



## Method in production of starch pigments and applications on paper coatings

### CURRENT SITUATION

In paper making the use of mineral fillers has been continuously increasing. Mineral fillers are cheaper than wood fibres and they give paper opacity, brightness and better printability. However, when 1000 kg of this kind of paper is recycled, 50-80 kg of inorganic sludge is formed. There is a growing need for a method to manufacture organic fillers and pigments to replace mineral materials in paper production. Assuming fillers and pigments were organic and they could be combusted, 8 million tons of fuel oil could be replaced by them in energy production. Renewable starch-based pigments are lightweight, less harmful for wood fibres, less abrasive for paper machine components (wires, cutters etc.) and environmentally friendly.

### INVENTION

VTT has developed and patented a novel synthesis and processing technology for starch-based pigments. The developed method enables manufacture of nanoscale pigments or stabilized porous filler structures of renewable materials to be used in paper converting instead of mineral materials. The approach is based on ideas well known in starch processing, manufacturing of chemicals and pigments.

The technology is now being verified in industrial pilot scale both in manufacturing and application sites.

VTT produces research services that enhance international competitiveness of companies, society and other customers at all stages of their innovation process, and thereby creates the prerequisites for growth, employment and wellbeing.

VTT promotes the realisation of innovative solutions and new businesses by foreseeing the future needs of its customers already in strategic research.

With its 2,700 employees, VTT is the largest research organization in Northern Europe. VTT's Ventures operation creates profitable and growing technology and wellbeing as well as more effective use of VTT produced Intellectual Property Rights.

## SOLUTION BENEFITS

- Stable raw material like plastics – production starts from dissolving starch acetate, precipitation with water (particle size definition), evaporation, filtration, washing and finally drying.
- Improved surface properties (gloss, smoothness, brightness), improved surface strength, improved offset printability (print gloss, density, dot size)
- Adhesion promotion as coated surface in extrusion coating
- Novel, clean and effective production technology
- Easy adaptation into current products
- Easy way to add new functional groups into starch backbone
- New business prospects with old customers and opening of totally new customerships.

## APPLICATIONS AND CUSTOMERS

### Application areas:

- Paper coatings
- Paper board coatings
- Extrusion coated paper / Paper board
- Mineral pigment replacement – new functional properties

### Potential customers in early phase:

- Current pigment manufacturers
- Current paper mineral manufacturers
- Chemical companies for paper converting
- Paper and board manufacturers

VTT is looking for a partner to produce pigments and provide application support for different end users.

VTT is also seeking industrial partners who are interested to apply this pigment derivative for their products either by replacing old technology or for totally new applications.

Starch based pigments are available from VTT for R&D purposes.



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