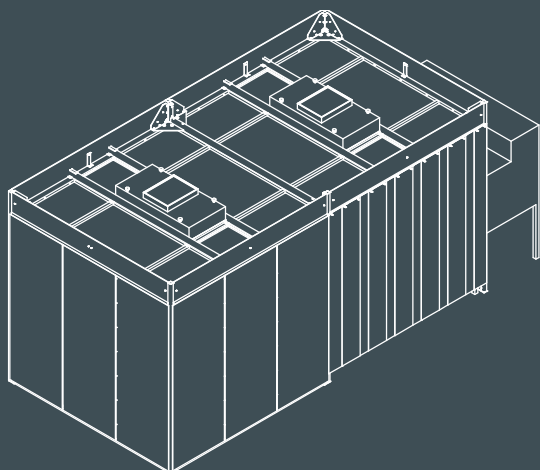




**WE BUILD  
YOUR  
EXPERTISE**



## **Modular cleanrooms**

ISO-class 4 to 9 (ISO14644-1)

Softwall, hardwall and  
hybrid combinations

PROFESSIONALS IN MODULAR CLEANROOM TECHNOLOGY



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# Modular cleanrooms

ProCleanroom provides modular cleanrooms in all sizes and designs. The cleanrooms are flexible in size and future-proof because of the many possibilities for expansion (from 1 to 300 m<sup>2</sup>), adaptation and relocation (e.g. when moving). Compared to the traditional fixed cleanrooms, our cleanrooms distinguish themselves by lower costs in purchasing, shorter delivery time and enhanced flexibility. Also, ProCleanroom guarantees the lowest power consumption and lowest operating costs in the cleanroom market.

ProCleanroom is the expert for contamination issues. Develop your expertise with a cleanroom from ProCleanroom. Your partner for the supply of clean work environment that complies with the laws and regulations in your industry. The cleanrooms (ISO Class 4 to 9) are available with various wall finishes (hardwall, softwall or hybrid variant). In addition, the possibilities in design are unlimited. **ProCleanroom: Build your expertise.**



## Applications

The cleanrooms by ProCleanroom are ideally suited for industries where product or process protection is a requirement. Think of high-tech and electronics industry, research institutes and laboratories

The cleanrooms by ProCleanroom create an ultra-clean working environment. Within this environment, critical processes (such as sampling, cleaning, packaging, etc.) can be performed in the best possible way.

**1 Fan unit**  
Unit with ebm-papst DC ECM motor. ErP2016 compliant. Energy savings of 70% compared to conventional AC motor and hence low operating costs. Heat load is nil through efficient engine technology.

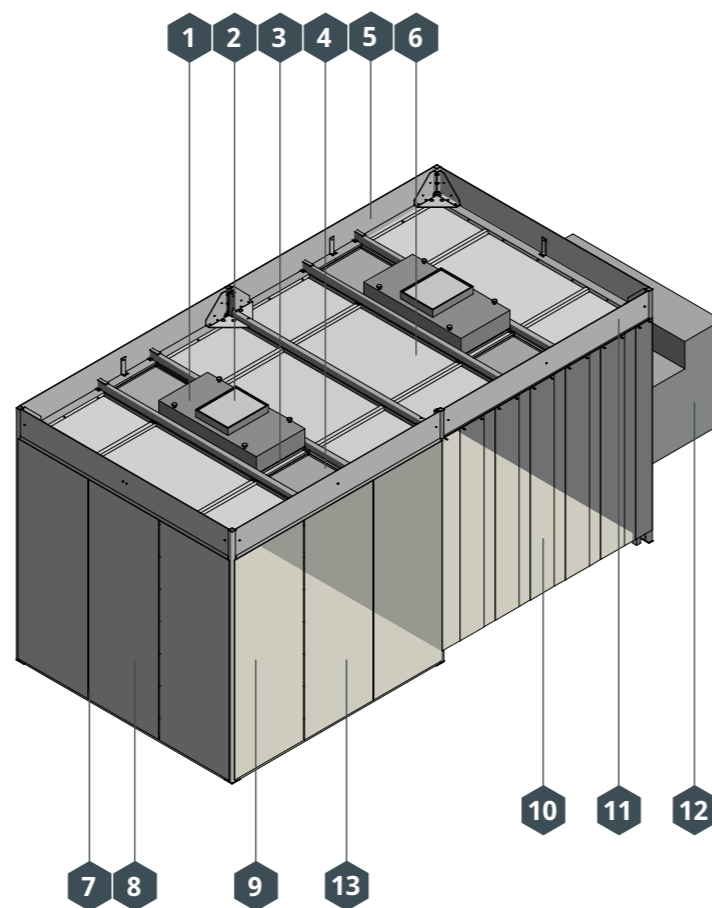
**2 Prefilter**  
Type G4 high capacity for longer life span.

**3 HEPA-filter type H14 (ISO-class 5 to 9)  
ULPA-filter type U15 (ISO-class 4 to 5)**

**4 LED lighting**  
Integrated and fully flush finish, high light levels.

**5 Fascia boarding**  
Technology neatly concealed for a sleek design of the cleanroom.

**6 Innovative cleanroom ceiling**  
Completely flush finish, aluminium composite material. Easy and quick to clean. Stays clean.



**7 Frame**  
Powder coated steel or stainless steel. Fixed on the floor, on height-adjustable feet or as a mobile version on wheels. Construction and cabling neatly concealed, which makes it easy to clean.

**8 Wall finish**  
Choice of solid wall panels, plastic strip curtain, or a combination. Transparent or opaque. Optionally supplied as ESD version or with UV filter.

**9 Cleanroom controller**  
Manual operation or fully automatic with adjustable weekly programme. Optionally with continuous control and monitoring of air velocity through flow sensor. Various audio and visual alarms are possible.

**10 Entrance**  
Various options: plastic strip curtain, swing door, sliding door, automatic rolling door or any combination.

**11 Magnehelic pressure gauge**  
Integrated in fascia boarding. Provides direct insight into the performance of cleanroom and life span of the HEPA or ULPA filter.

**12 Possibilities for integration of machine, flow cabinet or any customer set-up into the wall.**

**13 Layout and dimensions**  
Almost any size and layout is possible. A single room, a combination of spaces or a space linked to a changing room or goods area. Surfaces of: 1 to 300 m<sup>2</sup>.

### Further options:

Wall sockets for electrical equipment, network connections, active carbon filter for molecular level VOCs and odour filtration, connections for pressurised air, gas and vacuum, ion bars for neutralising electrical charge in the air (ESD), temperature control and pass-through hatches.

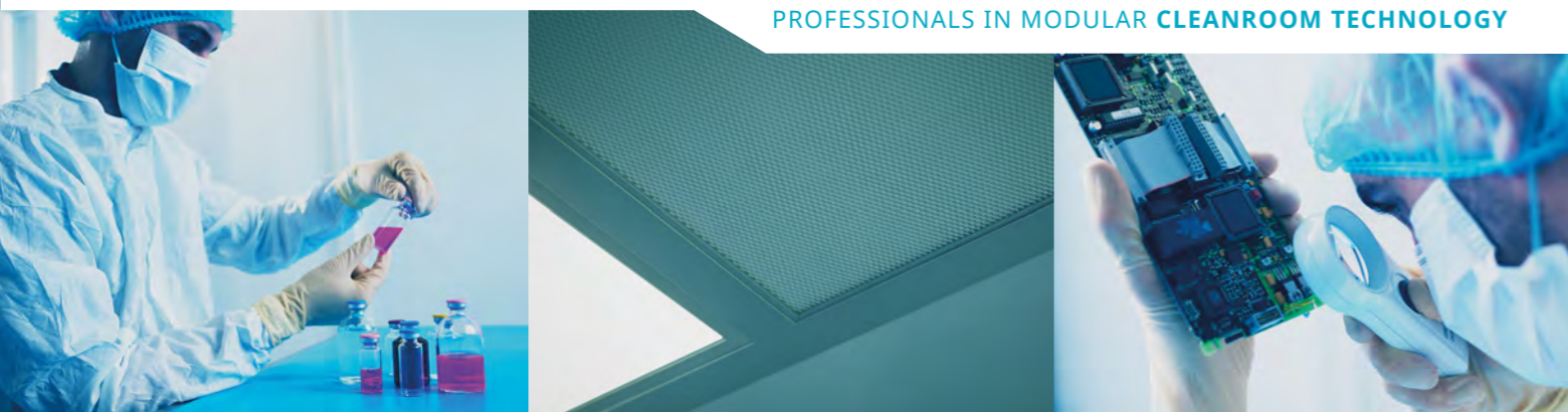


**CLEANROOM EXPERT**

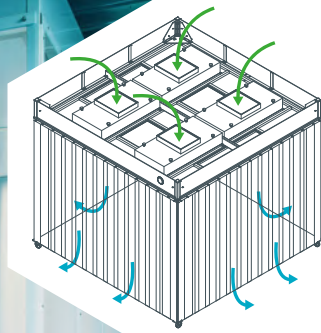
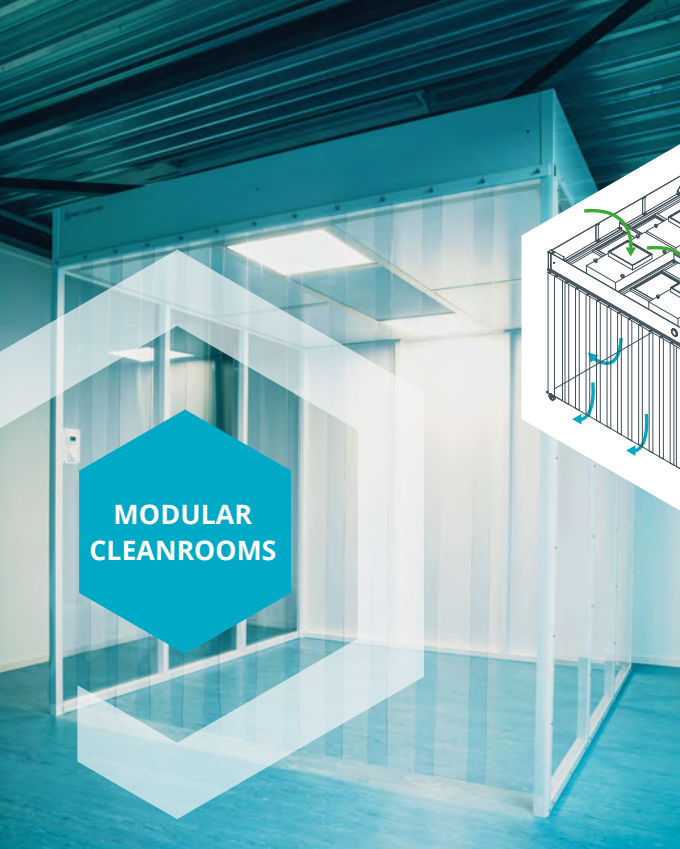
- **Cleanroom expertise. Installation, validation and maintenance.**
- **Modular and therefore flexible in regard to expansion and relocation.**
- **Lowest power consumption available in the market.**
- **Lowest operating costs in the market.**
- **Low purchase price compared to traditional fixed cleanrooms.**
- **Fan unit with DC ECM-motor, ErP2016 compatible.**
- **For areas of 1 to 2000 m<sup>2</sup>.**
- **Short delivery times compared to traditional fixed cleanrooms.**

**CE** ErP2016, European energy directive ISO14644 & EU GMP standards

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### Protection of product or process

The cleanrooms of ProCleanroom offer optimal protection against contamination through the flow of filtered air over product and process. On the upper side of the cleanroom, the filter system draws in ambient air and conducts it through the filter to the working environment.

The air then flows out at the underside (softwall) or through the walls by perforations or air grills (hard wall). When cooling or heating the cleanroom, recirculation ensures maximum efficiency and cost savings.

### Customisation

ProCleanroom supplies a few compact standard cleanrooms from stock. In case of specific requirements in terms of dimensions and specifications, ProCleanroom offers customised cleanrooms. The engineering department of ProCleanroom models the cleanroom with Inventor 3D CAD software. The possibilities are unlimited. For a good impression of the possibilities, visit the ProCleanroom showroom.

### Definition of a cleanroom according to the international standard ISO 14644-1:

“Cleanroom - Room in which the concentration of airborne particles is controlled and classified, and which is constructed and used in a manner to minimize the introduction, generation and retention of particles inside the area.”

#### Selected Airborne Particulate Cleanliness Classes for cleanrooms and clean zones shown in ISO 14644-1:2015

Maximum concentration limits (particles/m<sup>3</sup> of air) for particles equal to and larger than the considered sizes shown below

ISO Classification number	≥0.1µm	≥0.2µm	≥0.3µm	≥0.5µm	≥1.0µm	≥5.0µm
ISO Class 1	10	-	-	-	-	-
ISO Class 2	100	24	10	-	-	-
ISO Class 3	1.000	237	102	35	-	-
ISO Class 4	10.000	2.370	1.020	352	83	-
ISO Class 5	100.000	23.700	10.200	3.520	832	-
ISO Class 6	1.000.000	237.000	102.000	35.200	8.320	293
ISO Class 7	-	-	-	352.000	83.200	2.930
ISO Class 8	-	-	-	3.520.000	832.000	29.300
ISO Class 9	-	-	-	35.200.000	8.320.000	293.000

#### Cross reference to other standards and recommended air changes per class

Cleanroom Standard	Cleanroom Classification					
ISO 14644-1	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
Federal Standard 209E	1	10	100	1.000	10.000	100.000
EU GGMP	-	-	A/B	-	C	D
Air changes per hour	360-540	300-540	240-480	150-240	60-90	5-48

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