

A FULLY INTEGRATED SOLUTION

Cleanseal Integrity is an evolution of Camfil's Cleanseal platform to facilitate validation tests on high performance Terminal HEPA filters. This development supports:

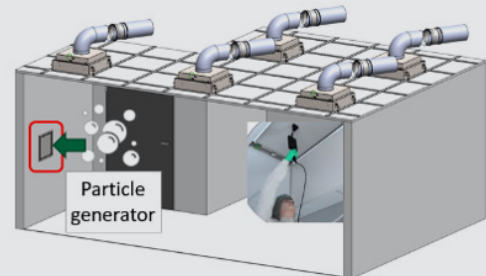
- Centralized aerosol injection for groups of standard CleanSeal, Optionally additional local injection through the individual housing
- More efficient testing
- Versatility to adapt to any clean room design
- Risk mitigation compared to thermal aerosol generation

Cleanseal Integrity has been validated to comply with ISO14644-3 requirements

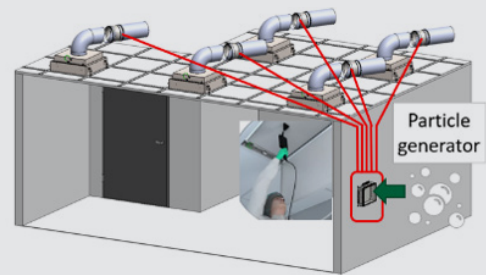
ADVANTAGES

- **Prolonged HEPA filter lifetime** by allowing low aerosol concentration
- **Decreased fire risk** by using cold aerosol generation, as well as avoiding upstream duct soiling
- **Clean room Configuration adaptability** by allowing for room side / technical side injection, in new built or retrofit projects
- **Qualified aerosol injection** with validated upstream concentration uniformity, allowing for testing by Discrete Particle Counter or Photometer, whether with DEHS or PAO
- **Operator fail safe design** by toolless operation. All connections deported in the control boxes, with space for connection identifiers
- **Faster maintenance and operation** by toolless design, quick & easy access, fast filter change
- **Life Science grade quality** with fully welded, pressure tested body and specific, H₂O₂ resistant coating

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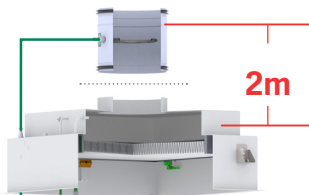
Only one operator required.



Perfect for retrofit or to reduce foreign equipment in the cleanroom. Two operators required.

AEROSOL INJECTION THROUGH THE HOUSING

(for CleanSeal Integrity versions only)

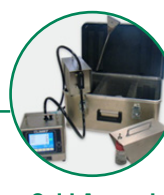


*Validated IntegriPod installation distance for optimal aerosol distribution.

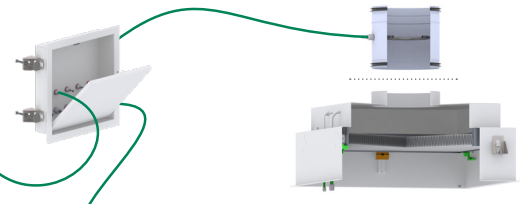
Every standard CleanSeal includes a full suite of measurement ports for supply air filter validation. Integrity versions include additionally a dedicated self-sealing fitting for local aerosol injection and a qualified injection module (IntegriPod).

AEROSOL INJECTION THROUGH THE INTEGRIBOX

(for any standard CleanSeal)

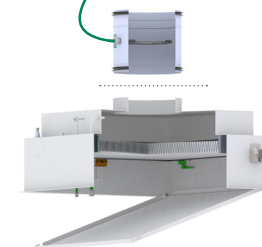


Cold Aerosol Generator



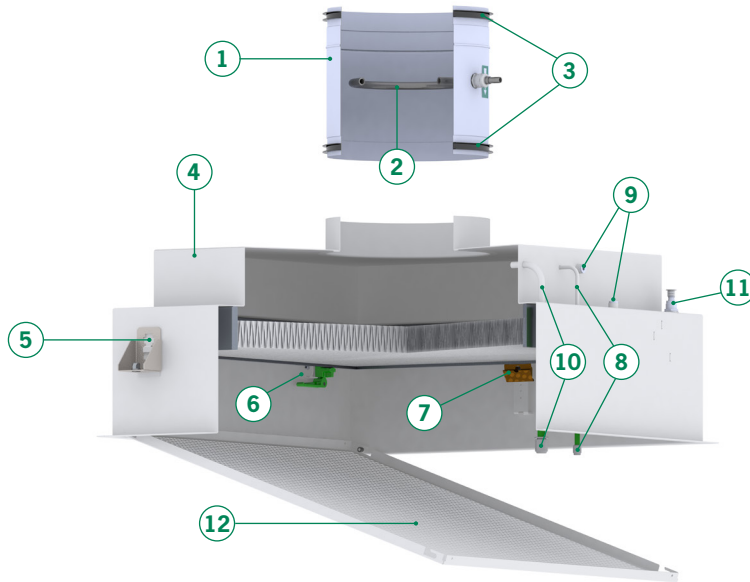
Up to 20m tube length (with tubes D12d9 mm).

* Calculation and tests including four 90° fittings.



Up to 5 Cleanseal can be aerosol tested through one IntegriBox.

CLEANSEAL INTEGRITY IN DETAIL



All CleanSeal housings include a full suite of welded measurement ports for in-situ filter validation. They may be combined with the qualified IntegriPod aerosol injection device add-on, using the IntegriBox as injection port terminal.

CleanSeal Integrity are installation kits including the IntegriPod device, plus one additional local injection port (11) on the housing. IntegriBox terminals are optional.

- | | |
|--|---|
| 1. IntegriPod injection add-on | 7. Multi-position filter retainer |
| 2. Qualified stainless steel injection probe | 8. Upstream pressure port P+ (room side access) |
| 3. EPDM double lip gasket for EUROVENT Class D connection | 9. Secondary pressure ports P+/- for remote sensor hookup |
| 4. CleanSeal housing, fully welded body | 10. Dedicated upstream Concentration port (room side access) |
| 5. Detachable mounting blocks for compression or suspension setup | 11. Self sealing fitting for local aerosol injection (Integrity version only) |
| 6. Multi-position toolless filter clamping system (factory preset) | 12. Interchangeable front plate |

INTEGRIPOD



The CleanSeal Integrity aerosol injection device is available for all standard housings types and for duct sizes:
D160 / D200 / D250 / D315 / D355

	Performance*	Requirements**
Aerosol concentration @0,45 m/s	15-25 µg/l	1-100 µg/l
Stability over time	<=8%	<±10%
Relative STD deviation	<=8%	<20%
Relative MAX deviation	<=15%	<50%
Concentration ratio 100% sampling port vs. average	0,95 - 1,1	>0,75 < 1,25
Pressure drop	2 - 10 Pa	

*depending on IntegriPod size

**acc. to IEST-RP-CC034-4 / ISO 14644-3

INTEGRIBOX



Service box with quick connect fittings for managing 1 to 5 CleanSeal housings. Versions for in or outside the clean room, wall or ceiling mounted. With flush door in CleanSeal design.

Particle injection loss for DEHS

