



1 *Determination of the rheological properties using a cone-plate measuring system.*

## RHEOLOGY

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### Rheology

Rheology characterizes the flow properties of deformable systems and provides essential constitutive equations for the design of mixing, dosing, and application equipment.

The rheological properties of adhesives and sealants as well as coatings are often very complex. The flow properties determine the processing characteristics of an adhesive or coating, from the container to the finished product.

The experts of the Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM measure and analyse the rheological properties of specimens in test series specifically adapted to meet the needs of customers. This information is used, for example, to optimize adhesives and coatings regarding the processing behavior.

Further, the rheological properties of adhesives and sealants, as well as coatings

are also sensitive indicators of changes to materials, regarding compositional changes or changes due to aging.

### Selection of characteristic material properties studied at Fraunhofer IFAM

- Viscosity as a function of shear rate and temperature
- Flow properties (flow limits, thixotropy, etc.)
- Storage and loss moduli, damping factor  $\tan \delta$
- Creep and relaxation behavior
- Viscosity and stiffness changes during curing

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## Application areas

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### Development and selection of materials

- Rheological properties, processing stability and thermal stability
- Suitability for a specific application method
- Determination of parameters for designing mixing, dosing, and application systems
- Determination of the dynamic-mechanical properties during curing
- Influence of different molecular weight distributions and contaminants on the processing properties

### Process optimization

- Determination of suitable processing parameters (process window)

### Quality assurance

- Demonstration of required properties

### Failure analysis

- Characterization of the rheological properties of materials and their changes due to storage, processing, and application