

Sources & evidence of the antiviral, antibacterial and antifungal effectiveness of copper

1 Metallic Copper as an Antimicrobial Surface

„The antimicrobial properties of copper surfaces have now been firmly established. Hospital trials have shown a reduction in bacterial counts, indicating that copper surfaces are a promising additional tool alongside other hygienic measures to curb the number and severity of hospital-acquired infections.“

Source 1.1: Applied and Environmental Microbiology of American Society for Microbiology (ASM)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3067274/>

1 Inactivation of Norovirus on Dry Copper Alloy Surfaces

„There is now a considerable body of evidence from laboratory based studies that copper alloys are efficacious against a diverse range of pathogenic microorganisms. Earlier studies demonstrated a rapid kill of *Escherichia coli* O157, *Listeria monocytogenes* and methicillin-resistant *Staphylococcus aureus* (MRSA)“

Source 1.2: PLoS ONE by Public Library of Science

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3767632/>

1 Inactivation of Influenza A Virus on Copper versus Stainless Steel Surfaces

„Influenza A virus particles (2×10^6) were inoculated onto copper or stainless steel and incubated at 22°C at 50 to 60% relative humidity. Infectivity of survivors was determined by utilizing a defined monolayer with fluorescent microscopy analysis. After incubation for 24 h on stainless steel, 500,000 virus particles were still infectious. After incubation for 6 h on copper, only 500 particles were active.“

Source 1.3: American Society for Microbiology (ASM)

<https://aem.asm.org/content/73/8/2748>

2 Test report Laboratories Dr Döring 25 March 2020, comparison of Shieldex Kiel vs. metallic solid copper

„It has been shown that, due to the unique metallization process, the Shieldex[®] Kiel eluates have released an average 7 times higher concentration of copper ions than the copper sheet eluates“

Source 2: Laboratorien Dr. Döring on behalf of the company Statex Produktions- und Vertriebs GmbH

<https://statex.de/pruefbericht-kupferionenfreisetzung-20200326/>

3 Copper against germs: Asklepios Klinikum Harburg ensures greater patient safety

„This project is the largest of its kind in Europe and the USA to date. Copper has a proven antimicrobial effect and can significantly reduce dangerous germs such as bacteria, fungi and viruses“.

Source 3: Asklepios Klinikum Harburg

<https://www.asklepios.com/presse/presse-mitteilungen/konzernmeldungen/kupfer-gegen-keime-ref=4ab1380b-6900-416e-89ee-cb6c64f61cab~>

4 Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1

SARS-CoV-2 was more stable on plastic and stainless steel than on copper and cardboard, and viable virus was detected up to 72 hours after application to these surfaces, although the virus titer was greatly reduced. The stability kinetics of SARS-CoV-1 were similar. On copper, no viable SARS-CoV-2 was measured after 4 hours and no viable SARS-CoV-1 was measured after 8 hours. On cardboard, no viable SARS-CoV-2 was measured after 24 hours and no viable SARS-CoV-1 was measured after 8 hours.

Source 4: Letter by Dr. van Doremalen, Mr. Bushmaker & Mr. Morris – published, 17.03.2020 at NEJM.org

<https://www.nejm.org/doi/10.1056/NEJMc2004973>