

Ultra Pure Water Systems

How low can you go?

Allan D. Chasey, Del E. Webb School of Construction, ASU

Abstract:

Semiconductor companies use substantial amounts of a highly purified water, called ultra pure water (UPW), to rinse the semiconductor circuits, channels, and gates of photo-resist developers and other chemicals used in the device manufacturing process. By definition, ultra pure water contains virtually no inorganic (cations, anions, and solids) or organic (carbon based) material. Because of its polarity, hydrogen-bonding capability, small molecular size, and unexcelled capacity to dissolve inorganic and organic substances, ultra pure water is the primary silicon wafer “cleaning chemical” used in the production of semiconductor devices. During the manufacture of semiconductor devices, UPW will contact the wafer surface at least 20 different times. Inorganic salts and organic matter (ie, contaminates) remaining or left on the wafer surface following rinse operations affects the number of usable devices produced on a silicon wafer thus directly affecting plant production yield.