

Will copper lead the industry out of lockdown?

So far, 2020 has been undeniably challenging for the mining and metals industry. The Covid-19 global pandemic has routed markets and dented investor confidence around the world. Until now, gold as a safe-harbour asset, has been one of the rare gainers in metals markets - but is it about to be joined by copper?



On the London Metal Exchange copper prices have risen to six-month highs - adding 12% in the last month alone - as investors look to the partial reopening of some national economies. Benchmark three-month copper has hit \$5,260/tonne, it's best showing since March 17. The most-traded June contract on the Shanghai Futures Exchange has made 42,880 Yuan (\$6,058.15), a near-two week high.

As copper producers such as Ivanhoe Mining have long been evangelising, the metal possesses some remarkable antimicrobial qualities that are suddenly becoming very attractive to post-lockdown manufacturers. The European Cooperation in Science and Technology (COST) is one of the institutions which has been carrying out extensive studies on the antimicrobial coating properties of copper.

In a world where global warming and long-distance travel quickly spread infectious diseases like Covid-19, innovative germ-killing coatings for hospitals could save lives. Millions of people worldwide catch infectious diseases from hospitals and other healthcare settings – over four-million people each year in the EU alone, according to the European Centre for Disease Prevention and Control. These sometimes-lethal infections are mainly transmitted via surfaces such as beds or tables, which are also a source of infection for viruses like Covid-19.

Hygiene coatings

Anti-microbial coatings (AMC) are a possible solution. Active ingredients like copper or special chemical compounds protect walls, bed curtains and other surfaces, killing or repelling bacteria and viruses. The COST Action Anti-Microbial Coating Innovations to Prevent Infectious Diseases (AMiCI) is making it easier for manufacturers and hospitals to make full use of these coatings. The network of over 60 institutes and companies from 33 European countries has developed a database of active ingredients in AMCs, an overview of current European research, and advice on designing safe products.

AMiCI has also identified issues with testing methods and approval processes in Europe and prepared guidelines for combining the coatings with best cleaning practice to optimise hospital hygiene. "Before Covid-19, [hospital-acquired

infection] was an urgent issue. Now, sadly, more people are waking up to it,” says the Action Chair, Dr Minna Keinänen-Toivola of Satakunta University of Applied Sciences in Finland. She explains that in severe cases of viral disease like Covid-19, patients can develop secondary bacterial infections in their lungs. She believes that lessons from Covid-19 will include better use of microbe-resistant coatings: “We have to be prepared. This will not be the last pandemic”, she adds.

Anti-microbial copper

Over on the other side of the world in Australia, innovative company, Spee3D, has successfully developed and tested a fast and affordable way to 3D print anti-microbial copper onto metal surfaces. Laboratory tests have shown that touch surfaces modified by this process ‘contact kills’ 96% of SARS-CoV-2, the virus that causes Covid-19, in just two hours. Recent studies have shown that the Covid-19 virus may remain on surfaces or objects for up to 72 hours depending on the surface and conditions.

The process, known as Activat3D copper, has been developed by modifying the company's 3D printing technology, using new algorithms for controlling their metal printers to allow existing metal parts to be coated with copper. Copper parts are difficult to produce using traditional methods and thus 3D printing may be the only tool available to rapidly deploy copper. The results showed that 96% of the virus is killed in two hours and 99.2% of the virus killed in five hours.

The team then developed a process to coat a stainless-steel door touch plate and other handles in five minutes. The digital print files were then sent to participating partners around the globe, allowing the simultaneous installation of newly-coated parts in buildings in the US, Asia and Australia.

Spee3D CEO Byron Kennedy said the company has focused on developing a solution that can be rapidly deployed and is more efficient than printing solid copper parts from scratch. He said: “The lab results show the copper surfaces behave much better than traditional stainless, which may offer a promising solution to a global problem. The technology can be used globally addressing local requirements, be they in hospitals, schools, on ships or shopping centres.”

The company developed the unique technique to harness copper's proven abilities to eradicate bacteria, yeasts and viruses rapidly on contact by breaking down the cell wall and destroying the genome. By comparison, SARS-CoV-2 can survive on traditional surfaces like stainless steel and plastic for up to three days if they are not regularly disinfected.

“Recognising supply chain shortfalls over the last couple of months, it was clear to this team that fabrication speed was a priority,” said Assistant Director of Digital Design and Additive Manufacturing at the University of Delaware, Larry (LJ) Holmes. “Using this technology, we are able to rapidly transition safe options for high-touch surfaces.” SPEE3D has also worked with the RAN and Australian Army on 3D printing trials to significantly increase parts available compared to what the regular supply chain can provide. Defence has invested \$1.5m in the technology.

In addition to progress in Europe and Australia, over the pond, legislators in the state of New York have introduced bills designed to require the use of copper push-plates on doors in buildings that will be built with public funding or financing.

Growth industry

In April, an online report by the Rome (New York) Sentinel indicated that two different legislators have introduced bills that would “require construction projects that receive public funding to use anti-microbial copper alloy for all touch surfaces to reduce the spread of disease-causing bacteria and viruses, including Covid-19”. New York Assemblywoman Marianne Buttenschon, a co-author of one of the bills, reportedly referred to studies that have found door handles and handrails made of copper can offer significantly lower contamination levels as measured by the presence of disease-causing bacteria compared with other commonly used materials.

Judging by the innovation and experimentation currently happening around the world, it might well be that copper emerges as a significant growth metal for the mining industry just as it begins to emerge from the crippling effects of the pandemic in these last few months.

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