

STRUMENTI SCIENTIFICI

CINEL® s.r.l.

Cinel was founded in Padua in the 70's with a technical partnership of INFN LNL Legnaro Laboratory on particle accelerator projects and since then has been involved in some of the most challenging projects all over Europe.

Nowadays, CINEL has reached a long experience on mechanical design and manufacturing of apparatuses in several scientific and research fields such as Synchrotron Light Sources (monochromators, fully integrated front ends and beam lines, experimental chambers), as well as accelerator components (vacuum chambers, accelerating cavities, radiofrequency quadrupole cavities).

Cinel has acquired skilled experience in the field of cryogenics, superconductivity, astrophysics and bio-mechanics collaborating with well-known institutions as a qualified partner in the mechanical, thermal and control system design and it can thus now propose turnkey solutions with high level standardization.

CAD-CAM environment and CNC machines allow Cinel to fully develop whole technical projects, from the design phase to the product certification taking care of all the electro-mechanical, pneumatic and hydraulic aspects.

Cinel is an ISO 9001 qualified company.



DESIGN

TESTING

ASSEMBLY

ENGINEERING

INSTALLATION

MANUFACTURING

Components for **PARTICLE ACCELERATORS**

Strumenti Scientifici CINEL S.r.l.

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Vacuum Furnace Brazing

HIGH VACUUM, HIGH TEMPERATURE SPECIAL BRAZINGS

- All metal vacuum furnace (working volume 60/60/120 cm)
- Aviation standard (AMS2750) compliant
- Vacuum chamber is in stainless steel with Conflat flanges
- Heating chamber has a circular cross section and it is entirely metallic (pure molybdenum, stainless steel and alumina); 3 independently controlled heating zones along the useful length are provided
- Provided with internal gas cooling system, including tube&fin heat exchanger, centrifugal fan and motor
- Maximum operating temperature 1400°C
- High vacuum (1E-6 mbar range) or partial pressure of Ar - H₂ (adjustable from PLC) environment
- The pumping group consists of a pre-vacuum pump system, a 17500 l/s diffusion pump, and a cryogenic trap



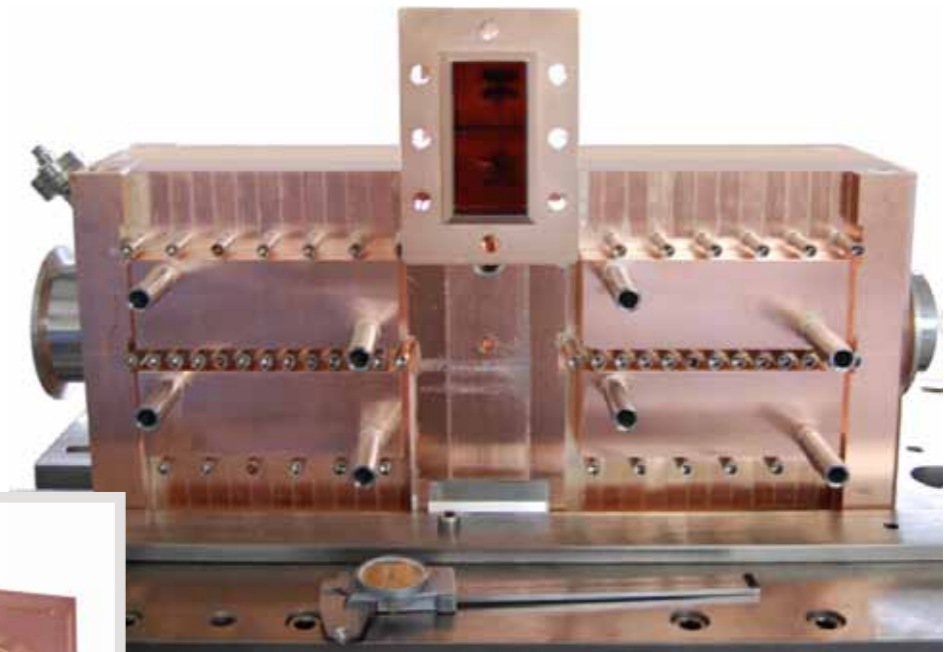
Working space:

- width = 600 mm
- height = 600 mm
- depth = 1200 mm
- max weight load (gross) = 600 kg

■ Vacuum furnace specials brazing

ACCELERATORS

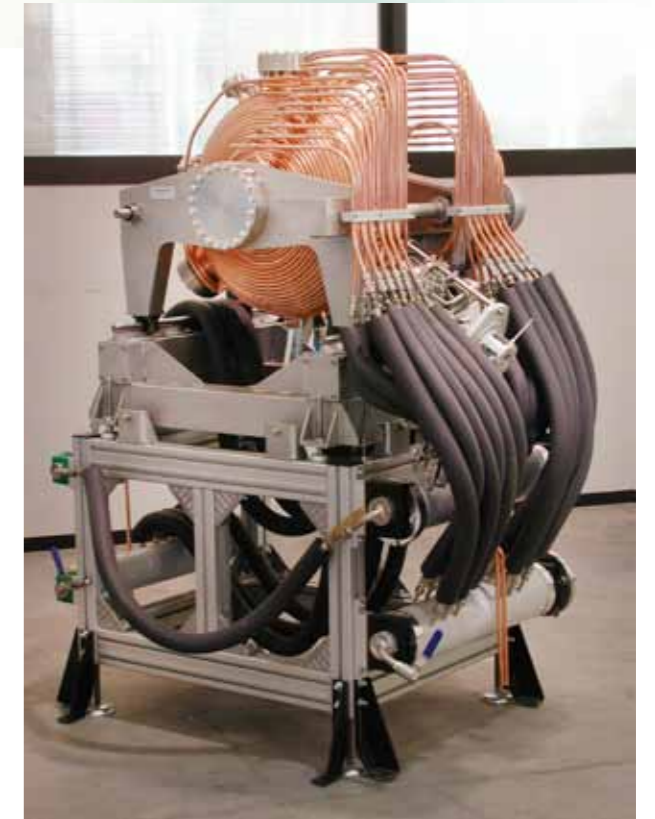
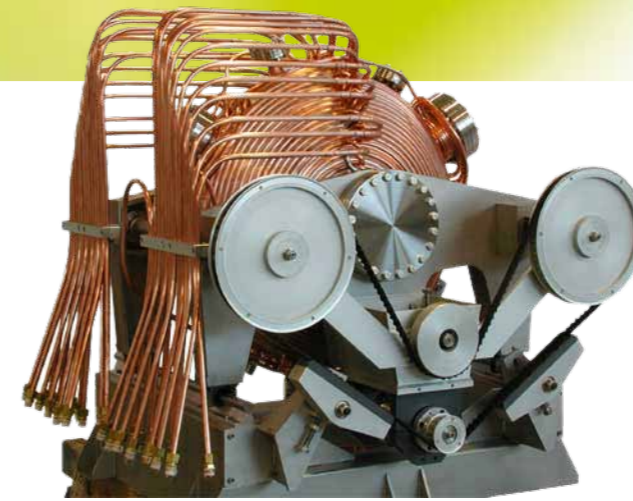
■ Side Coupled Linac (ACLIP) Prototype (2998 Mhz)
Italian Institute for Nuclear Physics, Napoli (Italy)



■ Vacuum Chamber for the Low Energy Ion Ring (LEIR) Electrostatic Septum SEH10
CERN, Geneva (Switzerland)

ACCELERATORS

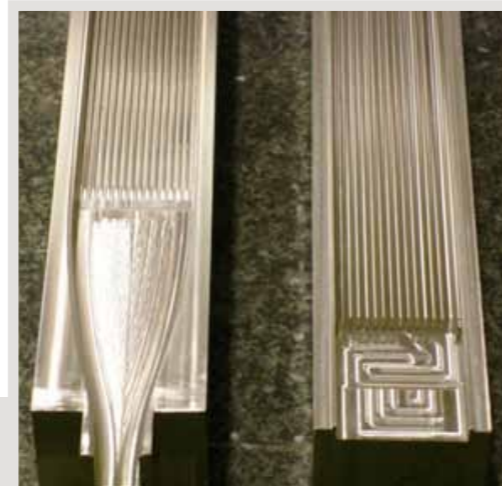
- **DTL Linear Accelerator Prototipe (H-ions, 352.2 Mhz), for LINAC 4 injector**
CERN, Geneva (Switzerland)



- **Elliptic Section Cooled Cavity (476 Mhz) with Tuning System and H.O.M. Frequency Shifter**
Elettra Synchrotron Laboratory, Trieste (Italy),
ANKA Laboratory Karlsruhe, (Germany),
LNLS/CNPq Laboratory, Campinas (Brazil),
Raja Ramanna Center for Advanced Technology, Indus II Indore (India)



- **Compact Linear Collider: Stainless Steel Power Load**
CERN, Geneva (Switzerland)



- **Compact Linear Collider: 3 db X-Band Hybrids**
CERN, Geneva (Switzerland)



ACCELERATORS



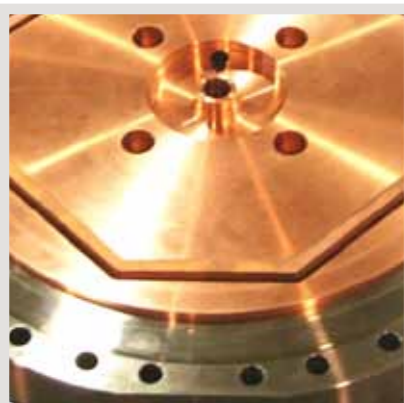
■ RF Planar Hybrid Coupler
CEA, Saclay (France)



■ Radio Frequency Quadrupole Ion Beam Injector
GSI, Darmstadt (Germany)



■ End Cell With Customized Brazed Rf Contact.
In House Brazing



■ Radio Frequency Quadrupole Linac Injector for High Intensity Proton Beam Linac (352.2 Mhz)
Italian Institute for Nuclear Physics, Legnaro (Italy)

RFQ Injector for High Intensity Proton Beam Linac, made of 3D forged OFE copper. Tolerances are ± 0.02 mm over 7 m length. The accelerator was designed and built with close reference to Carlo Rubbia proposal for an accelerator driven system (ADS) for nuclear waste transmutation.

