Introduction

• SC-15 Part A is an epoxy used in many industrial applications.
• It is an amorphous polymer that has no melting point.
• But it does have a glass transition point.
• The ultimate Tg of SC-15 Part A epoxy is 100°C.

* Tg is the temperature at which a polymer undergoes the transformation from glass to a rubber.

• Viscosity tests are important because it gives manufacturers the ability to predict how the substance will behave in the real world.
• For this experiment, five tests were performed using continuous rotation and rotational oscillation with a rheometer to demonstrate how different test types present different flow curves.

Rheometer

• Modern rheometers can operate with continuous rotation and oscillation to perform shear tests.
• The results are called flow curves.
• Rheometers measure the way a liquid flows under applied force.

Continuous Rotation Shear
Rotation shear tests can be carried out in two different modes.
- First way is the use of torque or shear stress.
  • These types of tests simulate force-dependent applications such as squeezing toothpaste out of its tube.
- Second way is the use of rotational speed or shear rate.
  • Situations such as application of coatings with a brush can be given as an example of this method.

Oscillating Shear

Area of Use
• Oscillation is used to find complex viscosity of fluids.

Test Parameters
• Frequency Sweep (5Hz – 100Hz)

Complex Viscosity
• It is given by the quotient of the maximum stress amplitude and maximum strain rate amplitude.

Results and Discussion

• Above chart explicitly shows the difference between rotational mode and oscillatory mode rheology test results of SC-15 Part A epoxy.

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