

Axetris mass flow controllers for Volatile Organic Compounds (VOCs) measurement

Stricter VOC regulations require high-performing analytical instrumentation

Volatile Organic Compounds (VOCs) are organic substances in our environment that are volatile at room temperature. They can be emitted from a number of common materials, such as construction material, textiles, and adhesives. The link to harmful health effects of VOCs has resulted in an increased awareness and regulations to limit VOC exposure in various countries in recent years. Axetris mass flow meters (MFM) and controllers (MFC) are used in a number of analytical instruments which are used to detect and quantify VOCs, delivering key performance advantages.

VOC concentrations in the environment have a major impact on our well-being, comfort, and productivity. A number of countries have thus acted to set up new legislations to measure and control VOC emissions. The amendments to the Clean Air Act (CAA) of the United States and the “10 Measures for Environmental Protection” passed by the Chinese Government, initiated in 1990 and 2013 respectively, are important milestones in VOC regulation. Testing for VOC emissions from various materials, e.g. in automotive interiors, has gained importance across the world. Analytical techniques must provide sensitive and definitive measurements of VOCs in ambient air at sub parts per billion (ppb) concentrations to prove conformity to such legislations. Axetris mass flow meters (MFM) and controllers (MFC) are used in a variety of analytical instruments, such as gas chromatographs or air samplers, where they help achieve the required detection performance.

Key parameters to measure VOC concentration

Sorption rates of VOCs onto/from indoor surfaces are important factors driving their concentrations in the environment. VOC emission/sorption by indoor surfaces needs to be measured taking into account different key parameters such as the sorption coefficients, diffusion coefficients and the mass transfer coefficient through the boundary layer. An important prerequisite in achieving repeatable results is a high-performance flow measurement or control of the carrier gas used.

All about the right flow

Advantages over a wide range of analytical techniques

For sampling applications in VOC measurement, Axetris



VOC emission from and testing of materials has gained in importance, e.g. in automotive interiors

Advantages of Axetris' Mass Flow Meters and Controllers

- ✓ World-leading reproducibility
- ✓ Unmatched dynamic range (>1000:1)
- ✓ Compact OEM versions

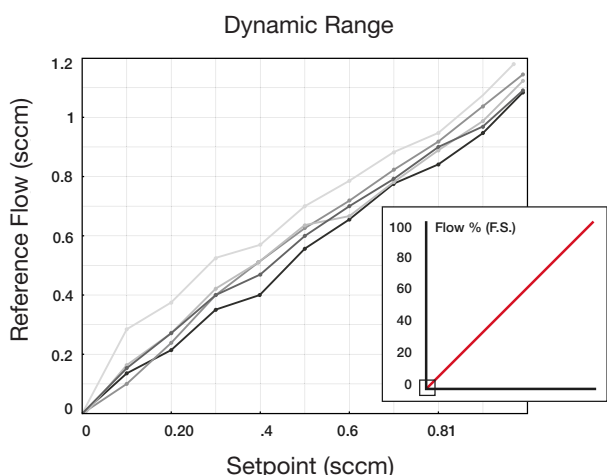
mass flow meters and controllers are often used in analytical techniques such as purge-and-trap, headspace and thermal desorption. For VOC quantification, gas chromatography (GC) is often applied, often in combination with a mass spectrometer (GC-MS) for analysis. Here again, high reproducibility of Axetris mass flow meters and controllers supports carrier and detection gas flow control.

Creating Standard Reference Samples

Axetris mass flow meters and controllers provide the accuracy and repeatability needed to produce standard reference samples. A standard sample is a mixture of known VOC concentration from liquid injection and/or bottled gas. Precise sample preparation to analyze for VOC concentrations requires highly reproducible mass flow controllers. Additionally, gas mixers that are used to create sample concentrations should be able to work across a wide flow range to allow for analytical

flexibility. Because of this, besides delivering high precision and reproducibility, the mass flow controllers must work across a *wide dynamic range and various performance parameters*.

Dynamic Range of Axetris Mass Flow Controllers



Excellent Dynamic Range – In this performance test, 6 Axetris mass flow controllers (F.S. = 1000 sccm) were tested at set points of <1 sccm (0.1% F.S)

About Axetris Mass Flow Meters and Controllers

Axetris offers OEM mass flow meters (MFM) and controllers (MFC) which offer outstanding value to the customer. The proprietary, platinum-based MEMS chip technology guarantees excellent accuracy and repeatability in combination with high speed and an extended dynamic range. The Axetris mass flow technology is used by many leading companies in the fields of gas chromatography, leak testing, thermal analytics, mass spectroscopy, thin film deposition, plasma engineering and more.

Axetris Mass Flow Meters and Controllers – A wide range of OEM options

	<p>OEM Mass Flow Meters</p> <ul style="list-style-type: none"> MFM 2020 MFM 2021 (PID Active) 	<p>For integration into flow and pressure control systems</p>
	<p>OEM Mass Flow Controllers</p> <ul style="list-style-type: none"> MFC 2022 MFC 2222 MFC 2252 	<p>Integrated mass flow controller; available with a variety of interface options</p>
	<p>Gas Mixing and Blending Systems</p> <p>Custom-made to your specifications</p>	<p>Multi-channel gas flow control, e.g. for split flow control and manifolds for carrier gas or detector gases</p>



Switzerland

Axetris AG (Headquarters)
6056 Kaegiswil
phone +41 41 662 76 76
axetris@axetris.com
www.axetris.com

USA

Leister Technologies LLC
Itasca, IL 60143
phone +1 844 293 8747
axetris.usa@axetris.com
www.axetris.com

China

Leister Technologies Ltd.
Shanghai 201 109
phone +86 21 6442 2398
axetris@axetris.cn
www.axetris.cn

Japan

Leister Technologies KK
Shin-Yokohama 222-0033
phone +81 45 477 36 37
axetris@axetris.jp
www.axetris.jp