

ABSTRACT

PT. Bara Sinar Sejahtera is a coconut shell charcoal briquette manufacturing company facing challenges in maintaining its product quality. During the observation period of January–February 2025, a high percentage of product defects was identified, primarily related to ash content exceeding the SNI (Indonesian National Standard), imperfect briquette shapes, and broken briquettes. This study aims to analyze the root causes of these product defects and propose improvements using the Six Sigma methodology with the DMAIC (Define, Measure, Analyze, Improve, Control) approach. The Define and Measure phases indicated that 75% of the defects stemmed from high ash content, with the remainder resulting from imperfect shapes and broken briquettes. Based on calculations, the Defects Per Million Opportunities (DPMO) was 105,935.66, and the sigma level was 2.77, indicating that the production process still has low quality capability and requires continuous improvement. Further analysis using Pareto diagrams, fishbone diagrams, and FMEA revealed that the main sources of problems originated from material and measurement factors. Based on this analysis, several improvement proposals were developed during the Improve phase, including establishing raw material specification standards, implementing workplace cleanliness SOPs, and conducting internal testing using simple tools. In the Control phase, an improved p-control chart was designed as a monitoring tool, and various supporting documents proposed during the Improve phase were prepared to strengthen the quality control system in a sustainable manner. Since this research focused on identifying root causes and designing improvement strategies, the proposed improvements were not implemented directly. However, they have been systematically arranged and can serve as a reference for the company. The results of this study demonstrate that the Six Sigma approach can be used systematically to identify root causes and design quality improvement strategies..

Keywords: *Briquette charcoal, DMAIC, ash content, product quality, Six Sigma.*