

HOW TO SELECT A PASS-THRU: ITS ROLE AS A CLEANROOM COMPONENT AND DESIGN CONSIDERATIONS

By Katie Addis
Clean Air Products

Selecting the right pass-thru airlock means fewer people entering the cleanroom, reducing cleanroom contamination and increasing operating efficiency.

Modular cleanrooms protect manufacturing operations from the constant threat of air particulate contamination. Pass-thru cabinets (also called pass-thru airlocks) are a component of a cleanroom system and play an important role in reducing contamination. Clean manufacturing environments that are free of dust and bacteria are requirements not only in the production of medical devices and pharmaceuticals, but are also an increasingly common requirement of the modern manufacturing industry as a whole: computers and consumer electronics, food processing, vehicles, air and spacecraft, and many new manufacturing processes in biotechnology and nanotechnology.

Preventing product contamination increases productivity and also enables

manufacturers to comply with industry quality standards. For example, cleanroom systems, including pass-thrus used in compounding pharmacies, must comply with USP 797 and USP 800, which stipulate cleaning requirements. As manufacturing evolves in sophistication and advanced manufacturing

techniques emerge, the demand for cleanroom systems increases. To meet this increasing demand it is important to understand how cleanrooms function, and how to evaluate and choose the right components that make up an effective cleanroom system. In this article we will focus on pass-thrus: what their role is in relation to cleanrooms, how a pass-thru works, and how to select a pass-thru for a specific application.

THE ROLE OF A PASS-THRU

To prevent contamination of a cleanroom, people and materials must pass through some kind of vestibule that connects the controlled environment of the cleanroom to less-controlled “dirty air” or surrounding space. People walk through air showers, where high-velocity air nozzles remove particulate from clothing while a person stands in the air-locked space for a minute or so. Materials, products and specimens are transferred into the cleanroom through a pass-thru, which are cabinets mounted on the wall or floor of a cleanroom. Pass-thrus prevent cleanroom air from leaking out and depressurizing the cleanroom and also prevent dirty, untreated air from flowing into the cleanroom. Passing items through the pass-thru’s interlocked doors means fewer people have to enter the cleanroom, which reduces cleanroom contamination and increases operating efficiency. Properly designed and constructed, a pass-thru is easy to clean and maintain, which is crucial for maintaining cleanroom standards.

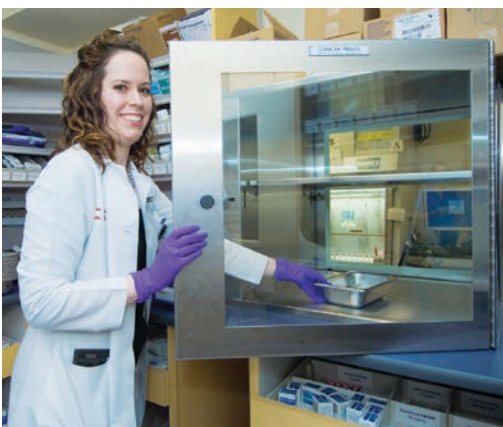


Photo: Dana-Farber Cancer Institute; Sam Ogden

steel interiors have smooth, formed-radius corners to prevent particulate from collecting in corners and edges. Spills are easily wiped up. These cabinets have the same “lipless” interior floor, silicone bulb gasket, and stainless steel T-handle door latch.

3. Bio-design

Specialized bio-contaminant or “germ-free” processes such as terminal sterilization processing, nanotechnology and production facilities with strict isolation procedures require aseptic cleaning of cleanroom equipment surfaces.

For these processes, bio-design pass-thrus feature the same solid, fully welded body with covered radius corners, and a seamless interior, but now with knife-edge hatch openings. This design is less likely to harbor particles and is easier to keep clean. Additional features for easy cleaning include a one-piece door gasket and doors with lift-off hinges that are easy to remove for special cleaning and autoclaving.

4. Additional considerations

Other factors to consider in selecting a pass-thru include how the pass-thru will be mounted to the cleanroom.

Check the size of wall spaces and clearances, and note obstructions that will affect door swings or access to service panels. Pass-thrus with 90-degree turns, vertical sliding doors and interior or exterior service panels provide flexible solutions that maximize space and operations efficiency of the cleanroom.

Consider the type of materials that will be transferred through the pass-thru, and how they will be transferred: whether materials are transferred in small quantities by hand, or in continuous batches on a roller bed or conveyor, will affect



the type of pass-thru selected. Some pass-thrus have manual or automatically operated doors and interlocks at the top.

Also consider how the pass-thru integrates with cleanroom operations and how it will be used by personnel. Some cleanrooms benefit from pass-thrus with their own HEPA air filters or external ventilation coupling to connect to the cleanroom air handling system. Interior shelves may be preferred by personnel to separate materials and keep them above floor surfaces of the pass-thru. Viewing windows, interior lights and easy access to internal parts for maintenance are other features important to cleanroom personnel.

To meet specialized requirements, pass-thrus can be designed with fire-rated doors, lead-lined doors or pneumatic vertical sliding doors.

CONCLUSION

In conclusion, the pass-thru is a critical component of cleanroom operations, important in maintaining the cleanroom environment. Pass-thrus simplify material transfer, efficiently reduce the amount of traffic, and preserve the air pressure and cleanliness of the cleanroom. Pass-thrus can be selected with a wide variety of options that maximize value, ease of use and efficiency of any cleanroom. Our pass-thrus are well designed, convenient to install, and easy to use and maintain. Durable, double-wall, all stainless-steel construction improves the functionality, and appearance, of the cleanroom.

About Clean Air Products

Clean Air Products designs and manufactures high quality cleanroom systems, components, equipment and supplies for a broad range of applications. Since 1969, Clean Air Products has served the medical, pharmaceutical, food and beverage processing, aerospace/military and semiconductor industries, among others.

For more information call 763.425.9122 or visit www.cleanairproducts.com.

www.cleanairproducts.com

8605 Wyoming Ave. N. • Minneapolis, Minnesota 55445

763.425.9122 • 800.423.9728 • fax: 763.425.2004

e-mail: sales@cleanairproducts.com