Ultra-clean environments for the biopharma industry

OTS-DF HEPA filter ceiling diffusers for operating theatres

Applications

Critical surgical procedures such as orthopaedic cases involving total hip or knee replacements demand measures that reduce the risk of post-operative infection. Research in Europe and the USA has established that the use of ultra-clean air-supply systems can be a significant factor in reducing infection levels. These systems use HEPA filters to remove particulate and biological contaminants down to 0.3µm from the supply air. A flow of ultra-clean air over the wound site sweeps away airborne contamination generated during the surgical procedures.

Description

Vilair-AAF OTS diffusers were developed as a low-cost means of meeting the needs of these applications, and are designed for installation in new construction or existing theatres. This system provides an economical means of achieving ultra-clean conditions by locating a single, large HEPA filter diffuser over the theatre table. The diffuser is designed to accommodate the centre penetration of a light fitting. This design provides a high degree of contamination control in a 2800 x 2800 mm 'clean zone' centred on the theatre table. The airflow pattern will be downwards and outward over the table so as to sweep airborne contamination from the surgical team away from the table[1]. This pattern will be assisted by the influence of low-level return-air grilles.

1. Some studies suggest that > 80% of wound infections are from the surgical team

Limitation of conventional HEPA filter installations

Many HEPA filter installations over or near the theatre table do *not* supply clean air to the table because of peripheral entrainment of contaminated air into the clean zone.

This contamination of the clean airflow is a function of HEPA filter face velocity and the degree of air turbulence from room activities. The effect can be inhibited by drawing a component of the return air from locations around the perimeter of the HEPA filter installation (see diagram below). The OTSV with optional proprietary grilles fitted around the perimeter[2] provides an effective airflow pattern that is essentially free from introduced contamination.

Construction

Frame

AAF modular ceiling grid system in anodised aluminium grid finish.

HEPA filters - options

FM-II, fan-assisted or TM non-fan assisted AAF HEPA filter modules. The anodised grid finish and the use of AAF minipleat HEPA filters with integral face guards present an attractive appearance without the need for underside filter guards. The filter arrangement is four or six 610 x 1220 mm HEPA modules (as specified).

Options

- Alternative filter arrangements
- Perimeter return air grilles 2
- Short curtain assembly
- Fluorescent lamps

Other products

- Laminar flow enclosures
- Dispensary and sampling booths
- Cleanroom ceiling and lighting systems
- Clean garment storage cabinets
- Pass-through hatches
- Air showers
- AAF and Vilair® air filters

Drawing

Please see next page. A six-filter arrangement is shown.

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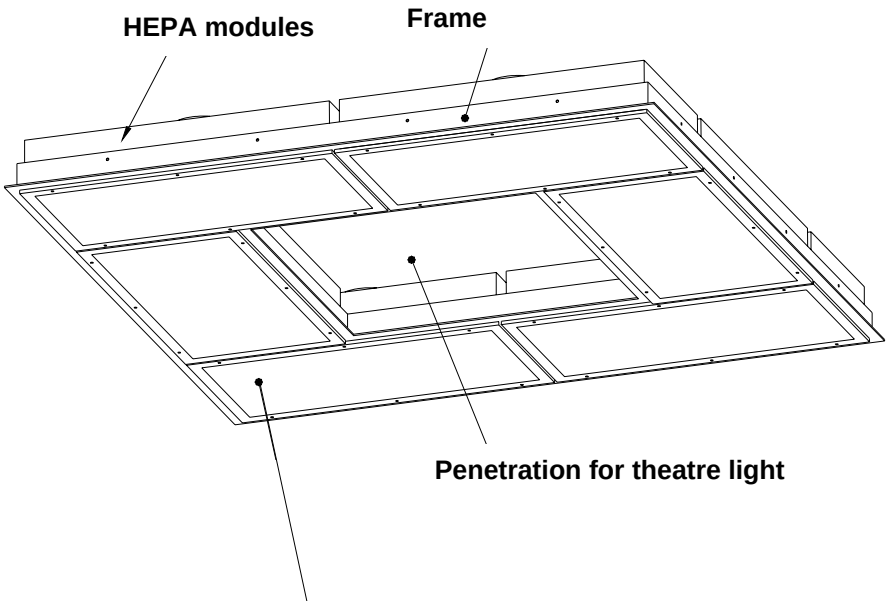

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