

Viscosity

What is viscosity?

Some liquids flow more easily than others do. For example, honey is very “thick” and flows very slowly. Water is very “thin” and flows very quickly. One is more viscous than the other is.

Viscosity is a term used to describe resistance to flow at a particular temperature. A liquid with a high internal resistance to flow is described as having a high viscosity (such as honey at room temperature). A liquid with a low internal resistance to flow is described as having a low viscosity (such as water at room temperature). The internal resistance being referred to is related to the ability for molecules to rearrange and move past each other. This rearrangement is necessary for flow. Liquids made up of small molecules have a low viscosity, and liquids with long chain molecules (such as plastics) have a much higher viscosity.

The viscosity of materials generally decreases with increasing temperature. This is true of plastics. Plastics also generally decrease in viscosity with increasing shear. Shear is created when twisting or sliding motion is imposed on a material; such as when plastic is being melted in extrusion or injection molding by the rotation of the screw while the barrel remains stationary. In injection molding, shear is also created as plastic moves past itself and the walls of the sprue, runner and cavity walls during injection. Faster injection promotes a lower material viscosity.

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