

A detailed 3D wireframe model of the Alvarez 2.0 Drift Tube Linac (DTL) structure. The model shows a long, curved, and segmented structure, likely representing the drift tubes and accelerating region. In the background, there is a smaller, more complex structure that appears to be part of the overall facility, possibly a target or a detector. The entire model is rendered in a wireframe style, showing the internal structure and the arrangement of the components.

Poster TUPOGE19

Status of the new Intense Heavy Ion DTL Project Alvarez 2.0 at GSI

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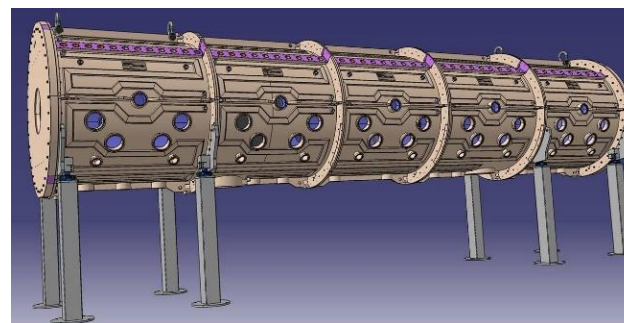
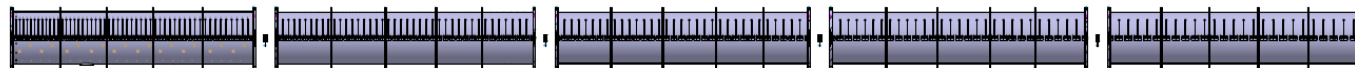
Target parameters

- heavy ion acceleration ($A/q \leq 8.5$) from 1.4 to 11.3 MeV/u
- ion current = $1.76 \text{ emA} \cdot A/q$
- transv. space charge tune depression up to 40%
- just few percent of budget for emittance growth
- change of ion type within 100 ms
- 108 MHz, 1.35 MW per power source

Challenges (selection)

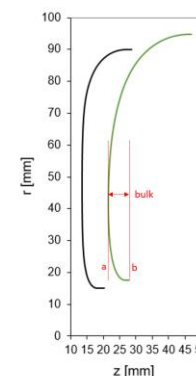
- **five n.c. cavities:**

- length ≈ 11 m, radius ≈ 1 m
- tolerance of radius ≈ 0.15 mm
- about 135 tons of stainless steel
- surface field $\leq 1.0 E_K$



- **177 drift tubes:**

- free-hand shaped end caps
- tight integration of pulsed e.m. quadrupole
- tight tolerances w.r.t. alignment of quadrupole and drift tube

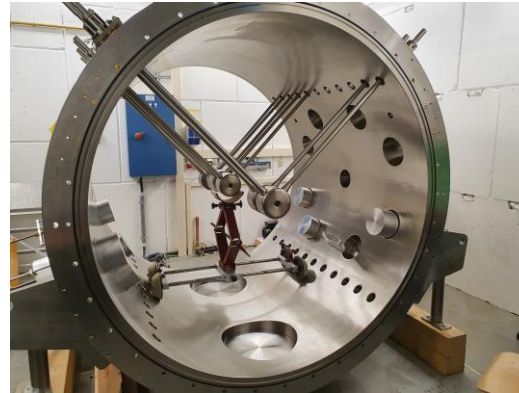


- **copper plating:**

- total of 400 m^2
- thickness $120 - 150 \text{ }\mu\text{m}$



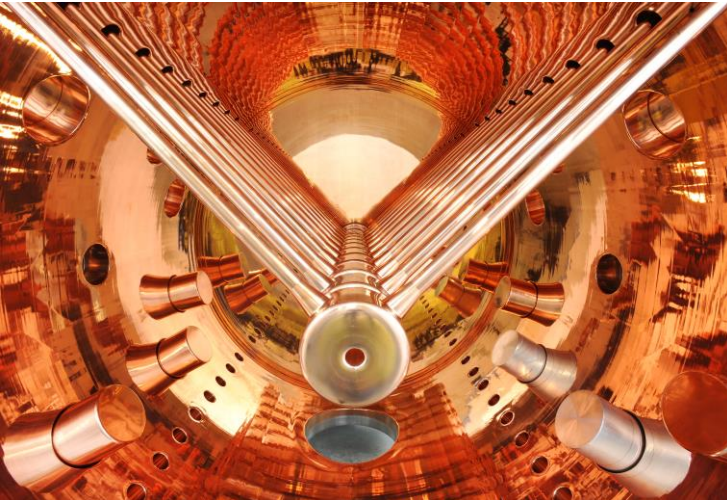
Prototyping



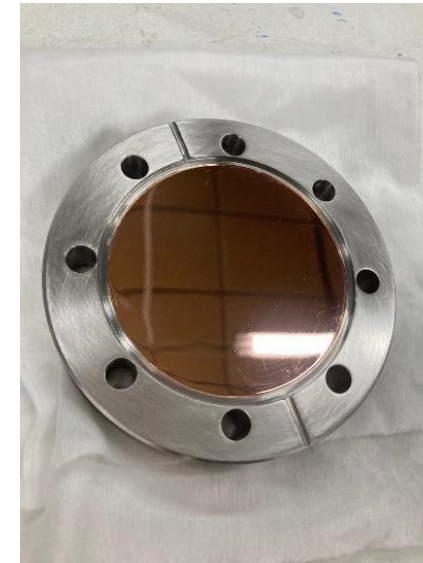
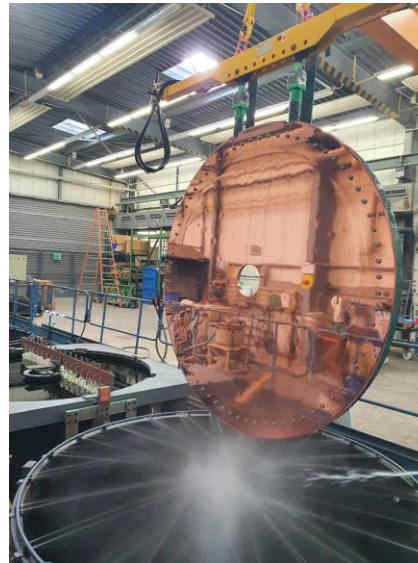
- completed within budget
- all specs met



Copper plating

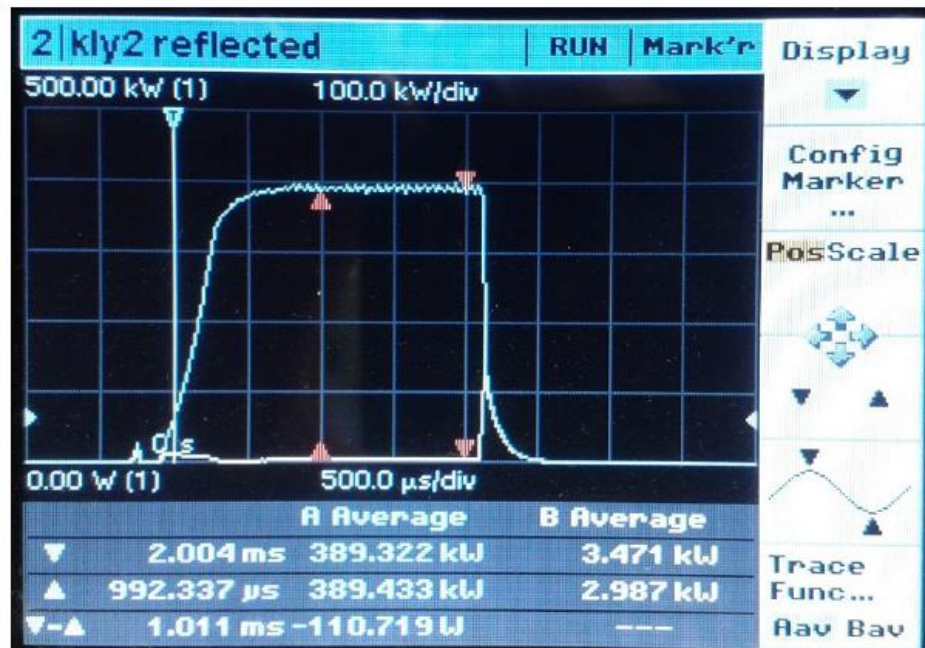


- tested with dedicated dummy cavity
- mantles & end plates plated in-house
- drift tubes / add-on parts plated externally



RF-testing, Series production

- RF-testing:
 - all design parameters reached / exceeded
 - no damage of copper surface
 - cooling ok
 - vacuum ok
 - **dedicated contribution MOPOPA17**



- series production:
 - ordered after RF-testing
 - first cavity: rolling mantle, welding flanges
 - tuners, bodies, bellows, flanges: pick-ups under production
 - first 52 drift tubes to be ordered in January 2023

