



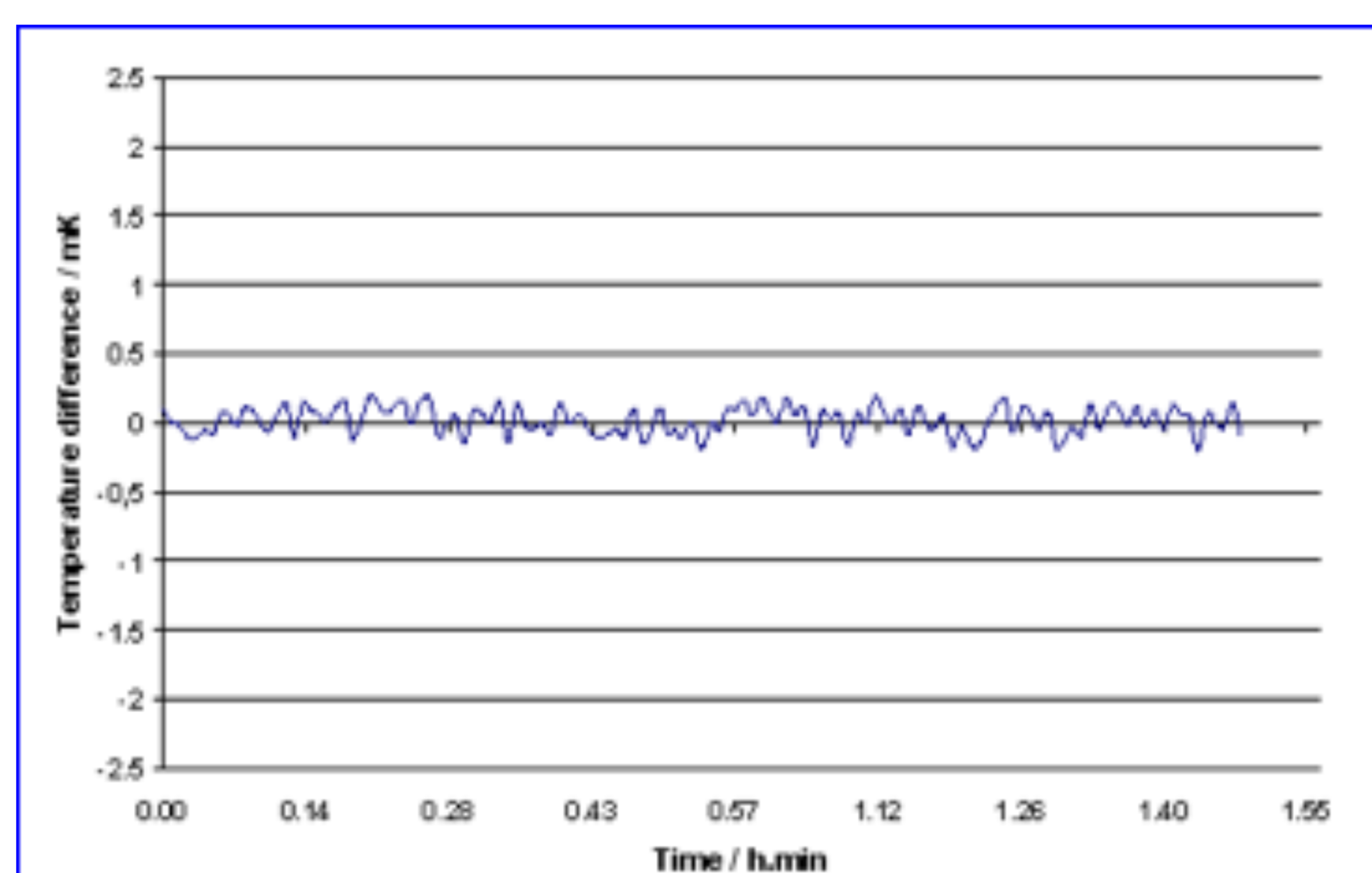
Pressure control for heat pipe applications

The Heat Pipe is a device that transfers heat with a very high thermal conductance, by boiling a fluid at one point and condensing it at another. The Gas-Controlled Heat-Pipe is a special kind of HP equipped with a gas-controlled line that enables direct control of the inner pressure. An inert gas such as helium or nitrogen, is used to control the vapour pressure of the working fluid.

Recently, a specific commercial pressure controller was produced by ARMANO for gas controlled heat pipes application: the DPC 3800 modelHP. This pressure controller was already successfully tested at INRiM and now is used by different accredited laboratories for the calibration of thermometers in heat pipes.

Different working fluids are used and, by associating to the heat pipe an appropriate pressure controller, the temperature stability inside the system can be controlled within few millikelvin, from 80 °C up to 900 °C.

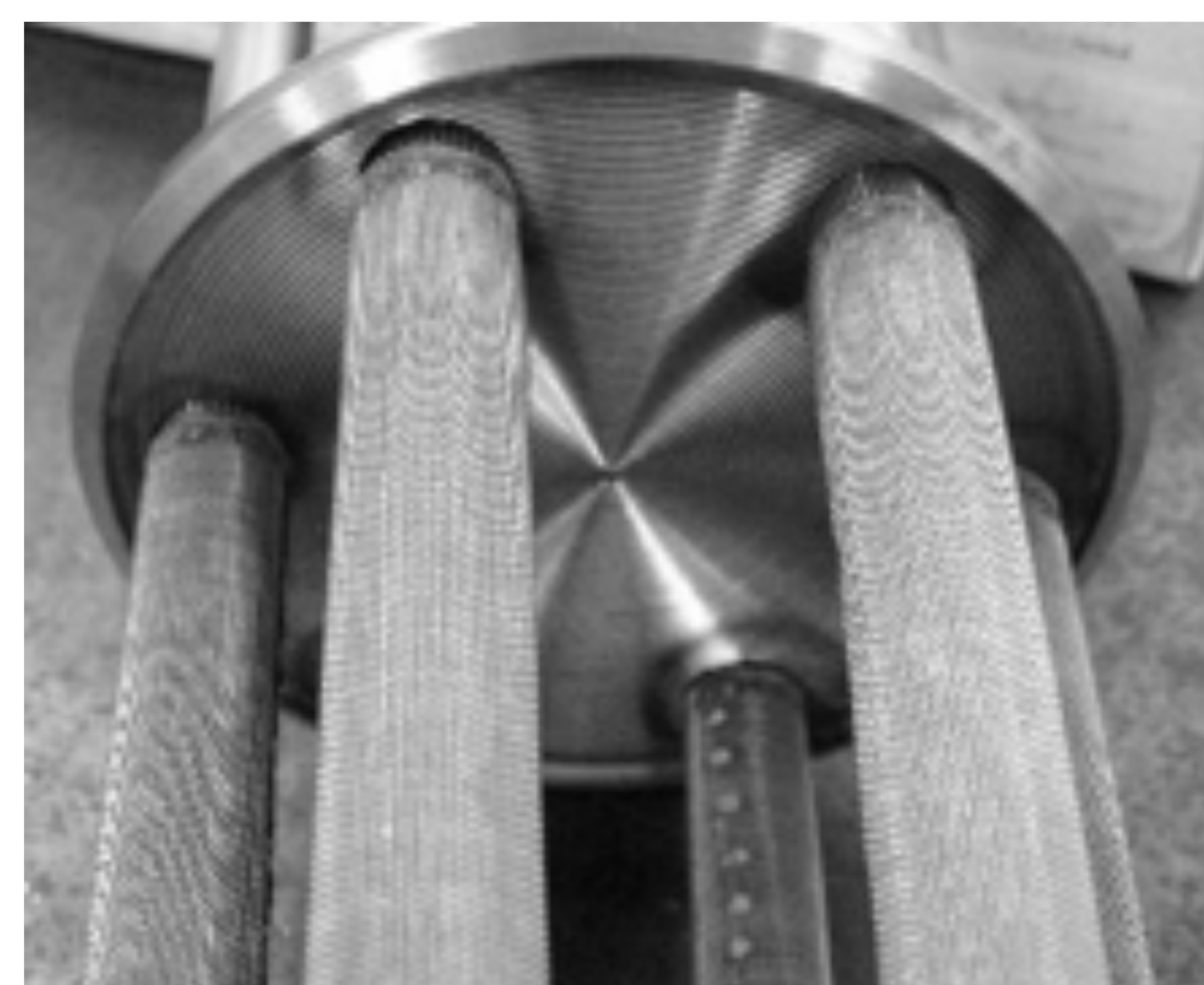
At the Italian Institute of Metrology (INRiM) the technology and the production of Gas Controlled Heat Pipes evolved constantly and now commercial systems are available for primary research and for calibration of primary and industrial thermometers.



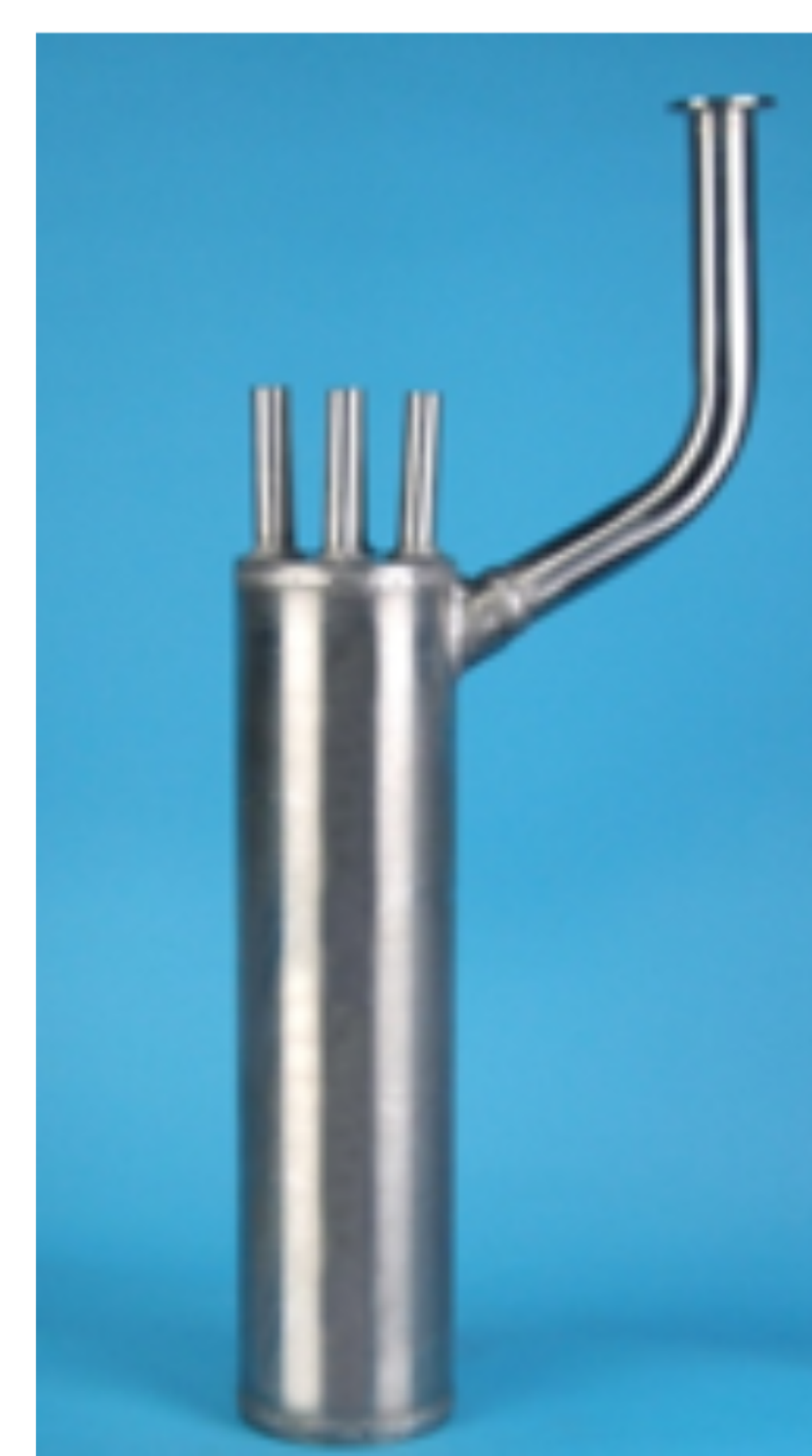
Temperature stability at the level of few tenths of a millikelvin at 370 °C achieved inside the new stainless steel mercury filled GCHP



Typical design of a modern gas controlled heat pipe for lower temperatures (80 °C to 400 °C).



Inner part of the thermometers well inside a gas controlled heat pipe



A sodium gas controlled heat pipes for temperatures up to 960 °C



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