

Characterization of Mobile Phone Cases for Remanufacturing Purpose

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Abstract. Remanufacturing is a process when used product or core is brought to 'like-new' condition, might be with an upgrade in performance. This process complies with technical specifications, including engineering, quality and testing standards. It yields a fully warranted product. The purpose of this study is to conduct an initial study on the feasibility of remanufacturing specifically on the mobile phone cases to provide information and consideration for a firm that would conduct remanufacturing of mobile phones. A material characterization on the mobile phone cases is performed to analyze the material structure for remanufacturing consideration. The results show that mobile phone cases are not suitable for remanufacturing, based on the material analysis, process difficulty, as well as cost projection.

Key words: remanufacturing; mobile phone cases; case study; material characterization.

1 Introduction

Rapid development in mobile phone technology during 2007 to 2017 has resulted in so many brands and types of mobile phones in the market, which further has shorten the usage phase of mobile phones. Furthermore, the number of discarded mobile phones increases significantly, either from damaged mobile phones or merely outdated models, which will become electronic wastes or e-waste. According to Baldé et al. [1], e-waste reaches 41.8 million tons in the world consisting of 1 million tons of waste lamps, 3 million tons of small electronic goods waste, 6.3 million tons of electronic display, 7 million tons of temperature control waste, 11.8 million tons of large electronic equipment waste and 12.8 million tons of small electronic equipment. Mobile phone is categorized as small electronic goods. Therefore, one way to overcome the waste problem is by performing remanufacturing.

According to Franke et al. [2], Tong [3], and Rathore et al. [4], remanufacturing is a promising recovery process for electronic products and mobile phones. Other studies by Guide et al. [5], Xing et al. [6], and Kwak & Kim [7] show that it is profitable.

Remanufacturing is a process when used product or core is brought to 'like-new' condition, might be with an upgrade in performance ([8], [9], [10]). This process complies with technical specifications, including engineering, quality and testing standards. It produces a product that provides similar guarantee to the new one. Remanufacturing is one

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