



## SOLARIS® FILTERS – PRESSURE ACTIVATION DURING FILTER STARTUP

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### Introduction

In the advanced-node chemical mechanical planarization (CMP) applications, scratch defects become a key factor in process yield performance. Slurry manufacturers use a variety of nano-abrasive materials (10 to 100 nm) in order to achieve the planarization demands while improving the efficiency and yield of the process. Filter technology developments are aligned closely to the needs of nanoscale contamination control in semiconductor applications.

The move from micron level contamination control of particles and gels in CMP slurries to nanoscale poses a unique challenge related to start-up times and the procedure. The increased density of the nanoscale filter media will trap air within the open cavities of the structure, increasing the initial pressure drop during the filter flushing time (startup/filter changeout).



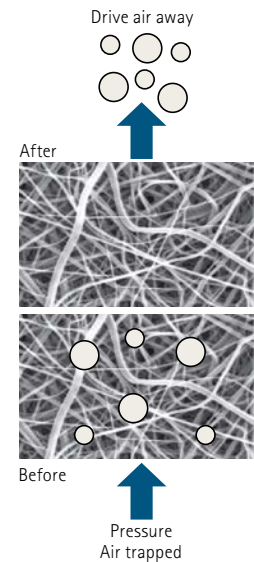
Solaris® CMP filters

### Sub-1 $\mu\text{m}$ Polypropylene Media

To reach this retention rating performance in sub-1  $\mu\text{m}$ , a shift in traditional media technology is required. Polypropylene (PP) media provides the necessary media technology to achieve these ratings, but requires some additional processing during the start-up procedure to enable the best performance.

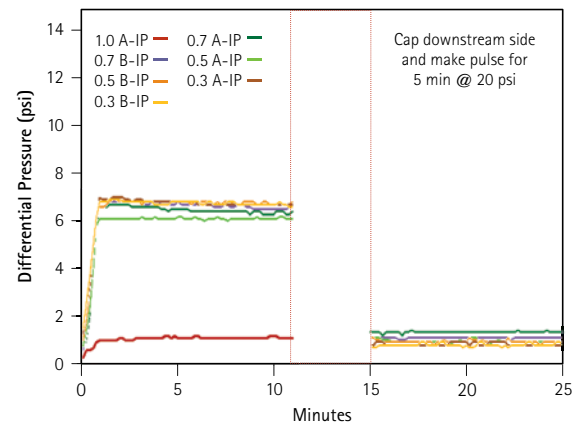
### Pressure Activation

The entrapment of air bubbles between the media will cause a higher-than-normal pressure drop, reduce the filter lifetime and utilize less of the available media inside the filter. By applying 20 psi of DI water (DIW) along with pulsed pressure downstream, the filter shows significant improvement in initial pressure drop.

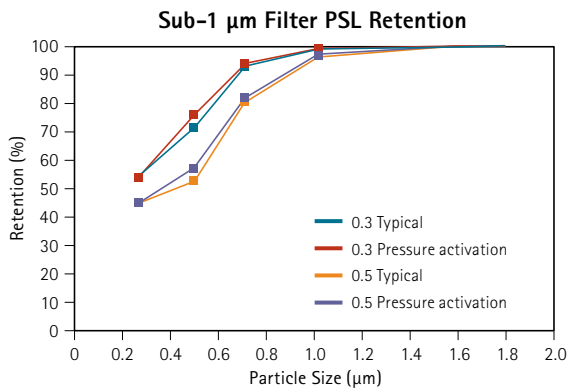


Air entrapment in media structure

### Pressure Activation Operation



Pressure activation effect on initial differential pressure



Pressure activation comparison

## Recommendation

To fully realize the benefits of CMP filters, pressure activation using DIW is recommended to improve sub-1 μm depth filter performance, extend filter lifetime and reduce start-up time.

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