

The LIEBE high-power target: Offline commissioning results.

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With the aim of increasing the primary beam intensity in the next generation of Radioactive Ion Beam facilities, a major challenge is the production of targets capable of dissipating the high deposited beam power. In that context, LIEBE is a high-power target dedicated to the production of short-lived isotopes.

The design consists of a loop of molten lead-bismuth eutectic, in which the deposited primary beam power is dissipated by a water-cooled heat exchanger. The circulation of the liquid metal is achieved by an electromagnetic pump coupled to the loop. Additionally, the target includes a diffusion chamber next to the irradiation chamber to promote the creation of droplets through a grid. The extraction of short-lived isotopes is then enhanced by the shorter diffusion paths of the droplets compared to the ones of a liquid bath.

The LIEBE prototype is now fully assembled and before operating the target online at ISOLDE, the safety and operation conditions have to be reviewed. An offline commissioning phase has started, in which several non-conformities could be identified and solved. The flow established by the electromagnetic pump has been evaluated in a LIEBE replica, the stability of the target/pump coupling has been assessed through alignment and vibration measurements and the thermal control system has been tested. The final test will foresee the full operation of the prototype on the offline isotope separator.

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