Kreß GmbH
Sondermaschinenbau

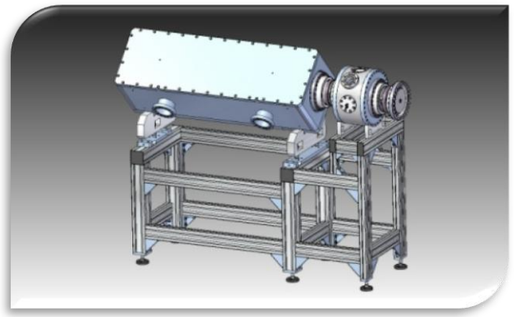
Radio Frequency Quadrupole RFQ accelerator for *Med*Austron, Vienna

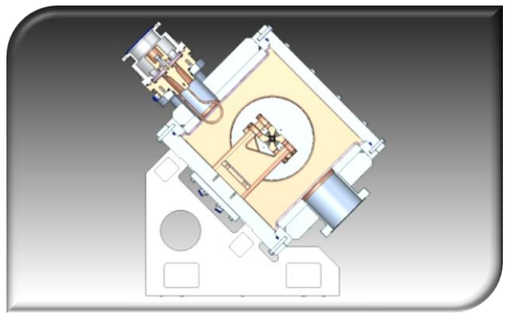
- **First RFQ for medical application with new design.**
- **Cavity with rectangular cross section for easy assembly, access and allignment**
- **RFQ-accelerator and Buncher separated for independent operation**

Technical Data:

Cavity made of stainless steel 304L, inner surface copper plated. Accelerating structure made of OF-Cu.

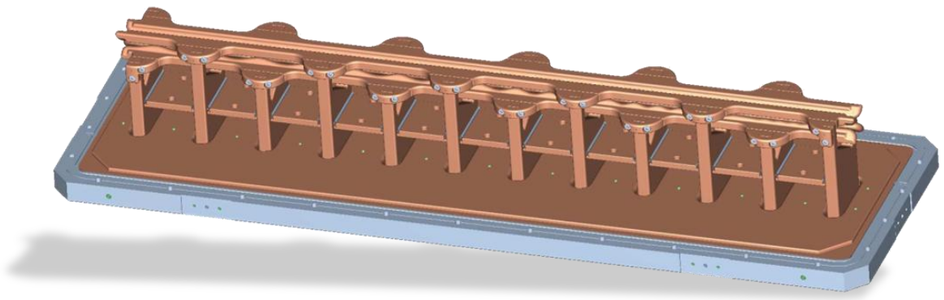
Length	1330 mm
Cross section	420 x 380 mm
Resonance frequency	216,8 MHz
Electrode voltage	70 kV
Input energy	8 keV/u
Output energy	400 keV/u





Designwork for the RFQ is completed and manufacturing will start soon.

For more information visit the *Med*Austron Homepage: www.medaustron.at



Work performed in collaboration with A. Schempp and the IAP-RFQ group (University Frankfurt, Germany)

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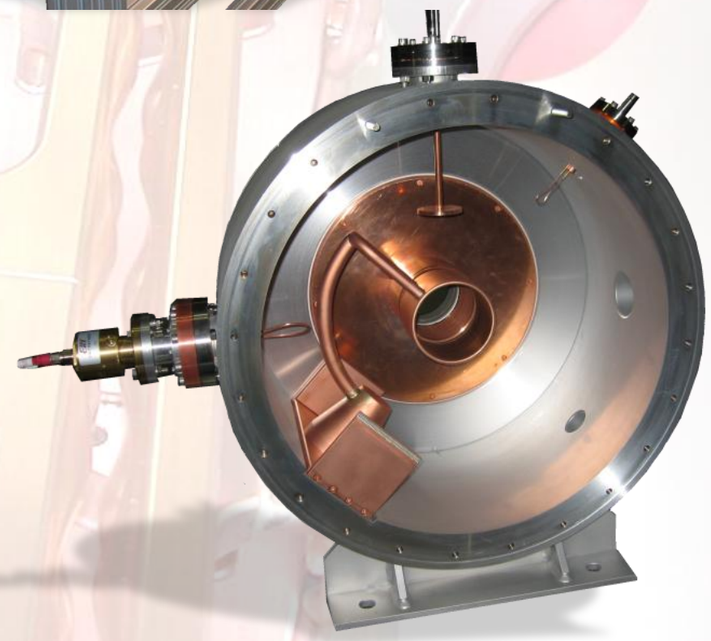
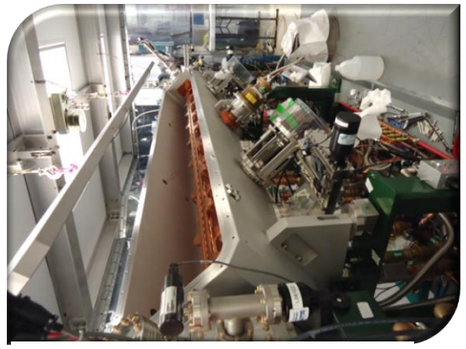
Accelerator Technology

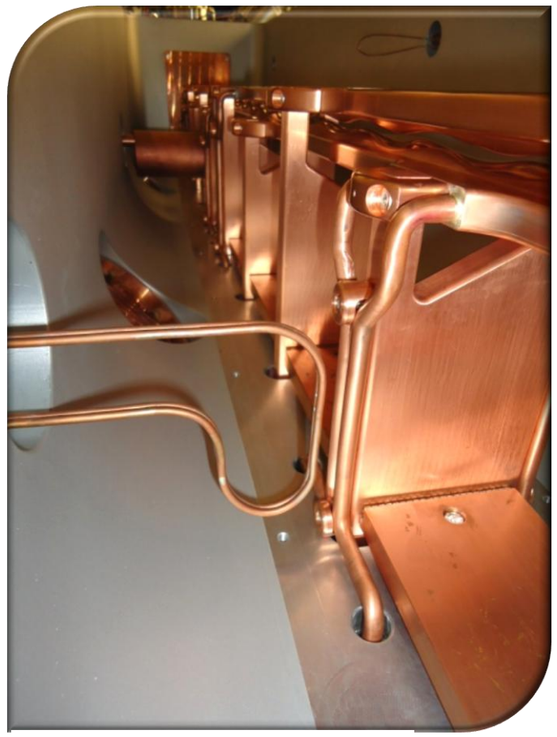


Radio Frequency Quadrupole (RFQ) accelerator for the NSCL at Michigan State University MSU, USA.

The RFQ accelerator shown below is the first ”4-Rod Type-RFQ“ with a housing made of aluminum with a rectangular cross section. The tank is manufactured from one aluminum block and the inner accelerating structure is made of OF-copper. All stainless steel CF-flanges are welded to the aluminum tank. Due to the new design concept a subsequent adjustment of the electrodes is not necessary. Time consuming and costly copper plating of the cavity is not required.
Together with the Institute of Applied Physics (IAP) and the Michigan State University, special planning and manufacturing processes have been developed in order to reduce the manufacturing time to 9 months. Up to now it took 24 months from the design to the final delivery of a CW operating RFQ accelerator.



Setup at NSCL



Cooling pipes with Swagelok fittings

Accelerating structure with rf-coupler

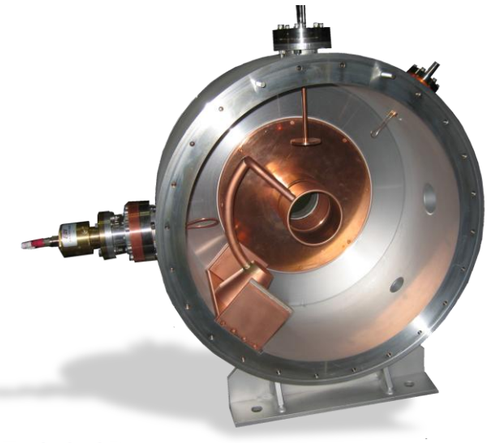
Technical Data:

Dimensions	3500mm / 500 mm / 500 mm	Resonance frequency	80,5 MHz
Cavity material	Aluminum	Electrode voltage	86,2 kV
Accelerating structure	OF-Cu	Input energy	12 keV/u
Flanges	Conflat (CF Al/SS)	Output energy	600 keV/u
CF-flange sealing	Copper gasket	Shuntimpedance	220 kΩm
Cover plate sealing	2 x Viton O-ring	RF-power	120 kW (CW)

Work performed in collaboration with A. Schempp and the IAP-RFQ group (University Frankfurt, Germany) and O. Kester (GSI Darmstadt, Germany, formerly NSCL at MSU, USA)

Spiral loaded buncher cavity (BNL_C3-Buncher) for Brookhaven National Laboratory (BNL), USA

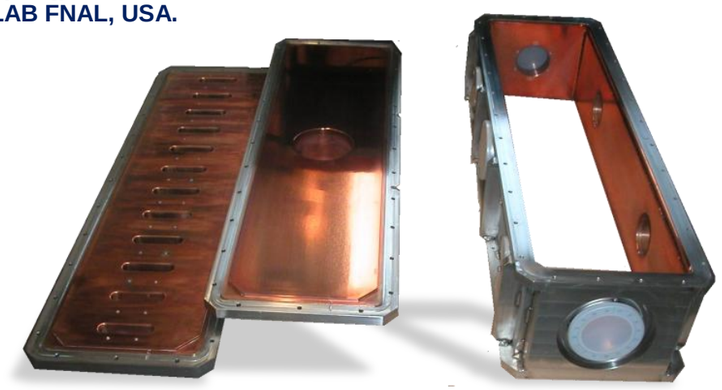
The spiral loaded cavity shown below operates as a buncher behind a 4-rod RFQ at BNL. The particle beam coming from the RFQ has to be longitudinally compressed before it can be injected into the next accelerator. This longitudinal focusing is required so that all ions of a particle pulse will be accepted from the following accelerator.
The cavity is manufactured from a massive block of aluminum and all flanges are conflat flanges (CF-type). The accelerating structure is made of OF-copper. A time consuming and costly copper plating of the cavity is not required.



Technical Data:

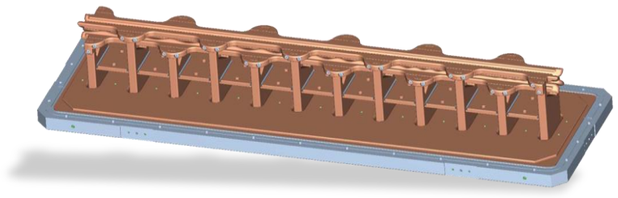
Length	200 mm
Inner / outer diameter	500 mm / 600 mm
Resonance frequency	100,6 MHz
Flanges	Conflat (CF-type)
End plate sealing	Viton+Helicoflex

Radio Frequency Quadrupole (RFQ) proton accelerator for FERMILAB FNAL, USA.



Technical Data:

Cavity made of stainless steel 304L, inner surface copper plated. Accelerating structure made of OF-Cu.



Length	1200 mm
Cross section	300 x 260 mm
Resonance frequency	201,25 MHz
Electrode voltage	76,2 kV
Input energy	35 keV/u
Output energy	750 keV/u

Work performed in collaboration with A. Schempp and the IAP-RFQ group (University Frankfurt, Germany)