



## Innovative Vacuum Coating Processes

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Permanently antibacterial surfaces are very important especially in healthcare facilities such as hospitals, clinics and specialized care centers. The surfaces of objects such as door knobs, elevator buttons, light switches etc. represent a significant risk for the transfer of bacterial and fungal cultures. It would therefore be helpful if the surfaces of objects in hospitals that are often touched by a number of different people could be given a permanent antibacterial coating. The environmentally friendly, low-cost functional coatings that are produced in SINGULUS TECHNOLOGIES vacuum coating systems minimize the risk of infection by the so-called "hospital superbug" MRSA (methicillin-resistant Staphylococcus aureus) and by E.coli bacteria, as various studies have shown.

For years, silver ions have been used in many areas for these coatings. Thereby, one takes advantage of antiseptic (biocides) effects of nano silver. Silver is a broad-spectrum antibiotic which is even effective against antibiotic-resistant bacteria. The areas of application of nano silver ranges from an artificial hip joint over medical cutlery, wall paint up to coatings in public transport. Currently, tests are running for the use in dental implants. Hereby, silver ions kill pathogens which lead to infections even years after placing a dental implant.

### Alternatives to nano silver

A copper alloy applied in a vacuum is an excellent alternative to the still-widespread use of silver. Copper alloys are unique in that they significantly reduce MRSA bacteria on surfaces. The copper alloy applied in a vacuum utilizes the natural interaction between cell membranes of simple organisms such as viruses or bacteria. The contact leads to a crack in the cell wall membrane. Due to the cracks in the outer membrane, the cell loses vital nutrients and water by which it is weakened. Ultimately, the cell dies. The

copper alloy is entirely safe for the human body and the original surface properties of the treated material are fully preserved despite the alloy. The crucial advantage of the machinery and system concept developed is that standard parts are enveloped in a thin layer in the production process.

### Environmentally friendly & and cost effective layers

SINGULUS's fully automated production system marketed under the product name DECOLINE II allows the efficient application of these functional layers. The basis for such a production line is the inline vacuum sputtering system POLYCOATER. This complete production line integrates metallizing under vacuum and automatically transports of the parts to defined transfer points. In combination with a base coat, the coating applies an additional finish to two or three-dimensional components with various characteristics. Rotationally symmetrical components with a diameter of up to 69 mm and up to 130 mm in size can easily be processed. The SINGULUS TECHNOLOGIES system concept includes a universal work piece carrier with 18 bays, on which the various work pieces can be placed using an individually shaped plastic adapter. This affords ample scope for scaling the size and number of products to be treated. The cycle time per carrier is only six seconds. Alternatively, one can use the complete coating area for approximate two-dimensional components. The size is 480 mm x 130 mm. SINGULUS TECHNOLOGIES is working on further extension levels with additional benefits.

All kinds of surfaces can be treated such as synthetic material, glass and metal. All conventional components can be used. The adjustment of the surface characteristics are achieved through a central vacuum coating station.

The applied UV coatings are recycled. Thus, the emission of the polluting substances is minimized. The flexible process offers a genuine environmentally friendly alternative to the batch processes.

## General Layer Stack Description

Cu Alloy Metal Layer

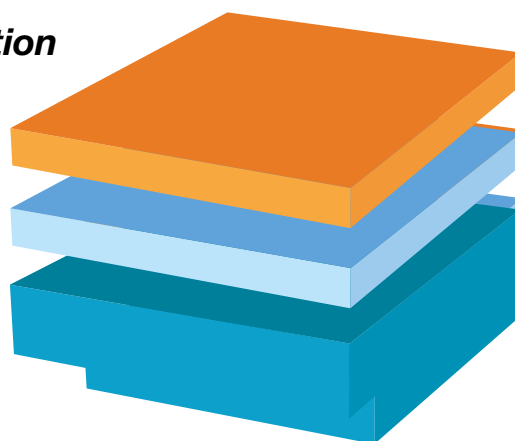


Base Coat (optional)



Basic Component

- Plastic
- Glass
- Metal



### SINGULUS TECHNOLOGIES AG

Hanauer Landstrasse 103  
D - 63796 Kahl, Germany  
Tel. +49 6188 440-0 | Fax +49 6188 440-1130  
sales@singulus.de | www.singulus.de



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