# DOWNWARD LAMINAR FLOW BOOTHS

![SbD4Nano logo - SAFE BY DESIGN FOR NANO]

The downward laminar flow booths (or 'walk-in' booths) are defined as a booth, in which a curtain of descending laminar air is created between the ceiling and the rear of the booth where exhaust grilles are located at the lower section. This device is also designed to protect the products. Flow booths can be equipped with partial or full screen glove ports, potentially offering further level of containment. These screens could be partial, partial fitted with glove ports and full fitted with glove ports.

## Downward laminar flow

Three types of screens are used:

- **Partial screens**: Partial screens cover the majority of the front of the process/booth. However there may be relatively small openings for operator hands and/or gaps at the top and bottom of the booth.

- **Partial screens fitted with glove ports**: Partial screen cover the majority of front of process/booth and is fitted with glove ports to allow the operator to handle the product. However there may be relatively small gaps at the top and/or bottom of the booth.

- **Full screen fitted with glove ports**: Full screen cover the entire front of the process/booth and is fitted with glove ports.



*Photo from Hosokawa Micron Powder Systems*

### Effectiveness

**Mean: 89%**

50%                                    100%
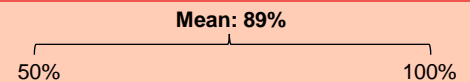
### Resources

*Wouter Fransman, TNO Quality of Life (The Netherlands) et al., « Development of a mechanistic model for the Advanced REACH Tool (ART) ».*

## Best Practices

To be effective in reducing personal exposure levels the worker must not stand in-between the source and the grilles. The exhaust volume is typically between 3500-4000 m3/h (per 1m width). Other conditions that make the booth effective are:

1. The booths must completely enclose the work task and the worker

2. Booth sizes are adaptable to the work task and process equipment and can have varying levels of filtration

3. The filter should have high dust holding capacity, and performance and volume air flow need to be checked regularly

4. For downward laminar flow booths the capture velocity should approximate 0.5 m/second

5. A safe work line (SWL) marks the limit of effective containment and dust capture