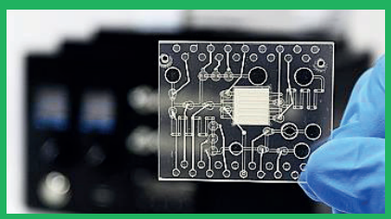
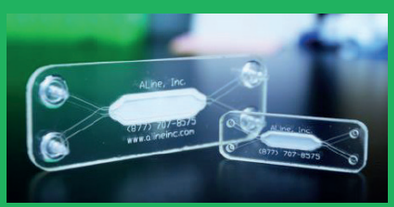
Microfluidic Engineering

We Understand the Science We Engineer the Solution



ALine's scientific expertise in the physics of Microfluidics, and in bioanalytical systems enables practical, product-oriented solutions for integrating complex analytical assays into engineered, modular fluidic & instrument components. Our solutions create scalable, repeatable, and, if required, semi-automated analytical systems for **both active and passive microfluidic control.**

With a free initial consultation, we'll offer an expert assessment of the scientific and engineering risks that require attention.



Facilities

- Class 10,000 Clean Room
- Multi-layer Lamination
- Laser Machining, 3D Printing
- Pick & Place/ UV Bonding Automation
- Injection/Compression Molding
- Surface Modifications & Metrology
- Application & Testing Lab
- Ultrapure water system.

Modular Solutions for Lab-on-Chip Products

Lab-on-Chip products require execution of the target assay as early in the development as possible. Whether your product has **passive or active fluid control**, the sooner the entire workflow is integrated and managed in a repeatable fashion, the better the final product design will be.

Our objective: **measurements with the target assay within the first six to 12 weeks of development**. Once the microfluidic cartridge is operated in a repeatable, semi-automated fashion, new microfluidic design modifications are required. **Addressing workflow and interface issues early accelerates assay development and optimization**, providing a smoother path to a product system that delivers on the analytical objective.

Microfluidic Design, Engineering and Production

- Rapid batch production of microfluidics in standard materials with modular designs.
- "Smart Capping Layer":
  - Reduce injection-molded part complexity
  - Achieve robust performance with a shorter development cycle
- Designs for manufacture at program initiation
- Manufacture and Assembly for volume production
- Robust, functional solutions for fluid control in the chip; passive & active
- Design and Integration of injection-molded component
- Sensor integration – optical or electrochemical
- Reagent integration (blister packs, dried reagents)
- Materials selection and verification expertise.

Instrumented Control of Microfluidic Devices

- Modular & Custom Instrumentation with Pneumatic, Flow, and Thermal Control
- Focus on assay optimization with repeatable experimental control
- Reduce risk and cost of system integration.

Applications

- Immunoassays, IVDs
- Cell Culture; Organ-on-Chip
- Nucleic Acid Detection
- Multiplexed Fluid Control Manifolds
- Flow Cells for Array Based Detection
- Flow cells for Electroactive detection
- Flow cells for Optical Detection
- Droplet-based Microfluidics.

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Microfluidic Fabrication

Working with ALine

Key features of working with us include:

- Initial discussion of application and device requirements
- Mutual Non-Disclosure to Protect Confidential Information
- Standard design files made available for valves and pumps in your design
- Designs provided in pdf or dxf with part number and revision approval & tracking
- DFMA processes developed
- Source materials, specify bonding method based on requirements
- Fabrication and assembly with 3 to 7 day turnaround time
- Functional tests and videography of performance, 100% visual QC inspection with test report.

Product Development Process

Proof of Concept:
Batches of 10 to 30 parts
Cost: per batch $1500-5000 USD
2- 5 Design iterations over 1 – 3 months

Development Beta 1:
Batches of 100 – 200
Cost per piece: $10-200 USD
Root Cause Failure Analysis
Design, material refinement

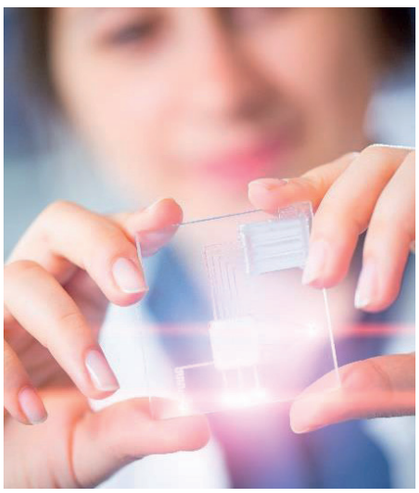
Development Beta 2:
Batches of 100 – 200
Evaluate interface issues assay reproducibility issues
Fix materials, optimize design for performance

Prepare for Clinical Trials:
Batches of 3000- 6000
Cost per piece $2-25 USD

Product Launch:
Blanket purchase for 6 to 12 month projected volumes, prepare for high volume manufacture capital investment
Cost per piece: $1-15 USD

Shorten the Development Process

Use NO TOOLING methods to move quickly through the Design-Build-Test Cycle



We combine techniques including:

- Engineered Laminates
- Machining
- Silicone Molding
- 3D Printing
- Injection Molding.

ALine's Engineered Laminate Platform is a computer-automated method for creating complex fluid circuits that integrate on-board valves, vents and pumps by machining features in different layers or sheets. The layers are then stacked, aligned and bonded in a batch fabrication process.

Integrated Functional Solutions

- Incorporate electrodes, membranes, on-board valves & pumps
- Integrate optical and electro-active sensors; PCBs, silicon and glass
- Integrate injection-molded components and blister packs
- Reagent deposition
- Pop-on fluidic components that interface to a fluidic 'motherboard'.

ISO9001:2008 Certified, and ISO13485 Compliant.
Assembly in a Class 7 Cleanroom
QA Processes: Metrology and Pressure Decay Testing.

Material	Thickness
PMMA	.002" to .177"; 50 microns to 4.5 mm
ACETAL	.005" to .125"; 125 microns to 3 mm
PET	.0005" to .010"; 12.5 to 250 microns
POLYCARBONATE	.005" and .010";125 and 250 microns
POLYSTYRENE	.0002" to .005"; 6 to 125 microns
POLYPROPYLENE	.002" to .040"; 50 to 1 mm
COP	.002" and .007"; 50 and 175 microns
SILICONE	.005" to .060"; 125 micron to 1.5 mm
POLYIMIDE	.001" to .005"; 25 to 125 microns
FLUOROPOLYMERS: FEP, PTFE, PVDF	.001" to .010"; 25 to 250 microns

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