Progress Toward a Gas Flow Standard for Metering Semiconductor Gases from 10 µL/min to 1 L/min

Keith Gillis[1, S, C], Jopie Pope[1] and Aaron Johnson[1]

[1]*Sensor Science Division, Physical Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, U.S.A.*
keith.gillis@nist.gov

In chip manufacturing, delivering the prescribed amount of precursor gases to a reaction chamber is critical for maximizing device throughput and yield. Commercial flow standards for hazardous gases do not exist resulting in variation among different manufacturers' meters for other than inert gases. Therefore, there is a need to improve on meter performance in the gases that the semiconductor industry uses. We are developing a flow standard to validate mass flow meter and controller performance across gas species. We will model the performance of differential pressure and thermal mass flow meters in semiconductor gases using the flow standard and accurate thermophysical gas properties. The models will be used to predict accurate performance of mass flow meters in hazardous gases based on a calibration performed in nitrogen.