

# Technical Tuesdays

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## Self Cleaning Textiles - An overview

### How does the Self Cleaning concept came

Nature has already developed an elegant approach that combines chemistry and physics to create super repellent surfaces as well as self cleaning surfaces. **Lotus leaves** is the best example of self cleaning surfaces. The concept of self cleaning textiles is based on the lotus plant whose leaves are well-known for their ability to self-clean by repelling water and dirt.

More recently, botany and nanotechnology have united to explore not only the beauty and cleanliness of the leaf, but also its lack of contamination and bacteria, despite its dwelling in dirty ponds.

Basically, the lotus leaf has two levels of structure affecting this behavior micro-scale bumps and nano-scale hair-like structures coupled with the leaf's waxy chemical composition. **On the basis of lotus leaf concept scientist developed a new concept Self cleaning textile the textile surface which can be cleaned itself without using any laundering action.**

### Need for Selfcleaning textiles -Techno economical Benefit

Now a days people are very busy in their work that they do not have time for clean their daily wear cloths . Also military people have to survive in such drastic condition that they cannot wash their cloths.

### Nanotechnology

Nano technology provides a new concept self cleaning textiles which gives self cleaning as well as fresh cloths every day, this not only technically benefited but techno economically also benefited.

Nanotechnology has real commercial potential for the textile industry. Nanotechnology can provide high durability for fabrics, because nano-particles have a large surface area-to-volume ratio and high surface energy, thus presenting better affinity for fabrics and leading to an increase in durability of the function. In addition, a coating of nano-particles on fabrics will not affect their breath ability or hand feel. Therefore, the interest in using nanotechnologies in the textile industry is increasing.

There are basically two types of self-cleaning surfaces involving nanotechnology.

- 1) Extremely water repellent, microscopically rough surfaces: dirt particles can hardly get a hold on them and are, therefore, removed by rain or by a simple rinse in water .
- 2) By photo-catalytic layers: due to a layer of nanocrystalline titanium oxide, fouling organic material is destroyed by solar irradiation. Self cleaning fabrics not only resist coffee and red wine stains but are also repellent to water, dirt, odour and are antibacterial as well.

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