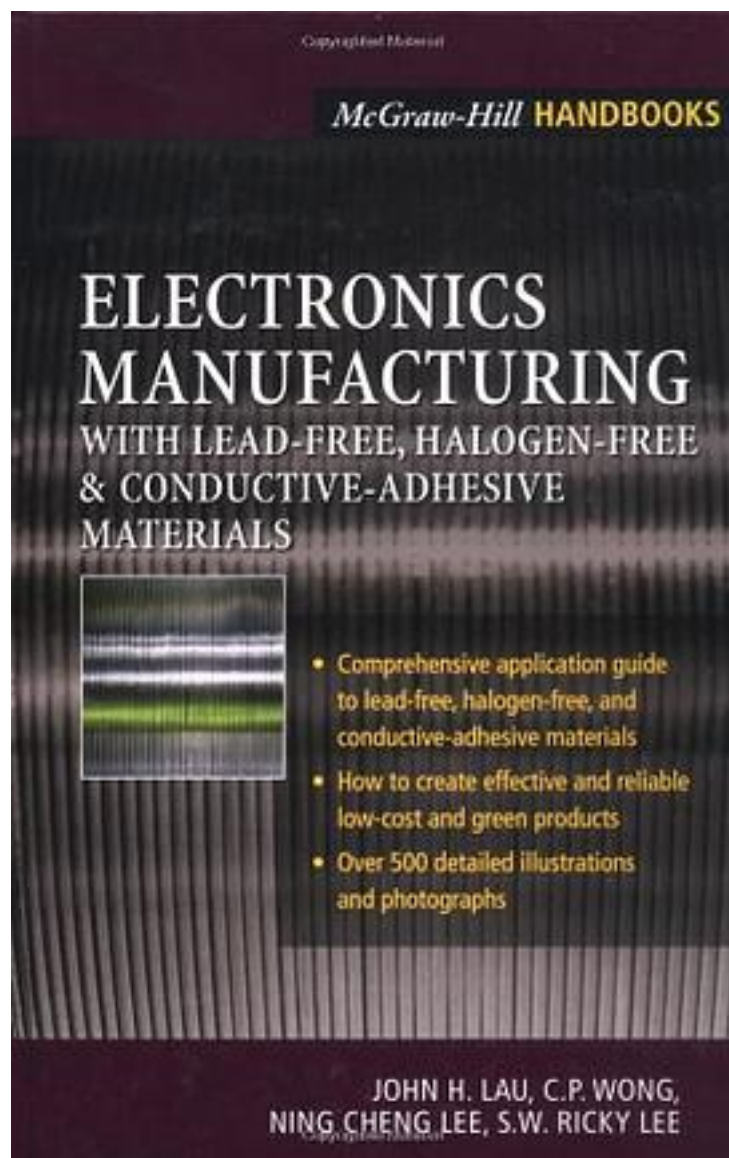


# Electronics Manufacturing



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This comprehensive guide provides cutting edge information on lead-free, halogen-free, and conductive-adhesive technologies and their application to low-cost, high-density, reliable, and green products. Essential for electronics manufacturing and packaging professionals who wish to master lead-free, halogen-free, and conductive-adhesive problem solving methods, and those demanding cost-effective designs and high-yield environmental benign manufacturing processes, this valuable reference covers all aspects of this fast-growing field. Written for design, materials, process, equipment, manufacturing, reliability, component, packaging, and system engineers, and technical and marketing managers in electronics and photonics packaging and interconnection, this book teaches a practical understanding of the cost, design, materials, process, equipment, manufacturing, and reliability issues of lead-free, halogen-free, and conductive-adhesive technologies. Among the topics explored: chip (wafer) level interconnects with lead-free solder bumps; lead-free solder wafer bumping with micro-ball mounting and paste printing methods; lead-free solder joint reliability of WLCSPs on organic and ceramic substrates; chip (wafer) level interconnects with solderless bumps such as Ni-Au, Au, and Cu, Cu wires, Au wires, Au studs, and Cu studs; design, materials, process, and reliability of WLCSPs with solderless interconnects on PCB/substrate; halogen-free molding compounds for PQFP, PBGA, and MAP-PBGA packages; environmentally benign die-attach films for PQFP and PBGA packages and lead-free die-attach bonding techniques for IC packaging; environmental issues for conventional PCBs and substrates; some environmentally conscious flame-retardants for PCBs and organic substrates; emerging technologies for fabricating environmental friendly PCBs such as design for environment, green PCB manufacturing, and environmental safety. It also includes the topics: lead-free soldering activities such as legislation, consortia programs, and regional preferences on lead-free solder alternatives; criteria, development approaches, and varieties of alloys and properties of lead-free solders; physical, mechanical, chemical, electrical, and soldering properties of lead-free solders; manufacturing process and performance of lead-free surface finishes for both PCB and component applications; implementation and execution challenges of lead-free soldering, especially for the reflow and wave soldering process; fundamental understanding of electrically conductive adhesive (ECA) technology; effects of lubricant removal and cure shrinkage on ECAs; mechanisms underlying the contact resistance shifts of ECAs; effects of electrolytes and moisture absorption on contact resistance shifts of ECAs; and stabilization of contact resistance of ECAs using various additives.

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