FLEXIM

# Dynamic Gas Master

## Non-invasive clamp-on measurement of gas properties

Standard volumetric flow rate and mass flow rate measurement for dynamically changing gas compositions

Compressibility and molar mass in real time

Ideal for retrofitting and as fast response redundant check system

Tracking of hydrogen content via molar mass measurement


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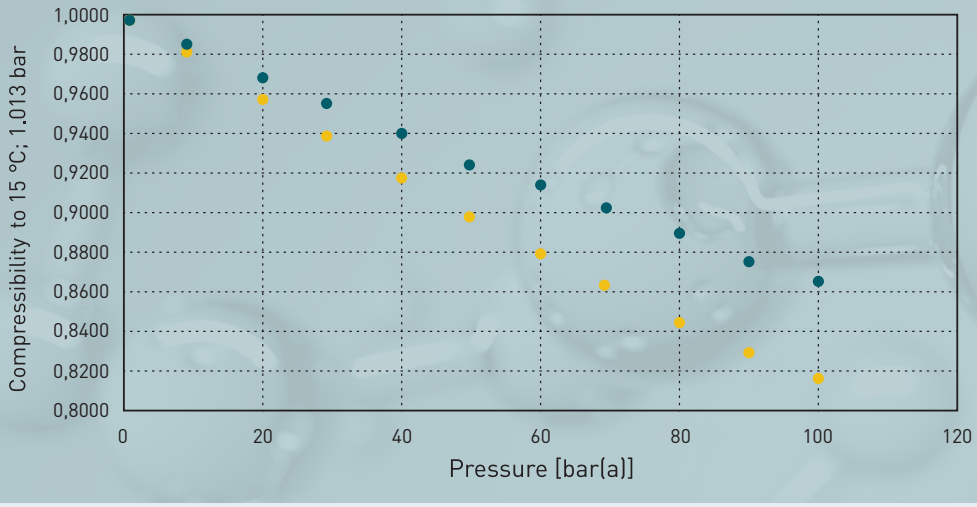
## Impact on non-compensated volumetric flow rate measurement




Without further adjustment, 10% hydrogen leads to an additional error of 1% at 20 bar and 5% at 100 bar (+ errors for viscosity, density impact on Reynolds number + technology impact).

Even without hydrogen, changes in gas composition can lead to high systematic errors.

- Natural Gas*
- Natural Gas* +10% H2

*95,5 % C1; 2,5 % C2; 1 % $CO_2$; 1 % $N_2$

**Recent changes in the world's energy pipeline have created new challenges** to ensuring a stable, reliable source of natural gas to the world market. What was once largely a single source, easily quantifiable commodity has been replaced with multiple sources of varying quality. Additionally, changes in hydrogen and biogas injection in transport systems demand a new way to measure natural gas.

**While custody measurements are commonly linked to analytic stations,** the CAPEX and OPEX of these gas chromatographs is significant. Lastly, process measurements are commonly not linked to continuous quality monitoring, leading to the risk of errors in process control.

**Reliable measurement of flow and sound speed is accomplished by** FLEXIM's proven, robust transducer technology using only two inputs – pressure and temperature set the base for analytical correction of changing compositions, allowing wide variations of gas quality to be easily analyzed.

FLEXIM's Dynamic Gas Master (DGM) measures natural gas sound speed using these clamp-on, ultrasonic flow measurements to calculate the compressibility, molar mass, density and gross heating value of any natural gas mix.

**Using more than 2,000 data sets,** FLEXIM's technology accommodates virtually unlimited working ranges. These ranges may be further fine-tuned to specific end-user requirement to precisely determine quality, character and quantity of any natural gas flow.

This directly impacts standard volumetric flow rate calculations and highlights the importance of accurate monitoring of compressibility as hydrogen is added to the gas mix.

**FLEXIM's Dynamic Gas Master system can be deployed at** any point in the network without additional piping, making it the perfect tool to monitor quality over the entire network. This function also allows easy retrofitting of process monitoring and control equipment.

Due to its extremely fast 1-second response time, FLEXIM's DGM serves as additional redundancy to gas chromatographs, helping identify real-time changes in composition.

**FLEXIM is the only company that provides non-invasive measurement of** compressibility, molar mass and density. Combined with precise and reliable flow measurement, FLEXIM's Dynamic Gas Master provides the comprehensive solution that meets the demands of a changing world.

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