

Filtration

TAS.OP
Laminar flow system for
Operating Theatres



SagiCofim
Ecoefficiency for Indoor Air Quality



Features

Air filtration and distribution system for operating theatres, with vertical unidirectional air flow, suitable for operating rooms from ISO 5 to ISO 8 class, according to ISO 14644.

A proper return grilles positioning is recommended to obtain the highest indoor air quality level in the whole room.



Advantages

- Suitable to operating theatres for critical surgery in ISO 5 class and for light surgery in ISO 7 or ISO 8 class, according to ISO 14644
- Canopy, diffuser and supporting frame in AISI 304 stainless steel for easy cleaning and disinfection
- H14 HEPA filters manufactured, tested and packaged in controlled clean environment
- Perforated panel diffusers easily removable for quick access to the HEPA filters

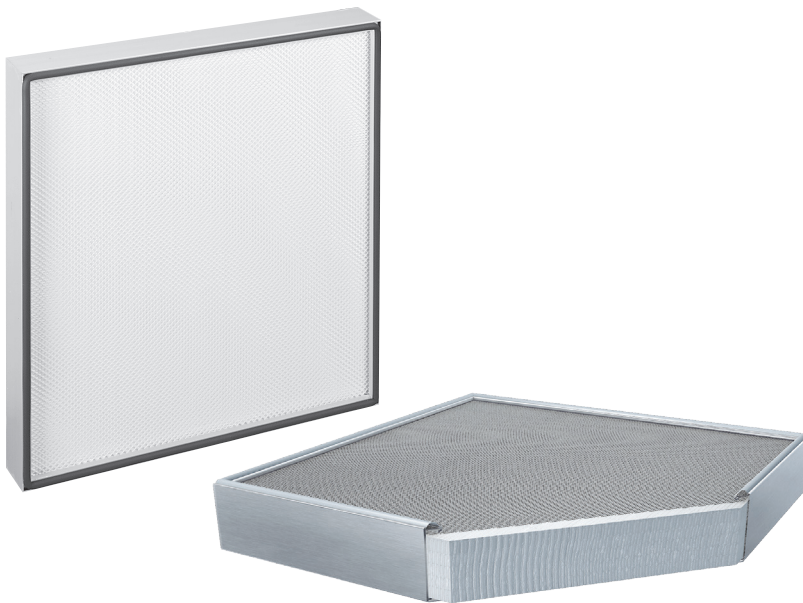
Technical data

Structure

The distribution plenum is in stainless steel AISI 304 with one or two side air inlets, whose size is designed to have a maximum air inlet velocity of 3-4 m/s for a proper air distribution inside the plenum itself. According to the ceiling size, the plenum can be supplied in one or two parts to be assembled on site.

Filters holding frame in stainless steel AISI 304 to avoid any risk of corrosion, ensuring the perfect planarity and air tightness for the whole system's life.

The perforated diffuser, also made of AISI 304 stainless steel, thanks to its properly designed perforated pattern, pushes the supply air by increasing its velocity downstream the HEPA filters, increasing the ventilation effectiveness also with low ΔT (1-2 °C).



Filtering section

HEPA absolute filters, 99.995% MPPS H 14 efficiency are used, according to UNI EN 1822.

Every single filter is manufactured with minipleat technology, aluminum frame, protection painted aluminum grids on both sides and seamless half-rounded polyurethane dry gasket for perfect air tightness.

Efficiency test is carried out on every single filter, with an optical particles counter, according to the EN 1822-4 standard. Single test report is packaged together with the filter.

Filters testing and packaging are carried out in an ISO5 controlled contamination room.

Technical data

Air flow rate vs air velocity design

TAS.OP laminar flow system suits all the most used International Standards.

In the following table the design air flow rate to achieve the minimum required air velocities according to the design Standards or Guidelines

TAS.OP								
Model	Nominal size [mm]	Design air flow rate [m ³ /h]						
		Versions with surgical light setting			Versions without surgical light setting			
		V= 0.24 m/s	V= 0.30 m/s	V= 0.38 m/s	V= 0.24 m/s	V= 0.30 m/s	V= 0.38 m/s	
14/20	1400 x 2000	1600	2000	2500	2000	2400	3000	
14/25	1400 x 2500	2200	2800	3500	2600	3200	4000	
20/20	2000 x 2000	2600	3200	4000	3000	3600	4500	
20/25	2000 x 2500	3500	4400	5500	4000	4800	6000	
20/32	2000 x 3200	4400	5600	7000	4700	6000	7600	
25/25	2500 x 2500	4800	6000	7600	5200	6400	8200	
25/32	2500 x 3200	6200	7600	9700	6600	8000	10200	
32/32	3200 x 3200	7800	9600	12000	8200	10000	12600	

Testing and validation

Two dedicated ports are factory mounted to make all the testing and validation procedures as easy as possible.

- **HEPA filters pressure drop:** a good filtration directly into the AHUs (typically G4 + F9 + H13) is required to make terminal HEPA filters' life as long as possible. The H14 filters in the TAS.OP should be replaced when their total pressure drop is 250-300 Pa, according to the available static pressure from the fans. By plugging a manometer to the port mounted by one side of the plenum, it is easy to check directly from the room the HEPA filters pressure drop.
- **Leakage test:** to verify the proper installation of the systems, a leakage test "at rest" should be carried out, to check any potential air leakage due to a wrong installation or to filters damaged during the installation. For this purpose, a so called "DOP port" is factory mounted by one side of the plenum, with easy access from the room.
- **Room validation:** after the leakage test and after a deep cleaning of the room, it is possible to validate the operating room according to the required ISO class (usually ISO5 for critical surgery and ISO7 or 8 for light surgery).

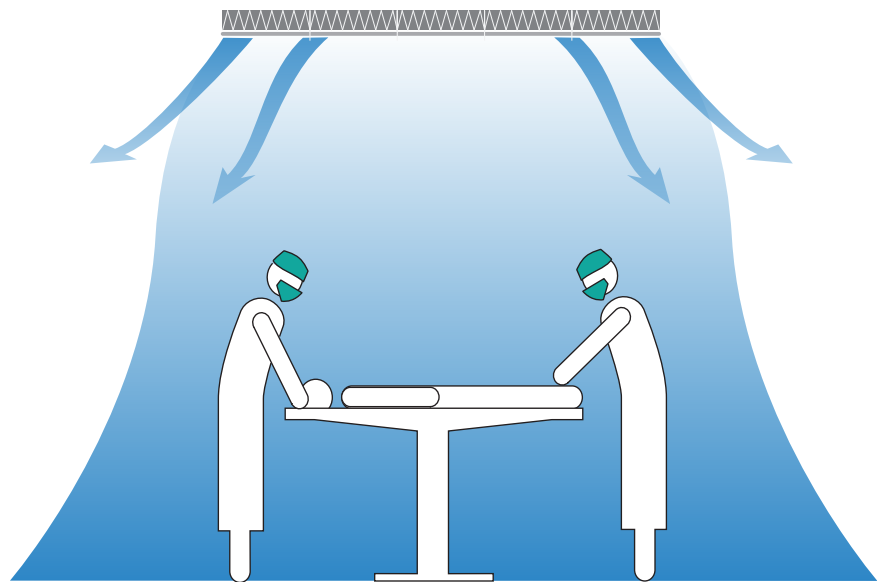
Technical data

Air exhausting and ventilation effectiveness

It is recommended to exhaust 65-70% of the total air flow from the floor level and, the balance, from the highest part of the walls, by installing four grilles in the lower part and four smaller grilles on the upper part of the walls.

By following this rule, the overall ventilation effectiveness would be improved, helping the supply air flowing from the ceiling to the exhaust grilles to keep a stable and uniform direction, from the surgical table to the walls, protecting the patient and effectively exhausting all the kind of contaminants: heavy particles bigger than $5\mu\text{m}$, very small and light particles $0.5\mu\text{m}$ size and smaller, gases, skin flakes, etc.

We recommend our exhaust grilles for clean environments mod. DEC-S. Made of AISI 304 stainless steel, thanks to their design, they can be installed flush to the walls to make the cleaning operations very easy. These grilles can be supplied with a G4 for filter, an F9 filter or with both G4 + F9.



Technical advice

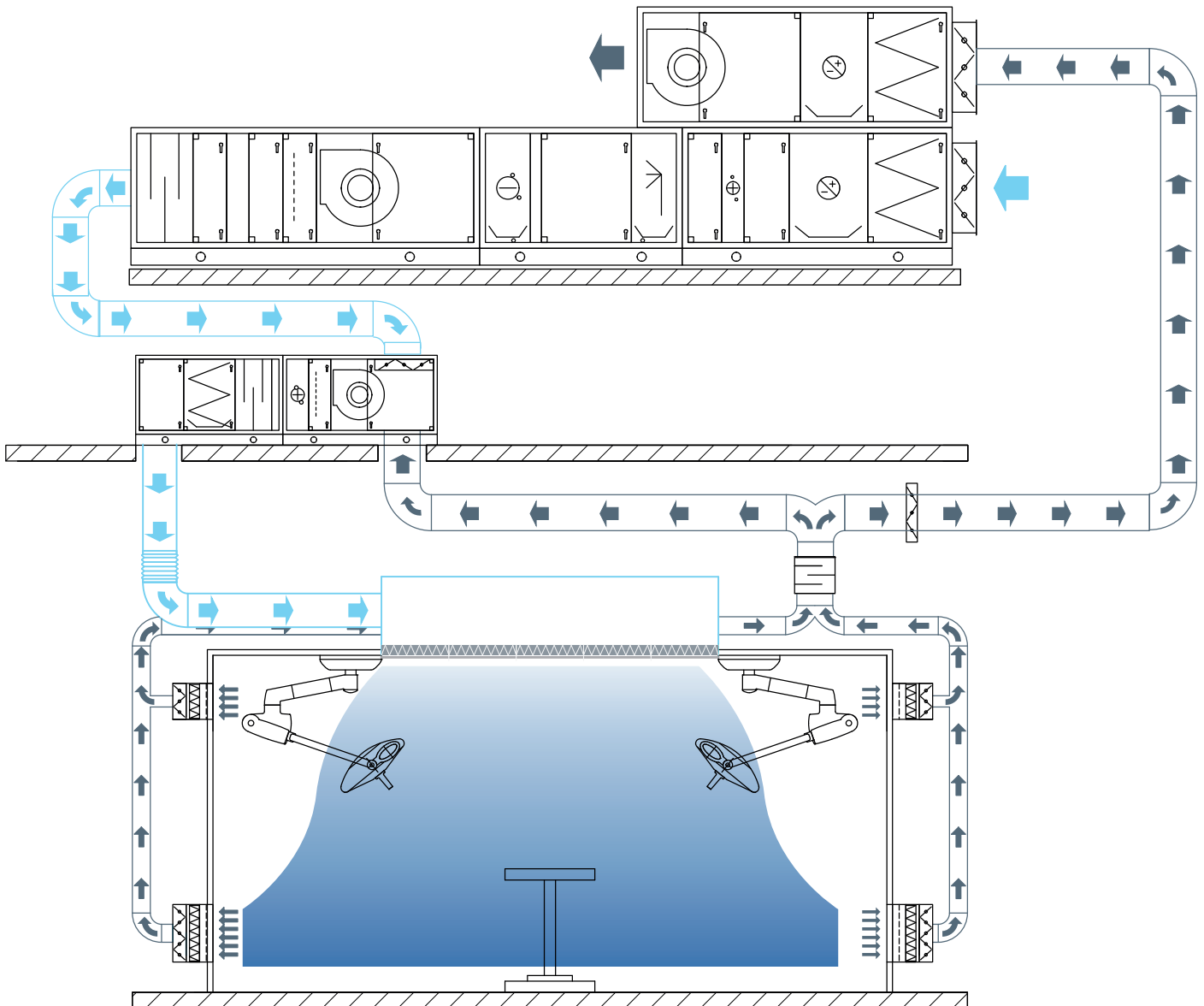
Recirculation

To reach and maintain the proper cleanliness class (typically ISO 5 according to ISO 14644) and to keep the CFUs concentration below the requested level (typically 5-10 CFU/m³) in operational, a big amount of air is needed.

To achieve the proper air quality inside the operating theatres and, at the same time, to reduce the energy consumption for cooling/heating the total air volume, the most used solution is to have a minimum amount of fresh air and then a dedicated recirculation system for every single surgery room.

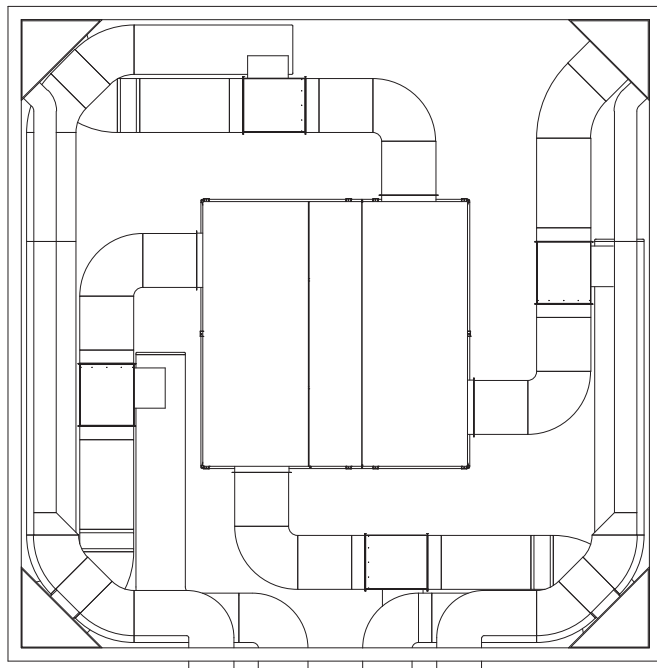
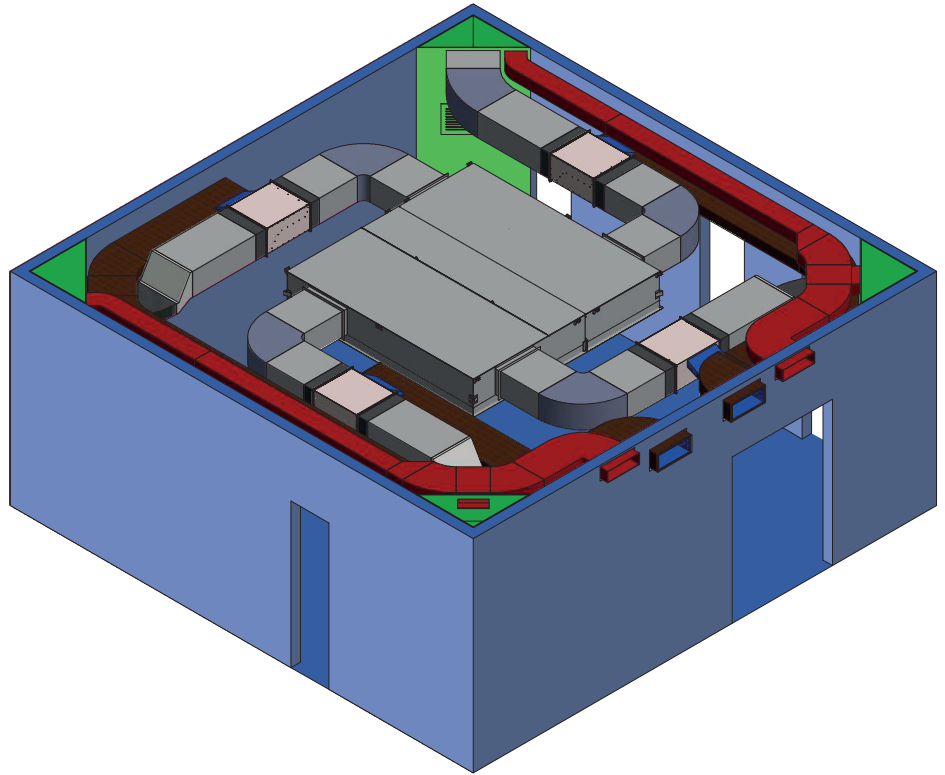
The air recirculation can be designed in two different ways:

1. One or more makeup air AHUs, supplying the needed fresh air volume and a much smaller unit dedicated to one room only, supplying both air recirculation and the relevant amount of fresh air coming from the AHU.



Technical advice

2. One or more makeup air AHUs to supply the total needed amount of fresh air to all the operating rooms and a “built-in” recirculation system above the false ceiling and directly connected to the filtering ceiling plenum.



TAS.OP

Tender text TAS-OP

Plenum-type laminar flow-style diffuser for clean air supply in operating rooms.

The air, duly filtered through H14 HEPA filters, will play a major role in:

- Airborne contamination dilution
- Moving contaminants from cleaner to less clean areas, reducing the risk of contamination over the surgical table
- Temperature and humidity control
- Dilution and removal of waste anesthetic gases

The structure is totally made of AISI 304 stainless steel, for easy cleaning and corrosion-free long operating life

The HEPA filters are H14 class according to EN 1822 Standard, with a minimum efficiency 99.995% MPPS; each filter is manufactured, tested and packaged in a controlled clean environment.

The filtering media is protected by a double protective grid, upstream and downstream, made of epoxy painted aluminum.

To avoid air leakage, a half-round seamless polyurethane dry gasket is factory applied along the aluminum frame of the filters.

Each filter is supplied with its own test report in a sealed plastic bag, to protect it from contamination.

The system is suitable to operating rooms ISO 5 class and lower (ISO 7 and ISO 8).

The air diffusers consist of stainless steel AISI 304 perforated panels, for a uniform, vertical and unidirectional air flow.

They are easily removable for easy and quick access to the HEPA filters for their testing or replacement.

Flush to the structure and without any sharp profile or corner, they can be deeply, easily and safely cleaned.

HEPA filters pressure drop and DOP test are easily carried out by the room side, by means of the two dedicated ports factory mounted by two opposite sides of the plenum.

Options:

- HEPA filters with reverse liquid seal technology and gel gasket
- Patented fabric laminator downstream the HEPA filters, for air velocity laminarity within +/- 3%. This solution can be used instead of the standard perforated diffusers.

SagiCofim spa

Comfort Filtration Engineering

via Firenze 1
20063 Cernusco sul Naviglio
Milan Italy
tel +39 02 929021
fax +39 02 92902300
info@sagicofim.com
www.sagicofim.com



Sagicofim S.p.A. reserves the right to change or modify product features and specifications at any moment, without prior notice.