HAUTE INNOVATION
MATERIAL AND TECHNOLOGY

Sustainable Material Design for Automotive Interiors

automotive interiors EXPO 2012, Stuttgart

Dr. Sascha Peters
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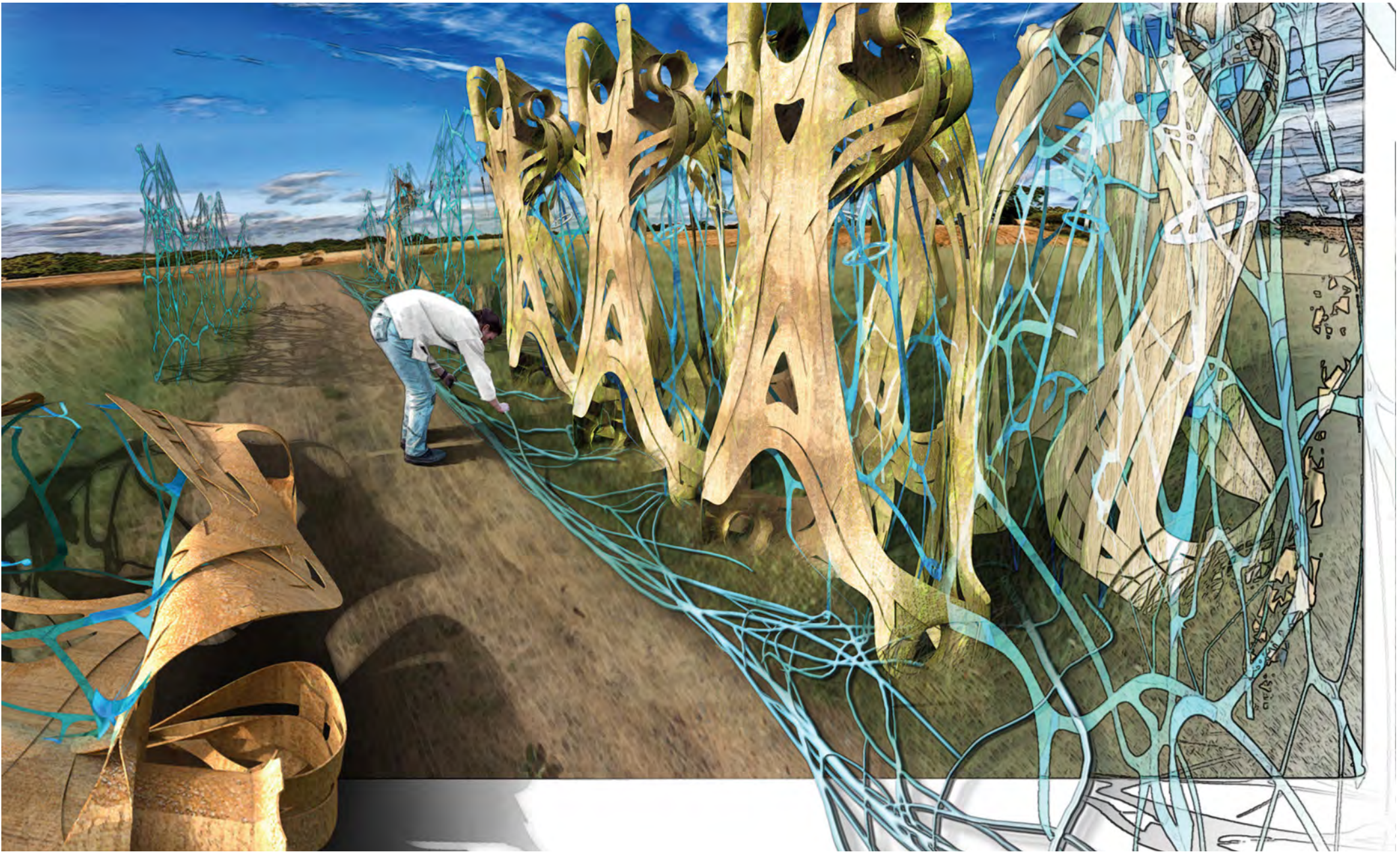
In 2033 car producers will use more natural material ...

Mercedes Racy with a wooden body (2006)

... they will plant parts on the field ...

Nissan concept car „Locally Grown“ (2010)



... that can clean the air...

GMC Hummer transforms CO_2 into oxygen

... consist of textile fabrics ...

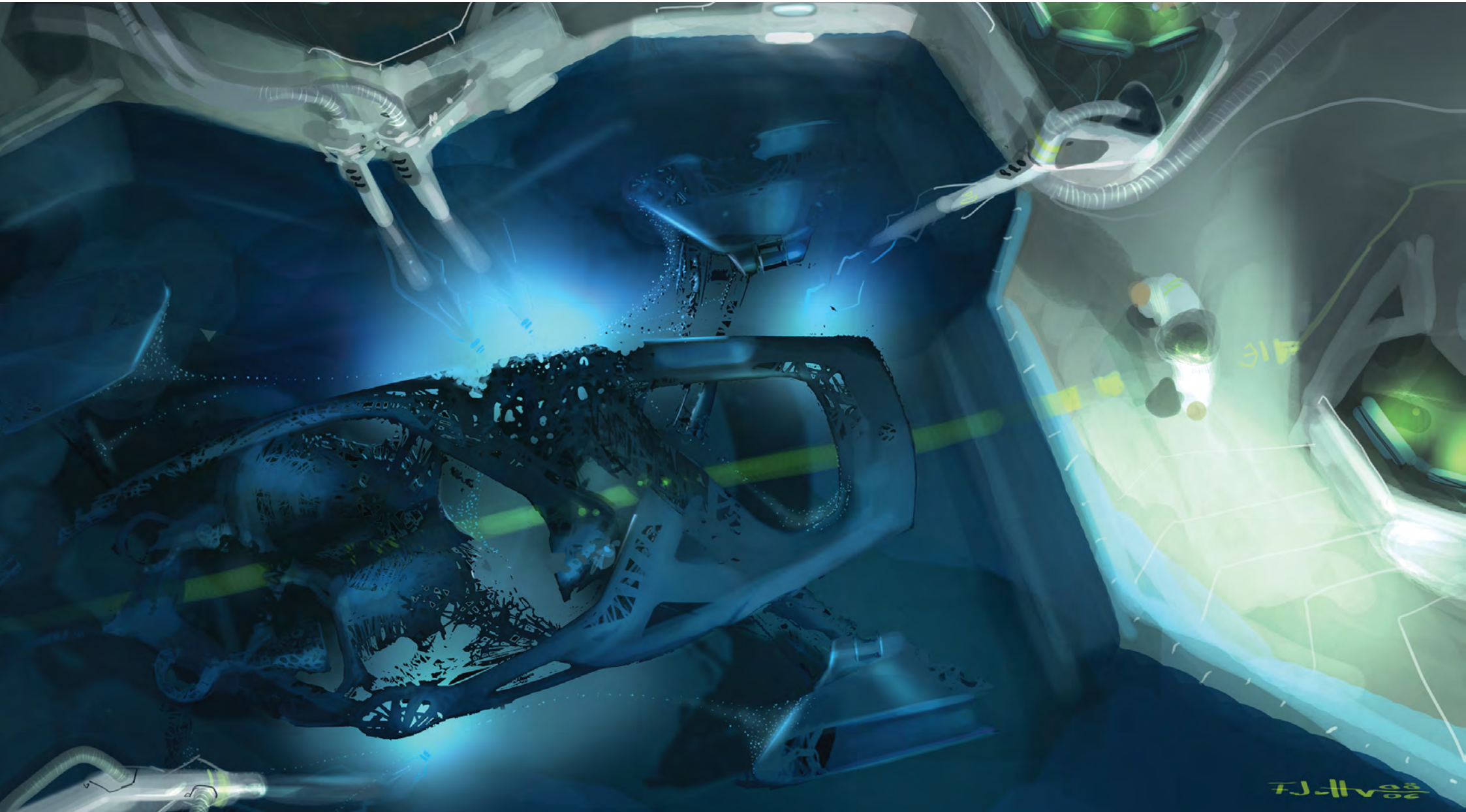
BMW GINA (2008)

... will be produced within a generative process...

screwdrivers race HAWK (2010)

... or will be assembled by robots.

VW Nanospdyer, LA Design Challenge (2006)



Cars 2033 will be strong and flexible at the same time...

lightweight structures of spider silk proteins, Nissan Design (2010)

... change shape according to the wind temperature ...

shape memory materials for car bodies

Source: Sam Holgate

... and adapt to the digital generation!

EDAG Light Car with OLED Screens (2009)

4 Trends

BIOLOGICAL, EFFICIENT, SMART, ENERGETIC

1. The organic trend changes from the supermarket in the industrial production.

2. The resource efficiency reaches a higher importance than today.

3. Materials and surfaces will receive additional qualities in addition to their mechanical functions.

4. Surfaces are a new source of energy functions.

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Reinforced plastics with natural fibers

WPC in interior design (Johnson Controls)

Barktex

Fibers of a tree (Barkcloth)

Reinforced plastics with bark fibers

laminats made by bark (Barkcloth)

Banana fibres for flooring

BananaPlac (Barkcloth)

New sources of raw material

textiles from the skin of the cow stomach (Mandy den Elzen)

Maize Cob Board

lightweight with organic waste

Palm Leather

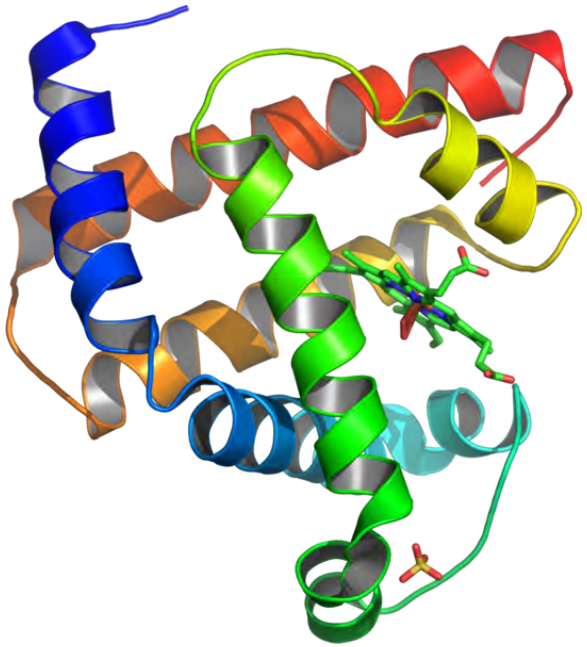
gummy biomaterial with leather-like quality (Tjeerd Veenhoven)

Olives-leather

tanning with olive residues (N-Zyme)

Bio-based Chemistry

polysaccharides, proteins and fats



- Vegetable raw material provide polymers based on polysaccharides. Sugar molecules are long, chain-like compounds: starch, cellulose, chitin
- Animal raw material provide proteins, in which amino acids build up spiral coiled chains. Silk and wool therefore differ fundamentally in the chemical structure of cotton and linen.
- Fats consist of fatty acids and glycerol. Physical properties depend on chain length and frequency of C = C double bonds.

Polymers on base of polysaccharides

PLA (NaturWorks)

Polyethylen on base of sugar cane

Green PE „Terralene“

Milk protein fabrics

organic fibers with antibacterial properties

Polymers on base of vegetable oil

polyamid made of castor oil (Evonik Industries)

Chipboard without synthetical resin

enzym-based lignin-binder

Protein-based binder

FluidSolids

Binder on base of vegetable oil

reaserch project of KIT/TESA

Binder on base of glycerol

human hair as reinforcing material (Thomas Vailly)

Material on base of bakteria

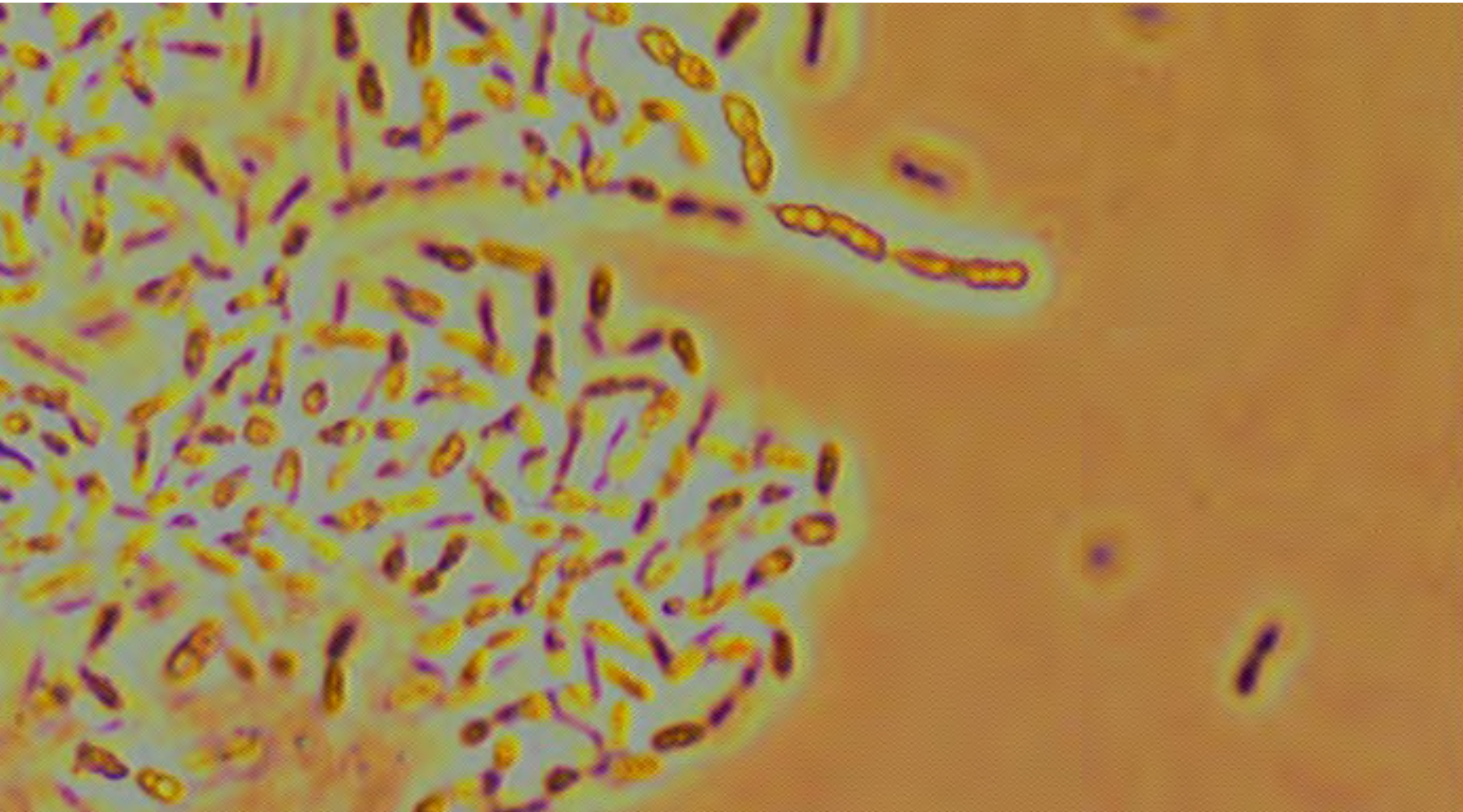
bacterial cellulose (Susan Lee, BioCouture)

Mushroom also produce fibres

foam structures from mycelial fungiaus

Acrylic glass made of sugar

PMMA on base of enzyme (Evonik Industries, Helmholtz Gesellschaft)

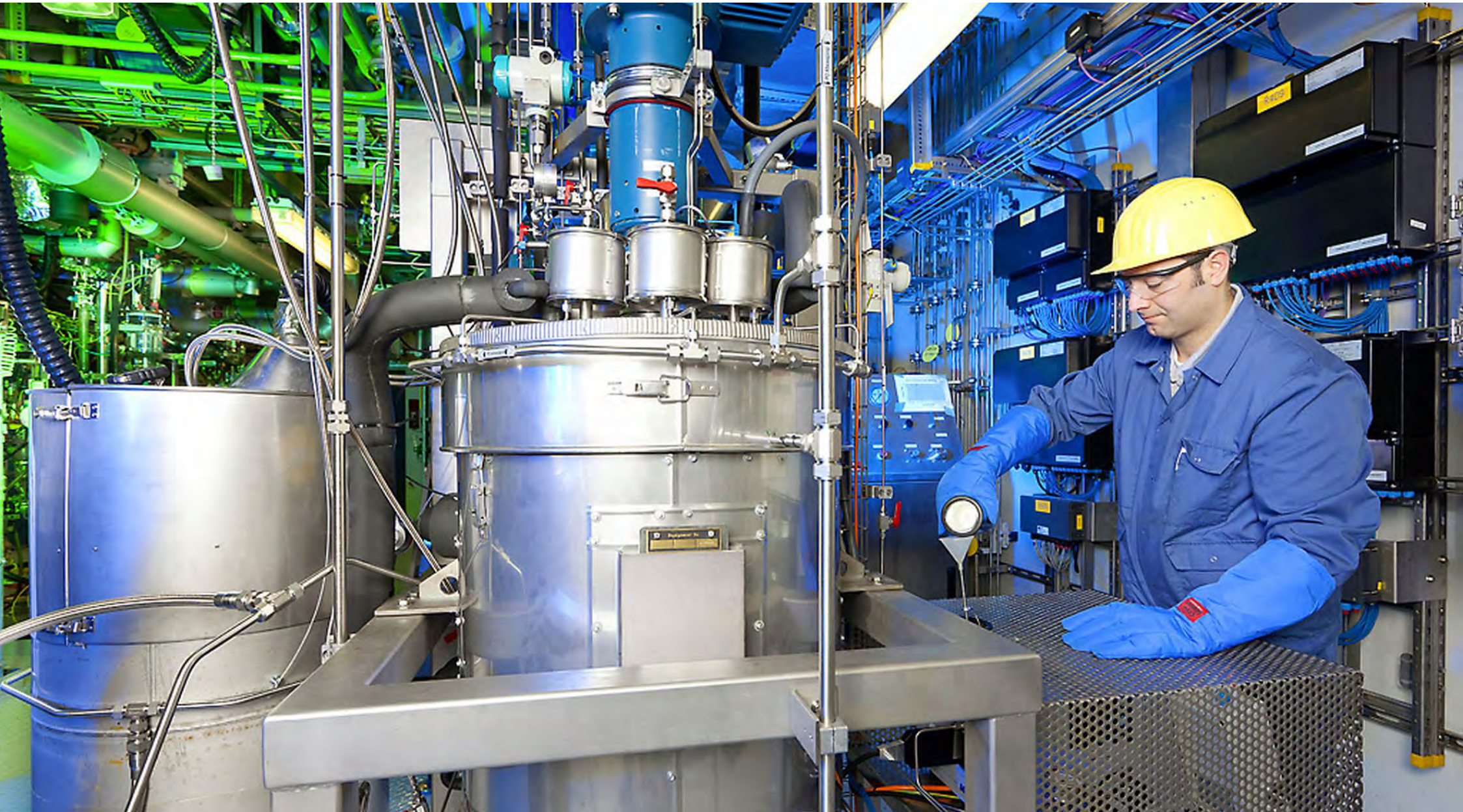


Algae-based foam

Alginsulat (VPZ Graz)

CO_2 Polymers

plastics production with greenhouse gas



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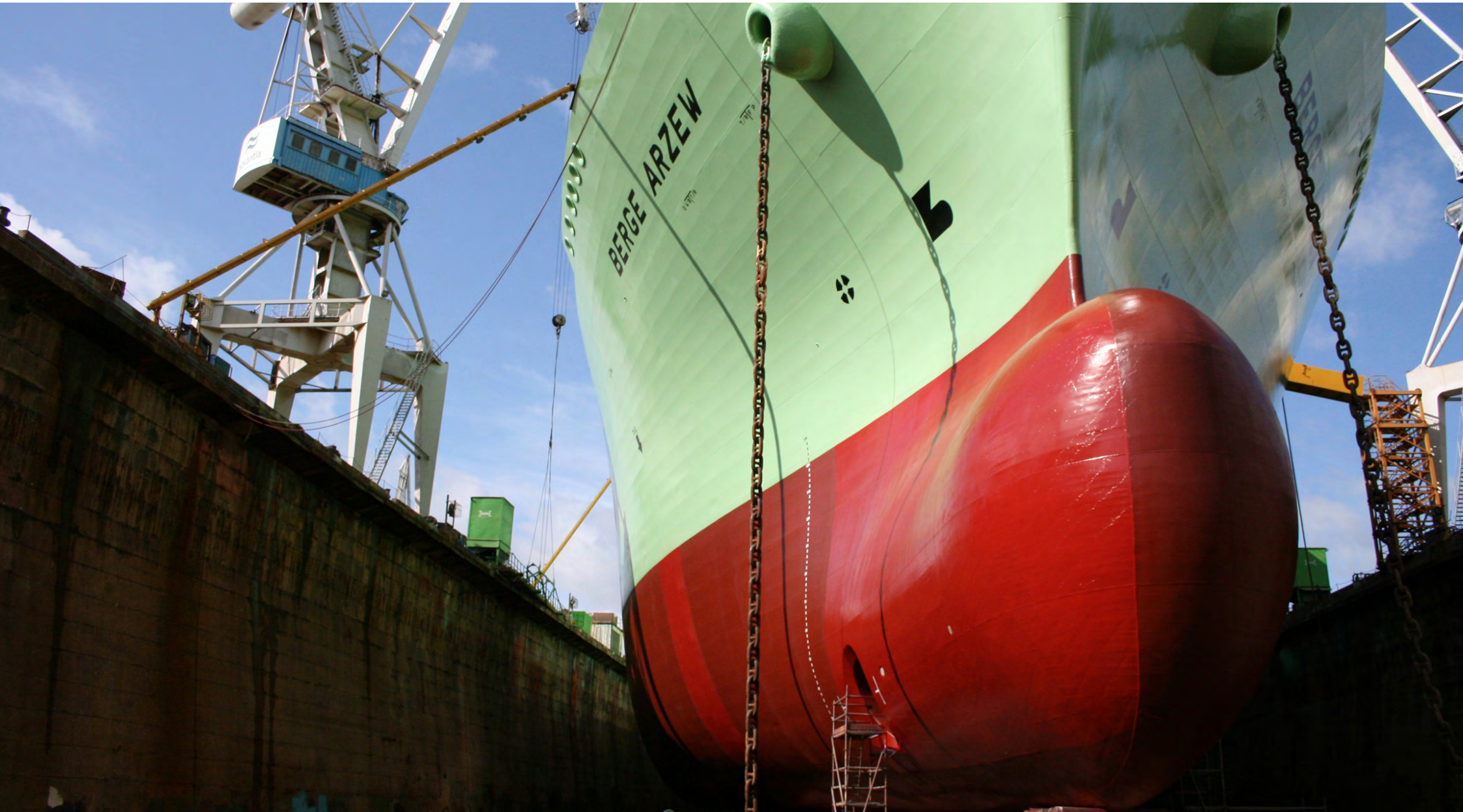
Is the heating still on?

thermosensitive wall-papper

Quelle: **Shi Yuan**

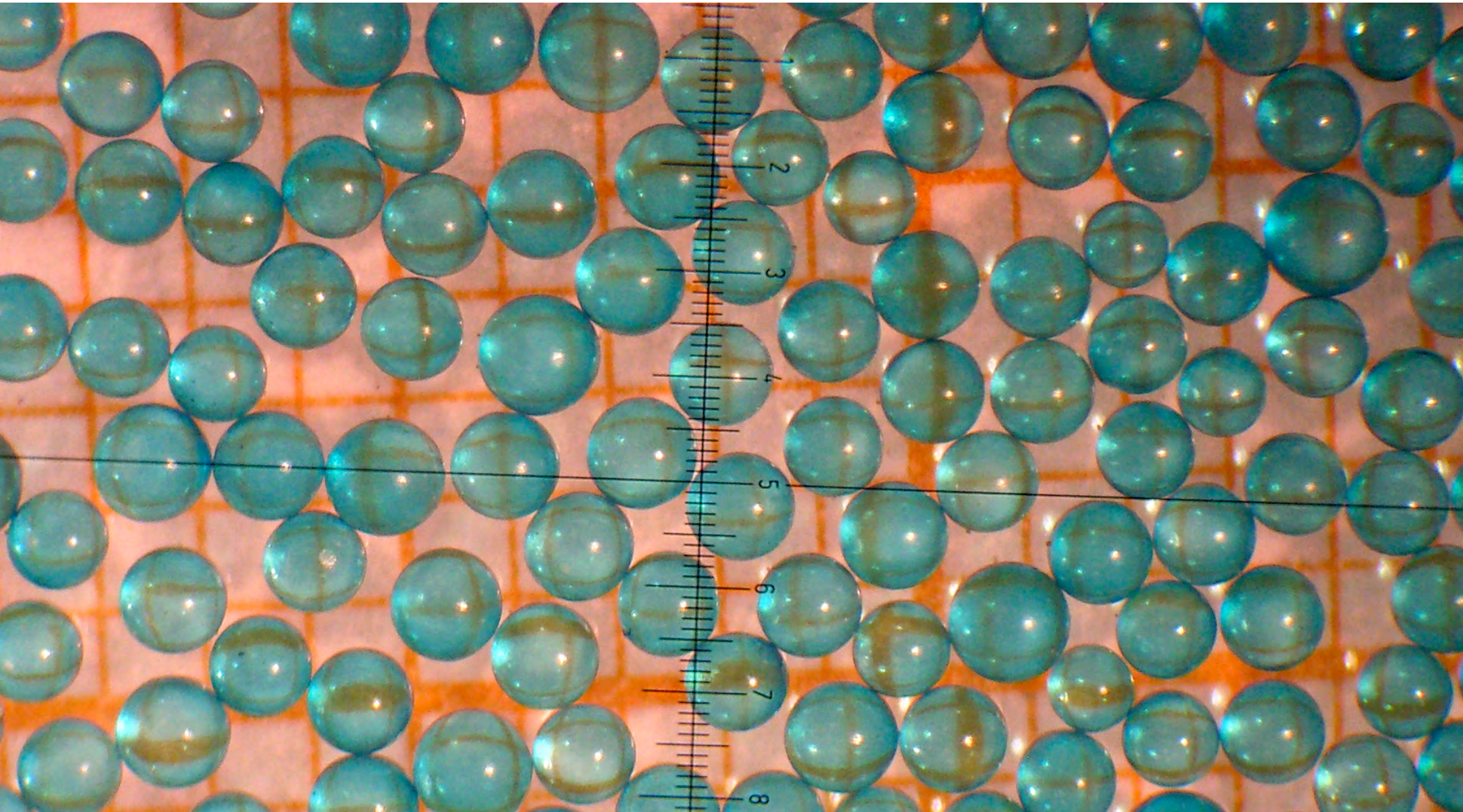
Self-healing surfaces

nano-encapsulated adhesive and coating materials (Bayer MaterialScience)



Fragrance microcapsules

Brace GmbH



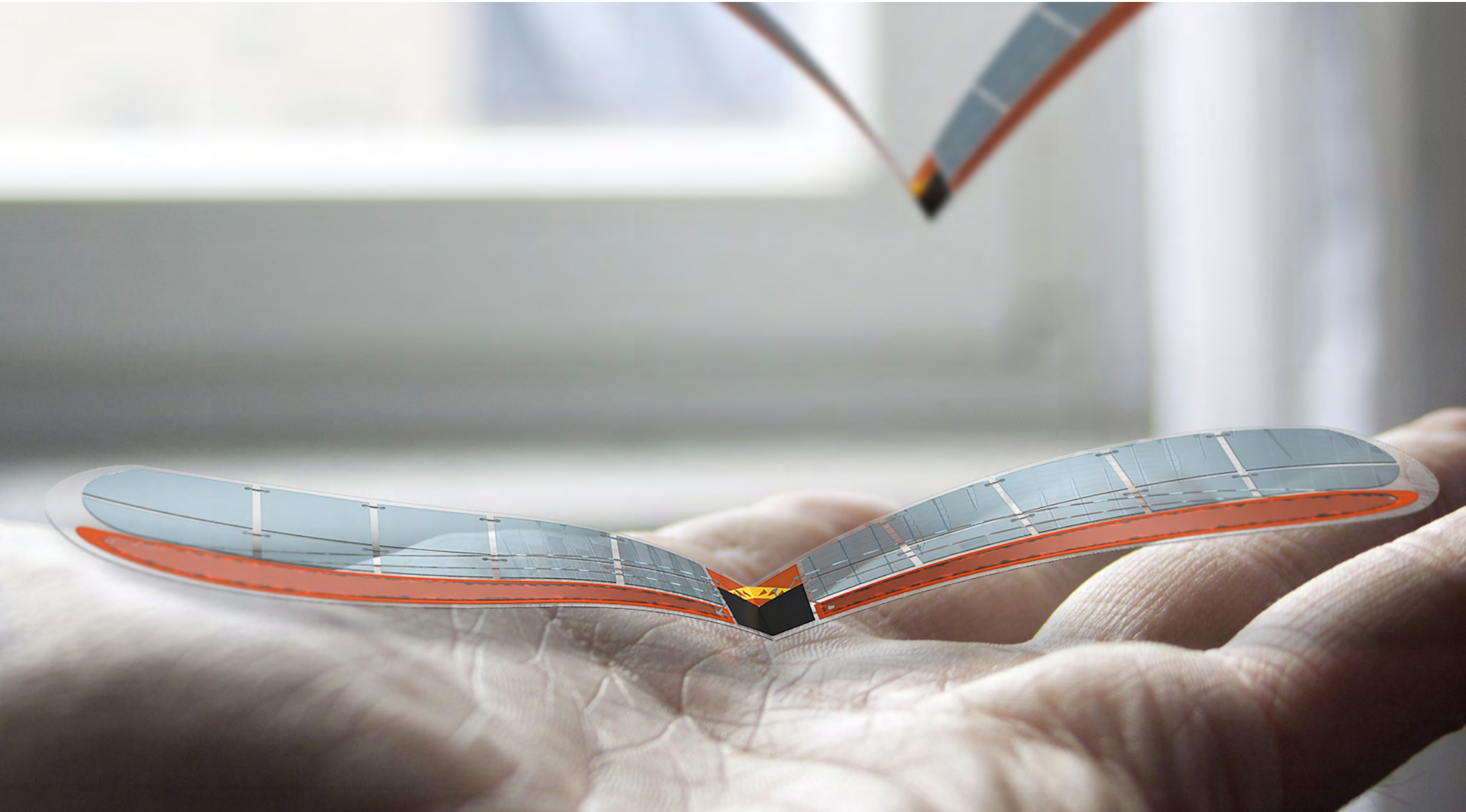
Air cleaning surfaces

nanotitandioxide (Nanogate AG)


TÛRANOR PlanetSolar

Organic dye solar cells

organic inks (LISICON, Merck)



Heating with carbonnanotubes CNT

carbo e-therm (Future Carbon)

Non-iron on holiday

textiles with memory qualities (Corpo Nove)

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DEVELOPMENT

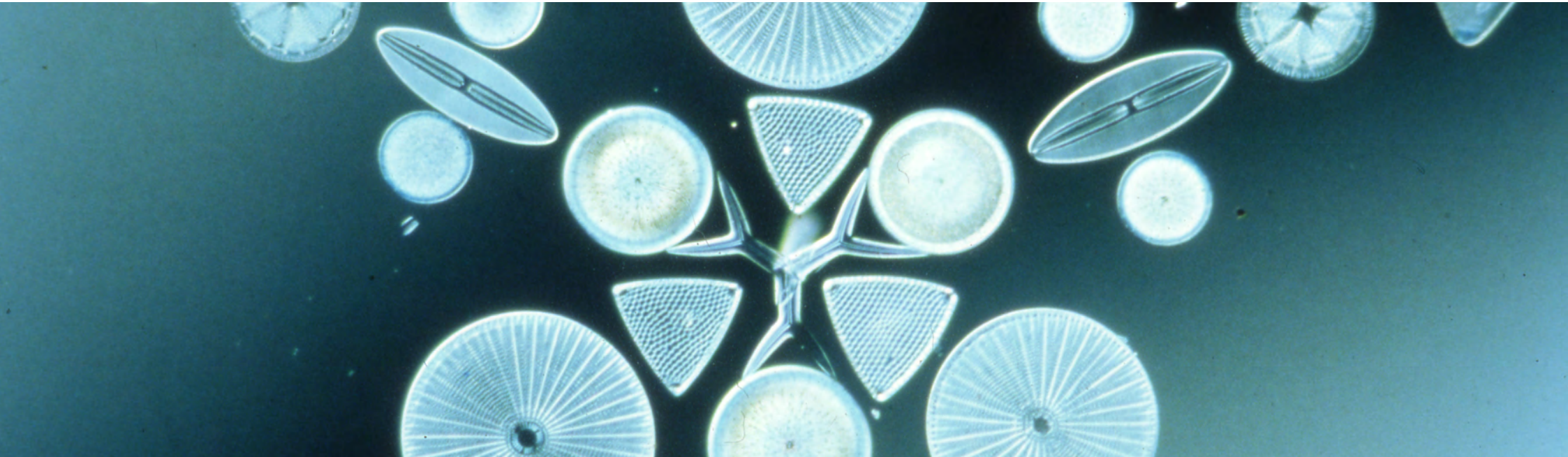
- Product development
- Application scenarios for innovative material
- Innovation-workshop

CONCULTING

- Identification of innovative and sustainable material
- Identification of producers
- Alternative production technologies

COMMUNICATION

- Development of communication media
- Events and conferences
- Publications and speeches



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