

+ SELF-HEALING POLYMER MATERIALS

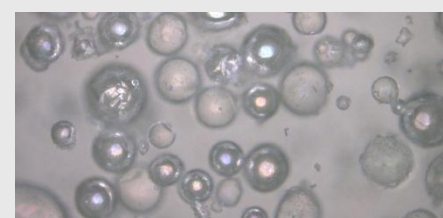
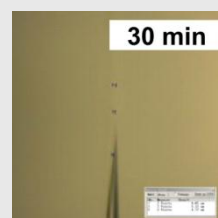
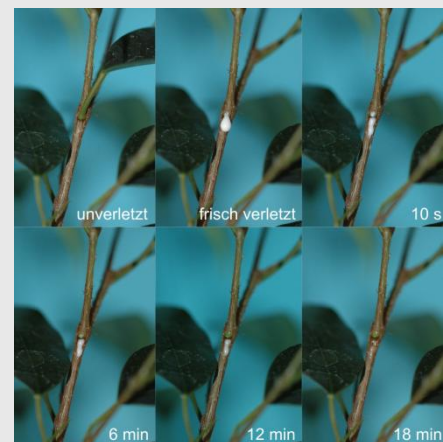
OSIRIS

On the basis of a technical problem (fatigue fractures in elastomers for sealings and vibration dampers), suitable role models of biological self-healing materials are selected and their function principles are translated into technical applications.

Polymers are often used in fields of application with high mechanical loads. Thereby, micro-cracks, which can exist in every component, may grow up to overcritical lengths when exposed to cyclic loading, become instable and abruptly lead to failure of the component. Healing or hardening of these micro-cracks may inhibit or at least decelerate crack expansion. A smart approach is to equip these components with intrinsic self-healing capabilities. The aim of the project OSIRIS is to develop biomimetic self-healing concepts for elastomers and corresponding prototypal sealings and vibration dampers.

Plant secretions, for example the latex of the Weeping Fig (*Ficus benjamina*) as well as their transport and storage tissue, are used as biological role models. Upon injury of the plant, these secretions deplete, coagulate and hence seal the wound.

The transferred technical self-healing system is suitable for an autonomous self-repair of micro-cracks concerning its scaling, geometry and kinetics without altering other polymer properties. The storage and transport system of the component will be established based on micro capsules, micro tubes, hollow glass fibres or solid emulsions.



R & D Partner

Prof. Dr. Thomas Speck & Dipl. Biol. Georg Bauer

Plant Biomechanics Group, University of Freiburg

Prof. Dr. Rolf Mühlhaupt, Dipl. Chem. Andreas Schüssele & Dipl. Chem. Oliver Carstensen

Fraunhofer Materials Research Center FMF

IWF Ingenieurbüro

Gummi- und Kunststofftechnik GmbH (GKT)

Project coordination & Contact

Dr. rer. nat. Anke Nellesen, Dipl.-Wirt.-Chem. Max von Tapavicza, Dipl.-Ing. Jürgen Bertling

Fraunhofer UMSICHT
 Business Unit 'Advanced Materials'
 Osterfelder Strasse 3
 D-46047 Oberhausen

P: +49 (0) 208 / 8598 - 1147
 E: anke.nellesen@umsicht.fraunhofer.de

More information on the internet

www.kompetenznetz-biomimetik.de
<http://www.bionische-innovationen.de/#verbundvorhaben/osiris.html>



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