Profile SFR-30

KASOLA

GERMANY

GENERAL INFORMATION
NAME OF THE FACILITY: Karlsruhe Sodium Laboratory
ACRONYM: KASOLA
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: Dr. Wolfgang Hering
Karlsruhe Institute of Technology (KIT)
Head of department INR-ASS
+49 721 608 22556
wolfgang.heruing@kit.edu

STATUS OF THE FACILITY
Start of operation (date): 2014

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
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 currently being erected and commissioning tests are scheduled in 2014. 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 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 m$^3$. 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 150m$^3$/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

![Scheme of the KASOLA facility](image)

FIG. 1. Scheme of the KASOLA facility

3D drawing/photo
FIG. 2. View of the KASOLA facility

### Parameters table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coolant inventory</td>
<td>7m³</td>
</tr>
<tr>
<td>Power</td>
<td>800kW</td>
</tr>
<tr>
<td><strong>Test sections: 2</strong></td>
<td></td>
</tr>
<tr>
<td><strong>TS #1</strong></td>
<td></td>
</tr>
<tr>
<td>Characteristic dimensions</td>
<td></td>
</tr>
<tr>
<td>height</td>
<td>6000mm</td>
</tr>
<tr>
<td>Static/dynamic experiment</td>
<td>both</td>
</tr>
<tr>
<td>Temperature range in the test section (Delta T)</td>
<td>-550°C</td>
</tr>
<tr>
<td>Operating pressure and design pressure</td>
<td>1 bar / 60 bar</td>
</tr>
<tr>
<td>Flow range (mass, velocity, etc.)</td>
<td>150m³/h</td>
</tr>
<tr>
<td><strong>TS #2</strong></td>
<td></td>
</tr>
<tr>
<td>Characteristic dimensions</td>
<td></td>
</tr>
<tr>
<td>height</td>
<td>4000mm</td>
</tr>
<tr>
<td>Static/dynamic experiment</td>
<td>both</td>
</tr>
<tr>
<td>Temperature range in the test section (Delta T)</td>
<td>-550°C</td>
</tr>
<tr>
<td>Operating pressure and design pressure</td>
<td>1 bar / 60 bar</td>
</tr>
<tr>
<td>Flow range (mass, velocity, etc.)</td>
<td>50m³/h</td>
</tr>
<tr>
<td>Coolant chemistry measurement and</td>
<td>plugging meter</td>
</tr>
</tbody>
</table>
control (active or not, measured parameters)

Instrumentation

- flow meter
- Thermocouples
- UDV

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

PLANNED EXPERIMENTS (including time schedule)

TRAINING ACTIVITIES
Bachelor, Master and PhD Thesis

REFERENCES (specification of availability and language)

1. HERING W., STIEGLITZ R., JIANU A., LUX M., ONEA A., SCHERRER S., HOMANN C.; Scientific program of the Karlsruhe Sodium Laboratory (KASOLA); IAEA-CN-199/257; Int. Conf. on Fast Reactors and Related Fuel Cycles, Paris, France, March 4.–7, 2013