HZO Collaborates with NASA to Publish Groundbreaking Research Article on Parylene Coatings for Infrared Applications

HZO worked with NASA & the University of Colorado to develop a unique Linear Variable Bypass Filter (LVBF) for observational tools to enhance space observation.

MORRISVILLE, NC, UNITED STATES, October 24, 2024 /EINPresswire.com/ -- MORRISVILLE, NC – OCTOBER 24, 2024 – HZO, a global leader in delivering world-class protective nanocoatings that safeguard electronics from the most demanding environments, is proud to announce the release of a new Applied Optics research article, "Metal-Mesh Linear Variable Bandpass Filter for Far-Infrared Wavelengths," developed in partnership with NASA's Goddard Space Flight Center and the University of Colorado. This groundbreaking research highlights the development of advanced far-infrared linear variable bandpass filters (LVBFs) and emphasizes the essential role Parylene coatings play in their performance.

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> *Dr. Sean Clancy*

The study details using Parylene-C as a critical anti-reflection (AR) coating to enhance the performance of filters used in far-infrared spectrophotometric imaging observatories. HZO developed and applied the controlled-gradient-thickness coatings to improve transmission efficiency and ensure cryogenic robustness, a key requirement for applications in extreme environments, such as the Balloon Experiment for Galactic Infrared Science (BEGINS) and the Probe far-Infrared Mission for Astrophysics (PRIMA), recently selected by NASA for a mission concept study.

“We are thrilled to have contributed to this project by leveraging our expertise in Parylene chemistry and deposition,” said Dr. Sean Clancy, HZO’s lead contributor to the paper. “Collaborating with NASA and the University of Colorado has been an incredible experience, and this research demonstrates how HZO’s conformal coatings can enhance the efficiency and durability of precision optical instruments in challenging operating conditions.”

Parylene-C, a thermoplastic polymer known for its exceptional mechanical stability and low water absorption, was essential to achieving high transmission levels in these filters. The paper reveals that the Parylene-coated LVBFs achieved peak transmission rates between 80% and 90% at cryogenic temperatures (5 K), far exceeding the performance of non-coated alternatives. These results underscore the importance of conformal coatings in minimizing losses and improving overall system efficiency for optical instruments operating at far-infrared wavelengths.

This collaborative work marks a significant milestone for HZO and its partners, showing the potential of advanced materials in space exploration and scientific research. The full paper is available at Optica.

For more information about HZO and its innovative protective solutions, please visit hzo.com.

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