

Water absorbing UV-cured coatings

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Summary

- ▶ Introduction of ChemStream
- ▶ Super absorbing polymers (SAP's)
- ▶ ChemStream's concept: UV-cured SAP coatings
- ▶ The UV-curing process
- ▶ Applications
- ▶ **EcoBlock** product line...
- ▶ Thanks to...

Introduction of ChemStream

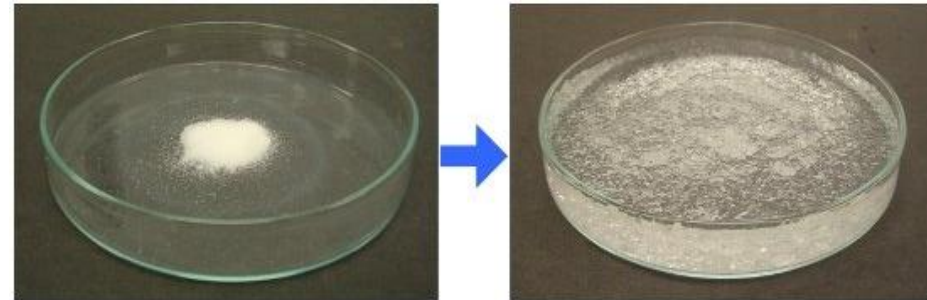
ChemStream:

- Is an **independent experienced research company** in designing, developing, prototyping and up-scaling of **dispersions, coatings, (inkjet) inks and functional fluids**.
- Has a R&D core team (PhD's) with **more than 20 years of experience** in application driven material and technology development.
- Aims to be **a dynamic partner** to introduce innovative and sustainable chemical formulations or technologies within industrial applications.



Super absorbing polymers (SAP's)

- Are very **hydrophilic**
- **Absorb water** in high quantities
- Are called 'hydrogels'
- Are used in diapers and sanitary napkins
- Are co-polymers, mainly made from acrylic acid and acrylamide
- **Differ by variation of monomer composition and final macromolecular network**
- Are usually produced and sold as **particles/powders**
- Are thus **incorporated into chemical formulations** in order to be applied



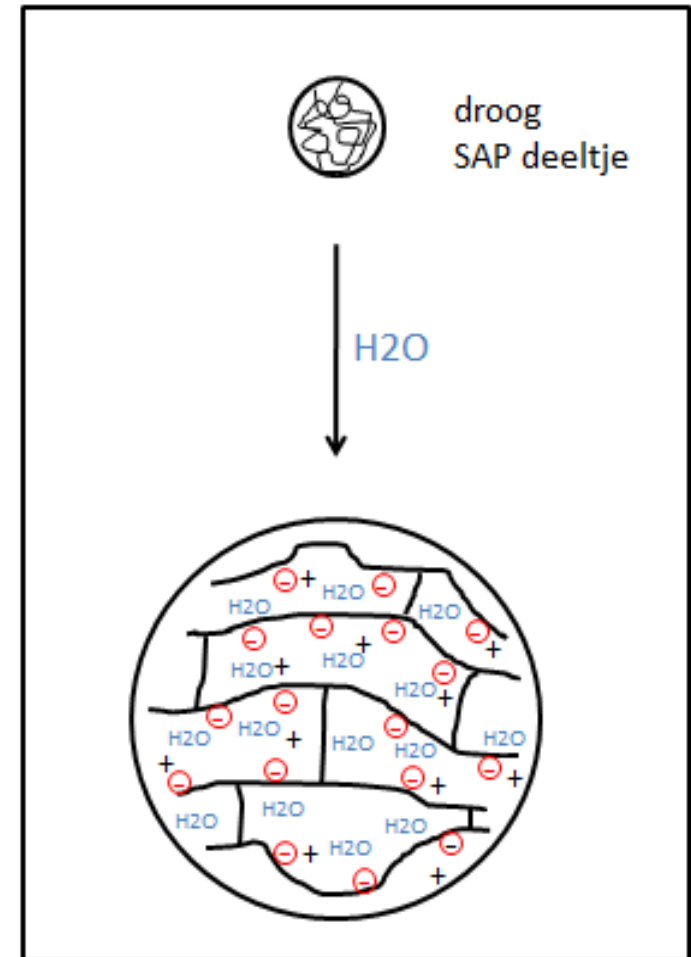
Super absorbing polymers (SAP's)

Chemically, SAP's are:

- Co-polymers consisting of building blocks that are **anionic reactive monomers and their salts**
- **Weakly cross-linked** to generate a non-soluble but swellable network in water
- Synthesized in a one-pot reactor, generating particles/powder

The swelling process is:

mainly based on the **osmotic pressure buildup** within the hydrogel structure, leading to the **diffusion of water** into the network.



ChemStream's concept: UV-cured SAP coatings

Incorporation of SAP powders can be difficult:

- In aqueous based formulations
(=> instant swelling of the beads)
- Because of dust formation in the production plant

EcoBlock

Therefore ChemStream developed a UV-cured water-absorbing coating that is applied by coating + UV-curing. This coating swells in contact with water.

Patent has been filed

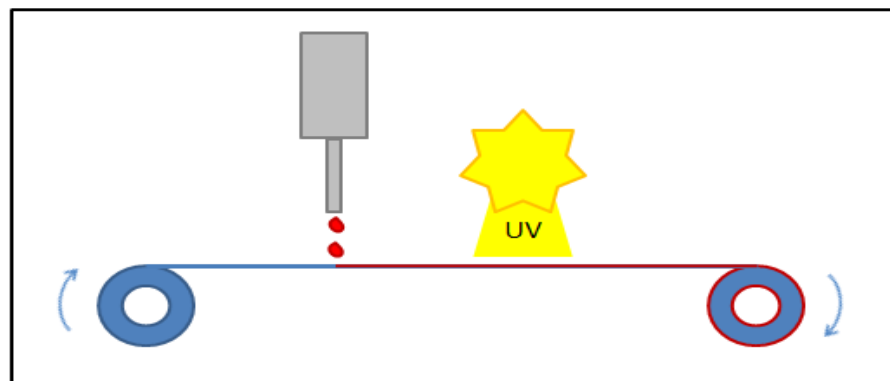


The UV-curing process

The SAP-precursor formulation gets polymerized on a substrate by the use of UV-curing technology.

This process needs:

- a transport system
- an application system
- a UV-curing system
- (a drying unit)



The SAP-precursor formulation contains:

- Monomers
- Cross-linker
- Fotoinitiating system
- (solvent)
- (additives)

This proces can be:

- In-line
- Fast
- Flexible
- Clean
- Energy saving

Applications

Water-absorbing UV-cured coatings can be used for:

- Their water blocking properties
- The delayed release of an incorporated ingredient

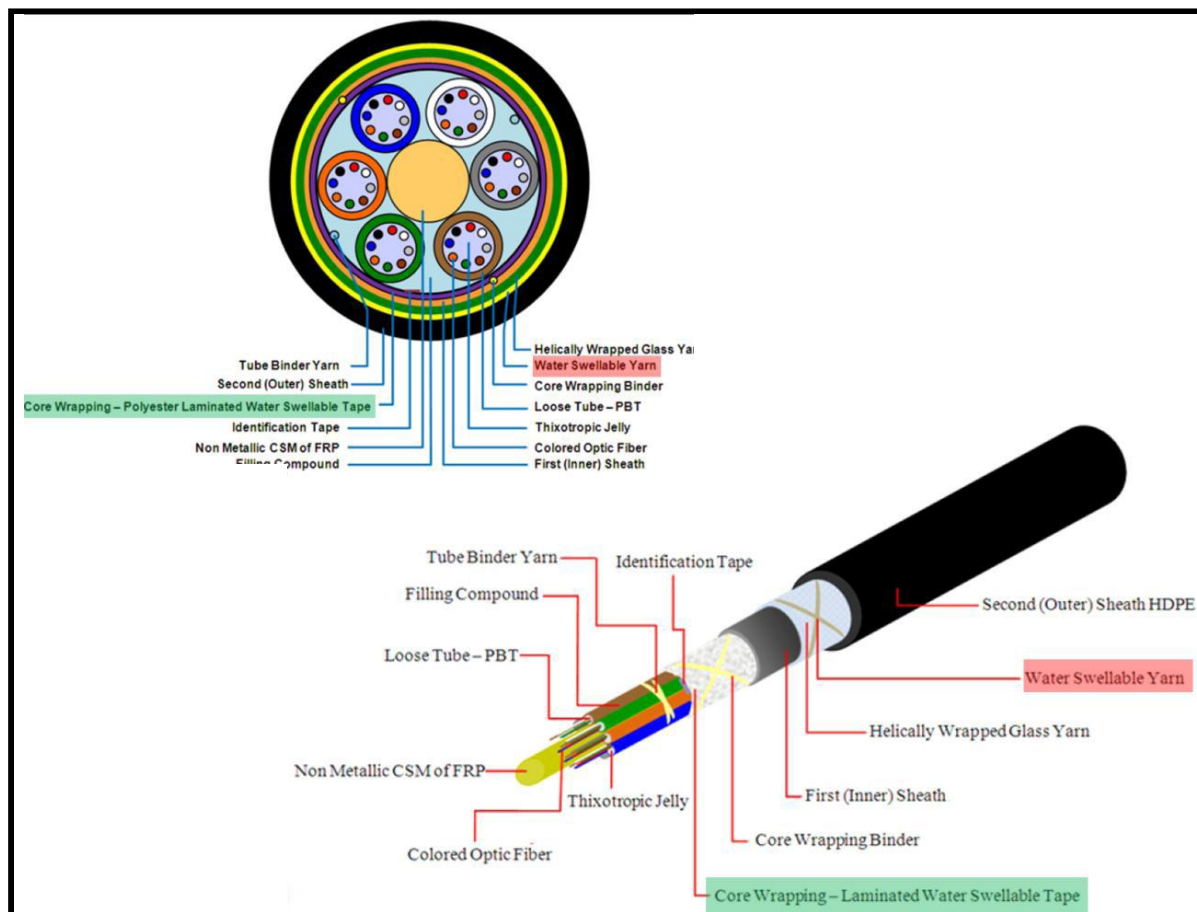
In:

- the agricultural sector
- construction
- hygienic applications
- medical world
- telecommunication
- etc.



Applications

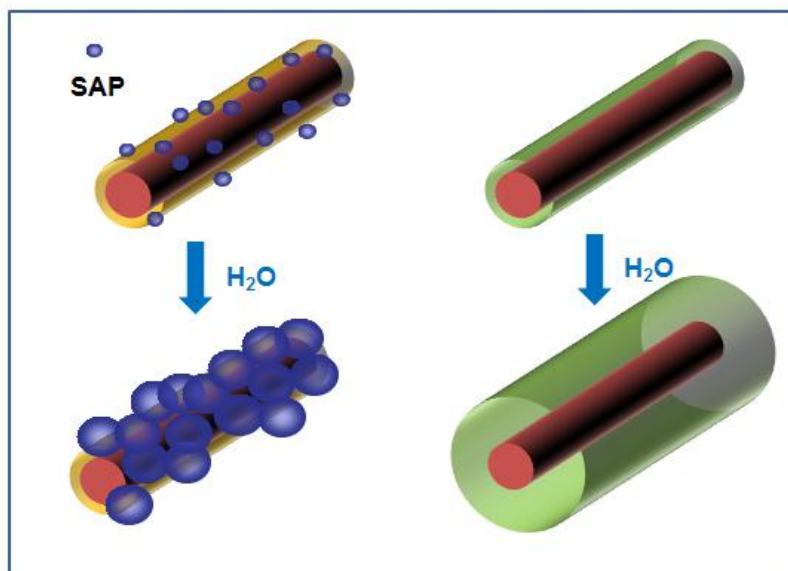
Example: Water-absorbing yarns in opticle cables



Applications

Example: Water-absorbing yarns in opticle cables

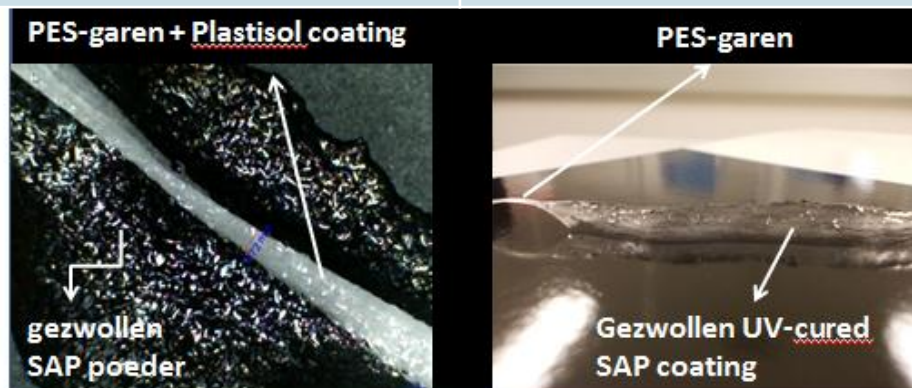
	Common situation	New situation
Buildup	Yarn + coating	Yarn + coating
Coating =	Plastisol + SAP powder	water absorbing UV-cured coating



Applications

Example: Water-absorbing yarns in opticle cables

	Common situation	New situation
Buildup	Yarn + coating	Yarn + coating
Coating	Plastisol + SAP powder	water absorbing UV-cured coating
Pro's & Con's	<ul style="list-style-type: none"> • Dust in production plant • Low efficiency in water take-up • Swollen particles detach from yarn after swelling • Fast swelling of the particles 	<ul style="list-style-type: none"> • No dust in production plant • High efficiency in water take-up • Preserved coating shape after swelling • Slower swelling of the coating



EcoBlock product line...

means that ChemStream can:

- PROVIDE YOU WITH WATER-ABSORBING UV-CURED COATINGS FOR YOUR APPLICATIONS
- TWEAK & TURN THE FORMULATIONS TO YOUR SPECIFIC REQUIREMENTS
- ASSIST YOU WITH FEASIBILITY TESTING, TRIAL SETUPS AND WITH THE IMPLEMENTATION INTO YOUR INDUSTRIAL PROCESS
- BE A DYNAMIC PARTNER IN YOUR INNOVATIONS

Thanks to...



Our partners in the consortium



Funded Crosstexnet project

