

ChemScan®

PROCESS ANALYZERS

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ChemScan® Application Summary #80 Electrodeless Copper Plating

Statement of the Problem

Electrodeless copper deposits are typically applied before conventional electroplating in order to provide a conductive base on plastics or other nonconductors. Major markets for electrodeless copper include automotive parts, appliance components, printed wiring boards, molded interconnect devices, plastic composite connectors, multichip modules and EMI/RFI shielding of electronic devices.

Components of the electrodeless bath include an aqueous solution of copper ions, reducing agents, complexing agents and bath stabilizers operating in a specific ion concentration, temperature and pH range. The typical reducing agent used is formaldehyde and the typical complexing agent is Rochelle Salt.

Control Strategy

The consumption of critical components in the bath occurs in direct proportion to the consumption of copper. Complexing agents and stabilizer levels occasionally need independent control, although on-line analysis of dissolved copper is sufficient for most applications.

Apparatus

ChemScan Process Analyzers can detect copper directly in an undiluted side stream recirculated from the plating bath using spectrophotometric (light absorbance) techniques and a temperature measurement. Copper concentration is calculated by the ChemScan Analyzer and is output in the form of a 4-20 mA signal, which can be used as an input value for control of replenishment concentrate feed pumps. See Figure 1 for comparative results from a high copper bath.

