

Viscometer in Chemical Applications

PCE Americas Inc.
711 Commerce Way
Suite 8
Jupiter
FL-33458
USA

From outside US: +1
Tel: (561) 320-9162
Fax: (561) 320-9176
info@pce-americas.com

PCE Instruments UK Ltd.
Units 12/13
Southpoint Business Park
Ensign way
Hampshire / Southampton
United Kingdom, SO31 4RF

From outside UK: +44
Tel: (0) 2380 98703 0
Fax: (0) 2380 98703 9
info@pce-instruments.com

www.pce-instruments.com/english
www.pce-instruments.com

Viscometer basic information

The viscosity / rheology describes by means of a measurement the flow behavior of the liquids and gases.

In industry viscometer and rheometer are traditionally used for the quality control in order to determine these physical features. Viscosity characterizes the substance in relation to its flow and texture and is a quality parameter during the incoming and manufacturing process.

Different substances require also different measuring systems for defining the viscosity.

Falling ball viscometer

A special feature of the falling ball viscometers is that any liquid substance at a certain temperature has got its own "inner friction". With the help of the measurement the time of falling of a ball within a certain drop distance in a pipe with 10% incline is measured. The standard norms are described in DIN 53015. The measurements are possible in transparent Newtonian liquids.



Falling ball viscometer in breweries

The viscosity of the beer has got an influence of the filterability and foam stability. High viscosity $> 1,6$ mPas from one side make the filtration more difficult, but from another side – improve the foam stability and taste of a beer.

Capillary viscometer measures the flow speed of an average flowable substance in a capillary as a laminar steady flow. An application which is often used in that kind of viscometers is the plastics technology to determine the average molecular weight (length of chain of one plastics molecule). In such a way with the help of the suitable solvents the plastics dispersion is measured.



The physical basics for the calculation of the capillary flow has already been described for about 150 years in a so-called Hagen-Poiseuilleschen law.

Rotation viscometer supplement (expand) the application area and are often used for the not transparent or non-Newtonian liquids. The condition here is that a rotary unit under controlled rotation with a friction resistance of a certain sample is determined at the room temperatures. Rotation viscometers often play an important role in the incoming goods inspection, as lots of measurements in a relatively short time should be carried out at the room temperatures. The ISO 2555 standard provides the requirements to the rotational units and number of revolutions so that to make the measuring results comparable.



Image Source:

„Falling ball viscometer“source:

KIT - Karlsruher Institut für Technologie, Germany