Executive Summary: <u>Antimicrobial Copper</u>

Strategy:

The ICA Antimicrobial Copper Initiative is a worldwide program to develop new markets as well as fund clinical research for copper, based on its inherent antimicrobial properties. The healthcare sector has been targeted first, though there is now increasing interest in antimicrobial copper for schools, mass transit and public buildings.

Why Copper?

Copper and its alloys possess an inherent capability to quickly inactivate infection-causing bacteria such as MRSA and E. coli, as well as viruses and fungi. The antimicrobial property is intrinsic to the metal and last the lifetime of the product. Competing materials such as stainless steel, plastics and aluminum do not have this capability. Copper can reduce total bacteria load on its surface by 99.9% within two hours of exposure.

Copper and copper alloys come in a wide array of colors- from golden yellow, to rich red, and even silvery-white. Aside from being visually appealing, copper alloys can provide a warmer and more soothing environment when compared to the rigidness appearance of stainless steel. All copper alloys are 100% recyclable and promote sustainable building design.

The EPA has also granted Antimicrobial Copper registration to make public health claims against bacteria. Copper and copper alloys are unique classes of solid materials as no other solid touch surfaces have permission to make human health claims. The public health registration EPA granted to copper and copper alloys was truly a groundbreaking occurrence, previously reserved for liquid and gaseous products.

Copper in Clinical Setting:

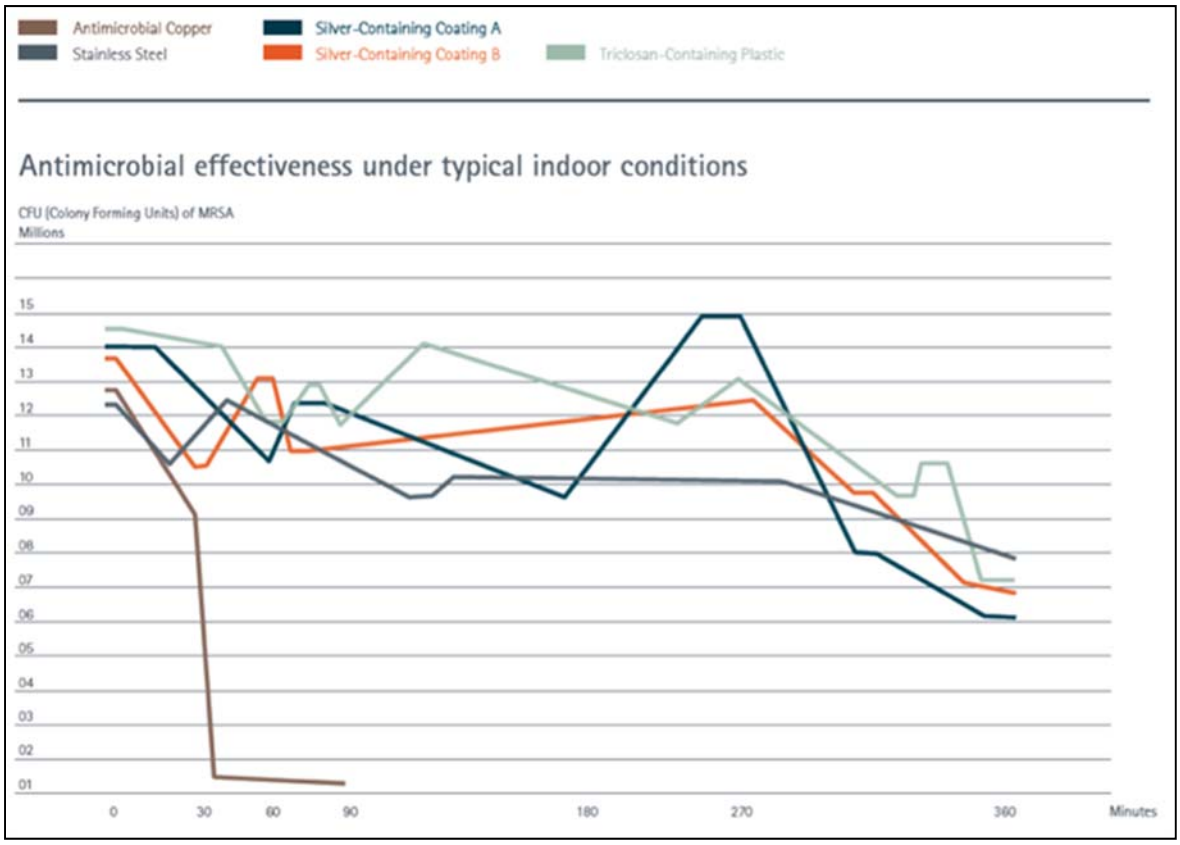
Standard infection control practices are insufficient resulting in climbing infection rates, increased mortality, treatment costs, and antibiotic resistance. Initiative has been taken to prove Antimicrobial Copper's efficacy against various bacteria and infections through the funding of clinical trials and regulatory positioning.

A recently completed multi-site Clinical Trial proved how valuable Antimicrobial Copper can be when implemented in a healthcare environment. Three hospitals in the US replaced traditional materials with Antimicrobial Copper on selected touch surfaces in their ICU rooms.

The results: 97% less bacteria on the copper surfaces compared to non-copper equivalents, and a 40% lower risk of acquiring an infection for patients treated in copper rooms. This remarkable reduction was caused by adding less than $2m^2$ of copper surfaces in each ICU room.

It is estimated that 80% of infectious diseases are transmitted by touch, and healthcare-associated infections claim nearly 100,000 lives annually in the US alone, costing the federal government approximately $40 billion each year. The implementation of Antimicrobial Copper in a healthcare environment will directly correlate to facilities saving both lives of patients and on expense for treating infections. A 40% reduction in infections could lead to a $16 billion savings for healthcare facilities across the nation.

Broad comparison tests showed that copper kills bacteria much faster than any other touch surface material



Reducing the risk of Hospital-Acquired Infections with Copper:

Copper surfaces rapidly destroy/kill harmful bacteria. This phenomenon has been known since ancient times and is currently receiving renewed attention. The effectiveness of copper against harmful bacteria has been demonstrated convincingly by modern techniques. Successful hospital trials using copper touch surfaces to ward off the spread of microorganisms have taken place in several countries around the globe. Copper and its alloys (such as bronze and brass) are a new tool to (potentially) help reduce the risk of hospital-acquired infections.

How Antimicrobial Copper Works

Cells perish rapidly: Harmful bacteria are rapidly destroyed on copper surfaces, but survive for several days on other materials commonly used in hospitals.

Copper accumulates within the cell; Even short exposure to copper surfaces causes bacteria to accumulate high amounts of copper within their cell bodies.

Copper does not cause mutations: Exposure to copper surfaces does not cause mutations in bacterial or fungal cells. Copper's primary target is the exterior of the bacterium. The genetic material is not reached until the bacterium is already lethally injured.

Bacterial cell membranes are damaged: Cells, after being exposed to copper surfaces, show extensive damage to the structure of the cell's protective envelope. This causes loss of essential cellular components, and loss of the cell's integrity.

Final stroke of cell destruction: The DNA of the bacteria is destroyed after the cell membrane has been rendered nonfunctional and copper reaches the cell's internal, genetic material. This event greatly minimizes the chance that the bacteria can adapt and develop resistance to solid copper.

Conclusions and Future Perspectives: Conventional antibiotics hit only one target within the bacterium – typically a step in the cell's ability to build its own envelope. Copper, on the other hand, hits many cellular targets: from compromising the cell's envelope, to oxidative damage inside the cell's body to irretrievable damage at the cell's very core, the genetic material. Copper's action is rapid, and cell destruction is complete. The bacteria never have a chance to develop resistance to copper's effect.

Cu+, a Global Brand:

In March of 2010, the International Copper Association unveiled a new global brand to represents the inherent antimicrobial properties of copper. The Cu+ brand is the mark of the 'most effective touch surface' on the market and helps the public instantly recognize and distinguish these products. The global brand has gained significant traction since its creation and continues to build market awareness.

The Cu+ brand presents a unique solution for a variety of stakeholders, including builders, designers, and healthcare providers. A growing number of touch surface product manufacturers have signed up to use the Cu+ brand on their antimicrobial copper ranges of healthcare equipment and fittings. There are currently 75-100 manufacturers who are able to produce commercial-grade Antimicrobial Copper products for multiple applications.

Opportunities are available for the development of innovative copper products with our members and partners around the world.

A dedicated website:

Antimicrobial Copper isn't really a brand; it's the introduction of a whole new category. To differentiate Cu+ and unite information and resources in one location, a dedicated website was been created. The site is structured by region: U.S., UK and the Rest of the World in order to provide the user with specifically tailored regional content.

The website is an excellent resource which contains valuable and pertinent information for a wide variety of stakeholders.

- **Why Antimicrobial Copper?** An introduction to Antimicrobial Copper; sections highlighting Physical Properties and Characteristics, Proper Use and Care and FAQ's, to name a few.
- **Scientific Proof.** Encompasses Antimicrobial Efficacy, Public Health Claims, Clinical Trials, etc.
- **Markets and Applications:** Medical and Healthcare, Schools and Public Buildings, Public Transport and other applications.
- **News and Downloads Center –** the latest news and events, articles, case studies and other interesting collateral.
- **Partner Resources –** join the partner database and register to use the Antimicrobial Copper brand/Cu+ mark. Marketing support material, design tools and free Antimicrobial Copper samples are available.

For more information about Cu+ visit www.antimicrobialcopper.com