



Copper Touch Surfaces in Healthcare Facilities

- Naturally Antimicrobial

Recent and ongoing research by Professor Bill Keevil and Dr Jonathan Noyce at the University of Southampton has shown that copper surfaces inactivate disease-causing germs in as little as 45 minutes. Studies have clearly demonstrated such an antimicrobial effect on a range of microbes including Methicillin-resistant *Staphylococcus aureus* (MRSA), *E. coli* O157, *Listeria monocytogenes* and other hospital-acquired infections.

The antimicrobial effects observed are an intrinsic property of copper and copper alloys.

This natural hygienic property makes copper and its alloys, e.g. brass, ideal for hospital touch surfaces such as door handles, push plates, light switches, bed rails, intravenous poles, drug trolleys, counter and table tops and hand rails. These touch surfaces are all potential reservoirs of infection, and reducing the number of live germs on these surfaces could help in controlling the spread of MRSA and other hospital-acquired infections.

Figure 1 shows that on copper surfaces MRSA survival was limited to just 1.5 hours. The brass surface showed a significant reduction in live bacteria after 3 hours with complete invariability after 4.5 hours. The copper-nickel-zinc showed significant and continuing reduction in live bacteria after 4.5 hours. Survival time on stainless steel continued beyond 72 hours.

The result of this experiment led the research team to conclude that the contemporary use of stainless steel for work surfaces and door furniture in hospital environments is potentially exacerbating an already critical situation with regards to MRSA transmission and infection. Noyce advised hospitals to switch materials from stainless steel to copper alloys in critical care areas where patients are at greatest risk of being infected.

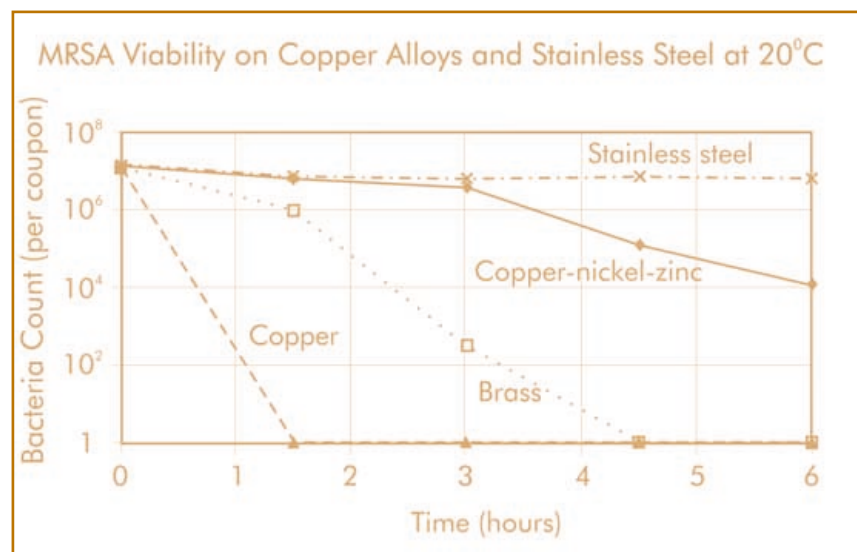


Figure 1 - Source: University of Southampton, Keevil et al. 2004

Survival times of Methicillin-resistant *Staphylococcus aureus* (MRSA) on three copper alloys and stainless steel at room temperature.

Copper (commercially pure) - 99% copper

Brass - 80% copper, 20% zinc

Copper-nickel-zinc - 55% copper, 27% zinc, 18% nickel

Stainless steel - 74% iron, 18% chromium, 8% nickel

Copper alloys should be considered for antimicrobial applications where their intrinsic properties will benefit human health.

To the naked eye, stainless steel and aluminium doorknobs and push plates, used in hospitals, appear to be clean yet can still harbour deadly microbes, which can survive on these surfaces for days, even months. Although some copper alloys may tarnish slightly, tests show that tarnished surfaces of the same alloy do not decrease effectiveness against microbes – and may actually exhibit increased antimicrobial characteristics. Copper alloys, with their differing chemical compositions, provide a group of materials with properties suitable for a wide range of applications and a spectrum of colours from the characteristic salmon red through golds and bronzes to silver.

Copper has been used throughout history and around the world as a hygienic material, and there is a long list of touch surfaces which could benefit from copper's antimicrobial properties today. A few low-cost and easy to implement improvements in facilities design can reduce the viability of microbes on the most frequently touched surfaces. For example, stainless steel and aluminium door handles can be replaced with brass handles.

To keep costs down, it may be possible to retrofit door handles only in those areas of hospitals where the transmission of infectious diseases is a special concern, such as intensive care units, burn units or quarantined areas.

Copper alloys are homogeneous and solid, so they provide superior lifetime efficacy and durability in comparison to coated substrates.



Copper alloy touch surfaces could help reduce reservoirs of infectious microbes and provide an additional measure to good hygiene practice to combat hospital-acquired infections.

Antimicrobial Copper Interest Group

The Antimicrobial Copper Interest Group has been formed for designers, healthcare professionals, facilities managers, product manufacturers and material suppliers who wish to keep up with the latest developments, research and in-situ trials from the US, Japan and Europe. The prime aims of the group are information dissemination and networking. To apply to join please email your expression of interest to: alison.brett@copperdev.co.uk.

Copper - essential for health:

It is important to remember that, as well as being antimicrobial, copper is also a micro-nutrient that is essential to all plant, animal and human life.

- ◆ *Copper is necessary for the growth, development and maintenance of bone, connective tissue, brain, heart and many other body organs*
- ◆ *Copper is involved in the formation of red blood cells, the absorption and utilisation of iron, and the synthesis and release of life-sustaining proteins and enzymes*
- ◆ *Copper is known to stimulate the immune system, repair injured tissues and promote healing*
- ◆ *Copper is essential for the normal growth and development of human fetuses, infants and children.*

Copper Development Association

5 Grovelands Business Centre, Boundary Way, Hemel Hempstead, HP2 7TE

Tel: 01442 275705, Fax: 01442 275716

Website: www.cda.org.uk

E-mail: helpline@copperdev.co.uk