

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

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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

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