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Introduction

Industrialized countries all over the world are facing the serious aftermath of rapid development that has taken place in the last few decades. In recent years, environmental awareness and recycling regulations have been putting pressure on many manufacturers and consumers, forcing them to produce and dispose of products in an environmentally responsible manner. Government regulations are becoming more persuasive and thus many manufacturers feel the pressure to use recycled materials whenever possible. Occasionally they are even required to take care of their products at the end of their useful lives. This has created a need to design products that are friendly toward the environment, and easy to disassemble and recycle. To that end, there is a need to develop algorithms, models, heuristics, and software for addressing recycling and other end of life issues (such as the economic viability and the logistic aspects of disassembly, recycling, and remanufacturing) for an ever-increasing number of discarded products.

Environmentally Conscious Manufacturing (ECM) is an emerging discipline that addresses the above-mentioned issues and is concerned with developing methods for manufacturing new products from conceptual design to final delivery and ultimately to product recovery and, as a last resort, end-of-life disposal such that all the environmental standards and requirements are satisfied.

The Fourth International Conference on Environmentally Conscious Manufacturing that took place in Philadelphia, Pennsylvania, USA, on October 26 and 27, 2004, attempted to do its part in addressing the above-mentioned needs. Both academicians and the industrial community in the United States and abroad participated in this timely conference. The conference provided a forum for the latest developments in the field of ECM.

This volume is a compilation of the papers selected for the conference. The papers included here represent the wide variety of fronts where research activities are taking place in the general area of ECM. Based on the quality and variety of papers included in this volume, it is clear that the conference was a success. It is my hope that this volume will inspire further research in ECM and motivate new researchers to get interested in this all too important field of study.

The conference and this volume would not have been possible without the devotion and commitment of the authors. They have been very patient in preparing their manuscripts. I would also like to express my appreciation for having been given the opportunity to organize and chair this conference. I especially want to thank the SPIE staff for providing seamless support in unraveling all of the obstacles that arose in putting the conference and this volume together.

Surendra M. Gupta

