

Profile LFR-52

JLBL-3

JAPAN

GENERAL INFORMATION

NAME OF THE FACILITY	JAEA Lead-Bismuth flow Loop-3
ACRONYM	JLBL-3
COOLANT(S) OF THE FACILITY	LBE
LOCATION (address):	2-4, Oaza-Shirakata, Tokai, Ibaraki, Japan
OPERATOR	JAEA
CONTACT PERSON	Toshinobu SASA
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STATUS OF THE FACILITY	Stanby
Start of operation (date):	2003

MAIN RESEARCH FIELD(S)	<input type="checkbox"/>	Zero power facility for V&V and licensing purposes
	<input type="checkbox"/>	Design Basis Accidents (DBA) and Design Extended Conditions (DEC)
	<input checked="" type="checkbox"/>	Thermal-hydraulics
	<input type="checkbox"/>	Coolant chemistry
	<input type="checkbox"/>	Materials
	<input checked="" type="checkbox"/>	Systems and components
	<input type="checkbox"/>	Instrumentation & ISI&R

TECHNICAL DESCRIPTION

Description of the facility

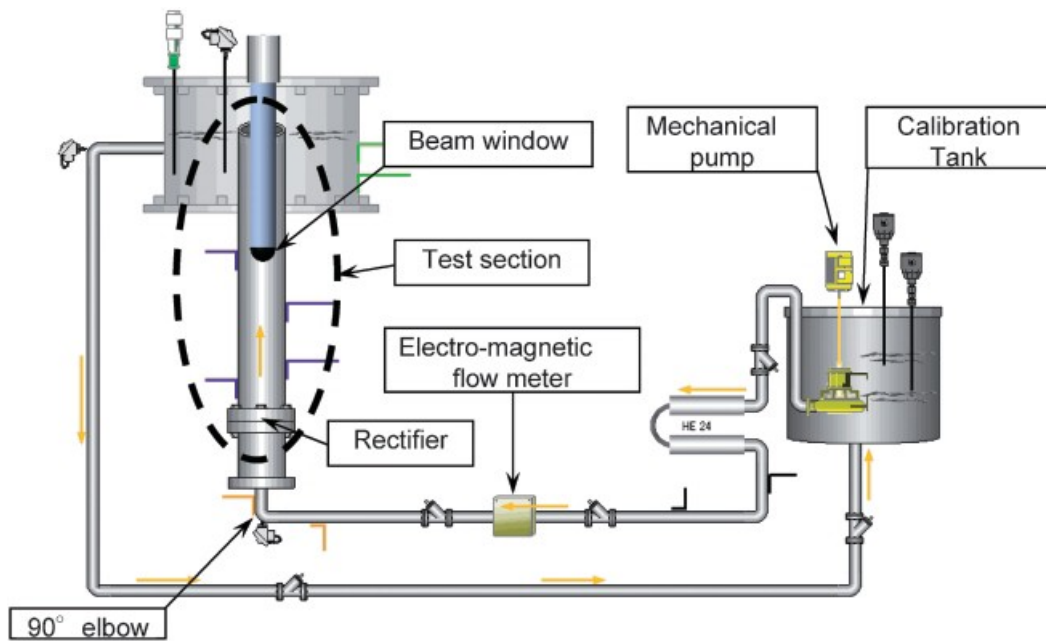
The JLBL-3 facility consists of a test section with a beam window mock-up, heaters, an air cooler, a mechanical pump, an electro-magnetic flow meter, a calibration tank, a storage tank and filter.

The experiments carried out in the JLBL-3 are dedicated to investigate mainly (1) Thermal fluid test of beam window, (2) Measurement of heat transfer characteristic around beam window, (3) Proof test of mechanical pump and massive LBE flow.

Acceptance of radioactive material

No

Scheme/diagram



3D drawing/photo



Parameters table

Coolant inventory	450 litres
Power	41 kW (beam window mock-up:6kW)
Test sections	
TS #1	<i>Characteristic dimensions</i> 89.5 mm in diameter, 845 mm in length.
	<i>Static/dynamic experiment</i> Dynamic experiment
	<i>Temperature range in the test section (Delta T)</i> 200-450°C (100°C)
	<i>Operating pressure and design pressure</i> 0.5 MPa

	<u>Flow range (mass, velocity, etc.)</u> Maximum flow rate: 500L/min.
Coolant chemistry measurement and control (active or not, measured parameters)	Oxygen concentration are measured and controlled.
Instrumentation	Oxygen sensor, thermocouple, electro-magnetic flow meter

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

- (1) Heat transfer characteristics of the hemispherical beam window was formulized.
- (2) Over 500 L/min. LBE flow was achieved by mechanical pump.

PLANNED EXPERIMENTS (including time schedule)

- (1) Heat transfer test on various type of beam window.
- (2) Bundle test.

TRAINING ACTIVITIES

No.

REFERENCES (*specification of availability and language*)

K. Hayashi, et al., Thermal-Hydraulic Experiment on Beam Window for Developing the Accelerator-Driven Transmutation System, Transactions of the Atomic Energy Society of Japan, 7, 1, pp44-57, (2008) [In Japanese].