

Energy Consumption: FDM materials: PLA vs. PETG vs. PHA.

Summary Report

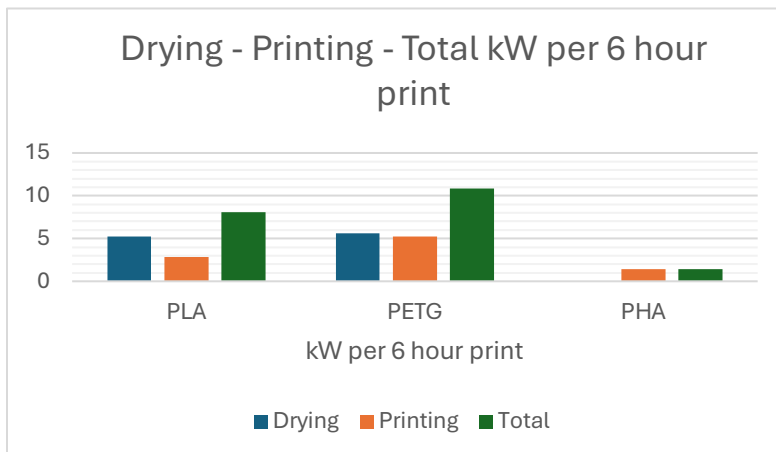
Fused Deposition Modeling (FDM) 3D printing is rapidly becoming a household staple, much like the introduction of personal computers in the early 1980s. This widespread adoption has been largely driven by the open-source community that initially pioneered this technology.



We compared the two most common FDM filaments, PLA and PETG, with PHA. We looked at the drying conditions needed and printed identical objects on the same printer with identical print speeds and parameters, other than those specific to the material behavior (melt temp, bed temp).

6 hours of drying followed by 6 hours of printing later:

Left to Right: PETG - PHA - PLA



Conclusion

Results: PHA print uses up to 5X less energy than PLA and 8X less than PETG.

With the cost of services increasing and environmental impacts. This can play a significant role for 3D printing farms.

3mf files are available here:

https://drive.google.com/drive/folders/1f-FlBvuN8J-vlNB75eLXuVfjyu2fn9AK?usp=drive_link

Link to full report: https://www.ecogenesisbiopolymers.com/s/Energy-Analysis-for-FDM-3D-Printing_v40_final-formatted-031125.pdf

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