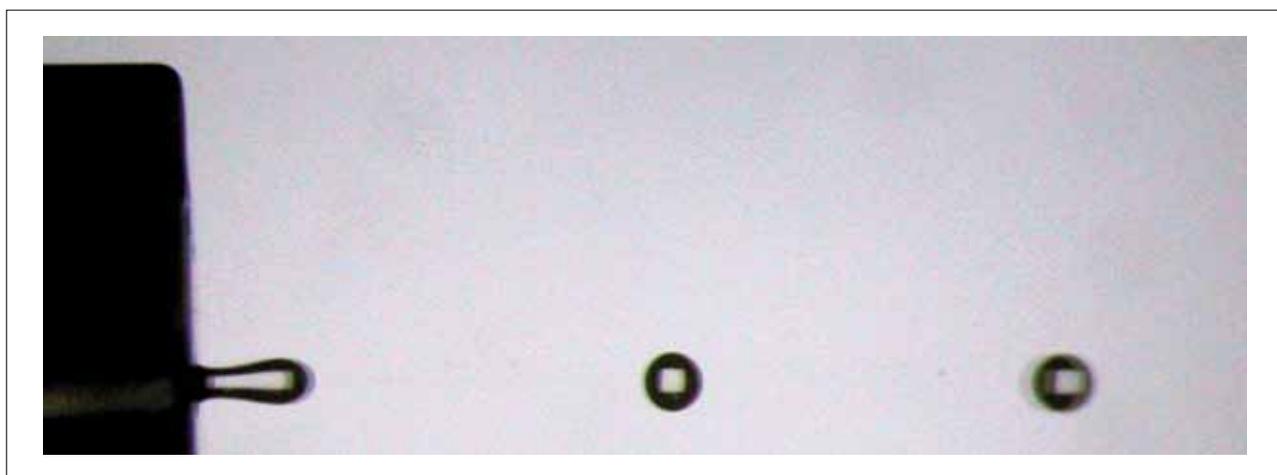


MICRO VALVE SELECTION

The right micro valve is selected primarily based on the following influential parameters and properties:

- Dispensing media, viscosity, temperature
- Dispensing time, dispensing volume
- Medium feeder, pressure

The table below shows an overview of what valve type is basically suitable depending on the viscosity and the desired dispensing volume. The selection is always application-specific, however. Contact us for a detailed consultation.



Viscosities	Low Up to 110 mPa.s	Medium 110 - 500 mPa.s	High 500 - 15000 mPa.s
Dispensing media	Gases Water Alcohols DMSO Buffers Cells Solvent Inks Reagents MEK etc.	Mineral oils Glycerine Detergents Liquid adhesives UV-varnish etc.	Greases Pastes Adhesives Lacquer etc.
Minimal dispensing volume	under 10 nl	more than 50 nl	more than 200 nl
Medium pressure	1 – 5 bar	3 – 12 bar	8 – 50 bar
Temperature	Room temperature	30 - 70° C	50 - 100° C
Nozzle diameter	Ø 0.10 and Ø 0.15 mm	Ø 0.20 and Ø 0.30 mm	Ø 0.45 and Ø 0.60 mm
Travel	0.03 and 0.06 mm	0,10 mm	0.10 and 0.15 mm

DISPENSING VOLUME

A minimal dispensing volume is achieved with the optimal nozzle diameter, a valve travel corresponding to the medium and a fast and precise actuation of the micro valves.

Our modular valve controller MVC 1 is well-suited for the best possible actuation. Up to 16 micro valves can be actuated independently of one another with the MVC 1.

MEDIUM PRESSURE

If possible, the medium should be discharged from a pressure container. If the medium takes on air, this can lead to fluctuations in the dispensing volume as well as to satellite splatters. To prevent this, solutions are available where the medium and the air are separated by a piston. In order to not have to operate

the dispensing system under an unnecessarily high pressure, we specially recommend that the cross section of the supply line up to the micro valve be selected as large as possible for highly viscous media.

TEMPERATURE

When using media with a higher viscosity which cannot be dispensed at room temperature, the medium can be heated. The viscosity is then changed, and optimal dispensability is achieved. Micro valve heating is limited to 100°C by

the valve coil. The micro valves can withstand a much higher temperature, however. Our MVC 1 can also control up to 4 heating systems.

RELATIONSHIP BETWEEN NOZZLE DIAMETER AND VALVE TRAVEL

Nozzle diameter and valve travel are important influential parameters for the drop formation. To achieve the best dispensing results, the nozzle diameter and the valve travel have to be matched and combined with each other. The table shows the recommended standard combinations. Larger nozzle diameters and valve

travel are used for larger flow volumes and media with higher viscosity. Smaller diameters with small valve travel are suitable for small dispensing volumes for the longest life-time.

DETERMINING THE VALVE TYPE

SMLD 300, the fast one

If a medium of low viscosity is used, and if the highest speeds of up to 4000 Hz and the highest dynamics are required, the micro valve SMLD 300 is used. This valve type offers a small inner volume of only 25 µl and a minimum pattern width of 4 mm for cramped spatial conditions.

SMLD 300G, the flexible one

If there is enough of space and if the inner volume of 65 µl is suitable for the application requirements, the micro valve SMLD 300G is used. The micro valve is available with all established nozzle diameters. It can be combined with a valve holder with an integrated heater. This allows dispensing in the entire possible viscosity range.