

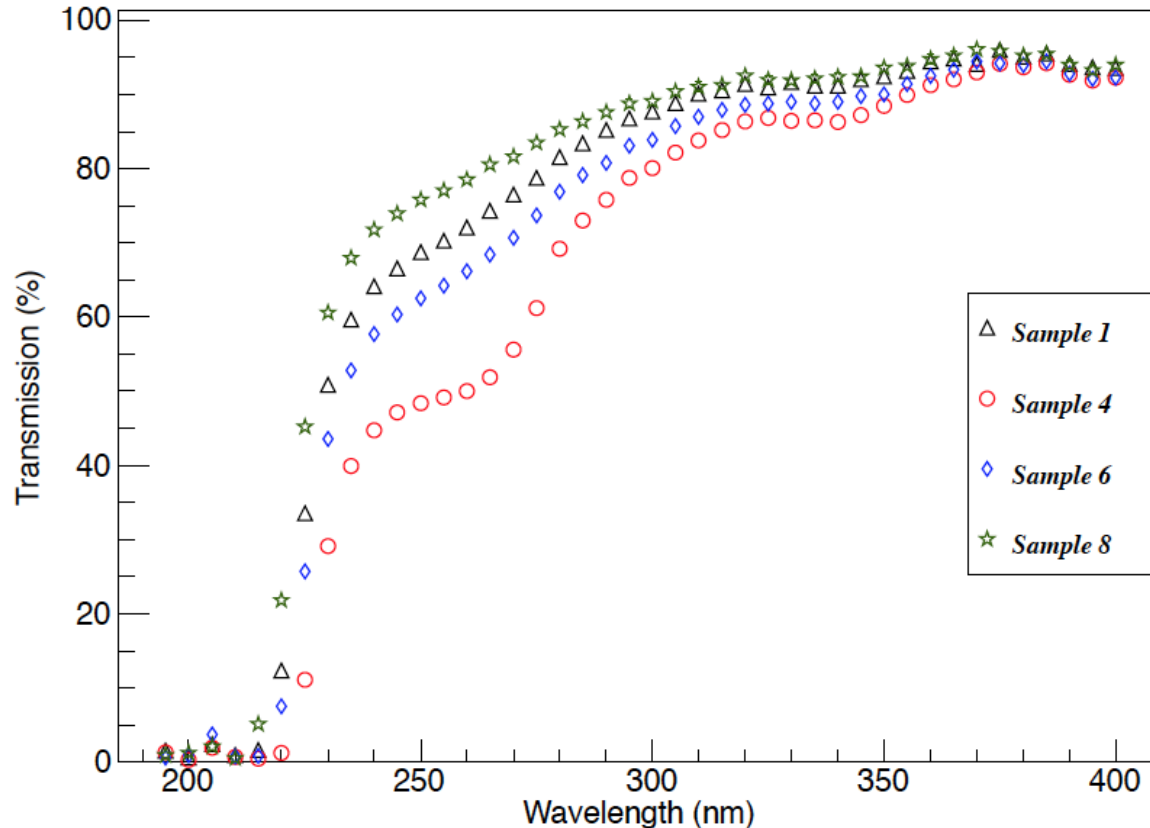
# Transmission of cookies Update

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# Update

- Transmittance data from Belle II, [1407.3258v1], Eljen is superimposed with our measurements so that one can conclude
  - We measured transmittance  $<400$  nm, which is significantly lower than in other results
  - Epotek cuts at  $\sim 290$  nm, so 290-400 nm is an important region
- Cost of RTV material vs. sheets
- Light port – buy feedthrough ?

# Transmittance for RTV615, 100:10, 20C

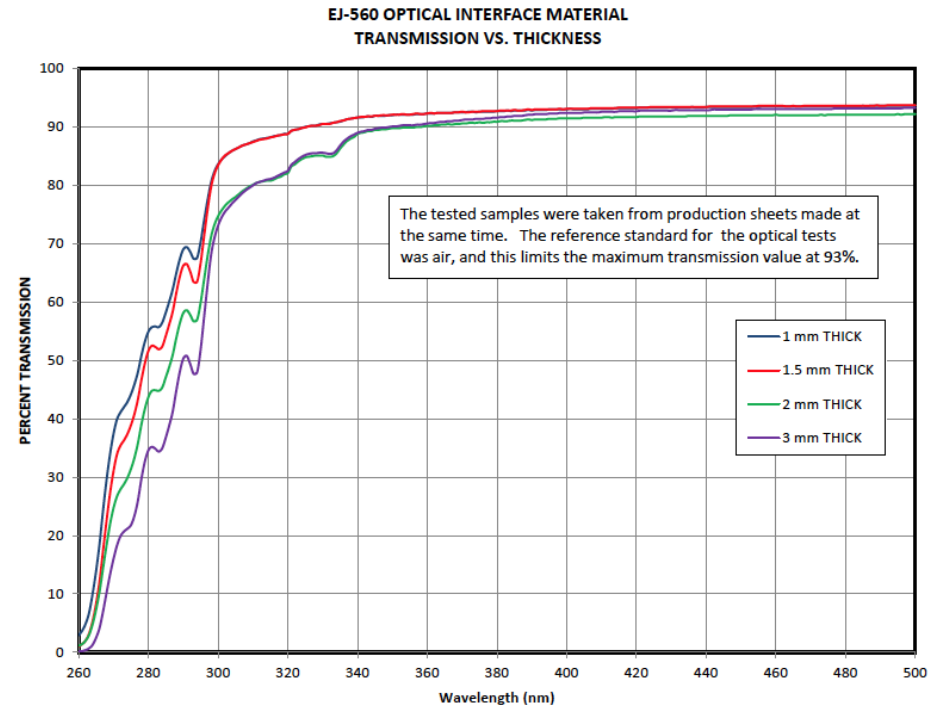
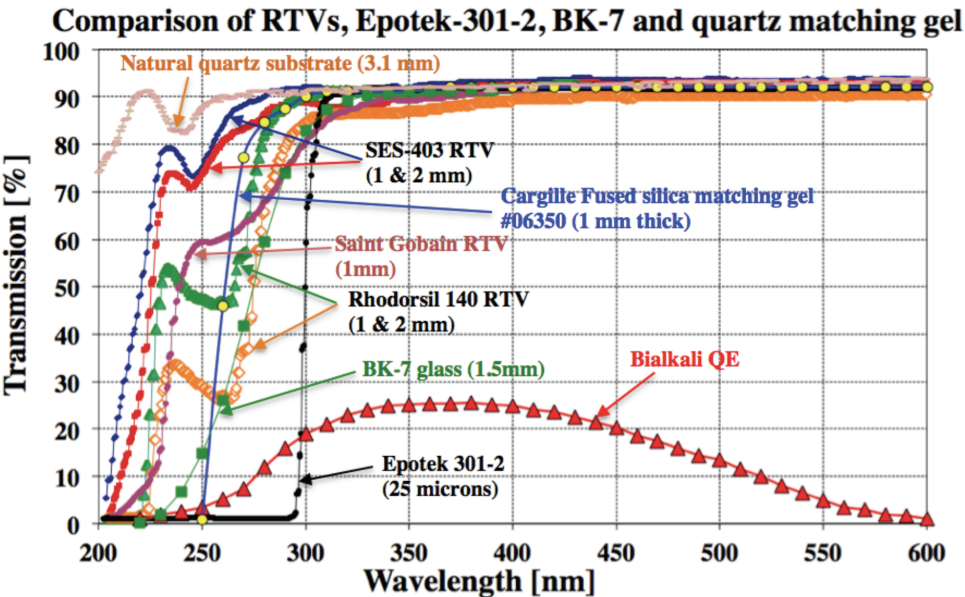


[1407.3258v1]

Sample 1: 1.9 mm, 25 C  
Sample 4: 3.3 mm, 25 C  
Sample 6: 2.3 mm, 25 C  
Sample 8: 1.4 mm, 25 C

Measured for interface air-silicone-air,  
to compare with our results this curve was corrected for Fresnel reflection using  
factor  $0.98 = T(\text{air-FS-air}) / T(\text{air-silicone-air})$

# Transmittance for RTV and Eljen-560



From J.Vavra "Optical properties of RICH detectors"

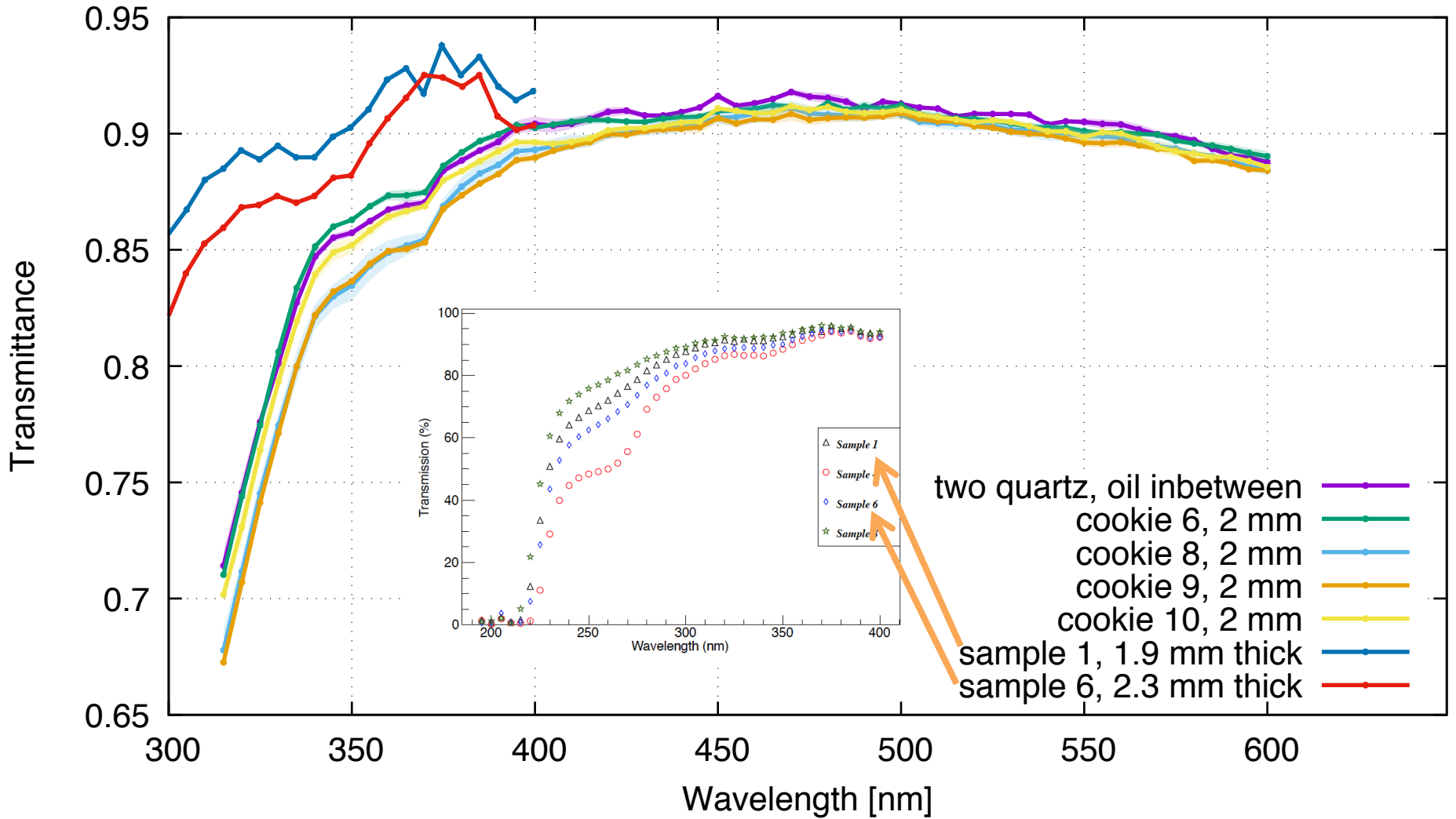
Absolute measurement:  
(air-FS-material-FS-air)

Epotek cuts at ~290 nm

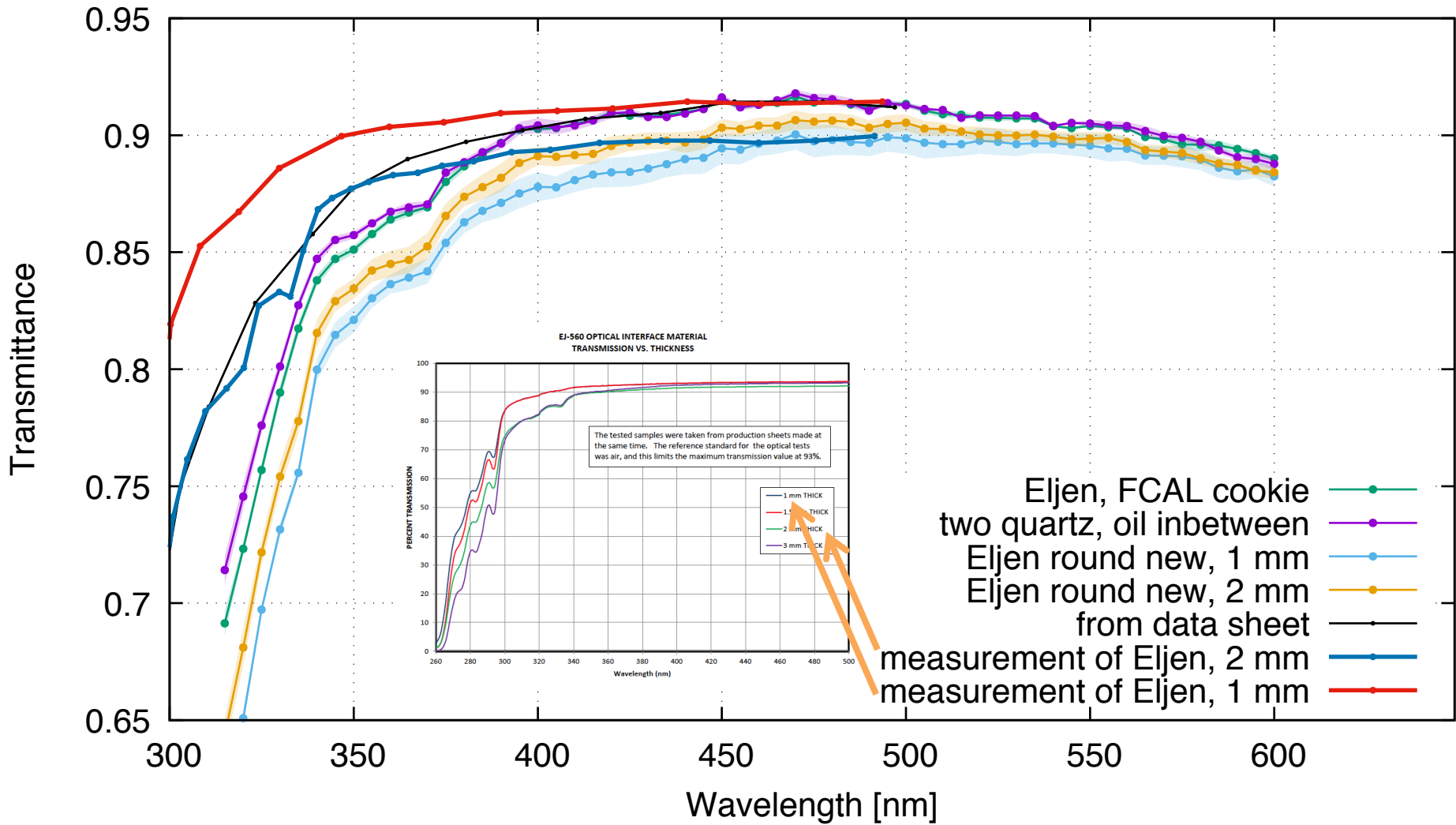
Manufacturer has variations in transmission within the same batch

Relative measurement: (air-silicone-air)/air → Fresnel limit is 94%

# RTV 2 mm thick cookies



# Premade cookies



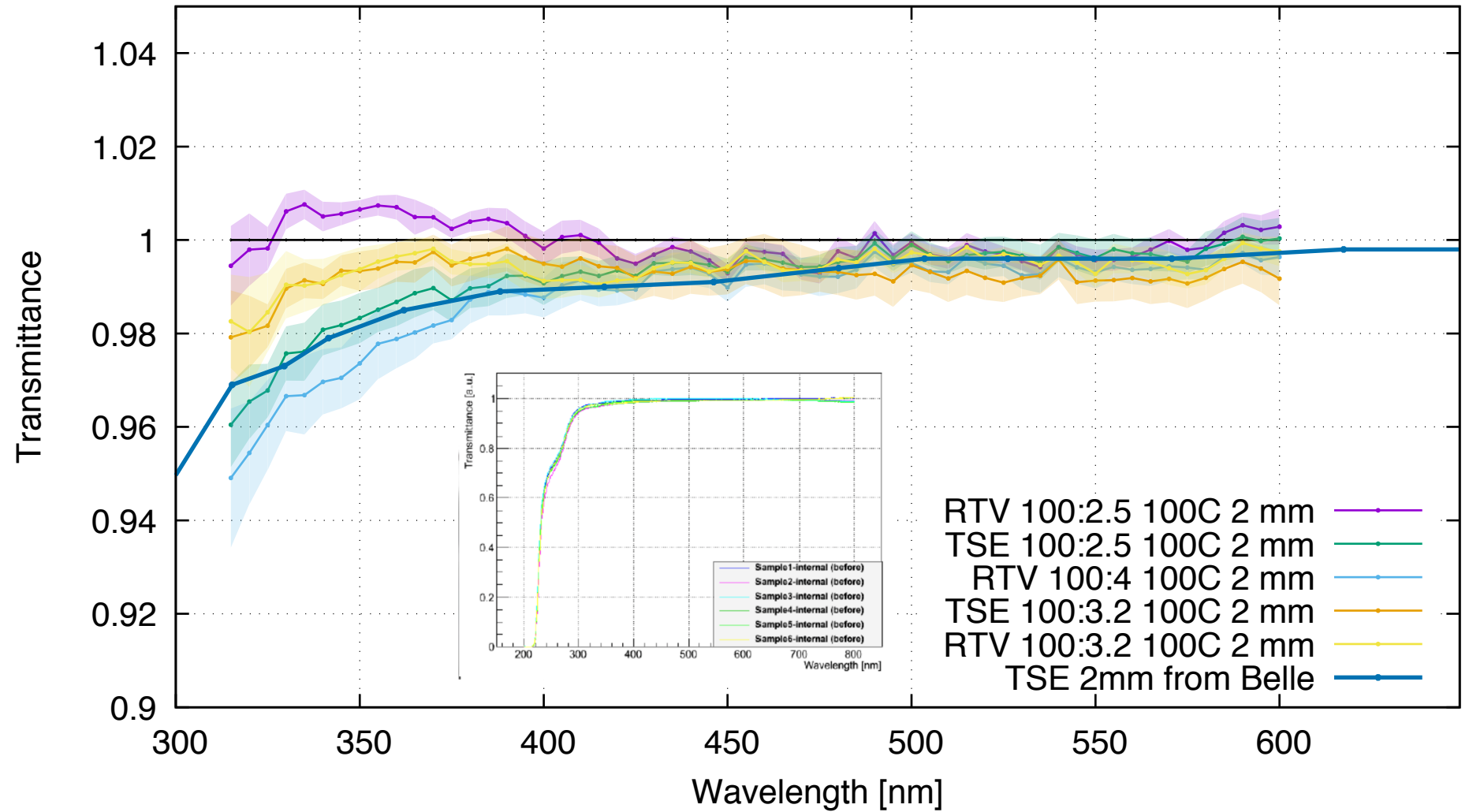
# Plots of relative transmission

relative to

- two windows with greasing oil inbetween

Shaded area shows averaging between 3 points

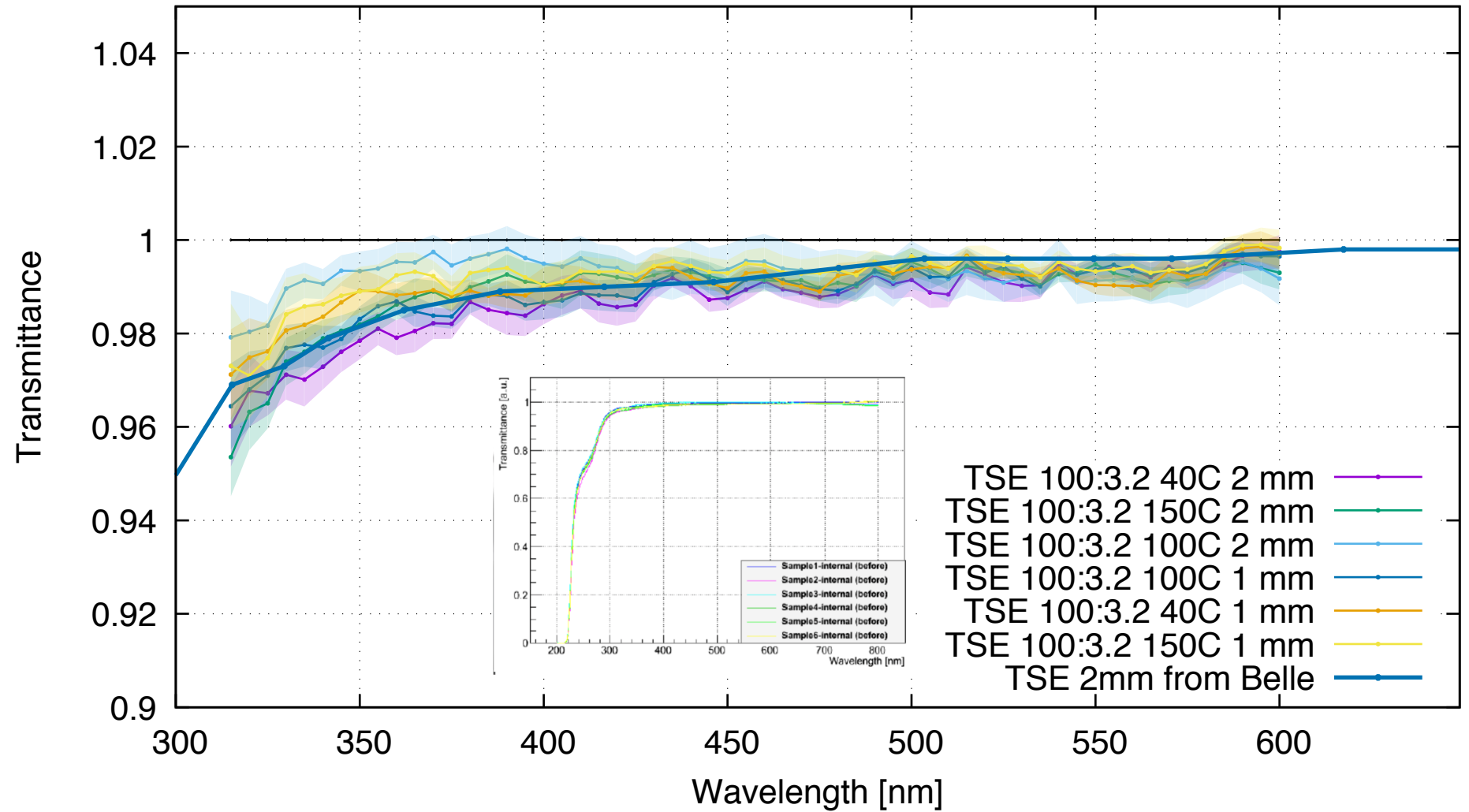
# Relative to two quartz windows with oil inbetween



Comparison of different mixing ratios using 2 mm thick cookies

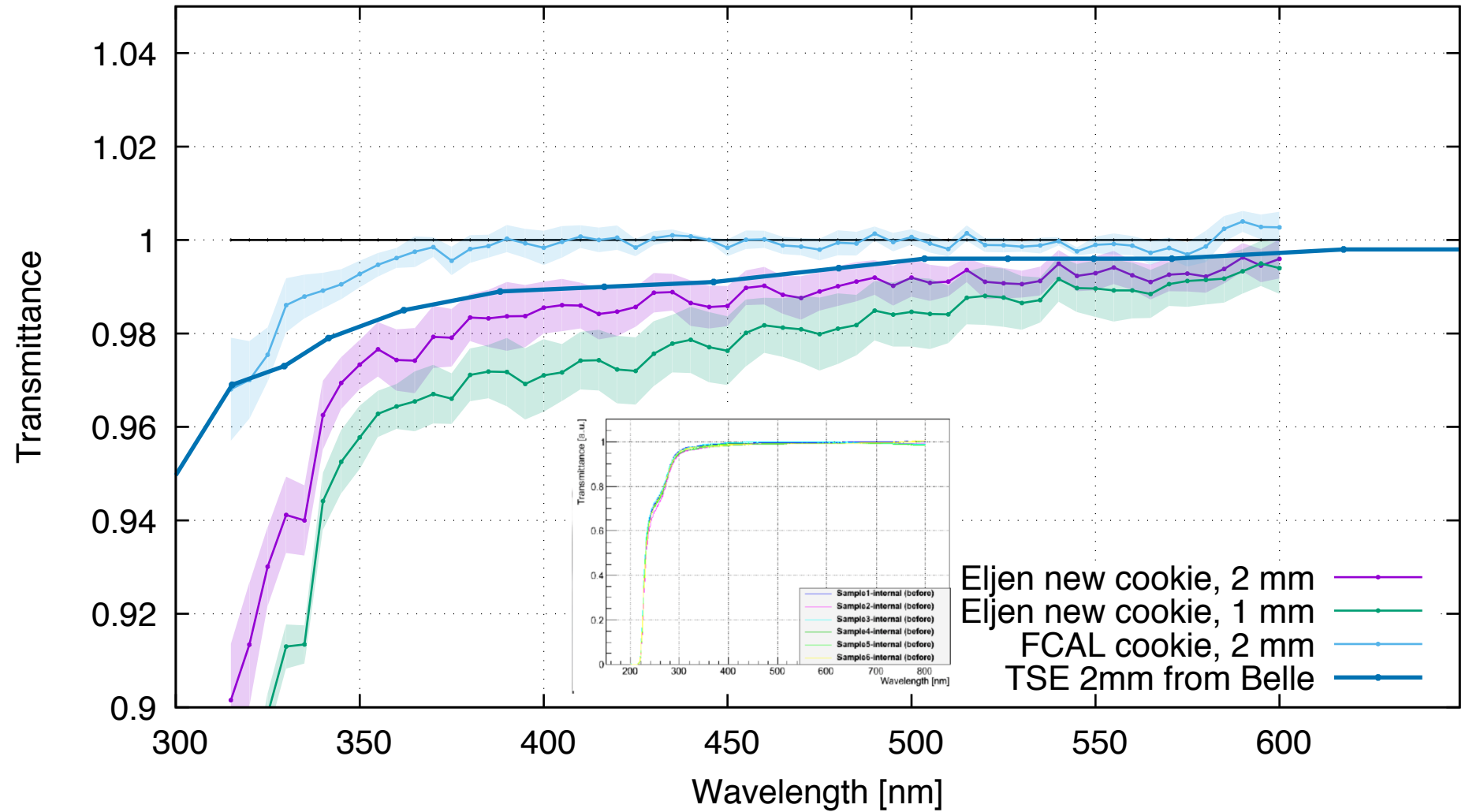


# Relative to two quartz windows with oil inbetween



Comparison of different curing temperatures

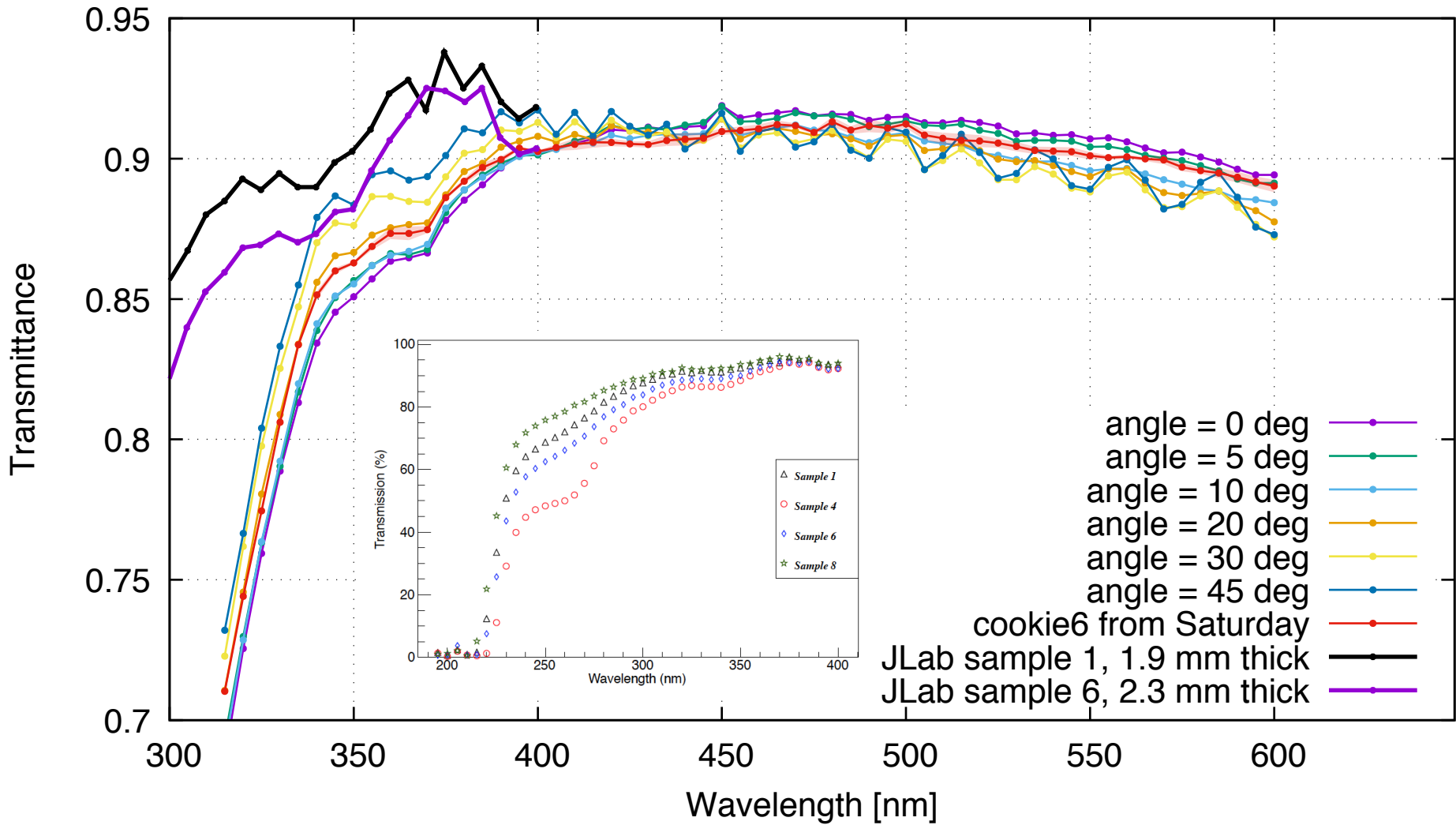
# Relative to two quartz windows with oil inbetween



Old FCAL cookies are very good.

Recently purchased Eljen cookies are worse, and slightly worse than ours.

Angle dependence for cookie: RTV 100:2.5 100C 2 mm



Cookie 6

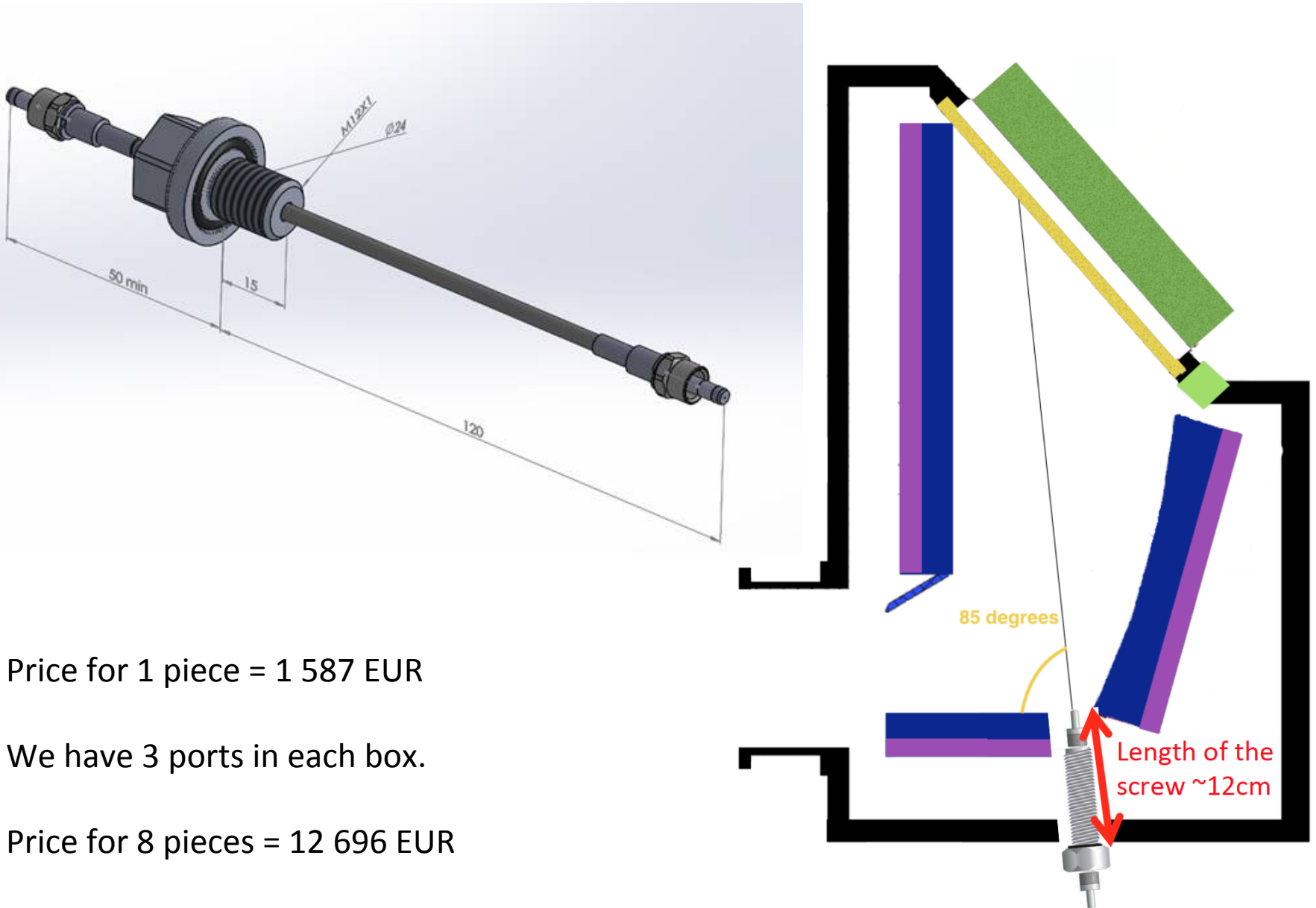
# Cost of RTV

Comparison of buying pre-made cookies to buying RTV material:

material needed to equip DIRC [cc]	RTV615 material	Eljen optical interface sheets
18 x 2 x 2 = 72 cookies (5.2 cm x 15.8 cm) with thickness 0.2 cm	minimal order 12 lb = 5443g, density 1.03 g/cc	size of one sheet: 330mm x 530mm x 2 mm, which makes 20 cookies
~1200	~5300 for \$1626	4 sheets x \$350 = \$1740
extra volume we get for a minimal order	340% (4100 cc)	18% (210 cc = 0.6 sheet)

It is significantly cheaper to buy molding set of RTV615: for about the same money (\$1700) we can get either Eljen sheets with extra 4100 cc (340%) of material or RTV615 (assuming we mold ourselves) with excess of 0.6 sheet (18%).

# Laser feedthrough



Price for 1 piece = 1 587 EUR

We have 3 ports in each box.

Price for 8 pieces = 12 696 EUR

# Plans

- Measure transparency for new cookies:
  - Order RTV material and an EJ-560 sheet
  - New molds?
- Order feedthrough?
- Simulation in GlueX software using Geant4