

## Profile LFR-37

**TELEMAT**

**GERMANY**

### GENERAL INFORMATION

NAME OF THE FACILITY Test Loop for Lead Material testing  
ACRONYM TELEMAT  
COOLANT(S) OF THE FACILITY Pb  
LOCATION (address): Karlsruhe Institute of Technology (KIT)  
Institute for Nuclear and Energy Technologies (IKET)  
Hermann-von-Helmholtz-Platz 1, Bldg 415  
76344 Eggenstein-Leopoldshafen  
Germany  
OPERATOR KIT  
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Head of Karlsruhe Liquid Metal Laboratory (KALLA)  
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STATUS OF THE FACILITY Standby  
Start of operation (date): 2013

MAIN RESEARCH FIELD(S)

- Zero power facility for V&V and licensing purposes
- Design Basis Accidents (DBA) and Design Extended Conditions (DEC)
- Thermal-hydraulics
- Coolant chemistry
- Materials
- Systems and components
- Instrumentation & ISI&R

### TECHNICAL DESCRIPTION

**Description of the facility**

TELEMAT is a forced-convection loop for exposing structural material (piping, test sections) to lead at temperatures up to 750°C. Depending on the test section, a mass flow rate of 1.5m<sup>3</sup>/h can be achieved.

It basically consists of a heater, sensor instrumentation and the test section in the hot part of the loop and an electromagnetic pump, an oxygen control system and a cooler in the cold part of the loop. Both parts are connected by a heat exchanger. The horizontal test port has a maximum length of 3500mm and an inner diameter of 19mm.

Telemat is made of austenitic stainless steel (DIN W.-Nr 1.4571). Oxygen is added or removed in the oxygen control by exposing the lead to a flowing gas atmosphere with variable oxygen partial pressure. Electrochemical oxygen sensors are mounted to measure the oxygen content in the lead.

Main research interest of TELEMAT is:

- Long-term corrosion investigations of structural materials in high temperature flowing Lead
- Long-term corrosion investigations of coated materials in high temperature flowing Lead
- Modelling of corrosion/precipitation behaviour in high temperature flowing Lead.

### Acceptance of radioactive material

No

### Scheme/diagram

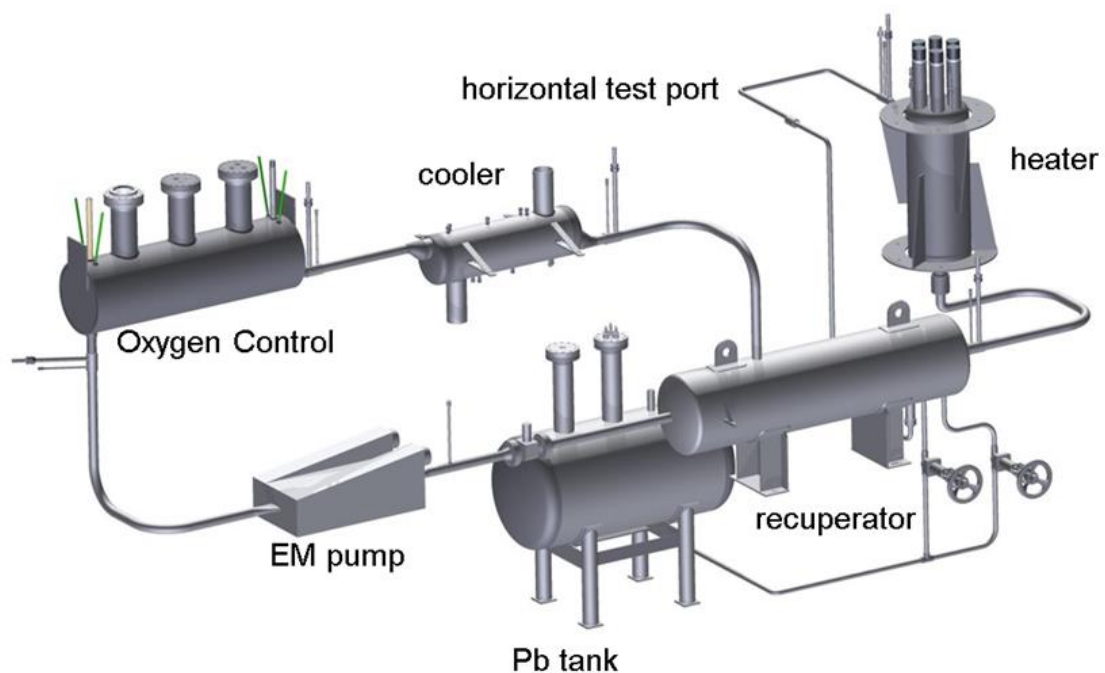


FIG. 1. Scheme of the TELEMAT facility

### 3D drawing/photo



FIG. 2. View of the TELEMAT facility

### Parameters table

Coolant inventory	150l
Power	110kW
Test sections	
TS #1	<u>Characteristic dimensions</u> horizontal TS, length 3500mm, tube diameter 18,9mm
	<u>Static/dynamic experiment</u> dynamic
	<u>Temperature range in the test section (Delta T)</u> 350°C - 750°C
	<u>Operating pressure and design pressure</u> 2 bar
	<u>Flow range (mass, velocity, etc.)</u> 1,5m <sup>3</sup> /h
Coolant chemistry measurement and control (active or not, measured parameters)	active oxygen control system by Pt/air oxygen sensor and gas phase oxygen exchange
Instrumentation	pressure transducer thermocouples

**COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS**

n/a

**PLANNED EXPERIMENTS (including time schedule)**

Standby, no planned experiments.

**TRAINING ACTIVITIES**

Training activities are possible, depending on availability and after prior agreement under supervision of KIT.

**REFERENCES (*specification of availability and language*)**

n/a