Superhydrophobic “Lotus Effect” surface coating

Reference No: B73221

CHALLENGE
Superhydrophobic or non-stick coatings are important in many areas of daily life, since they confer water-resistance and protect surfaces from corrosion and friction. In addition, they prevent soiling, allow easier cleaning of e.g. textiles, surfaces and technical components and are thus highly coveted as functional finishing for a broad range of materials. Conventional superhydrophobic surfaces usually rely on dispersions of fluorinated or silicon-containing compounds. Also, special nanostructured surfaces can form the basis for non-stick effects, as in the well-known “lotus effect”. All existing processes have important drawbacks, such as the need for large volumes of toxic and flammable organic solvents and the poor adhesion of the non-stick coating to target surfaces.

INNOVATION
The innovative method, developed at the University of Bayreuth, uses electro-spinning to produce cylindrical, porous nanofibers with an excellent non-stick effect that are spun directly onto the surface of interest. The inventive coating forms a highly porous, breathable three-dimensional network that adheres well to different surfaces. For the innovative green process, polymers are dispersed in watery solution, thereby circumventing the need for organic solvents. Nanofibers are produced by electrospinning and subsequently silanized by dip-coating, followed by a final curing step.

Important advantages of the new method are:
• Superior water-repellent and oil-repellent properties
• Excellent adhesion on different surface materials (metals, glass, …)
• Porous, breathable coating
• No organic solvents: “green” method

COMMERCIAL OPPORTUNITIES
The inventive superhydrophobic surfaces can be applied in various fields:
• Textiles
• Paper production
• Air filtration
• Self-cleaning battery materials
• Surface refinement (construction, automotive, industrial, …)

DEVELOPMENT STATUS
Proof of concept | Ready to use

REFERENCE: