ReGaS (Reactive Gas Standard)

SI-traceable reference gas mixtures for reactive compounds on-site

METAS
Your reference.

Imprint

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ReGaS

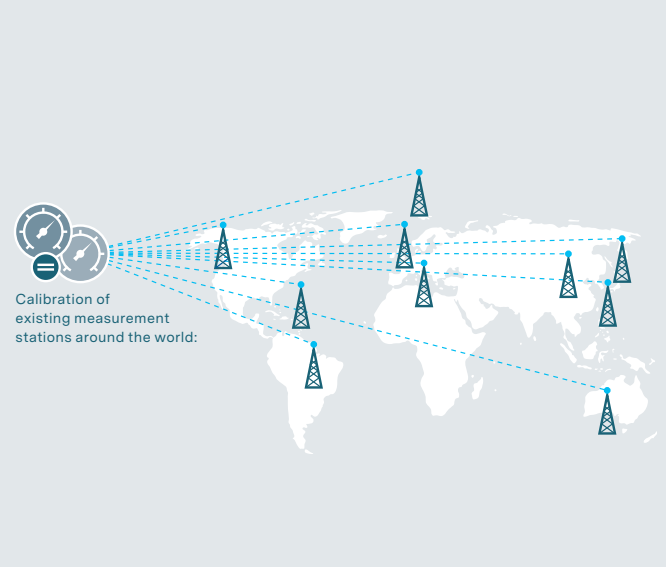
ReGaS is a portable device to produce SI-traceable reference gas mixtures for reactive compounds at atmospheric levels on-site.

Content

Reference gas mixtures for measurement stations

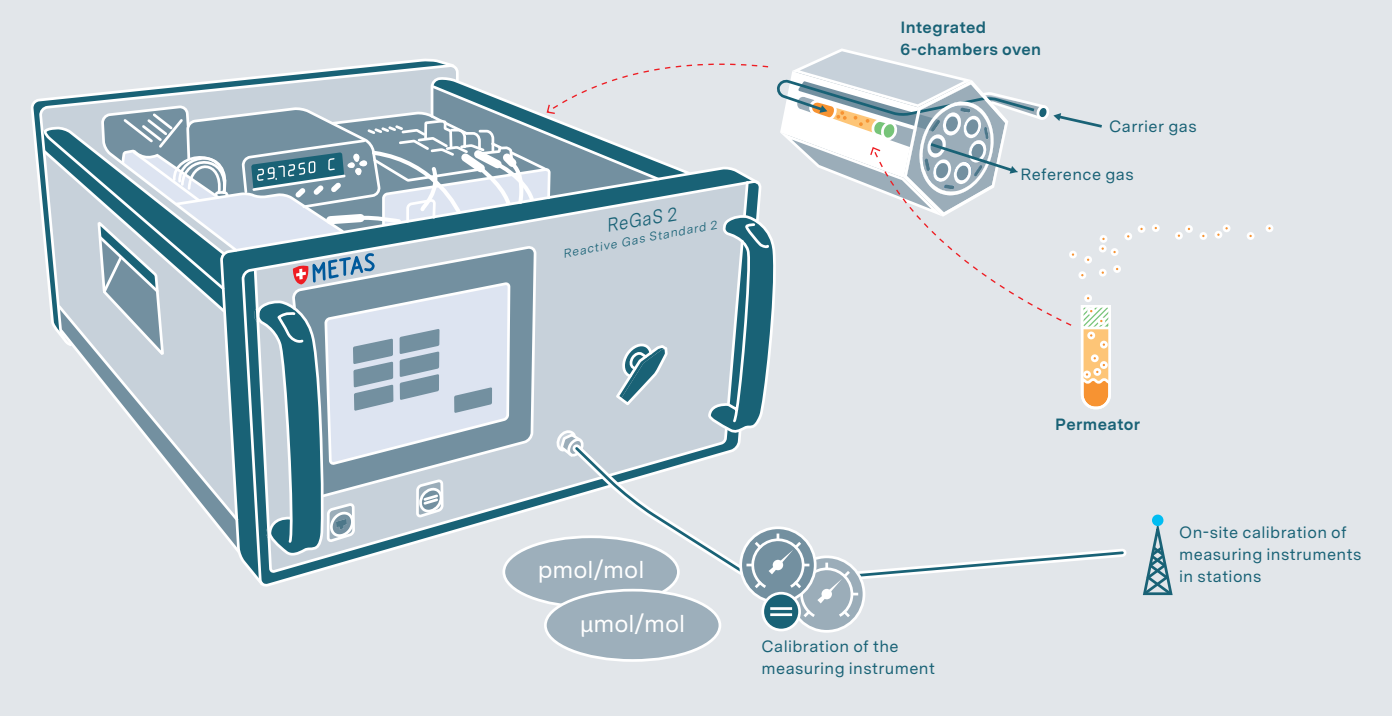
SI-traceable reference gas mixtures are needed to monitor gases in the atmosphere on a comparable basis worldwide on the long-term.

Calibrating instruments at measurement stations worldwide for stable gaseous compounds such as CO_2 and CH_4 is well established: gas cylinders are commonly used to calibrate analysers on-site. However, this approach is not feasible for reactive compounds like NO_2, NH_3 and many volatile organic compounds (VOCs) due to their instability in cylinders. METAS offers a solution to this problem: Reactive Gas Standard – a portable reference gas generator for reactive gases. With ReGaS, we can now produce SI-traceable precision reference gas mixtures for reactive compounds on-site using the permeation method and dynamic dilution. ReGaS allows simultaneous generation of reference gas mixtures for up to five compounds, with precise control of the amount fraction, thanks to the built-in dilution system.



For accurate and comparable measurement results, instruments must be calibrated using SI-traceable reference gases.

On-site calibration using ReGaS



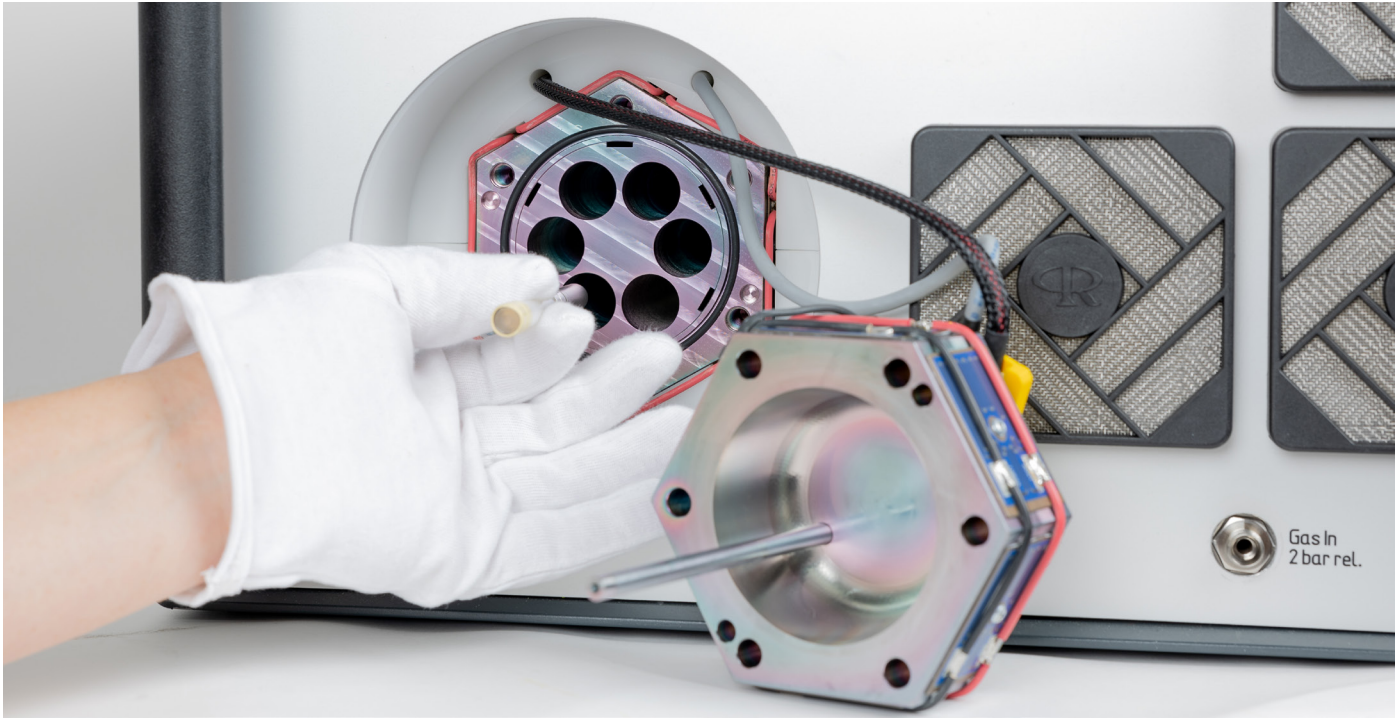
ReGaS generates reference gas mixtures based on permeation, allowing for on-site calibration anywhere.

Permeator

Two permeators.

The permeator contains the substance of interest in pure liquid form. As the substance permeates through the membrane, it is continuously added to the carrier gas flowing through the permeation chamber. Prior to and following its use in ReGaS, the permeator is calibrated in a magnetic suspension balance at METAS.

The permeator is placed in the oven of ReGaS. Precise control of temperature, gas flow and pressure results in a remarkably low expanded measurement uncertainty of the amount fraction of the produced reference gas – less than 5 %.



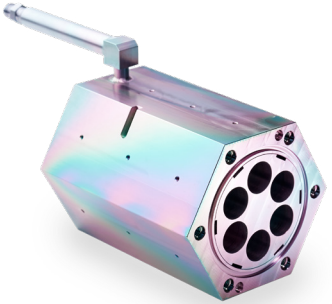
A permeator is being installed in the oven of ReGaS.

Oven

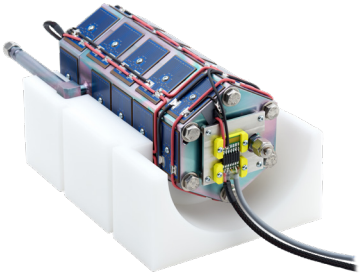
Reference gas mixtures with up to five compounds can be generated using the multi-chamber oven developed at METAS. The individual chambers avoid contamination between the different reactive gas sources.

All parts of ReGaS that come into contact with the reference gas are coated with SilcoNert®2000. This coating significantly reduces the adsorption of reactive gas molecules on surfaces, resulting in very short stabilisation times.

The oven features 30 heating elements, allowing it to achieve temperatures up to 70 °C with a stability of better than 0.01 °C. The oven is thermally insulated with a polyoxymethylene shell.



The heart of ReGaS: a custom-built SilcoNert®2000 coated stainless steal oven.



The oven with its 30 heating elements.

Reference gas mixtures

The desired amount fractions (ranging from pmol/mol to low µmol/mol) and gas flows (between 1 L/min and 10 L/min) can easily be configured with the user-friendly software and the touch interface.

If you require an SI-traceable reference gas for a reactive compound on-site, feel free to reach out to us.

Calibration of an NO_2 measurement device in the field using high-precision reference gas mixtures generated by ReGaS.

Gas Laboratory at METAS

METAS keeps up with scientific and technological developments in order to maintain its place at the forefront. It is engaged in research and development with a view to improving measuring stations and metrological services. The Gas Laboratory is at the forefront of dynamic generation of reactive gas mixtures.

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Federal Institute of Metrology METAS

METAS is the national metrology institute of Switzerland. With its activities and services, it creates the conditions for measurements to be carried out in Switzerland, with the precision required for the needs of business, research, administration and society.

METAS also supervises the placing on the market, use and control of measuring instruments in trade, transport, public safety, health and environmental protection.

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