

CLEAN ROOMS

» SPOTLESS TURN-KEY SOLUTIONS IN HEALTHCARE





CLEAN ROOMS

FläktGroup Clean Room technologies offer flawless quality and meet strictest hygienic requirements: for system components, room air handling, and air filters.

Energy-efficient packages for strictest hygienic requirements in hospitals

FläktGroup

As an internationally active technology group, FläktGroup concentrates on process technology and components for demanding production processes in a wide variety of end user markets. Clean Rooms are impressive proof of this quality and innovative strength.

Clean Rooms

Clean rooms and ultra-clean rooms represent some of the most complex challenges for air treatment. They demand absolutely top standards of competence, sophisticated air treatment, as well as specific experience for clean rooms that you can trust. Clean Rooms satisfy all international clean room standards and ISO classifications. They far exceed conventional quality levels. Clean rooms must conform to a specified, monitored level of contamination that is specified by a number of particles per cubic meter with a specified particle size. For example, an operating room requires a minimum of ISO Class 7, which allows 352,000 particles per cubic meter in the size range from 0.5 µm to 5.0 µm. An ultra-aseptic operating room can require ISO Class 5, which allows 3,520 particles in this particle size range. In comparison, the ambient air outside in a typical urban environment contains 35 million such particles.

Covering the entire process for turnkey solutions

FläktGroup customers profit from our comprehensive overall expertise in room air handling and filter technology. In contrast to other providers, we cover the entire process of air treatment and air filtration for supply air and extract air systems. We understand the interrelationships and manage them down to the smallest detail. As a result, we can offer highly effective, process-dedicated package solutions with energy-efficient technology – optimized for your sector and applications. Efficient Heat Recovery Systems and reliable Air Filtration Systems with low pressure drop assure considerable energy savings. We deliver turnkey solutions on a one-stop shopping basis: beginning with building elements such as ceiling grid modules, filter and panel ceilings, laminar flow ceilings, room walls, wall paneling, windows, and doors – including development and installation of your clean room facilities and extending to after sales service.



One-stop solutions:

- Room air handling
- Air filtration
- Cleanroom design software
- Ceiling, including lighting
- Partition-wall panels
- INWALL Click® covering panels
- Windows and doors
- Monitoring and documentation systems
- After sales service



Clean Room system solutions **Maximum benefits with manageable investment**

Applications:

- Operating rooms
- Intensive care units
- Pharmacies
- Radiography, CT, MR
- Laboratories

FläktGroup manufactures and delivers a comprehensive system of built-in clean rooms, which enables a decrease in the number of undesirable airborne particles to a level suitable for healthcare complying with the requirements of standard EN ISO 14644. The FläktGroup portfolio includes wall panels, wall lining, doors, pass-through boxes, ceilings, laminar fields, ceiling air outlets, light fixtures, as well as air handling and HVAC components. FläktGroup Clean Rooms allow easy integration of display and diagnostics systems into the internal wall cladding of operating rooms. The whole product range conforms to strict requirements for working areas prescribed by health care systems: e.g., specifications relating to cleanliness, air exchange, even air flow, and lighting.



- Highly sensitive controls, 24/7 service
- Optimized life-cycle costs
- Safe and hygienic environment
- Tailor-made solutions from a single source
- Easy maintenance and flawless sanitation
- Controlled airflow

Clean rooms:

- Minimal release of particles from surfaces
- Rounded inner corners and radius connection of the wall partition to the floor and ceiling
- Room tightness that guarantees the required positive and negative pressures in a room
- Easy maintenance, effective sanitation and resistance to disinfectants
- Health safety
- Engineering design and manufacturing from a single source





- Both FS 209E and ISO 14644-1 assume log-log relationships between particle size and particle concentration.
- US FED STD 209E was officially cancelled by the General Services Administration of the US Department of Commerce in 2001, but is still widely used.
- Other standards are VDI2083 in Germany, BS 5295 (1989) in Great Britain, and GMP EU classification stipulations for the EU.

Packages according to all standards

FläktGroup Clean Rooms are designed according to international standards, and their individual components satisfy ErP and EUROVENT guidelines. FläktGroup offers the complete range of components and services needed for a medical cleanroom. The one-stop FläktGroup solution includes planning, engineering design, production, assembly, commissioning, validation, and after sales service.

FläktGroup Clean Rooms ensure maintaining the required positive or negative pressure in a room. Rounded inner corners and connections of wall partitions to the floor and ceiling, smooth surfaces, and dismountable parts enable easy maintenance of Fläkt Group Clean Rooms. Maintaining flawless sanitation is without difficulty. Clean rooms assure particulate-free air through operation of either high efficiency particulate air filters (HEPA) or ultra-low penetration air filters (ULPA), which implement laminar or turbulent air flow principles. FläktGroup Air Handling Units and filters feature low pressure drop. Electronically commutated (EC) motors and LEDs ensure energy savings and economic efficiency. Modular systems offer tailor-made solutions and manageable investments at the same time. Comprehensive service includes project implementation, assembly, and systems validation, all provided as standard.



Technical Data

Cleanliness classes according to relevant standards

US standards: Federal Standard 209E	100,000	10,000	1,000	100	10	1
German standard: DIN EN ISO 14644-1	8	7	6	5	4	3
British standard: BS 5295 (1989)	K	J	H-G	F-E	D	C
French standard: NF S 90-351	Zone 2	Zone 3		Zone 4		
EC Guide (for pharmaceuticals)	D	C	B-A	B-A	A	A
Cleanliness class according to EN ISO 14644	ISO Class 8	ISO Class 7	ISO Class 6	ISO Class 5	ISO Class 4	ISO Class 3

Healthcare systems	●	●	●	●		
Pharmaceuticals	●	●	●	●	●	
Research	●	●	●	●	●	●
Ultra-aseptic operating rooms			●	●		
Ancillary areas of an ultra-aseptic operating room		●				
Aseptic and septic operating rooms		●				
Ancillary areas of aseptic and septic operating rooms	●					
Treatment rooms	●					
Intensive care unit – burns and transplantations			●	●		
Intensive care unit – postoperative	●					
Departments of anesthesiology, resuscitation and intensive care		●				
Pharmacy – cytostatics production		●				

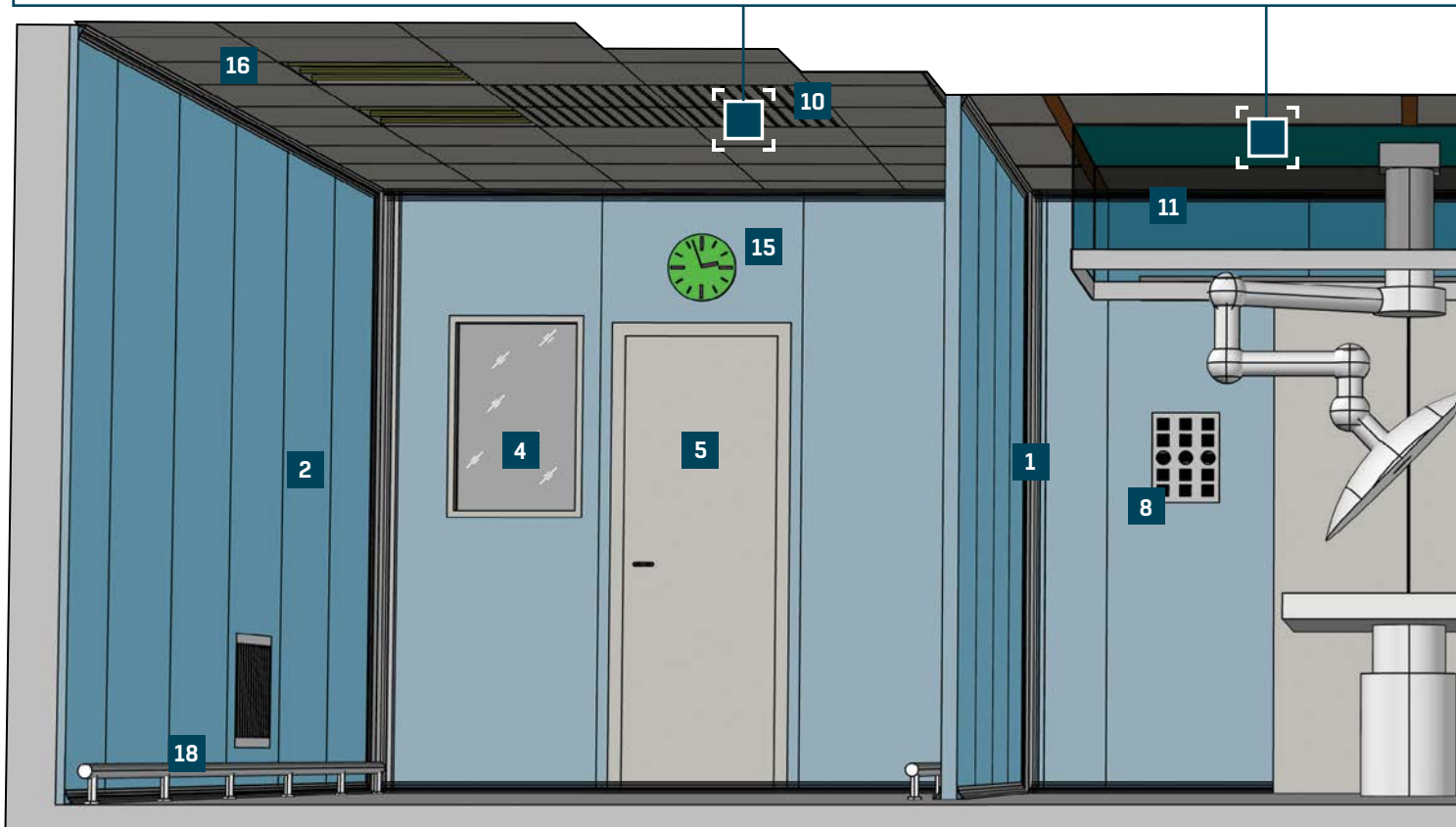
Fresh Heaven MAXX O laminar field	●	●	●	●	●	●
Fresh Heaven laminar field	●					
Fan filter unit Fresh Breeze	●	●	●	●	●	●
CGx ceiling air outlet (w/ H13 Filter)	●	●	●	●		
INWALL SYSTEMS® wall lining	●	●	●	●		
Wall partitions	●	●	●	●	●	●
Windows	●	●	●	●	●	●
Doors	●	●	●	●	●	●
Light ceiling	●	●	●	●		
Coffered and panel ceilings	●	●	●	●	●	●



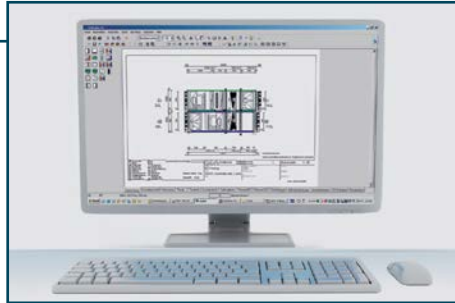
HVAC units



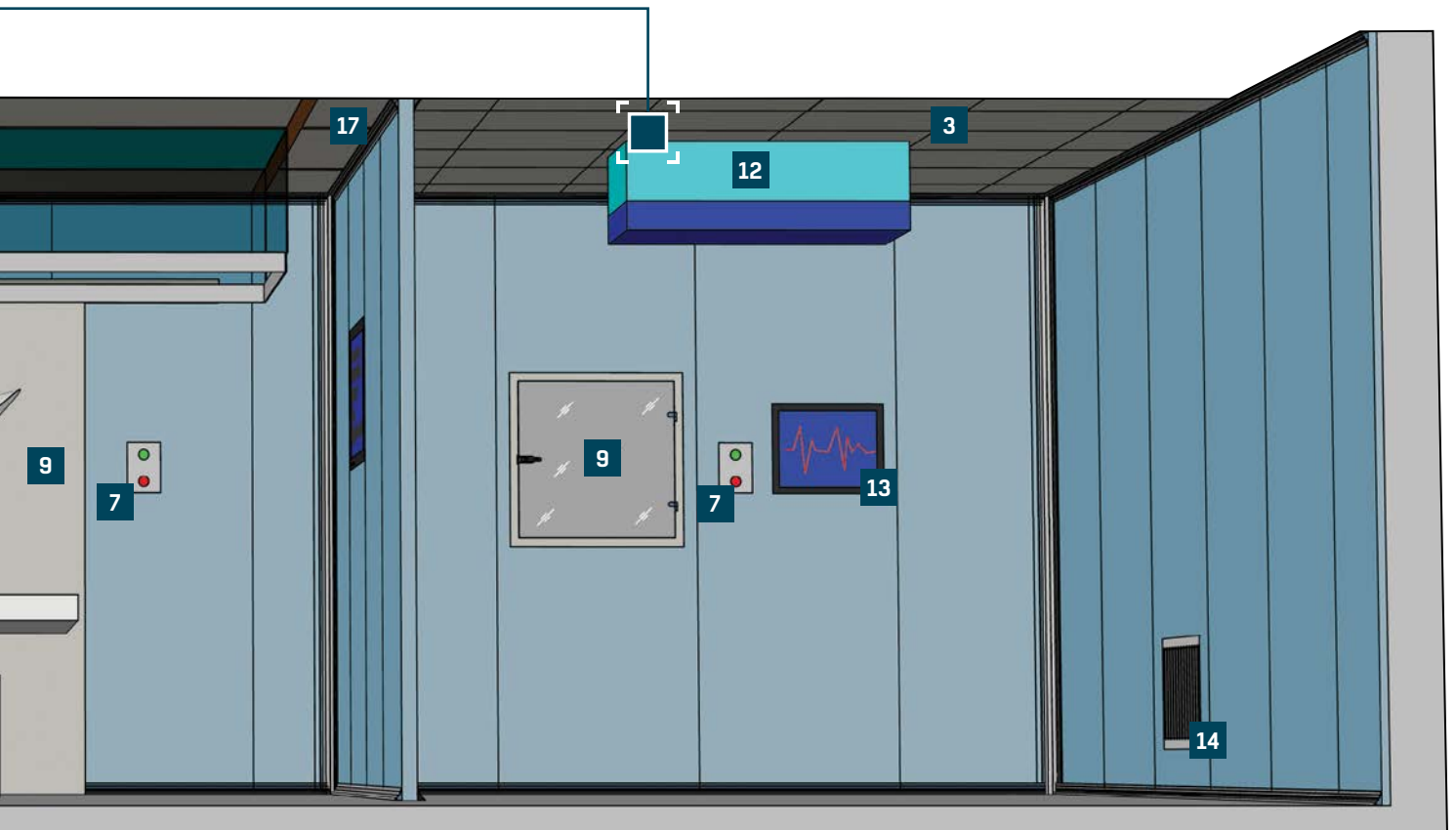
Chillers



- | | | |
|--------------------------------------|---|-------------------------------------|
| 1 Wall panels | 7 Signalization of door opening | 13 Built-in diagnostics |
| 2 INWALL SYSTEMS® wall lining | 8 Multifunction panels | 14 Ventilation grid |
| 3 Light Ceiling | 9 Pass-through boxes | 15 Built-in clock |
| 4 Windows | 10 CGx ceiling air outlet | 16 Light fixture |
| 5 Doors | 11 Fresh Heaven or Fresh Heaven MAXX 0 – laminar field | 17 Coffered ceiling |
| 6 Sliding doors | 12 Fresh Breeze – filtration and ventilation unit | 18 Protection against impact |



HVAC control site



Highlights from the **Clean Rooms product range**



Laminar Flow Field **Fresh Heaven and** **Fresh Heaven MAXX O**

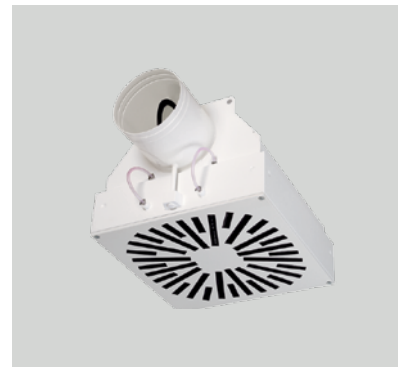
Fresh Heaven is a large area air supply unit. It appears in enamel paint or stainless steel casing, in riveted finish. The unit inlets are prepared for HEPA filters. The construction allows a wide range of dimensions and features optional light fixtures. This air supply unit facilitates semi-turbulent airflow.

Even lower initial pressure loss and integrated linear LED lamps provide highenergy efficiency of the Fresh Heaven MAXX O high-end unit. The stainless steel structure facilitates laminar airflow and is equipped with fullarea HEPA filters and fluid gaskets. Laminarisators improve uniform airflow further. Fresh Heaven MAXX O has dimensions of 3,125 x 3,125 mm and features a central passage for the operating room lamp.



Fan-Filter Unit **Fresh Breeze**

The Fresh Breeze fan filter system is a circulation sub-ceiling unit with dimensions of 600 x 1,200 mm or 1,200 x 1,200 mm. It is designed to locally supply filtered and cooled air in a clean room with requirement for laminar flow. The unit conditions the air which it intakes from the clean room, and it can be connected to a supply of air from an airconditioning unit.



Air diffusor **Ceiling air outlet (CGx)**

Air Filtration Systems reliably filter suspended solid particles, flue gas, sooty particles, bacteria, viruses, and spores from room air. Filter media for clean rooms (HEPA, ULPA) are available. Germ nests and dirt accumulation are basically prevented by filter design. An integrated damper ensures contamination-free filter exchange.



Walls Paneling (INWALL SYSTEM®) Ceilings

The sandwich wall construction is available with various fillings: e.g., mineral wool or polystyrene. All connections are prefabricated, and the panels can include ducts for wiring. The panel surface appears in either stainless steel or RAL colors. Higher fire-resistance and X-ray protection is optional.

The panels are made for covering existing walls in clean room standard, realized with a drywall work. INWALL Click® covering panels consist of a maximum number of prefabricated components, available in smart design with various color shades and combinations. Joints are sealed with permanently elastic sealant.

Simple light ceilings for lower classes of clean rooms feature lightweight construction, although overpressure is possible. They are easy to install and to clean. Coffered ceilings and walkable panel ceilings are designed for the strictest clean room classes.



Windows Doors

Windows are available with single or double glazing and feature aluminum window frames. The window glass is flush with frame and surrounding panels for easy cleaning. Boxes and sliding windows are available as variants.

Clean Room doors are available with single or double leaf and come with stainless steel door fittings and aluminum door frames. Sandwich or safety glass construction is selectable. For automatic operation, sliding doors offer door drives, and hinged doors come with actuators.

They can be equipped with an automatic seal rail. All doors are available with the Interlock system to avoid air contamination. Also, X-ray protection is optional.



Service Design software

Comprehensive 24/7 FläktGroup service is offered without question.

Your medical clean room takes shape with the FläktGroup Clean Rooms Designer. This comprehensive software is an AutoCAD extension for AC 2004 and higher. It provides your planners, architects, and procurement managers with AutoCAD drawings with automatic component specifications.

EXCELLENCE IN SOLUTIONS

WWW.FLAKTGROUP.COM

VERSATILE COMPLETE SYSTEMS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

PRODUCT FUNCTIONS BY FLÄKTGROUP

Air Treatment | Air Movement | Air Diffusion | Air Distribution
Air Filtration | Air Management | Air Conditioning & Heating
Controls | Service

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