



Contribution ID: 1659 Contribution code: THPM030

Type: **Poster Presentation**

Initial high electric field –vacuum arc breakdown test results for additively manufactured pure copper electrodes

Thursday 11 May 2023 16:30 (2 hours)

Additive Machining (AM) technology is already used in many manufacturing domains and provides many benefits such as design freedom, cooling, and performance improvements as well as significant manufacturing time reduction. AM is also being considered for the manufacture of a Radio Frequency Quadrupole, where an important unknown is the voltage holding capability of AM surfaces. To address this question a series of high electrical field tests was performed on additively manufactured (AM) pure copper electrodes using the CERN pulsed dc high-voltage system. The tests were carried out with different test surface conditions such as “rough”, as built by AM, post-processed and machined. During each test, an ultra-high vacuum was maintained, and the breakdown rate monitored by changing the electric field level and pulse structure. The initial results provide the first reference values for AM built pure copper electrodes performance under vacuum arc breakdown test. According to test results, AM process and material powder characterisation as well as post-processing will be improved in preparation for RF power and beam tests on a full RFQ prototype.

Funding Agency

This project has received funding from the EU Horizon 2020 Research and Innovation programme: agreement No 101004730 and is supported by the Latvian Council of Science grant VPP-IZM-CERN-2020/1-0002.

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: RATKUS, Andris (Riga Technical University)

Co-authors: DA PALMA SERAFIM, Catarina (European Organization for Nuclear Research); PIKURS, Gun-tis (Riga Technical University); POZZI, Mateo (Rosler Italian); FOPPA PEDRETTI, Maurizio (Rösler Italiana s.r.l.); VEDANI, Maurizio (Politecnico di Milano); VRETENAR, Maurizio (European Organization for Nuclear Research); Ms PEACOCK, Ruth (Cockcroft Institute); CALATRONI, Sergio (European Organization for Nuclear Research); ROMANO, Tobia (Politecnico di Milano); Dr TORIMS, Toms (European Organization for Nuclear Research); BJELLAND, Victoria (European Organization for Nuclear Research); WUENSCH, Walter (European Organization for Nuclear Research)

Presenter: RATKUS, Andris (Riga Technical University)

Session Classification: Thursday Poster Session

Track Classification: MC7: Accelerator Technology and Sustainability: MC7.T35: Advanced Manufacturing Technologies for Accelerator Components