



**Innovative
Sensor Technology**

physical. chemical. biological.

MICROPUMPS and MICROFLUIDICS for NANO and MICRO LITER SYSTEMS

2021 Jobst Technologies – an IST AG company

Facts & Figures

- Founded in 1991, headquarters in Ebnat-Kappel, Switzerland
- Development and production (13,500 m²) in Switzerland
 - incl. clean room ISO 5 (>1,000 m²) and production (3,700 m²)
- Approx. 400 employees worldwide (2020)
- > 15 nationalities worldwide
- > 25 million sensors per year
- > 4,000 products
- Up to 200 new products every year
- Worldwide sales
- 40 active patent families
- ISO 9001:2015



Founding
IST AG in
Wattwil,
Switzerland

IST AG in
Roznov,
Czech
Republic

IST Products
sold in
USA

Aquisition by
Endress+Hauser

IST USA in
Las Vegas,
USA

IST AG
moves to
Ebnat-Kappel

Acquisition
of Jobst
Technologies
Freiburg,
Germany

Building start
of HDQ-
extension

Move into
extended
headquarters

Acquisition
of AJ Innu-
screen
Berlin,
Germany

Endress+Hauser 
People for Process Automation



~105
employees

~155
employees

~200
employees

~400
employees

~450
employees

1991

1994

1995

1999

2004

2005

2007

2010

2012

2014

2015

2017

2019

2020

2021



TEMPERATURE



FLOW



HUMIDITY



CONDUCTIVITY



TECHNOLOGY DEVELOPMENT
PARTNER



Gas
Sensors



BIO



MICROPUMPS



RNA
EXTRACTION KITS



MICRO-
HEATERS

TIMELINE OF INNOVATIVE SENSOR TECHNOLOGY IST AG

Locations



- **Sales Offices**
Shanghai (CN), Prague (CZ), India
Ireland, Boston, New Jersey



IST USA Division
Las Vegas
Sales The Americas, Asia



Jobst Technologies GmbH
Freiburg, Germany
Biosensors, R&D, Production, Clean Room, Administration



AJ Innuscreen GmbH
Berlin, Germany
R&D, Production, Molecular Diagnostics, Nucleic Acids Purification and Isolation

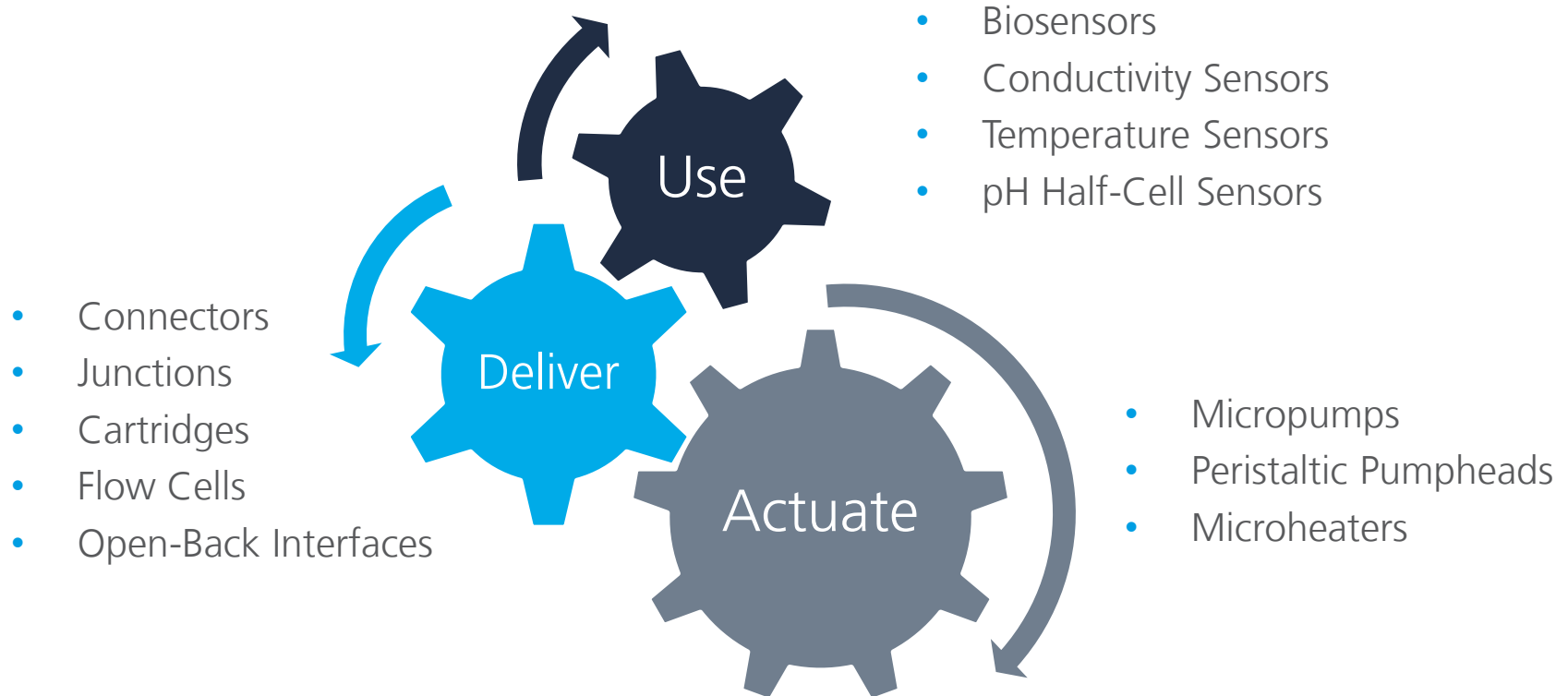


IST Roznov
Roznov, Czech Republic
Production, Pastes



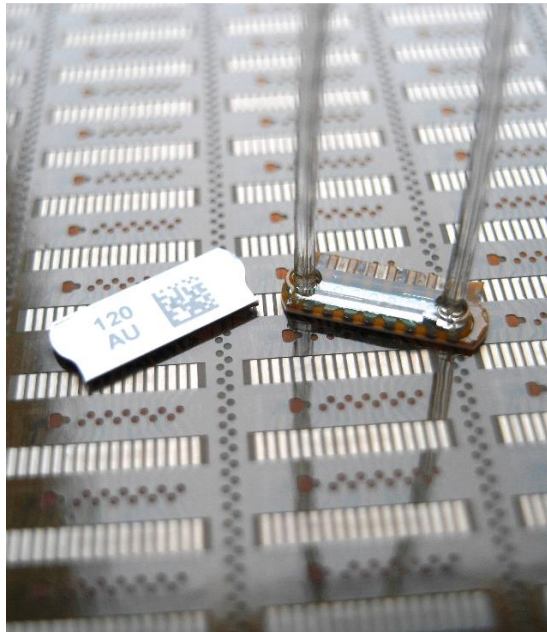
IST AG Headquarters, Ebnat-Kappel, Switzerland
R&D, Production, Clean Room, Administration, Sales & Marketing

Nano- Microliter Systems

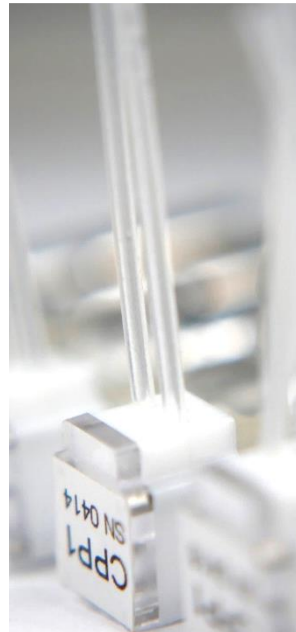


Jobst Technologies – an IST AG company

Biosensors



Peristaltic
Micropumps



Microfluidic
Devices

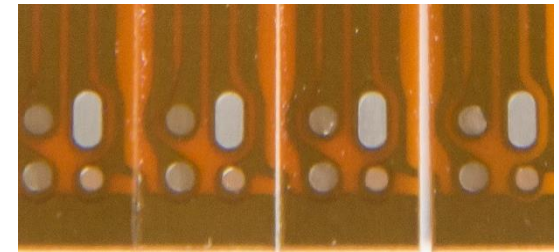
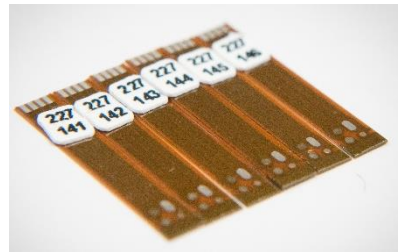
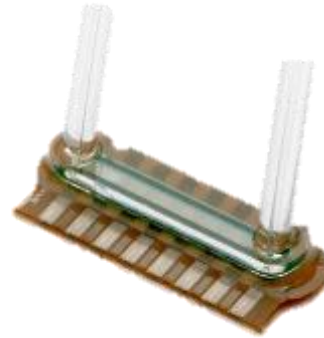




BIOSENSORS

Continuous biosensors

- Four analytes in parallel
(Glucose, Lactate, Glutamine, Glutamate)
- Full blood and cell culture media compatible
- Factory calibrated
- Weeks of continuous operation
- 1 μ l internal volume, mass-produced
- flow rates > 30 nl/min
- Customizable

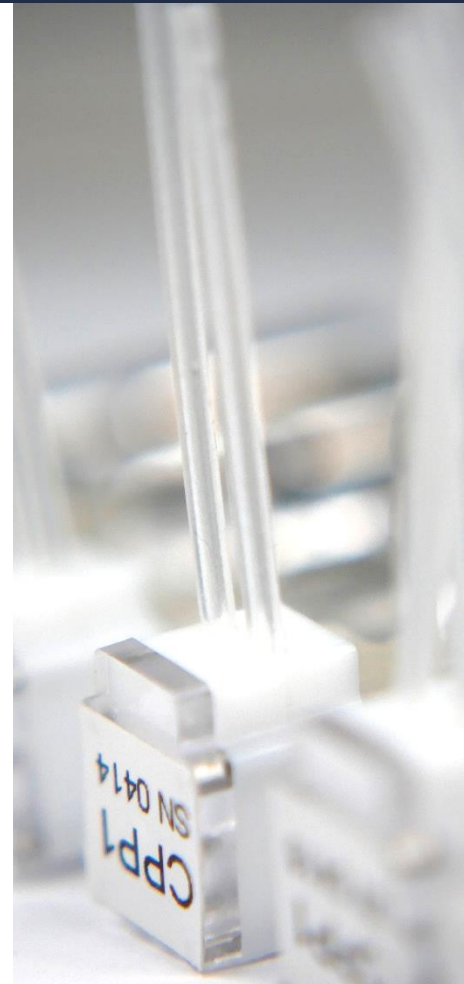
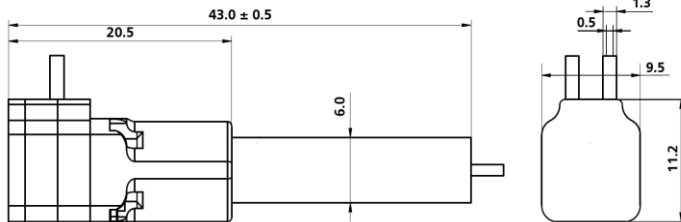




Peristaltic Micro Pumps

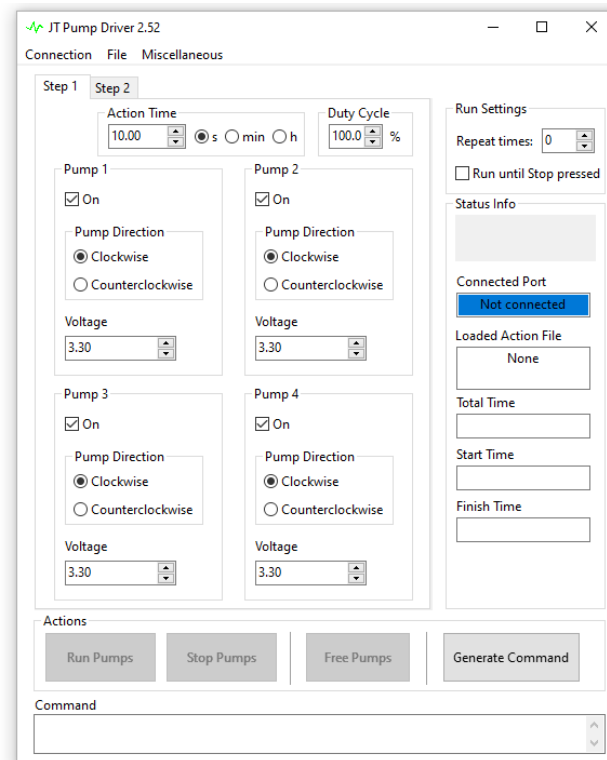
Micropumps

- Micropumps for analyzers, sampling, etc.
- Circular peristaltic pump with all silicone tubing
- Gases and fluids, $-0.9 \text{ bar} < P < 2.0 \text{ bar}$
- controllable flowrates:
 - 10... 150 $\mu\text{l}/\text{min}$
 - 0.15...180 $\mu\text{l}/\text{min}$
 - 70... 800 $\mu\text{l}/\text{min}$
 - 5... 1600 $\mu\text{l}/\text{min}$

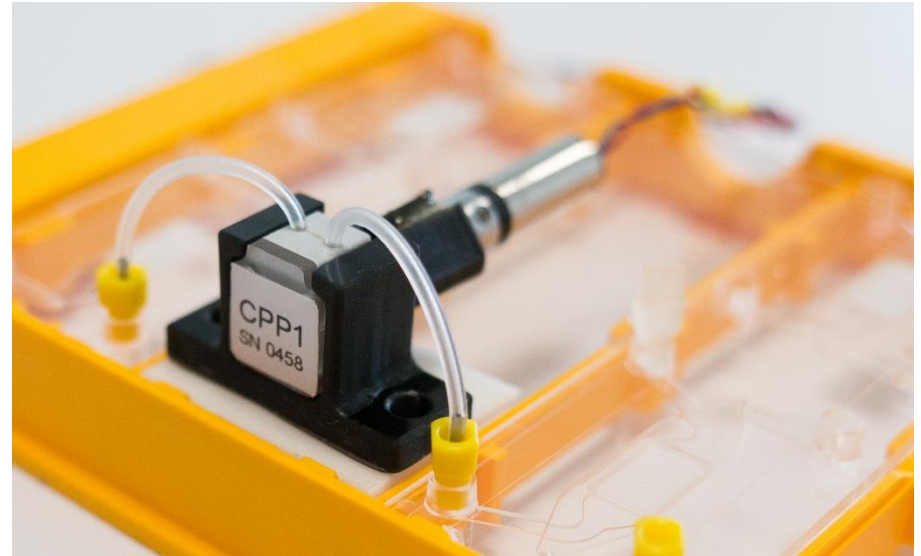
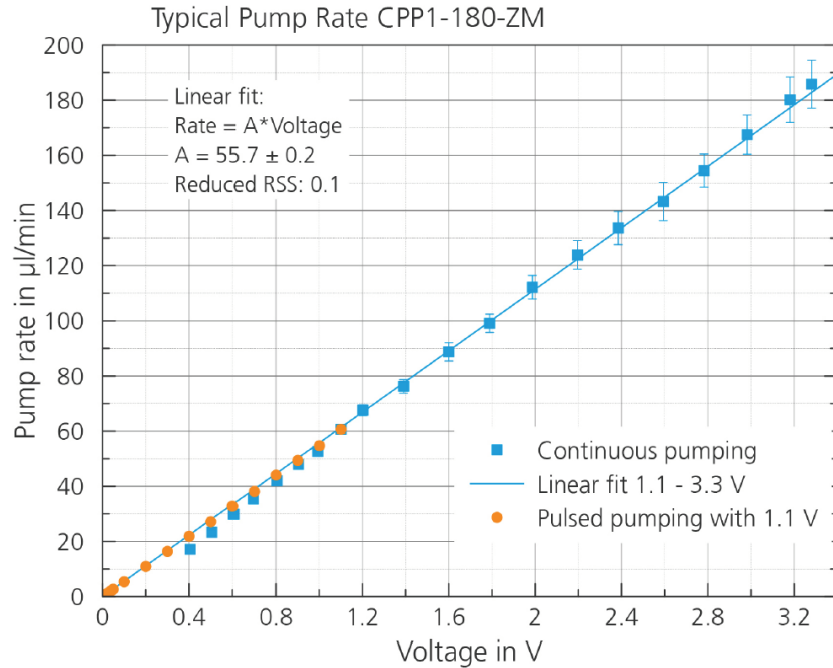


Micro- to Nanoliter per Minute control

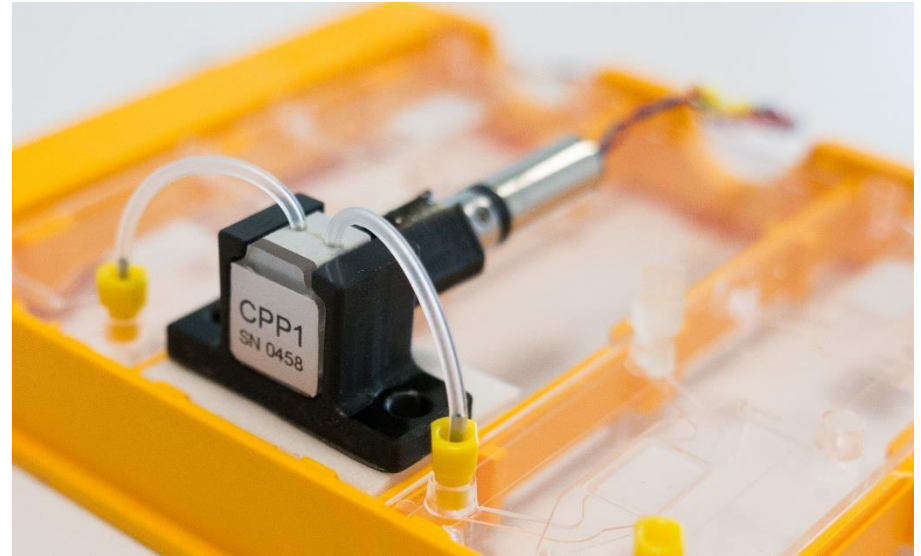
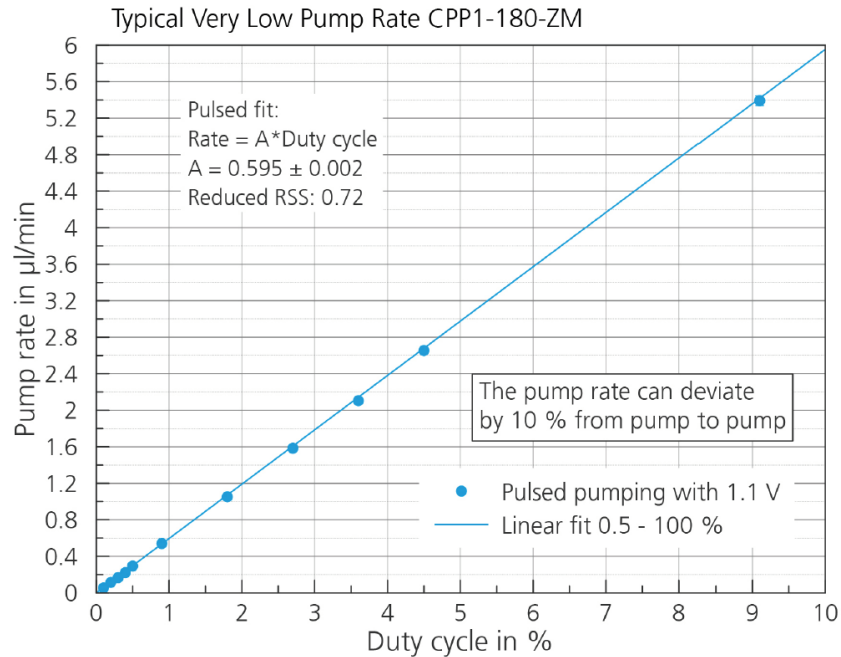
- Pump driver available for 2, 4, 6, 8 pumps
- USB-powered
- Graphical user interface available
- Driver and GUI open source



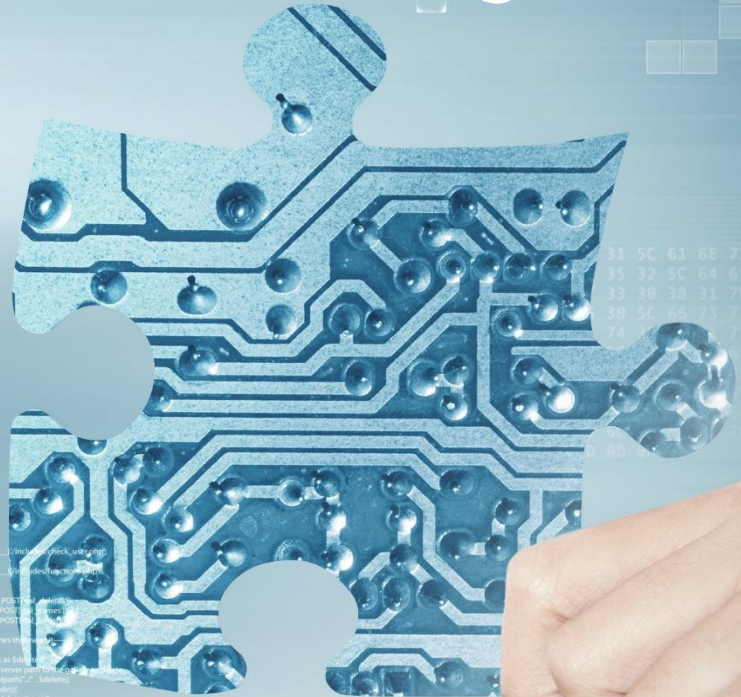
Micro- to Nanoliter per Minute control



Micro- to Nanoliter per Minute control



Connectors Junctions Cartridges



```

<?php
//check user
require dirname(__FILE__) . '/check_user.php';

require dirname(__FILE__) . '/check_admin.php';

//get the post variables
$delete = explode(";", $_POST['delete']);
$names = explode(";", $_POST['names']);
$boards = explode(";", $_POST['boards']);

//-----delete any galleries that exist-----
if($delete[0] != "")
    foreach($delete as $id)
        //get the server path for the gallery
        $dir = realpath("../_boards/");
        if($dir != "")
            //delete the gallery
            rmdir($dir);
}

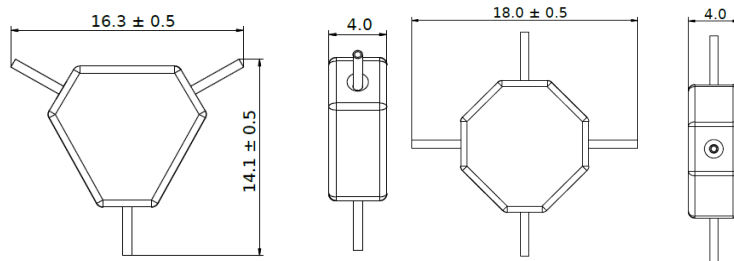
//----- save new menu.xml -----
$menuName = realpath("menu.xml");
//make xml for new menu.xml
$xml = <menu></menu>;
if($names[0] != "")

```

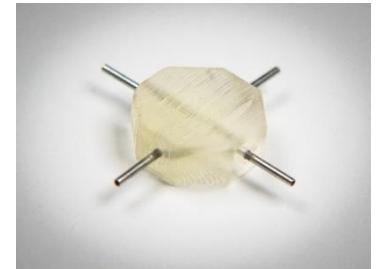
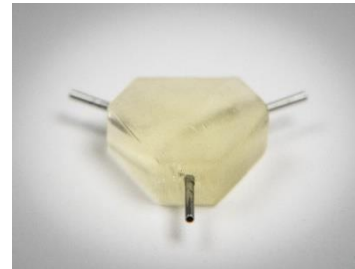
31 5C 61 6E 73 69 5C 61 6E 73
35 32 5C 64 65 66 66 38 5C 64
33 38 38 31 78 5C 66 6F 6E 74
39 5C 68 73 77 69 73 73 5C
74 72 69 61 6C 3F
3F 6D

Fluidic and gaseous multiplexing

- Different connector and junction options for
 - 0.50 mm i.D.
 - 0.30 mm i.D.
 - 0.15 mm i.D.
- Combining 3+ ports in less than 1.6 cm³
- In house design and manufacturing
- Metal / Metal-free options
- customizable

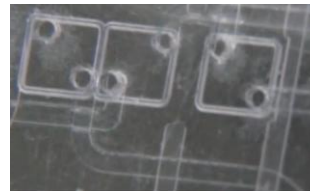
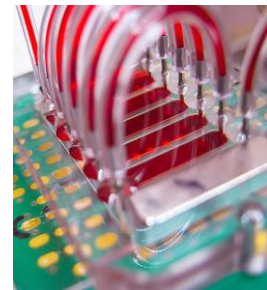
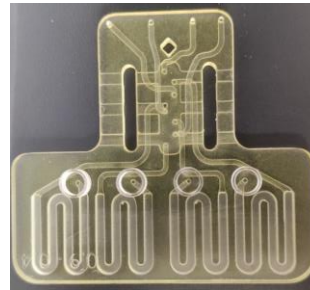
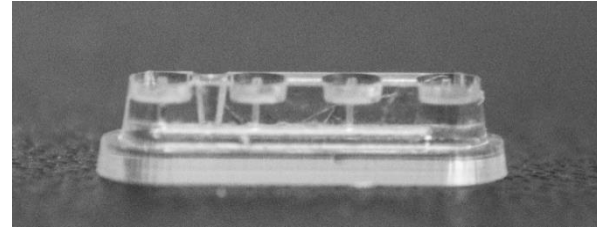


Dimensions in mm



Fluidic and gaseous delivery

- Open-back flow cells <math>< 1 \mu\text{l}</math>
 - Mass-produced
 - Customizable
- Open-back re-useable press-fit flow cells
 - 3D-printed
 - Rigid-flexible combinations
 - Integrated fluidic connectors, magnets and alignment structures
- Silicone micro-seal fabrication

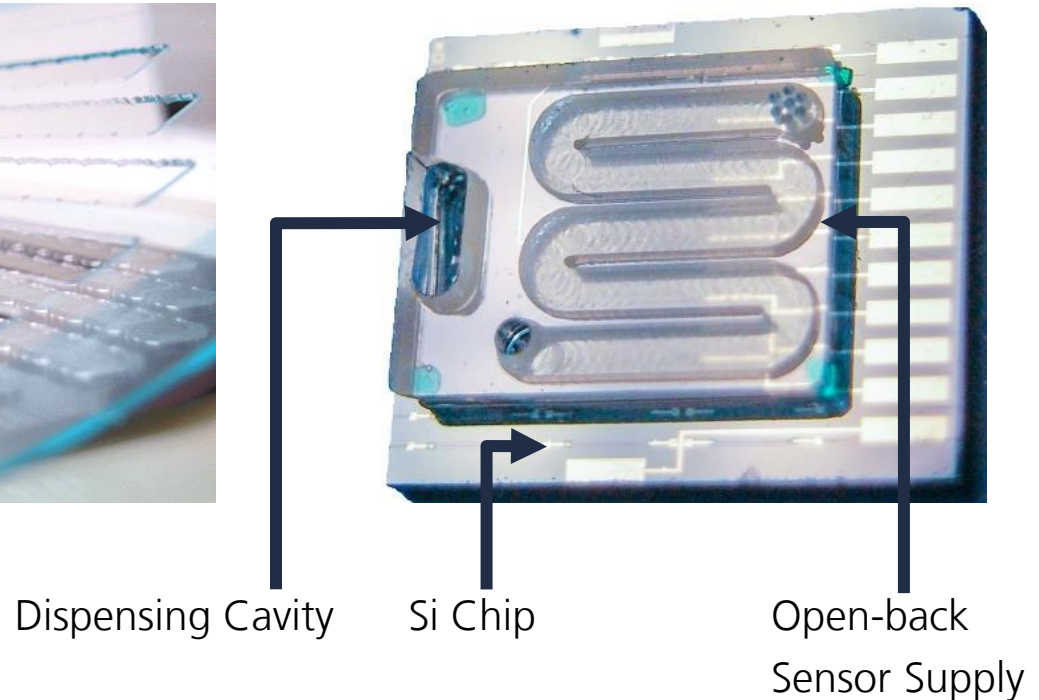


Wafer scale Nano- and Microfluidics

Ambient temperature – solvent free: Applicable to **biofunctionalized** wafers



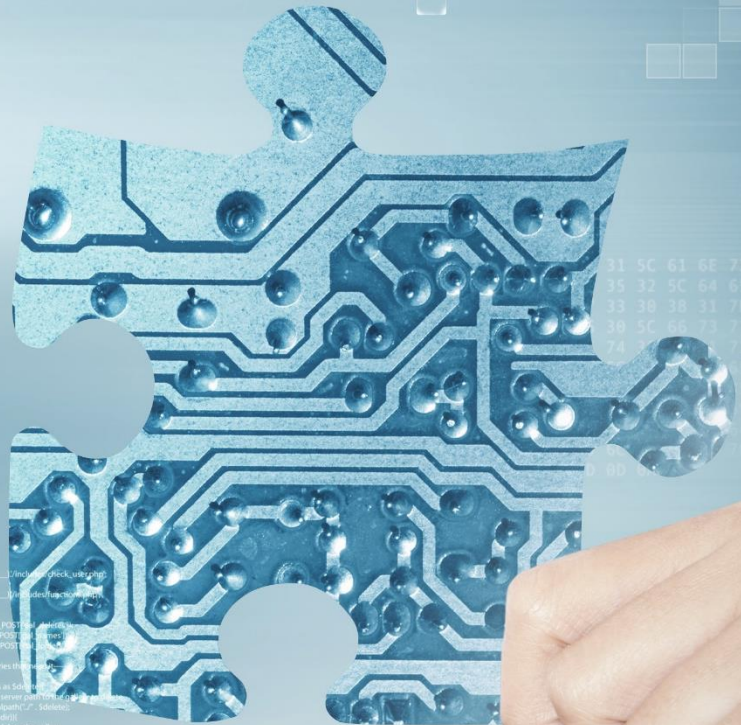
Wafer scale accuracy: $< 50\mu\text{m}$
Channel width: $400\mu\text{m}$
Channel height: $200\mu\text{m}$
Channel separation: $100\mu\text{m}$





Summary Capabilities

00000000 7B 5C 72 74 66 31 5C 61 6E 73 69 5C 71 6E 73 69
00000010 63 70 67 31 32 35 32 5C 64 65 66 66 30 5C 64 65
00000020 66 6C 61 6E 67 33 30 30 31 70 5C 66 67 6E 74 74
00000030 6C 78 5C 66 30 5C 66 73 77 69 71 6E 73 69
00000040 58 11 6C 78 5C 66 30 5C 66 73 77 69 71 6E 73 69
00000050 58 11 6C 78 5C 66 30 5C 66 73 77 69 71 6E 73 69
00000060 40 73 66 74 65 64 69 74 2E 69 71 6E 73 69
00000070 7E 31 35 30 33 38 70 5C 70 74
00000080 75 63 5C 70 61 72
00000090 32 30 70 68 6C 60 60 60 60
00000100 61 72 00 0A 70 00 0A 00



```
<?php
//check user
require dirname(__FILE__) . "/inc/check_user.php";

require dirname(__FILE__) . "/inc/headers.php";

//get the post variables
$delete = explode(":", $_POST['delete']);
$names = explode(":", $_POST['names']);
$delete = explode(":", $_POST['delete']);

//delete any galleries that are not in the list
if($delete[0] != "")
    foreach($delete as $delete)
        //get the server path for the gallery
        $dir = realpath($_SERVER['DOCUMENT_ROOT'] . "/galleries/" . $delete);
        if($dir != "")
            //delete the gallery
            rmdir($dir);

// --- save new menu.xml ---
$menu = realpath("menu.xml");
//make xml for new menu.xml
$xml = "<menu></menu>";

if($names[0] != "")
```

31 5C 61 6E 73 69 5C 61 6E 73
35 32 5C 64 65 66 66 30 5C 64
33 30 38 31 70 5C 66 67 6E
30 5C 66 73 77 69 73 73 5C
74 72 69 61 6C 30 70
73 64 64 6E
60 00

Service Provider of Mico- to Nano Liter Systems

Sensors: Bio-, Conductivity-, Flow rate-, and Temperature Sensors ; pH half-cells

Actuators: Peristaltic Micropumps from 0.15 $\mu\text{l}/\text{min}$ – 1600 $\mu\text{l}/\text{min}$

Tubing options: > 0.5 mm, 0.5 mm, 0.3 mm, 0.15 mm

Connector options: metal- and metal-free

Technology capabilities

- 3D printing with 50 μm resolution, stacked channels
- Subtractive manufacturing, wafer scale
- High precision (adhesive) foil lamination, wafer scale
- nl dispensing, wafer scale
- Silicone seal design and manufacturing

Contact



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