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## Characterization of Sn100cv filler metal in UNS C10700 copper silver alloy vacuum soldering for Sirius vacuum chamber manufacturing

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Sirius is one of the first 4th generation synchrotron light source globally, currently in operation by the Brazilian Synchrotron Light Laboratory (LNLS). One of the components that will be part of the light source are the vacuum chambers defining the environment in which the electron beam travels under the influence of electromagnetic fields. This environment should be substantially free of gas molecules, since collisions between the electron beam and gas molecules can lead to the loss of stored electrons and a rapid decrease in the beam current. These chambers must be cooled and for chamber production, a joint of the silver-copper vacuum chamber alloy is required to be made to ETP copper by the process of soldering. This process achieved all the functional requirements of the project, being ultra-high vacuum tightness, low deformation, low oxidation, low temperature, and, low porosity. The development and characterization of the brazing process were carried out through tests of metallography, optical microscopy, microhardness, Scanning Electron Microscopy (SEM), and Energy-Dispersive X-ray Spectroscopy (EDS). With the results obtained through the tests performed, it was possible to characterize the solder and determine the intermetallic behavior after several types of heat treatment conditions.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

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