

Whitley Workstations HEPA Filtration



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Don Whitley Scientific (DWS) offers the unique Whitley Internal HEPA Filtration System to provide a high degree of product/sample protection on modified atmosphere workstations. HEPA fitted workstations are ideal for use as part of a pharmaceutical manufacturing process, for the cultivation of slow-growing anaerobes, or for applications requiring complex manipulations under anaerobic conditions (ie biochemical assays).

Using innovative circulation technology, all the atmosphere in the chamber passes through the filter hundreds of times per hour, quickly creating and maintaining a particle-free environment (tested down to 0.3µm – exceeding ISO 14644 Class 3, as referenced in the Cell Tissue Culture Directive, or Class 1 of US Federal Standard 209E). Unlike some other systems, DWS integrates the filter within the workstation. Because the warm, moist atmosphere isn't pumped to an external filter, the filter does not become saturated with condensate and thus rendered ineffective.

Although DWS workstations are positive pressure devices, this HEPA filtration system provides the highest known level of atmospheric cleanliness of any positive pressure modified atmospheric workstation. Tests have determined that aerosols of bacterial cells and spores are trapped by the system, thereby preventing the contamination of any media present in the workstation.

No need to filter incoming gas supplies.

Clean-up time after a period of activity is considerably less than the 20 minutes allowed by the standard.

Rather than use 'off-the-shelf' filters, the Whitley HEPA Filtration System uses filters designed specifically for the product in conjunction with one of the world's leading filter manufacturers.

Proof of atmospheric cleanliness can be provided on request.



The Evidence

Tests were carried out in the DWS GLP compliant laboratories on the use of the Whitley HEPA Filtration System within an anaerobic chamber. Two Whitley Workstations were used - one fitted with HEPA filtration, one without HEPA. These tests demonstrated that the system produces a rapid and substantial reduction in bacterial contamination of the atmosphere. Atmosphere was sampled from three locations - the chamber interior, the location adjacent to the pressure relief valve outlet, and the external atmosphere adjacent to the chamber (in the operator's position). The results confirmed that no bacterial colonies were recovered from any of the sampling points after 2 minutes of the introduction of bacteria by nebulization.

The full results of these experiments are shown in the adjacent tables and the paper can be found on our website under Whitley A35 downloads.

Potential uses of a Whitley HEPA Filtered Workstation:

Use of anaerobic culture as part of a pharmaceutical manufacturing process, which would ideally be conducted under "cleanroom" conditions, ie the growth or manipulation of anaerobes used to produce a vaccine or pharmaceutical preparation.

Cultivation of slow-growing anaerobes: HEPA filtration would reduce the risk of contamination by faster growing strains.

Applications requiring complex manipulations under anaerobic conditions (for example, biochemical assays) where anaerobe cultures may be open to the ambient atmosphere for an extended period. HEPA filtration would reduce the risk of contamination under these conditions.

- Cancer Research
- Neurology
- Cardiovascular research
- Stem cell work and many other types of cell culture work

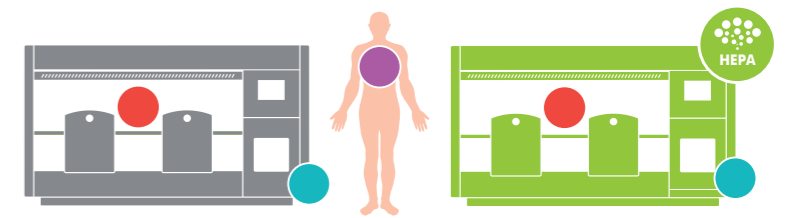


Table 1: Recovery of K. rhizophila colonies from standard anaerobic chamber (No HEPA)

Before nebulization	During nebulization (1.9x10 ⁸ cfu / 5 min)	After nebulization							
		0	2 min	5 min	10 min	15 min	20 min	30 min	
0	≥258	≥258	≥258	≥258	≥258	≥258	≥258	≥258	
0	≥258	≥258	≥258	≥258	≥258	≥258	≥258	≥258	

Table 2: Recovery of K. rhizophila colonies from HEPA filtered anaerobic chamber

Before nebulization	During nebulization (2.3x10 ⁸ cfu / 5 min)	After nebulization							
		0	2 min	5 min	10 min	15 min	20 min	30 min	
0	≥258	55	2	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	

Table 3: Recovery of C. beijerinckii colonies from HEPA filtered anaerobic chamber

Before nebulization	During nebulization (3.3x10 ⁵ cfu / 5 min)	After nebulization							
		0	2 min	5 min	10 min	15 min	20 min	30 min	
0	232	8	0	0	0	0	0	0	

Table 4: Recovery of K. rhizophila colonies from operator's position (No HEPA)

Before nebulization	During nebulization (1.9x10 ⁸ cfu / 5 min)	After nebulization							
		0	2 min	5 min	10 min	15 min	20 min	30 min	
0	≥258	≥258	≥258	≥258	≥258	≥258	≥258	≥258	

Table 5: Recovery of K. rhizophila colonies from operator's position (HEPA)

Before nebulization	During nebulization (1.2x10 ⁸ cfu / 5 min)	After nebulization							
		0	2 min	5 min	10 min	15 min	20 min	30 min	
0	0	0	0	0	0	0	0	0	

Numbers of colonies recovered are all from 100 litre air samples / Upper detection limit for air sampler = 258 colonies