

The Hidden Limitation of Laminar Flow cabinets and Traditional Testing

Horizontal laminar flow hoods inherently have a weakness. As HEPA filtered air flows horizontally across the entire worksurface, any obstruction, like a worker's hands, beakers, or flasks, creates a turbulent wake or

low-pressure region downstream which can pull dirty room air back into the work zone. Clean benches are typically tested under "at rest" or empty conditions, which doesn't capture the effect of these real-world conditions.



The Solution

Baker's High-Velocity Return Air Slots

After identifying this phenomenon, Baker developed and tested high-velocity return air slots for the EdgeGARD® Horizontal Flow Clean Bench. These slots are added to the front edge of the worksurface and along the sidewalls.

The function is to pull the air out of the boundary layer regions where turbulence forms capturing air right where "backwash" would occur. These return air slots collapse the negative pressure zone, re-establishing directional dominance of the primary horizontal flow preventing room air entrainment into the critical area. Simply put, these slots grab disturbed air before it can roll back into the work zone.

The Air Slots

- Capture disturbed air at its source
- Prevent backflow into the critical work zone
- Maintain directional airflow during real use

Testing shows:

- ISO Class 5 air cleanliness across the work surface
- Clean airflow extends to the front opening - and slightly beyond under ideal conditions
- Return air slots actively capture disrupted airflow

Supporting Proper Work Practices

High velocity return air slots increase product protection across the entire worksurface and beyond. Their inclusion in design is critical for providing protection in actual conditions. While EdgeGARD® enhances airflow control, aseptic technique remains critical. To gain the full effect of protection and provide the cleanest possible location for critical operations, work should be located not closer than 6 inches from the front of the worksurface.

Evidence it works. Smoke studies and testing show:



Without high velocity slots, contaminated room air can enter the work area.



With slots, contaminated air is captured and protects the work area.

All laminar flow benches can provide clean air.
Only EdgeGARD® provides control where it matters most.



Discover how high-velocity
Airflow Slots maximizes
cleanliness. Watch the video.

