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School of Electrical
Engineering

Single wafer box with support for wafer quarters

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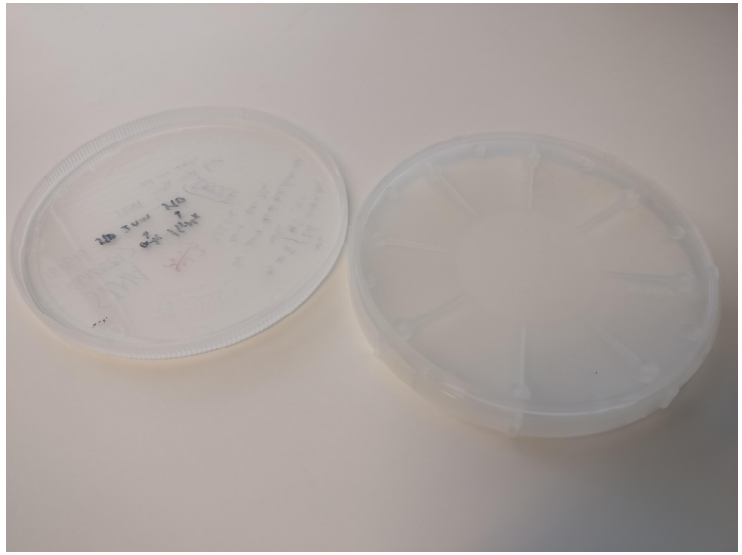
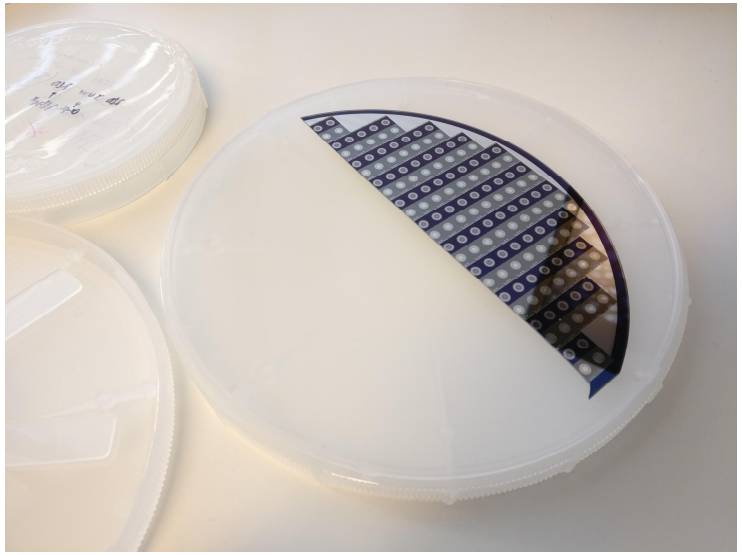
ELEC-L3999: 3D Printing of Open Source Hardware for Science
20.10.2017

Motivation

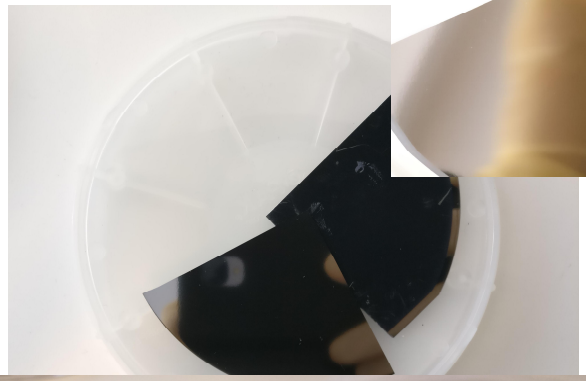
Single wafer boxes are a handy way to pack wafers securely e.g. during shipping or to store valuable samples separately.

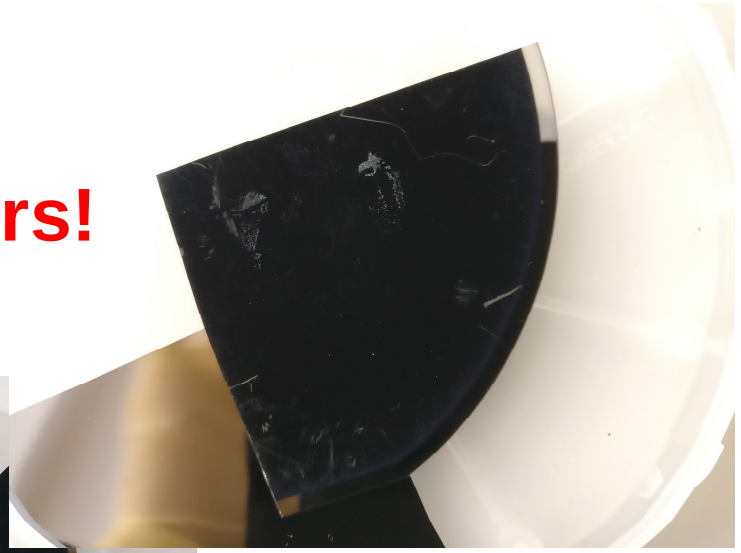


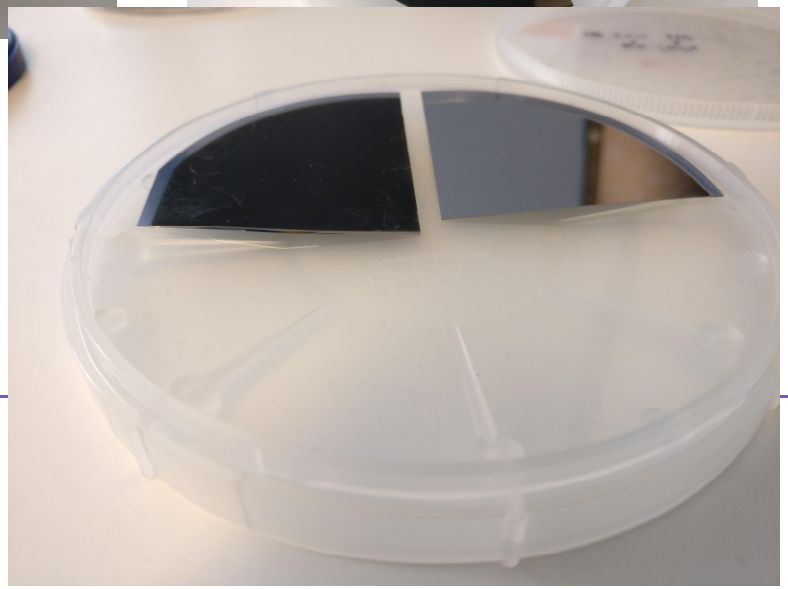


Motivation

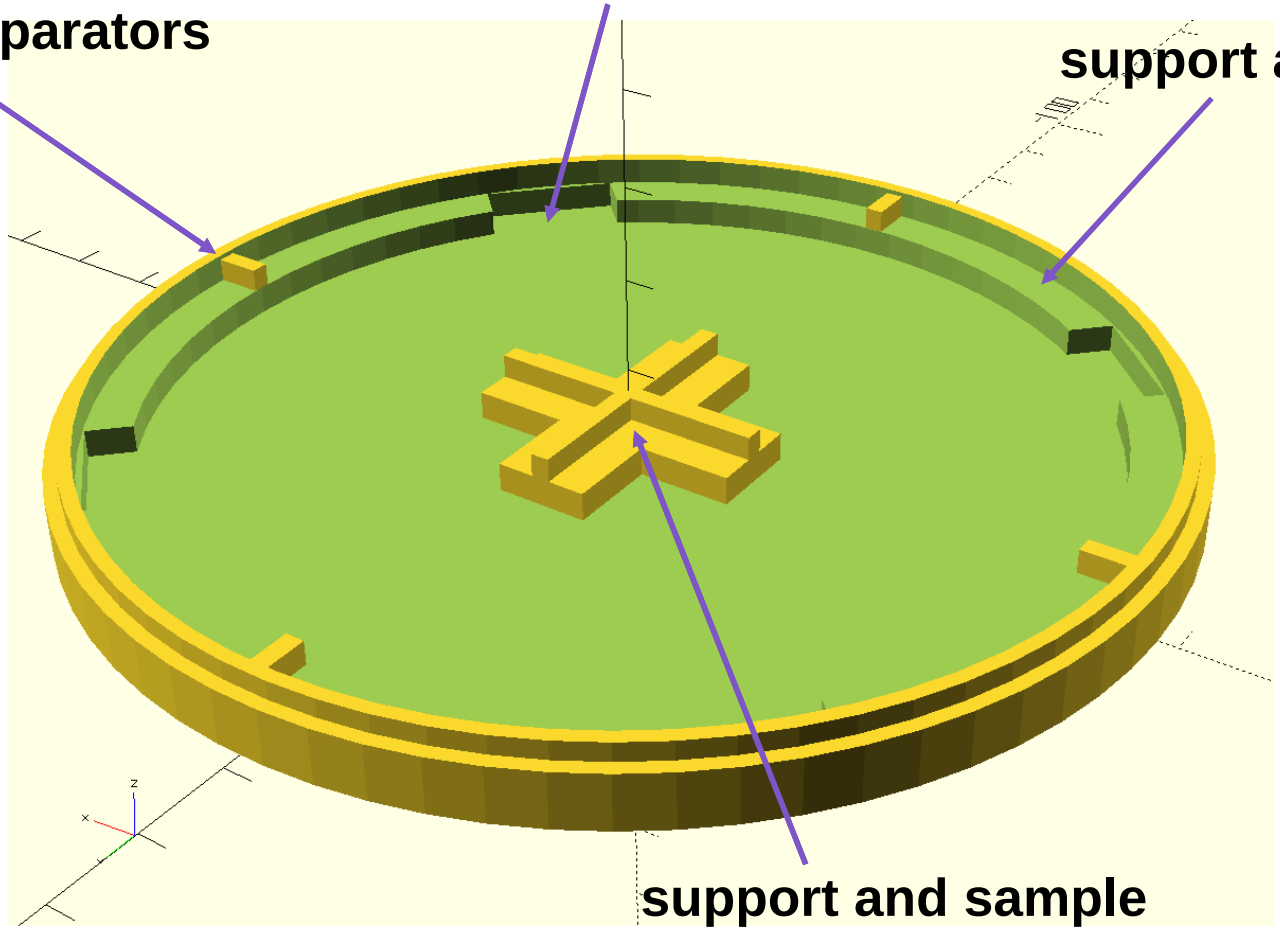
Not suitable for wafer quarters!





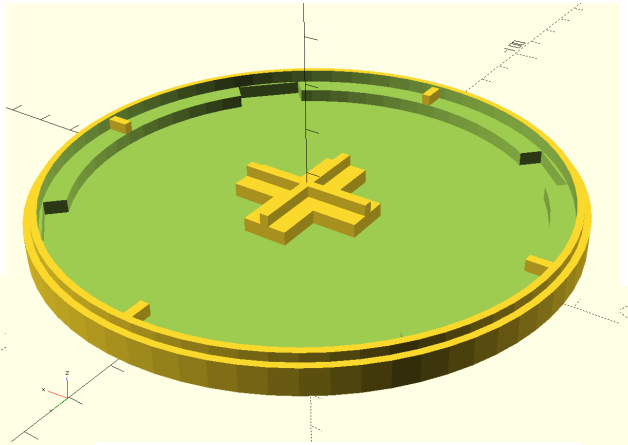


Model

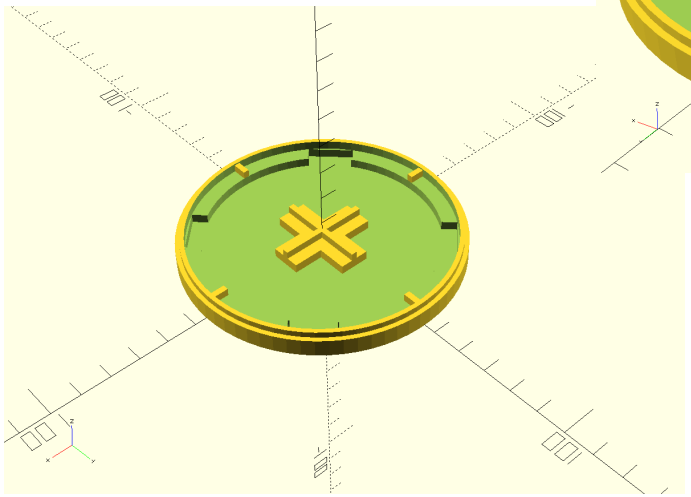

gap for easy
sample removal
sample separators
support at the edge
support and sample
separators in the center

Easily adjustable for various wafer sizes

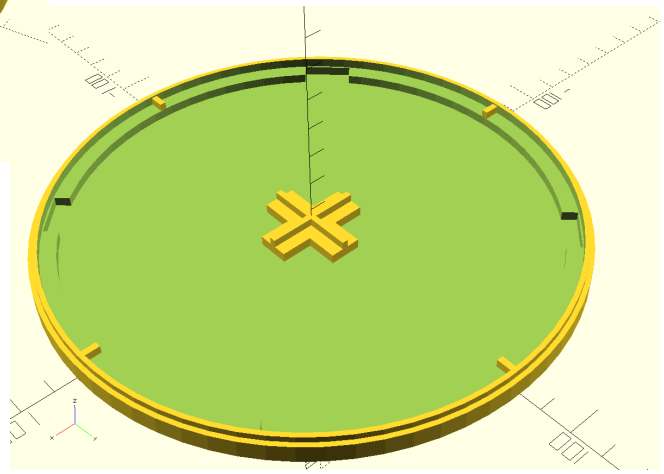
4” (100 mm)



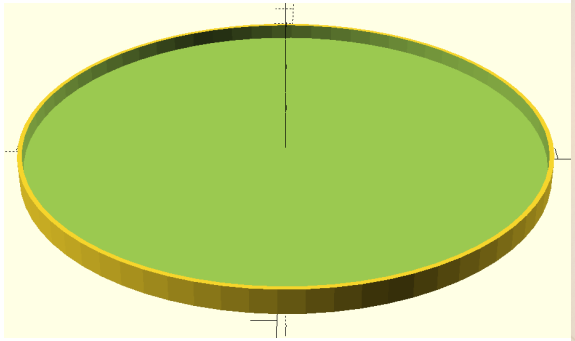
3” (76 mm)

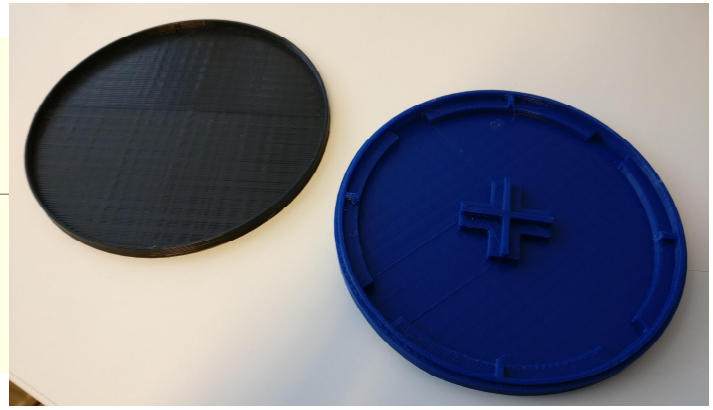


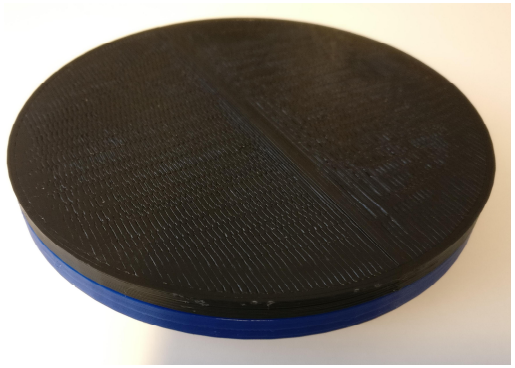
6” (150 mm)

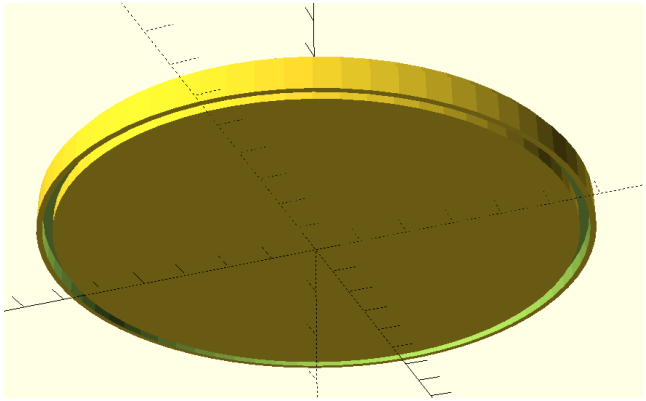


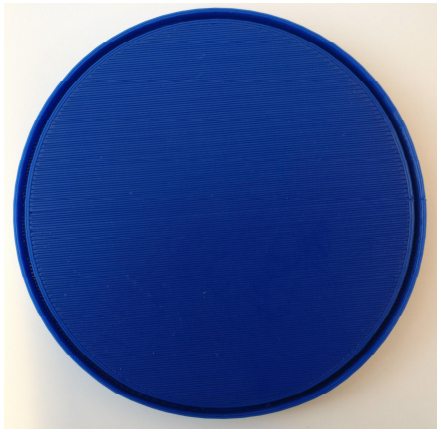
Lid & stacking

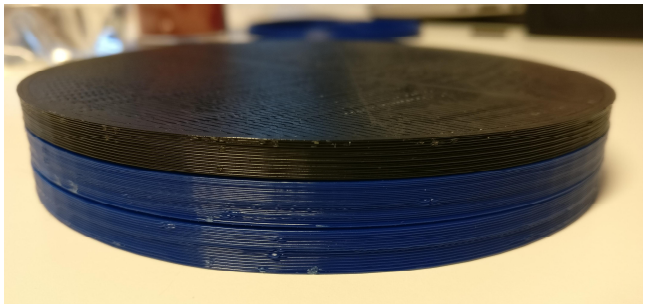




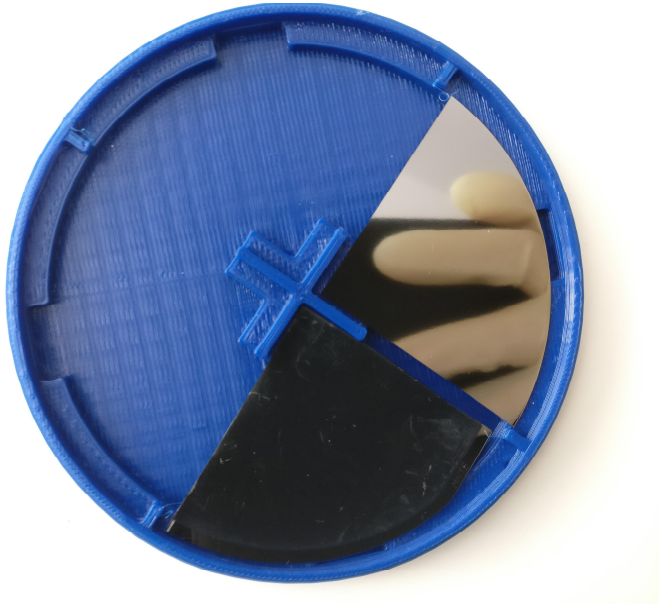


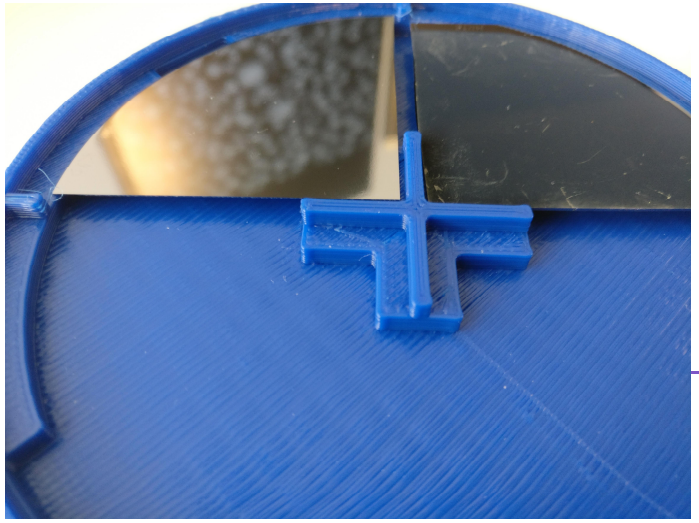






First prototype



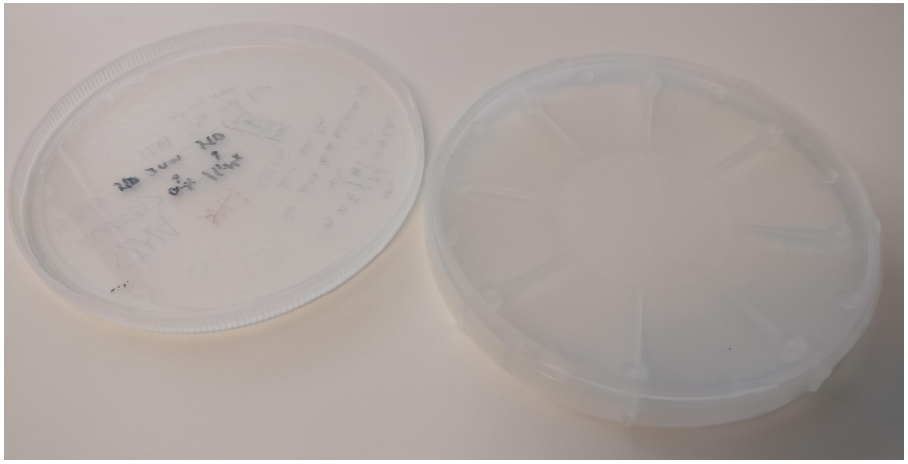


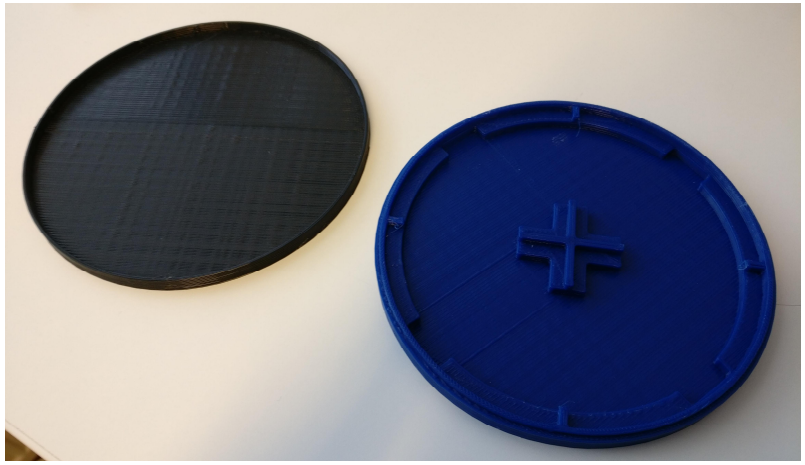
Bottom and wall thickness: 2 mm
Height: 8 mm

- Material: PolyLite PLA (Polymaker)
- Infill: 20 %
- Print speed: 50 mm/s
- Print temperature: 205 ˚C
- Bottom: 30 g, top: 29 g
- Print time: ~1.5 h/pc.

- Seems to be rather firm and samples fit well

Cost savings





Current price at Micronova
(polypropylene, cleanroom compatible):
$22.18 pc. (4”), $28.09 pc. (6”)

3D printed:
Polymaker PolyLite PLA*
$25 / 1 kg → **~$1.48 pc.** (4”)

$20.7 savings per pc. + additional features!

LutzBot TAZ 6 price ($2500**)
saved after 121 boxes.

(Cleanroom compatibility needs to be ensured)

*https://www.lulzbot.com/store/filament/polylite-pla
**https://www.lulzbot.com/store/printers/lulzbot-taz-6

Aalto University
School of Electrical
Engineering

Thank you for your attention!