

## New Ways to Test for SMC

In addition to particles, Airborne and Surface Molecular Contamination (AMC and SMC) can, and do lead to substantial yield loss in today's fabs.

AMC monitoring remains a vital part of ensuring cleanroom quality and process yield, however SMC is receiving increased attention and definition within the industry. SMC was added to the ITRS recently and addressed critical levels of Metals, Dopants, and Organics on the wafer surface.

An extension of the ITRS guidelines that Balazs promotes is to test other sources of SMC outside the typical "airborne" thought process. Exposure to common cleanroom materials or processes can be a source for contamination via direct exposure or simply via proximity passive outgassing.

FOUPs, pods, and mini-environments, and the isolation of the wafer from conventional cleanroom air exposure also pushes the need for SMC analysis. Within these closed environments, wafer exposure to a fixed volume of contamination is much different than open wafer storage where large volumes of cleanroom air bring contamination to the wafer surface.

Balazs has been at the forefront for promoting SMC monitoring and control within the electronics industry. The case studies described below demonstrate new benefits and advantages to performing SMC testing.

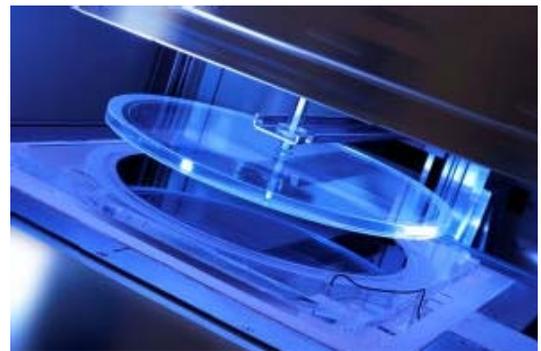
Surfaces including floor tiles, curtains, walls and any new material going into a fab can be tested. In addition FOUPs, gloves, and wipes can also be evaluated to see what SMCs make their way to the wafer surface. As we move into new technology nodes the identification of new contamination sources is critical to avoid downtime and achieve the best possible process in the shortest possible timeframe.

Balazs can help you with your specific needs to ensure SMCs are not a surprise in your fab.

### **24h exposure to air-wafers placed above pre-cleaned surfaces and under cover**



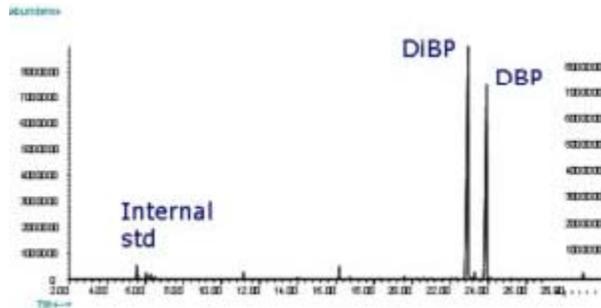
Wafer on a stand, above the surface to be tested



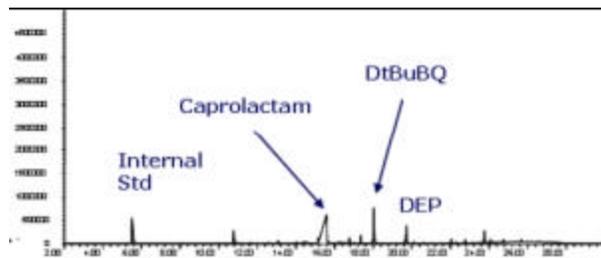
After exposure, the wafer is then desorbed. Outgassed components are identified via GC-MS

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### Examples: flooring material and FOUP



Flooring material showing presence of 31 ng/cm<sup>2</sup> of phtalates, more than 10x the ITRS limit for Surface Molecular Organics



10 days wafer exposure within a closed FOUP. Presence of various SMOrgs that total 4.5 ng/cm<sup>2</sup>, above the ITRS limit and potentially damaging to process yield.