

## **Textile Nanotechnology – Facts and Fiction**

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Nanotechnology is one of the key technologies of the 21st century – including for the textile industry. Virtually no other topic has been mentioned so frequently in connection with textile innovations in recent times. The lecture will provide an overview of both existing developments and possible developments for the future:

Ceramic nano-coatings that are applied to a dressing using sol-gel processes give the dressing anti-adhesive properties so the newly formed skin remains on the wound when the dressing is changed. Nano-particles in or on the fibre can provide a textile with antimicrobial functionality or significantly increase its UV protection. Microcapsule or nano-capsule systems that are later applied to the finished textile are suitable for wellness and medical applications. Rubbing during wear causes the incorporated active substances to be released. A fresh finish is achieved using cyclodextrins. These nano-scale repository structures are capable of binding odour molecules by absorbing them and releasing these once again in the next wash. There is still a lot to be learnt from nature. The keyword here is bionics. One initial application is a swimsuit with extremely low flow resistance for top athletes which is modelled on a shark's skin. The principle of self-cleaning modelled on the leaf of a lotus plant and many types of insect has also found its way into textile applications.

In the future, there will be intense textile colour effects which cannot be produced using conventional chemical dyes. This system is taken from a butterfly that achieves its ultrablack colouring using nano-scale "light traps". Carbon nano-tubes will play an essential role in the next few years in relation to high-strength or semi-conductor-like fibres.

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