ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC Personal Modular Impactor (PMI)

Loading, flow rate verification, sampling and care of the SKC Personal Modular Impactors for PM2.5, PM10 and PM Coarse at 3 L/min.

AMTC-IN-0032

Rev. 2 · October 2026

About this document

The SKC Personal Modular Impactor (PMI) is a small impactor worn in the breathing zone. Run at 3 L/min, it separates airborne particles by size: the large ones stay on a 25 mm impaction substrate, the fine ones pass on to a 37 mm filter that the laboratory weighs or analyses. Depending on the model, the PMI collects PM2.5, PM10 or — with a second filter cassette — PM Coarse, the fraction between 2.5 and 10 µm.

These instructions cover the three models, PMI PM2.5 (Cat. No. 225-352), PMI PM10 (225-350) and PMI PM Coarse (225-351), and the PM Coarse Ring (225-3512) that turns a PM10 sampler into a PM Coarse sampler.

Read Safety (p. 4) first. Then read Product and supplied items (p. 5) to see how the sampler is built, then follow Before use (p. 7) (which includes Verifying the flow rate (p. 9)), Procedure (p. 11) and After use and sample handling (p. 12) in that order. Cleaning and care (p. 13) keeps the sampler in condition. Analyt-MTC supplies and supports the samplers; for questions and orders see Ordering information (p. 15) and Service and contacts (p. 16).

Keep these instructions for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

How these instructions mark information

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

Document information

Title	SKC Personal Modular Impactor (PMI) — Instructions for use
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Manufacturer	SKC Inc.

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Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages.
1	October 2026	First issue.

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CHAPTER 1

Safety

Read the safety message in this chapter before you load the sampler. It appears again at the step it belongs to.

Intended use

The SKC Personal Modular Impactors (PMI) collect PM2.5, PM10 or PM Coarse (2.5 to 10 µm) at a flow rate of 3 L/min, for gravimetric and chemical analysis. The sampler is clipped to the worker's collar, in the breathing zone, and runs with a flow-compensating sample pump.

Safety messages

NOTICE

The impaction substrate can slip out of place if you tilt the sampler before the inlet is screwed on firmly. Keep the sampler upright until the inlet is screwed firmly onto the exhaust.

CHAPTER 2

Product and supplied items

Every PMI runs at 3 L/min and is built from the same parts: an inlet with the impaction nozzles, a removable filter cassette and an exhaust that connects to the pump. The model decides which particle fraction reaches the filter.

Models

Each PMI is supplied assembled, with its filter cassette and stainless steel support screen. Impaction substrates and collection filters are ordered separately (see Ordering information (p. 15)).

Order code	Model	Colour	50 % cut-point	What the final filter collects
225-352	PMI PM2.5	Gold	2.5 µm	PM2.5
225-350	PMI PM10	Silver	10 µm	PM10
225-351	PMI PM Coarse	—	10 µm and 2.5 µm	PM2.5; a second 25 mm filter collects PM Coarse (2.5–10 µm)

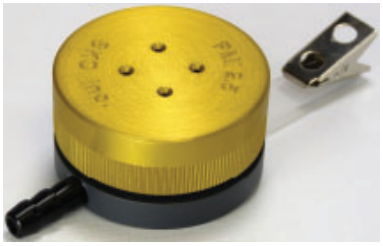


Figure 2-1. The PMI PM2.5 (gold).

The PMI PM Coarse stacks two stages: a PM10 inlet over a first filter cassette, then a PM2.5 inlet — the Coarse Ring — over a second filter cassette. The PM Coarse Ring, Cat. No. 225-3512, with its filter cassette and filter retainer, turns an existing PMI PM10 into the same sampler. PM Coarse sampling needs additional impaction and collection media.

Sample media

- **Impaction substrate:** a 25 mm pre-oiled porous plastic disc, ready to use and disposable (Cat. No. 225-355 or 225-355A). It is required for sampling and gives the PMI its best performance.
- **25 mm filter instead of the disc:** if the laboratory is to analyse the larger particles chemically, a 25 mm filter can take the place of the disc.
- **Final collection filter:** a 37 mm filter, its material chosen for the analysis — for example quartz or PTFE (see Sample media (p. 15) in the ordering information).

> **Note**
> The back pressure of PTFE filters can vary from filter to filter, even within one lot.

How the PMI separates the particles

The PMI works by inertial impaction, which sorts particles by their aerodynamic diameter. The pump draws air in through the nozzles on top of the inlet. The nozzles are sized for 3 L/min, so the air leaves

them as jets aimed at the impaction substrate just below.

Particles larger than the cut-point carry too much momentum to follow the air as it turns sharply aside: they strike the substrate and stay there. The oil in the porous plastic disc keeps them from bouncing off. The air, with the smaller particles, flows through the openings in the top of the filter cassette to the 37 mm final collection filter inside the cassette, where the small particles are collected. Figures 2-2 and 2-3 show the parts in the order they are stacked.

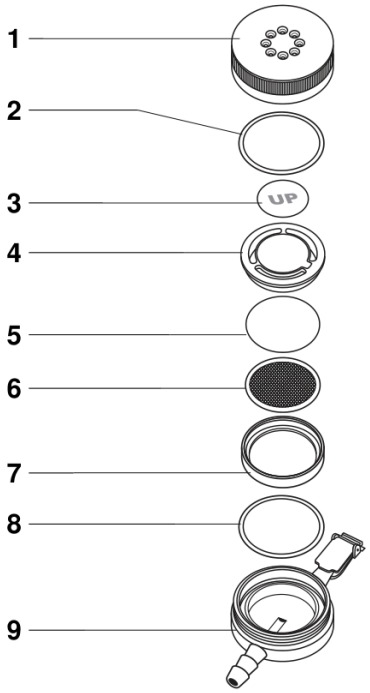


Figure 2-2. PMI PM2.5; the PMI PM10 is built the same way. The numbers are those of the table below.

No.	Part
1	Inlet
2	PTFE O-ring
3	25 mm impaction substrate
4	Filter cassette top
5	37 mm final collection filter
6	Support screen
7	Filter cassette bottom
8	BUNA-N O-ring
9	Exhaust

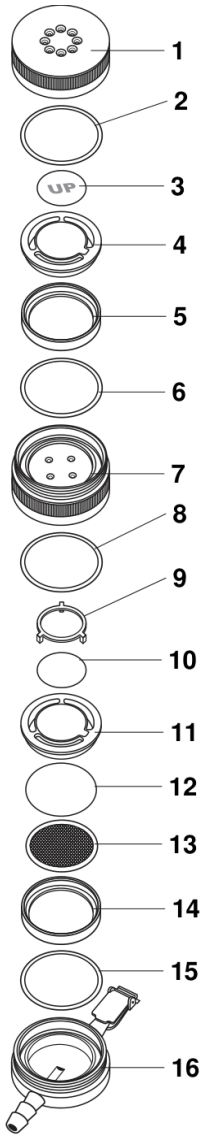


Figure 2-3. PMI PM Coarse. The numbers are those of the table beside it.

No.	Part
1	PM10 inlet
2	PTFE O-ring
3	25 mm impaction substrate
4	Filter cassette top
5	Filter cassette bottom
6	BUNA-N O-ring
7	PM2.5 inlet (Coarse Ring)
8	PTFE O-ring
9	Filter retainer
10	25 mm filter in the impaction substrate position
11	Filter cassette top
12	37 mm final collection filter
13	Support screen
14	Filter cassette bottom
15	BUNA-N O-ring
16	Exhaust

CHAPTER 3

Before use

The PMI arrives assembled but without media. Before each sample, take it apart, load a 37 mm final collection filter into the filter cassette, put a new impaction substrate on top and close the sampler. Always load the filter first.

Preparing the media

- **Final collection filter:** condition (equilibrate) and weigh the filter in a clean environment, following the procedure your method prescribes. Record the result as the pre-sample weight.
- **Impaction substrate:** take a new pre-oiled disc (Cat. No. 225-355 or 225-355A), or a 25 mm filter if the larger particles are to be analysed.

> **Note**
> Use a new impaction substrate for every sample. Handle filters with stainless steel forceps with flat, non-serrated tips (Cat. No. 225-8371), and open the filter cassette with the PMI Cassette Opener (Cat. No. 225-357).

Inserting the final collection filter

1. Unscrew the inlet from the exhaust.
2. Lift the filter cassette out of the exhaust.
3. Open the filter cassette with the cassette opener.
4. Check that the stainless steel support screen lies in the bottom half of the filter cassette.
5. With the forceps, place a pre-weighed 37 mm filter on the support screen.
6. Press the top of the filter cassette into the bottom half.
7. Put the filter cassette back into the impactor.



Figure 3-1. Step 1.



Figure 3-2. Step 2.

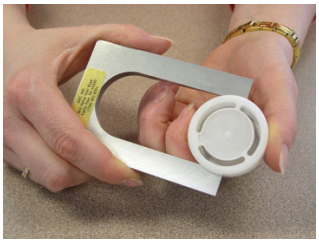


Figure 3-3. Step 3.



Figure 3-4. Step 4.



Figure 3-5. Step 5.



Figure 3-6. Step 6.



Figure 3-7. Step 7.

Inserting the impaction substrate and closing the PMI

8. Check that the filter cassette holds a final collection filter (see Inserting the final collection filter (p. 7)).
9. Place the impaction disc — or the 25 mm filter — on top of the filter cassette, **rough side up**.

> **NOTICE**
>
> The impaction substrate can slip out of place if you tilt the sampler before the inlet is screwed on firmly. Keep the sampler upright until the inlet is screwed firmly onto the exhaust.

10. Screw the inlet onto the exhaust just until it is tight, then tighten it by hand a further **quarter turn only**.



Figure 3-8. Impaction disc on the cassette (step 9).



Figure 3-9. Closing the PMI (step 10).

Loading for PM Coarse

With the PMI PM Coarse, or a PMI PM10 fitted with the PM Coarse Ring, the sampler holds two filter cassettes (Figure 2-3 (p. 6)). Load them as follows:

1. **First filter cassette** (under the PM10 inlet): put **no** final collection filter in it. Place an impaction disc on top, rough side up.
2. **Second filter cassette** (under the Coarse Ring): load a 37 mm final collection filter as in Inserting the final collection filter (p. 7). Place a 25 mm filter on top, in the impaction substrate position, and hold it in place with the filter retainer supplied with the Coarse Ring or the PMI PM Coarse.
3. Stack the parts on the exhaust: the second filter cassette, the Coarse Ring, then the first filter cassette.
4. Screw the inlet onto the exhaust just until it is tight, then a further **quarter turn only** by hand. Keep the stack upright until the inlet is firmly in place.



Figure 3-10. Assembled PMI PM Coarse.

Verifying the flow rate

The PMI's cut-points hold only at 3 L/min. Verify the flow through the complete sampling train before and after each sample, with the PMI in line, loaded with its final collection filter and impaction substrate.

Pump and flowmeter

> **Note**
> As particles build up on the final filter during sampling, the pressure drop across the sampler rises. Use a flow-compensating sample pump that holds the flow against this rising resistance, for example a pump of the SKC AirChek TOUCH series.

Set the pump to **3 L/min**. You also need the PMI Calibration Adapter (Cat. No. 225-358), which seals onto the inlet so the flowmeter measures the air entering the nozzles, and two lengths of flexible tubing. For the settings, follow the operating instructions of the pump and of the flowmeter.

Verifying the flow

1. Check that the PMI is loaded and fully assembled (see Before use (p. 7)).
2. Line the calibration adapter up with the PMI inlet and press it down until it seals firmly.
3. Let the pump run for five minutes before you verify the flow. Meanwhile, connect the outlet (suction port) of the flowmeter to the inlet of the calibration adapter with flexible tubing.
4. With a second length of tubing, connect the exhaust of the PMI to the pump inlet.
5. Check that the flow is 3 L/min and adjust the pump if it is not, as described in the pump and flowmeter instructions.
6. When the flow is right, remove the flowmeter, the tubing and the calibration adapter.



Figure 3-11. Step 1.



Figure 3-12. Step 2.



Figure 3-13. Steps 3 and 4: flowmeter, PMI with calibration adapter and sample pump.

CHAPTER 4

Procedure

Sample with the PMI you verified, loaded with fresh media. After sampling, check the flow once more, then take out the filter and the substrate for the laboratory.

Taking the sample

1. If your method requires it, replace the media used for the flow rate verification with new, pre-weighed media (see Before use (p. 7)).
2. Connect the exhaust of the PMI to the pump inlet with flexible tubing, 1/4 in inside diameter.
3. Clip the PMI to the worker's collar, in the breathing zone.
4. Switch the pump on.
5. Record the start time and any other data your method asks for.
6. When the sample time is up, switch the pump off.
7. Record the stop time and the other data.
8. Set up the verification train again and verify the flow rate as in Verifying the flow rate (p. 9).
9. Disconnect the pump and the tubing from the PMI.



Figure 4-1. The PMI at the collar, in the breathing zone.

CHAPTER 5

After use and sample handling

Removing the filter and the substrate

1. Unscrew the inlet from the exhaust.
2. Find the recess in the top of the filter cassette and use it to lift out the impaction substrate. If the larger particles are to be analysed chemically, put the substrate in a suitable container for shipping to the laboratory, such as a Filter-Keeper.
3. Lift the filter cassette gently out of the exhaust.
4. Separate the two halves of the cassette with the cassette opener.
5. With the forceps, take out the final collection filter and put it in a suitable container for shipping to the laboratory.



Figure 5-1. Step 1.



Figure 5-2. Step 2; the inset shows the recess in the cassette top.



Figure 5-3. Step 3.

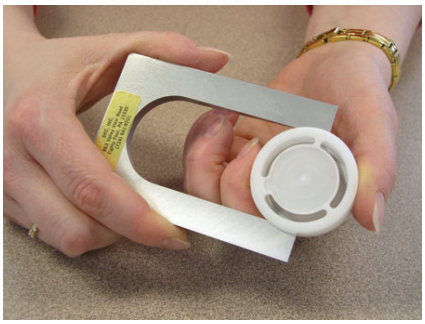


Figure 5-4. Step 4.



Figure 5-5. Step 5.

PM Coarse

Follow steps 1 to 5 for the **second** filter cassette only. It holds two filters: the 25 mm filter on top (coarse fraction, 2.5 to 10 µm) and the 37 mm final collection filter (PM2.5). Put each in its own container and send both to the laboratory. If you want it analysed, send the impaction disc from the first filter cassette as well.

Transport and analysis

Pack the samples together with the blanks so that nothing is lost and nothing is contaminated on the way — Filter-Keepers (Cat. Nos. 225-8303 and 225-8303A) are made for transporting 37 mm filters. Send them to an accredited laboratory for gravimetric or chemical analysis, or both.

Cleaning and care

Oil from the impaction discs collects on the top of the filter cassette, and other residue builds up with frequent sampling. Clean the PMI after every five runs, or sooner if you see material building up, and check the O-rings each time.

Cleaning the PMI

1. Take the PMI apart and remove any filters and substrates.

   > **Note**
   > Never place a mechanical object in the inlet nozzles.

2. Wash the parts in water with a liquid detergent or soap.
3. Rinse them.
4. Let all parts air-dry completely in a clean place before you reassemble the PMI.

O-rings

The PMI seals with two kinds of O-ring: a PTFE O-ring in the inlet and a BUNA-N O-ring on the exhaust; the PMI PM Coarse has one more of each in its Coarse Ring stage (Figures 2-2 and 2-3 in How the PMI separates the particles (p. 5)). Check every BUNA-N O-ring:

- its surface is smooth, without cracks, cuts or other damage;
- it sits properly in its groove.

Replace a BUNA-N O-ring if it is damaged, stretched or has become thin. The replacement exhaust O-ring is Cat. No. P32001.

> **Note**
> The PTFE O-rings cannot be replaced by the user. If one is damaged, contact Analyt-MTC (see Service and contacts (p. 16)).

Disposal

Dispose of the PMI under local regulations; separate metal, glass and plastic parts for recycling where possible.

CHAPTER 6

Specifications

Sampling

Fractions	PM2.5, PM10 or PM Coarse (PM10–2.5), depending on the model
Flow rate	3 L/min
50 % cut-point	2.5 µm or 10 µm, depending on the model; PM Coarse: 10 µm and 2.5 µm
Recommended pump	Flow-compensating pump, for example SKC AirChek TOUCH series
Tubing	1/4 in inside diameter
Analysis	Gravimetric and chemical

Sample media

Impaction substrate	25 mm pre-oiled porous plastic disc, disposable; reduces particle bounce. New for every sample.
Alternative impaction substrate	25 mm filter, for optional chemical analysis of the larger particles
Final collection filter	37 mm; material chosen for the application

Physical data

Inlet	Aluminium
Exhaust	PVC
Filter cassette	Delrin®, with stainless steel support screen
O-rings	Inlet: PTFE · exhaust: BUNA-N
Dimensions	2 × 1 in (5.1 × 2.6 cm)
Weight	2.5 oz (70.9 g)

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

Samplers

Description	Order code
Personal Modular Impactor PM2.5 (gold)	225-352
Personal Modular Impactor PM10 (silver)	225-350
Personal Modular Impactor PM Coarse, with 2 filter cassettes and a filter retainer	225-351

Sample media

Description	Order code
IMPACTION SUBSTRATES — REQUIRED FOR SAMPLING; A NEW ONE FOR EVERY SAMPLE	
Pre-oiled porous plastic impaction discs**, 25 mm, ready to use, disposable, pack of 25	225-355
Pre-oiled porous plastic impaction discs**, 25 mm, ready to use, disposable, pack of 50	225-355A
FINAL COLLECTION FILTERS, 37 MM — RECOMMENDED	
Quartz filters, Tissuquartz™, 432 µm thick, pack of 25	225-1822
PTFE filters*, 2.0 µm pore size, with PMP support ring, pack of 50	225-1709
PTFE filters*, 1.0 µm pore size, pack of 100	225-17-32

* The back pressure of PTFE filters can vary within one lot.
** A 25 mm filter can replace the disc when the larger particles are to be analysed chemically.

Accessories

Description	Order code
PM Coarse Ring, with filter cassette and filter retainer; turns a PMI PM10 into a PMI PM Coarse	225-3512
PMI Calibration Adapter	225-358
PMI Cassette Opener	225-357
Filter Retainer, holds a filter in the impaction substrate position on top of the cassette	225-354
Forceps, stainless steel, flat non-serrated tips, for delicate membranes	225-8371
Filter-Keepers, 37 mm, for filter transport, pack of 100	225-8303
Filter-Keepers, 37 mm, for filter transport, pack of 10	225-8303A

Spare parts

Description	Order code
Replacement filter cassette	225-356
Replacement exhaust O-ring, BUNA-N	P32001

CHAPTER 8

Service and contacts

Analyt-MTC is your contact for everything concerning the Personal Modular Impactor: choosing the model and the filter for your method, orders of samplers, media, accessories and spare parts, technical questions and complaints. Warranty and returns follow Analyt-MTC's terms and conditions of sale.

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Before you contact Analyt-MTC

Have the following at hand so Analyt-MTC can help you quickly:

- the catalogue number of the sampler, for example 225-352;
- the impaction substrate and the filter you sample with;
- the pump and flowmeter you use, and the flow rate you verified.

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