

# TECHNICAL

**Bryony Samuel** is communications officer for the Copper Development Association



## THE HYGIENIC PROPERTIES OF ANTIMICROBIAL COPPER

**N**ext time you're planning a new build or refurbishment, consider upgrading the high-touch surfaces to antimicrobial copper, says Bryony Samuel

Copper – humanity's first metal – has been recognised for its hygienic qualities for centuries. The Ancient Egyptians, Greeks and Romans used copper-based preparations to treat ailments and to prevent wound infection, and today – with more than 200 scientific papers demonstrating its efficacy against pathogens including MRSA, influenza and norovirus – it has an important role to play in reducing the spread of infections.

Government and commercial advertising campaigns have raised awareness of the risk to public health posed by bacteria and viruses on hard surfaces, particularly at the height of threats from flu and norovirus. It is reported that 80 per cent of all infections are spread by touch.

Good hand hygiene and frequent surface cleaning are the pillars of infection control in hospitals, but in busy environments it is impractical to wash hands and surfaces often enough to keep contamination below levels posing an infection risk. Everywhere that people gather – from health care facilities to gym and sports facilities, schools and mass transport hubs – infections can and will spread.

Copper is inherently antimicrobial. Without any additives, coatings or special treatments, it will rapidly eliminate bacteria, viruses and

fungi on contact. It shares this benefit with a range of copper-containing alloys – including brasses, bronzes and copper-nickels – a family of materials called 'antimicrobial copper'.

### What is it?

Antimicrobial copper is an engineering material used to make a wide range of surfaces – such as door furniture, handrails, light switches and taps – that, unlike other materials, will not allow potentially harmful microbes to breed, actively destroying them so they cannot be picked up on hands.

Laboratory work proving its efficacy against headline-making pathogens led to clinical trials in hospitals around the world to explore its potential in healthcare. These trials – including one at Selly Oak Hospital in Birmingham – found that surfaces made from antimicrobial copper harbour 80 per cent fewer pathogens than non-copper equivalents.

In 2013, a multi-site US clinical trial – funded by the Department of Defense – showed that replacing just six

frequently touched surfaces around an intensive care unit patient with antimicrobial copper equivalents reduced his risk of acquiring an infection by 58 per cent.

Many copper alloys are familiar from applications like coins, taps and door furniture and are known for their durability. The range of alloys also offers a variety of colours, meaning antimicrobial copper products can be chosen to match a colour scheme as well as providing long years of service, and, unlike coatings, the antimicrobial efficacy will last the lifetime of the products.

With regular cleaning using standard cleaning products items made from solid antimicrobial copper will continuously reduce contamination 24/7 without requiring any further action or special maintenance. Some alloys might undergo oxidation and darken, but their efficacy is not affected.

### Are products expensive?

Material costs are only a small part of a product's cost, so only equipment with high material cost or high labour input will be more expensive. But it is important to note that antimicrobial copper components offer additional hygiene benefits over non-copper surfaces, making a simple cost comparison misleading.

Cost benefits associated with installing antimicrobial

copper surfaces in hospitals have been explored by York Health Economics Consortium (YHEC), which carried out a study comparing expenditure on copper and standard components with improvements in patient outcomes (fewer infections, shorter stays) and other tangible benefits, based on data from the US clinical trial.

It developed a spreadsheet-based model showing the cost of upgrading standard products to antimicrobial copper and the associated payback. It predicts that the cost of replacing the six key touch surfaces in a 20-bed ICU with antimicrobial copper equivalents will be recouped in less than two months.

Dr Matthew Taylor, YHEC's director and one of the model's authors, says: 'After the initial two months, ongoing cost savings will accrue from the reduction in blocked beds and better-directed staff resources.'

The Copper Development Association (CDA) – the UK office of the Copper Alliance – provides guidance on key touch surfaces to upgrade for healthcare, based on information provided by clinical trial teams around the world and the US Centres for Disease Control and Prevention guidelines for cleaning contamination hotspots.

The CDA also operates the Copper Alliance stewardship scheme to help specifiers identify and source approved products. The scheme's Antimicrobial Copper brand and Cu+ mark are used by leading hospital equipment manufacturers to indicate that their products are made from approved antimicrobial copper alloys, and they adhere to strict use rules. **FM**

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