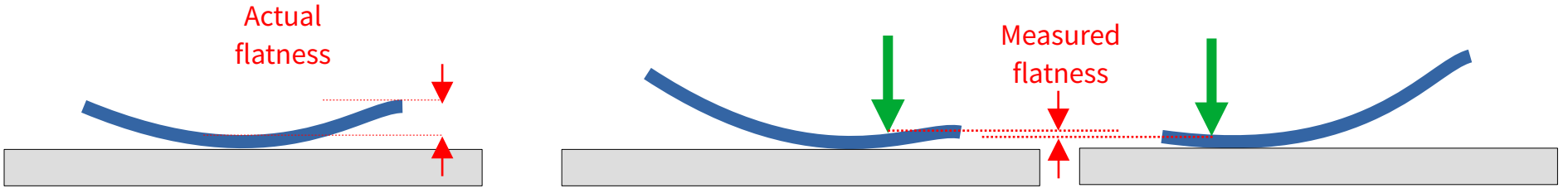
The Ti Flatness Saga – False measurements

Fooling the Keyence machine

For bend plates, the Keyence machine can be fooled to give a plates a “OK” flatness grade when it actually isn’t.

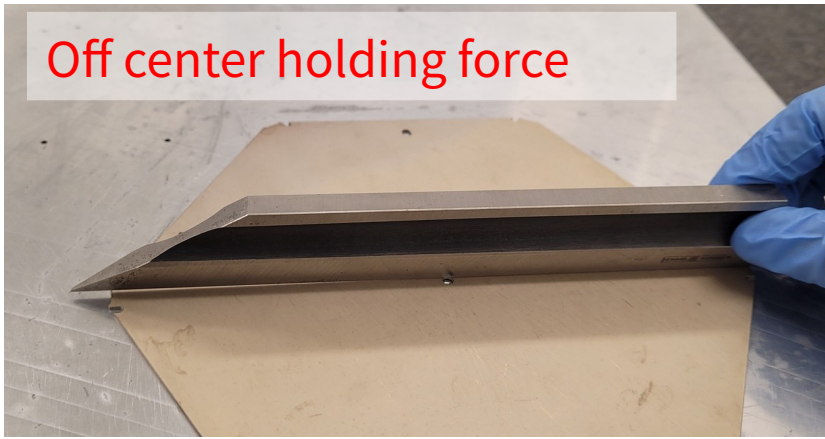
- Mainly for convex plates, where the Keyence probe can physically move the plate
- Problem becomes prominent in the lighter Ti plates
- Difference between convex and concave plates has been observed to be as large as 150um (observed, could be even bigger!)



Measuring flatness – Reference straight edge

Use reference straight edge (“haarlineal”), we already have one from the workshop.

- Samples along entire line
- Samples non-quantitative deviations (no absolute measurement)
- Requires everyone so use it “in the same way” (Because everything can be flat given enough force)

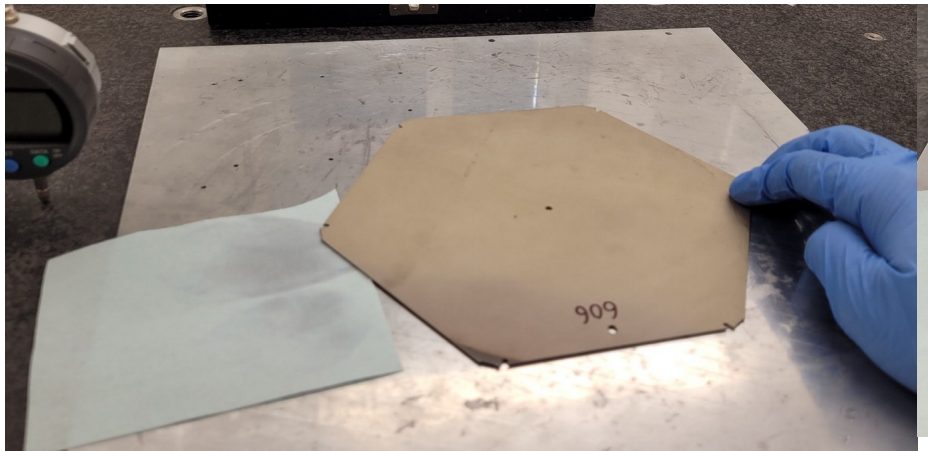


Measuring flatness – standard shims

Hold a corner, then see if pass/fail shim can fit underneath the plate of interest.

- A pass/fail test for concave plates
- Requires a reference flat surface (granite table/standard flat surface)
  - We can also use the haarlinear as the reference?
- Potential problems:
  - What about convex plates? (top down measurement with haarlinear?)
  - What about saddled plates?

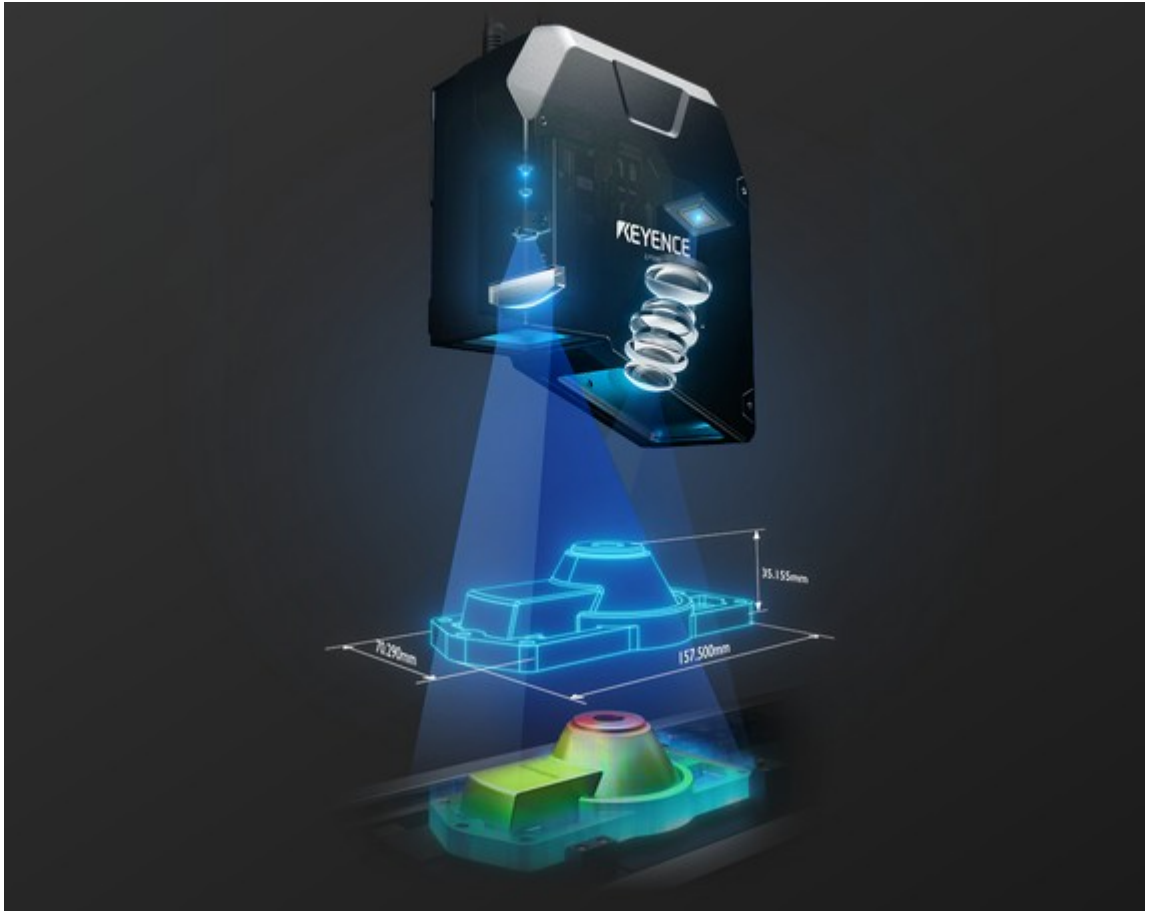
Cleaning tissue is fairly consistently 150um thick



Easier to define “consistent use” of haarlinear

Commercial solutions - Profilers

https://www.keyence.eu/products/measure/laser-2d/



Flatness requirement

The reason that we care about flatness is to reduce stress in the silicon. If flatness can be easily changed by hand-exerted measurements, is this enough for silicon?

- There is also glue that can hold the metal shape (but glue degrades in radiation)
- The standard lamination weight reduces flatness from 300um → 150um (assuming the top face of weights are completely flat)
- Do we want to glue a few pieces just to try if post lamination flatness is “Good”?
  - **Comment:** I cannot imagine that Araldite is significantly more rigid than Ti metal...

Purchase projection

Ti requests until August:

- 284 Partials (non-5), 168 LDFive, 720 Fulls = 720 Full plate equivalent
- 500 Full plates arriving May 20th
- Defficiency: 310 Full plate equivalent area + 220 Full plate
  - 530 Full plate equivalent
  - 53 large sheets (current size) or
  - 106 smaller sheets

CuW

- Will we work with IHEP to satsify CuW Full request until the K-order completely takes over?

Kapton Price inquiry

Cleaning equipment recommendations

We need to glue cleaning equipment for ~1-2mm scale, ideally proerly clean room grade.

- Previously using cotton Q-tips from Taiwan (200pieces/~1EUR), exhausted
- New cotton Q-tips from DM is not good… (50 peices/0.7EUR)
  - Wider, cotton is packed much looser, generates threads after mild use
- Suggestions to where to look for this?