

# LAMINAR FLOW



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## UNI-FLOW INTEGRATED AIR & LIGHT CEILING

Bacteria cause infection within operating theatres.

In tests carried out by the UK Department of Health "Vertical Laminar Flow Ventilation" was found to reduce the amount of bacteria present in a typical operating theatre by a factor of up to 15,000".

The UniFlow Integrated Air and Lighting operating theatre ceilings are designed to meet the varying demands of modern surgical techniques.

Modular Integration of the filtration, air diffusion, lighting and plenum chamber solves the problems of coordination encountered during construction.

Individually tailored to suit the customer's requirements, Schön offers a selection of ceilings to suit all surgical applications.

Supplied with optional Air-conditioning and control systems, or as part of an existing mechanical services system, the Schön range of specialist ceiling reduce the risk of post-operative infection, while providing optimum comfort through the use of conditioned, filtered clean air.

The range of ventilated ceiling has been specifically designed for the application and is ideally suited for today's surgical techniques.

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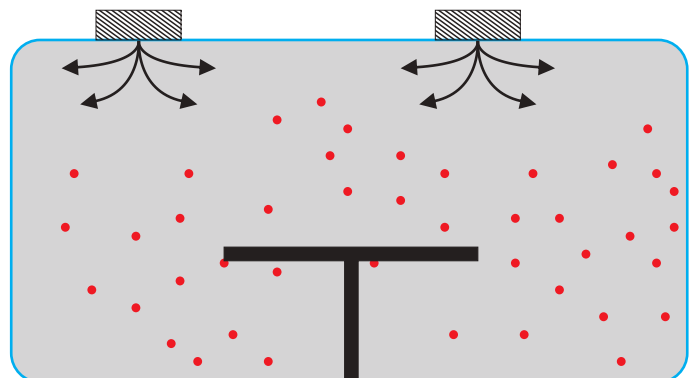
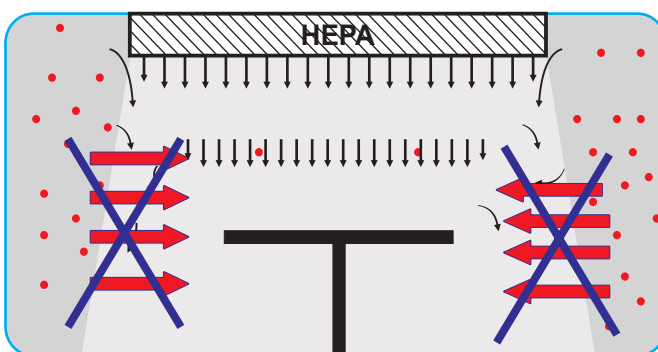
Simultaneously solving the problems of coordination, which may be encountered during the construction or refurbishment of the modern operating theatre departments.



The ceiling is available in a range of sizes, the standard being 260 Meters x 2.40 Meters completely integrated within the adjacent false ceiling.

The ceilings consist of a plenum box supplied with conditioned air from the central system via "S" class HEPA filters mounted on the inlet to the supply ceiling. The ceiling can include optional integral lighting, and composite air/light diffusers.

## Air Pollution Elements



All ceiling incorporate supports to secure them to the main structural frame of the modular operating theatre, or structural ceiling slab.

The air\light diffusers consist of a monofilament precision woven polyester bonded to aluminum frames. The screens have uniform porosity, with an open area of sufficient resistance to create laminar airflow from the diffuser face.

Diffusing air into the theatres, uniformly over the total are, the mgi range of ventilated ceiling, provide the sterility and cleanliness required in today's operating theatre environment. Optional integral lighting provides illumination across their total area.

Like this way it is also providing such problems which can hinder the integrity up from building of the stages of the modern operation theatre time till to using of this building.

With its illumination and diffuser variants, designed system can meet all of the requirements from the OP Room Staff and it can offer the customers variants of selections. Laminar Air Flooded OP Room Ceiling are produces in the standard sizes like 2,6 m x 2,4 m but it can also be produced variable to the customers requirement In bigger or smaller sizes in the condition that the functions will be the same.

The produced Laminar Flow OP Room Celling are In exact conformity with the existent suspended ceiling.

System Design below parameters must be controlled.

- 1-Temperature
- 2- Humidity
- 3- Clean Air
- 4- Particle and Micro Organism number
- 5- Atmosphere Air Pressure
- 6- Air Condition

Regarding the Operation Type the Temperature of the OP Room can be wished low or high. The temperature of the OP Room must be as below;

- DIN 1946/4,1989 22-26 C°. %30 - %65
- DIN 1946/4.1999 22-26 C°. %30-%65
- DIN 1946/4,2005 figure 19-26 C° can be arranged.

## IMPORTANT PROPERTIES OF THE OP ROOM HUMIDITY

Humidity in the OP Room must be adjustable in accommodation conditions and if it is wished.

## IMPORTANT FROM THE CLEAN AIR IN THE OP ROOM

The filtered air given to the OP Room must increase the quality of the OP Room air.

Minimum clean airflow must be as below;

- DIN 1946/4,1989 1200 m<sup>3</sup>/h
- DIN 1946/4,1999 1200 m<sup>3</sup>/h
- DIN 1946/4,2005 figure 1200 m<sup>3</sup>/h

# LAMINAR FLOW

Operation Room Feeding Air flow DIN 1946/4, 1989, 1999

- depends on Temperature decrease or increase
- mustn't be under the 2400 m<sup>3</sup>/h
- for the 1.A OP Room Theatres under the name Laminar Flow, must be the air flow 2400 m<sup>3</sup>/h and the pollution factor 0,67.

The OP Room Theatre air feeding rate 2005 figure, must be for OP Rooms Operation table, instruments and operation materials must be lower than linear flow.

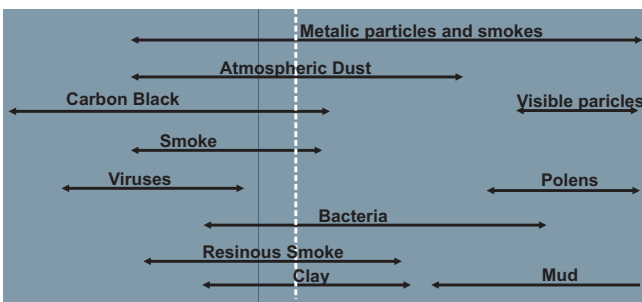
This is approximately equivalent to 3x3 m<sup>2</sup>, and it is changing to OP types.

Linear air flow capacity must be higher than 0,23 m /sec.

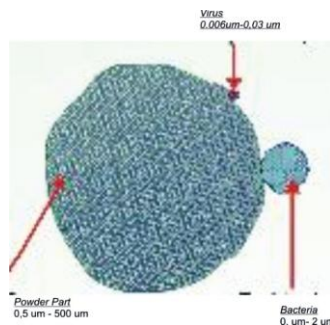
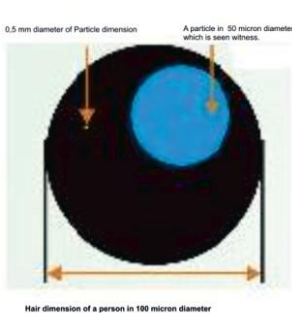
## MODEL CONFIGIRATIONS

MODEL	DIMENSION (WXL) (mm x mm)	MINIMUM REQUIRED HEADROOM (mm)	FLOW CAPACITY (m <sup>3</sup> /h)	SPEED RANGE (m/sn)	HEPA FILTER QUANTITY	INITIAL PRESSURE DROP (Pa)
SM-LF 120x120	1200 x 1200	400	1200-2000	0,15-0,25	2	300
SM-LF 120x240	1200 x 2400	400	1200-2000	0,15-0,25	2	300
SM-LF 140x240	1400 x 2400	400	1200-2000	0,15-0,25	2	300
SM-LF 160x240	1600 x 2400	400	2200-3000	0,15-0,25	4	300
SM-LF 160x300	1600 x 3000	400	2500-3400	0,15-0,25	4	300
SM-LF 180x240	1800 x 2400	400	2800-3800	0,15-0,25	4	300
SM-LF 240x260	2400 x 2600	400	2800-3800	0,15-0,25	4	300

## Particle and Micro-Organism



Class	Diameter of particle				Particle Count
	0.1 Mikron	0.3 Mikron	0.5 Mikron	5 Mikron	
1	1,240	265	35	-	
10	12,400	2,650	353	-	
100	-	26,500	3,530	-	
1,000	-	-	35,300	247	
10,000	-	-	353,000	2,470	
100,000	-	-	3,530,000	24,700	

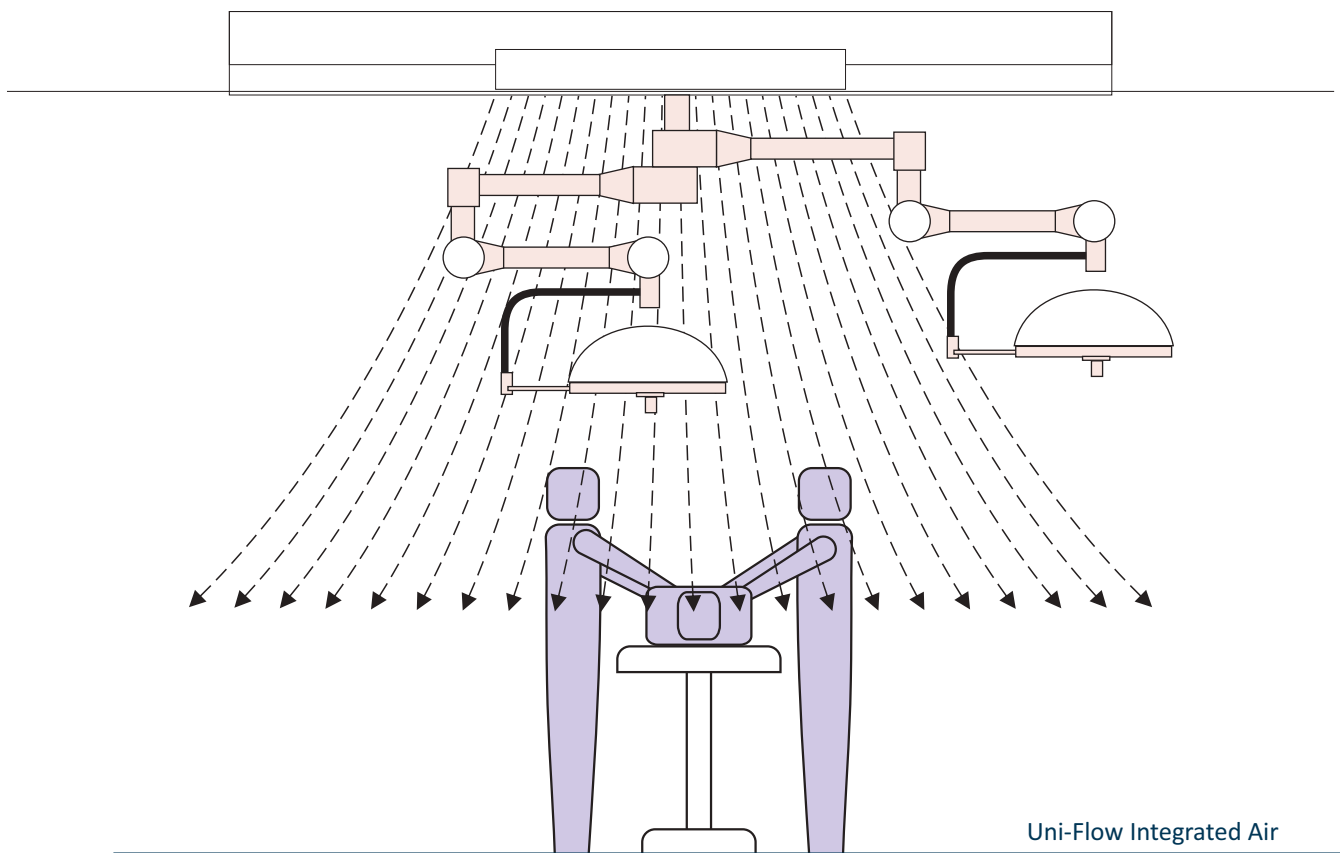


MOVEMENT TYPE		Expansive Particle Quantity
	Immoveable Halt	100.000 ea./min.
	Feed, Head or Neck movement	500.000 ea./min.
	Sit down and stand up	2.500.000 ea./min.
	Run	10.000.000 ea./min.

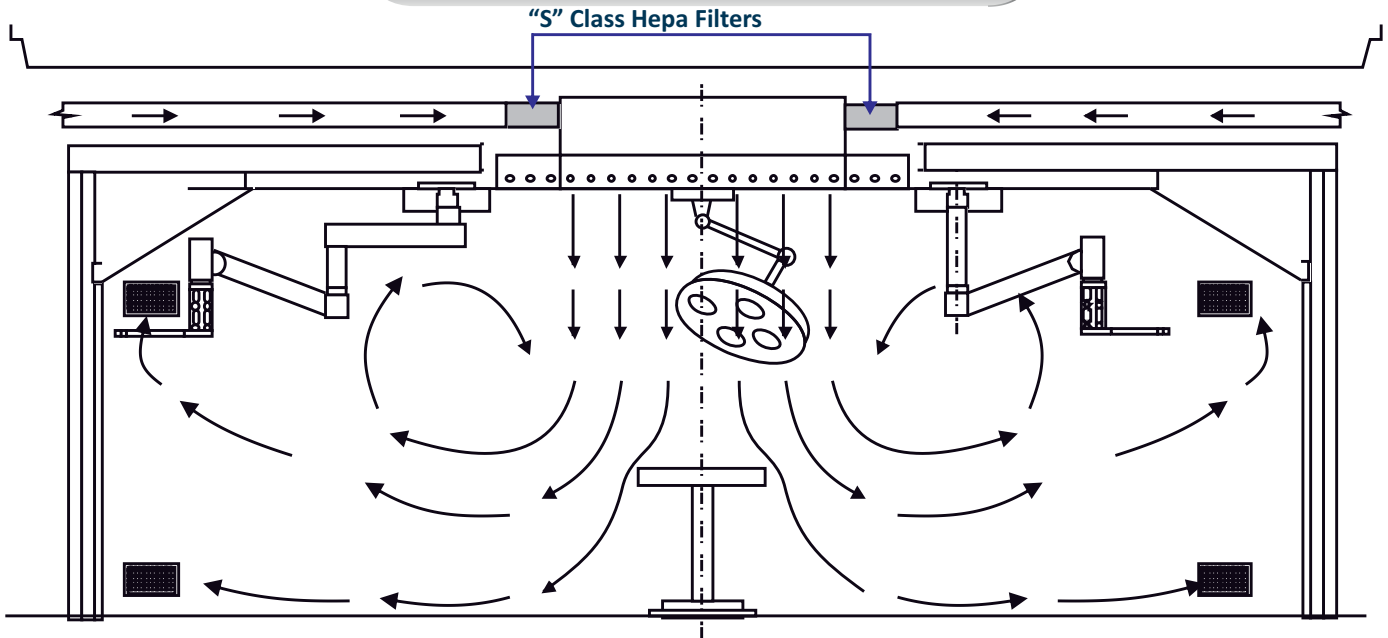
# LAMINAR FLOW

## SPECIFICATION

- The ceilings consist of a plenum box supplied with conditioned air from the central system via “S” class HEPA filters mounted on the inlet to the supply ceiling.
- The ceiling can include optional integral lighting and composite air/light diffusers.
- All HEPA filters and housings are factory tested and certified.
- All ceilings incorporate supports to secure them to the main structural frame of the modular operating theatre, or structural ceiling slab.
- The air / light diffusers consist of a monofilament precision woven polyester bonded to aluminum frames.
- The screens have uniform porosity, with an open area of sufficient resistance to create laminar airflow from the diffuser face.
- Uniformly diffusing air into the theatres, over the total area, through the mgi range of ventilated ceilings provide the sterility and cleanliness required in today’s operating theatre environment.
- Optional integral lighting provides illumination across their total area.
- Lighting is generated from high frequency electronic ballasts; complete with color corrected fluorescent tubes ensuring a comfortable, shadowless working environment.



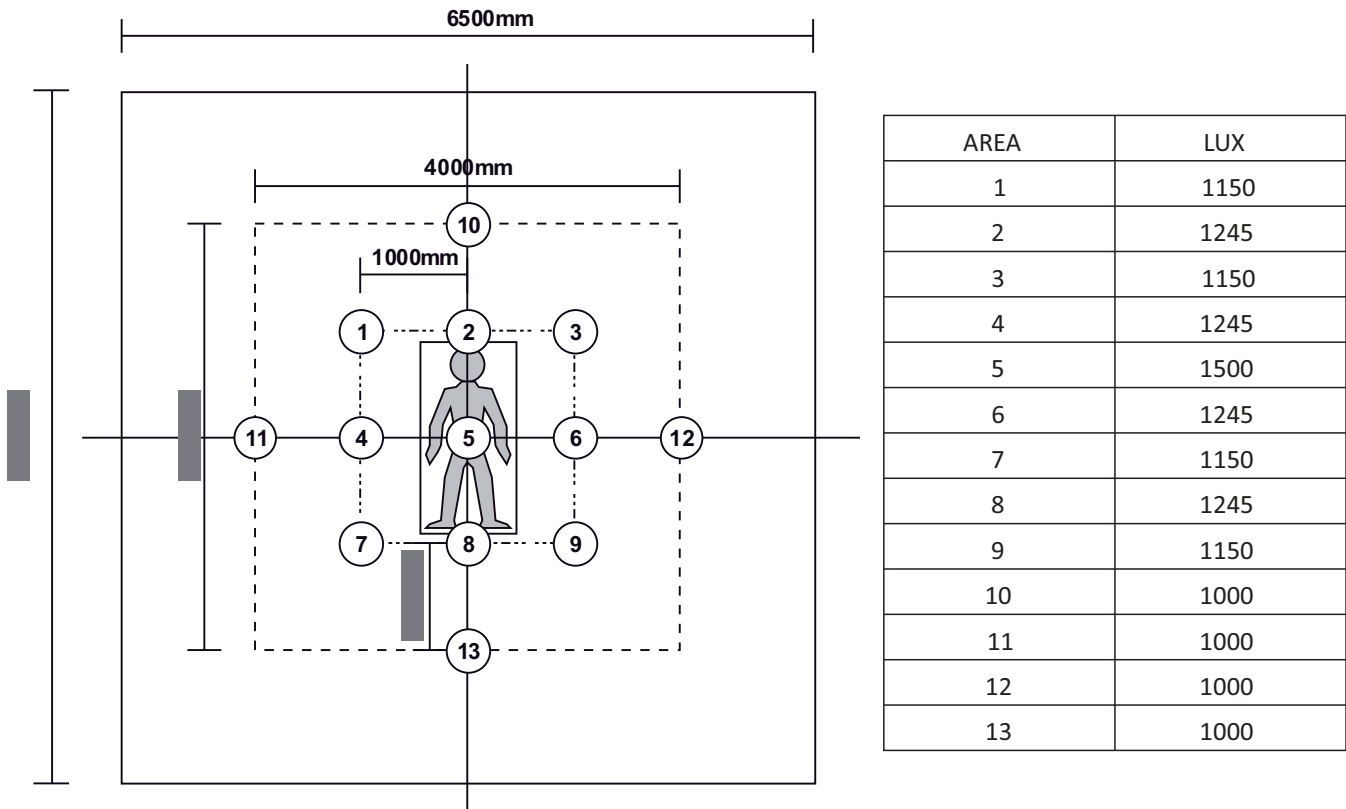
# LAMINAR FLOW



## CHARACTERISTICS AND ADVANTAGES

- Air conditioner which is passed through the “S” class HEPA filters.
- Operator lamp which integrated to the system and eliminates the coordination and service problems.
- Uniform backspace lighting between 150-1500 lux smooth adjustable lighting level.
- Arbitrarily area lighting
- Produced complying with DIN 4799 and DIN 1946 and tested in one meter cubic less then 10 bacterial carrier particle.
- Expert SCHÖNN design, production, assembly and International service assurance.

## THE DIMENSIONS OF A STANDARD OPERATION ROOM THEATRE’S LAMINAR FLOWW CEILING LUX (LIGHTING )



# LAMINAR FLOW

## PLAN AIR LAMINAR AIR FLOW CEILING

### THE IMPORTANCE OF THE OPERATING ROOM TEMPERATURE

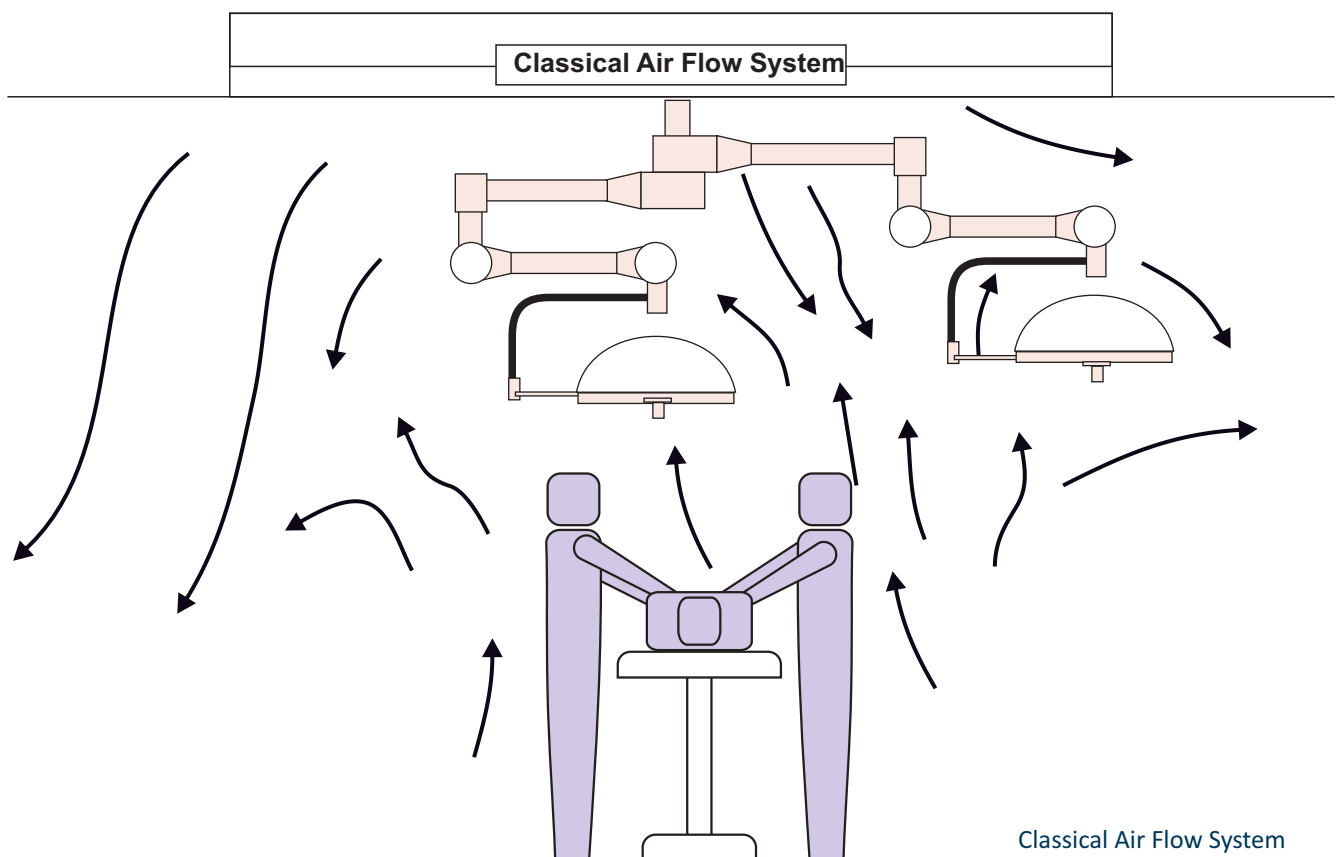
In some operations, the body temperature of the patient during the operation is very important.

Depending on the type of Operation Type the Temperature of the OP Room can be adjusted. The temperature of the OP Room must be as below;

- DIN 1946\4,1989 22-26 C°, %30-%65
- DIN 1946\4,1999 22-26 C°, %30-%65
- DIN 1946\4, 2005figure 19-26C°° can be arranged.

### THE IMPORTANCE OF THE OPERATING ROOM HUMIDITY

Humidity in the OP Room must be adjustable to suit the working conditions.



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# LAMINAR FLOW



## LAMINAR FLOW TECHNICAL SPECIFICATION

<b>Working Surface</b>	Aluminium / Stainless Steel
<b>Chassis</b>	18 G Stainless Steel
<b>Dimensions</b>	2400 x 2600 mm (Height : 45-50mm)
<b>Controlled parameters</b>	Temperature, Humidity, Clean Air, Particle and Micro Organism number, Atmosphere Air Pressure, Air Condition
<b>Background Lighting</b>	150-1500 lux smooth adjustable lighting level
<b>Lighting</b>	60-120 cm LED light tubes -32 pieces
<b>Filter Class according to DIN 24184</b>	Type S (EU 13)
<b>Dimension of Hepafilter</b>	610mm x 610 mm
<b>Activity NaCl to Test</b>	%99,997
<b>Pressure Drop at nominal flow start</b>	25 Pascal
<b>Maximum Flow</b>	4x1200 m <sup>3</sup> / h
<b>Absolute pressure</b>	600 Pascal
<b>Tightness gasket</b>	Variable
<b>Standarts</b>	DIN-4799, DIN -1946