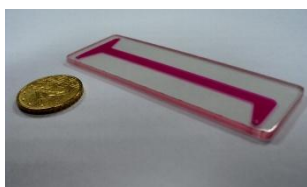
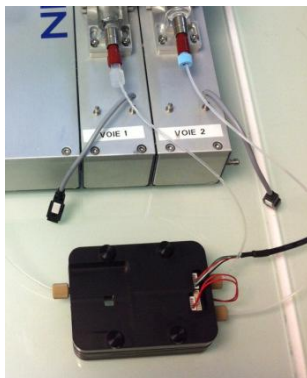


Microfluidic Visual Rheology



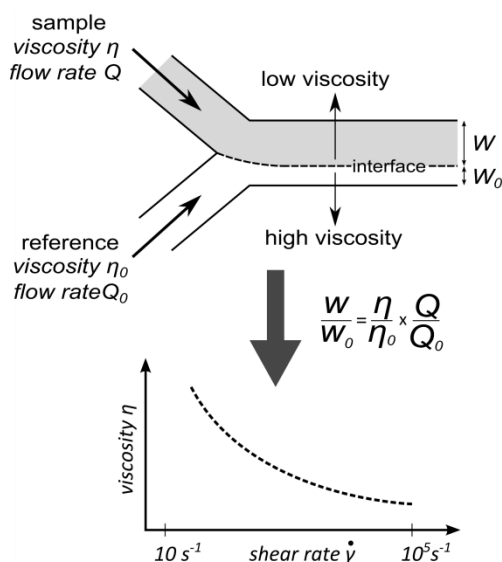
Our microfluidic system allows fast and simple rheological measurements, using minute amounts of sample. The microchannel configuration allows viscosity analysis under high shear rates and under strong confinement, mimicking your real process conditions.

Principle

A sample and a viscosity standard are introduced together in the microfluidic channel (typically 5 mm wide, from 150 down to 25 μm deep). The applied shear stress is simply adjusted by a computer-controlled syringe pump. Images of the resulting laminar flow (no mixing) are acquired via an integrated microscopy system.

Under these conditions, the interface position is related to the viscosity ratio between the sample and the reference. Our software automatically extracts the true sample viscosity as a function of the shear rate using a patented method.

Local, in-channel measurement with virtually no dead volume allows fast response times and eliminates complex entrance and exit effects usually associated with capillary rheometers. The plastic microfluidic cartridge is disposable and can be available with a range of channel depths (150 down to 25 μm) depending on the targeted range of shear stress, viscosity and sample volumes.



APPLICATIONS

PHARMACEUTICAL INDUSTRY
Formulation of therapeutic proteins, injectable or sprayable drugs

INKS AND INKJET
Printing, flexible electronics, biochips

SPRAY
Cosmetics, foods, drugs

BIOMEDICAL DIAGNOSTICS
Blood, saliva, synovia

EYE DROP

OIL INDUSTRY
Asphaltenes, enhanced-oil recovery

LUBRICANTS
Mechanics, machining, cutting oil, wire drawing

PAINT AND COATINGS INDUSTRY

BATTERIES AND FUEL CELLS
Formulation of electrolytes

Why microfluidics?

- **Small sample volumes (below 1ml)**
- **Extend measurement range (as compared to a rotational rheometer)**
 - High shear (up to 10^5 s^{-1} depending on channel depth)
 - Strong confinement (150 down to 25 μm , other dimensions are available on demand)
- **Automated sample preparation and analysis**
 - Automated dilution or formulation with an in-line mixer
 - Image acquisition and analysis as a function of shear rate
- **User-friendly, fast measurements**

Forget the troublesome opening / cleaning of the rheometer cell: just flow your sample into the disposable cartridge and get your results in a few minutes.

A range of microfluidic solutions

Beyond microscopy and rheology, our instrument can be customized to address your specific needs:

- **Customized microfluidic chips:** From straight channel for in-line microscopy to complex microfluidic networks, nozzle or other shapes mimicking your process conditions.
- **Dedicated vision system:** The high transparency of the chip allows a wide range of automated optical analysis under a controlled shear flow: standard or specialty microscopy, turbidity or birefringency mapping, etc.