



AirTrap[®] Mini User Guide

Operating & Instruction Manual



Contents

Section 1 — Intended Use.....	3
Section 2 — Summary.....	3
Section 3 — Applications	3
Section 4 — Advantages	4
Section 5 — Principle of Operation	4
Section 6 — Opening and Closing the Caps.....	5
Section 7 — Recommended Sampling Procedures.....	6
General.....	6
Pump Calibration	6
Sampling of Ambient Environments.....	6
Sampling in Wall Cavities.....	6
Recommended Sampling Time Intervals	7
Section 8 — Inspecting Your Cassettes.....	8
Section 9 — Storage and Operating Conditions	8
Warnings and Precautions	9
Section 10 — Laboratory Analysis	9
Section 11 — Product Specifications.....	9
Section 12 — Related Documents	10
Section 13 — Ordering Information.....	10

Section 1 — Intended Use

The AirTrap® Mini is a compact, single-use air sampling cassette designed for the efficient, quick, and precise collection of a wide range of biological and non-biological airborne particulates. It is used to evaluate indoor air quality complaints involving bioaerosols (for example, mold spores, pollen, dander, insect parts, and skin cell fragments); to investigate catastrophic insurance claims involving water damage and fires (wildfire and structure fires); and to assess cross-contamination from building-generated and construction-related particles.

Each AirTrap Mini cassette is intended for single use to maintain data integrity and accuracy.

Section 2 — Summary

The AirTrap Mini is designed to deliver high-performance sampling across a wide range of environmental monitoring scenarios. Compared with widely used slit-impaction spore-trap cassettes, the AirTrap Mini incorporates several design improvements that enhance usability for both field professionals and laboratory analysts.

Comparative studies have been conducted to evaluate the AirTrap Mini against these commonly used devices. Results demonstrate improved particle collection, retention, and analytical performance across a broad aerodynamic range, from small mold spores to larger building-generated particles.

The AirTrap Mini concentrates airborne particles onto a well-defined area of a microscope slide, allowing their accurate quantification. When combined with a thorough investigation, the AirTrap Mini can assist with determining the sources and concentrations of various indoor contaminants.

With sustainability in mind, the cassette housing is made of #5 polypropylene, which makes it recyclable, and uses about half the plastic of legacy cassettes. Please recycle.

Section 3 — Applications

Suggested and potential applications of the AirTrap Mini include, but are not limited to:

- **Mold and Indoor Air Quality (IAQ) Assessments:** Collects the full range of common IAQ target particles, including mold and mushroom spores, fungal fragments, pollen grains, insect parts, dust mites, skin cells, fibers, dander, construction dust, combustion particles, corrosion particles, and more.
- **Home and Real Estate Inspection:** Identify mold and other airborne contaminants associated with building shedding, construction defects, and more.
- **Moisture Intrusion and Mold Claim Investigations:** Evaluate cause-and-origin claims and differentiate indoor amplification from background levels.

- **Flood Restoration:** Evaluate initial mold spore contamination and perform post-remediation verification (PRV).
- **Wildfire and Structure Fire Claim Investigations:** Analysis of char, ash, soot, and forensic indicator particles for initial contamination and post-remediation verification (PRV).
- **Allergen Assessments:** Detect common targets such as mold and mushroom spores, fungal fragments, pollen grains, insect parts, pet dander, dust, and dust mites.
- **HVAC Contamination Assessments:** Evaluation of HVAC-generated aerosol amplification from mechanical system corrosion or shedding.
- **Cleanroom Monitoring:** Low-level particle detection of biological and inorganic building-generated contamination.
- **Fiber Analysis:** Suitable for fiberglass, asbestiform, cellulosic, synthetic, ceramic, and biological fibers.
- **Stack Emissions:** Monitoring of emissions such as fly ash and inorganic dust.

Section 4 — Advantages

- **Excellent Detection Limits:** Concentrates airborne particles onto a small, well-defined trace, giving low detection limits with short sampling times.
- **Sample Integrity Protection:** The AirTrap Mini's sealed caps and enclosed slide design prevent sample loss and cross-contamination, issues that are common with other devices, especially during transportation and handling.
- **No Field Handling of Media:** The cassette eliminates the need for direct handling or field preparation of collection media and microscope slides, making sampling more efficient and reducing the risk of contamination.
- **Compact Size:** The AirTrap Mini's convenient size reduces shipping and storage volume.
- **Durable and Recyclable:** The AirTrap Mini is lightweight and durable. Made from #5 polypropylene, it's recyclable, and uses about half the plastic of legacy cassettes.
- **Lab-Ready:** Accepted by spore-trap laboratories and analyzed with the same methods as the industry-standard cassette (see the AirTrap Lab Guide).
- **Universal Pump Compatibility:** The AirTrap Mini works with the standard 15 lpm air sampling pumps used to collect airborne particles and bioaerosols. No change to pump selection, field calibration equipment, or methodology is required.

Section 5 — Principle of Operation

The AirTrap Mini uses inertial impaction to collect airborne particles. As air is drawn through the cassette, it accelerates through a tapered inlet and a narrow slit aimed directly at an

enclosed glass slide coated with a clear adhesive media. Particles carry enough momentum to leave the airstream and embed in the media, while the air turns 90 degrees, passes around the slide, and exits the cassette.

The collected sample can be analyzed by a trained microscopist and can also be paired with AI-assisted microscopy, providing an efficient solution for monitoring mold spores and other indicators of potential environmental exposure.

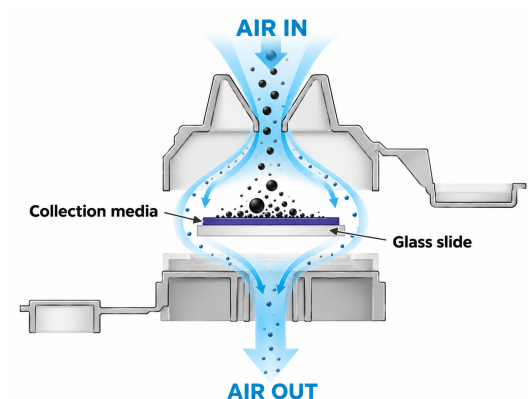


Figure 1. Airflow through the cassette. Particles impact the collection media while the air turns and exits through the base.

Section 6 — Opening and Closing the Caps

The AirTrap Mini has integrated caps on both the inlet and the outlet. They pop open and snap closed, like the cap on a mustard bottle, with an audible click. Before sampling, open both caps. After sampling, close both caps firmly; the caps seal the cassette for transport and prevent sample loss and contamination.



Figure 2. The AirTrap Mini with both caps open. Open the inlet cap (top) and outlet cap (side) before sampling; snap both closed afterward.

Section 7 — Recommended Sampling Procedures

General

The AirTrap Mini is designed for use with air sampling pumps intended for bioaerosol collection, calibrated to 15 liters per minute (lpm). It can be operated in any vertical or horizontal orientation without concern for loss of large particles or vibration.

When paired with the AirTrap In-Wall Adapter, the AirTrap Mini can be used to sample confined spaces such as wall and floor cavities.

Pump Calibration

Calibrate the pump to 15 lpm before sampling, following the pump manufacturer's instructions and using a rotameter calibrated to a primary standard, a soap-bubble or dry-bubble meter, or an electronic field calibrator. Some pumps work only with specific calibration devices; check your pump's manual.

Because the AirTrap replicates the flow characteristics of the standard slit-impaction cassette, no change to pump selection, calibration equipment, or method is required. Calibrate with a dummy Air-O-Cell or AirTrap in line to 15 lpm, then run a fresh AirTrap for the sample. Step-by-step procedures for common pump and calibrator combinations are in the AirTrap Field Calibration Guide (AT-FCG-001).

Sampling of Ambient Environments

To ensure accurate interpretation, collect comparison or control samples from unaffected areas and from an outdoor reference location whenever possible.

1. Label the cassette before sampling.
2. Open the inlet and outlet caps (Section 6).
3. Firmly connect the outlet end of the cassette to the sampling pump tubing or adapter.
4. Position the cassette with the inlet facing the air to be sampled and turn the pump on for the selected sampling time (see Table 1).
5. Turn the pump off, disconnect the cassette, and close and seal both the inlet and outlet.
6. Record the sample on the chain-of-custody form (paper or digital), including location, date, time, flow rate, and sampling time.

Always use a fresh cassette for every sample. Place all collected samples in the return bag or mailer, flat, and ship to the laboratory promptly, preferably overnight.

Sampling in Wall Cavities

1. Fit the AirTrap In-Wall Adapter directly to the cassette inlet and attach 1/4-inch tubing to the adapter.

2. Feed the free end of the tubing through the access opening into the cavity. The In-Wall Adapter Starter Kit includes a push rod to help guide it.
3. Sample for 2 minutes at 15 lpm. Wall cavities are enclosed spaces with little air exchange and lots of dust, so a shorter sample avoids overloading the trace.
4. Record the location and note that the sample was a wall-cavity sample.

Recommended Sampling Time Intervals

Spore traps concentrate particles onto a small trace, which gives them low detection limits but also makes them sensitive to overloading. In the field, the deposition trace at the end of sampling should be barely visible through the cassette body with the naked eye or a hand lens; do not open the cassette to check. If the trace is highly visible or opaque, collect additional samples at shorter time intervals.

The optimal flow rate is 15 lpm. Flow rates above 20 lpm may cause "bounce-off" of larger particles such as pollen grains. Flow rates below 10 lpm will not capture the smallest mold spores, such as *Aspergillus* and *Penicillium*, as efficiently.

The recommended sampling time at 15 lpm is 5 minutes. Table 1 lists adjustments for various environmental conditions. These are guidelines; the final determination is made on site by a trained professional.

Spore-trap sampling is a comparative analysis. Indoor samples and the outdoor reference sample should mirror each other: use the same flow rate and the same sampling time for both, so that the results can be compared directly. Do not run a longer sample outdoors than indoors.

Table 1. Recommended sampling intervals at 15 lpm

Environmental dust conditions	Sampling time
Outdoor reference sample	5–10 minutes
Wall cavity (with AirTrap In-Wall Adapter)	2 minutes
"Clean" office environment or outdoors, no visible dust	5–10 minutes
Indoor environment with normal occupant activity	5 minutes
Indoor environment with evidence of drywall renovation or industrial dust	1–5 minutes
Indoor environment with visible dust emissions from a point source	0.5–1 minute

Section 8 — Inspecting Your Cassettes

Inspect every cassette on arrival and again before use. The cassette body is translucent: turn it over and look inside for two black lines. If both lines are intact, the glass slide is intact. Do not use a cassette with a missing or broken line, visible damage, an open seal, or an expired date, and report any defect to AirTrap Technical Support with the lot and serial number from the packaging.

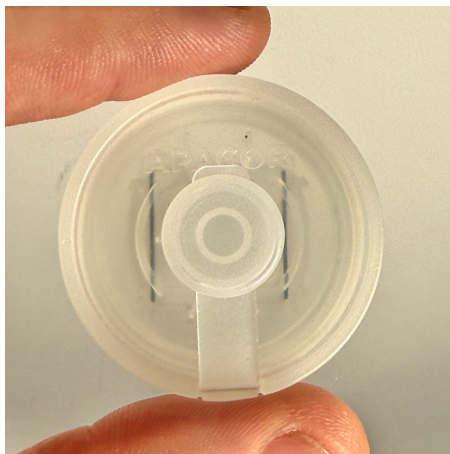


Figure 3. The two black lines seen through the base of the cassette confirm the collection slide is intact.

Every AirTrap cassette carries full lot and serial traceability to the production line and day, so please include both numbers in any report.

Section 9 — Storage and Operating Conditions

- **Storage temperature:** Store at room temperature, between 60–82°F (15–28°C).
- **Operating temperature:** Do not use below 32°F (0°C).
- **Acclimation:** If exposed to freezing temperatures before sampling, allow the cassette to acclimate to the sampling environment before use.
- **Humidity:** Store at 40–60% relative humidity, the same range recommended for healthy indoor environments.
- **Shelf life:** Use by the expiration date printed on the cassette. A month-year date means the last day of that month.
- **Usage:** AirTrap Mini cassettes are designed for one-time use only and are not reusable. They are recyclable though, so please recycle them.

Think of the cassettes like fresh fruit: keep them stable, dry, and at room temperature, and never leave them in a hot or cold vehicle. The adhesive media has a temperature sweet spot; too hot and it can soften or shift, too cold and it loses its ability to capture particles. See the AirTrap Product Care Guide for complete care and handling instructions.

Warnings and Precautions

- Store unused AirTrap cassettes flat in a cool, dry place.
- Inspect the cassette and components before use (Section 8).
- Do not use if the cassette appears damaged or otherwise compromised.
- Do not use after the expiration date indicated on the packaging.
- Keep the cassette closed at all times except during sampling.
- Do not eat, drink, or smoke in the vicinity of the sampling location.
- Humidity and temperature fluctuations can affect sample collection.
- Keep samples, supplies, and equipment out of reach of children and pets.
- Do not attempt to modify or disassemble the cassette; this could compromise performance and safety.
- Avoid direct exposure to collected particulates, which may cause respiratory or allergic reactions.

Section 10 — Laboratory Analysis

AirTrap Mini cassettes are opened and analyzed only in the laboratory. Samples are intended to be analyzed in accordance with ASTM D7391 by a qualified laboratory, such as one accredited under AIHA's Environmental Microbiology Laboratory Accreditation Program (EMLAP). Analysis follows the AirTrap Lab Guide.

Section 11 — Product Specifications

Specification	AirTrap Mini
Optimal flow rate	15 lpm
Particle size range	2 µm to 200+ µm
Collection slide	Glass, adhesive media, fully enclosed
Cassette dimensions	1.625" x 1.625" x 1.125"
Cassette weight	13g
Housing material	Recyclable #5 polypropylene
Outlet connection	Fits standard 15 lpm spore-trap sampling pumps and tubing
Storage temperature	60–82°F (15–28°C)
Minimum operating temperature	32°F (0°C)
Pack size	48 per box

Section 12 — Related Documents

These documents complete the AirTrap support set. Each is available at airtrap.us.

- **AirTrap Product Care Guide (AT-PCG-001):** Inspection on arrival, storage, handling, transport, and shipping samples to the laboratory. <http://airtrap.us/docs/product-care-guide.pdf>
- **AirTrap Lab Guide (AT-LG-001):** Opening the cassette, slide preparation, stains, microscopic examination, and concentration calculations. For laboratories only. <http://airtrap.us/docs/lab-guide.pdf>
- **Field Calibration Guide (AT-FCG-001):** Step-by-step pump calibration for common pump and calibrator combinations. <http://airtrap.us/docs/calibration-guide.pdf>
- **Engineering Position Statement (AT-EPS-001):** Why no change to pump selection or calibration method is required when substituting AirTrap for the legacy cassette. <https://airtrap.us/docs/engineering-statement.pdf>

Section 13 — Ordering Information

Product	Product code
AirTrap Mini (pk. 48)	350048
AirTrap Mini (pk. 10)	350048-10PK
AirTrap Mini Benchtop Prep Jig (pk. 5)	3520
AirTrap In-Wall Adapter (pk. 10)	3516
AirTrap In-Wall Adapter Starter Kit (Push Rod + pk. 10)	3516-ST
AirTrap Inlet Adapter (pk. 10)	3511
AirTrap Swabs (pk. 10)	3561
AirTrap Flow Meter (Coming Soon)	350100
AirTrap Stain (pk. 5)	3530

AirTrap Technical Support

1-800-838-1388 · support@airtrap.us · airtrap.us

Got questions? Let us know. We're here to help.

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