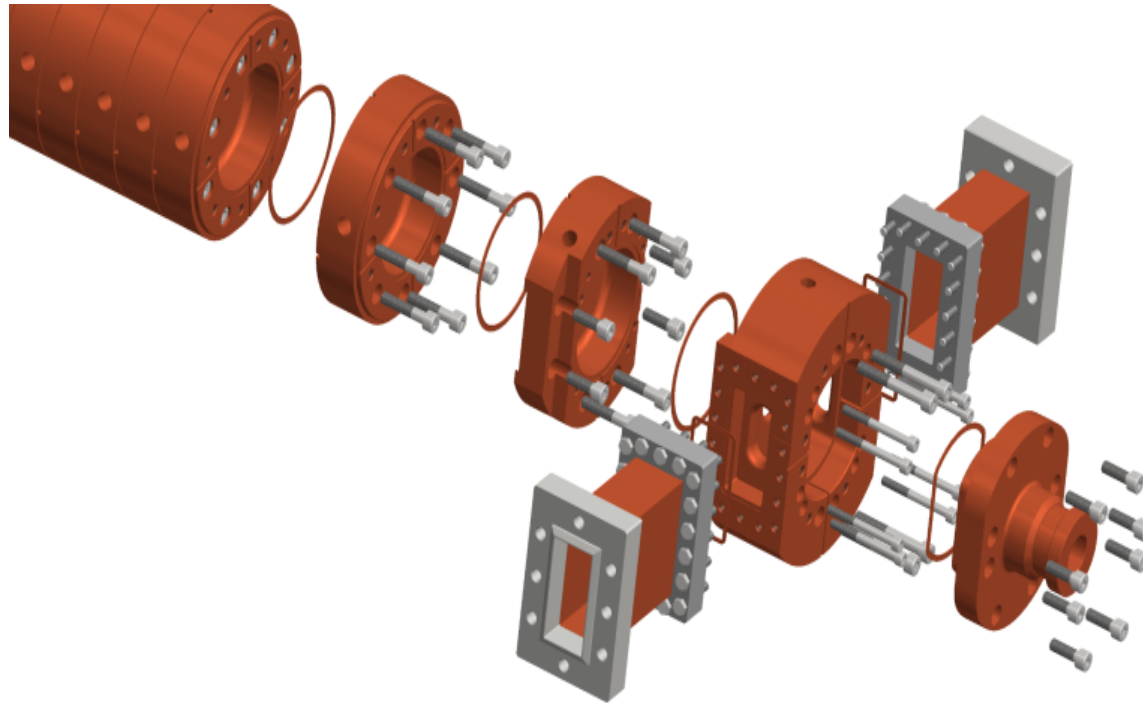


BEYOND BRAZING



PRIORITY NUMBER:

102015000008811

KEYWORDS:

Metal gasket

RF contact

Ultra high vacuum

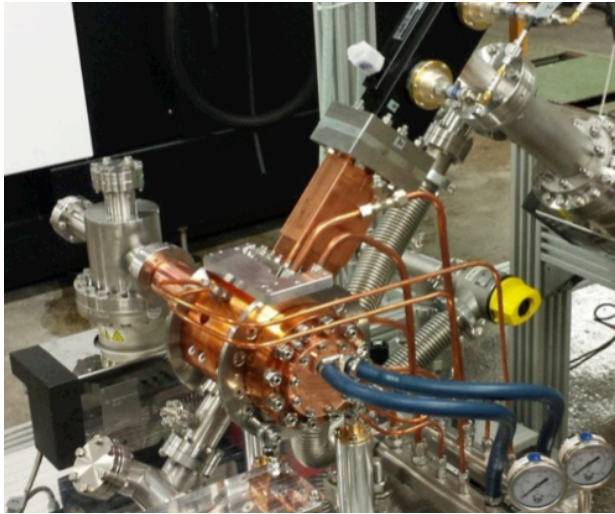
The Invention is about the assembling of complex structures, such as sections of linear particle accelerators (LINAC) and radiofrequency components (RF). The Invention replaces brazing while maintaining the mechanical properties of metals and optimal final product performance. Two key elements at work:

Special Metal Gasket and Fastening Technique



Istituto Nazionale di Fisica Nucleare

BEYOND BRAZING



DESCRIPTION:

How does it work?

Both Special Metal Gasket and Fastening Technique guarantee:

- high/ultra high vacuum up to $10^{-8} \div 10^{-10}$ mbar;
- electrical continuity in RF fields up to tens of MW.

The Gasket - even made of the same material of the portions to be connected - allows both RF contact and vacuum seal. Thanks to its properties, the Gasket enables high precision alignment between metal surfaces and reduces the risks of RF discharges.

More info: <https://doi.org/10.1103/PhysRevSTAB.18.092001>

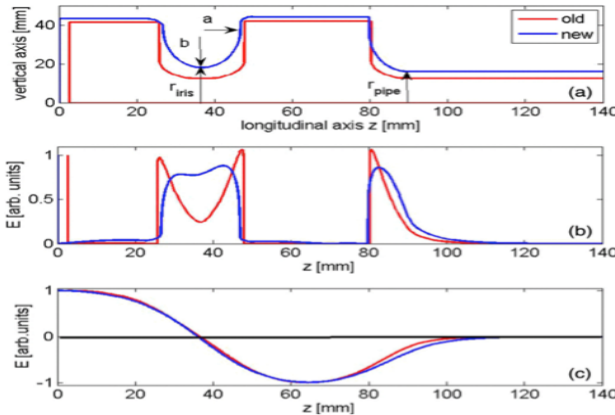


Figure: a) 2D profile compared with a 'standard' gun profile ('old'); b) Surface electric field normalized to the peak cathode field; c) Longitudinal electric field on axis

ADVANTAGES:

- No more Brazing
- No Vacuum oven needed
- Lower failure rate
- Lower production costs
- Time-saving manufacturing process
- Optimal performance in high gradient RF fields

APPLICATIONS:

- High precision mechanical manufacturing and UHV systems assembling
- Manufacture of components of RF structures
- Particle accelerators
- Nuclear reactors
- In-vacuum cooling systems
- High energy physics apparatus
- Aerospace structures