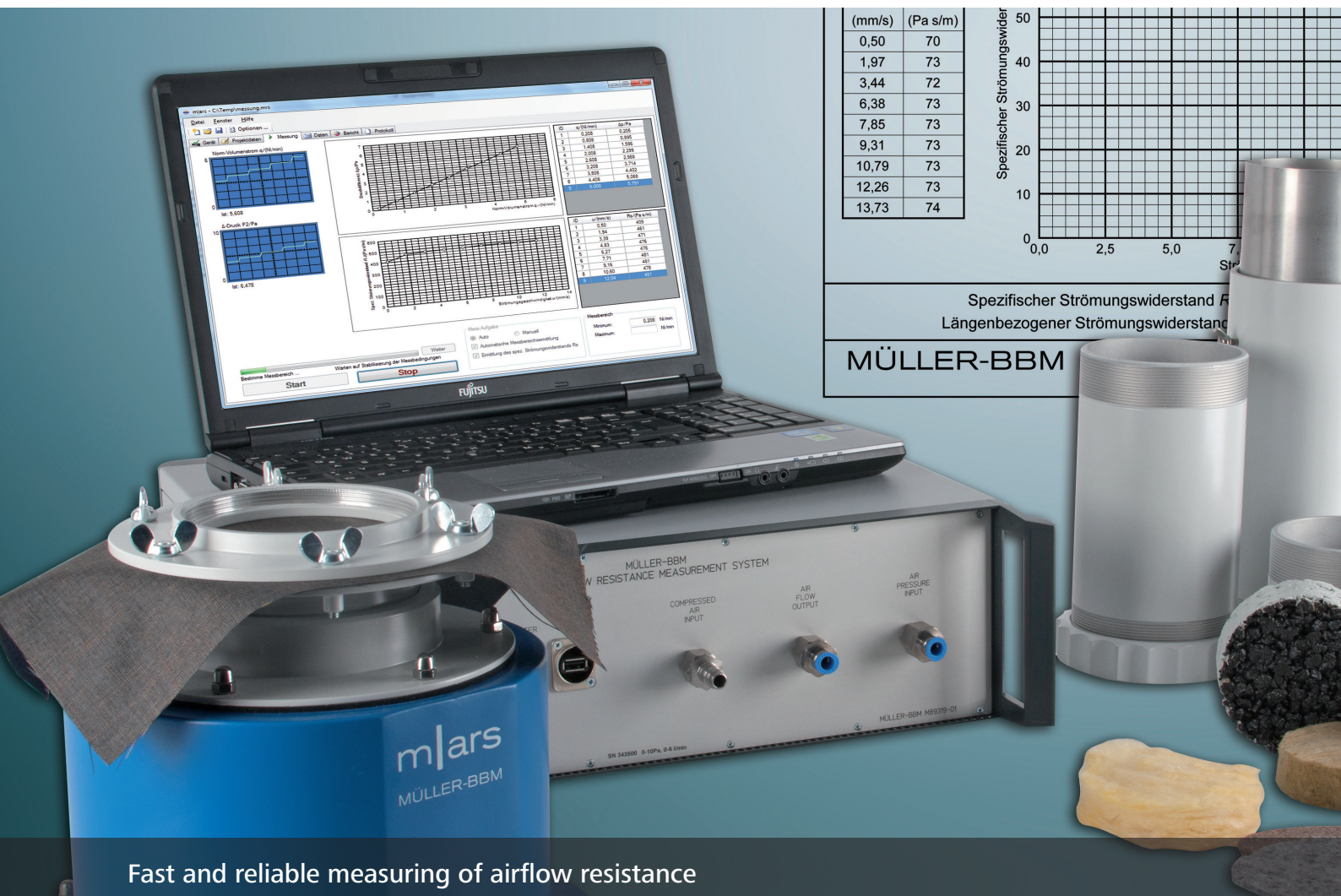


# MÜLLER-BBM

ACOUSTIC SOLUTIONS



Fast and reliable measuring of airflow resistance

**mlars**

Measuring system for determining  
the specific airflow resistance  
according to ISO 9053-1



## Airflow resistance measurement system

Measuring the airflow resistance with m|ars ensures a convenient assessment of the sound absorption capacity of different types of materials. Small sample sizes and the short measurement duration of only a few minutes are ideal for its use in routine production monitoring. Moreover, when developing new materials, m|ars helps to shorten and simplify the preselection process.



### The measuring principle

m|ars uses the quasi-static airflow method described in the ISO 9053-1:2018 standard to measure the airflow resistance. A constant volume flow is passed through the sample. At the same time, the increase of pressure in front of the sample referred to the atmospheric pressure behind the sample is measured. The ratio of pressure difference and flow velocity results in the airflow resistance, which is independent of the flow velocity for most porous materials. According to ISO 9053, the airflow resistance divided by the sample surface is called specific airflow resistance. The specific airflow resistance extrapolated or interpolated to a flow velocity of 0.5 mm/s is given as a single number. This flow velocity corresponds to the sound velocity of a plane sound wave at a sound pressure level of approx. 80 dB.

### Flexible: the measuring setup

For measuring different samples, m|ars is equipped with a pressure cylinder: thin samples such as fabrics or felts are clamped to a flange; thick, flexible samples can be pressed to a predefined thickness. A set of tubes of varying lengths makes it possible to measure firm samples.

### Precise: the measuring unit

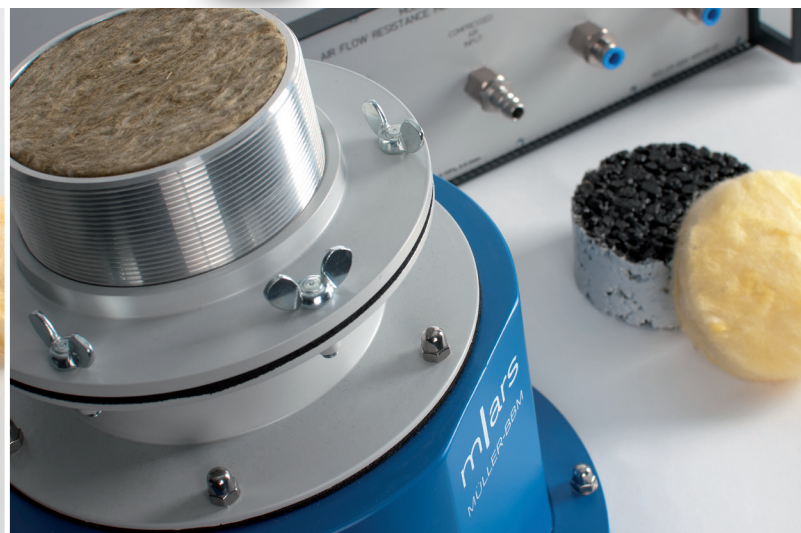
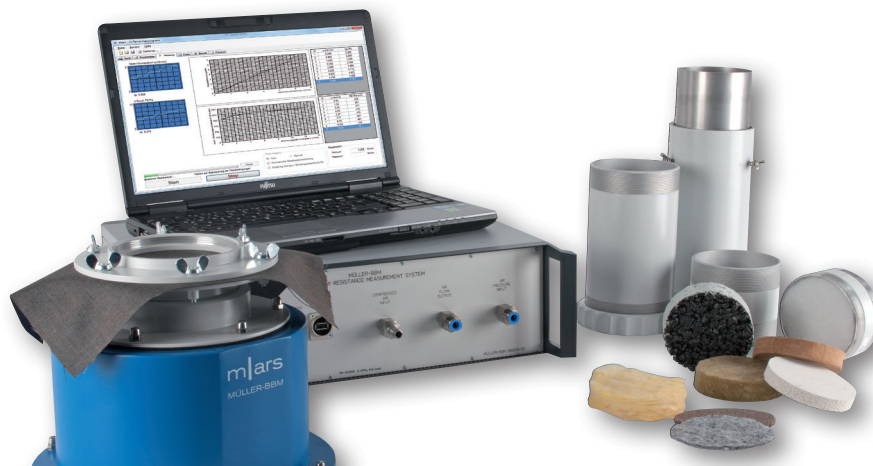
m|ars contains high-grade measuring transducers for providing precise results even at low airflow velocities. The transducers measure the volume flow and differential pressure with the highest resolution. Sensors for temperature, humidity and atmospheric pressure automatically and continually record the ambient conditions.

### Reliable: the verifiability

The measuring system m|ars comes with two different reference resistors. By measuring the airflow resistance of these resistors, the precision of the measuring system can be verified at regular intervals. All measuring units are adjusted to traceably calibrated reference measuring devices. The software works with characteristic calibration curves for compensating individual deviations of the measuring transducers.

We recommend regular recalibration by us at two-year intervals.





## Simple: the software

The included m|ars software is convenient, easy to operate and has the following functions:

- Individual adjustment and central storage of the default settings for measuring and test reports
- Automatic definition of the measuring range
- Creation of an adaptable test report including a presentation of measuring data in tables and graphs in different languages
- English or German user interface
- Software license for an unlimited number of workstations

## Technical specifications

- Volume flow adjustable from 0.1  $\text{NL/min}$  to 6  $\text{NL/min}$
- Differential pressure measurable between 0.1 Pa and 10 Pa
- Measurable flow resistance between 10 Pa s/m and 40,000 Pa s/m

## System requirements

- Dry compressed air that is oil-free and particle-free (1 bar – 15 bar)
- PC with Windows 10 or higher and an USB port

## The system includes

- Pressure cylinder with various fixtures for measuring thin, pressed or thick samples
- Measuring unit with air pressure reducer, volume flow regulator, differential pressure gauge and air pressure sensor
- Sensor for measuring temperature and humidity in the pressure cylinder
- Stencil for cutting holes in thin samples using a hollow punch so they can be clamped on the flange of the pressure cylinder
- 2 reference resistors
- Software and documentation (pdf file)

## OUR PASSION

We offer you sophisticated and practice-approved measurement systems for special measurement tasks. Discover our products and become another happy customer.

## OUR PROMISE

### We do our best for you

We want you to be happy with us and come back to us at any time – that's why you are our focus.

## OUR EXPERIENCE

### Experience for more than five decades

Our acoustic measurement systems are a major factor in this success. Due to the constant development of the testing methods and measuring systems, we can offer our customers sophisticated measuring systems optimized for the testing task.

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## Comprehensive solutions from a single source

Consulting • Planning • Measuring • Expert Opinions • Research

Müller-BBM Acoustic Solutions GmbH is a subsidiary of Müller-BBM GmbH headquartered in Planegg near Munich. Since 1962, Müller-BBM has provided consulting services to clients worldwide and has become one of the globally leading engineering firms in Germany. More than 400 highly qualified employees form an interdisciplinary team of engineers, architects and physicists in the most diverse specialist areas.

Müller-BBM Acoustic Solutions GmbH develops and produces measurement systems for acoustic test facilities. All products have been developed on the basis of daily use in our testing laboratories and therefore notably correspond to the needs of their users. The systems are optimized for special measurement tasks and enable an efficient and intuitive operation after a short training period. Plausibility-checking criteria are integrated into the measurement software in order to quickly evaluate the quality of the results, even in routine operation.

From the knowledge gained from participation in standardization committees, cooperation with colleges and universities and, last but not least, our own consulting activities, further developments of the test procedures and innovations are continuously integrated into the measurement systems. Due to constant further development in daily test stand operation, we can offer our customers optimized measurement systems for decades.

You may also be interested in the following measuring systems:

- **m|dod** Spherical loudspeaker for mobile use ISO 10140, ISO 16283 and ISO 3382
- **m|abstube** Sound absorption in the impedance tube ISO 10534-2
- **m|abshall** Sound absorption in the reverberation chamber ISO 354
- **m|abssitu** In-situ sound absorption CEN/TS 1793-5 and 1793-6

Do you have any questions? We will be happy to assist you!