

PVT-diagram of partial crystalline polymer,
original printout from Rheograph 6000
and Rheo-Tester 2000

Useful options available in combination with Capillary Rheometers

Tests and measurement techniques that may be used
in conjunction with our capillary rheometers



GÖTTFERT®

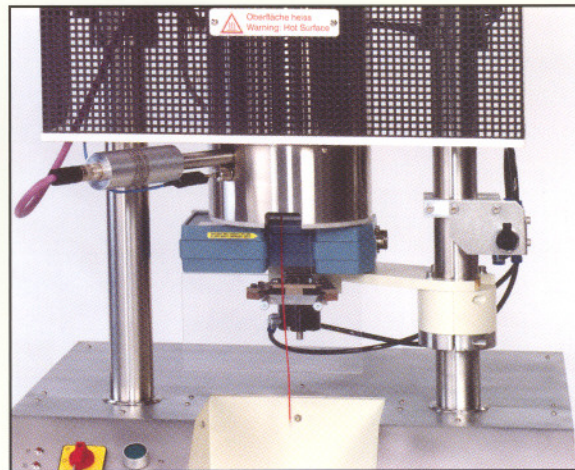
More than just capillary rheology!

The main function of any capillary rheometer is the measurement of the viscosity function. However, in the course of developing this system further, additional need arose, new questions were asked, which led to a long list of options that have become available from GOETTERT. Additional measurement technology that works in conjunction with GOETTERT's capillary rheometers offer many opportunities to increase the effective use of the whole measurement system.

Laser Die Swell

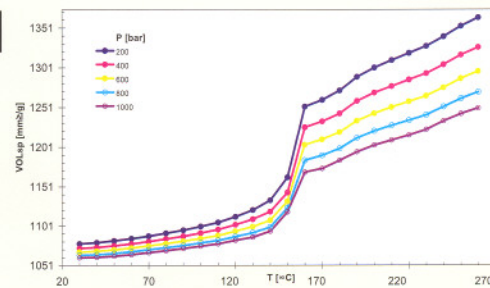
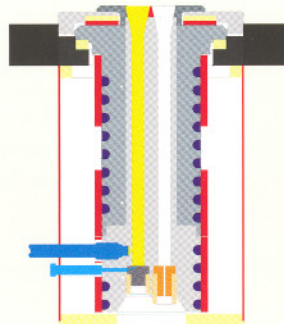
Laser optics, accuracy:

- Measuring range 0.2 – 32 mm
- Repeatability $\pm 0.2 \mu\text{m}$
- Automated cutting device
- Height adjustable swivel arm
- Static and dynamic measurements



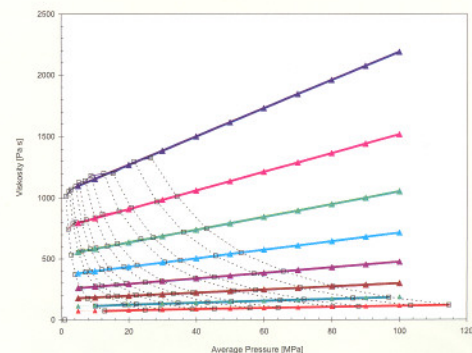
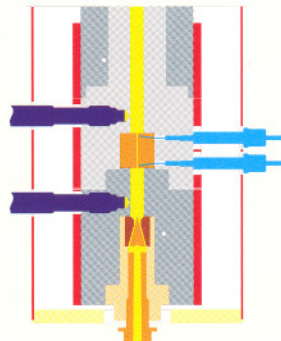
PVT

- Evaluation of following characteristics: pressure, volume and temperature
- Graphical display of PVT diagram
- Optimization of flow- and shrinkage- behaviour during processing



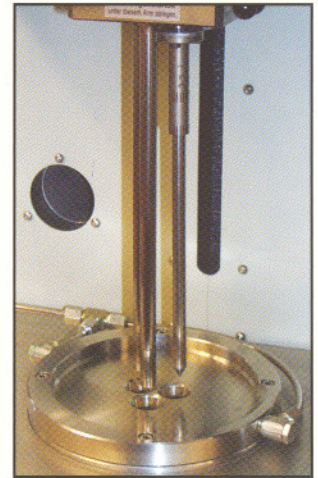
Pressure dependant viscosity – Counter-pressure chamber

- Pressure dependant viscosity
- Wall slip behaviour
- Process simulation



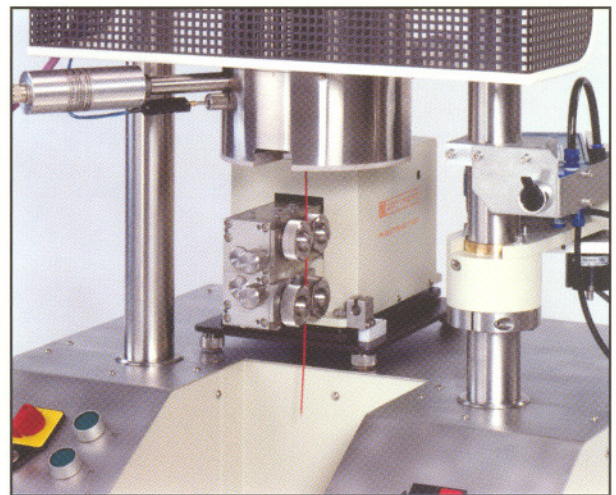
Thermal Conductivity

- Thermal conductivity measurement
- Graphical display of the thermal conductivity measurement (pressure, temperature)
- Optimization of thermal conductivity
- Optimization of cooling time calculations



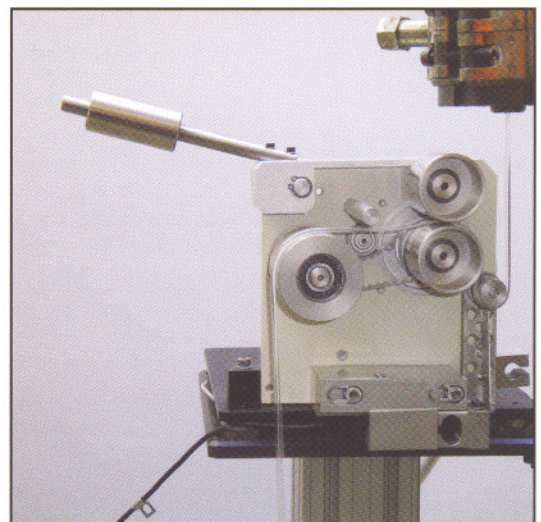
Melt elongation Rheotens

- Freely adjustable haul-off speeds 0 – 190 cm/s
- Force measuring range 0 – 2.0 N
- Resolution 0.001 N
- Freely adjustable linear or exponential acceleration
- Wheels with smooth or ridged surface
- Optional set of wheels to counter material sticking to the measurement wheels
- Optional wheel cooling to help counter stickiness behaviour
- MS Windows ® software
- Extensional Viscosity measurements (Wagner)
- Sample applications: blow molding, film, coating, spinning, etc.



Melt elongation Haul-off

- Freely adjustable haul-off speeds 0 – 600 m/min, 0 – 2000 m/min Option
- Force measuring range 0 – 2.0 N
- Resolution 0.001 N
- Freely adjustable linear or exponential acceleration
- MS Windows ® software
- Sample application: spinning, etc.



Which instruments offer which options ?



RHEO-TESTER 500	RHEO-TESTER 1000	RHEO-TESTER 2000	RHEOGRAPH 6000
Shear stress *1: 1.4 – 1105 kPa Shear rate *1: 0.072 – 276480 s ⁻¹	Shear stress *1: 0.3 – 3316 kPa Shear rate *1: 0.072 – 92160 s ⁻¹	Shear stress *1: 0.3 – 4421 kPa Shear rate *1: 0.014 – 184320 s ⁻¹	Shear stress *1: 0.3 – 6631 kPa Shear rate *1: 0.014 – 368640 s ⁻¹
Die swell	Die swell	Die swell	Die swell
Rheotens	Rheotens	Rheotens	Rheotens
	Haul-off	Haul-off	Haul-off
		Counter pressure	Counter pressure
		PVT	PVT
		Thermal conductivity	Thermal conductivity

*1 Data is valid for barrel diameter Ø 12 mm and with capillaries: Ø 0.5 / 2.0 mm, length 20 mm

*2 Data is valid for barrel diameter Ø 12 mm and with capillaries: Ø 0,5 / 2,0 mm

WebRheo Software

Features	Complete software suit to run the rheometer and to evaluate its measurements (Access data base), networkable
Calculations	Slit die, round hole capillaries
Corrections	Rabinowitsch-Weissenberg; Bagley linear and non-linear, Mooney; pressure factor
Viscosity models	Ostwald de Waele, Carreau-Winter, Yasuda, Sabia, Münstedt
Extensional viscosity	Cogswell
Evaluation	NNI-Factor, thermal stability, relaxation, ramping
Options	Swell factor, PVT, thermal conductivity



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