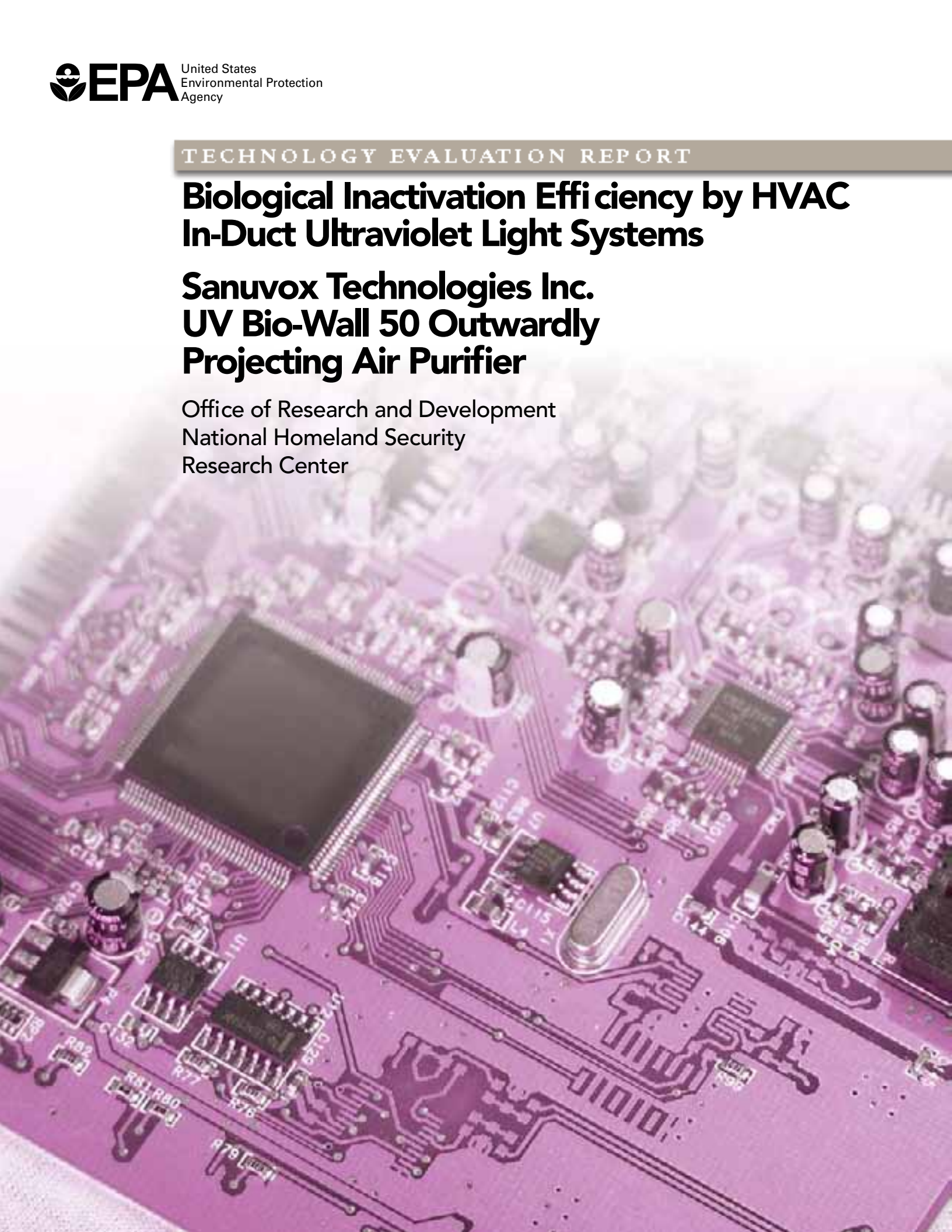
United States
Environmental Protection
Agency

TECHNOLOGY EVALUATION REPORT

Biological Inactivation Efficiency by HVAC In-Duct Ultraviolet Light Systems

Sanuvox Technologies Inc. UV Bio-Wall 50 Outwardly Projecting Air Purifier

Office of Research and Development
National Homeland Security
Research Center



Notice

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Executive Summary

The U.S. Environmental Protection Agency's (EPA's) National Homeland Security Research Center (NHSRC) Technology Testing and Evaluation Program (TTEP) is helping to protect human health and the environment from adverse impacts resulting from acts of terror by carrying out performance tests on homeland security technologies. Under TTEP, RTI recently evaluated the performance of the Sanuvox Technologies Inc.
Bio-Wall 50 Outwardly Projecting Air Purifier. The objective of testing the device was to evaluate its bioaerosol inactivation efficiency as a heating, ventilation and air-conditioning (HVAC) in-duct ultraviolet light system.

The product was tested using a test plan approved by EPA, *Test/QA Plan for Biological Inactivation Efficiency by HVAC In-Duct Ultraviolet Light Air Cleaners.*[(1)] The tests were conducted using three organisms, two bacteria (*Bacillus atrophaeus* and *Serratia marcescens)* and one bacterial virus (MS2). These organisms were selected because their sizes, shapes and susceptibility to UV inactivation make them reasonable surrogates for biological warfare agents (BWAs). Generally, vegetative bacteria are readily killed and bacterial spores are more difficult. To model use in an HVAC system, RTI used a test duct designed for testing filtration and inactivation efficiencies of aerosol, bioaerosol, and chemical challenges.

The bioaerosol inactivation efficiencies calculated for the three organisms were 93% for *B. atrophaeus*, ∃99.97% for *S. marcescens* and 99% for MS2. The irradiance was measured as 1200 $\mu W/cm^2$ at 133 cm (52.4 in.) upstream from the closest glass part of the lamps with an airflow of 0.93 m^3/sec (1970 cfm). The system had five lamps that were burned in for 100 hours prior to measurements.