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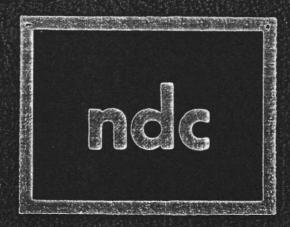
# Toxic Waste Minimization in the Printed Circuit Board Industry

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POLLUTION TECHNOLOGY REVIEW No. 162



## **Foreword**

This book presents information on waste minimization practices currently employed in the printed circuit board (PCB) and semiconductor manufacturing industries. Case studies conducted at six facilities evaluated the technical, environmental and cost impacts associated with the implementation of technologies for reducing the volume and toxicity of PCB metals-containing sludges and solvent wastes. The analyses of these data are the basis for demonstrating waste minimization technologies to reduce hazardous waste.

With the enactment of the Hazardous and Solid Waste Amendments in November 1984, Congress set forth a schedule for evaluating the land disposal restriction of various classes of hazardous wastes. A key issue identified in the evaluation of the waste bans is the availability of commercial treatment capacity to handle the wastes proposed for banning. Therefore, Congress also asked EPA to evaluate the potential for onsite waste minimization to reduce the quantity or toxicity of wastes being considered under the ban.

The electronics industry was initially judged as a good choice for individual case studies because it is a growth-oriented industry and ranks in the top 20 industries generating solvent wastes. The criteria for selecting case studies was further narrowed down to those facilities generating waste described by RCRA as waste treatment sludges from electroplating operations, and spent halogenated solvents or still bottoms from recovery of those solvents. These waste types were selected because they are two of the largest volume hazardous waste streams generated by the electronics industry.

The six case study assessments in the book use the results of analytical measurements to discuss the performance of each technology. In addition, measurements of process residuals and/or other discharges are presented. Finally, an assessment of the economics of each technology is also given to assist the cost evaluation of each technology.

Each facility investigated employs some practice that requires offsite disposal. Two of the case studies focus on the recovery of spent halogenated solvents, and the remaining four discuss the recovery or reduction of metal plating and etching process wastes.

The information in the book is from *Waste Minimization in the Printed Circuit Board Industry—Case Studies,* prepared by T. Nunno, S. Palmer, M. Arienti, and M. Breton of Alliance Technologies Corporation for the U.S. Environmental Protection Agency, January 1988.

The table of contents is organized in such a way as to serve as a subject index and provides easy access to the information contained in the book.

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### NOTICE

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Final determination of the suitability of any information or procedure for use contemplated by any user, and the manner of that use, is the sole responsibility of the user. The reader is warned that caution must always be exercised when dealing with toxic waste materials, and expert advice should be sought at all times.

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