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Electrostatic Spray Disinfection with Nano-Engineered Solutions for High-Touch Indoor and Outdoor Surfaces

Electrostatic sprayer with nanoparticle solution ensures long-lasting, uniform surface disinfection across environments.

Researchers at Purdue University have developed a system and protocol for electrostatic spraying of disinfectants. Infectious agents can be spread via contaminated surfaces called fomites. Researchers have found that SARS-CoV-2, a particular virus of importance, can remain infectious on surfaces at room temperature for 9 days. Electrostatic spraying is more effective than traditional disinfection measures because the electrostatically sprayed droplets are charged and, thus, attracted to the target surface. The Purdue researchers' optimized protocol and system uses a nanoparticle solution called Nanoxen which is sprayed electrostatically and provides a uniform coating of nanoparticles to the target surface. The electrostatic sprayer is controlled by software that automatically provides position feedback for optimum coverage of the target surface.

Technology Validation: The researchers tested a range of system parameters for electrostatically spraying disinfectants on 12 different surfaces (metal, plastic, and wood surfaces). The researchers have identified the ideal spraying distance, spray particle size, and ion generation voltage to achieve an optimized distribution of sprayed nanoparticles suitable for any surface.

Advantages:

- Provides long-lasting disinfection

- Provides optimized distribution of nanoparticles

Applications:

- Electrostatic spraying of disinfectants

TRL: 4

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Authors
Victor Manuel Castano-Meneses
Luciano Castillo
Tanya Purwar

Further information
Aaron Taggart
adtaggart@prf.org

View online

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