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Laboratory examples in additive manufacturing

ISIM Timișoara

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Laboratory examples
Additive Manufacturing

The Additive Manufacturing Laboratory from ISIM Timișoara, it is equipped with high-end technology regarding the 3D printing sector.

It can provide modelling through CAD designing software from Solidworks and other learning educational platforms and creation of new part designs using by using additive manufacturing of different printing equipments.

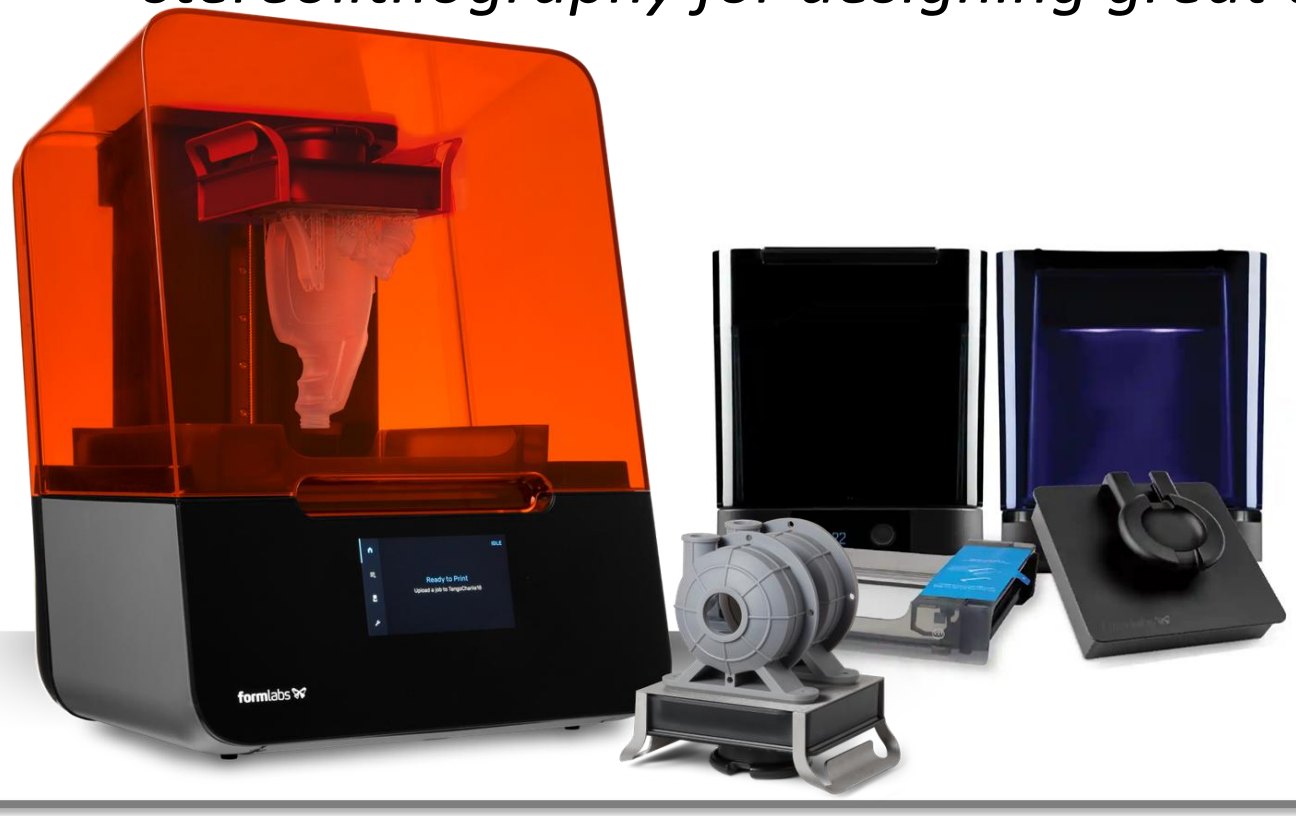
- *The equipments are:*

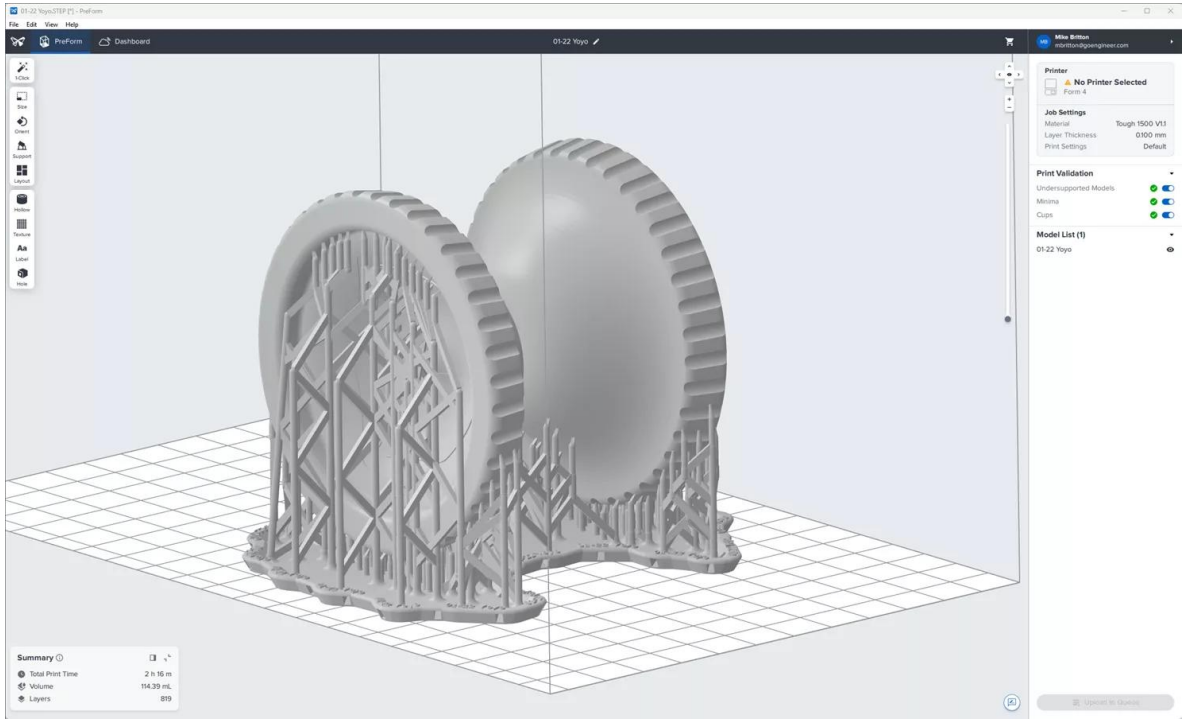
➢ *MARKFORGED x7 3D printer (2 extrusion heads known for the insertion of Kevlar fiber and other fibers)*



Laboratory examples
Technology using stereolitography

- *Resin Printer Formlabs3+ (it uses laser technology on stereolithography for designing great details on printing parts)*





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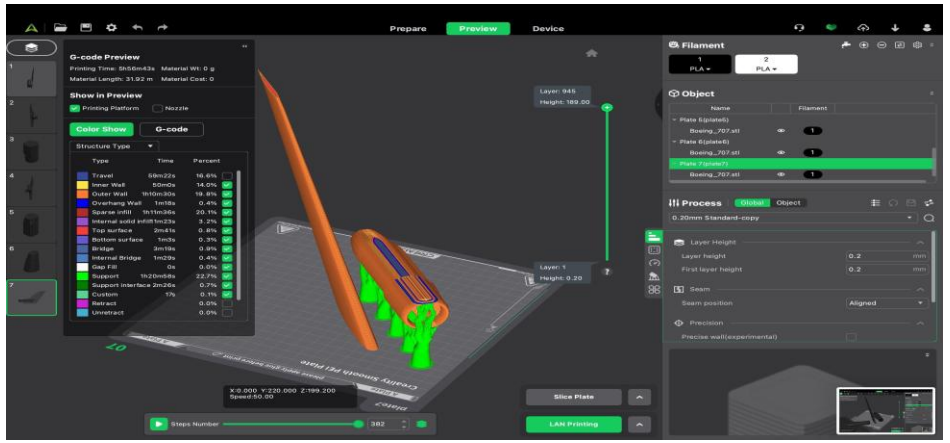
Laboratory examples
Technology with filament printers

- *Creality K2 PRO Combo (filament 3D printer which uses simultanously 4 filaments with different color, it is equipped with a system of reducing the vibrations and the hardened steel nozzle can melt filament of 1.7 mm of hardened polymers reinforced with metals or carbon fibers)*





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Practical sessions with students







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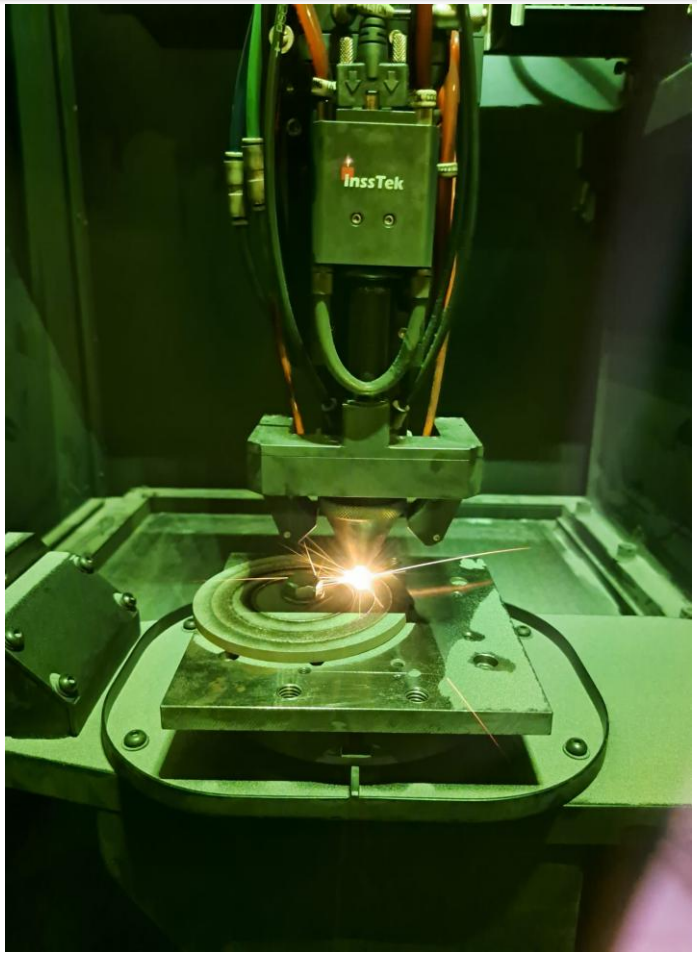
Laboratory examples
Technology using direct energy deposition of metal powders

- *InssTek MX-Mini (a 3D metal powder printer, it is known for the high precision in metal printing and it is powered by a feeder which contains 6 hoppers in which the new metal powders are mixed to create new super-alloys).*











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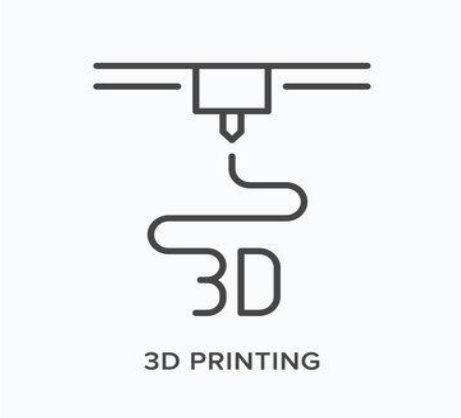
Laboratory examples
Additive Manufacturing – How It's Made?

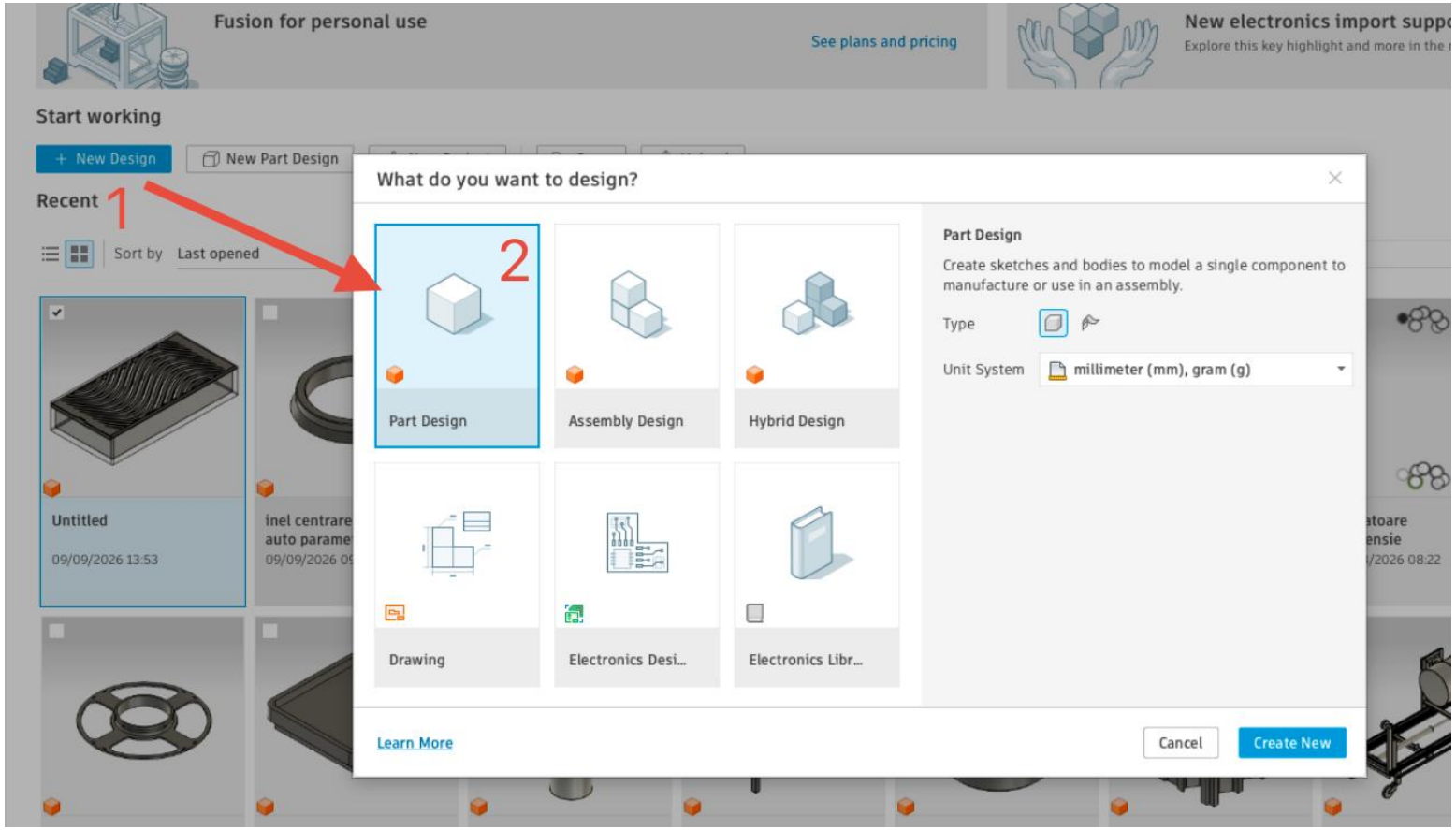
- *The 3D printing technology has in common:*
- *Modelling Softwares*
- *Designing Softwares*
- *Parametric optimisation Softwares (slicers)*





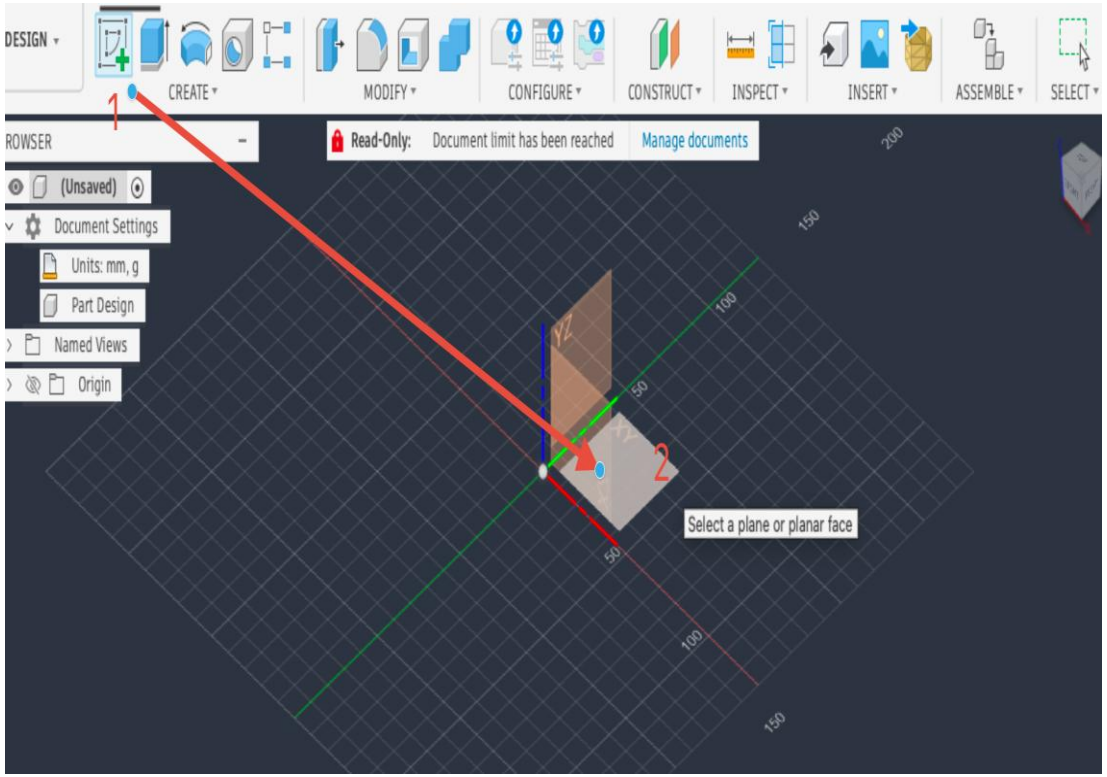
Laboratory examples
Additive Manufacturing – How It's Designed

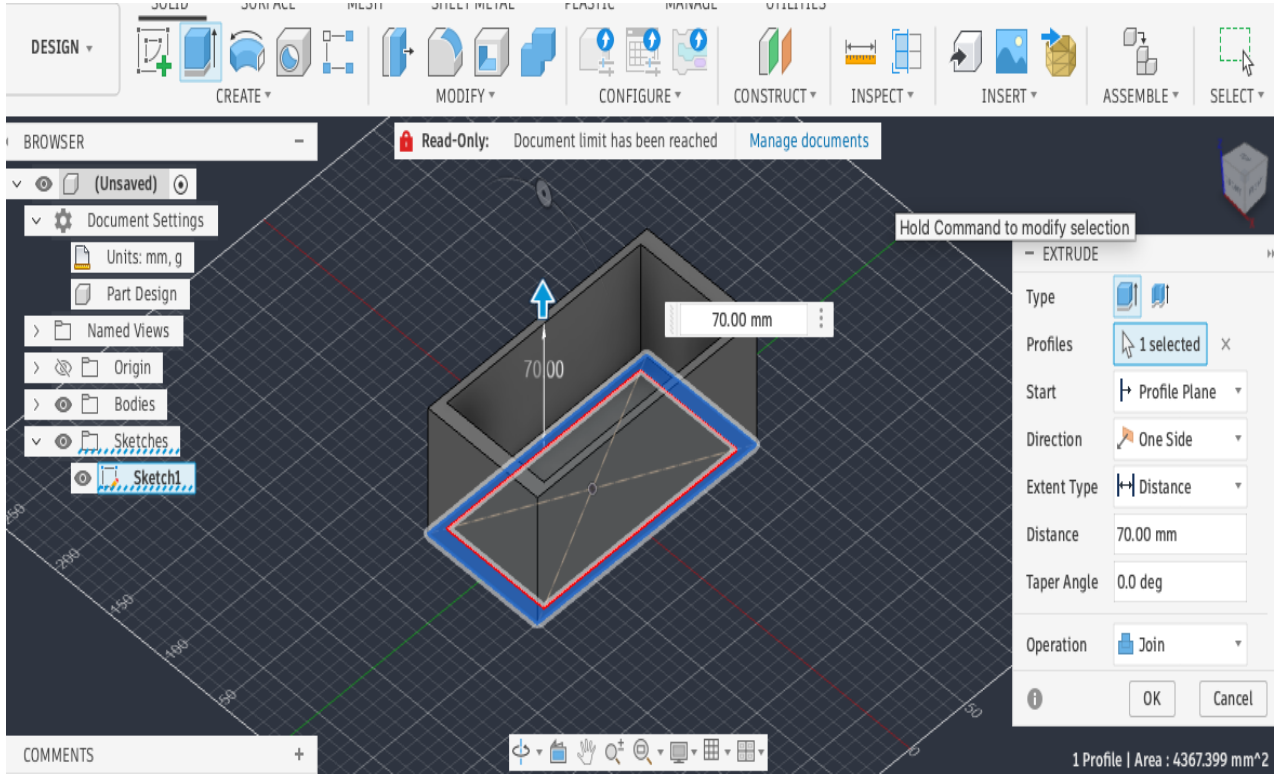
- *Modelling and design of the parts*
- *We begin by accessing the CAD program like Fusion360*
- *We start the design of a 2D sketch and dimensions and constraints*



Specific data save formats

- *Extrudation of the 2D sketch-part into 3D model and save it as a specific STEP/STL File to access the next step into SLICERS*





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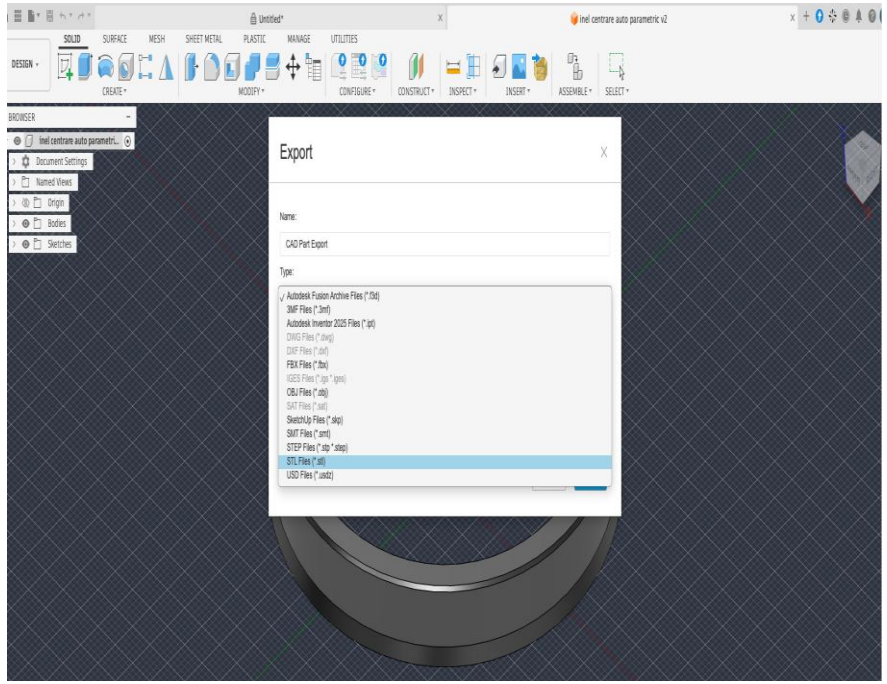
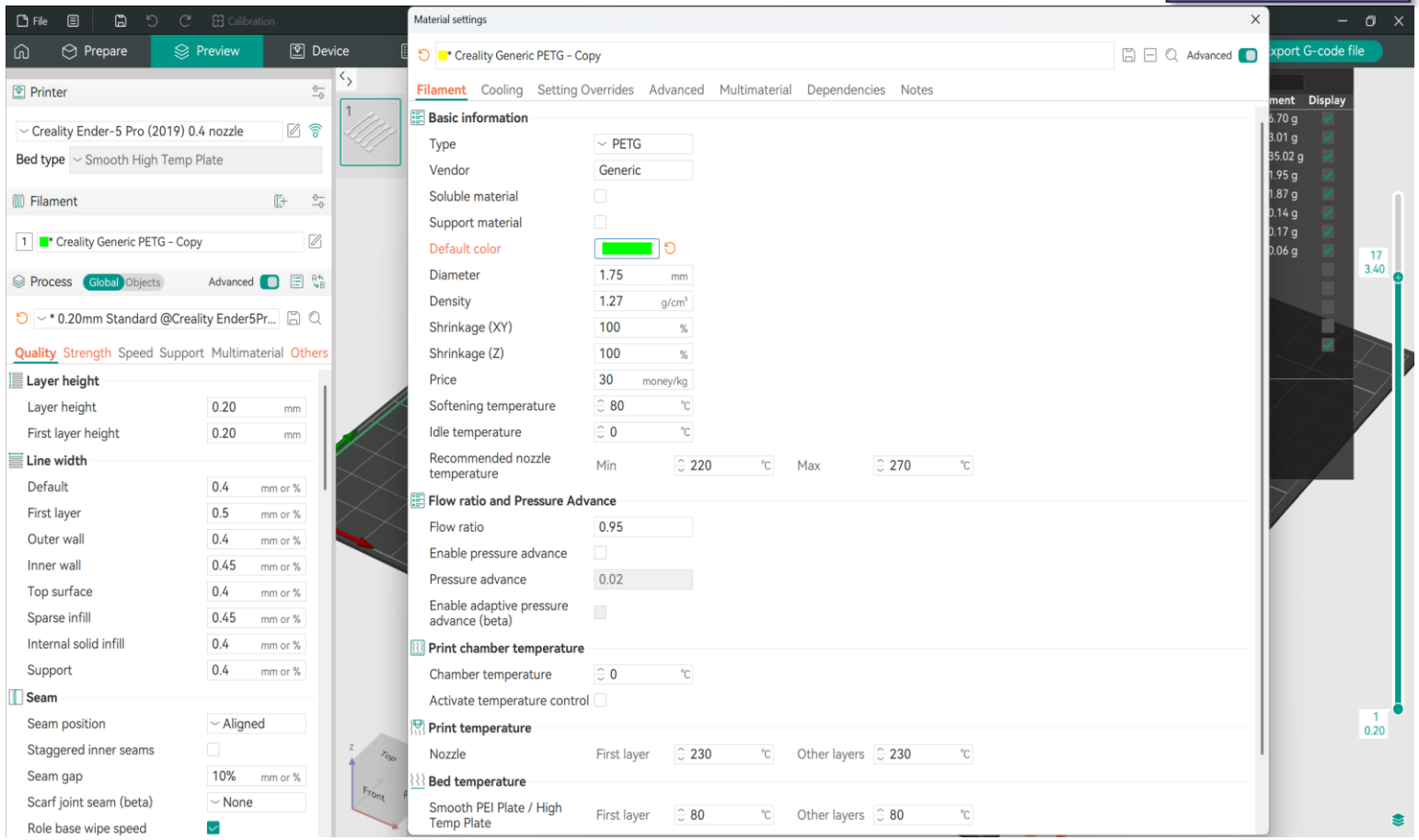
From 3d to STL and optimisation

In the slicer we begin to optimise the parameters of interest in temperature of the nozzle, bed temperature, layer height, number of walls, infill types, nozzle diameter used, supports and many others.
After the optimisation is made, we begin to insert the program to the printers and based on the G-Coding they will start to generate from 0 to Final Part in a specific time limit, based on the optimisation of the parameters.





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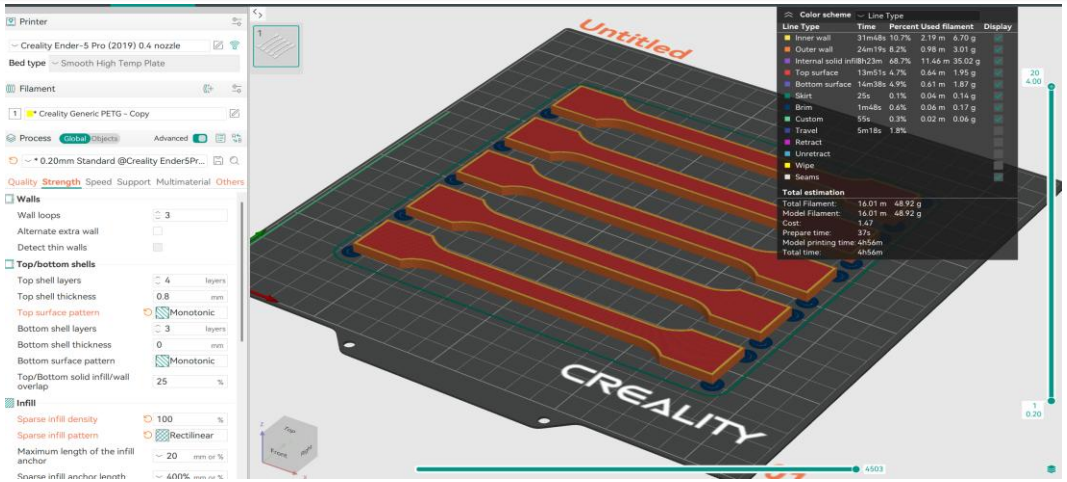
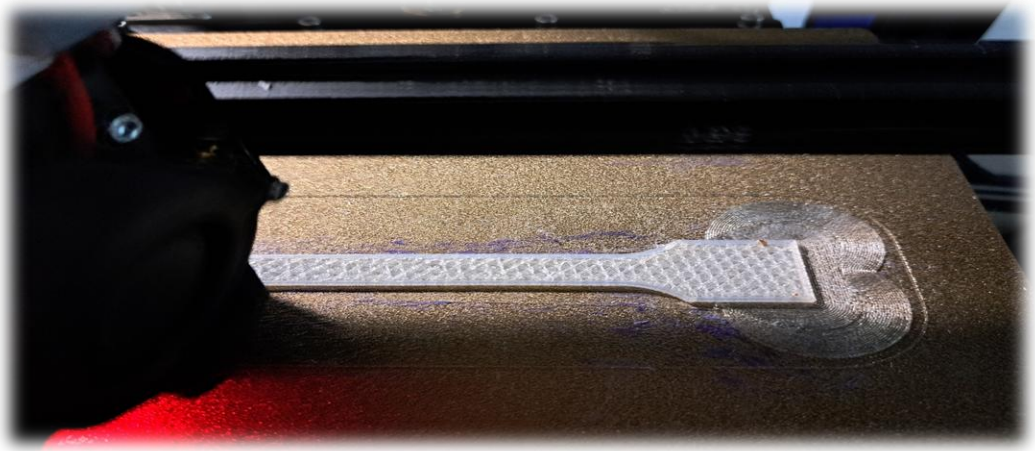
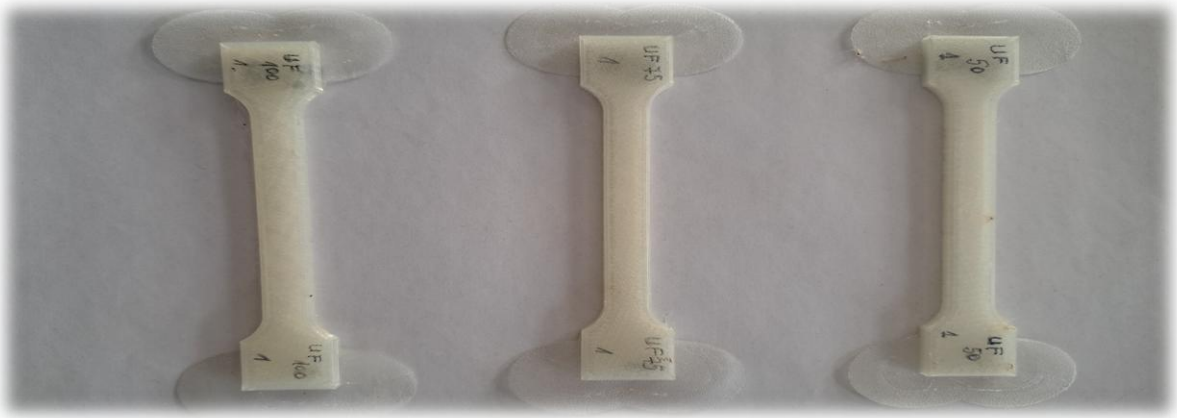
Final part & results









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Thank you!

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