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PARAMETERS OPTIMIZATION OF 3D PRINTING BIOMATERIAL

M.K.A Ariffin^{1*}, Nor Aiman Sukindar²

¹Department of Mechanical and Manufacturing Engineering, Serdang, 40430, Malaysia

²Mechanical Department of Politeknik Kuching, Sarawak, Malaysia

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*Corresponding author:

Nor Aiman Sukindar

Email:

aiman@poliku.edu.my

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SUMMARY

Biomaterials have played significant roles in medical application due to ability to dissolve in human tissue. This will avoid the needs of removing the attached material in the human body especially related to the accident surgery. The surgery usually will require a customized measurement of the artificial bones for the patient and this can be achieved by the application 3D printer technology. Most of the 3D printer that currently available in the market is made for the commercial and domestic usage and very rare for the medical application. The fundamental of the 3D printer is really on the processing parameters for specific materials. Therefore, it is necessary to determine the optimized processing parameters for the biomaterials especially in producing the porous bone structure. In this study the authors have selected the PMMA as the biomaterial for 3D printer. For the porous materials the contributor factors are air gap, raster angle and layer thickness. From the study it was found that percentage infill of 70% giving the compressive strength of 6Mpa to 7Mpa which is ideal for trabecular bone application. It is concluded that the percentage infill is the major contributor for producing the porous biomedical material.