

EXILVA SOLVENT COMPATIBILITY FOCUSING ON ETHANOL, ISOPROPANOL, GLYCEROL AND PROPYLENE GLYCOL

Exilva can be mixed with common alcohols up to 10% without losing the viscosity effect of Exilva.

When the partial amount of the solvent is increased above that, some solvents start to cause aggregation of the fibers, leading to lower viscosity. Exilva tolerates ethanol up to 50 w-%. Even 90% of ethanol can be added without phase separation, but the viscosity is clearly lower as the concentration of the solvent increases.

Glycols are hydrogen bonding solvents which have strong interactions with cellulose. When these solvents are mixed with Exilva they will strengthen the fiber network, leading to higher viscosity compared to Exilva/water suspensions. In case of glycerol and propylene glycol, the viscosity increase is significant.

BROOKFIELD VISCOSITY

Brookfield viscosity values of 10wt% Exilva F 01-V (1 wt% fibrils) with different solvents at different concentrations.

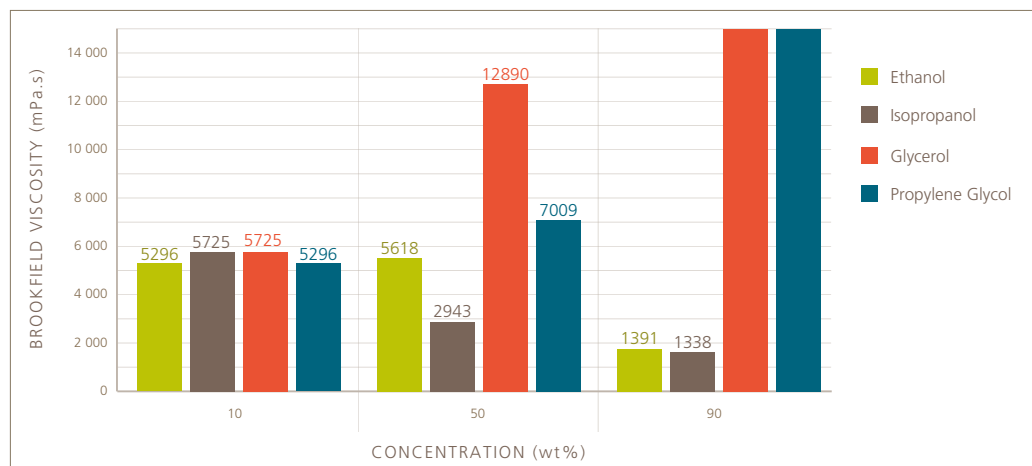


FIGURE 1: Brookfield viscosity of Exilva in different solvents (Alcohols, Glycols).

METHODS

Samples were made from Exilva F 01-V by diluting with corresponding water/solvent mixture, resulting in 1% solid content (sample size 200 g). Water and solvent were first mixed together. Exilva was mixed in using Ultra Turrax (10.000 rpm / 4 min). Brookfield viscosity was measured with a V-73 spindle at 10 rpm after 5 min measurement time.

SUMMARY

- Exilva is dispersible in upto 90% Ethanol, Isopropanol, Glycerol and Propylene Glycol.
- Exilva can be diluted and mixed with several polar organic solvents that are miscible with water. The actual effect of the solvent in a final formulation will depend on other solvents included, compounds, and their dosages.
- All formulations with Exilva are non-transparent and opaque depending on the concentration cellulose fibrils incorporated.
- The structure, texture and viscosity of the formulations containing Exilva are best when using a combination of low concentrations of polar solvents (glycerol or propylene glycol) with high concentration of the alcohols.

ADVANTAGES FROM EXILVA

- allows spraying and non-dripping of thick and thin formulations
- is non sticky and will reduce tackiness of products
- provides nice moisturizing feel.
- is a Biobased material that will reduce the carbon footprint of end products.

KEY POINTS

- ✓ High shear disperse the Exilva paste in the most polar phase of the formulation.
- ✓ Very slowly add the Ethanol to the Exilva dispersion while under stirring.