

ANTIMICROBIAL COATING FOR A SAFER ENVIRONMENT

Prevention of infectious disease transmission via surface contact

During the COVID-19 outbreak, a common mode of infectious disease transmission is through contact with contaminated surfaces. The need for a cleaner and safer environment has never been more pressing. While disinfectants are commercially and widely available, users need to clean the surfaces actively and regularly in order to remove microbes from the surface. An anti-microbial coating on the surface would help to reduce transmission risk.

Researchers from SIMTech have developed an antimicrobial coating with a stain-repellent function. In collaboration with the National University of Singapore (NUS) School of Medicine, preliminary findings show that the coating is effective against enterovirus A71 (EV-A71), a common cause of Hand, Foot and Mouth Disease (HFMD). The coating is also being tested against enveloped RNA (ribonucleic acid) viruses including Influenza A (H1N1) and murine coronavirus (M-CoV).

The coating can be applied to a myriad of materials for various purposes, and is particularly relevant in the current pandemic situation. The team is working with the NUS spin-off company, AiRazor Technologies Pte Ltd, to enhance its current 'Generation 2' proprietary filter, which has a virus filtration efficiency of over 99.5% for the coronavirus associated with Severe Acute Respiratory Syndrome (SARS).

By applying SIMTech's anti-microbial coating, viruses that are filtered and trapped on AiRazor's filter will also be actively eliminated.

The enhanced 'Generation 3' filter represents a cost effective solution to remove and eliminate harmful airborne particulates and microbes, including viruses. This is particularly important as the SARS-CoV-2 virus, that causes the COVID-19 infection, has been associated with airborne transmission in droplets and aerosols that are typically ejected by an infected person via sneezing, coughing - or even just talking.

It is hoped that the anti-microbial coated filter can be used in surgical masks, conventional fans, split air-conditioning units for homes, industrial heating, ventilation and air conditioning (HVAC) systems in commercial buildings, and even in air-conditioning systems used on public transportation to provide a safer indoor environment.

Additionally, Nanoveu, a local technology company that manufactures a range of products specifically designed to enhance the use of handheld technologies, has licensed this technology and is looking to work with SIMTech to apply this coating onto cases and screen protectors for mobile phones and tablets. Nanoveu also aims to expand the use of anti-microbial coatings into other market segments such as protective films on touchscreens of ATMs and digital displays.

"While it is not possible to ensure that our hands are always clean especially when we are out public areas, we can at least ensure that our personal devices and areas of high touch points can be protected and not be a medium of transmission," said Mr Alfred Chong, the CEO of Nanoveu.

Moving forward, SIMTech aims to build up an ecosystem and supply chain in Singapore to enable the widespread deployment of this surface technology in various industrial sectors, and to work towards a safer environment post COVID-19. For example, SIMTech is looking to extend the use of this technology to aircraft cabin interior parts, and is seeking partners to work with on other materials such as cinema seats fabrics.



Escherichia coli strain on agar plate

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“By enhancing our filter with SIMTech's anti-viral coating, the Gen 3 filter will not only be able to remove airborne droplets and aerosols associated with virus transmission in the indoor environment, but also eliminate viruses on the filter itself”

Prof. Jeff Obbard, Technical Director, AiRazor Technologies Ltd.