



 **RH7-D & RH10-D CAPILLARY RHEOMETERS**

# RH7-D and RH10-D Advanced, powerful rheometers suitable for research

Since its launch, the Rosand RH7 has set new standards in research level capillary rheometry. Today, the Rosand RH7 is used in several hundred research laboratories around the world for a range of applications including polymers, foods, coatings and ceramics. Bohlin Instruments has continuously developed the original RH7 design and its operating software to produce a new generation of floor standing capillary units with market leading performance characteristics and capabilities. The RH7-D and RH10-D retain the robust 'H' frame design principle, which lies at the heart of the instruments' ability to operate under high loading conditions. A new digital drive system, gives the RH7-D and the RH10-D unsurpassed performance in terms of speed control, accuracy, and dynamic operating range. This new hardware is supported by the latest generation of 32 bit Windows™ based software, Flowmaster™, with many new experimental possibilities.

## Key Features and Benefits

### Rosand Twin Bore Principle

Rosand was the first manufacturer to introduce the twin bore measurement principle in a commercially available rheometer unit. Simultaneous measurements can therefore be made on both long and short dies to determine the inlet pressure drop at the die, and therefore absolute viscosity, using the Bagley method. More commonly, Rosand 'zero length' dies are used to directly measure the inlet pressure drop and measure the extensional viscosity using the Cogswell method. The twin bore technique gives obvious experimental advantages including improved throughput since both experiments are preheated simultaneously. Alternatively, the software can be configured to run a two material test, thus measuring the apparent viscosity of two different materials simultaneously.

### Rigid 'H' frame design

The 'H' frame design principle gives a vertical frame stiffness well in excess of that achievable with cantilever or 'C' frame designs. The frame design is effectively rigid at loads many times in excess of the 100kN measurement limit. This is an important consideration in transient tests such as PVT, which rely upon compliance free measurement for accurate volume determination.

### Bi-Modal speed control

Bohlin has developed a bespoke bi-modal digital speed control technology to control the latest generation of capillary rheometers. The technology uses different speed control algorithms suited to high and low speed operation in order to optimise performance. This gives the rheometer units an impressive dynamic range in speed control. In practice, the lower limit is determined only by long experimental times at low shear rates but a dynamic range in speed of in excess of 400:000:1 is available if required. This greatly enhances the system's flexibility and means that a greater range of shear rates can be covered using a particular die.

### Integral fume chamber with extraction

For operator safety, the RH7-D and RH10-D are equipped with a safety interlocked fume chamber with fan extraction of the gases to a vent at the back of the rheometer unit. An extractor fan is also situated below the rheometer barrel.

### Floor standing design

The floor standing design affords the rheometers with an open architecture below the barrel and heater assembly. This space can be used to accommodate other experimental options such as die swell measurement, a slot die, haul-off (melt strength) and a haul-off (post-extrusion) oven.



## Specifications

	RH7-D
Maximum Force	50 kN
Maximum Speed	600 mm/min
Dynamic Range in Speed	>400,000:1
Speed Uncertainty	Better than 0.1%
Temperature Range	Ambient to 250°C (500°C optional)
Temperature Range <sup>2)</sup>	-40°C to 250°C
Temperature Control	Up to 4 zones
Temperature Control	<+/-0.1°C

1) Optional 2,400 mm/min at 50kN force 2) With optional cooling system

# Powerful floor standing capillary rheometers for research and product development

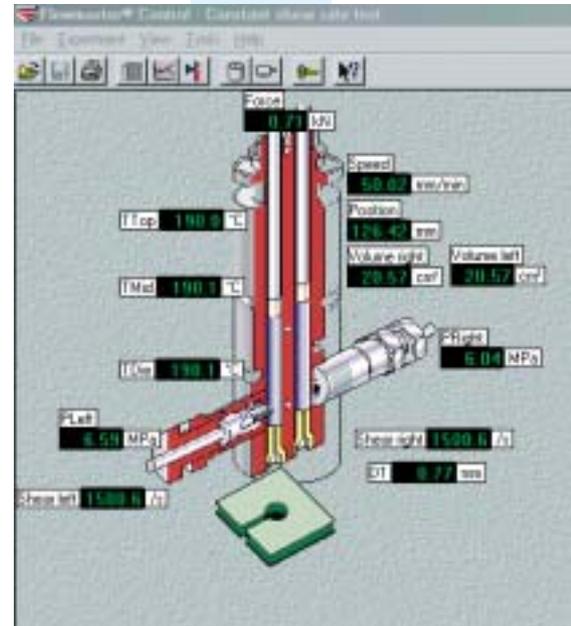


## 32 bit Flowmaster™ Software

Bohlin has continuously developed the Rosand Flowmaster™ software which represents a very comprehensive data acquisition and analysis package with a wide range of measurement options.

### Software modules available include:

- Manual Control
- Constant Shear Test
- Extensional Test
- Die Swell Measurement
- Flow/No Flow
- Melt Fracture/Flow Instability
- Material Degradation/Thermal Stability
- Low Speed Degradation
- Relaxation Test
- Data Export Utility
- Low Level Scripting
- Wall Slip Analysis



Flowmaster™ software graphic image of barrel with measured parameters

Where appropriate, the Rabinowitsch, Bagley, and Hagenbach corrections are available within the Flowmaster™ software. The Cogswell convergent flow model is used to determine the extensional viscosity.

## Options

### Barrel Materials and Dimensions

For aqueous or aggressive materials, stainless steel or Hastalloy barrels are available in place of the standard Nitrided version. The wide dynamic range in speed means that the standard 15mm diameter barrel is suitable for the vast majority of testing applications. However, barrels are available with 9.5mm, 12mm, 19mm and 24mm bores as an option.

### Low Temperature

For applications that require sub-ambient measurements, a special low temperature option is available which utilises liquid nitrogen.

## Accessories

Several accessories are available to suit particular applications or enhance the testing capability of the base units. The main accessories are listed below (see separate Capillary Accessories brochure):

- Alternative test dies
- Nitrogen purge
- 'Tragethon' haul-off (melt strength)
- Haul-off (post-extrusion) oven
- Laser die swell measurement
- Slot die assembly
- PVT test
- Die and melt cutters

	RH10-D
	100 kN
min	1200 mm/min <sup>1)</sup>
1	>400,000:1
n 0.1%	Better than 0.1%
o 400°C (optional)	Ambient to 400°C (500°C optional)
50°C	-40°C to 250°C
ones, PID	Up to 4 zones, PID
	<+/-0.1°C

Low Temperature option



## YOUR PARTNER IN RHEOLOGY

The flow of matter is created by Force, Deformation and Time. The Symbol of Bohlin Instruments represents this infinite process as the three links of a chain, just as our quality, service and support are invaluable to materials testing. The competitive edge which Rheology offers industry is the driving force for Bohlin innovation. As more and more industrial applications demand the information which only rheology and rheological measurements can provide, Bohlin Instruments responds with the knowledge and experience to offer practical rheology solutions.

### Bohlin Instruments' Rheology Support Package

Bohlin Instruments has direct sales and service facilities in the USA, the UK, Germany and France, as well as a global network of distributors. To ensure that customers get the most from their instrumentation, Bohlin offers rheometer and viscometer usage training, contract testing, consultancy, applications advice, seminars, application notes, service support and guaranteed response service contracts.

**Rotational Rheometers**  
**Capillary Rheometers**  
**Viscometers**

**Contract Testing**  
**Consultancy**  
**Training**



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