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The Game-Changing Innovation of NanoFense

n an era where air quality and public health have taken center stage, the need for advanced filtration solutions has never been more critical. While traditional air filtration systems can trap airborne microbes, they often fail at eliminating these harmful pathogens, leaving the potential for self-contamination and further spread. Applied Nanoscience Inc. (ANI) has developed a breakthrough solution to this long-standing problem – NanoFense™, an innovative antimicrobial filter media coating designed to eradicate, rather than simply capture, harmful airborne pathogens.

Identifying the Problem and Developing the Solution

The deficiencies of conventional air filtration systems became apparent through extensive industry research and real-world observations. At the heart of NanoFense is a deceptively simple idea: Why stop at capturing microbes when you can eradicate them entirely? Protected by U.S. Patent No. 7,807,199, this antimicrobial filter media 'coating' transforms any existing filtration system into a proactive defender. Applied as a suspension material, NanoFense uniformly coats filter media with a formulation that acts as a "destructive adsorbent" – a scientific mouthful that translates to a microscopic killing machine. Think of it as a shield that doesn't just block the enemy – it is obliterated.

NanoFense is a proprietary antimicrobial suspension that can be seamlessly applied to virtually any filtration media, transforming conventional air filters into active defense mechanisms against viruses and bacteria. Unlike traditional filters that may become a breeding ground for pathogens, NanoFense ensures that collected microbes are neutralized on contact, preventing bacterial colonization and viral persistence. Protected under U.S. Patent No. 7,807,199, this technology is poised to enhance air filtration products across multiple industries, including disposable facemasks, room air purifiers, and airline cabin air systems. With verified scalability in production, ANI is positioning NanoFense as a vital enhancement for companies seeking to elevate their air filtration performance.

2µm

The Research and Development Journey

The research and development of NanoFense has spanned over a decade, from initial research and formulation refinement to realworld application trials. ANI methodically evolved the validation of its formulation from suspension time-kill studies to aerosolized pathogen testing on aged, coated filter media samples. This ensured that the solution remained effective over time and in real-use conditions.

Scientifically Validated Protection

Comprehensive independent laboratory testing was exclusively conducted at Microbiotest, Inc., a BSL-3 level facility in Sterling, Virginia. This division of Microbac Laboratories, Inc. specializes in microbiology and virology, offering antimicrobial efficacy testing and viral clearance services globally. The studies provided conclusive validation that NanoFense not only kills but eradicates a broad spectrum of viruses and bacteria.

- Avian Influenza virus (H9N2)
- Human Influenza A virus
- Haemophilus Influenzae (H-flu)
- Rhinovirus
- Swine Influenza virus (H1N1)
- Staphylococcus aureus (including MRSA strain)
- Streptococcus pneumoniae

▲ S.E.M. images of NanoFense coated filter media. I Applied Nanoscience

Target Market & Industrial Scale Potential

While NanoFense has wide-ranging applications, initial interest has been strongest in the disposable facemask and air purifier segments, where consumer and regulatory demands for enhanced filtration performance are at an all-time high. Additionally, industries such as aviation, healthcare, and HVAC manufacturers are recognizing the potential for NanoFense to add value to their existing filtration systems. These sectors offer the most viable paths for large-scale production and integration due to the critical need for improved air quality in enclosed spaces.

A Vision for Global Impact

As air filtration companies face increasing demands for more effective protective solutions, ANI is positioned as a key partner in advancing public safety. "The ever-growing demand for air filtration companies to provide genuinely protective solutions necessitates ANI's position as an attractive partner for the introduction of pragmatic value-added products. Public safety is non-negotiable, and air quality is a frontline defense," says Thomas Allen, President and CEO of ANI.

Bringing NanoFense to market on a global scale requires collaboration with industry leaders who possess extensive distribution capabilities. ANI envisions a future where NanoFenseenhanced filtration becomes the new standard in air quality protection, safeguarding public health in homes, workplaces, transportation systems, and medical environments worldwide.

Contact Applied Nanoscience at jointventure@appliednanoscience.com. III www.appliednanoscience.com

▶ For details on how to submit your company's technology for consideration as a "Technology Spotlight" in *IFN*, contact Ken Norberg at ken@filtnews.com or +1 202.681.2022.



Optimize *Your* Product's Performance

Defending Health Through Innovation

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NanoFenseTM has been proven effective against:

- ✓ Avian influenza virus (H9N2)
- ✓ Human Influenza A virus
- ✓ Haemophilus Influenzae (H-flu)
- ✓ Rhinovirus
- ✓ Swine Influenza virus (H1N1)
- ✓ Staphylococcus aureus including the viral MRSA strain
- ✓ Streptococcus pneumoniae



Patent No.: US 7,807,199 ANTIMICROBIAL COMPOSITION