

Insights: Publications

Manufacturing Implementation of Corona Oxide Silicon (COS) Systems for Diffusion Furnace Contamination Monitoring

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Maximizing production utilization of manufacturing tools is of vital importance to the economic health of a wafer fabrication facility; however, preventative maintenance and qualification is important to maintain the highest quality product from these tools. This imposes contradictory constraints on the time allocated to preventative maintenance qualification activities. For diffusion furnaces, the standard procedure is to utilize high-frequency capacitance-voltage (CV) measurements to assess the overall cleanliness of the quartzware. This requires an oxide to be grown in the furnace on test wafers usually without the presence of product. Following this, additional processing of these wafers is necessary to generate a structure which can be probed (electrode deposition, doping, pattern, and etch) and some type of furnace cleaning cycle is run for each boat in the system. Depending upon the type of furnace, the total time that product cannot be run can amount to one day and, depending on the qualification cycle, this hit in manufacturing time can occur each week, every two weeks, or every month. Once the furnace returns to manufacturing for running production, an additional delay is encountered prior to learning the outcome of the CV results potentially resulting in material being run through the furnace out of specification. By utilizing a state-of-the-art Corona Oxide Semiconductor (COS) system for furnace qualifications, we have been able to cut our qualification time from 26.5 hours to 2.5 hours per week and have effectively increased our furnace capacity.

Related People



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