

Choosing the right mixer chip

Micronit offers two kinds of mixer chips. The Swirl Mixer chip is suitable for flows with a Reynolds number above 50 and the Teardrop Mixer chip is suitable for flows with a Reynolds number below 100.

What is a Reynolds number?

A Reynolds number describes the ratio of inertial forces to viscous forces. It depends on the fluids, the flow speed and the geometry of the flow. In the case of our chips, it can be calculated as follows:

$$Re = \frac{Q}{0.24\nu}$$

Q = flowrate in L/s (liters per second). This is the total flowrate of all fluids combined.
 ν = kinematic viscosity in m²/s (square meters per second).

Example 1

If you only use watery solutions at room temperature ($\nu = 8,917 \cdot 10^{-7}$ m²/s) with a combined flowrate of 100 μ L/s, the Reynolds number would be:

$$Re = \frac{100 \cdot 10^{-6}}{0.24 \cdot 8,917 \cdot 10^{-7}} = 467$$

In this case you should choose the Swirl Mixer chip.

Example 2

If you only use solutions based on silicone oil 350 cSt at room temperature ($\nu = 350 \cdot 10^{-6}$ m²/s) with a combined flowrate of 1 μ L/s, the Reynolds number would be:

$$Re = \frac{1 \cdot 10^{-6}}{0.24 \cdot 350 \cdot 10^{-6}} = 0.012$$

In this case you should choose the Teardrop Mixer chip.