

Innovative in 3D Printing: Design and Simulation an Innovative Beverage Cup towards Green Environment using SOLIDWORKS

Abstract

Recently, the acceleration and popularization of beverages in the catering trade are rising. Since the increase in the number of beverages, the use of single-used products is increasing. Gradually, plastic waste or plastic pollution had become a sparked issue and discussion around the world. 3D printing technology and simulation had discussed and utilized in this research. 3D printing technology and simulation often provide beneficial in innovative and improving the existing product. 3D printing technology usually applied in the design, manufacture, and engineering industries. This research aims to create and simulate an innovative beverage cup that can improve the green-environment by using SOLIDWORKS software. Before started design, data collection and idea forming had progress. Observation had used to observe and monitor the existing product. In this research, SOLIDWORKS used as the main CAD software to structure and sketch the 3D model or virtual prototype as well as simulate the 3D model that had designed. For the simulation part, finite element analysis (FEA) was applied, which is drop test analysis to evaluate and estimate the stress, displacement, and strain analysis of the virtual prototype. To evaluate the prototype's durability, the drop test analysis tested by dropping from 4 meter height and 9.81 m/s^2 in gravity. In the end, an actual prototype had fabricated. The result shows the output of this research assist to improve the design towards green environment. The finding of this research concerns the comparison between the existing products and the new actual prototype within the design, function, and green-environment.