

Progress Status: Aluminium Capsule – BLIP Irradiation Program

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- Thermal analysis has been performed with the following assumptions:
 - The capsule is filled with helium
 - The gap between the specimens in the transverse to the beam direction is 50 μm
 - The gap between the specimens in the beam direction is 20 μm : **Could anyone advice on the reasonable gap size between the SS304 window and the aluminium sample layer?**
- The maximum temperature in the aluminium sample is calculated to be 73 C.

Sample Preparation

- The aluminium alloy sheets are ordered from www.onlinemetals.com and Goodfellows
- The samples for the capsule and for the cold tests will be prepared at Lund University in September
- The aluminium samples with a thin luminescent coating will be prepared in parallel

Capsule Manufacturing Route

- Checking the Possibility at CERN:
 - Hope to discuss about this possibility during the RaDIATE Meeting today
- Checking the Possibility at FZ-Jülich:
 - Capable of manufacturing the SS304 capsule
 - The service of welding in helium is not provided
 - Possibilities are:
 - EB welding in **vacuum**: **Could anyone advice on the plausible thermal contact resistance between the SS304 window and the aluminium sample layer?**
 - Laser beam welding in **argon**: Concerns on irradiation temperature due to an order of magnitude lower thermal conductivity of argon compared to helium. In order to keep the irradiation temperature below 130 °C (to make Al6061-T6 keep its aging properties), the gap between the window and the sample must be smaller than **5 um**: **Could anyone advice whether this is a reasonably achievable gap size in reality, in the contact area in the middle of the capsule? What is the cooling water pressure?**

Path towards the capsule assembly

- The aluminium alloy specimens will be shipped from ESS to the lab where the SS304 capsule will be manufactured and welded.
- The Capsule will be welded and the leak tightness will be tested:
 - A guidance from BNL on the quality specifications of the leak tightness test will be appreciated.