THE ART of
µMANUFACTURING

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NEXT-GENERATION
MICROFLUIDICS

FEMTOPRINT®
3D PRINTING FOR GLASS MICRODEVICES

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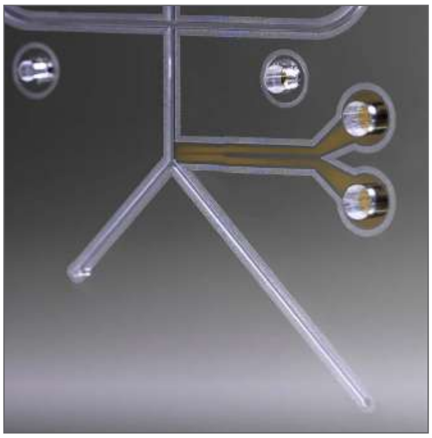
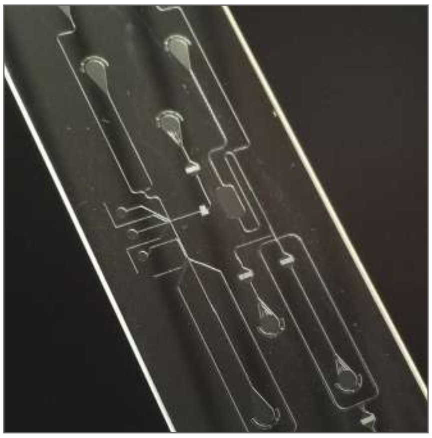
FEMTOPRINT is a proven key partner across a multitude of Life Sciences Applications.

From DNA sequencing to gene editing, lifescience applications increasingly depend on microfluidic chips that are both personalized and precise.

These chips must integrate optical, fluidic, and mechanical functions seamlessly.

FEMTOPRINT enables just that by transforming your ideas into high-performance glass micro-devices.





WHO WE ARE AND WHAT WE DO AT FEMTOPRINT FOR YOU

FEMTOPRINT® is a pioneer and leading company in 3D micromanufacturing in glass. Our technology, based on femtolaser-assisted chemical etching, enables the fabrication of complex, high-precision microstructures in glass materials. We specialize in creating microfluidic chips that can integrate miniaturized optical or mechanical components frequently in a single monolithic substrate. Our work empowers researchers, innovators, and product developers to bring high-performance solutions to life in diagnostics, therapeutics, analytics, and more.

What we can do for you

Whether you're prototyping a cutting-edge device or scaling production for a commercial product, FEMTOPRINT enables you to realize highly customized and fully integrated microfluidic chips. We support you from concept to fabrication, bringing your ideas to life even when you don't yet know how to design them. With unmatched geometrical freedom and material properties, we provide you the performance, reliability, and integration that off-the-shelf solutions or polymers can't deliver.

What makes us fundamentally different

We offer a unique micromanufacturing technology that greatly enhances how microfluidic chips are made, enabling true 3D geometries in glass. You don't need a fully defined chip design or engineering expertise: we'll help you define, optimize, and manufacture it with you. Our process isn't just for R&D but it's a robust industrial platform, scaling from one-off prototypes to 10,000+ units with consistent quality and precision.

From Prototype to n+1, we make rapid iteration easy

With our platform, fully maskless, changes to an existing design can be implemented quickly and cost-effectively, which is perfect for iterative testing or personalized versions that fully integrate into your existing equipment.

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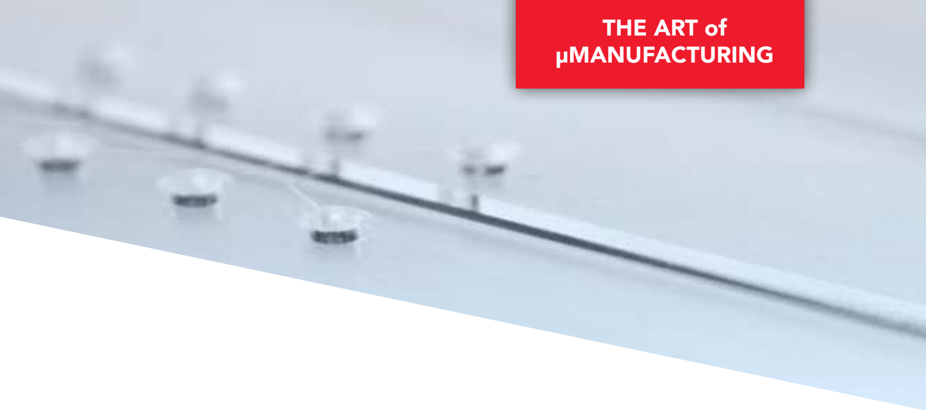

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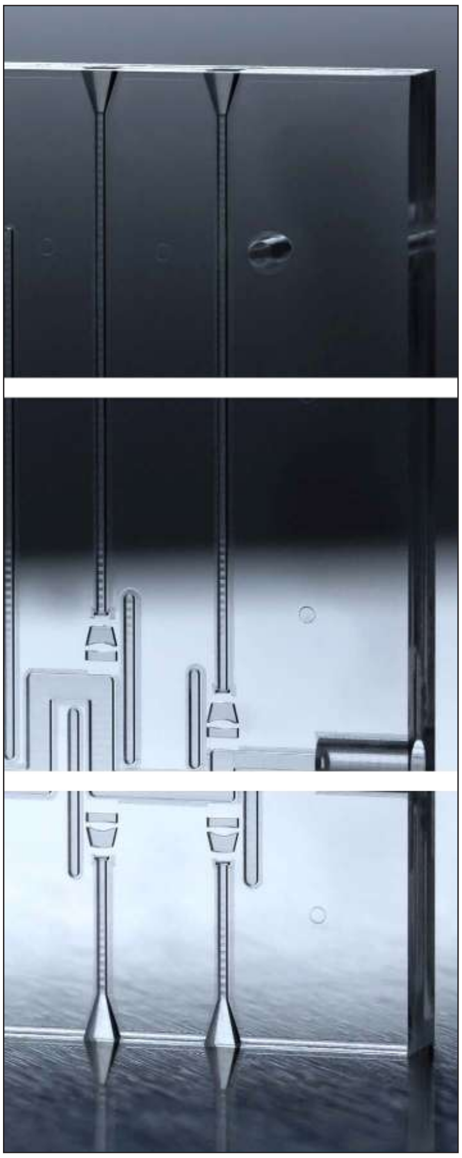

WHY CHOOSE GLASS TO MANUFACTURE YOUR NEXT MICROFLUIDIC CHIP?

Where polymers fall short, glass excels.

Feature	Why it matters and benefit you
Optical Transparency	High transmission across visible, UV, and NIR spectra enables precise imaging, spectroscopy, and optical alignment. Glass also supports low dielectric loss for electrical functionality.
Mechanical & Thermal Stability	Rigid, warp-free surfaces with low CTE (3–7 ppm/°C) ensure dimensional accuracy and compatibility with silicon—ideal for high-precision applications.
Chemical Resistance	Inert to solvents, acids, biological media, and moisture. Chips remain durable, clean, and compatible with autoclaving (>130°C) and long-term use.
Biocompatibility	Naturally cell-friendly and non-reactive. Glass doesn't trigger immune responses crucial for therapeutic and in vitro use.
Superior to Polymers	Unlike PDMS or thermoplastics, glass maintains shape, transparency, and surface properties over time. No swelling, leaching, or degradation in aggressive conditions.

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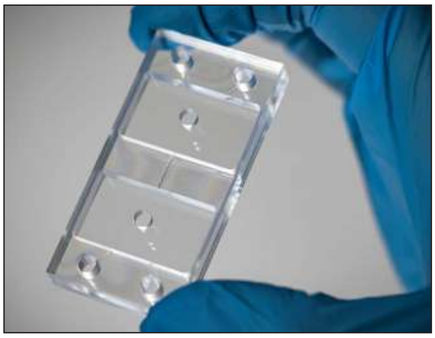

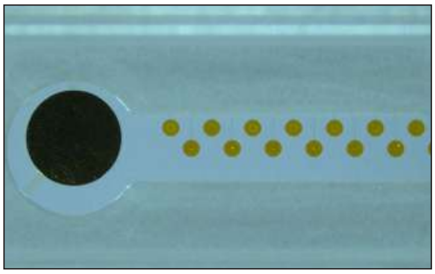

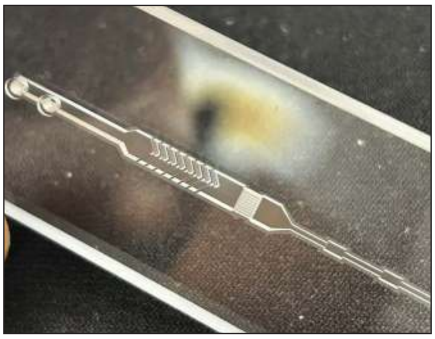

OUR TECHNICAL CAPABILITIES PROPEL YOUR INNOVATION

FEMTOPRINT offers unmatched precision, repeatability, and complexity in glass micromanufacturing thus meeting the evolving needs of the life science industry.

We can fabricate intricate 3D microfluidic networks, high-aspect-ratio channels, reservoirs, mixers, valves, and capillary traps with micron-scale resolution, all inside a single glass chip. Our process enables freeform geometries with smooth surfaces, sharp features, and full spatial control in X, Y, and Z.

Certain complex microfluidic architectures require multi-part assemblies.
For these cases, we apply advanced glass-to-glass welding techniques that ensure hermetic sealing, structural integrity, and precise alignment.

Our process guarantees no cross-talk or contamination between microchannels while preserving flow fidelity, chemical isolation, and device performance even under pressure or thermal cycling.

For life science innovators, this means chips with fully integrated optical windows, waveguides, mirrors, and filters no need for secondary assembly or bonding. Our monolithic approach eliminates alignment issues, reduces leakage risk, and improves reliability.

Whether you're developing lab-on-chip devices, biosensing platforms, therapeutic delivery systems, or microreactors, we offer:

- Microchannels with customizable geometries
- Integrated optical elements for detection and analysis
- Sample inlets, mixers, and flow dividers
- High-volume-compatible chip formats
- Multi-layered channels for sequential processing
- Co-design and consultation support

FEMTOPRINT bridges the gap between function, integration, and manufacturability.

MICROFABRICATION WHERE LIFE SCIENCE NEEDS IT MOST

Every life science application comes with its own technical bottlenecks. We design and fabricate high-performance glass microdevices that directly address those constraints—improving function, reliability, and scalability across the field's most demanding use cases.

Cell Therapies
We fabricate biocompatible flow cells, microreactors, and cartridges designed to preserve sterility and viability during cell processing. These elements address critical issues in therapeutic workflows, such as contamination risk, inconsistent cell expansion, and the need for gentle handling of sensitive biological materials.

Single Cell Analysis
Our chips integrate ultra-precise 3D microchannels and embedded optical windows to enable individual cell isolation, manipulation, and imaging. These solve challenges in throughput, spatial resolution, and integration, which are essential for reliable single-cell omics, sorting, and diagnostics.

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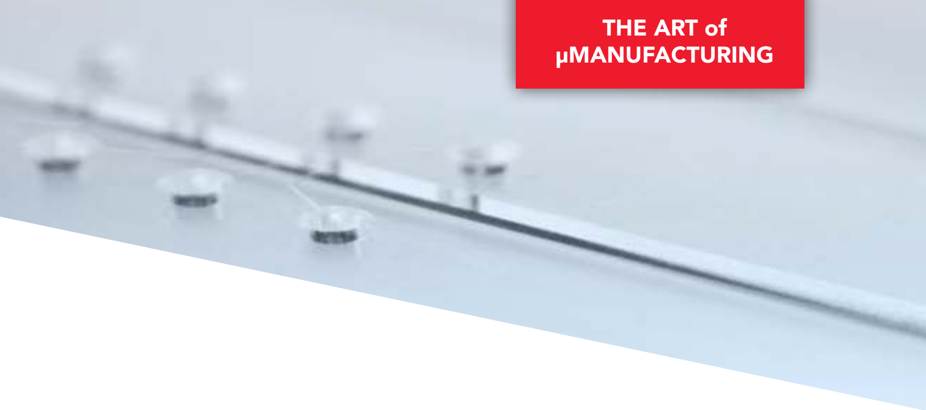

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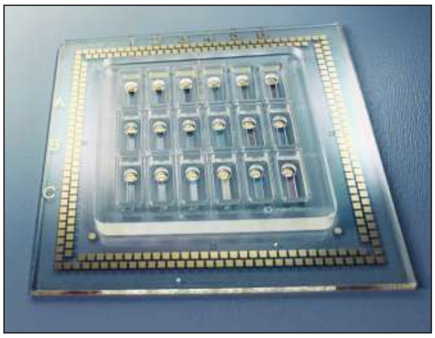

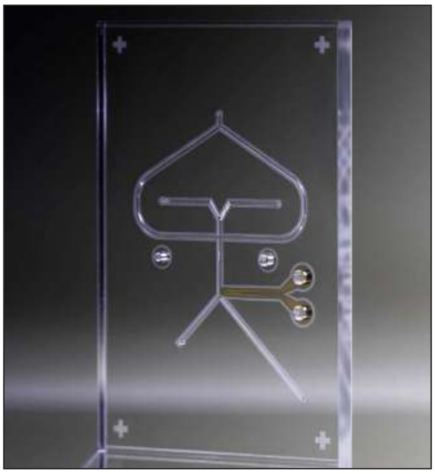

Drug Delivery
We create microreservoirs, diffusion barriers, and high-precision micronozzles that enable localized and time-controlled drug release. This directly addresses the need for miniaturized, programmable delivery systems in implants, wearable devices, and targeted therapies.

Photonic Analytics
By embedding waveguides, microlenses, and mirrors directly into glass, we eliminate the need for complex alignments and bonding. This allows for compact, robust optofluidic systems thus solving the pain of integrating fluidics with optical detection for biosensing, spectroscopy, or interferometry.

Printheads
Our high-aspect-ratio nozzle arrays and mixers are tailored for high-viscosity fluid control particularly suited for bioprinting or inkjet systems. These components tackle common issues such as clogging, inconsistent droplet formation, and mixing inefficiencies in precision dispensing.

Bio-(chemical) Sensing
We provide monolithic chips with tightly integrated optical and fluidic interfaces for inline bioassay readouts and chemical monitoring. These robust platforms solve alignment drift, signal loss, and chemical incompatibility ensuring consistent, real-time analytics.

Glass Masters
We produce ultra-precise glass templates for polymer microfluidic replication. These masters guarantee repeatable, high-fidelity duplication across batches thus solving problems in scale-up, quality control, and feature degradation seen with softer materials.

Bioreactor Testing
Our miniature glass bioreactors combine inlets, mixing zones, and sampling ports in a single chip streamlining R&D of cellular systems. This solves the need for space-efficient, sterile, and configurable bioprocessing setups in labs.

Antibody Isolation
We develop integrated microstructures for filtration, separation, and binding. These systems enable scalable, compact biomolecule purification and address the demand for faster, more efficient isolation of antibodies and proteins in therapeutic and research workflows.

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ABOUT FEMTOPRINT

COMPETENCIES

- Design For Manufacturing (DFM)
- Product engineering and development
- Pilot & volume manufacturing
- Engineering competencies in material sciences, physics, optics, photonics and microfabrication
- Rapid prototyping
- Structural & functional characterization in QC

PERFORMANCES

- Free-form geometries
- Process resolution ~ 1 µm
- Standard surface roughness Sa ≤ 100 nm
- After treatment Sa < 10 nm
- Aspect ratio: > 1:500
- Substrate thickness: up to 30 mm
- Working area: up to 300 mm Ø

WHY FEMTOprint

- Trusted partner from product development to wafer-scale volumes manufacturing
- Excellence in delivering superior quality, Swiss Made
- One-stop glass manufacturing foundry, vertically integrated
- Free-form design at the µm scale
- Fast turnaround time in prototyping

FEMTOPRINT is a Swiss high-tech Contract Development and Manufacturing Organization (CDMO) specializing in high-precision 3D microfabrication in glass. With the ground-breaking FEMTOPRINT® microfabrication platform, we support leading industrial Customers with services spanning feasibility studies, rapid prototyping, pilot production, and industrial-scale series manufacturing at the wafer level.

FEMTOprint's manufacturing plant is located in Agno, Switzerland since 2022, the company runs a subsidiary in Neuchâtel, and sales operations in the USA. The company is ISO certified 9001 and 13485.

INDUSTRIES WE SERVE

Life Sciences & Diagnostics | MedTech | Optics & Photonics | Quantum
Watchmaking | Aerospace | Semiconductors | Industrial Machinery | AI | Automotive | Energy

APPLICATIONS

Microfluidics | Micro-optics | Photonics | Microelectronics | Micromechanics |
Advanced Packaging | Masters for polymer replication |

The core FEMTOPRINT® micro-manufacturing platform leverages cutting-edge ultrafast laser-based technology combined with etching techniques to produce innovative, three-dimensional glass microdevices with micrometer-scale resolution. This advanced platform is further enhanced by additional capabilities, including laser welding, three-dimensional waveguide inscription, dicing, and surface treatments. It accommodates a wide range of transparent substrates as raw materials for the creation of intricate 3D structures, such as fused silica, borosilicate, ULE, boroaluminosilicate, and alkali-free glass.

ADVANTAGES

- Free-form microfabrication technlogy with micro-metric accuracy.
- High surface quality and outstanding process repeatability, suitable for wafer-scale production.
- Glass offers numerous functional advantages over for example polymers, ceramics, silicon and metals.
- Integration of optical, fluidic, electrical and mechanical functionalities.
- Wafer-scale production for volumes.
- Engineering expertise to support product development.
- Full control over proprietary processes and systems.

We want to be part of your success, contact us:

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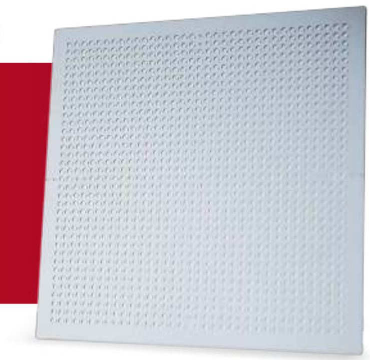

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