Potsdam Sensors Performs Particulate Air Quality Sensor Comparison

NYS P2I | New York State **Pollution Prevention Institute**

Potsdam Sensors, LLC.

Potsdam Sensors LLC, (Potsdam Sensors) is a business founded by Suresh Dhaniyala, Bayard D. Clarkson distinguished professor in the Engineering department at Clarkson University and director of the Center for Air Resources Engineering and Science. The business was founded in 2011 to build a low-cost sensor that can examine much smaller particles than most similar sensors and is currently housed in Clarkson University's incubator space in Peyton Hall.

Challenge

The "Miniature Electrical Aerosol Sensor" (MEAS) was developed by Potsdam Sensors to detect particulate matter in the size range of 10 nanometers to 2,500 nanometers as a result of emerging concerns over human impacts associated with small particles in this range. Other technologies typically use light-based detection systems, limiting them to particles sizes that can efficiently scatter light being used by the sensor, typically 0.2-10 micrometers in diameter. As a result, Potsdam Sensors wanted to determine the lower detection limits with respect to particle size, concentration, and flow rate of Potsdam Sensors' MEAS technology while varying the configuration of collection plates within the sensor.

Solutions

In an effort to prove their sensor technology's sensitivity, Potsdam Sensors partnered with the New York State Pollution Prevention Institute (NYSP2I). A sensitivity analysis was planned to reduce the concentration of particulate matter in the aerosol stream using six different particle sizes. Additionally, NYSP2I determined the key influences affecting the sensor results and generated a Design of Experiments with two levels and three factors that to be completed by Clarkson University. A verification of Clarkson University's High-Flow, Dual Channel Differential Mobility Analyzer (HD-DMA) was also performed using Rochester Institute of Technology's Scanning Mode Particle Spectrometer.

Challenge

- Potsdam Sensors wanted to determine the lower detection limits with respect to particle size, concentration, and flow rate of their MEAS technology while varying the configuration of collection plates within the sensor.

Solution

- A sensitivity analysis was structured by NYSP2I to reduce the concentration of particulate matter in the aerosol stream using six different particle sizes.
- NYSP2I determined the performance influences affecting the sensor and generated a Design of Experiments with two levels and three factors that to be completed by Clarkson University.

Results

- Based on information gathered during this project, Potsdam Sensors has begun work on developing the next generation of MEAS products.

Results

NYSP2I plotted the mode size of particle selected by the HD-DMA vs. the intended or targeted size.
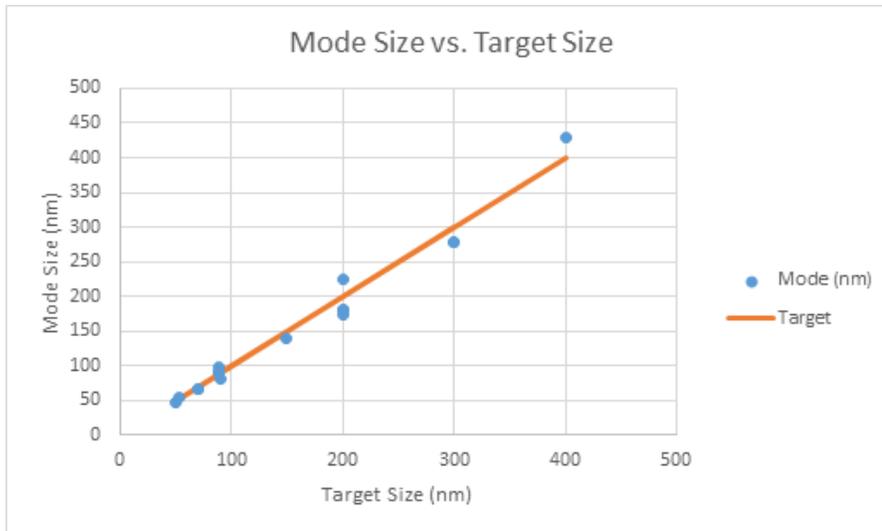
Based on information gathered, Potsdam Sensors has begun work on developing the next generation of MEAS products. Potsdam Sensors estimates that commercialization of the MEAS product will result in four jobs over three years added to the New York State workforce.

POTSDAM SENSORS LLC

Potsdam Sensors, LLC.

R. Vijayakumar
COO
65 Main Street, Suite 3102
Potsdam, NY 13676
315-506-6883
vijay@aerfil.com

Partners

RIT

Rensselaer

Clarkson UNIVERSITY

Cornell CALS
College of Agriculture and Life Sciences

BINGHAMTON UNIVERSITY
STATE UNIVERSITY OF NEW YORK

NEW YORK
Manufacturing
Extension Partnership

For more information please contact us:

585-475-2512
www.rit.edu/affiliate/nysp2i/
nysp2i@rit.edu

111 Lomb Memorial Drive, Bldg 78
Rochester, NY 14623