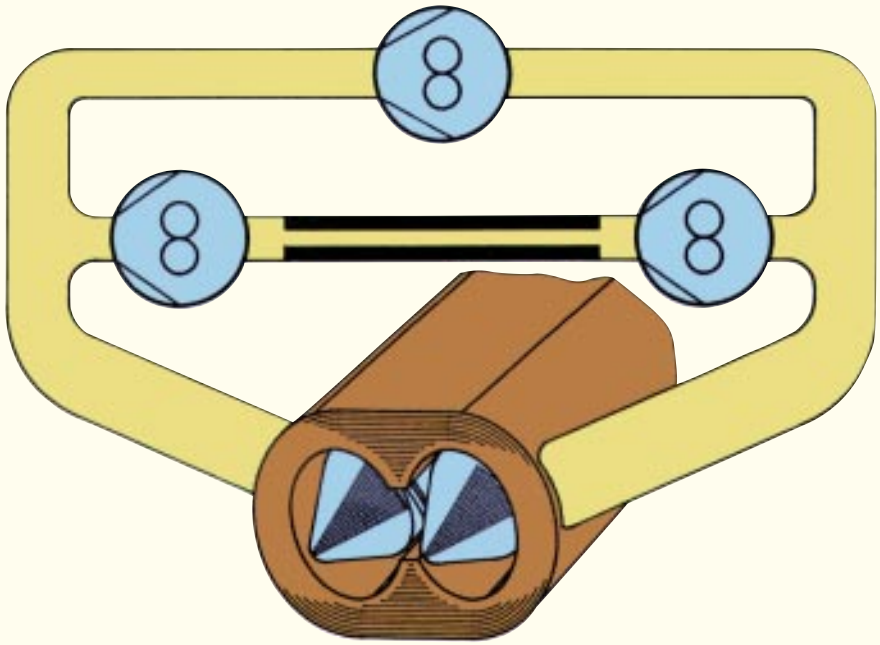


RTR-RTS

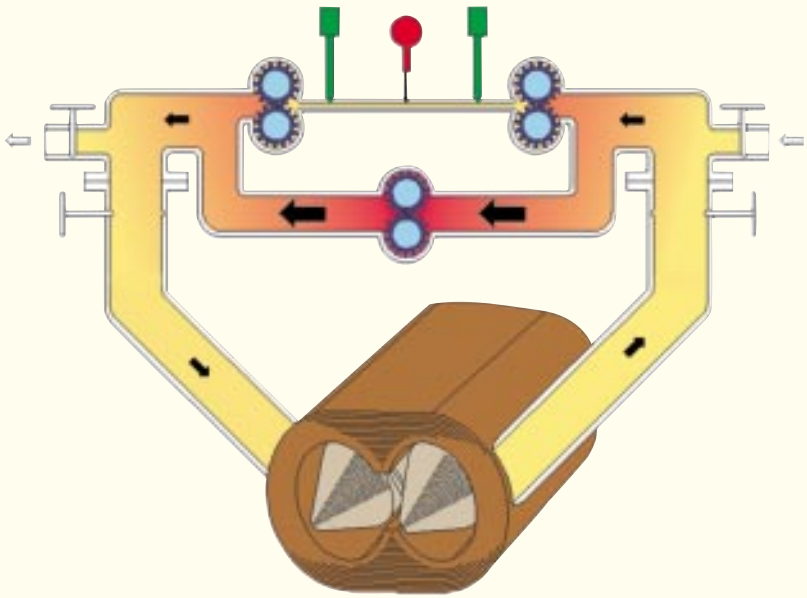
On-Line-Capillary Rheometry with Melt Return

GÖTTFERT®

GFT 019.04.5-9-02

RTR - Real Time Rheometer

On-line capillary rheometers must respond quickly to process fluctuations in order to monitor the polymer manufacturing process and/or serve as a feedback sensor for closed loop control.
Today the worldwide patented RTR concept, with more than 100 installations, is the only industrially proven system to provide near instantaneous single or multiple point measurements.



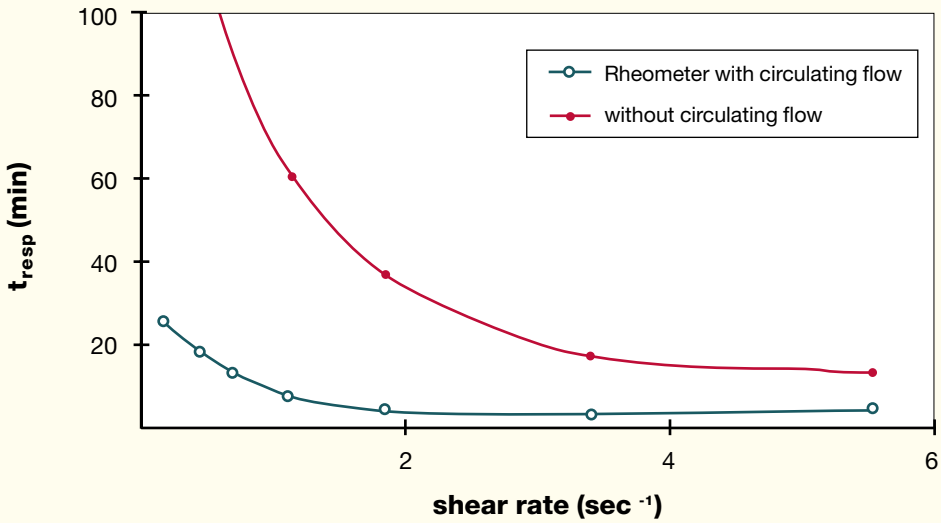
- **Shear rate sweep over three decades**
- **Short response time even during low shear rate tests**
- **Transfer line length not critical**

The RTR Principle

In conventional on-line capillary rheometers, the volumetric flow through the transfer lines is identical to the flow through the capillary or slit die. When keeping the pressure drop in the system constant the material residence time in the rheometer becomes material dependent.

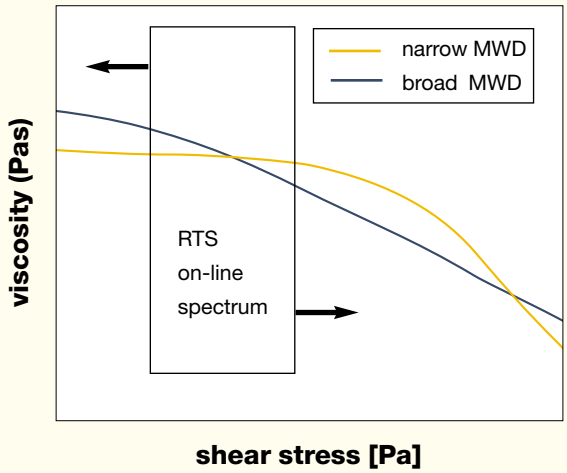
For medium and high molecular polymer melts the response time behavior will be poor due to low flow rates through the die. The incorporation of a **Circulating Volumetric Flow**, which circulates polymer independently of the Measured Volumetric Flow, provides fresh melt to the metering pump which feeds the capillary, even during low shear rate tests. This circulation principle moves the polymer melt through the transfer lines up to 100 times faster than through the capillary, giving an important advantage over conventional on-line rheometers.

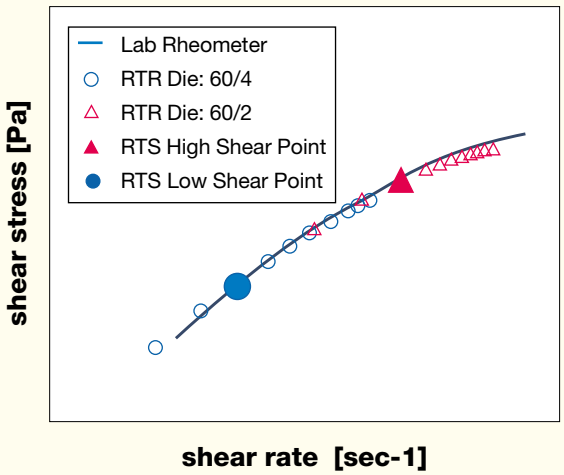
RTR - Up to 100 times faster response time than any other on-line rheometer !



Real-Time Rheometry - to control the polymer structure

Melt flow index as a single point experiment is a practical measure of changes in the average molecular weight. The molecular weight distribution, however, has a strong impact on the shape of the viscosity function. With conventional on-line rheometers at least a two point measurement is required to determine the slope of the flow curve. To perform the experiments in sequence, however, will increase the response time characteristics.





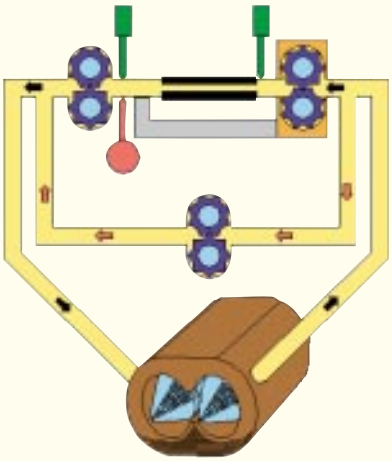
The **RTS** (see back page) offers the advantage of continuously monitoring a significant spectrum of the viscosity function using single point conditions at the „High Shear Point“ and „Low Shear Point“.

Real Time Spectrometer - RTS

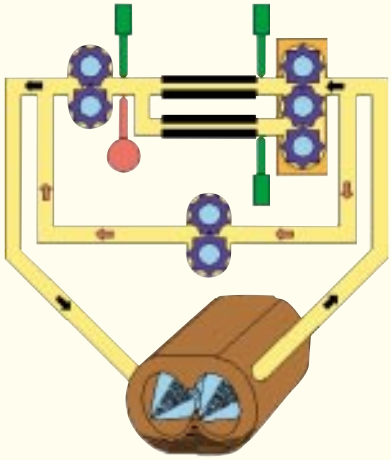
Continous On-Line Control of the Viscosity Function using Stable Single Point Measurement Conditions !

The rheometer system RTR-RTS uses a single die-block design configured with a single capillary (RTR) or two capillaries (RTS). A switch from one system to the other is therefore easily accomplished.

This transforms a Real Time Rheometer (RTR) into a Real Time Spectrometer (RTS)

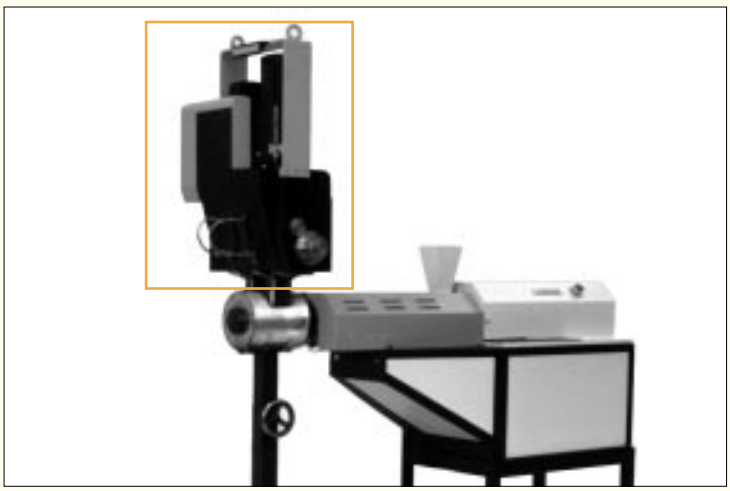


Basic Instrument with a Single Capillary (RTR)



Twin Capillary Version (RTS)

The twin bore design with two different die diameters generates two shear rates simultaneously. Consequently a continuously measured window of the flow curve is being monitored.



RTR-RTS with Lab Extruder

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