

Int J Adv Manuf Technol (2014) 70:1403–1413
DOI 10.1007/s00170-013-5373-3

ORIGINAL ARTICLE

Development of decision support system for fastener selection in product recovery oriented design

Raja Ariffin Raja Ghazilla · Zahari Taha ·
Sumiani Yusoff · Salwa Hanim Abdul Rashid ·
Novita Sakundarini

Received: 4 October 2011 / Accepted: 27 September 2013 / Published online: 22 October 2013
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Abstract Among the important strategies in sustainable product development is by maintaining product recovery and prolonging product life which are highly dependent on the ease of disassembly. When considering the design for disassembly, there are many fastener-associated factors to be considered such as structural, disassembly process and the pre-disassembly process. There are very few designs for disassembly methods that support the selection of fasteners for design for disassembly (DfD) concepts. Most of the tools developed are more applicable during later stages of the design process when more product information is available. The process of selecting a fastener for its functional characteristics itself is often vague. Additionally, the requirements for disassemblability further complicate the process. This paper proposes the development of a multi-criteria decision making model to assist designers in selecting fasteners for DfD. PROMETHEE was used to build a decision-making model to help the designers in selecting the fasteners that could perform their intended functions with ease of disassembly. A design case study is described to reflect the usefulness of the fasteners selection model.

Keywords Design for disassembly · Product recovery · Fasteners selection · Decision-making model · PROMETHEE

R. A. R. Ghazilla (✉) · S. Yusoff · S. H. A. Rashid · N. Sakundarini
Centre for Product Design and Manufacturing, University of Malaya,
Kuala Lumpur 50603, Malaysia
e-mail: rajaariffin@gmail.com

Z. Taha
Faculty of Manufacturing Engineering and Management
Technology, University Malaysia Pahang, Kuantan, Malaysia