

Profile SFR-30

KASOLA

GERMANY

GENERAL INFORMATION

NAME OF THE FACILITY	Karlsruhe Sodium Laboratory
ACRONYM	KASOLA
MEDIUM (COOLANT(S)) OF THE FACILITY	Na
LOCATION (address):	Karlsruhe Institute of Technology (KIT) Institute for Neutron Physics and Reactor Technology (INR) Hermann-von-Helmholtz-Platz 1, Bldg 521 76344 Eggenstein-Leopoldshafen Germany
OPERATOR	KIT
CONTACT PERSON (name, address, institute, function, telephone, email):	Dr. Wolfgang Hering Karlsruhe Institute of Technology (KIT) Head of department INR-ASS +49 721 608 22556 wolfgang.hering@kit.edu

STATUS OF THE FACILITY	In operation
Start of operation (date):	2019

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

At the Institute of Neutron physics and Reactor technology (INR) of the Karlsruhe Institute of Technology (KIT), the experimental sodium loop KASOLA (Karlsruhe Sodium Laboratory) is in hot qualification phase. A key feature of the facility is its flexibility with respect to different needs such as thermal hydraulic (TH) experiments to validate modern system and CFD codes, component validation tests, thermal-hydraulic benchmark experiments, and systems integration of direct energy conversion system and high temperature thermal storage devices. To cover this, KASOLA has a

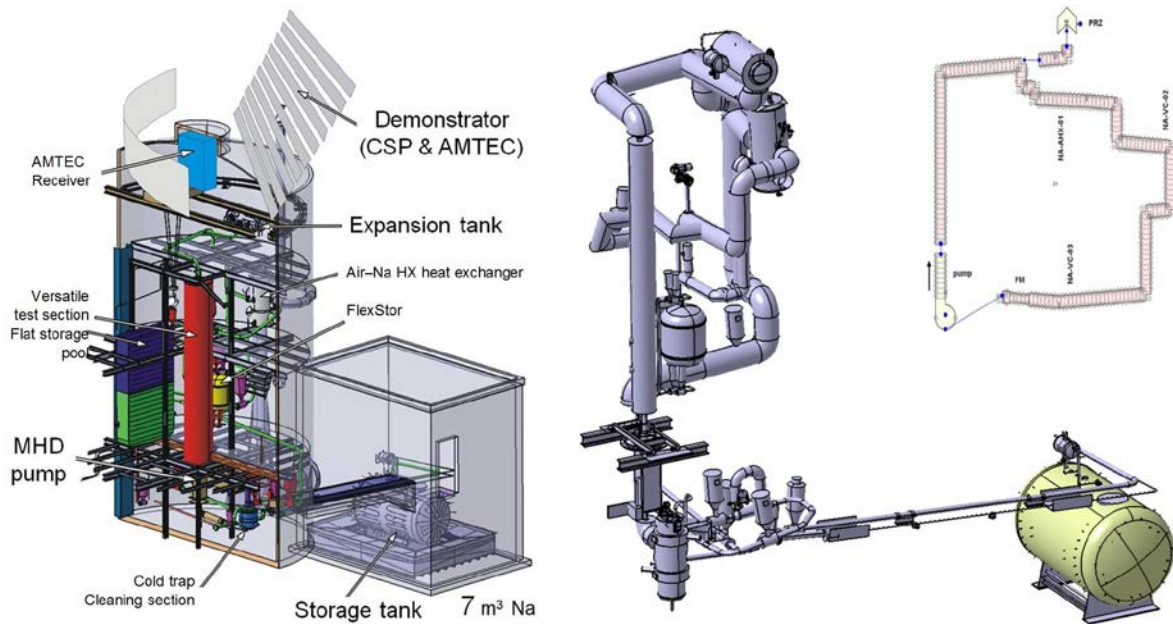
versatile test section with a maximum height of 5 m and a sodium inventory of 7 m³. It operates up to 550 °C in the hot leg. Embedded in the base loop is a magneto-hydrodynamic (MHD) pump serving a flow rate of up 150m³/h at a pressure head of 0.5 MPa. By this pump concept various pump characteristics as well as a reversal of the flow direction can be realized to study numerous potentially occurring technical scenarios.

Karlsruhe Sodium Laboratory (KASOLA) main loop (base loop) consists of the cleaning section with the cold trap, a section for qualification of non-invasive velocity measurement devices, and two test ports: a high flow test port and a versatile test port plus a low temperature port to make KASOLA infrastructure available to other small scale facilities.

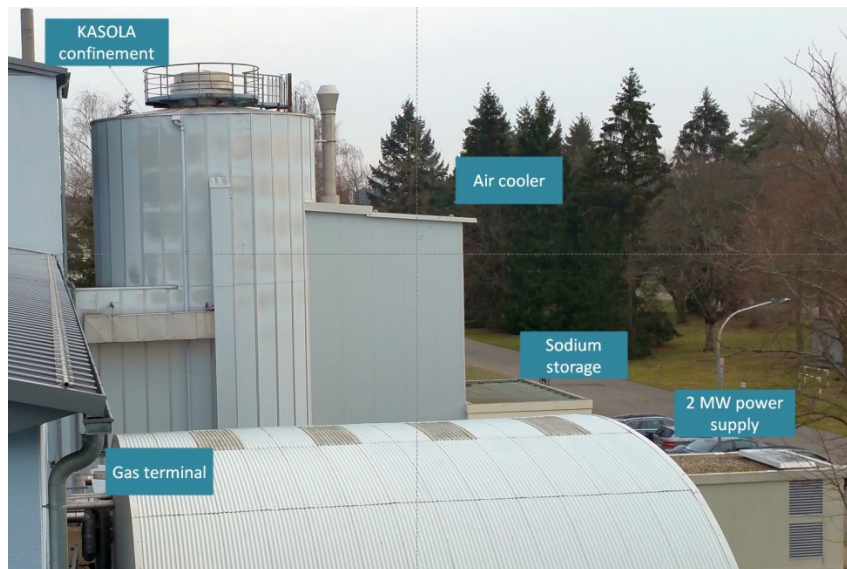
Acceptance of radioactive material

No

Scheme/diagram



3D drawing/photo



Parameters table

Medium (Coolant) inventory	7m ³
Power	800kW
Test sections: 2	
TS #1	<u>Characteristic dimensions</u> height 6000mm
	<u>Static/dynamic experiment</u> both
	<u>Temperature range in the test section (Delta T)</u> -550°C
	<u>Operating pressure and design pressure</u> <1 bar / 6 bar
	<u>Flow range (mass, velocity, etc.)</u> 150m ³ /h
TS #2	<u>Characteristic dimensions</u> height 6000mm
	<u>Static/dynamic experiment</u> both
	<u>Temperature range in the test section (Delta T)</u> -550°C
	<u>Operating pressure and design pressure</u> 1 bar / 6 bar
	<u>Flow range (mass, velocity, etc.)</u> 50m ³ /h
Medium (Coolant) chemistry measurement and control (active or not, measured parameters)	plugging meter
Instrumentation	3 flow meters Thermocouples, pressure, level UDV

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

Commissioning Phase 1

PLANNED EXPERIMENTS (including time schedule)

Q2/19 thermal hydraulics qualification

Q1/20 Start BFS and TES

TRAINING ACTIVITIES

Bachelor, Master and PhD Thesis

REFERENCES (*specification of availability and language*)

Sara Perez-Martin, Thomas Schaub, Angela Jianu, Alexandru Onea, Wadim Jäger, Wolfgang Hering, Robert Stieglitz, Research on Liquid metal thermal hydraulics at KIT, Meeting on Expert Group on Liquid Metal Technology, 14-15 May, 2018, NEA, Boulogne-Billancourt, France

W. Hering, A. Jianu, A. Onea, M. Lux, S. Vielhaber, W. Jäger, R. Stieglitz, P. Freiner, O. Albrecht, Design and Engineering report of the Karlsruhe Sodium Laboratory (KASOLA), KIT Scientific report, 2019, in print.