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Mechanical design of a QWR cavity for the new ISIS MEBT

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The Quarter Wave Resonator (QWR) is a longitudinal bunching cavity for the MEBT section of the Pre-injector Upgrade project at ISIS. Four cavities are required with at least one functional spare. The production of a full scale prototype is discussed here. Three main manufacturing challenges were encountered as follows: the tight manufacturing tolerances of the stainless steel tank, most noticeably the $80\ \mu\text{m}$ tolerance along the length of the 370 mm bore; the $50\ \mu\text{m} \pm 10\ \mu\text{m}$ copper plating layer on the inside of the complex geometry cavity; and the brazing of the copper lid to a long (280 mm) stem with the use of a jig, to achieve a tight precision in the length inside the cavity. Trials for all these have been conducted before being accurately assembled with a CMM, with lessons learnt and the final solutions presented.

Footnotes

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Word

Region represented

Europe

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