NSE Pressure Cell for Soft Matter

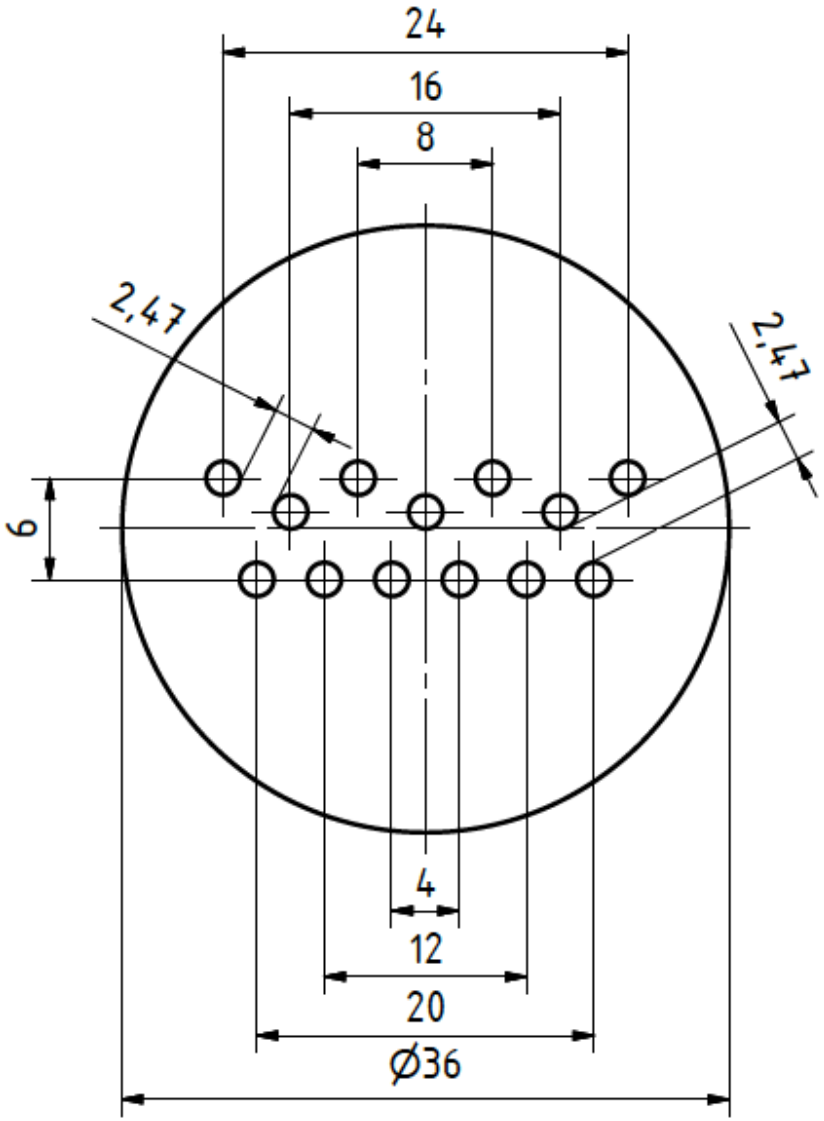
Requirements: (cell #1)

- Large Sample Area (3x3cm^2) with 2mm thickness
- Max. Pressure ??? → science case
- High Scattering Angles

Compromises??? (cell #2)

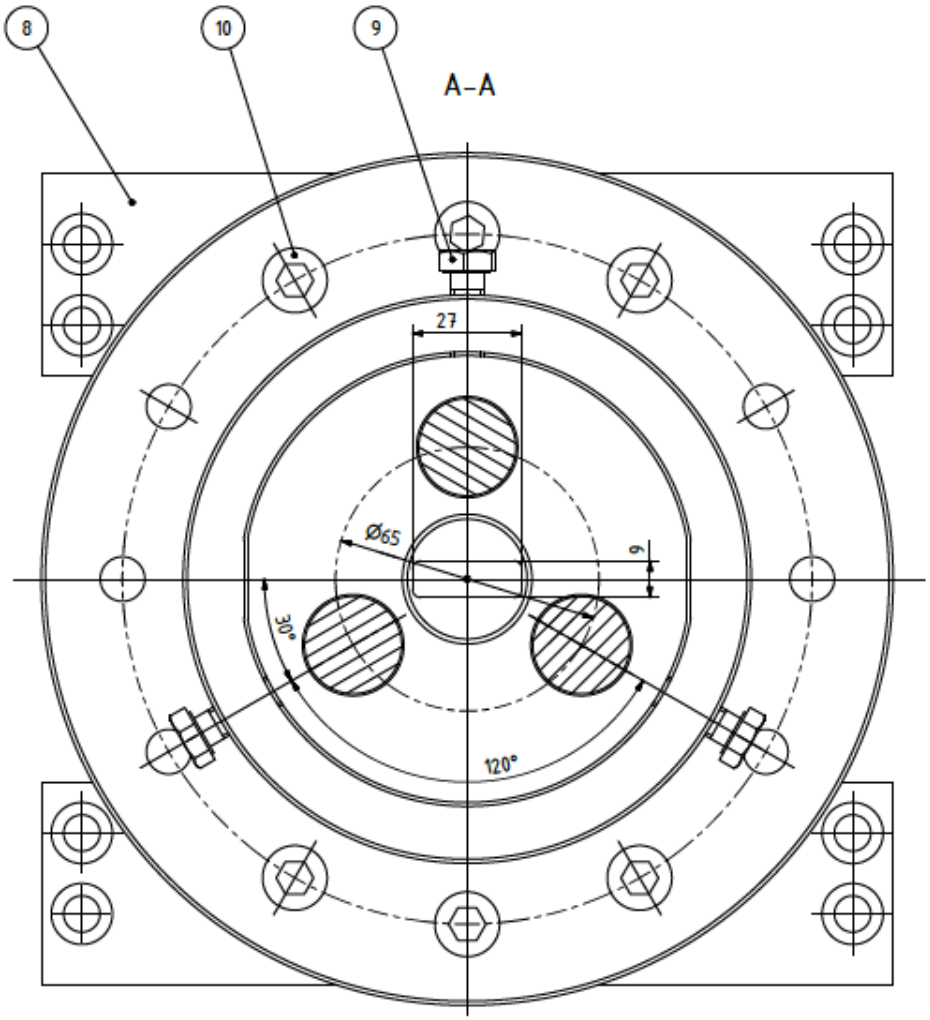
- thinner sample
- max. pressure
- high scattering angles still !!!!

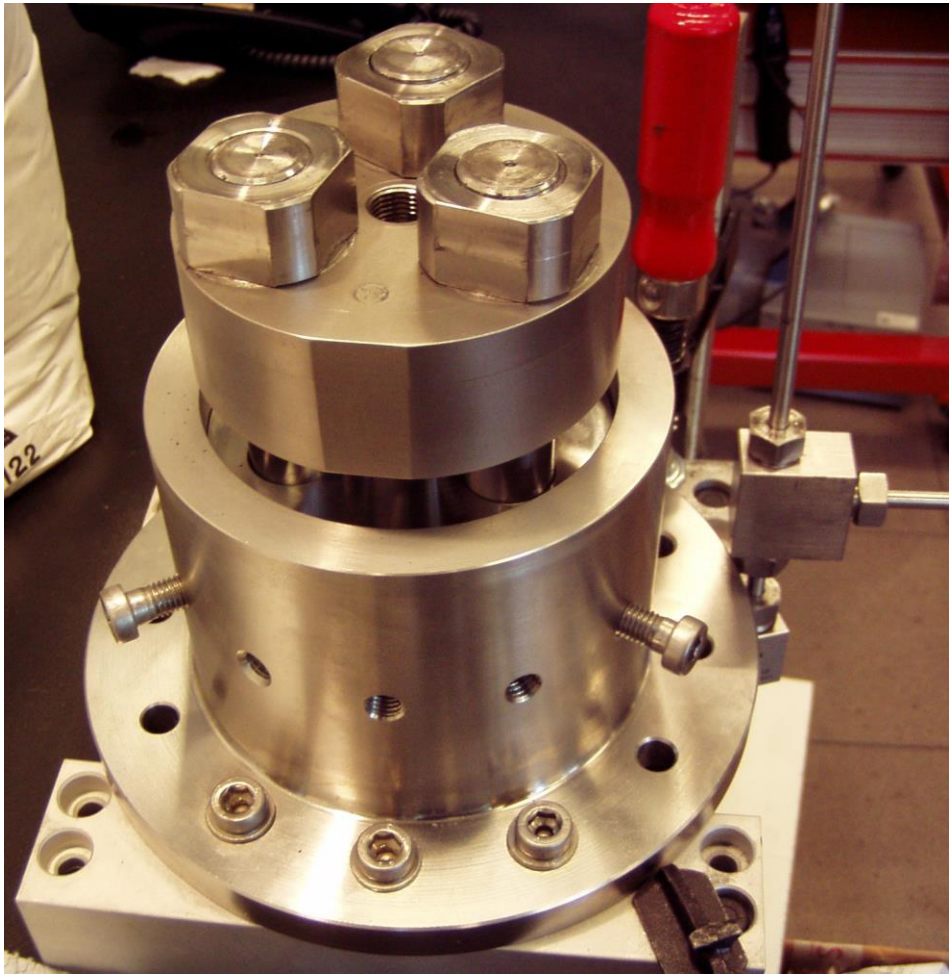
Cell #1



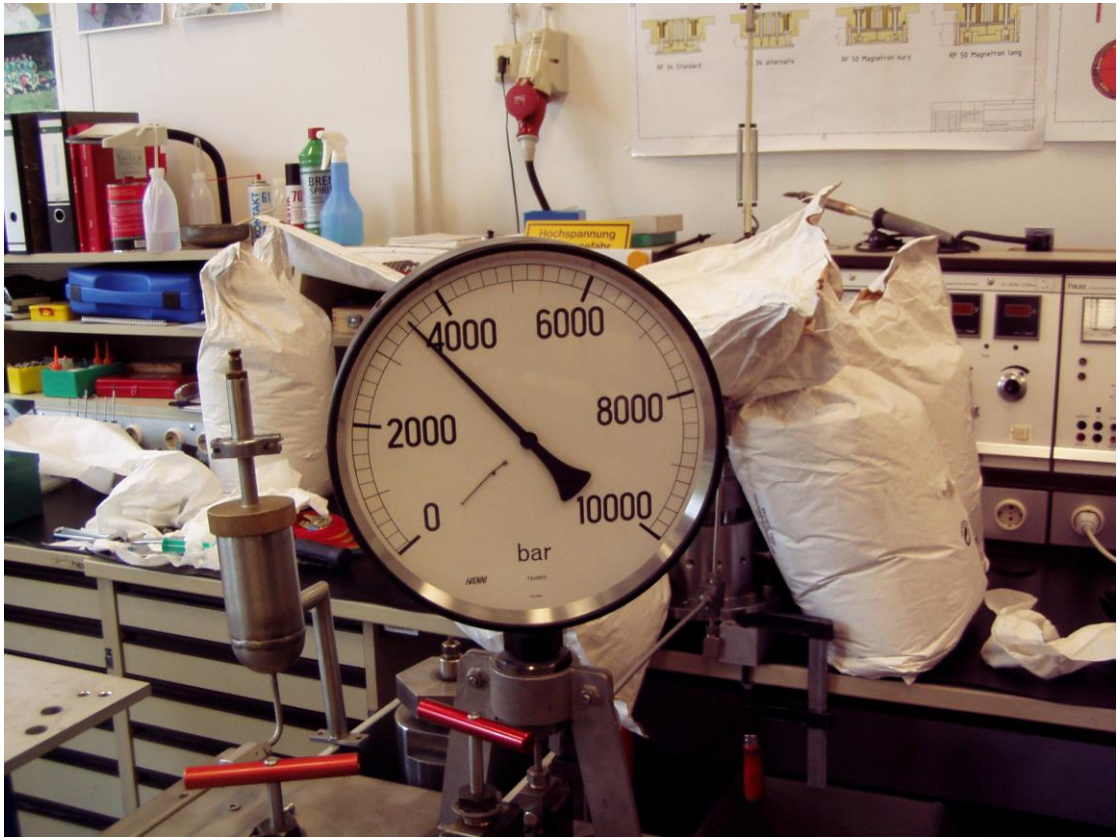
TiZr

Cell #1



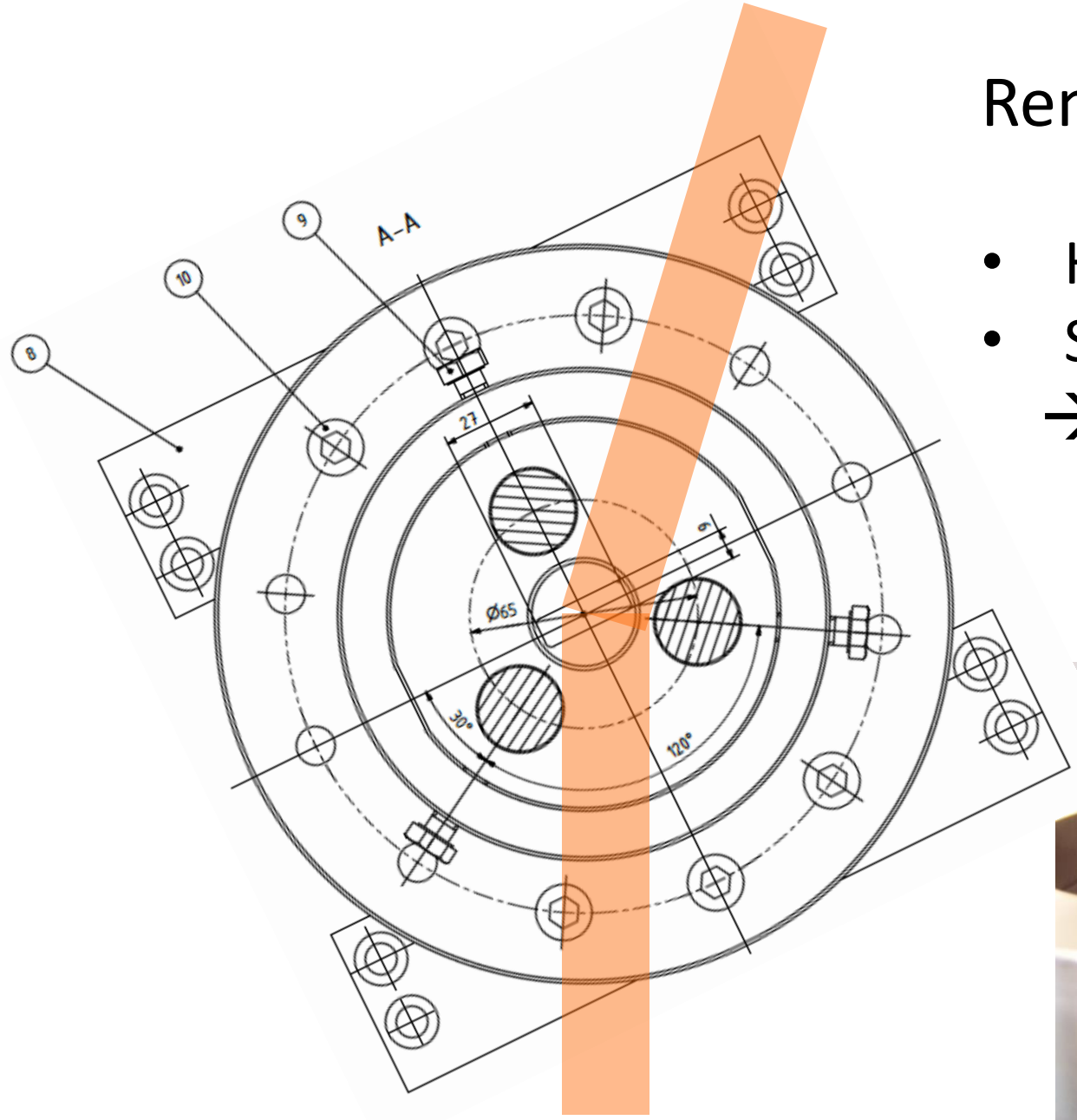


Cell #1 --- Testing Pressure 3.5 kbar



→ operation at 2.4 kbar

Cell #1 --- Scattering Geometry



Remaining: Test

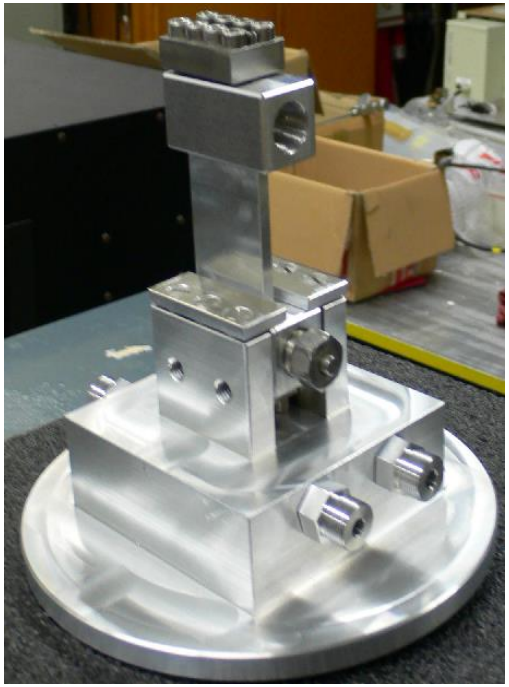
- How easy to fill ?
- Signal/Background

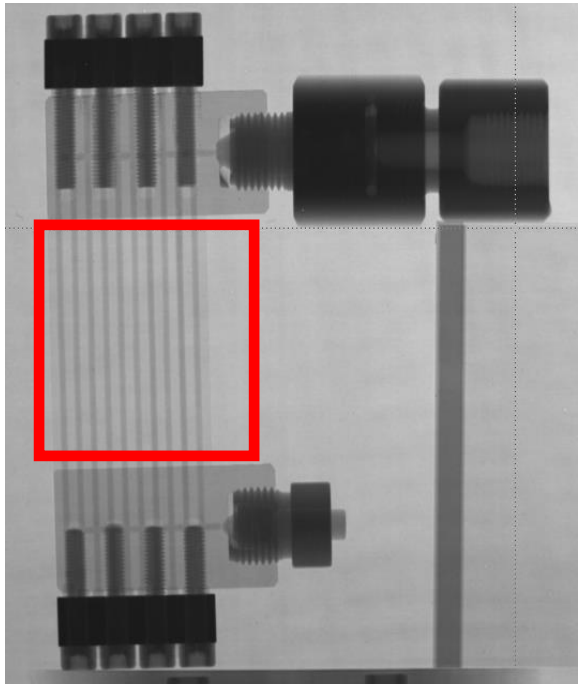
→ typically Q > 0.08A^{-1}

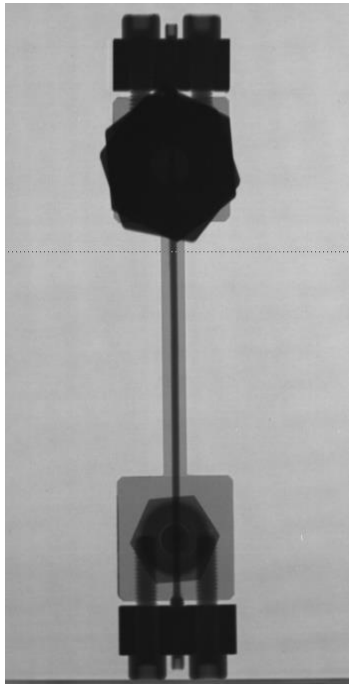
Simply do it !

Cell #2 --- improvement of performance

(existing concept with Al7075 – 2kbar, R. Funer & J.Dörbecker)
3kbar, -> G. Simeoni)







This concept with TiZr will lead to 5 (7) kbar !!! (H. Feilbach)

Concept already at ISIS for 7 kbar.

Cell #2 --- Benefits

- Higher Pressure
- Lower Background (lower Q)
- Maybe: Thinner Samples (needs to be checked)
- Maybe: Simpler filling of cell
- More difficult: Tempering – but can be solved

Science Case (in general)

- Classical Soft Matter: 2.5kbar sufficient in most cases
- Protein (denaturation): 5-7 kbar
- Other ideas ??? Study literature !

→ Set of NSE pressure cells obtained !!