

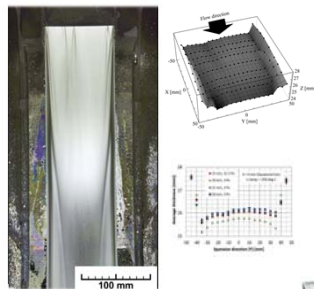
# The Accomplishments of Lithium Target and Test Facility Validation Activities in the IFMIF/EVEDA Phase

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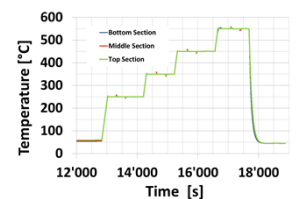
During the Engineering Validation and Engineering Design Activities (EVEDA) phase of the **International Fusion Materials Irradiation Facility (IFMIF)**, major elements of the *Lithium Target Facility* (the neutron source) and the *Test Facility* (implementing the irradiation experiments) were prototyped and tested. These works were successfully concluded in the frame of the Japanese and European Broader approach activities between 2007 – 2015.

The validation activities included *basic research* (SSTT, corrosion), *components* (irradiation modules) and *large scale facilities* (lithium and helium loops). The results were fed back to the EVEDA design process and support the ongoing design activities towards an IFMIF plant to be realized timely, as necessary element of the fusion roadmaps.

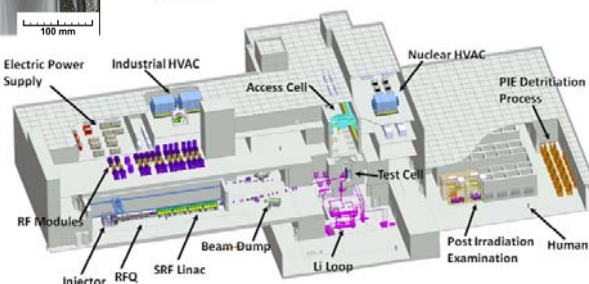
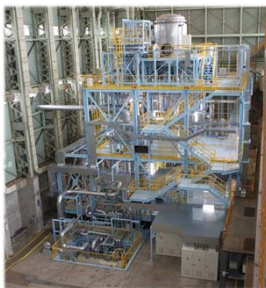
The **Lithium Target** operates at 15m/s, 250°C. The long term stability of the lithium flow thickness 25+/-1mm was proven by Laser probe measurements.



HELOKA-LP is the prototype low pressure **helium loop** for coolant supply of the test modules.



Prototypes of two **High Flux Test Module** versions were built. The irradiation temperature range (HFTM-V: 250-550°C, HFTM-H: up to 1000°C) and temperature homogeneity was demonstrated.

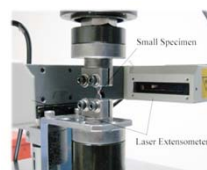


The IFMIF plant overview

The **Lithium Loop** supplies a constant flow of Li to the target. The ELTL loop operated 519 days, startup and operation scenarios as well as Li purity measurements were performed.



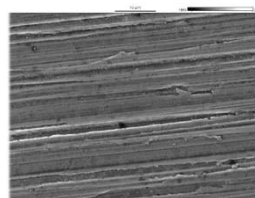
The **Small Specimen Test Technique** is essential for the IFMIF mission. Specimen shapes, test setups and data analysis were further developed.



An irradiation in the **BR2 reactor** served to test the irradiation capsules, fission chambers and Cherenkov fiber optics for the characterization of the IFMIF source.



Remote handling operations were validated for a 1:1 Target Assembly mockup.



Li-corrosion tests of RAFM steels under relevant conditions (15m/s, <30 wppm N, 330°C) showed erosion <0.3µm/year

