



Droplet Break Up in Spray and Coatings

Summary

The Capillary Breakup Extensional Rheometer (CaBER®) was initially developed at Cambridge Polymer Group under a Small Business Innovation and Research (SBIR) grant. The instrument has since been commercialized in collaboration with Thermo Haake (Germany) and is now the only commercially available solution extensional rheometer available. This instrument will find utility in a broad range of fields as diverse as inks and paints, adhesives and polymer solutions, as well as food stuffs and beverages.

Specifications

Hencky strain : up to $\epsilon_0 = 10$ (i.e. $R_0/R = 148$)

Strain rate range

- Imposed strain rate : $0.01 < \dot{\epsilon} < 300 \text{ s}^{-1}$
- Strain rate in sample : $10^{-5} < \dot{\epsilon} < 10 \text{ s}^{-1}$

Shear viscosity range : $50 - 10^6 \text{ mPa}\cdot\text{s}$

Plate diameter : 4 - 8 mm, standard = 6 mm

Temperature range : 0 - 80 °C

Laser micrometer resolution : 10 μm

Data acquisition rate : 30,000 Hz

Dimensions : 40 x 34 x 60 cm



Description

Conventional shear rheometers are extremely well developed and represent a very mature technology. These instruments deform and measure fluids in shear, allowing the determination of fluid properties in a sliding deformation. However, many fluids exhibit markedly different properties when stretched and measuring fluids in this mode is not straightforward. The Capillary Breakup Extensional Rheometer (CaBER®), developed by CPG and sold by Thermo Haake, is currently the only available rheometer capable of examining the properties of solutions and liquids in pure extension. This instrument is useful for analyzing almost any fluid where the flow involves coating, deposition, pumping or spraying. In fact, the behavior of fluids in any free-surface extensional flow can be clarified using this instrument.

Markets

Polymer solutions

Inks

Adhesives

Coatings and sprays

Medical solutions and treatments

Biological fluids

