



**Sartorius**  
filter balances –  
tracking down even the  
smallest soot particles

## Lower detection limits – made possible by the highest level of weighing technology

When Neil Armstrong became the first human being ever to set foot on the moon, he said: "That's one small step for a man, one giant leap for mankind."

With Sartorius filter balances, high-precision gravimetric measurement of particulate diesel fuel emissions involves a whole 21 million steps – this is the number of scale intervals in an ultra-microbalance designed for measuring the weight of microscopically small soot particles.

In a way, each of these minute intervals also represents a giant leap for mankind, when you consider that the reduction of atmospheric pollution caused by soot and other nanoparticles will benefit all of humanity.



When emissions in diesel motors are reduced, however, the techniques for measurement have to be improved to detect ever-smaller amounts of soot. The 40 CFR 86.1312-2007 regulation issued by the United States Environmental Protection Agency (EPA), "Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures," specifies the use of an ultra-microbalance with a repeatability of 0.1 µg and a repeatability of 0.25 µg for gravimetric detection of particulate emissions.

### Weighing technology with the highest credentials

Sartorius has the ideal solution for this most demanding metrological task: the SE2-F microbalance. The draft shield on the SE2-F has been specially developed for weighing filters. Not only is it ergonomic for both left- and right-handed users, it also meets the highest standards for cleanability – an essential feature when working with nanoparticles – thanks to stainless steel components that can be easily dismantled for cleaning.

The special draft shield design makes this model particularly flexible in use: it is perfect for weighing the 47-mm filters specified in the EPA regulation, and can also be used with optional weighing pans for 75-mm or even 90-mm filters. And it does more than shield samples from drafts: it also provides excellent shielding from electrostatic charges.

### Filter balances for any requirements

Sartorius offers a wide range of filter balances for use in particulate emissions testing. These balances are ideal for measurements in research and testing institutes in the field of environmental technology – anywhere that the emissions produced by combustion processes are closely scrutinized.



## Sartorius filter balances: specialized equipment for a special weighing task

### SE2-F filter ultra-microbalances

These filter ultra-microbalances, with full resolution from 0.1 µg to 2.1 µg, are specially designed for weighing filters with a diameter of 50 mm (optionally up to 90 mm Ø). With the SE2-F, fast and reliable analyses are assured by the combination of a built-in differential weighing program for up to 999 samples and lot designations, and a comprehensive statistical evaluation program. The exact weights of filters with and without particulate matter can be determined quickly and easily, and the amount of particulate emissions calculated automatically. Two RS-232 data interfaces enable flexible data collection and recording using a PC, printer and, for example, a bar code scanner.



### ME5-F filter microbalance

Featuring full resolution from 1 µg to 5.1 g, these microbalances are ideal for weighing filters with a diameter of 50 mm (optionally up to 90 mm Ø). Other performance features of the ME5-F are the same as those found in the SE2-F. These balances are suitable for emissions testing in cases where the strict requirements of 40 CFR 86.1312-2007 are not applied, or when greater particle size means a lower resolution is sufficient.



### CP2P-F filter microbalance

This is a PolyRange filter balance for convenient and high-precision emissions testing performed on filters with a diameter of up to 120 mm, with a continuous fine range of 1 µg resolution and a capacity of up to 2 g. The filter weighing pan has a separate cover that eliminates the distorting effects of static electricity. The low-profile, stainless steel draft shield enables fast and uncomplicated work routines and meets the highest cleanliness standards.



### LA130S-F analytical filter balances

This is the ideal filter balance for large filter sizes in all standard formats, with dimensions up to 208 x 264 mm. The LA130S-F has a readability of 0.1 mg and a weighing capacity of up to 150 g. Here, too, the built-in differential weighing program supports data collection and analysis.



## Filter Balance Specifications

Model		SE2-F	ME5-F	CP2P-F	LA130S-F
Weighing range structure		SuperRange	SuperRange	PolyRange	SuperRange
Weighing capacity	g	2.1	5.1	0.5 1 2	150
Readability	µg	0.1	1	1 2 5	100
Repeatability	µg	≤± 0.25*	≤± 1*	≤± 2 3 4*	≤± 200
Calibration weight		Built-in isoCAL	Built-in isoCAL	Built-in	Built-in isoCAL
Weighing pan	mm	Standard pan Ø20 Filter pan Ø50 Optional: Filter pan Ø75 and Ø90	Standard pan Ø30 Filter pan Ø50 Optional: Filter pan Ø75 and Ø90	Standard pan Ø20 Filter pan Ø120	208×265
Data output port		RS-232C+ printer	RS-232C+ printer	RS-232C	RS-232C
Dimensions					
Weigh cell (W×D×H)	mm	122×318×106	122×318×106	213×342×115	364×373×198
Electronic Unit (W×D×H)	mm	254×320×106	254×320×106		
Weighing chamber	mm	Ø106 × H 40	Ø106 × H 40	H 12	H 91

\*with standard pan

## Key Accessories

Model		SE2-F	ME5-F	CP2P-F	LA130S-F
Data printer		YDP03-OCE	YDP03-OCE	YDP03-OCE	YDP03-OCE
Filter pan 75 mm Ø		VF2562	VF2562		
Filter pan 90 mm Ø		VF2880	VF2880		
Ionizing blower for eliminating static electricity		YIB01-ODR	YIB01-ODR	YIB01-ODR	YIB01-ODR
Stat-Pen: anti-static device for eliminating electrostatic charges on samples and containers		YSTP01	YSTP01		
Foot switch for taring		YFS01	YFS01	YFS01	YFS01
Balance table (wooden frame with cast stone slab inset)		YWT01	YWT01	YWT01	YWT01
Balance table made entirely of cast stone		YWT03	YWT03	YWT03	YWT03

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