

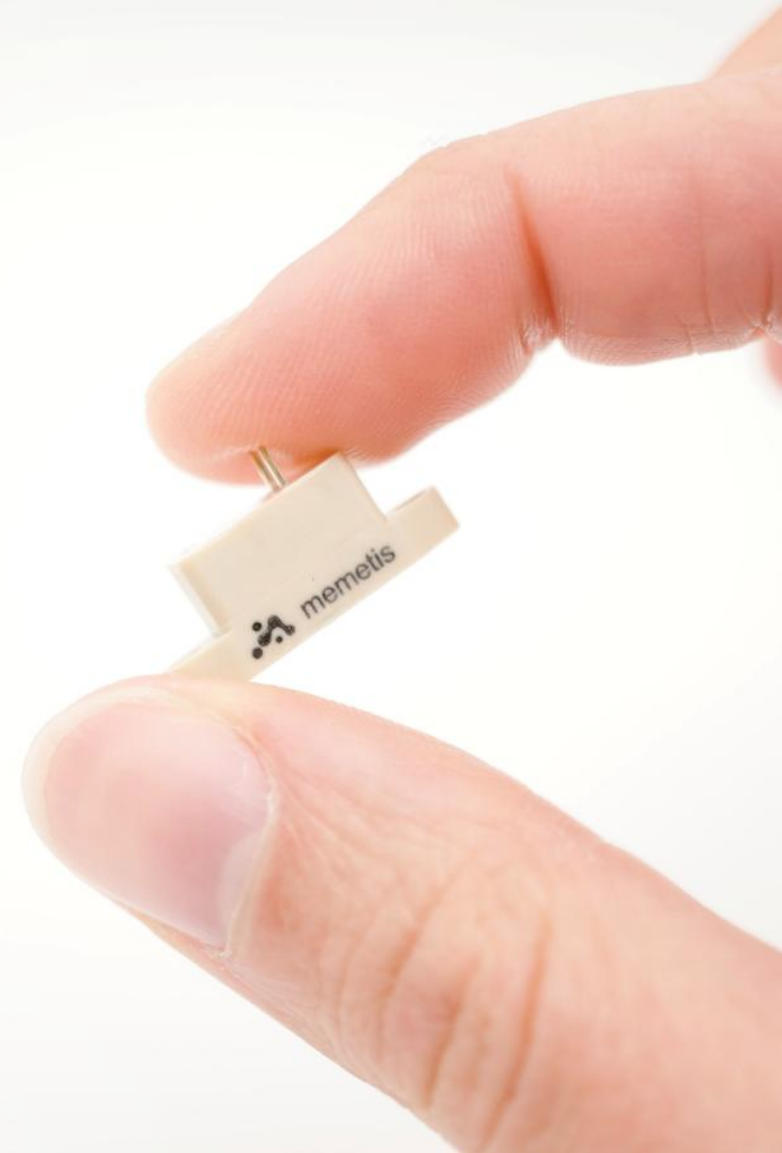
FLUIDICS



Memetis Multivalve Systems and their Role in Replacing Conventional Flow Control Solutions

IVAM Mid-Week Coffee Break – 2026-09-16

www.memetis.com

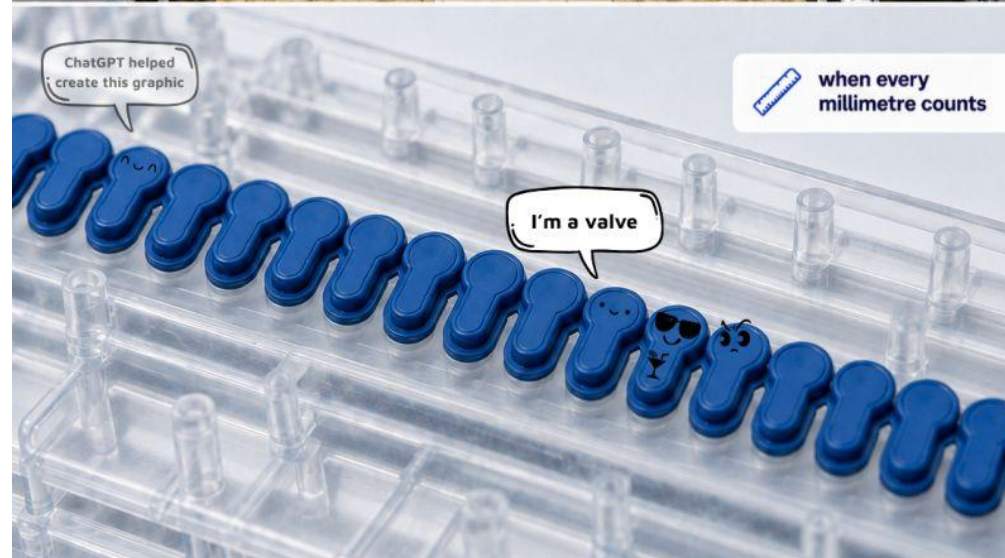


Beach chairs love spacing. Your device probably doesn't.

memetis multivalve | ultra-dense valve integration with 3 mm spacing



summer
peak season



ChatGPT helped
create this graphic



when every
millimetre counts

I'm a valve

Power the Flow – Control the Flow

Fluid-o-Tech group

- **400+** Employees
- **€124 million** Group turnover in 2023
- **15 %** CAGR Fluid-o-Tech Group in last 10 years
- Headquarter in **Milano**, Italy

Portfolio

- **Pumps, valves, and sensors**
- State of the art production facilities
- ISO 9001, ISO 13485

memetis GmbH



- **20** employees
- ISO 9001
- Located in **Karlsruhe**, Germany

Portfolio

- **Microfluidic** components
- Custom **fluidic systems**
- Development services & Prototyping
- Shape memory **miniature actuation** solutions

All-round partner for fluidics

Fluid-o-Tech Group Portfolio



Portfolio

Power the Flow with Pumps

Gear & Vane Pumps, Peristaltic & Micropumps



High Precision



High Flow



Dosing

Control the Flow with Valves

Smart SMA & Piezo Valves, Microvalves



Smallest Size



Proportional Control



Fastest Switching

Applications

Medical Devices

Hemodialysis

Respiratory

Drug Delivery,
Medical Implants

Laboratory
Equipment

Life Sciences

Bioreactors

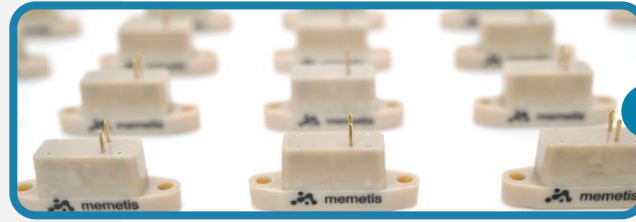
Research
Instruments

IVD

Point of Care

Centralized
Diagnostics

memetis portfolio overview



Microvalves

Make it small!



System solutions

Master the flow



Pneumatic solutions

Gentle on cells

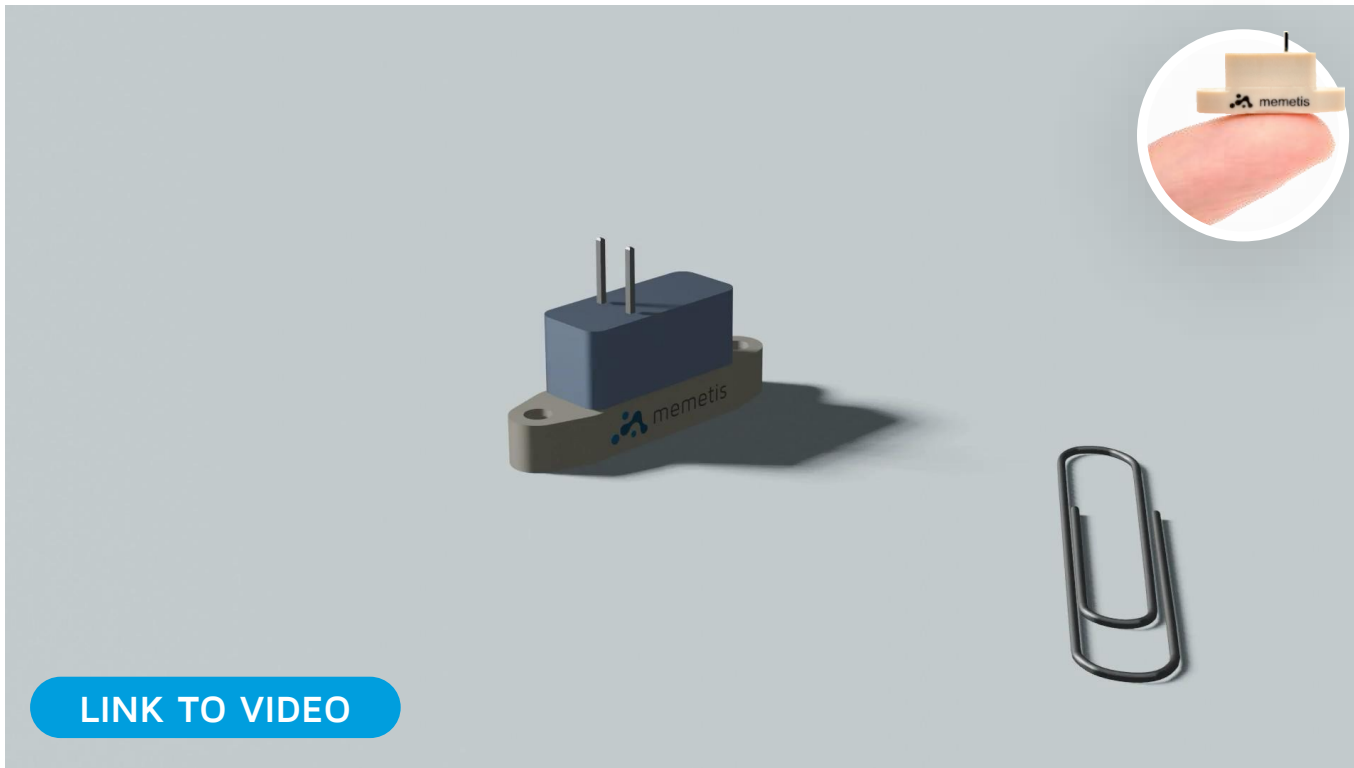


Chip actuators

Zero Contamination

Microvalves

Get maximum functionality in the smallest of space



Advantages:

- **Ultra-compact & Lightweight**
Enables compact yet sophisticated fluidic systems and highest packing density. Optimal for portable devices
- **Lowest power consumption**
Makes battery operation possible while offering soft switching behaviour that is noiseless and can be **proportionally** controlled
- **Media separated & Autoclavable**
Designed for liquids and gases, ideal for life science applications

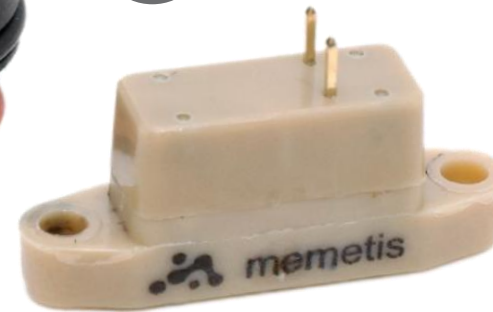
Technology

The shape memory alloy value proposition for microvalves

The material is the machine



VS



World's smallest

memetis has developed the world's smallest media-separated valve

It is significantly more compact, quiet, and energy-efficient than its counterparts

75 %

Volume saving

85 %

Weight saving

80 %

Power saving

Conventional valves

Solenoid valves produce magnetic stray fields, heat, clicking noises, and they cannot become much smaller than they are today.



Stray fields



Noise

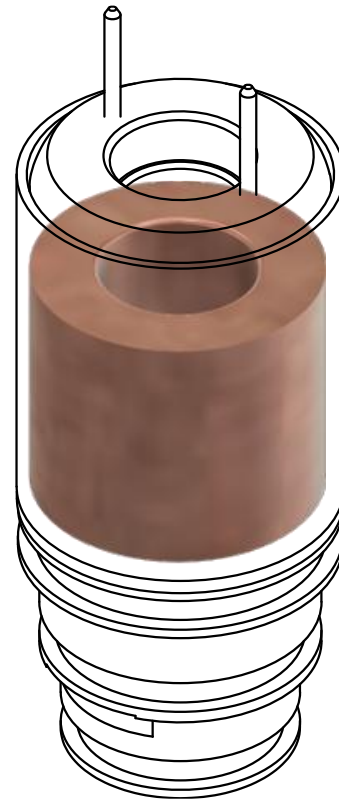


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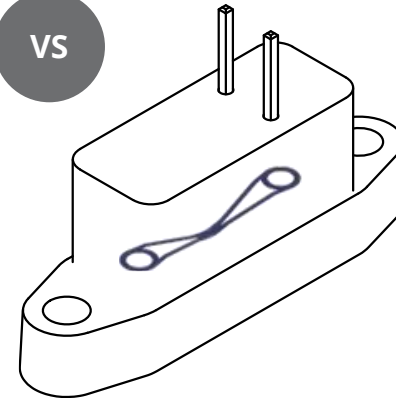
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Power saving

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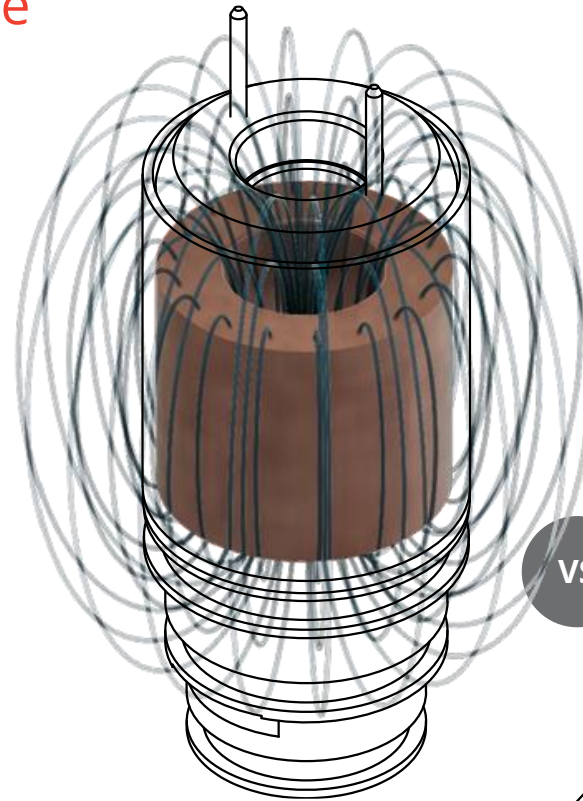


Heat

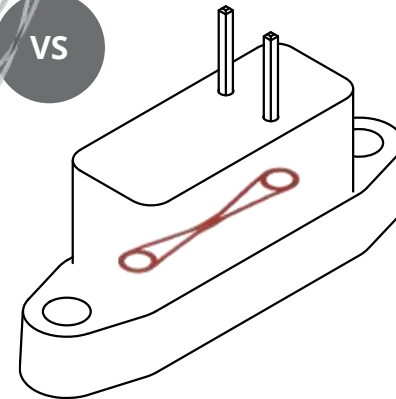
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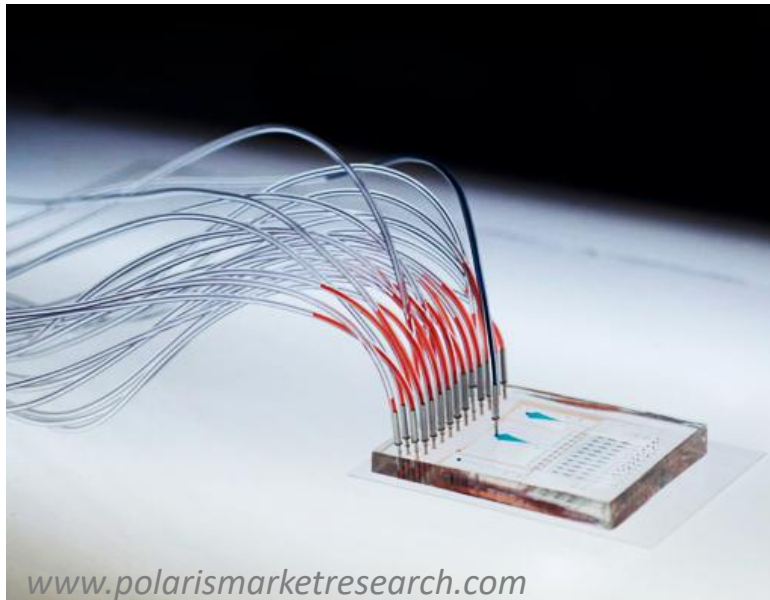
Heat

Microvalve arrays

Why multivalve?

Why multi-channel fluidics are hard

- Many valves, tubes, fittings, cables, dead volume, leak points.



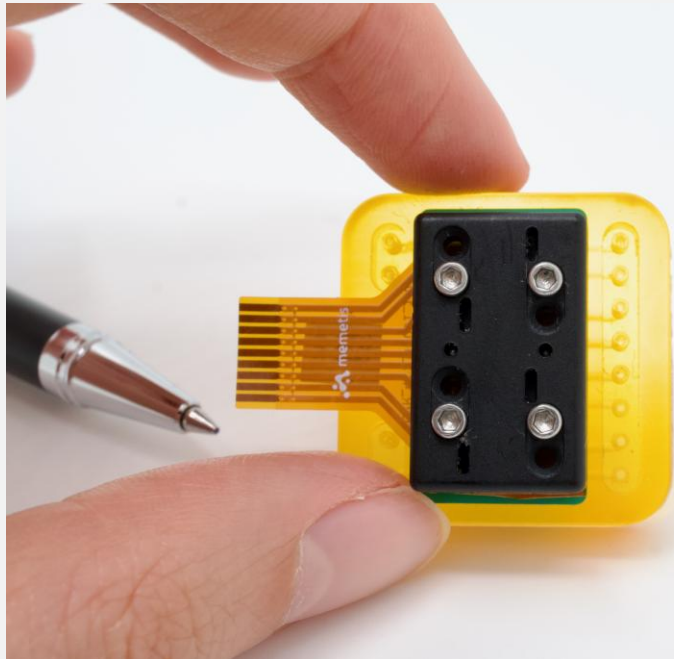
Fluid handling wish list

- More channels
- Smaller footprint
- Lower sample volume
- Fewer components
- Automation
- Less custom assembly

MICROVALVE ARRAYS

Multivalve for compact multi-channel fluid control

Smallest microvalve array on the market



3 mm

width per valve

8

2/2-way valves

Designed for

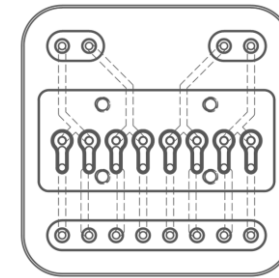
Multiplex fluid handling

Highest space restraints

Minimizing internal volumes and carry-over

Reducing tubing and wiring interfaces

Multivalve advantages



Most compact multi-valve integration

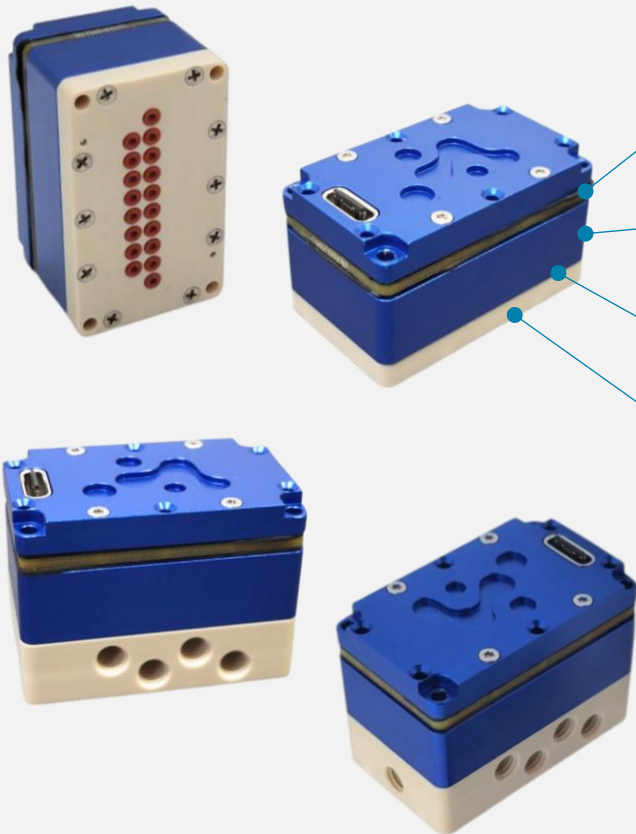
Individually controllable valve channels

Media-separated design for liquids and gases

Customization options to enable a multitude of fluidic functions

MICROVALVE ARRAYS

Off-shelf multivalve modules ready-to-use for concept testing



Electronics Layer

- Integrated 8-channel driver
- USB-C connector board
- Simple test firmware

Actuation Layer

- 8 individual actuators
- Force: 0.7N
- Stroke: 0.3mm

Valve/Membrane Interface

- Silicone or FFKM

Fluidic Layer

- PEEK

Fluidic Interface & Channel Logic

- Flat-mount interface for 16 ports with 8x 2/2-way function
- 8 in/out UNF 10/32 threaded ports with 1 common port

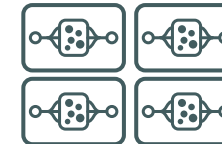
Example applications



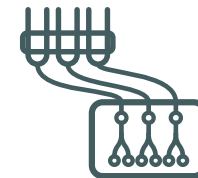
PoC cartridge processing



Sequencing / Flow-cell cycling



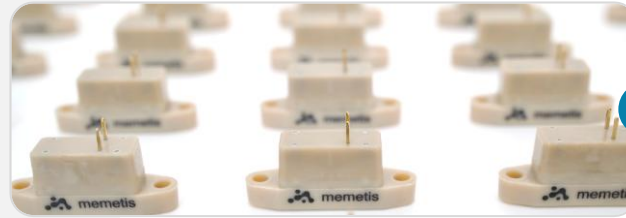
Organ-on-Chip / Cell culture



Lab-on-Chip / Reagent routing

Evaluation kits coming soon!

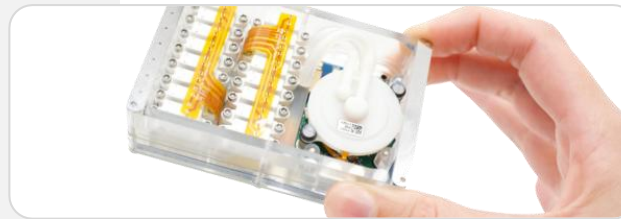
memetis portfolio overview



Microvalves
Make it small!



System solutions
Master the flow



Pneumatic solutions
Gentle on cells



Chip actuators
Zero Contamination

Multivalve system use case

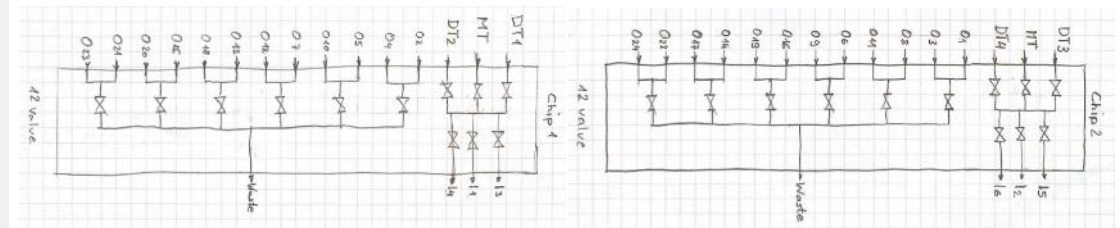
A true Lab-on-chip ready for take-off



<https://aris-space.ch/sage-cubesat/>

Challenge: 12 parallel experiments on a microscope slide

- Drug-cell interaction experiment at zero gravity
- Fluid handling and microscope in just $10 \times 10 \times 10 \text{ cm}^3$
- 24 active channels for supplying 12 reaction chambers
- Available space for valves in Cubesat: $75 \times 25 \text{ mm}^2$



BIBUS
SUPPORTING YOUR SUCCESS

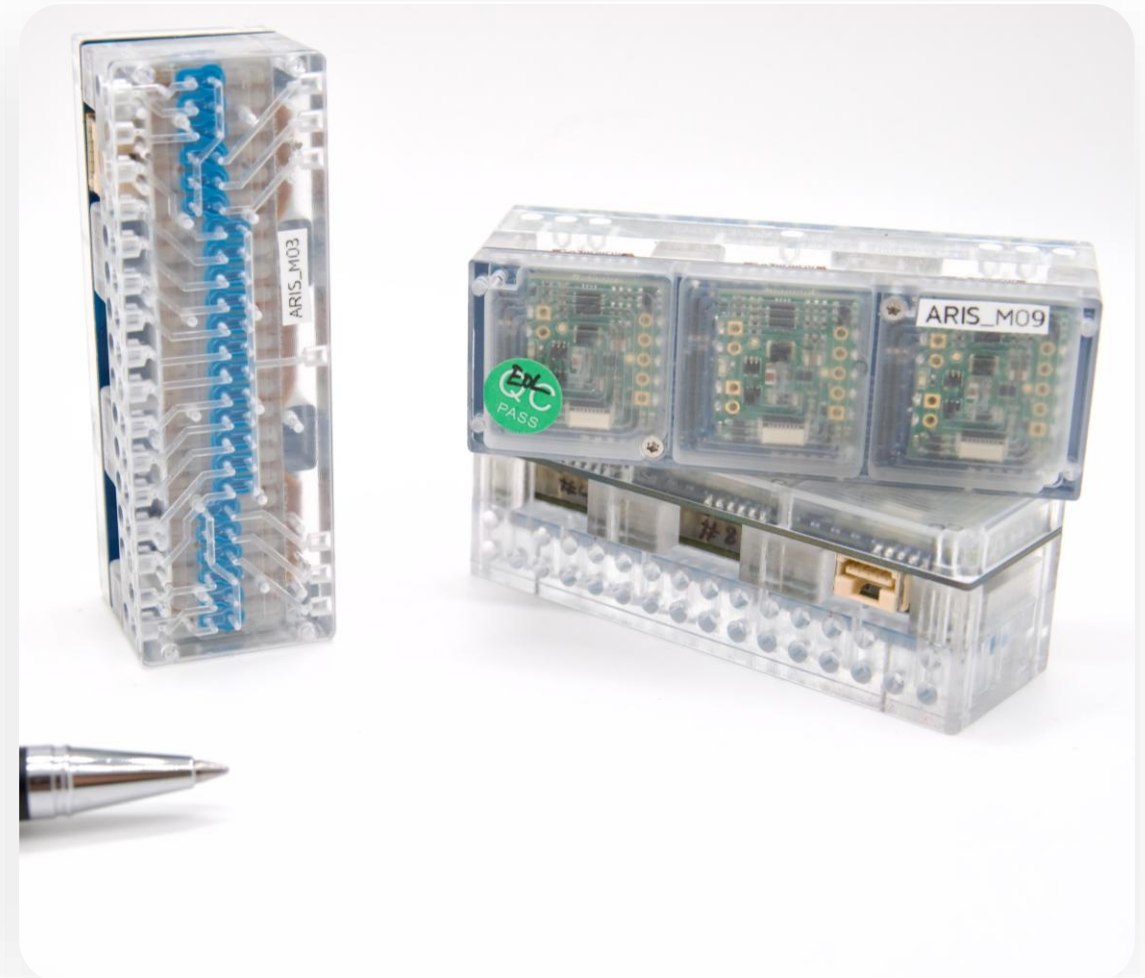
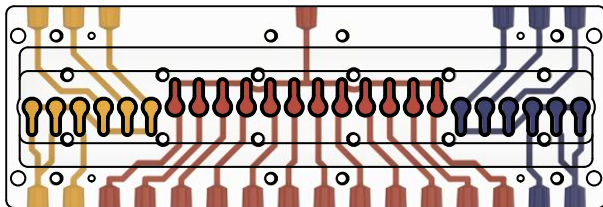
... our distribution partner in Switzerland

Multivalve system use case

A true Lab-on-chip ready for take-off

Memetis solution: custom 24-channel miniature flow control module

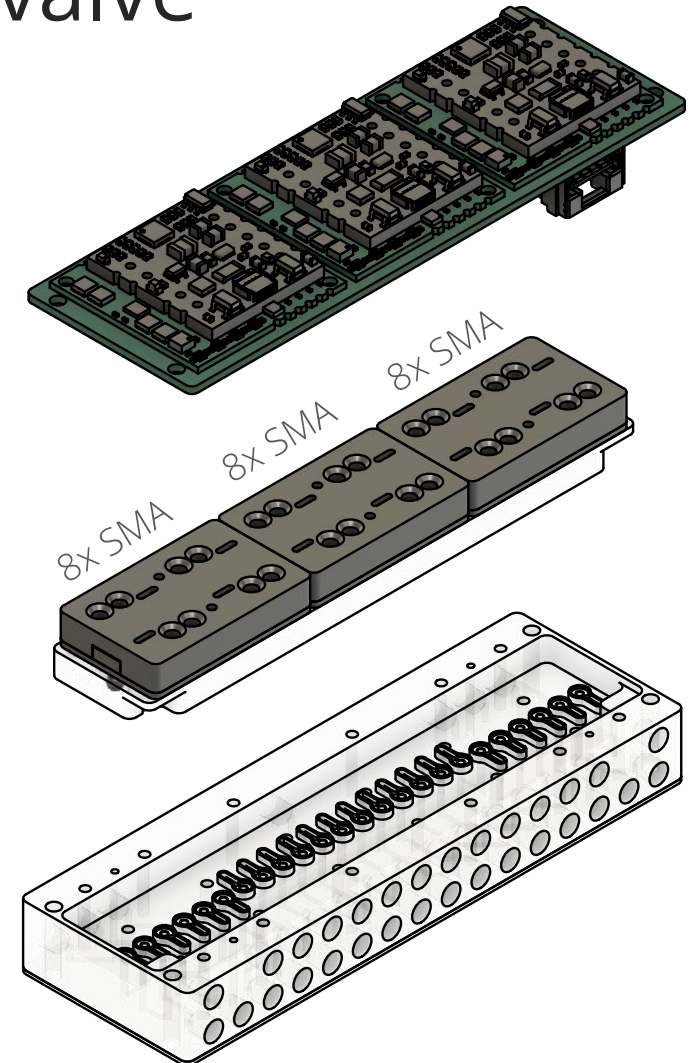
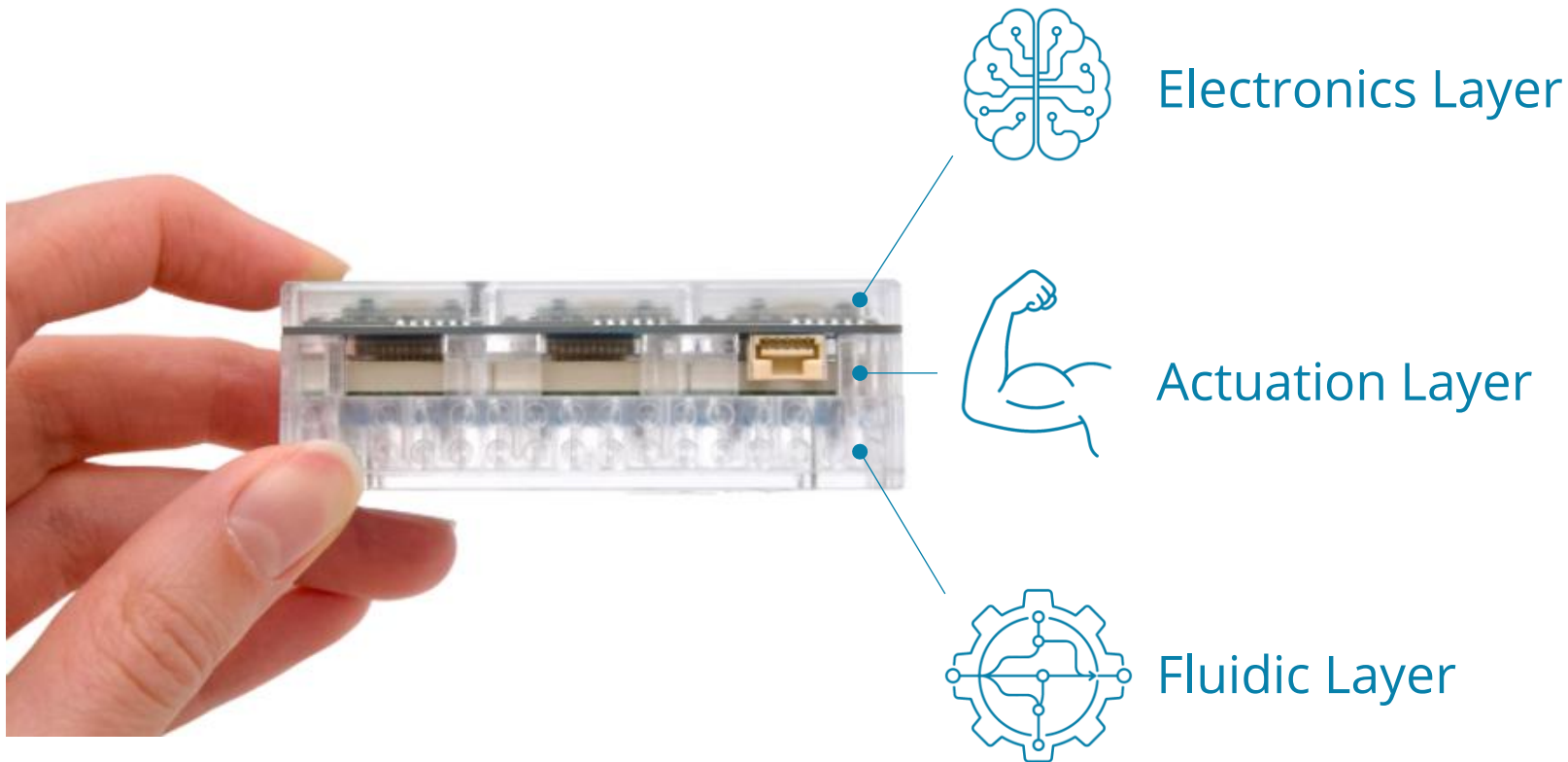
- 24 individual 2/2-way NC valves in a single package
- Fluidic logics implemented in a custom-designed channel plate
- Electronics on-board (valve driver and microcontroller)
- USB / I2C interface – only four cables
- Python library allows programming from PC



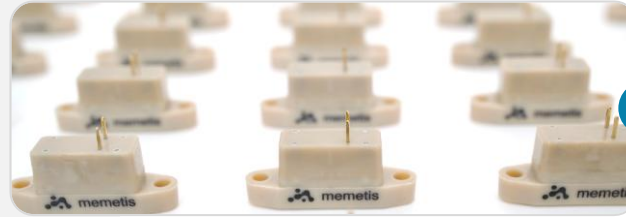
Multivalve system use case

The building blocks of the memetis Multivalve

Fully customizable



memetis portfolio overview



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Chip actuators
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Low-pressure pneumatics

Pneumatic systems for your sophisticated fluidic chips

8-channel pneumatics module

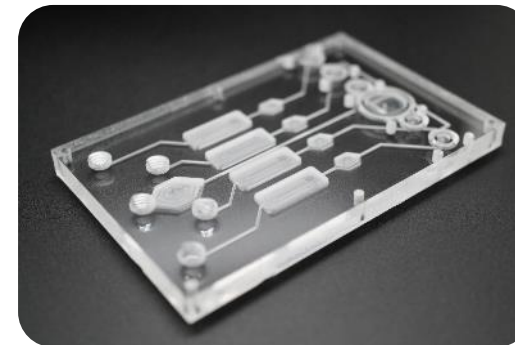
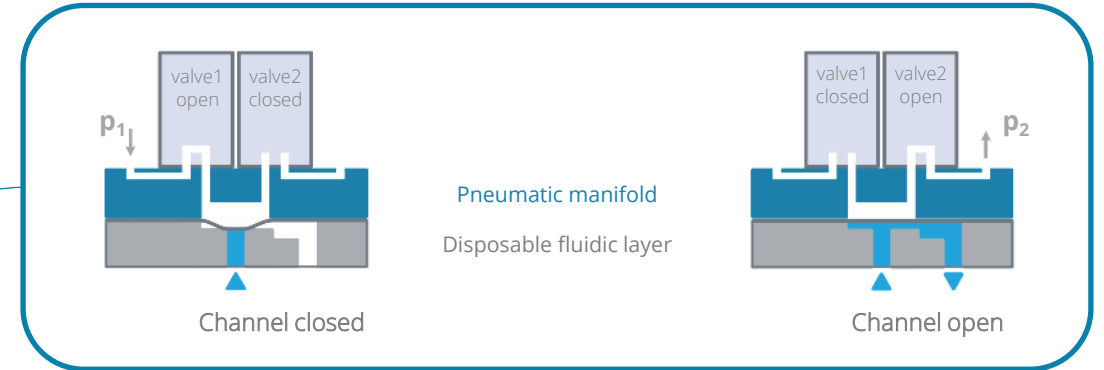
in business card size!



- Silent piezo pump
- 16 SMA microvalves
- Driver electronics on-board (5V)

On-chip pumps and valves

100% contamination-free



Low-pressure pneumatics

Pneumatic systems for your sophisticated fluidic chips

8-channel pneumatics module

in business card size!



- Silent piezo pump
- 16 SMA microvalves
- Driver electronics on-board (5V)

Pressure-driven flow



Cuffs and pillows



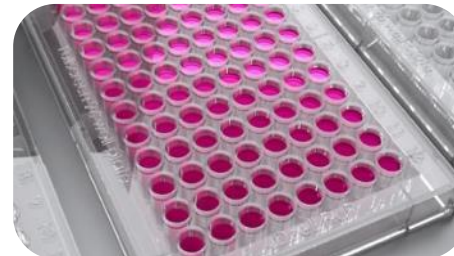
Automatic pipetting



Diagnostic cartridges



Cell cultures, Lab-on-Chip



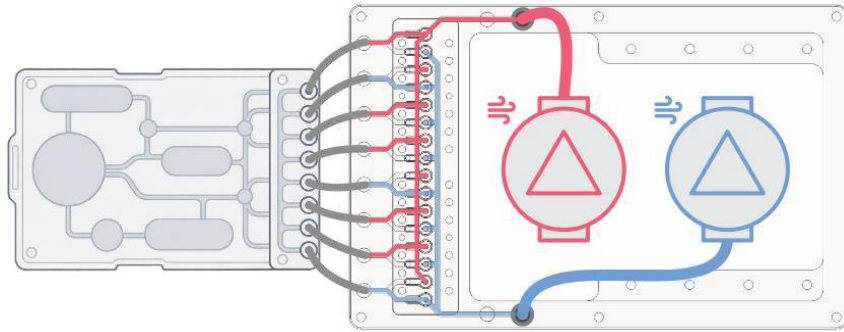
Pneumatic actuators



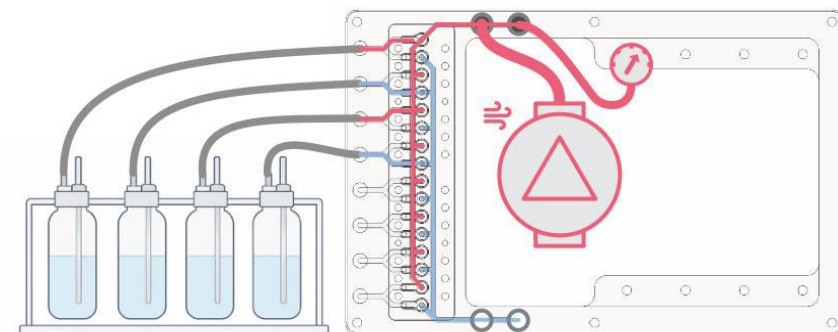
Business card sized fluid handling system

One system – many applications

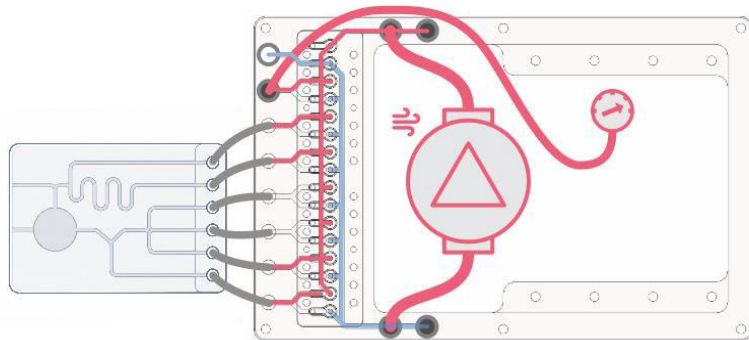
Configuration 1: Pneumatic Actuation of Disposable Cartridges



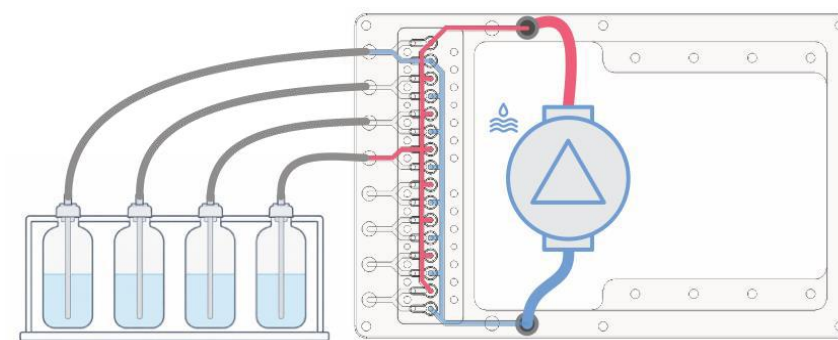
Configuration 3: Pressure-Driven Multi-Reagent Delivery



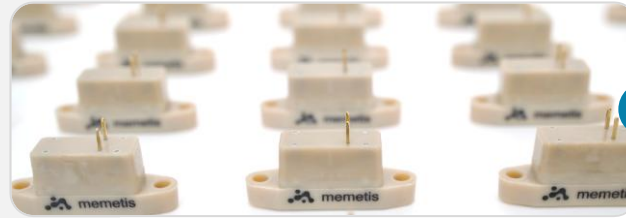
Configuration 2: Bidirectional Microfluidic Pressure Control



Configuration 4: Direct Liquid Distribution & Transfer



memetis portfolio overview



Microvalves
Make it small!



System solutions
Master the flow



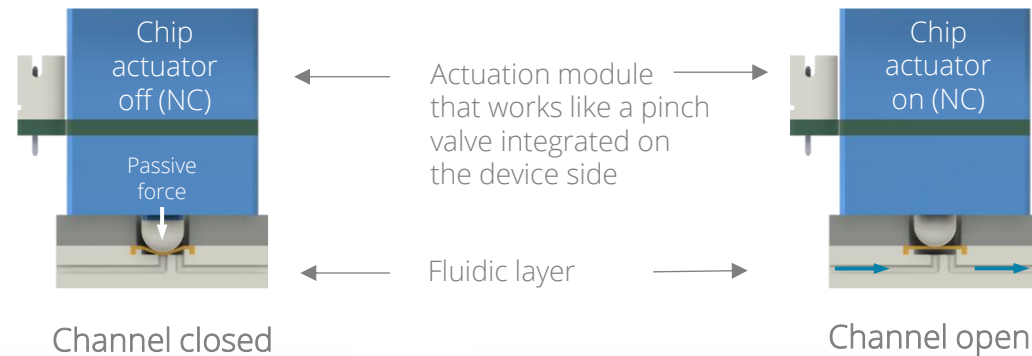
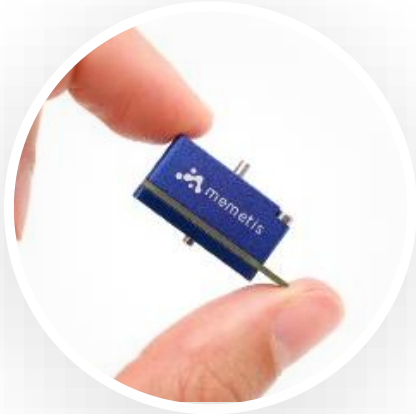
Pneumatic solutions
Gentle on cells



Chip actuators
Zero Contamination

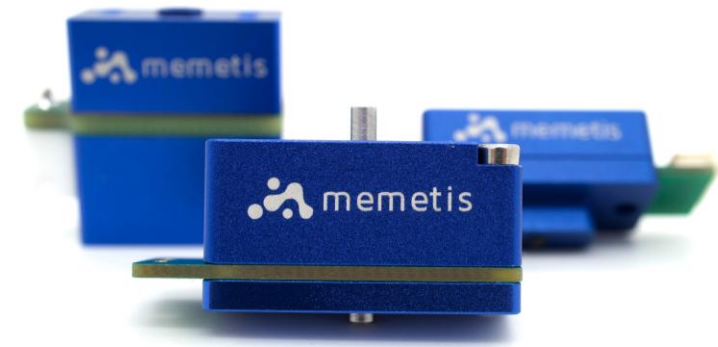
Chip actuators for disposables

Elegant fluid control on microfluidic chips and cartridges



Advantages of on-chip actuation

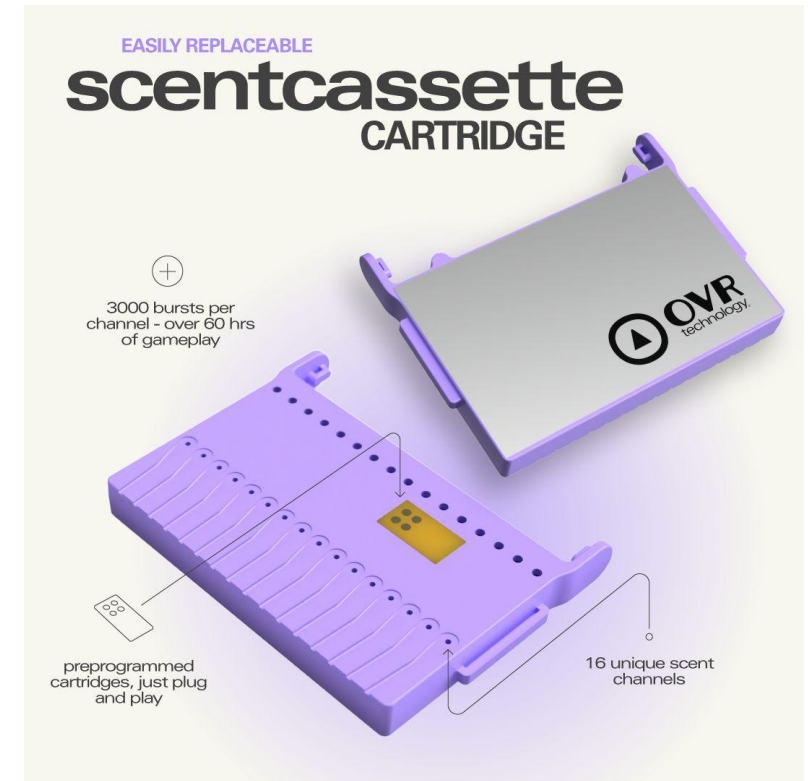
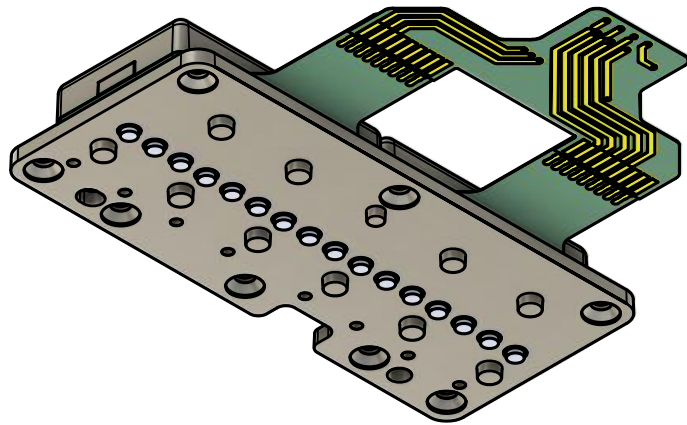
- Easy to integrate, no further peripherals needed
- **Adaptable to your needs for force and stroke**
- Low power and low voltage required
- Compact solution



Chip actuators for disposables

Elegant fluid control on microfluidic chips and cartridges

... even in 3 mm pitch!



Now you tell us!

How can memetis solve your challenges?

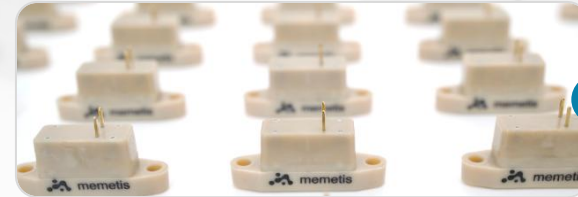
Get in contact

Email: contact@memetis.com

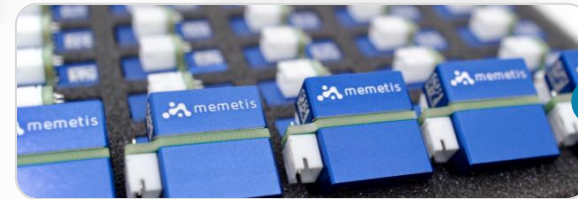
Phone: +49 721 47 000 240

Website: www.memetis.com

Online shop: shop.memetis.com



Microvalves



Chip actuators



System solutions



Customized valve solutions