

Quality Control of Exposition Bonded Bi-metal Material and Components

Explosion bonded (ExB) bi-metal materials are widely used in particle accelerator vacuum systems to facilitate UHV vacuum joints between dissimilar materials that could not be welded otherwise. Particularly, ExB stainless steel and aluminum alloy transitions are commonly used to enable reliable all-metal UHV joints on beampipes made of aluminum alloys. In the past, many large leaks were encountered in these transitions at the bonding zone of the bi-metal transition after aluminum-to-aluminum welding, though the bi-metal components were thoroughly tested and leak checked prior to the welding. To minimize these very costly failures, a stringent quality control specification and test procedure has been developed for procurements of the bi-metal raw material and/or UHV components, which will be shared in this presentation.

Summary

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