

# **Alternative Method and Device to Purify and Deliver Water Vapor**

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## **Abstract**

The Semiconductor industry faces technical challenges at each node. At the 65 nm and 45 nm nodes, processes in use include wafer cleaning, lithography, ALD, RTP, and diffusion. All of these processes are sensitive to the quality of the water or water vapor used. This paper describes a new method for generating ultrapure water vapor or 'clean steam' for use as a process gas or a feed that could be condensed to generate ultrapure water. Data will be presented that positively supports the validity of the new method. This new method was able to reduce high ppb levels in deionized water to ppt levels. Under class 100 sampling conditions metals in the purified steam were found to be below detection limits of single ppt except for sodium found to be 9 ppt. Significant reduction in TOC was also found. The purifier device was found to have a linear relationship between pressure differential across the device and mass flow rate.