ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC Preloaded Disposable Parallel Particle Impactors (PPI)

Preparation, flow rate verification and sampling with the single-use SKC Parallel Particle Impactors, preloaded with filter and support, for respirable dust at 2, 4 or 8 L/min and thoracic dust at 2 L/min.

AMTC-IN-0011

Rev. 2 · October 2026

About this document

The SKC Disposable Parallel Particle Impactor (PPI®) is a single-use, impaction-based sampler for the respirable or the thoracic fraction of airborne dust. The preloaded models described here leave the factory fully assembled — impaction substrates, 37 mm collection filter and, on most models, a support pad — so there is nothing to load or clean: you label the sampler, verify the flow rate, sample and send it to the laboratory.

These instructions cover the preloaded models and their preweighed variants: the respirable models 225-3841 (8 L/min), 225-3871 (4 L/min) and 225-3851 (2 L/min) with a PVC filter, the respirable 2 L/min model 225-3852 with a PTFE filter, the thoracic models 225-3861 and 225-3862 (2 L/min), and the preweighed versions of the three PVC models. The Disposable PPIs supplied without a filter, which you load yourself, have their own operating manual.

Read Safety (p. 5) first. Then start with Product and supplied items (p. 6) to choose the right model, then follow Before use (p. 8) (with Verifying the flow rate (p. 8)), Procedure (p. 10) and After use and sample handling (p. 11) in that order. Analyt-MTC supplies and supports the samplers; for questions and orders see Service and contacts (p. 14).

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 Preloaded Disposable Parallel Particle Impactors (PPI) — Instructions for use
Document number	AMTC-IN-0011
Revision	Rev. 2 — October 2026
Applies to	Preloaded Disposable PPIs, Cat. Nos. 225-3841, 225-3871, 225-3851, 225-3852, 225-3861, 225-3862, and preweighed 225-3851-PW
Language	English
Manufacturer	SKC Inc.

Revision history

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

PPI® is a registered trademark. The PPI design is protected by U.S. Patent No. 7,073,402. Information in these instructions is subject to change without notice. © 2026 ANALYT-MTC Messtechnik GmbH. All rights reserved.

Contents

1 **Safety** 5
- Intended use 5
- Safety messages 5

2 **Product and supplied items** 6
- Models 6
- How the PPI separates the dust 7
- Performance 7

3 **Before use** 8
- Before you start 8
- Preparing the sampler 8
- Verifying the flow rate 8
  - What you need 9
  - Verifying the flow 9

4 **Procedure** 10
- Sample time and dust loading 10
- Taking the sample 10

5 **After use and sample handling** 11
- After sampling 11
- Disposal 11

6 **Specifications** 12
- Sampling data 12
- Sample media 12
- Physical data 12
- References 12

7 **Ordering information** 13
- Respirable samplers 13
- Thoracic samplers 13
- Accessories 13

8 **Service and contacts** 14

CHAPTER 1

Safety

Read the safety messages in this chapter before you sample with a Disposable PPI.

Intended use

The SKC Preloaded Disposable PPI is a single-use, impaction-based sampler for the respirable or the thoracic fraction of airborne dust. Each sampler is for one sample only.

Safety messages

The same messages also appear where they apply, before the step they concern.

NOTICE

Every Disposable PPI is designed for one-time use: one sampler, one sample. Its shelf life is limited: check the expiry date on the packaging before use. Past that date, or after a second use, the sampler may not collect the sample reliably, so the result is then invalid.

CHAPTER 2

Product and supplied items

Each Disposable PPI separates one dust fraction — respirable or thoracic — at one flow rate. Choose the model by the fraction your method asks for, the flow rate your pump can deliver, and the analysis your laboratory will run.

Models

The colour of the body tells the model apart. All preloaded models carry four impaction substrates, one 37 mm collection filter and one 37 mm cellulose support pad; the PTFE model 225-3852 has no support pad, because its filter supports itself.

Preloaded Disposable PPIs

Order code	Flow	Colour	Preloaded filter
RESPIRABLE			
225-3841	8 L/min	Red	37 mm, 5.0 µm PVC, with support pad; not preweighed
Ask Analyt-MTC	8 L/min	Red	37 mm, 5.0 µm PVC, with support pad; preweighed
225-3871	4 L/min	Orange	37 mm, 5.0 µm PVC, with support pad; not preweighed
Ask Analyt-MTC	4 L/min	Orange	37 mm, 5.0 µm PVC, with support pad; preweighed
225-3851	2 L/min	Gold	37 mm, 5.0 µm PVC, with support pad; not preweighed
225-3851-PW	2 L/min	Gold	37 mm, 5.0 µm PVC, with support pad; preweighed
225-3852	2 L/min	Gold	37 mm, 1.0 µm PTFE, **no support pad**; not preweighed
THORACIC			
225-3861	2 L/min	Blue	37 mm, 0.8 µm MCE, with support pad; not preweighed
225-3862	2 L/min	Blue	37 mm R-100 Quartz, with support pad; not preweighed

The pack contains the sampler, a sampling label and a post-use label.

Chemical or gravimetric analysis

- **Preweighed models (-PW):** the 5.0 µm PVC filter is weighed by SKC to five decimal places, at 70 °F ±3 °F and 50 % ±5 % relative humidity. Use them for gravimetric analysis.
- **Models that are not preweighed:** intended for chemical analysis. If you need a gravimetric result from 225-3841, 225-3871, 225-3851 or 225-3852, ask your laboratory to weigh the filter before and after sampling.

NOTICE

Every Disposable PPI is designed for one-time use: one sampler, one sample. Its shelf life is limited: check the expiry date on the packaging before use. Past that date, or after a second use, the sampler may not collect the sample reliably, so the result is then invalid.

Which pump for which flow

Use a pump from the SKC AirChek TOUCH series for the 2 and 4 L/min models, and an SKC Leland Legacy pump for the 8 L/min model. The higher flow rates collect more dust in the same time; the respirable fraction is available at all three rates, the thoracic fraction at 2 L/min only.

How the PPI separates the dust

The inlet plate holds four small impactors side by side, each with its own 50 % cut-point. Each impactor is tuned to one quarter of the ISO/CEN sampling curve, so that together they follow the whole curve closely.

The pump draws air through the nozzle of each impactor. Particles larger than that impactor's cut-point cannot follow the air stream: they strike the porous, oiled impaction substrate below the nozzle and stay there. The smaller particles pass on to the 37 mm collection filter, which is analysed.

The respirable models are designed to match the respirable convention of ISO 7708/CEN, adopted by ACGIH, CEN and other occupational hygiene bodies, and meet the ISO 7708/CEN criteria included in the OSHA and MSHA final rules on respirable crystalline silica. The thoracic model matches the thoracic convention and meets the requirements for substances with an ACGIH thoracic TLV®.

Because the body is small, the sampler is comfortable on the collar, even under a helmet or other protective equipment.

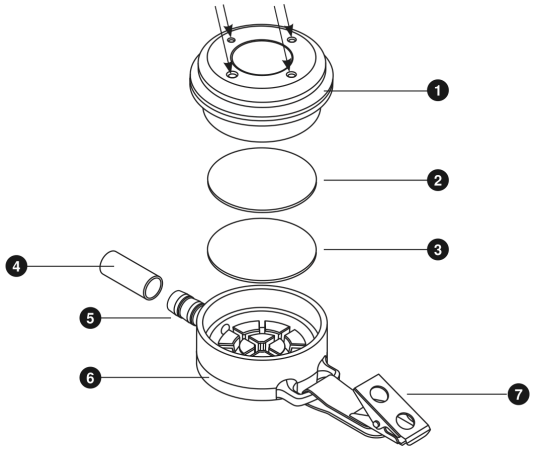


Figure 2-1. Parts of the Disposable PPI. The arrows show where air enters the four impactors.
1 Inlet plate with the four impactors and their impaction substrates, sonically welded · **2** 37 mm collection filter (assembled) · **3** 37 mm support pad (assembled; none in the PTFE model) · **4** Protective end cap · **5** Exhaust, to the pump · **6** Base plate · **7** Collar clip

Performance

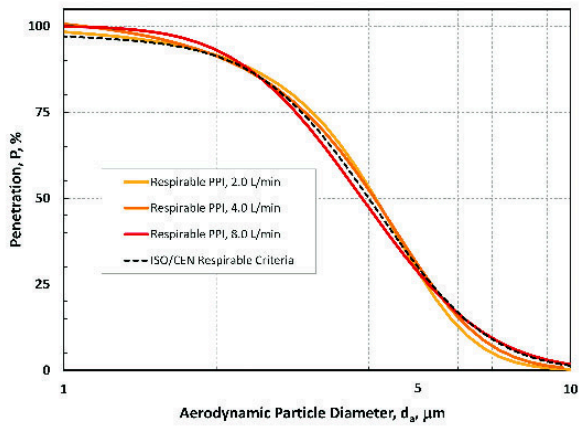


Figure 2-2. Collection efficiency of the 2, 4 and 8 L/min respirable PPIs compared with the ISO respirable convention. Penetration in %, against aerodynamic particle diameter in µm.

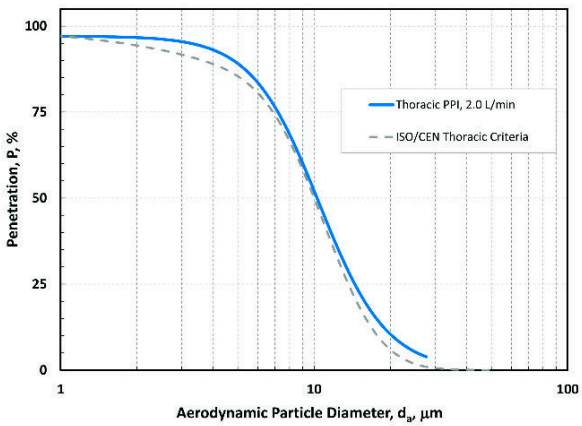


Figure 2-3. Collection efficiency of the 2 L/min thoracic PPI compared with the ISO thoracic convention. Penetration in %, against aerodynamic particle diameter in µm.

CHAPTER 3

Before use

A preloaded Disposable PPI arrives assembled and ready to sample. Preparing it takes three steps: unwrap it, label it and take off the end cap.

Before you start

- Check the expiry date on the packaging.
- For gravimetric analysis, use a preweighed model (see the table under Models). If you sample with a filter that is not preweighed — 225-3841, 225-3871, 225-3851 or 225-3852 — agree with your laboratory that it weighs the filter before and after sampling.
- Prepare one extra sampler of the same model as the *representative sampler* for flow rate verification (see Verifying the flow rate (p. 8)). It is never used for a sample.

Preparing the sampler

1. Remove the shrink wrap. The pack contains the sampler, a sampling label and a post-use label.
2. Write the sample ID on the sampling label and stick the label to the **bottom** of the base plate.
3. Remove the protective end cap from the exhaust. Keep it: you put it back on after sampling.



Figure 3-1. Sampler with sampling label and post-use label.



Figure 3-2. Write the sample ID on the sampling label (step 2) …



Figure 3-3. … and stick it to the bottom of the base plate.

Verifying the flow rate

The PPI works correctly only at its design flow rate (2, 4 or 8 L/min, by model): verify it through the whole sampling train before and after each sample.

> **Note**
> As dust builds up on the filter during sampling, the pressure drop across the sampler rises. Use a flow-compensating pump that holds the flow against this rising resistance: an SKC AirChek TOUCH series pump for 2 and 4 L/min, or an SKC Leland Legacy pump for 8 L/min.

What you need

- The sample pump, flexible tubing, and the operating instructions of the pump and the flowmeter.
- A flowmeter for the flow rate of your model. With the SKC High Flow chek-mate Flowmeter, a Pulsation Dampener (Cat. No. 375-150) is also needed in line.
- The Calibration Adapter for Disposable PPI (Cat. No. 225-389).
- A representative sampler: an assembled, preloaded Disposable PPI of the same model, with its end cap removed (see Preparing the sampler (p. 8)).

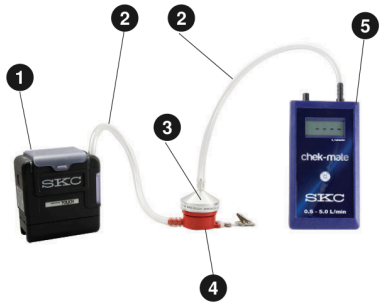


Figure 3-4. Verification train (AirChek TOUCH and standard chek-mate shown; 8 L/min needs the High Flow chek-mate). **1** Pump · **2** Tubing · **3** Calibration adapter · **4** Representative PPI · **5** Flowmeter

Verifying the flow

1. Switch the pump on and let it run for 5 minutes. Check that the representative sampler has its filter (and support pad) in place.
2. Set the bottom of the calibration adapter squarely on the inlet plate of the representative sampler. Press it down firmly until the adapter's O-ring engages and seals evenly all round, but no harder: an adapter pressed on with excessive force can be difficult to remove.
3. Connect the exhaust of the sampler to the inlet of the pump with flexible tubing, and the inlet of the calibration adapter to the suction port (outlet) of the flowmeter.
4. Verify the flow as described in the operating instructions of the pump and the flowmeter: **2 L/min** for the 2 L/min respirable and thoracic models, **4 L/min** for the 4 L/min model, **8 L/min** for the 8 L/min model.
5. Disconnect the tubing from the flowmeter and the adapter, then pull the adapter off the inlet plate with a firm twist, holding the sampler in the other hand.
6. Keep the representative sampler and the adapter for the check after sampling. Sample with a new, unused preloaded sampler of the same model — see Procedure (p. 10).

CHAPTER 4

Procedure

Sample with a new, unused preloaded sampler. After sampling, seal and label it, and check the flow rate once more.

Sample time and dust loading

The sample time depends on the method you follow. Two loading limits also apply:

- **Impaction substrates:** SKC's tests found no change in performance with up to 6.8 mg of dust on the four substrates together. As an example, that is the amount collected in 6 hours at 4 L/min where the respirable dust is 4.76 mg/m³ and makes up half of the total dust.
- **Collection filter:** for analytical reasons, laboratories asked SKC to keep the load on the filter to 2 mg or less.

> **Note**
> Agree the sample time with your laboratory before you sample, taking into account the dust levels you expect, so that neither limit is exceeded.

Taking the sample

1. Use a fresh preloaded sampler that you have prepared as described in Preparing the sampler (p. 8). The representative sampler from the flow verification must never be used for a sample.
2. Write the start time on the label.
3. Clip the sampler to the worker's collar or lapel, in the breathing zone — or place it in the area to be sampled.
4. Clip the pump to the worker's belt, or place it close to the sampler.
5. Connect the sampler's exhaust to the pump inlet with flexible tubing.
6. Switch the pump on.
7. Record the sample data you need.



Figure 4-1. Sampler on the collar, pump at the waist.

CHAPTER 5

After use and sample handling

After sampling

8. When the sample time is up, switch the pump off.
9. Unclip the sampler.
10. Stick the post-use label on the inlet plate. It seals the inlet.
11. Write the stop time on the label on the bottom of the sampler.
12. Disconnect the sampler from the pump.
13. Put the protective end cap back on the exhaust.
14. Set up the verification train again with the representative sampler and verify the flow rate as in Verifying the flow (p. 9).
15. Pack the samples together with the blanks and send them to an accredited laboratory for gravimetric or chemical analysis.



Figure 5-1. Post-use label (step 10).



Figure 5-2. End cap refitted (step 13).

Disposal

Dispose of used samplers and their packaging under local regulations.

CHAPTER 6

Specifications

Sampling data

Fractions	Respirable or thoracic, depending on the model; ISO 7708/CEN conventions
Flow rate	Respirable: 2, 4 or 8 L/min, depending on the model; thoracic: 2 L/min
Sample pump	Flow-compensating: SKC AirChek TOUCH series for 2 and 4 L/min; SKC Leland Legacy for 8 L/min
Sample time	As set by the method; see Sample time and dust loading (p. 10)
Impaction substrate loading	Up to 6.8 mg on the four substrates without effect on performance (SKC tests)
Analysis	Chemical or gravimetric

Sample media

Respirable models	37 mm, 5.0 µm PVC filter with cellulose support pad; or 37 mm, 1.0 µm PTFE filter without support pad
Thoracic models	37 mm, 0.8 µm MCE filter with cellulose support pad; or 37 mm R-100 Quartz filter with cellulose support pad
Preweighed filters (-PW)	5.0 µm PVC, weighed to five decimal places at 70 °F ±3 °F and 50 % ±5 % RH
Impaction substrates	Four pre-oiled porous plastic discs, 3/8 in diameter, assembled in every Disposable PPI

Physical data

Body material	Conductive ABS plastic; single use
Dimensions	Height 4.25 in (10.8 cm), clip to exhaust · diameter 1.8 in (4.6 cm) · depth 1.2 in (3 cm)
Weight	1.1 oz (31.2 g)
Shelf life	Limited; see the expiry date on the packaging

References

1. Trakumas, S., Hall, P.: Personal Respirable Sampler Containing Four Impactors Arranged in Parallel. Abstracts of the 23rd Annual AAAR Conference, Atlanta, GA, 2004, p. 78.
2. Trakumas, S., Salter, E.: Parallel Particle Impactor – Novel Size-selective Particle Sampler for Accurate Fractioning of Inhalable Particles. Journal of Physics: Conference Series 151 (2009) 012060. doi 10.1088/1742-6596/151/1/012060.
3. Trakumas, S.: High-flow Personal Respirator Dust Sampler for Increased Sensitivity. Poster 261, AIHce 2010, Denver, CO.
4. Trakumas, S.: High-flow Personal Sampler to Monitor Exposure to Respirable Crystalline Silica at New Lower TLV. IOHA 2010, 8th Conference, Book of Abstracts, Rome, p. 59.
5. Trakumas, S., Salter, E.: High-flow Personal Sampler to Monitor Exposure to Respirable Crystalline Silica at New Lower TLV. Presentation.
6. OSHA Final Rule on Respirable Crystalline Silica.
7. MSHA Final Rule on Respirable Crystalline Silica.
8. ISO 7708:1995 (2008), Air quality — Particle size fraction definitions for health-related sampling.
9. Stacey, P., Thorpe, A., Echt, A.: Performance of High Flow Rate Personal Respirable Samplers When Challenged with Mineral Aerosols of Different Particle Size Distributions. Ann. Occup. Hyg. 60 (2016), pp. 479–492.
10. Görner, P., Simon, X., Boivin, A., Bau, S.: Sampling Efficiency and Performance of Selected Thoracic Aerosol Samplers. Annals of Work Exposure and Health 61 (2017), No. 7, pp. 784–796.

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

Each preloaded sampler contains four porous plastic impaction substrates, one 37 mm collection filter and one 37 mm cellulose support pad, unless stated otherwise. All samplers are for one-time use.

Respirable samplers

Description	Order code
Respirable PPI (red), 8 L/min, 5.0 µm PVC filter	225-3841
Respirable PPI (red), 8 L/min, 5.0 µm PVC filter, preweighed to five decimal places	Ask Analyt-MTC
Respirable PPI (orange), 4 L/min, 5.0 µm PVC filter	225-3871
Respirable PPI (orange), 4 L/min, 5.0 µm PVC filter, preweighed to five decimal places	Ask Analyt-MTC
Respirable PPI (gold), 2 L/min, 5.0 µm PVC filter	225-3851
Respirable PPI (gold), 2 L/min, 5.0 µm PVC filter, preweighed to five decimal places	225-3851-PW
Respirable PPI (gold), 2 L/min, 1.0 µm PTFE filter, no support pad	225-3852

Thoracic samplers

Description	Order code
Thoracic PPI (blue), 2 L/min, 0.8 µm MCE filter	225-3861
Thoracic PPI (blue), 2 L/min, R-100 Quartz filter	225-3862

Accessories

Description	Order code
Calibration Adapter for Disposable PPI	225-389
Pulsation Dampener, needed in line with the SKC High Flow chek-mate Flowmeter	375-150

CHAPTER 8

Service and contacts

Analyt-MTC is your contact for everything concerning the Disposable PPI: choosing the model for your method, orders, accessories, technical questions and complaints. Warranty and returns follow Analyt-MTC's terms and conditions of sale.

Contact

ANALYT-MTC Messtechnik GmbH

German Headquarters

Klosterrunsstraße 18, 79379 Müllheim
Germany

+49 7631 5545

info@analyt-mtc.de

French Subsidiary

175 Avenue d'Alsace, 68000 Colmar
France

+33 3 89 41 47 78

info@analyt-mtc.fr

www.analyt-mtc.com

Before you contact Analyt-MTC

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

- the catalogue number of the sampler, for example 225-3851-PW;
- the expiry date from the packaging;
- the pump and flowmeter you use, and the flow rate you verified.

ANALYT-MTC Messtechnik GmbH

Sales, service and calibration

German Headquarters
Klosterrunsstraße 18, 79379 Müllheim
Germany
+49 7631 5545
info@analyt-mtc.de

French Subsidiary
175 Avenue d'Alsace, 68000 Colmar
France
+33 3 89 41 47 78
info@analyt-mtc.fr

www.analyt-mtc.com

AMTC-IN-0011 · Rev. 2 · 2026-10

© 2026 ANALYT-MTC Messtechnik GmbH. All rights reserved. Subject to technical changes without notice.