HME-3DP MicroFactory

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Elke Prasad

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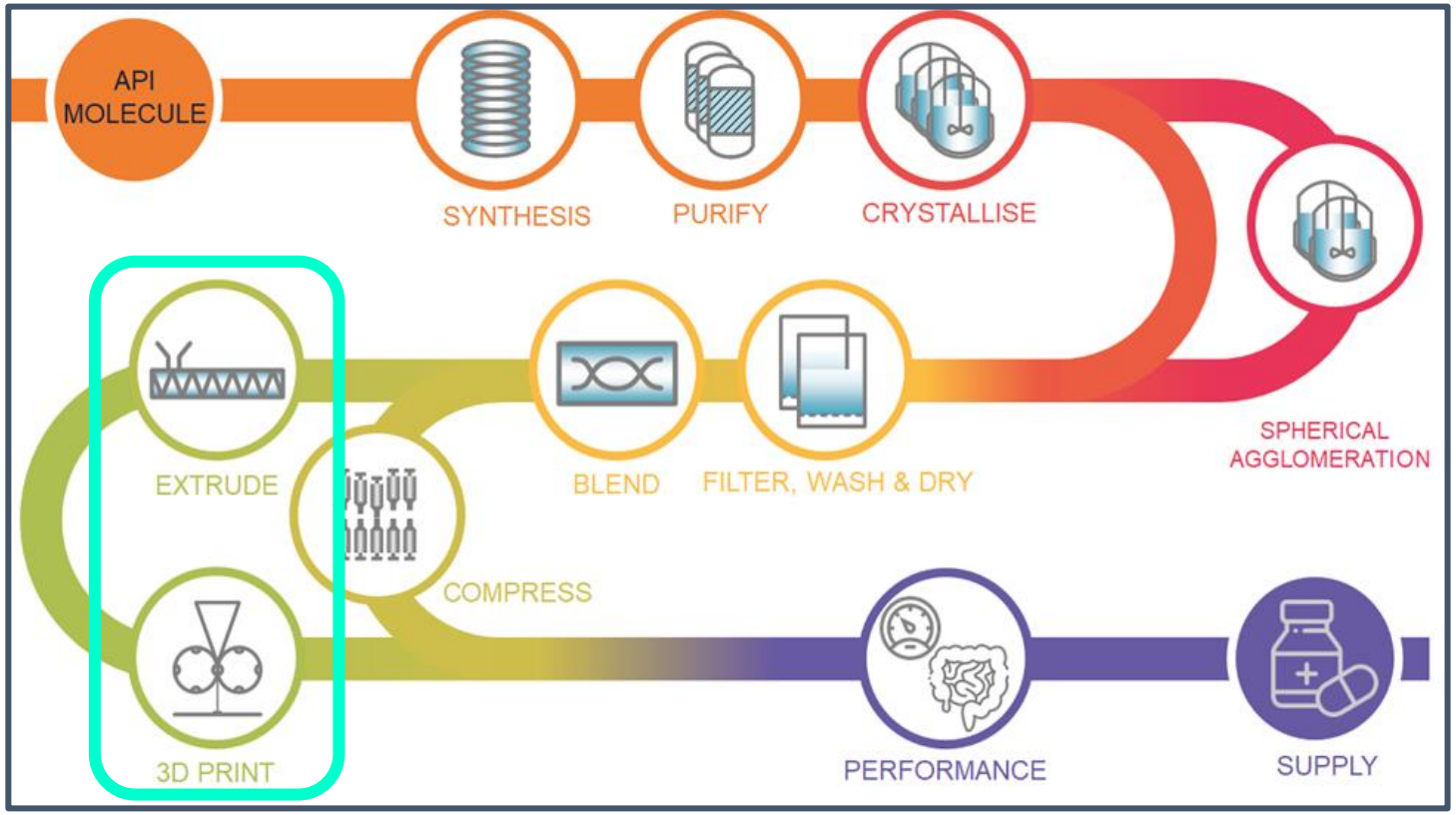
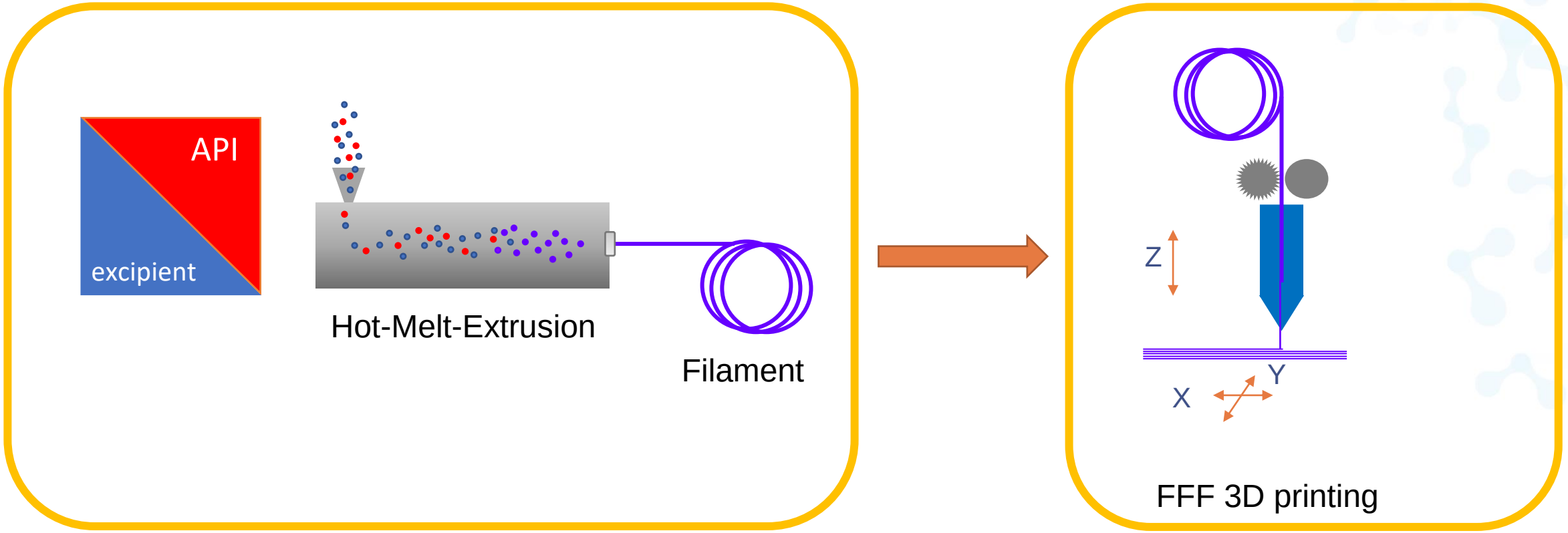
CMAC MicroFactory: HME-3DP

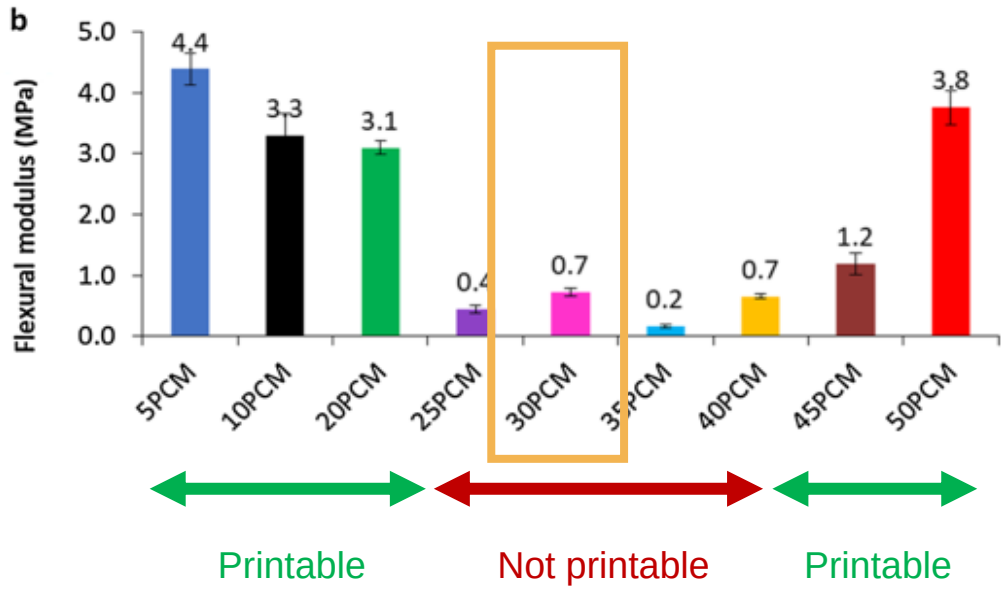


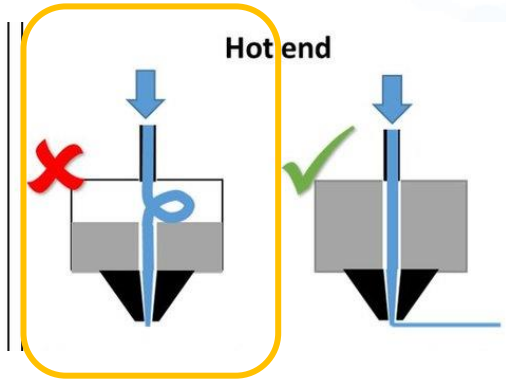
Fused Filament Fabrication (FFF) 3D Printing



Failure modes: Conventional FFF printer

5 – 50% w/w Paracetamol in Affinisol 15LV filaments for FFF 3D printing

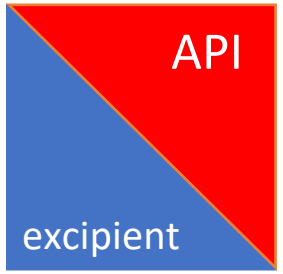


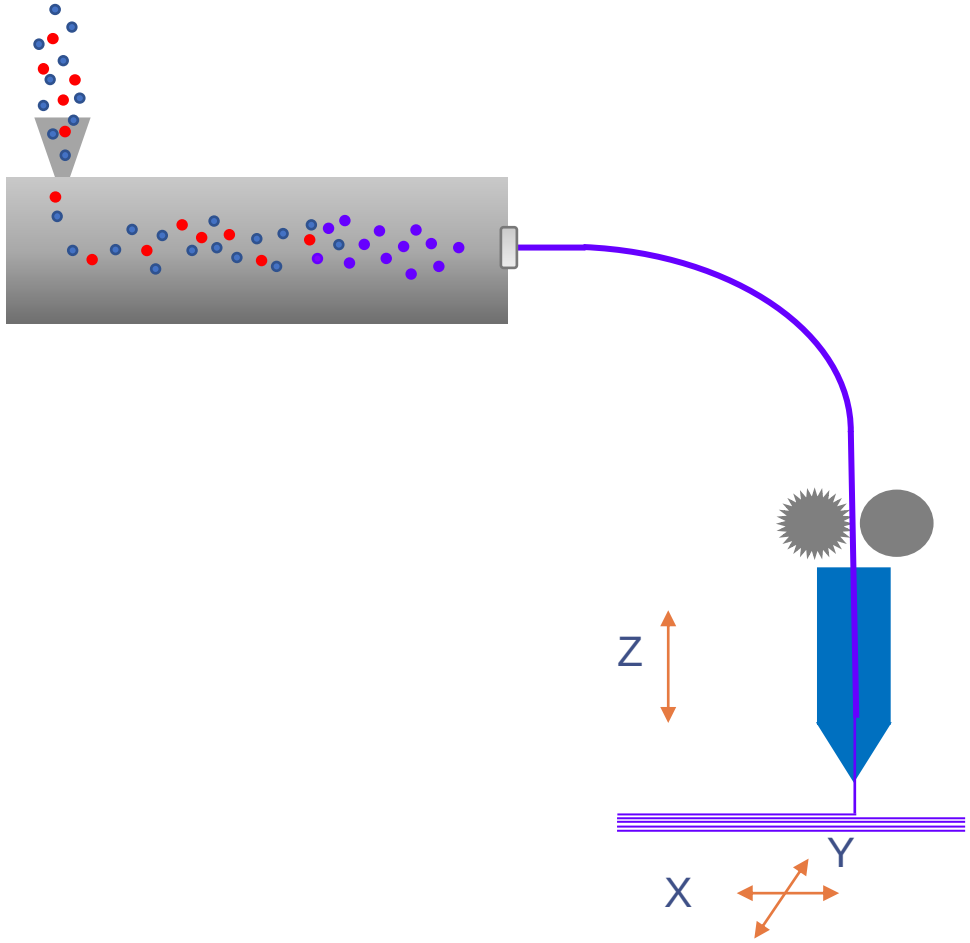


Prasad, E., M. T. Islam, D. J. Goodwin, A. J. Megarry, G. W. Halbert, A. J. Florence and J. Robertson (2019). Additive Manufacturing **29: 100776.**

Prasad et al, 2021 unpublished data

Filament Free FFF printer





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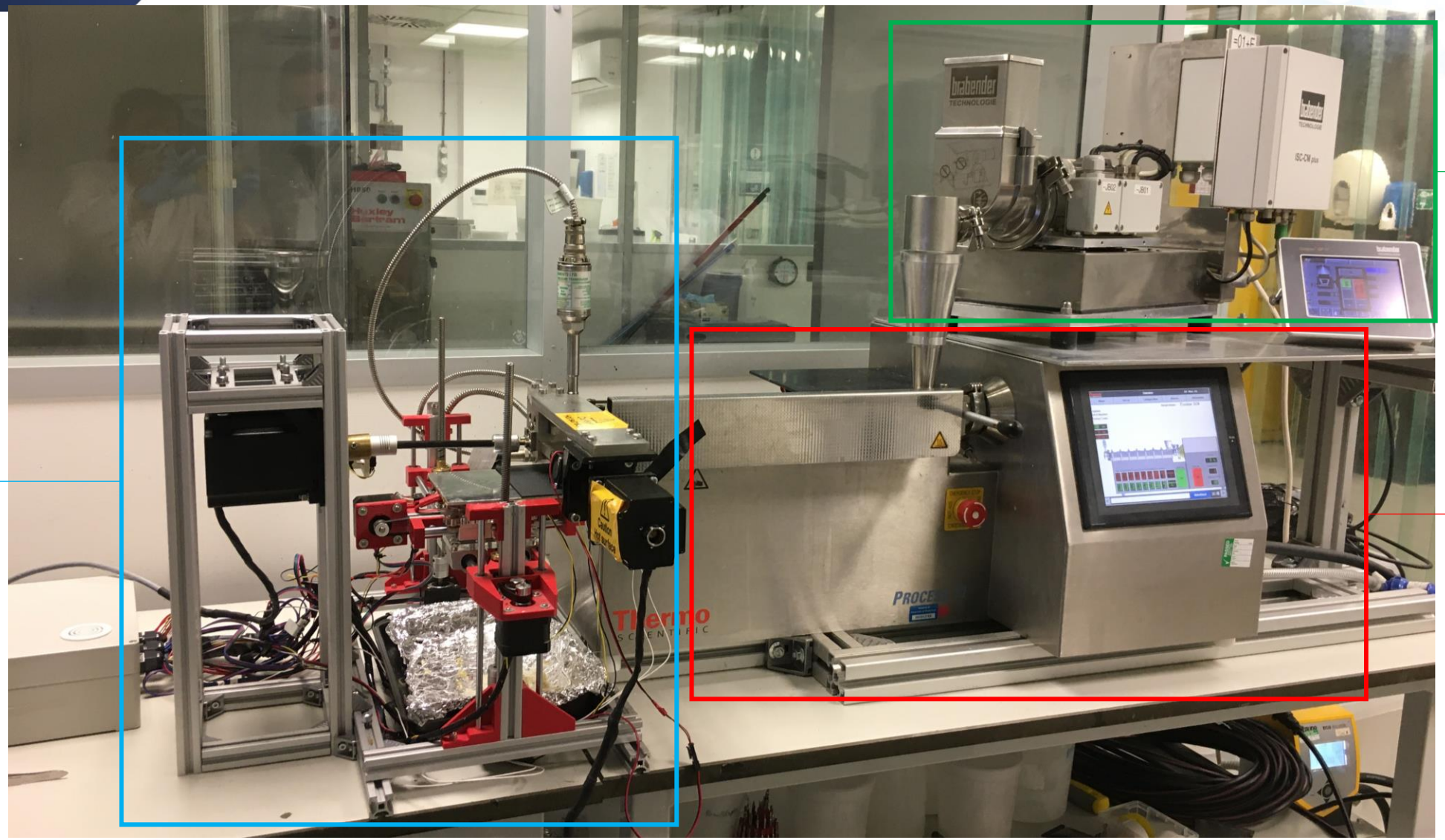
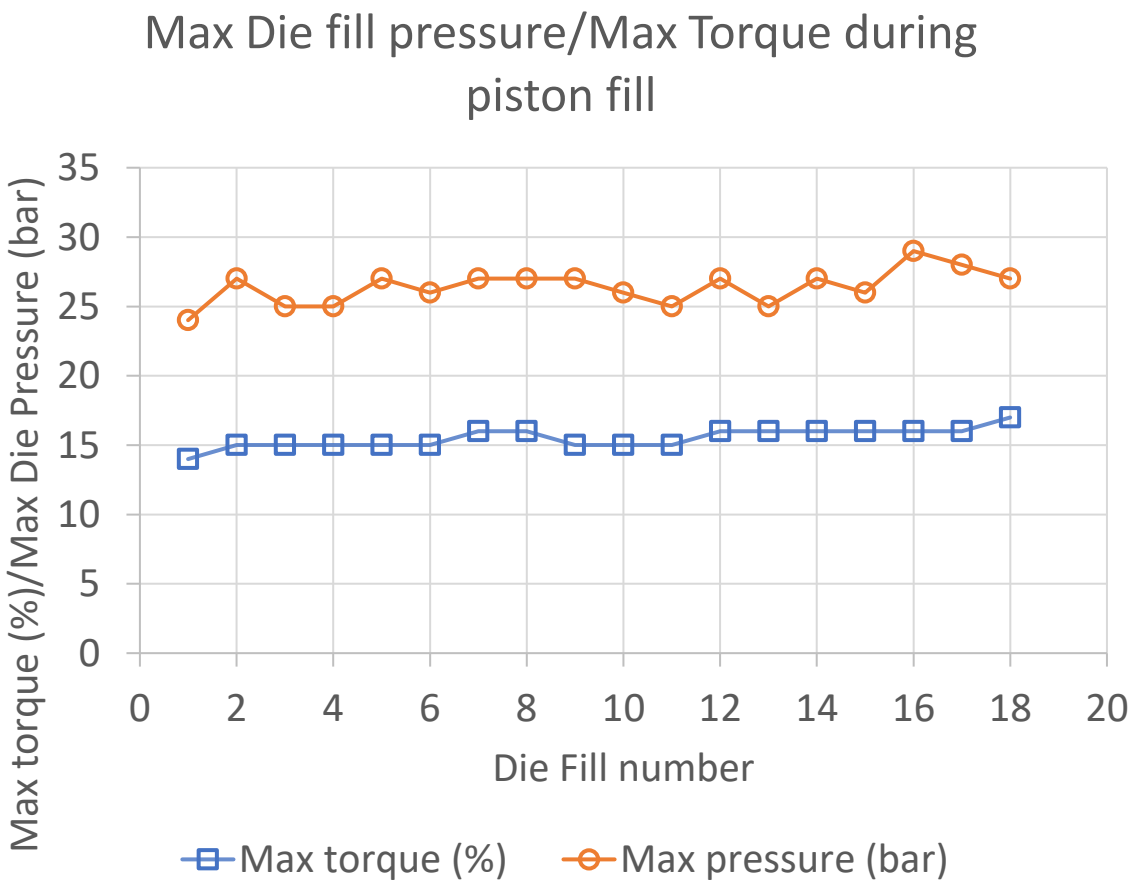


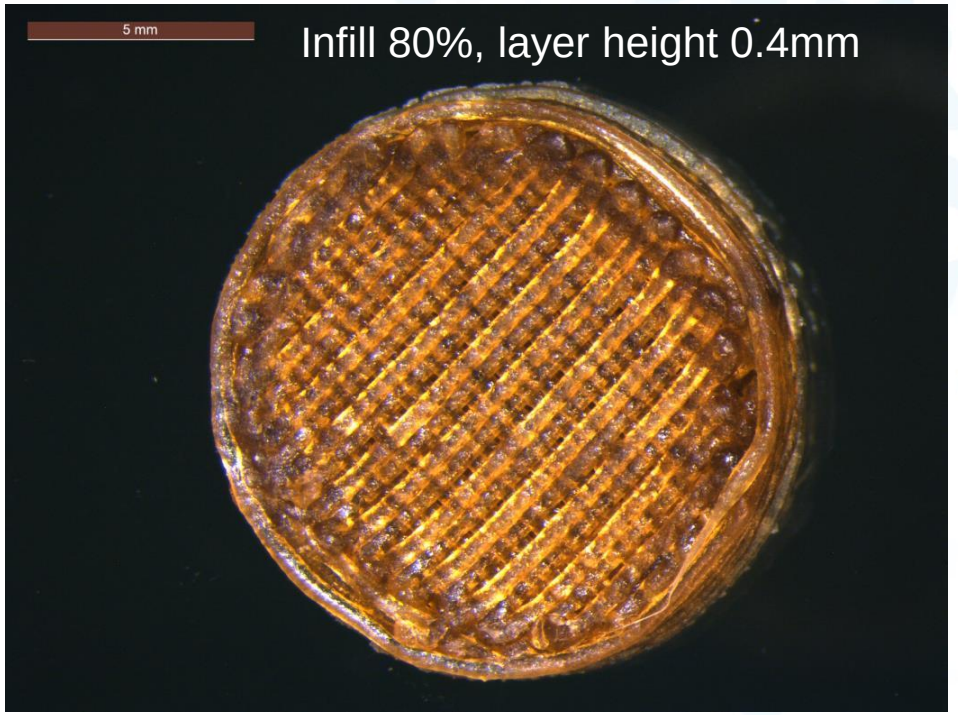
3DP

LIW feeder

HME Process 11

30PCM-Affinisol

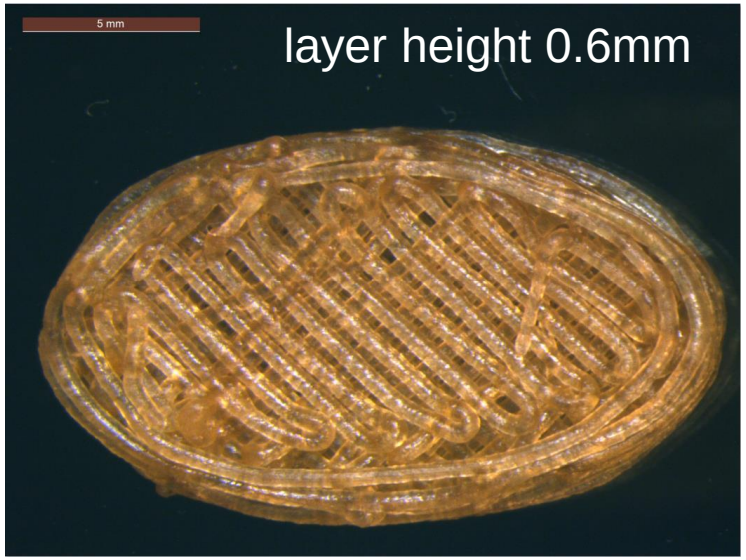


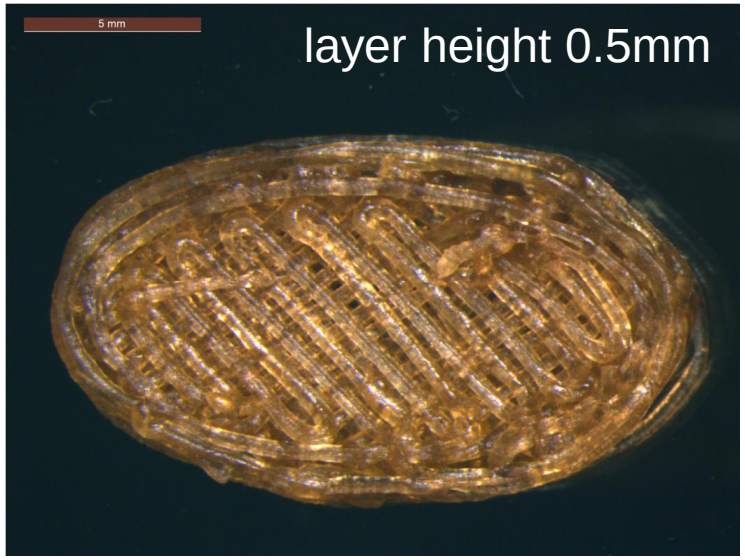


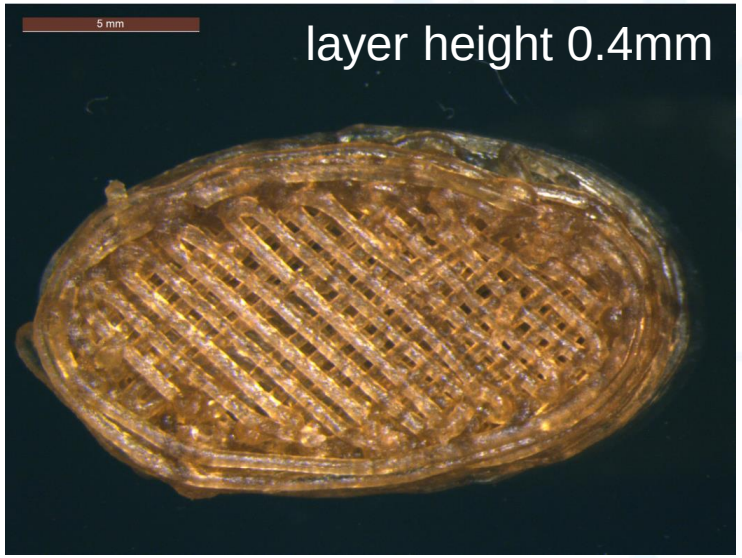
Print	weight (mg)	width (mm)	thickness (mm)
average	388.04	12.60	3.87
stdev	6.16	0.11	0.07
%RSD	**1.59**	**0.91**	**1.94**

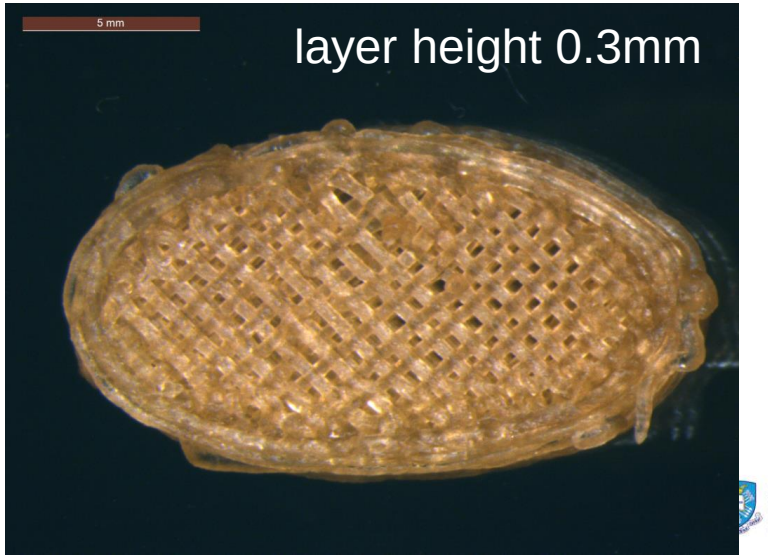
Batch reconciliation

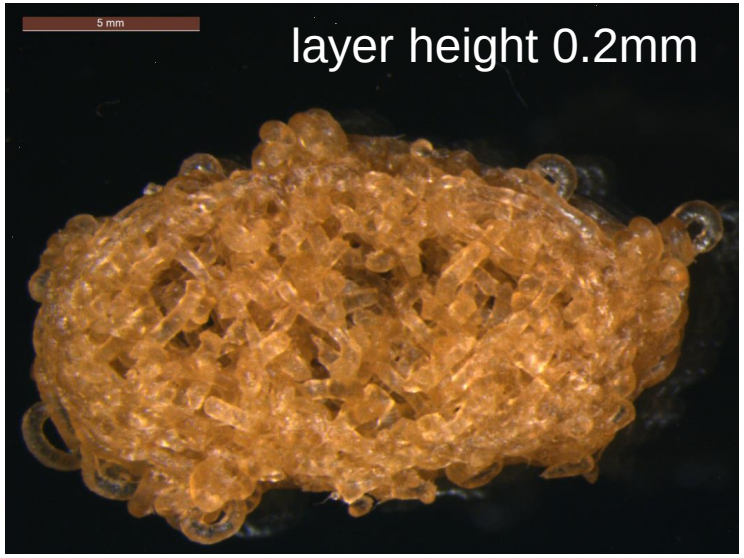
Operating Space: Layer Height





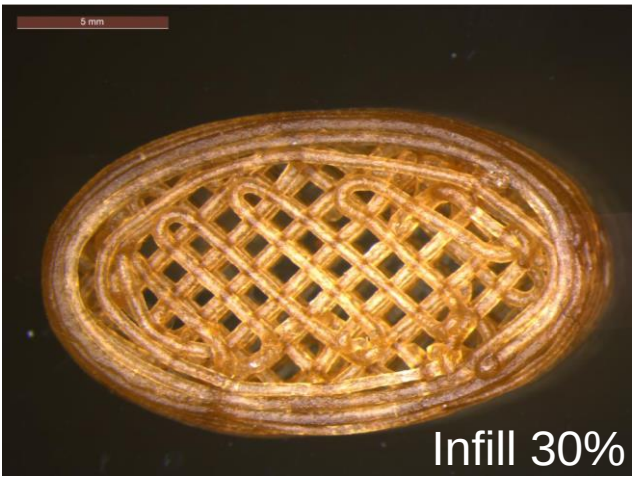


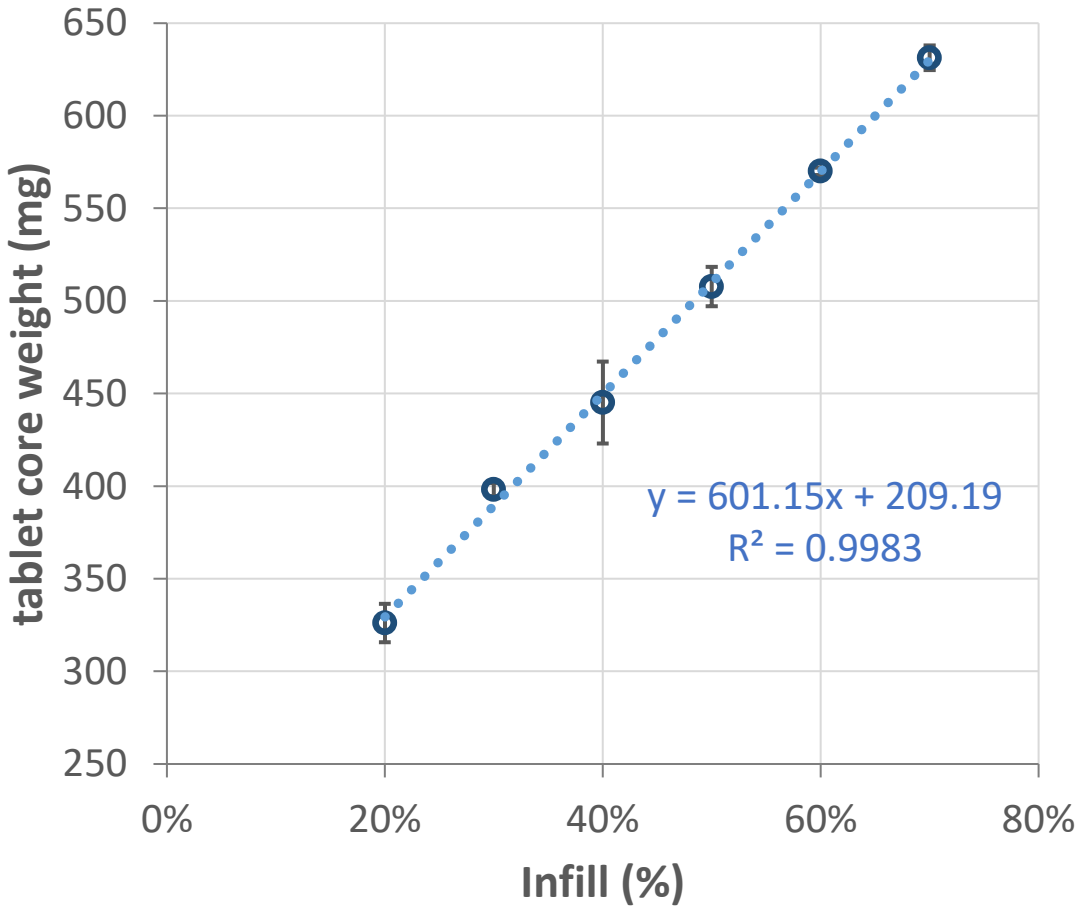




Layer height (mm)	Print speed (mm/s)	Infill %	Good quality
0.6 - 0.3	20	20-70	✓
0.6 - 0.2	40	n/a	✗

Infill versus weight





Conclusions

- Single step FFF process of a 30PCM-Affiniol formulation generated pharmaceutically acceptable oral dose forms
- The operating space for HME process parameters and slicer settings for processing the formulation on the novel printer were established
- Filament Free FFF printer opens up the pharmaceutical formulation space, facilitating a single, streamlined FFF process with reduced thermal load of the material

Acknowledgements

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- CMAC
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