

Inorganic paper finishing based on geopolymers

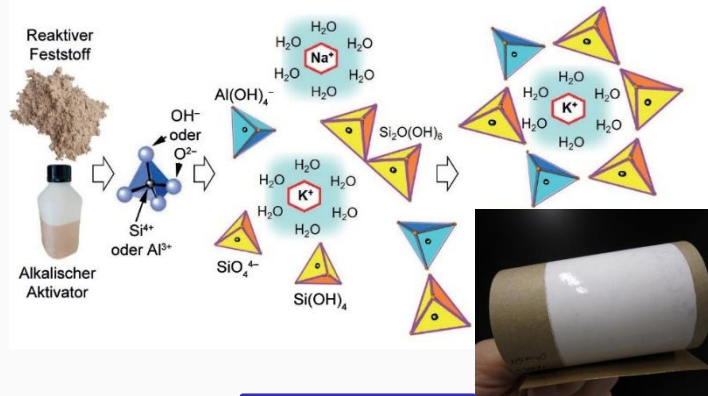
Novel coating technology for paper-based materials

STATUS QUO

[Paper and packaging materials are currently predominantly enhanced with polymer-based coatings to achieve functional surfaces. However, these conventional coatings are often unsustainable, difficult to recycle, and based on petrochemical resources. They also reach their limits when exposed to extreme mechanical or thermal demands. From the user's perspective, there is a growing need for environmentally friendly, high-performance alternatives that can be efficiently integrated into existing production processes.

OUR TECHNOLOGY

The developed geopolymer coating offers a sustainable, purely mineral-based alternative to conventional coatings, while meeting high standards for strength, temperature resistance, and printability. It can be produced in a resource-efficient manner, applied to paper materials using roll-to-roll processes, and is fully recyclable according to CEPI standards



BENEFITS

- Sustainable paper finishing without plastics
- Thin-layer applicable in roll-to-roll processes
- Flexible, mechanically robust, and printable

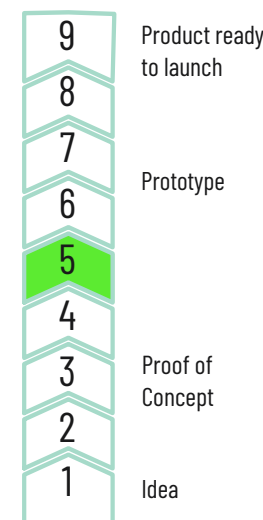
APPLICATION POSSIBILITIES

The technology is particularly suitable for paper-based packaging, technical specialty papers, as well as fiber-based lightweight and construction materials. It opens up new areas of application where previous coatings encounter limitations due to environmental regulations or functional boundaries.

COMMERCIALIZATION OPPORTUNITIES

There are various possibilities for cooperation between the industrial partner and TU Darmstadt: from an exchange with the know-how carriers of the technology up to a close cooperation in case of further development needs. The technology is protected by intellectual property rights and can be used by the industry partner after a sale or licensing agreement.

CURRENT STAGE OF DEVELOPMENT TECHNOLOGY READINESS LEVEL (TRL)



The technology development is at Level 5:

The technology has been successfully tested on a pilot scale using a roll-to-roll process and is protected by a German patent (DE 10 2022 127 915 A1); current efforts focus on scaling up and optimizing the system for industrial applications.

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