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## **Designing out Infection in Hospitals**

### **- A role for antimicrobial copper touch surfaces**

**At yesterday's 'Designing Against Cross Infection' seminar, organised by Architects for Health, Copper Development Association Director, Angela Vessey, addressed an aspect of material selection by highlighting copper's antimicrobial properties and the suitability of copper and its alloys for hospital touch surfaces.**

The seminar was one of The Building Centre's 'Capital Health Events', coinciding with the Capital Health Exhibition, with speakers representing infection control teams, architects, engineers and manufacturers discussing the issues surrounding hospital design to minimise transmission of infection.

"Latest research on antimicrobial properties of copper and its alloys from Professor Bill Keevil and his team at the University of Southampton are compelling. They show that copper inactivates MRSA, E.coli and other pathogens on its surface in as little as 90 minutes, making copper alloys ideal for hospital touch surfaces such as door handles, push plates, bed rails, intravenous poles, drug trolleys, counter tops and hand rails," explained Mrs Vessey. She added:

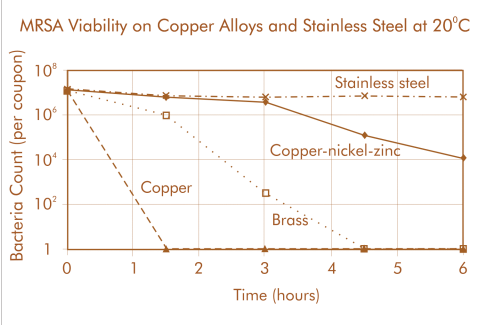

"Eighty percent of infectious diseases are transmitted by touch. To the naked eye, stainless steel and aluminium doorknobs and push plates, commonly used in hospitals today, appear to be clean yet can still harbour deadly microbes. Copper has been used around the world, throughout history, as a hygienic material. Professor Keevil's research demonstrates a log 7 reduction in 90 minutes and this scientific evidence indicates a role for copper alloy surfaces in helping to reduce reservoirs of pathogens in the fight against hospital acquired infections.

"Copper alloys are tried and tested materials, available in a range of alloys with different physical properties to suit different manufacturing processes and end uses. Unlike antimicrobial coatings, copper alloys are homogeneous and solid, so the antimicrobial properties would last the life of the product and not suffer deterioration when scratched by jewellery or damaged by sharp implements. Copper alloys can match the physical properties of other materials and have the added bonus of being naturally antimicrobial. Alloys are available in a range of colours from the flaming red of pure copper to the yellow-gold of brass and the silver-grey of bronzes.

The antimicrobial effect is seen at copper contents of between 63-99.9%, generally increasing with increasing copper content. The effect does not take place immediately but, as the figure below shows, on copper surfaces MRSA survival was limited to just 1.5 hours. On a brass surface (80% copper, 20% zinc) there was a significant reduction in live bacteria after 3 hours, with complete invariability after 4.5 hours. The copper-nickel-zinc (55% copper) showed significant and continuing reduction in live bacteria after 4.5 hours. Survival time on stainless steel continued beyond 72 hours".

The need for a multidisciplinary approach, based on good, accessible information and common sense, and drawing on each others experiences were just two of the conclusions of the evening. CDA has formed the Antimicrobial Copper Interest Group for architects, designers, product manufacturers, material suppliers, healthcare professionals and facilities managers to ensure that the latest information on antimicrobial copper alloys is made available. This group also provides an opportunity for networking to help bring the antimicrobial benefits of copper and copper alloys to healthcare facilities. For further information on antimicrobial properties of copper, or to join the Interest Group, please visit [www.cda.org.uk/antimicrobial](http://www.cda.org.uk/antimicrobial).

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<p><i>Figure 1: Source University of Southampton, Keevil et al. 2004</i></p> <p>Survival times of Methicillin-resistant Staphylococcus aureus (MRSA) on three copper alloys and stainless steel at room temperature.</p> <p>Copper - commercially pure 99% copper</p> <p>Brass - 80% copper, 20% zinc</p> <p>Copper-nickel-zinc - 55% copper, 27% zinc, 18% nickel</p> <p>Stainless steel - 18% chromium, 9.5% nickel</p>	<p><i>Photo by Nick Yarsley/WIZZWAM</i></p>

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