

Optimasi proses layer manufaktur dalam pembuatan obyek 3D menggunakan metode response surface

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Abstrak

Layer manufacturing methods have been used widely in many manufacturing industries for building a three dimensional object (3D), however, those methods still need improvement. One example of the improvement is process parameters of the second generation Glue Extruded Deposition (GED-2) developed by the author at the Department of Mechanical and Industrial Engineering UGM. A Surface Response method has been applied to investigate the optimum setting of process parameters include: scanning speed (V), scanning space (s), gap between working table surface and nozzle (h), and heating temperature of material (T). While, a model as a 3D object was a cube and the material for building the object was Ethylene Vinyl-Acetate (EVA) in the form of cylinder with 10 mm diameter and 100 mm long. The results show that the best dimension as recommended by surface response method were 0.8749 mm wide and 0.7035 mm thick. Other recommendations were excess dimension due to scanning was 0.37 mm long and the best setting of process parameters were $h = 0,64$ mm, $V = 80$ mm/minute and $T = 94^{\circ}\text{C}$.