



## *Klucel G*

### Uses:

Klucel is versatile: it is used in a wide variety of applications, including food, cosmetics, pharmaceuticals, coatings, adhesives, moldings, paper, paint removers, encapsulations, inks, and many other applications requiring a film-former, thickener, stabilizer, suspending agent, film barrier, thermoplastic, or protective colloid.

### Dissolving Klucel:

Klucel is soluble in water at room temperature. It is insoluble in water above 45 degrees Celsius. It is readily soluble in many polar organic solvents, hot or cold. The best methods for preparing solutions of Klucel in water or organic solvents are described in the following paragraphs.

#### Method 1:

In the first step, prepare a high-solids slurry by adding dry Klucel powder to 8 times (or more) its weight of well-agitated hot water at a temperature of 50 to 60 degrees Celsius. Temperature should not exceed 60 degrees Celsius. The slurry should be allowed to stir for a few minutes before addition to the main volume of cold water. This presoak results in a faster dissolving of particles in the second step. The hot slurry must be maintained above 50 degrees Celsius during this presoak to ensure that there is no premature dissolving of the particles that would result in the formation of a gelatinous mass. In the second step, the hot slurry is diluted with cold water (room temperature or lower). Agitation is continued until all particles are dissolved and solution is completely free of gels. High shear agitation is not necessary, and may be undesirable because of the tendency for foaming and air entrainment. In this dissolving step, the time factor is more important than high shear when it comes to ensuring complete solution of all gel particles.

Dissolving periods of 10 minutes or more may be required, depending on solution concentration and viscosity type being used. Solutions of lower viscosity Klucel types at low-solids concentration require the shortest time for preparation.

#### Method 2:

Add Klucel powder to the vortex of well-agitated water at room temperature. The rate of addition must be slow enough to permit particles to separate in the water. Addition of the powder should, however, be completed before any appreciable viscosity buildup is obtained in the solution. The rate of agitation may then be reduced, but continued until a gel-free solution is obtained. Throughout the mixing periods, solution temperature should be maintained below 35 degrees Celsius.

#### Method 3:

Dry-blend Klucel with any inert or nonpolymeric soluble material that will be used in the formulation. Blending aids separation of Klucel particles are first wetting and reduces tendency to lump. For best results Klucel should be less than 20% of the total dry blend. This blend is then handled as described in Method 2.

**As a leather consolidant:** 2% klucel dissolved in ethanol, isopropanol, or IMS

Klucel G, when applied to powdered leather, will reduce the powdering and extend the life of the leather. It is not a leather dressing.

**A solution to reinforce paper:** 1% klucel dissolved in ethanol, isopropanol, or IMS