

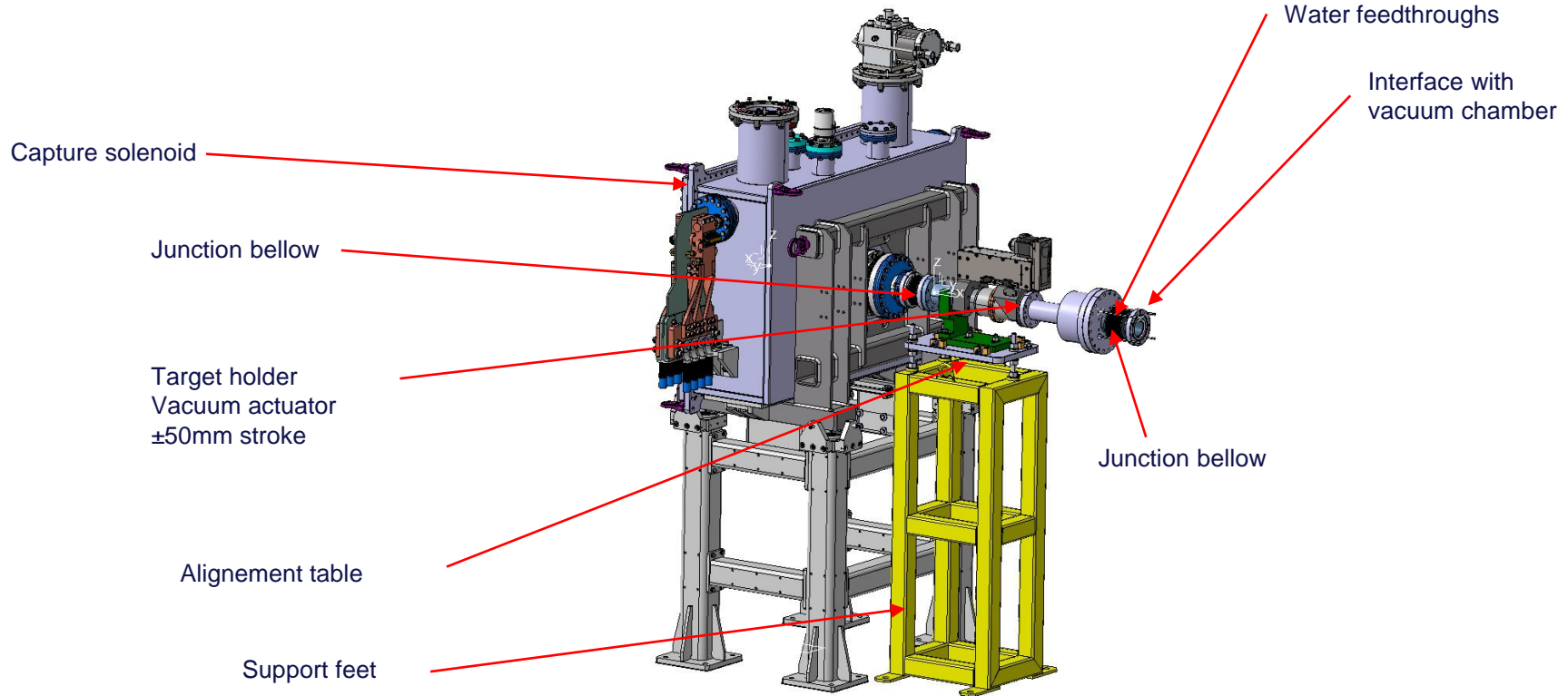
P³ Target - Update

Fcc-ee Injector Design (CHART Proposal) Coordination Meeting #20

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5/12/2024



P³ target holder design – general overview



P³ target holder production status

- Support and alignment frame completed
 - Vacuum actuator delivered
 - W Targets prototypes without cooling
 - Vacuum chambers (including test chambers) manufacturing ongoing
- Readiness Feb of 2025
Commissioning at CERN Q1 2025



P3 Target update

- Documentation

Paper written with N.Vallis about the conical targets (NIM-B)

Under internal review

- Manufacturing:

2.86GeV: 2 x 2 target units without cooling available (W and Ta)

Vacuum chamber for P3 (in progress)

- R&D activities:

Manufacturing of P3 target with cooling

- Welding tests for joining the tantalum pipes with the HIP capsule (ongoing)
- HIPing capsules manufacturing (under quotation)

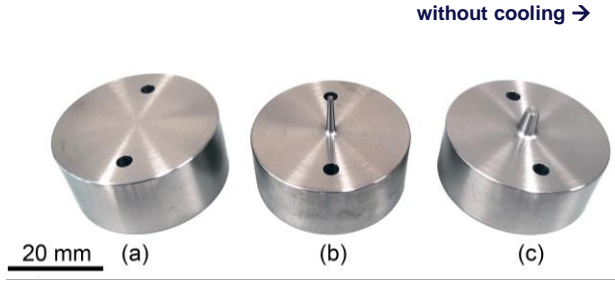


Fig. P3 target prototypes (a) baseline (b) $\sigma x=0.5$ mm and (c) $\sigma x=1$ mm conical,

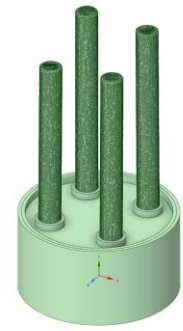
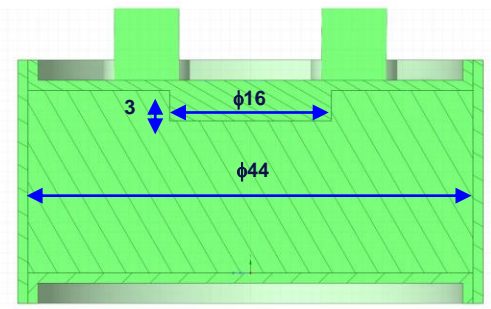


Fig. P3 target prototypes: HIPping capsule design →



2. Target prototyping: HIPing capsule (3/4)

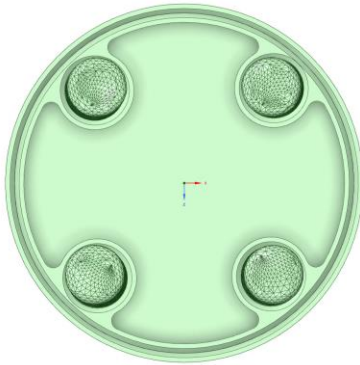
Option 2: Ta-Ta

(+) This option is made of pure tantalum (i.e no dissimilar materials to join).

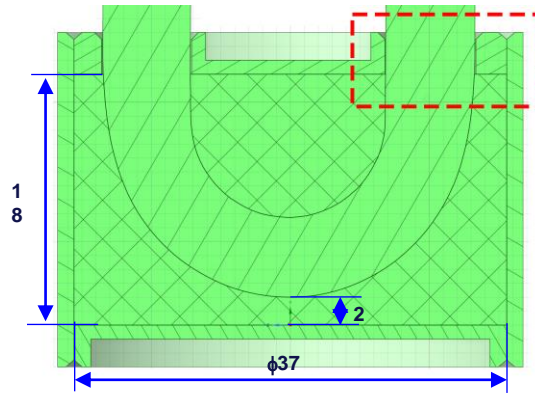
(+) The target thickness (18mm) is enough to host the distorted elbow of the cooling pipes.



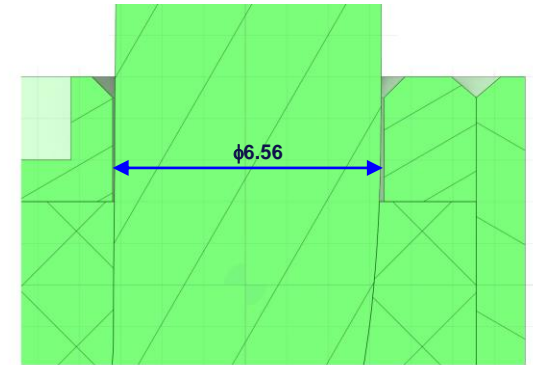
a) 3D model



b) top view



c) cross section (x=-10 mm)



d) gap between pipes and top cover

Fig. Ta-Ta capsule

2. Target prototyping: HIPing capsule (4/4)

Option 3: W-Ta with inserts

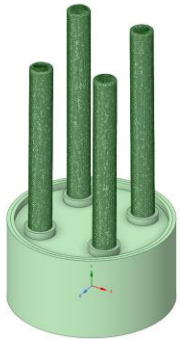
To extend 3mm the target only in a region around the cooling pipes

- *Target diameter (for the capsule) $\phi 44$*
- *To separate the pipes supports to the capsule*

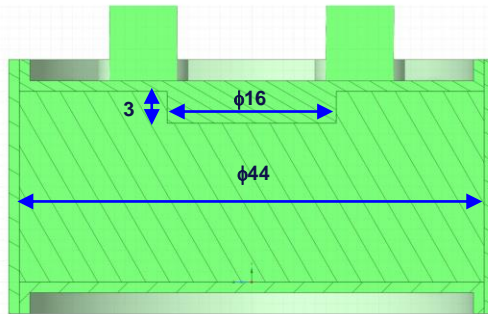
Selected design

Next steps:

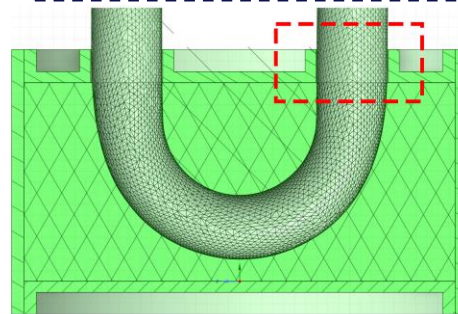
- *TIG welding test*
- *Capsule and target parts manufacturing*
- *Capsule preparation by EBW and HIPing*



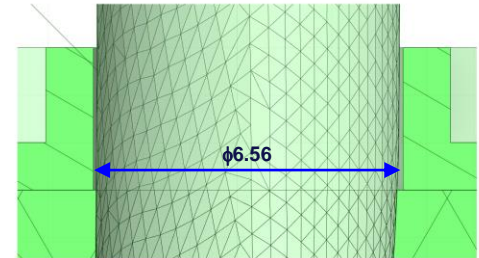
a) 3D model



b) cross section ($x=0$ mm)



c) cross section ($x=-10$ mm)



d) gap between pipes and top cover

Fig. W-Ta capsule with inserts

