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**Robert K. Henderson\*** (rkhenderson51@yahoo.com), 74 Tiburon Drive, Austin, TX 78738. *An Alternative Distributional Model for Control of Process Particle Counts in the Semiconductor Industry.*

Process control plans for particle or defect count distributions have historically been based on the assumption of an underlying Poisson distribution adequately describing the observed process data. However, it has been observed that particle and defect count distributions for semiconductor processes commonly have a heavier high end tail than what can be accounted for using a Poisson model. Previous work has suggested the use of an exponential distribution as more appropriate distributional model for wafer particle or defect counts; however, this model is a special case of a gamma distribution with a coefficient of variation set equal to one. This paper will explore the use of gamma distributional models in evaluating wafer count parameters, specifically considering approaches to determine if use of such a model is appropriate for a given process and how to establish reasonable process control plans for such processes using either traditional single-point beyond an upper control limit, or a sequential process control rule. (Received September 21, 2009)