

A Summary of Recent Water Conservation Efforts

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Water conservation has grown in importance in the semiconductor industry with respect to availability, cost reduction, manufacturing location, sustainability, and waste disposal. With the industry moving to a larger wafer size, increased ultrapure water (UPW) purity requirements and an increase in process steps, there is a potential for UPW consumption to increase if conservation measures are not implemented. The semiconductor wafer fabrication process requires a large amount of UPW – as much as 1,500 - 2,000 gallons or more per 200 mm wafer. CMP, wet cleans, wet etches, and their associated rinses can account for over 80% of the UPW consumed.

Motorola has investigated numerous water conservation possibilities at several different sites, and has brought in consultants to help explore new opportunities. Some of the recently implemented water use reduction activities this paper will discuss include CMP optimization based on resistivity and bacterial counts, CMP drain diversion for water reuse, dilute RCA cleans with reduced rinses, installation of restrictive flow orifices in CMP slurry lines, and flow standardization across tools (in CMP and wet cleans).