

Profile SFR-28

ALINA

GERMANY

GENERAL INFORMATION

NAME OF THE FACILITY	Karlsruhe experiments with Li and Na free jet
ACRONYM	ALINA
COOLANT(S) OF THE FACILITY	Na
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
CONTACT PERSON (name, address, institute, function, telephone, email):	Prof. Thomas Wetzel Karlsruhe Institute of Technology (KIT) Head of Karlsruhe Liquid Metal Laboratory (KALLA) +49 721 608 23462 thomas.wetzel@kit.edu

STATUS OF THE FACILITY	Standby
Start of operation (date):	2007

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 checked="" type="checkbox"/>	Materials
	<input checked="" type="checkbox"/>	Systems and components
	<input checked="" type="checkbox"/>	Instrumentation & ISI&R

TECHNICAL DESCRIPTION

Description of the facility

ALINA is a Sodium loop for investigation of free surface jets and flows at temperatures between 150°C and 300°C. It was planned and constructed for the demonstration of a liquid ion beam target in the framework of the NUSTAR collaboration.

The primary Sodium loop consists of a sump tank, an induction pump, a coriolis flow meter, a heat exchanger, a free surface sodium jet test section and an electrical heater. For safety and

temperature reasons the secondary cooling loop is running with diphyl-oil as coolant media that is cooled by air.

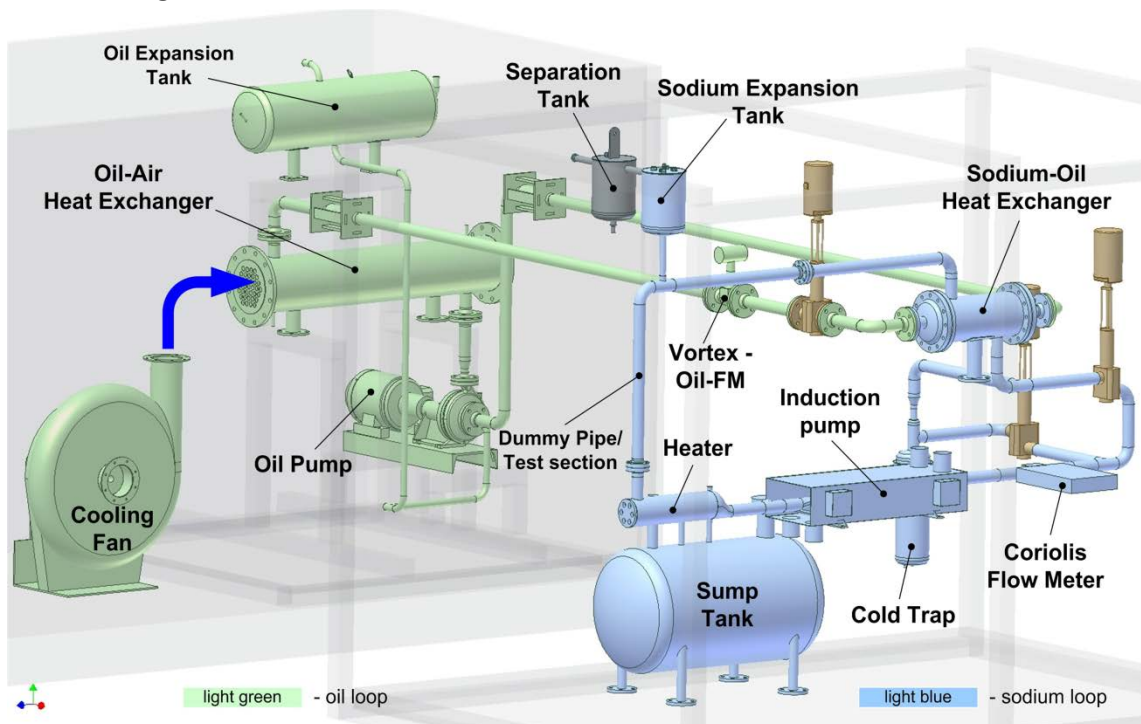
Main purposes are:

- Free surface flow investigation
- Free surface target investigation

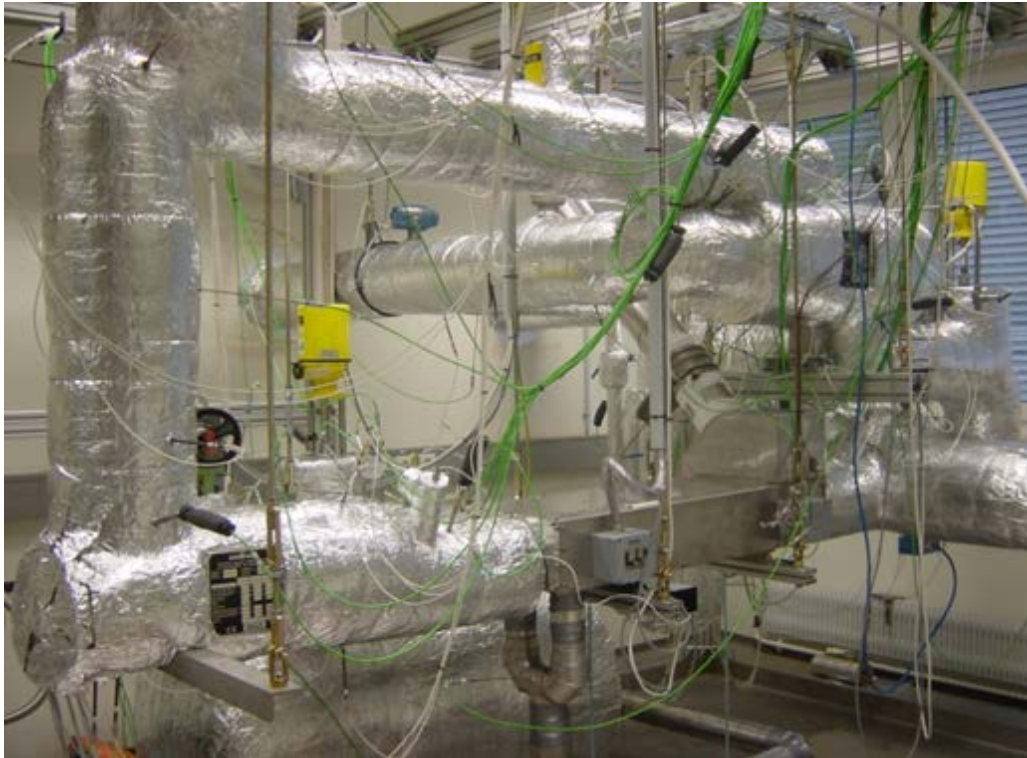
Acceptance of radioactive material

No

Scheme/diagram



3D drawing/photo



Parameters table

Coolant inventory	150l
Power	120kW
Test sections	
TS #1	<u>Characteristic dimensions</u> Height ca. 1000mm
	<u>Static/dynamic experiment</u> dynamic
	<u>Temperature range in the test section (Delta T)</u> 150°C - 300°C
	<u>Operating pressure and design pressure</u> 1 bar
	<u>Flow range (mass, velocity, etc.)</u> 20m ³ /h
Coolant chemistry measurement and control (active or not, measured parameters)	cold trap filtering
Instrumentation	coriolis flow meter thermocouples

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

Project FAIR: Liquid metal jet, free surface experiments

PLANNED EXPERIMENTS (including time schedule)

TRAINING ACTIVITIES

REFERENCES (*specification of availability and language*)

M. Daubner, F. Fellmoser, L. Stoppel: Technische Beschreibung der Versuchsanlage ALINA zur Untersuchung eines Natrium-Freistrahls; 2011; Karlsruher Institut für Technologie: KIT scientific reports 7570; <http://nbn-resolving.org/urn:nbn:de:0072-216826> (available in german only)