

Tech Tip # 3: Viscosity and the Thixotropic Index

Viscosity and the Thixotropic Index (T.I.) are two common components in an epoxy that can have a great effect on how the product will work for a particular application.

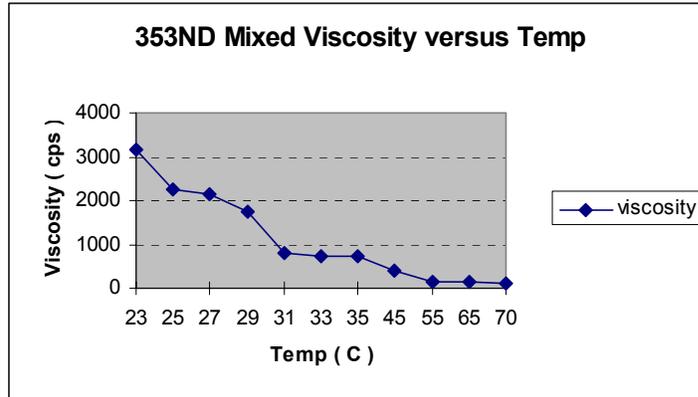
Viscosity is a measurement of a fluid's resistance to flow. Viscosity is measured in Poise, and the centipoise (cP) is the common unit used. One cP is defined as the viscosity of water. From this base, all other viscosities are derived. A product like honey would have a much higher viscosity—around 10,000 cPs—compared to water. Honey would flow much slower out of a tipped glass than water would. Here is a list of common material's and their viscosities:

Approximate Viscosities of Common Materials (At Room Temperature-70°F)	
Material	Viscosity in Centipoise
Water	1 cps
Milk	3 cps
SAE 10 Motor Oil	85-140 cps
SAE 20 Motor Oil	140-420 cps
SAE 30 Motor Oil	420-650 cps
SAE 40 Motor Oil	650-900 cps
Castrol Oil	1,000 cps
Karo Syrup	5,000 cps
Honey	10,000 cps
Chocolate	25,000 cps
Ketchup	50,000 cps
Mustard	70,000 cps
Sour Cream	100,000 cps
Peanut Butter	250,000 cps

Thixotropic Index is a ratio of a material's viscosity at two different speeds, generally different by a factor of ten. A thixotropic material's viscosity will reduce as agitation or pressure is increased. This index indicates the material's ability to hold its shape. Mayonnaise is a great example of this. It holds its shape very well, but when a shear stress is applied, the material easily spreads.

The viscosity of a material can be decreased with an increase in temperature in order to better suit an application. The viscosity of most materials will drop in a common fashion, exponential fashion. Below, the graph of 353ND shows how a material will react to heat.

Temp (°C)	Viscosity (cPs)
23	3153
25	2252
27	2147
29	1728
31	785
33	737
35	737
45	409
55	163
65	143
70	102



The viscosity of the 353ND drops very quickly, and then levels out at increased temperature. This is a good method to use if an epoxy is very good for a certain application, but the viscosity is slightly high. It must be noted that by heating up the mixture, some of the pot life is used up during the heating, so it will gel faster than if left at room temperature.

Still have questions?

Call Technical Services at 1-978-667-3805

Or

E-mail: techserv@epotek.com