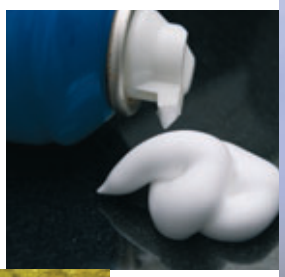
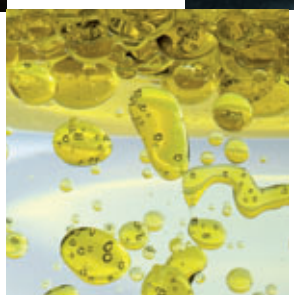
Product Specifications

Thermo Electron´s RheoScope module for the rheometer platform HAAKE MARS simultaneously measures rheological properties and changes in the microscopic structure of the tested sample. The results allow researchers to speed formulation development, process optimization and product processability.

RheoScope Module For the HAAKE MARS Rheometer

Combines rheological measurement with optical analysis





Applications

- **Food**
- **Polymers**
- **Pharmaceuticals**
- **Cosmetics**
- **Petrochemicals**

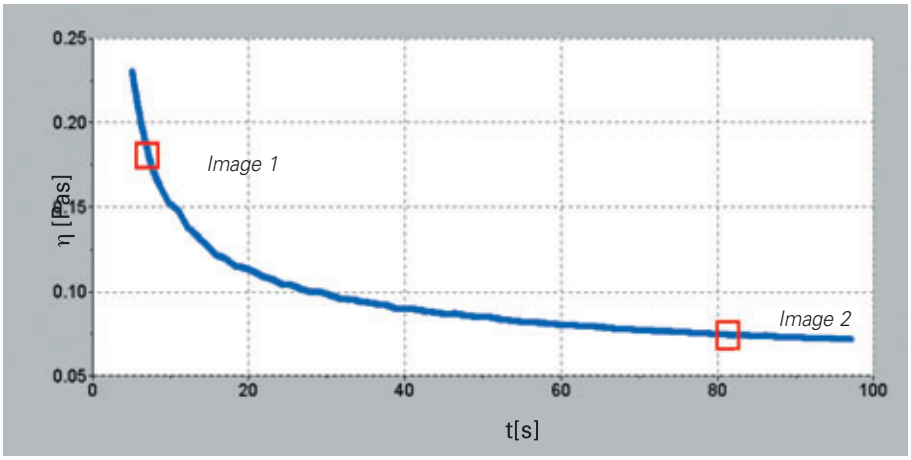
Formulations

- **Gels**
- **Suspensions**
- **Solutions**
- **Emulsions/Dispersions**
- **Foams**

Rheology and Microscopy

The RheoScope module simultaneously records rheological properties and changes in the microscopic structure of the tested sample at a macroscopic level. Understanding micro structures enables researchers to characterize a product's mechanical properties. The module is comprised of an optical microscope, digital video camera and temperature control unit that is used in conjunction with the HAAKE MARS rheometer platform.

The HAAKE RheoWin software used to control the rheometer also positions and focuses the scope and polarization filter. Rheological data and images (video sequences) can be viewed on line next to each other. In addition, the data and images can be stored in various formats for further evaluation and export. The RheoScope's architecture allows the module to be adapted quickly for customized user configurations.



Coalescence in an Emulsion

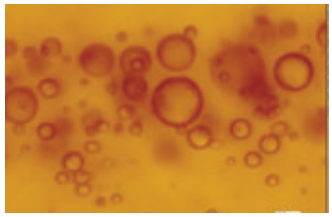


Image 1

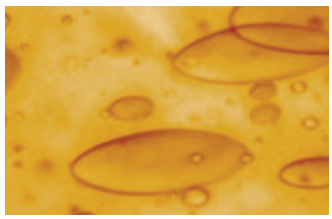


Image 2

Specifications:	
Optic	
Microscope	Servo motor-driven focus and position adjustments controlled via software
Lenses[1)]	Magnification: 5x, 10x, 20x and 50x
Light source[1)]	150 W, 12 V, wave length range: 380 – 750 nm
Resolution	1 µm (20x lenses)
Field depth	5 µm (20x lenses)
Contrast improvement	Motor-driven polarization filter
Camera[1)]	Progressive-scan CCD camera with 1024 x 768 pixels, C-connection and IEEE 1394 (Firewire) interface
Data acquisition and storage	
Data acquisition	Up to 15 images per second[2)] with HAAKE RheoWin 3 software
Storage	Maximum 15 images/second with standard image format (e.g. TIFF) or video acquisition with user-define definable data compression
Temperature Range	
Liquid temperature-controlled unit	-5 – 120°C[3)]
Measuring Geometries	
A range of plate/plate and cone/plate measuring geometries made of titanium with polished surfaces is available (PP60, C60/1°, PP35, C35/1°, custom dimensions are available on request)	

[1)] Components with standard interfaces are used, individual components can be adapted
[2)] Depending on the specifications of the components used
[3)] Depending on the circulator used

Rheological phenomena and structural changes that can be observed:

- Shear thinning
- Dilatancy
- Thixotropy
- Aging
- Emulsification
- Gelification
- Disaggregation
- Flocculation

Benefits:

- Compact and full integration in the HAAKE MARS rheometer platform
- All measuring modes including normal force measurement available with simultaneous recording of microscopic properties
- Camera and microscope control via software
- Simultaneous rheological and optical measurements
- Visualization of data and images in one software package
- Analysis of structural changes under shear
- Quantitative characterization of particle dynamics

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