

Development of ASTM international D8405 – Standard test method for evaluating PM_{2.5} sensors or sensors systems used in indoor applications

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ABSTRACT

Sensors and sensor systems for monitoring fine particles with aerodynamic diameter smaller than 2.5 µm can provide real-time feedback on indoor air quality, and thus can help guide actions to manage indoor air pollutant concentrations. Standardized verification of the performance and accuracy of sensors and sensor systems is crucial for predicting the efficacy of such monitoring. A new ASTM International standard test method (ASTM D8405) was created for this need and is the most exacting laboratory protocol published to date for evaluating indoor air quality sensors and sensors systems measuring particles smaller than 2.5 µm in diameter. ASTM D8405 subjects sensors and sensor systems to five test phases: 1) an initial particle concentration ramp; 2) exposure to various temperature and humidity conditions; 3) exposure to interfering particles; 4) temperature cycling; and 5) a final particle concentration ramp to assess drift. This paper discusses development of the standard test method, key aspects of the testing process, example evaluation results, and comparison of this standard test method against peer evaluation protocols.

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