Drones Could Accelerate Future of Fenestration Testing

As technology continues to develop, the fenestration industry may soon leverage drones to test windows and measure performance degradation.

University of Florida graduate students Farah Akiely and Vikram Ganesan showed an early prototype and its potential at NFRC’s September 23 Green Track meeting in Charlotte. The project is led by Ravi Srinivasan, an NFRC board member and Director of the University’s UrbSys Lab. The project sponsor is Bipin Shah, another NFRC board member and Director of WinBuild Inc.

As part of the presentation, Akiely and Ganesan showed data that commercial building energy use has been on the rise and urbanization—and the use of high-rise buildings—is expected to grow. These trends will not only increase the need for energy efficient fenestration products, but also for built environment stakeholders to monitor how window performance changes over time and determine the right time to replace aging infrastructure.

Akiely and Ganesan said studies have shown that hard water and hard minerals are the leading factors behind glass degradation, along with oxidation and corrosion for metal-framed windows. While degradation can affect the glazing U-factor, SHGC and Visible Transmittance, the drone testing study is focused on assessing the impact of U-factor degradation.
The drones used in the experiment are fitted with sensors to measure air velocity and exterior surface temperatures. The drone’s results are compared with attached surface thermocouples to validate the results.

Akiely and Ganesan said that the next steps will involve testing how the positioning of the sensors can impact results, drone turbulence in high altitude settings, and applications to sync test results with other 3-D modeling programs.