



## Bio-based dispersion

### Current situation

Dispersion and latexes are used in several applications, such as paper coating colours, paints, adhesives, and as coatings in paper, metal and pharmaceutical industry. Dispersions are based on materials derived from crude oil making the final products non-biodegradable or difficult to recycle. Common commercial latex products are water emulsions of styrene – butadiene, acrylate, vinyl acetate or combinations of these polymers. If these latex products were prepared from natural or biodegradable polymers environmental load could be decreased, e.g. packaging products could be composted and harmful chemicals could be avoided.

### Invention

Biopolymer dispersions are water dispersions of hydrophobic starch derivatives with high solid content. The properties can be varied over wide range by changing starch derivative, molecular weight of the polymer, solid content, plasticizers and additives. Dispersion technique is suitable also for other biopolymers. Blade or roll coating or aerosol spreading can be used in applying dispersions making them suitable for various processes.

Dispersion improves the barrier properties of paper and board clearly. Technique is well applicable to normal processes used in paper manufacturing. In cases where reasonable barrier properties are targeted an off-machine coating, extrusion coating can be avoided.

### Two patent families:

WO 98/29477 (FI, US, EP –patents)  
WO 04/029097 (FI –patent, applications EP, US, CA)

### Solution

VTT can offer a wide range of:

#### Water dispersions of starch derivatives

- adjustable properties: solid content up to 60%, viscosity from 350 to 35000 cP at 50% solids
- good adhesion on various surfaces
- good film forming
- improved water resistance with low coat weight
- improved oil resistance with low coat weight
- compatible with various chemicals
- biodegradable and compostable formulations



### Why partner with VTT?

#### 10 reasons for technology partnering with VTT

1. Key factor in Finland's success story with a track record to prove it
2. Licensing and co-venturing opportunities
3. Portfolio of more than 1,000 patents and inventions
4. New business and product concepts based on strong IP and world class research
5. Combined experience of more than 2,000 motivated researchers in eight focused areas of technology
6. Active member in hundreds of scientific & business communities
7. Excellent track record as coordinator and partner in EU projects
8. Collaboration with TOP 50 R&D companies in Finland
9. Global R&D partnership with 50 Fortune 500 companies
10. Market driven multi-disciplinary solutions

### Applications

- paper and board coating
- primer use
- binders for pigments
- adhesives for board packages
- controlled release coatings for active ingredients such as pharmaceuticals

Patented technologies (US 5,780,568, EP 0950074, WO 03/068884, WO 03/068823, WO 04/029097, WO 04/037864).

### Additional information

VTT Technical Research Centre of Finland  
Inka Orko, Business Development Manager  
Tel: +358 20 722 6630, inka.orko@vtt.fi  
P.O. Box 1000, FI-02044 VTT, Finland