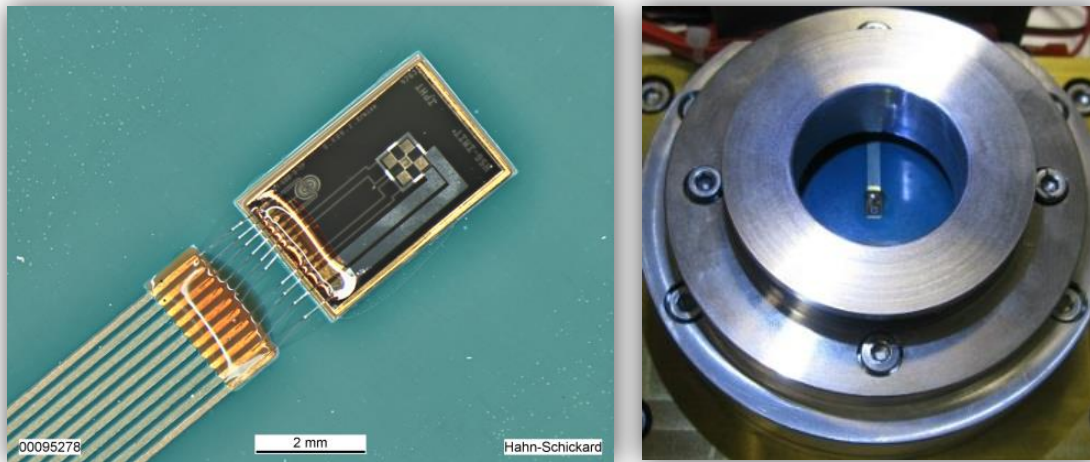


## Show-Case “Dew Point Measurement System”

Innovative smart sensor system with integrated Peltier-cooler



MEMS-sensor chip (left) and dew point measuring system (right)

An exact determination of the humidity is crucial for many industrial processes. This is usually done by a measurement of the temperature where the humidity in the environment starts to form small droplets on top of a defined surface (so called dew-point mirror).

Within the SMARTER-SI project a new type of sensor system integrating leading-edge technology has been manufactured:

The silicon-MEMS chip with the micromechanical integration of a Peltier-cooler that creates a cooling cascade together with a second external Peltier-element is a world-first solution!

This system enables the exact determination of the dew-point in very low humidity environment (dew-point temperatures about  $-45^{\circ}\text{C}_{\text{Td}}$ ).

The project partners of SMARTER-SI can provide all necessary technologies and building blocks to realise this innovative sensor system with the desired Technology Readiness Level (TRL).

A temperature measurement diode (building block by **CIS**), an integrated Peltier-cooler (building block by **IPHT**) and sensitive thermo-electrical layers (building block by **Hahn-Schickard**) in a common Silicon wafer processing sequence are integrated into one sensor chip which includes all necessary functions to determine absolute humidity at extremely low temperatures.

Partner **Swerea IVF** provides the necessary testing facilities and several SMEs will test the smart systems for their individual application fields. They will also be responsible for the subsequent commercialisation.