

## HOW TO INTRODUCE EXILVA

# CHOOSE THE CORRECT WAY TO DISPERSE EXILVA FOR YOUR NEEDS

Exilva microfibrillated cellulose products are water suspended, non-soluble, microfibers used in several application areas from cosmetics to paints and adhesives. Exilva microfibers form flexible aggregates with a high surface area allowing efficient interactions with the surroundings. When fully dispersed, Exilva possesses unique functionality as structured, thixotropic gel systems that are very dependent on the shear applied.

The concentration of the Exilva product influences the techniques chosen to prepare the suspensions.

In general, high shear mixing should be used whenever possible. The 2% gel can be dispersed with lower shear into the formulation, whereas the 10% paste always requires the use of high shear. High shear means the use of a stator-rotor homogenizer (e.g., Ultra Turrax, Silverson) and low shear high stirring speed propeller or blade mixer.

PROPER DISPERSION OF EXILVA IS **CRITICAL** IN ORDER TO OBTAIN FULL FUNCTIONALITY

### FACTORS FOR GOOD DISPERSION

Dispersion times depend highly on the scale and the equipment used, as well as on the composition of your formulation. The following examples demonstrate the performance of different dispersion equipment for different Exilva grades in water at lab scale. You should always evaluate your own system to ensure proper dispersion of Exilva.

Dispersion equipment	Speed (rpm)	Batch size (liter)	Dispersion time (min)	Grade	
				2%	10%
Ultra Turrax	10 000	0.2	4	✓	✓
Dispermat Dissolver	2 000	0.25	10	✓	✓
Overhead stirrer (3 blades)	750	0.2	30	✓	

### EVALUATION OF THE DISPERSION

- Visible lumps or aggregates are a clear indicative of an undispersed material. Also immediate sedimentation or phase separation might indicate insufficient dispersion. Correctly dispersed material will show efficient thickening effect with a smooth appearance.
- If you suspect that the dispersion is not optimal, you can test increasing the stirring speed and/or time and follow the viscosity. If the viscosity continues to increase, the original mixing was not sufficient.



### DISPERSION TO LIQUIDS

It is recommended to disperse Exilva in water phase early in the processing step. Stepwise dilution is recommended in the 10% paste. When water is not readily available, Exilva can be also dispersed in polar organic solvents, such as glycols, glycerol and diluted alcohols (up to 50 w-% alcohol). Please remember to adjust for the water Exilva contains. Note that hydrogen bonding solvents tend boost the viscosity of Exilva whereas more hydrophobic solvents may lower the viscosity.



### DISPERSION TO HIGH SURFACTANT CONTENT SYSTEMS

Avoid foam formation during dispersion of Exilva into surfactants, since this might cause phase separation. Use closed inline mixing systems, whenever possible. In the case of open system, use low shear and longer mixing times or defoamers.



### DISPERSION DURING GRINDING STEP

Exilva can be added during grinding phase of pigments or other solid materials.

## MULTIFUNCTIONALITY WITH EXILVA

- Improves rheology
  - Strong thickening and shear thinning
  - Readily activated with no hydration time required
  - Fast viscosity recovery and excellent anti-sag properties
  - Reduction or replacement of the rheology additive
- Improves anti-settling of particles
  - Replacement of thickener
- Control of transmission/reflection of light
  - Reduce the amount of mattifying agent
- High water holding capacity
  - Prevent cracking at low temperature film formation
  - Reduce the amount of coalescence agent
  - Reduce or replace the open-timer agent
- Emulsion stabilizer
  - Reduce the amount of surfactant
- Increases formulation efficiency
  - Multifunctional qualities reduce cost of formulation

Watch our dispersion how-to video on  
<http://hubs.ly/H06N87P0>  
or by scanning this code:



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