Anti-microbial coatings with a long-term effect for surfaces

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Researchers at the INM – Leibniz Institute for New Materials have now produced antimicrobial abrasion-resistant coatings with both silver and copper colloids with a long-term effect that kill germs reliably and at the same time prevent germs becoming established.

Hygienic conditions and sterile procedures are particularly important in hospitals, kitchens and sanitary facilities, air conditioning and ventilation

systems, in food preparation and in the manufacture of packaging material. In these areas, bacteria and fungi compromise the health of both consumers and patients. Researchers at the INM – Leibniz Institute for New Materials have now produced antimicrobial abrasion-resistant coatings with both silver and copper colloids with a long-term effect that kill germs reliably and at the same time prevent germs becoming established. The coatings are particularly suitable for the application on large and solid surfaces, on doorhandles and for textiles.

The INM from Saarbruecken will be one of the few German research institutions at the TechConnect World trade fair on 16 and 17 June in Washington DC, USA, where it will be presenting this and other results. Working in cooperation with the VDI Association of German Engineers, it will be showcasing its latest developments at Stand 301 in the German Area.

"The new development combines two properties which means the presence of germs and fungi on these surfaces is zero", explains Carsten Becker-Willinger, Head of the Nanomers Program Division. Silver or copper colloids which gradually release germicidal metal ions into the environment are incorporated in the coating. "The metal colloids are only a few nanometers in size, but their particular ratio of size to surface area produces a distinctive long-term effect. The "consumption" of metals to metal ions is then so low that the coating can be effective for several years", says the chemist. The long-term effect will also be increased by the high abrasion resistance.

At the same time, the surface of the coating is anti-adhesive, so neither dead nor fresh germs can adhere to the surface. As a result, the coating primarily counteracts the formation of an extensive biofilm.

The researchers were able to prove the double microbicidal and biofilm-inhibiting action using the standardised ASTM E2 180 test process. The

new material can be applied to a variety of substrates such as plastic, ceramic or metal using conventional techniques such as spraying or dipping, and cures thermally or photochemically. Selective variation of the individual components allows the developers to react to the particular and different needs of potential users.

As part of the EU-sponsored CuVito project, the developers are now looking at increasingly using copper colloids and copper ions as well as silver which they hope will open up other fields of application.

Provided by Leibniz-Institut für Neue Materialien gGmbH