

## **New age sustainable disinfectants and sanitizers may bring relief from chemical ones with side effects**

The days of suffering from dry, itching hands due to rinsing them multiple times with chemical disinfectants and soap as protection against contact infection of COVID 19 may soon be over. A number of start-ups based in different parts of India are now armed with a range of sustainable alternatives to conventional chemical-based decontaminants that can disinfect surfaces and even microcavities.

They also include technologies for disinfection of the biomedical waste generated at hospitals and the use of novel nanomaterials and chemical process innovations for long-lasting & safe sterilization of the recurrent use surfaces.

Safe disinfection and sanitization technologies have come from a total of 10 companies supported for disinfectants and sanitizers under Centre for Augmenting WAR with COVID-19 Health Crisis (CAWACH), an initiative by the National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), implemented by Society for Innovation and Entrepreneurship (SINE), IIT Bombay.

Mumbai based start-up Inphlox Water Systems, with expertise in treating complex polluted water and wastewater, modified their technology to design and develop a system for space and equipment disinfection to fight COVID 19 contamination titled VAJRA. The VAJRA KE Series uses a disinfection system consisting of a multistage disinfection process by incorporating electrostatic discharge that generates ozone, and the powerful sterilizing effects of UVC light spectrum. VAJRA Kavach-E (KE) uses advanced oxidation, electrostatic discharge, and UVC light spectrum to inactivate the viruses, bacteria, and other microbial strains present on the PPE. This saves costs by making the PPE, medical, and nonmedical gear reusable.

Inphlox Water Systems, which started with the Nidhi Prayas grant from DST (through IIT Bombay) for innovations in the water sector, used the CAWACH grant from DST to modify their technology to make it suitable for combating the COVID 19 infection. They prepared themselves for manufacturing 25 space disinfection systems per month, streamlined the production, supply chain, and logistics to scale up the manufacturing capacity by 25% with each passing month thereon.

At present, they are coordinating with IIT Bombay's and CCMB's (Hyderabad) virology labs for further testing of these systems. The startup is ready with commercial product versions and is working on improving product certifications so that specialized labs can also use their solutions.

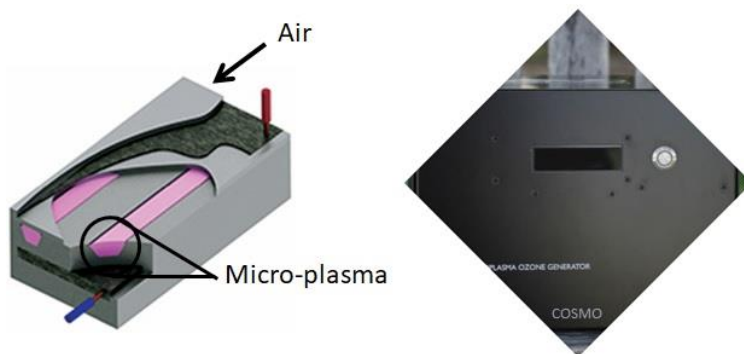


Coimbatore based Eta Purification offers advanced sterilization solutions is using environmentally-sound micro-cavity plasma technology. This novel technology, where the disinfectant is produced directly from air or oxygen offers a sustainable alternative to conventional chemical-based decontamination.

The COSMO (Complete Sterilization by Microplasma Oxidation) system can rapidly disinfect Covid-19 infected areas, including quarantine facilities, ambulatory care, and equipment surfaces. This innovative micro-plasma sterilization system offers compact and scalable modular units which are robust, flexible, and energy-efficient.

The disinfectant is produced on-site, thereby eliminating the transport, storage, and handling of hazardous chemicals. These decontamination systems are 10 times less than the conventional system of equivalent capacity, making it suitable for resource constraint environments. Their advanced sterilization systems surpass hypochlorite and other traditional disinfectants in its ability to neutralize multi-drug resistant pathogens. The company has already provided customized solutions to hospitals and healthcare settings to sterilize selective critical care areas.

They have also taken this innovation to vulnerable communities. Presently their advanced integrated micro-plasma oxidation system for rapid sterilization has been fully developed and tested rigorously for commercial use.



A mechanical hand sanitizing dispenser machine which quantifies the steps of hand sanitization through touchless, real-time monitoring via dashboard is offered by Chennai based startup MicroGO.

Weinnovate Biosolutions from Pune has developed silver nanoparticles based on non-alcoholic liquid sanitizer. Their technology pending for patent also inhibits the RNA replication activity – preventing spread of the virus and blocks surface glycoproteins – making the virus ineffective.

An instant microwave-based handheld steriliser ATULYA and a microwave-assisted cold sterilization device OPTIMASER for hazardous biomedical waste disinfection and making linen and PPE reusable is the offering from Lucknow based Maser Technology.

OPTIMASER is microwave-assisted cold sterilisation superior technological advancement over the conventional Autoclave. It allows for disinfection and sterilisation of the PPE Kits and the masks in order to ensure the 100 reusabilities, also ensuring the cost-effectiveness of

the same. ATULYA is an Instant Microwave based handheld sterilizer which offers the cutting edge over the UV tube-based steriliser, sanitising sprays & all the possible methods of sterilisation & protection.

Incubators like SINE IIT Bombay FIIT, IIT Delhi, SIIC, IIT Kanpur, HTIC, IIT Madras, Venture Centre, Pune, IKP Knowledge Park, Hyderabad, KIIT-TBI, Bhubaneswar provided timely advice on technical progress, guided the startups to follow all necessary guidelines, signing of MoUs and so on.

DST Secretary Prof. Ashutosh Sharma said, “Through these and other compelling examples of COVID-19 relevant products and technologies, the deep foundations of the Indian science and technology have rapidly come to fore by a seamless marriage of the knowledge creation and its consumption. The structures and processes which made these extraordinary achievements possible are being incorporated in the upcoming Science, Technology and Innovation Policy 2020.”