IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, April 2022
Impact Factor: 6.252

Effect of Process Parameters on Different Properties of 3D Printed PETG Parts Prepared Using FDM

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Abstract: *This study has been undertaken to give a review of polyethylene terephthalate glycol (PETG) material used in fused deposition modelling (FDM). It offers a review of the existing literature on PETG material. The objective of the paper is to providing guidance on different process parameters that can be used to improve strength of the part by performing various testing like tensile, compressive, flexural etc. This research targets to find new paths that can be used for further development of use of fiber reinforcement in PETG material.*

Keywords: FDM, PETG, Process Parameters, Mechanical Properties

REFERENCES

[1]. R. Srinivasan, W. Ruban, A. Deepanraj, R. Bhuvanesh, and T. Bhuvanesh, "Effect on infill density on mechanical properties of PETG part fabricated by fused deposition modelling," in Materials Today: Proceedings, Jan. 2020, vol. 27, pp. 1838–1842. doi: 10.1016/j.matpr.2020.03.797.

[2]. R. Srinivasan, K. Nirmal Kumar, A. Jenish Ibrahim, K. v. Anandu, and R. Gurudhevan, "Impact of fused deposition process parameter (infill pattern) on the strength of PETG part," in Materials Today: Proceedings, Jan. 2020, vol. 27, pp. 1801–1805. doi: 10.1016/j.matpr.2020.03.777.

[3]. R. Srinivasan, P. Prathap, A. Raj, S. A. Kannan, and V. Deepak, "Influence of fused deposition modeling process parameters on the mechanical properties of PETG parts," in Materials Today: Proceedings, Jan. 2020, vol. 27, pp. 1877–1883. doi: 10.1016/j.matpr.2020.03.809.

[4]. K. Durgashyam, M. Indra Reddy, A. Balakrishna, and K. Satyanarayana, "Experimental investigation on mechanical properties of PETG material processed by fused deposition modeling method," in Materials Today: Proceedings, 2019, vol. 18, pp. 2052–2059. doi: 10.1016/j.matpr.2019.06.082.

[5]. T. Panneerselvam, S. Raghuraman, and N. Vamsi Krishnan, "Investigating Mechanical Properties of 3D-Printed Polyethylene Terephthalate Glycol Material Under Fused Deposition Modeling," Journal of The Institution of Engineers (India): Series C, vol. 102, no. 2, pp. 375–387, Apr. 2021, doi: 10.1007/s40032-020-00646-8.

[6]. M. M. Hanon, R. Marczis, and L. Zsidai, "Anisotropy evaluation of different raster directions, spatial orientations, and fill percentage of 3d printed petg tensile test specimens," in Key Engineering Materials, 2019, vol. 821 KEM, pp. 167–173. doi: 10.4028/www.scientific.net/KEM.821.167.

[7]. A. Jaisingh Sheoran and H. Kumar, "Fused Deposition modeling process parameters optimization and effect on mechanical properties and part quality: Review and reflection on present research," in Materials Today: Proceedings, 2020, vol. 21, pp. 1659–1672. doi: 10.1016/j.matpr.2019.11.296.

[8]. D. Yadav, D. Chhabra, R. K. Gupta, A. Phogat, and A. Ahlawat, "Modeling and analysis of significant process parameters of FDM 3D printer using ANFIS," in Materials Today: Proceedings, 2020, vol. 21, pp. 1592–1604. doi: 10.1016/j.matpr.2019.11.227.

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[9]. J. M. Barrios and P. E. Romero, "Improvement of surface roughness and hydrophobicity in PETG parts manufactured via fused deposition modeling (FDM): An application in 3D printed self-cleaning parts," Materials, vol. 12, no. 15, Aug. 2019, doi: 10.3390/ma12152499.

[10]. M. H. Hsueh et al., "Effect of printing parameters on the thermal and mechanical properties of 3d-printed pla and petg, using fused deposition modeling," Polymers (Basel), vol. 13, no. 11, Jun. 2021, doi: 10.3390/polym13111758.

[11]. A. Özen, D. Auhl, C. Völlmecke, J. Kiendl, and B. E. Abali, "Optimization of manufacturing parameters and tensile specimen geometry for fused deposition modeling (Fdm) 3d-printed petg," Materials, vol. 14, no. 10, May 2021, doi: 10.3390/ma14102556.

[12]. P. P. Agarwal, T. S. Dadmode, M. R. Kadav, A. P. Ogale, and P. P. Mangave, "Experimental Analysis of Mechanical properties of PETG Material 3D Printed Material by Using Fused Deposition Modelling Technique," 2020, doi: 10.5281/zenodo.3739793.

[13]. J. M. Mercado-Colmenero, M. Dolores La Rubia, E. Mata-Garcia, M. Rodriguez-Santiago, and C. Martin-Doñate, "Experimental and numerical analysis for the mechanical characterization of petg polymers manufactured with fdm technology under pure uniaxial compression stress states for architectural applications," Polymers (Basel), vol. 12, no. 10, pp. 1–25, Oct. 2020, doi: 10.3390/polym12102202.

[14]. S. Swetha, P. Morampudi, K. Aruna, P. & Putha, and P. Kumar, "Evaluation of Tensile Properties of 3D Printed Petg Specimen as per ASTM Standards." [Online]. Available: www.tjprc.org