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Impact of Infill Design on Strength for ABS Material Samples Using Fused Deposition Modelling

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Authors:
Amirul Shahmie,
Mohd Haziq Zakaria. mohdhaziq@unikl.edu.my

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Abstract:
The aim of this research is to study the impact of infill design on product strength. To achieve the aim of the research, the objective of this research is to identify and select several types of infill pattern in printing a product, and to find the best parameter in printing a product for this study. The research experiment was designed using the Taguchi method L9 orthogonal array to find the best parameter on printing a strong product. The factors that were selected by referring to journals and articles to print the specimen in this research are infill pattern, infill density, and extrusion temperature. The specimen was printed and underwent impact test to find the specimen that can absorb highest impact energy to determine the best combination of parameter for this research. Minitab software was used to determine the signal to noise (S/N) ratio, main effect plot, and analysis of variance (ANOVA). S/N ratio analysis shows that the infill pattern of grid, infill density of 80%, and extrusion temperature of 240 °C is the best parameter of printing a strong product. This research concludes that infill design did influence the strength of printed material using fused deposition modelling.