
UNIDIRECTIONAL FLOW PANELS

ELEMENTS AND SYSTEMS CLASS ISO 5 - ISO 7 ISO 14644-1



GENERAL FEATURES:

PFM unidirectional flow panels have been designed and developed to diffuse air in a controlled manner and treated using very high efficiency filters of class H14, in accordance with EN 1822-1. This type of ceiling ensures the containment of biocontamination in the area of the operating theatre. This system is suitable for operating theatres intended for specialised surgical interventions such as organ transplants, prosthesis implantation (vascular, orthopaedic, spinal, etc.), neurosurgery and complex oncology and other complex operations, lasting more than 60 minutes, which require very high protection of the risk area (operating table, instrument table and operating space for surgeons and sterile storage). It can also be used for operating theatres intended for surgical operations without the implantation of foreign materials, but which require high protection, such as arthroscopic operations, vascular neurosurgery and obstetrics (caesarean section), for cardiac catheterisation and pacemaker implants and, in general, those of low invasiveness surgery.

The air diffusion system allows to obtain a unidirectional flow at uniform speed on the operating theatre. The use of unidirectional flow, allows having a fast time of particle decontamination of the environment (Recovery Time). The correct distribution of air within an environment is guaranteed if both the intake and the extraction of air are studied. For this purpose, in addition to the use of the PFM ceiling, the sizing and positioning of the recovery grids is of fundamental importance.

The construction consists of a structure in steel or stainless steel, epoxy painted, all perfectly sealed, inspectable and sterilisable. The system is divided into two elements to allow transport, positioning on site and facilitate assembly. The filtering section consists of laminated HEPA filters with efficiency class H14 according to EN 1822-1:2019. The filters are composed of an anodised aluminium extruded frame, double protective mesh in white painted aluminium, one-piece polyurethane gasket, resistant to disinfectants commonly used in operating theatres.

Support structure: in painted steel or stainless steel AISI 304L, (AISI316L on request), painted to accommodate mechanical sealing HEPA filters 68 mm thick.

Modular structure to optimise transport and installation.

Possible housing of the operating light, even if we strongly recommend the installation of the operating light or wall units outside the one-way flow, to make the most of its performance.

Perfect seal: ensured by the conformation of the filter housing and the one-piece polyurethane gasket.

Check system: each ceiling is equipped with a probe that allows the measurement of the pressure drop and one, acting from the sterile room, for the measurement of 100% of the upstream concentration for leak testing in accordance with ISO 14644:3.

Mounting: commonly suspended from ceiling with threaded bars.

Filter replacement: the fixing system allows easy and fast maintenance from a sterile room.

CURRENT REGULATIONS

SWKI VA 105-01 (2015-08)

DIN 1946-4 (2018)

VDI 2083

NS F 90-351

ONORM H 6020

GOST R52539

HTM 2025

ASHRAE 170-2013

UNI 11425

DPR n°37, 14/01/1997

50 years of experience at the service of our customers

OUR ADDED VALUE



SPEED AND FLEXIBILITY

Allow us to deliver any order, including special orders, as rapidly as possible, in Italy and abroad.



QUALITY AND CERTIFICATIONS

The quality of our processes and products is one of our strengths, thanks to a guaranteed production chain, certified according to the Standards ISO 9001 and Eurovent.



GREEN PHILOSOPHY

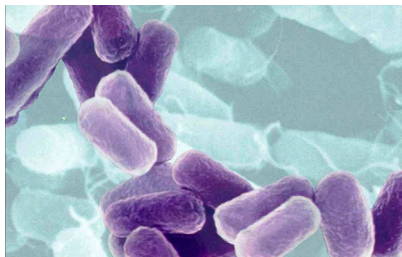
Our R&D is constantly committed to improve our product "performance", in order to offer advanced solution in a context of environmental and economic sustainability.

BENEFITS OF INDOOR AIR QUALITY



IMPROVED EFFICIENCY

Research shows that an optimal indoor air quality improves the productivity of the staff, also improving concentration and response in stressful situations.



REDUCED RISK OF INFECTIONS

Studies show that 80-90% of surgical infections depend on a "bad" air quality. An efficient filtration system and an optimal IAQ translated into a reduced risk of infection and thus reduced hospital costs.



LOWER COSTS

For example, to tackle an infection due to the Aspergillus niger mushroom, millions of Euro are spent every year in drugs; this amount could be in part saved thanks to a correct air filtration.

THE 9 AIR PURITY CLASSES

Maximum number of particles in the air (per cubic meter with $dm = 0 >$ with respect to the items specified)

CLASS	> 0.1 μm	> 0.2 μm	> 0.3 μm	> 0.5 μm	> 0.1 μm	> 0.5 μm	old class fed std 209 e
ISO CLASS 1	10	2					
ISO CLASS 2	100	24	10	4			
ISO CLASS 3	1.000	237	102	35	8		1
ISO CLASS 4	10.000	2.370	1.020	352	83		10
ISO CLASS 5	100.000	23.700	10.200	3.520	832	29	100
ISO CLASS 6	1.000.000	237.000	102.000	35.200	832.000	293	1.000
ISO CLASS 7				352.000	832.000	2.930	10.000
ISO CLASS 8				3.520.000	832.000	29.300	100.000
ISO CLASS 9				35.200.000	832.000	293.000	1.000.000

Standard ISO 14644-1 is based on the use of the quantity of sampled air expressed metric values (cubed meter) rather than imperial units (CFM), which have always been used to characterized the controlled contamination environments and areas. 9 air purity classes and 6 particle sizes with size comprised between 0.1 and 5 μm have been identified.



GENERAL FILTER
ITALIA | Air quality experts

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GENERAL FILTER
ITALIA | *Air quality experts*

PFM

GENERALFILTER

Since 1965, at your service to improve air quality



GeneralFilter, with over 50 years of experience in the filtration field, is capable of providing and guaranteeing the best technical and managerial solutions in the Indoor Air Quality (IAQ) field.

We produce a complete range of filters, from ISO Coarse to U15 efficiency class, plus filtration accessories and systems. We offer the certified guarantee of a customised service, where quality, flexibility and customer-oriented production are our stepping stones.

We believe we can improve our environment day by day, certain that the air we breathe is a precious asset. This is why we continue to invest in research & development, certifications and human resources, by focusing on sustainability and environmental comfort in our daily efforts.

GENERALFILTER'S CERTIFICATIONS



Year after year, we are increasingly focused on our production process, to offer the best quality experience possible to our customers.

We select our suppliers among the leading companies in the related fields, and we have been complying with Standard ISO 9001 since 1999.



Our attention for the environment and for energy savings, combined to our will to guarantee quality and transparency, led us to achieve the Eurovent certification. This certification ensures that our products are compliant with European and international Standards.

DIFFERENTIATED FLOW PANELS

ELEMENTS AND SYSTEMS

CLASS ISO 5

ISO 14644-1



GENERAL FEATURES:

PFM differentiated flow panels have been designed and developed to diffuse air in a controlled manner and treated by very high efficiency filters of class H14, in accordance with EN 1822-1. This type of ceiling lamp is the most effective choice to contain biocontamination in the area of the operating theatre. This system ensures the best performance for operating rooms intended for specialised surgical interventions such as organ transplants, implanting prostheses (vascular, orthopaedic, spinal, etc.), neurosurgery and complex oncology and other complex operations, lasting more than 60 minutes, which require very high protection of the risk area (operating table, tool table and operating space for surgeons and sterile storage). The advanced air diffusion system allows to obtain one-way flows at degrading speeds towards the perimeter that allow to have a flow that expands from the centre to the outside of the operating theatre. The use of the principle of differentiated speeds, allows to have a rapid time of particle decontamination of the environment (Recovery Time), typical of unidirectional flows, associated with a reduction of the necessary air flow with consequent reduction of energy consumption and avoids the use of physical barriers for the containment of the flow, simplifying the use of electromedical equipment.

The use of flows at different speeds allows to optimise the areas invested ensuring the best possible protection on the operating bed, a comfortable situation for the surgical team and the minimisation of the turbulent effect on the perimeter of the flow.

The correct distribution of air within an environment is guaranteed if both the intake and the extraction of air are studied. For this purpose, in addition to the use of the PFM, the sizing and positioning of the recovery grids is of fundamental importance.

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The construction consists of a stainless steel structure, epoxy painted, all perfectly sealed, inspectable and sterilisable. The system consists of two elements to allow transport, positioning on site and facilitate assembly. The filtering section consists of laminated HEPA filters with efficiency class H14 according to EN 1822-1:2019. The filters are composed of an anodised aluminium extruded frame, double protection mesh in white painted aluminium, gel gasket and a veil equaliser, resistant to disinfectants commonly used in operating rooms.

Load-bearing structure: in stainless steel AISI 304L, (AISI316L on request), painted to accommodate gel-tight HEPA filters with a thickness of 73 mm.

Modular structure to optimise transport and installation.

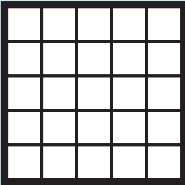
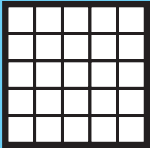
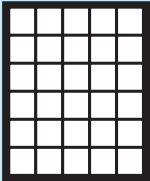
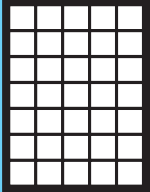
Maximum flexibility for the housing of the operating light, even if it is strongly recommended to install the operating light or wall units outside the differentiated flow ceiling, to make the most of its performance.

Perfect seal: ensured by the conformation of the filter housing and by the gel seal.

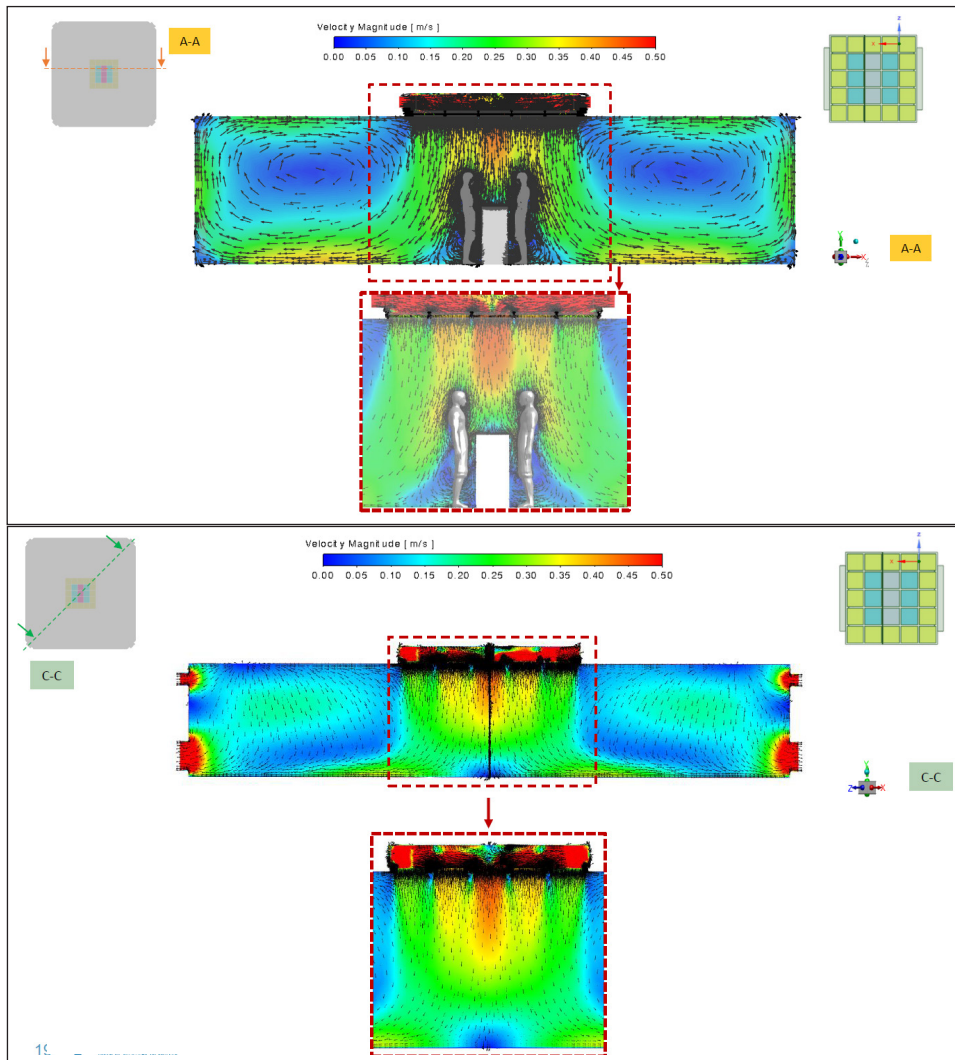
Check system: each ceiling is equipped with a probe that allows the measurement of the pressure drop and one, acting from the sterile room, for the measurement of 100% of the upstream concentration for leak testing in accordance with ISO 14644:3.

Mounting: commonly suspended from ceiling with threaded bars.

Filter replacement: the fixing system allows easy and fast maintenance from a sterile room.

Nominal dimensions (mm)	Filter dimensions (mm)	Filters Q.ty	Flow (m³/h)			Filters arrangement
			Min	Nominal	Max	
3200x3200x400	610x610x73	25	8300	9600	10800	
3000x3000x400	555x555x73	25	6800	7900	8900	
3000x3500x400	555x555x73	30	8300	9600	10800	
3000x4000x400	555x555x73	35	9700	11200	12700	

Fluid dynamic simulation display



MODULAR FILTER PANELS

ELEMENTS AND SYSTEMS
CLASS ISO 7 - ISO 8
ISO 14644-1

GENERAL FEATURES:



Modular filter panels are filtration systems developed for the filtration and distribution of air in sterile chambers; they improve the quality and hygiene of air in hospitals and aim to prevent the transmission of pathogens from patients to medical staff and vice versa; these systems work by keeping the air introduced into the chambers free from micro-powders, bacteria and micro-organisms. The aluminium profiles have been specially designed to create a perfect containment of HEPA and ULPA filters and to have a greater ease in replacing the filters. The air distribution plenum is made of bi-aluminium or painted steel depending on the size of the ceiling. The air diffusion panel is made of perforated aluminium sheet, while the air inlet, to be defined, can be on one or more sides.

The PFM ceiling lamp is designed for operating theatres intended for surgical operations without the implantation of foreign materials, but which require high protection, such as arthroscopic operations, neurosurgical and obstetric vascular surgery, those for cardiac catheterisation and pacemaker implants and in general those of low invasiveness surgery. In addition, it can be used in operating rooms for minor and short-term operations, or for interventions on a naturally contaminated field, such as visceral surgery, Day Surgery, urology and all those environments that can be defined as at risk in the project document.

The construction consists of a steel structure, epoxy painted, filter holders with an anodized aluminium perforated diffuser, all perfectly sealed, inspectable and sterilisable.

The system can be built in a single element or with a modular criterion when there are transport, on-site positioning and assembly needs. The filtering section consists of laminated HEPA and ULPA filters H14 efficiency according to European standard EN 1822:1, with extruded anodised aluminium frame, double mesh of protection in white painted aluminium, resistant to disinfectants commonly used in operating rooms.

Support structure: in anodised aluminium with upper plenum in painted steel capable of housing absolute filters with a thickness of 68 mm.

Modular structure to optimise transport and installation.

Horizontal air inlet. Possible installation of an operating light.

Perfect seal: ensured by the conformation of the filter housing, the gasket and the locking system.

Check system: each ceiling is equipped with a probe that allows the measurement of the pressure drop and one, acting from the sterile room, for the measurement of 100% of the upstream concentration for leak testing in accordance with ISO 14644:3.

Mounting: Ceiling suspension and connection to flexible and/or rigid pipes.

Filter replacement: the perforated diffusers and the fixing system allow easy and fast maintenance.

APPLICATIONS:

Modular filter panels, due to their construction characteristics, can be indicated for use in operating rooms, immunosuppressed wards, delivery rooms and neonatal units.

CURRENT REGULATIONS

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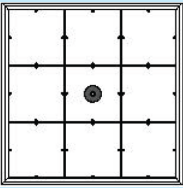
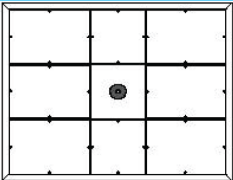
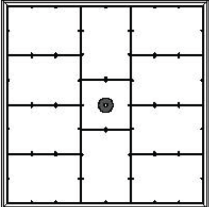
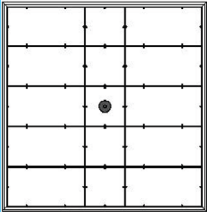
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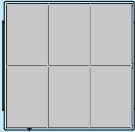


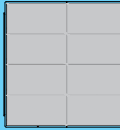
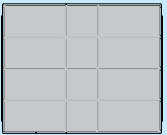
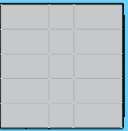
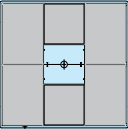
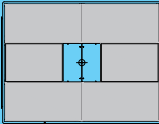
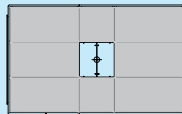
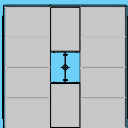
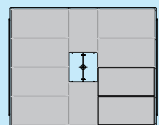
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Nominal dimensions (mm)	Filter dimensions (mm)	Filters Q.ty	Flow (m ³ /h)			Filters arrangement
			V = 0,24 m/s	V = 0,30 m/s	V = 0,38 m/s	
2049x2059x370	610x610	8	2600	3200	4000	
2059x2659x370	915x610 610x610	6 2	3500	4400	5500	
2669x2684x450	914x610	10	4800	6000	7600	
3339x3267x450	1219x610 610x610	10 4	7000	9000	11200	



Type of panels	Nominal dimensions (mm)	Filter dimensions (mm)	Filters Q.ty	Flow (m ³ /h)			Filters arrangement
				V = 0,24 m/s	V = 0,30 m/s	V = 0,38 m/s	
Unidirectional flow for class ISO 5 – ISO 7 without an operating light compartment	2000x2000x400	610x914x68	6	3000	3600	4500	
	2000x2500x400	610x1219x68	6	4000	4800	6000	
	2000x3200x400	610x610x68 610x1219x68	3 6	4700	6000	7600	
	2500x2500x400	610x1219x68	8	5200	6400	8200	
	2500x3200x400	610x610x68 610x1219x68	4 8	6600	8000	10500	
	3200x3200x400	610x610x68 610x1219x68	5 10	8200	10000	12600	
Unidirectional flow for class ISO 5 – ISO 7 with an operating light compartment	2000x2000x400	610x610x68 610x914x68	2 4	2600	3200	4000	
	2000x2500x400	610x914x68 610x1219x68	2 4	3500	4400	5500	
	2000x3200x400	610x610x68 610x1219x68	2 6	4400	5600	7000	
	2500x2500x400	610x914x68	10	4800	6000	7600	
	2500x3200x400	610x914x68 610x1219x68	2 8	6200	7600	9700	
	3200x3200x400	610x1219x68	12	7800	9600	12000	