

ABSTRACT OF THE DISCLOSURE

A plating system and method is provided for electroplating silicon wafers with copper using an insoluble anode wherein the electrolyte is agitated or preferably circulated through an electroplating tank of the system and a portion of the electrolyte is removed from the system when a predetermined operating parameter is met. A copper containing solution having a copper concentration greater than the copper concentration of the removed portion is added to the copper plating system simultaneously or after electrolyte removal, in a substantially equal amount to the electrolyte removed from the system and balances the amount of copper plated and removed in the removal stream. In a preferred method and system, an electrolyte holding tank is provided which serves as a reservoir for circulating electrolyte. The addition of the copper containing solution and removal of working electrolyte is also preferably made from the holding tank. The preferred apparatus is preferably cylindrical and is specially configured so that recirculating electrolyte enters near the anode and exits near the cathode with the outlet of the apparatus having a substantially continuous opening around the periphery of the electroplating tank so that electrolyte exiting the tank has a substantially uniform flow across the surface of the cathode. The anode is preferably circular and has a central through opening through which the entering electrolyte passes.

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