ABATEMENT TECHNOLOGIES®
World Class Indoor Air Quality Products

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Advantages of Negative Pressure 'Inflow' Systems compared to 'Outflow' Systems for Infectious Patient Isolation

The key to effectively isolating and controlling hazardous air contaminants for infectious patient isolation is the use of negative (lower) air pressure to control directional airflow patterns. A room that has a lower pressure compared to adjacent areas is under negative pressure. When the doors are opened, air is drawn into the room keeping contaminants from being pushed out, thereby creating an inflow air pattern.

Inflow Systems–A Proven Isolation Technique

Inflow is a tried-and-true, proven isolation technique for which the goal is to ensure that any breach in the containment barrier will cause 'clean' air from surrounding spaces to flow in, as opposed to allowing 'dirty' air from the contaminated area to escape. In accordance with U.S. Environmental Protection Agency Guidelines, this method has been used for decades by environmental remediation companies for effective containment and control of hazardous indoor air contaminants.

HEPA filtration devices (HFD) called negative air machines are placed inside of the containment zone prior to the start of the project. HFD's are located as far as possible from the entrance and run continuously throughout the project. The clean, filtered air exhausted from the HFD is ducted out of the zone to create negative (lower) pressure compared to surrounding spaces. Typically, the exhausted air is ducted directly to the outdoors, especially if the work is being done in an occupied building. This configuration will cause air within the zone to flow away from the entrance and toward the HFD.

Abatement Technologies HEPA-CARE In-Room Systems Create Negative Pressure & Purify the Air

Abatement Technologies HEPA-CARE® In-Room HEPA Filtration Systems are specifically designed to apply identical principles for isolation of infectious patients in health care settings. Ideally, the HFD's are placed as far from the entrance door as possible to cause air inflow into the room away from the corridor and across the patient. Filtered air is exhausted out of the isolation room to create negative pressure. In most instances, the filtered air is ducted directly to the outdoors rather then re-circulating it within the facility. This technique, known as 'single-pass' ventilation, virtually eliminates

any possibility that contaminants could escape into the facility in the remote chance of a HFD malfunction.

Outflow Systems

Some systems operate in essentially the reverse manner. A frame and fabric pass-through enclosure with zippered entry doors is erected in the corridor, just outside the patient room door, and used as a temporary anteroom. The HFD (typically a negative air machine), also located in the corridor, has an inlet collar that is attached to an exhaust port built into the enclosure.

The HFD pulls air out of the enclosure, filters it and exhausts the filtered air into the corridor for re-circulation within the building. The HFD will also pull a lesser volume of air into the enclosure from the isolation room and from the corridor, creating an outflow condition. As a result, the enclosure will be under negative pressure relative to both the room and the corridor, and the air pattern within the room will be toward the corridor, as opposed to away from it.

Air outflow may be counterintuitive, but it is an acceptable isolation technique under the CDC Guidelines. However, the overwhelming majority of indoor air quality experts agree that 'clean to dirty' air inflow is the most reliable and effective method for isolating and containing harmful airborne contaminants.