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

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 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 δ
- Creep and relaxation behavior
- Viscosity and stiffness changes during curing

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

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