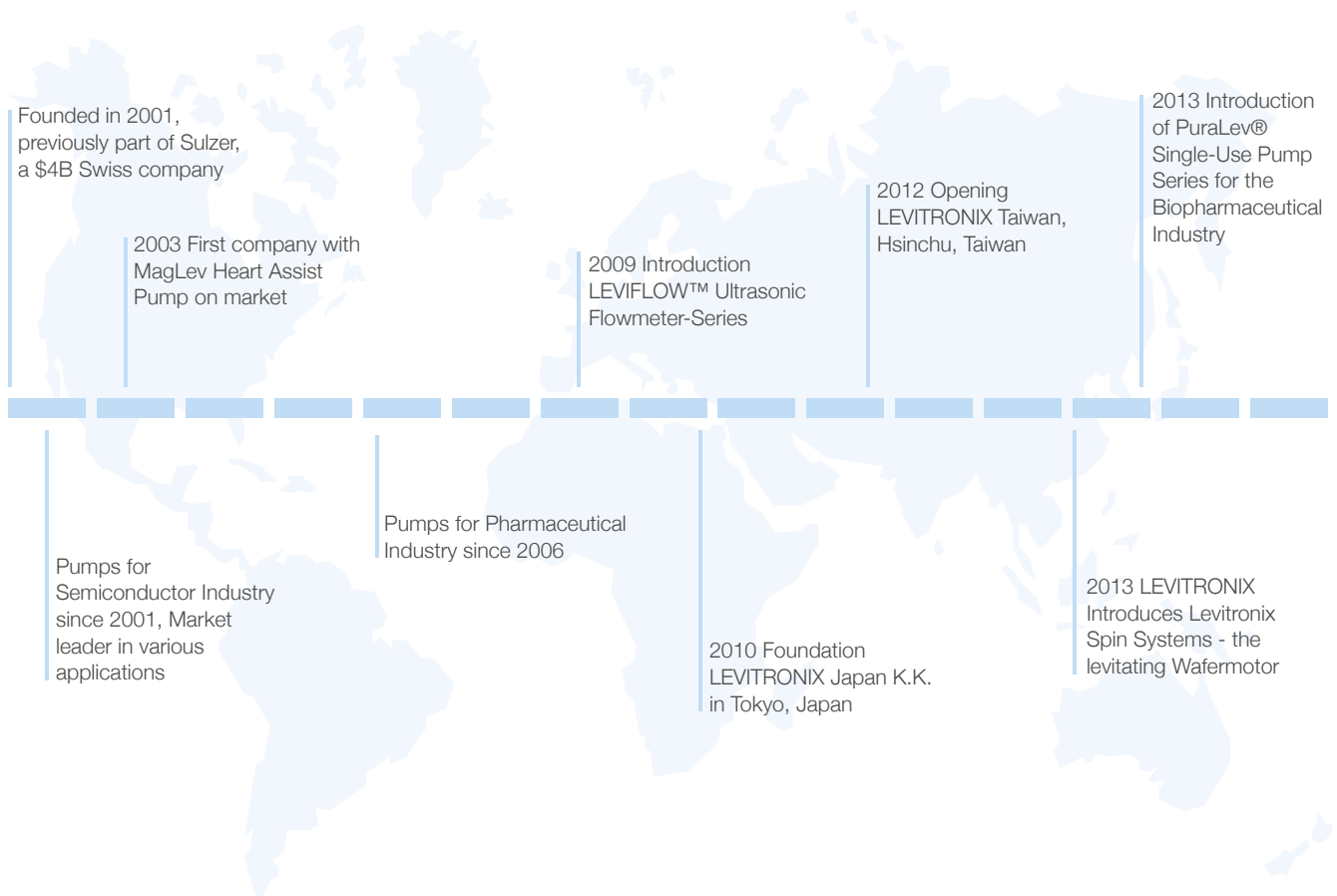


LEVITRONIX® Wafer Handling



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Company History



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