



The Atmosphere of Trust for Advanced Technology Facilities

Exyte Technology

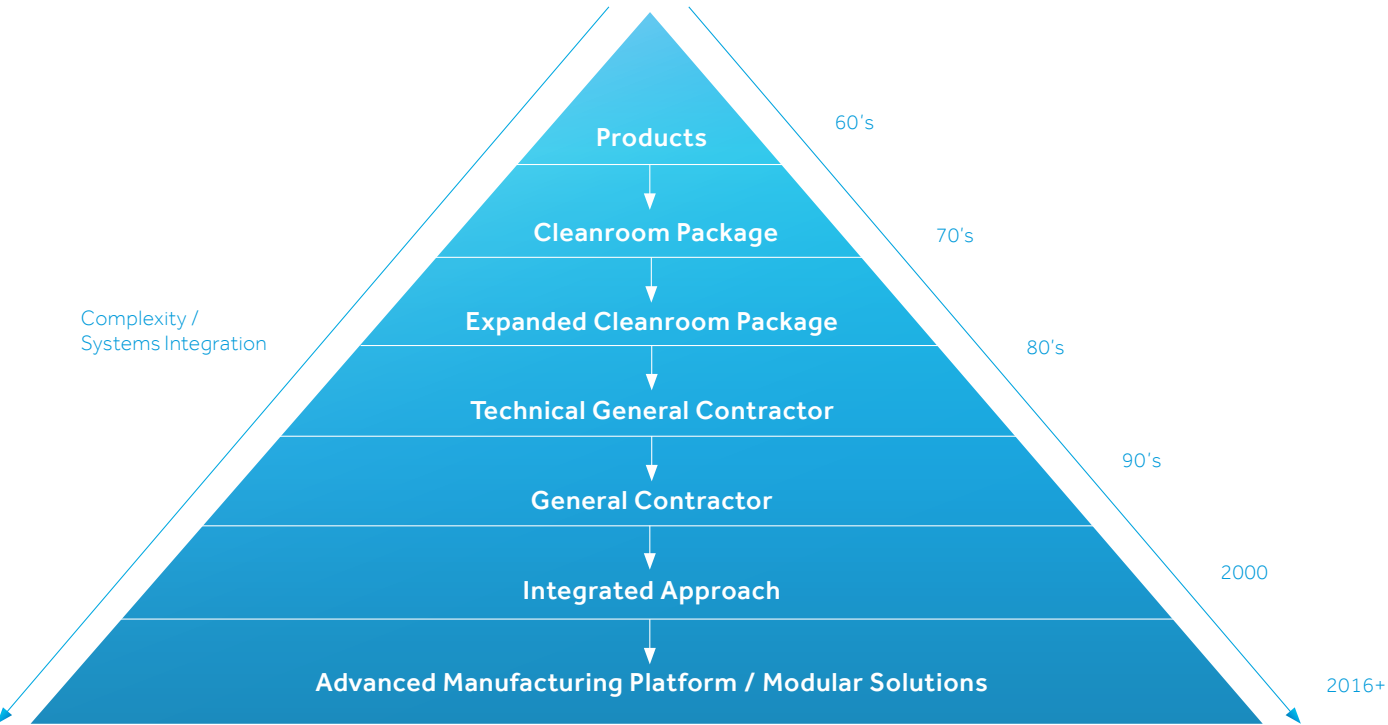


Creating your Atmosphere of Trust ...

... is our Commitment

Exyte Group at a Glance

Exyte Group is the leading global engineering, construction and project management company in the fields of Advanced Technology Facilities, Life Science & Chemicals, Energy & Environment Technologies and High-Tech Infrastructure. In 2020, with more than 4,800 employees the Group reached an order intake of over \$ 4.1 billion.



Linking Process Technologies, Products and Automation within complex Facilities

Whether for semiconductor, flat panel displays, photo-voltaic or battery cells: Exyte Group has a unique success story in the implementation of various projects.

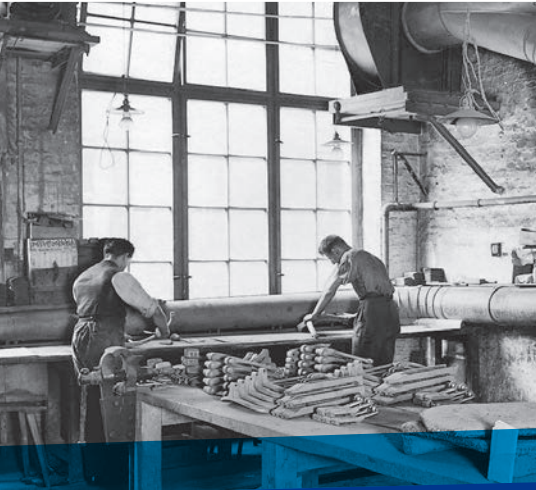
From traditional construction to the latest in modular solutions, for newly planned or existing operations around the globe Exyte Group puts safety first whilst helping you to meet latest requirements and modern standards for your environments.

Exyte Group is committed to **Leadership in Energy and Environmental Design** (LEED) and green solutions.

Semiconductor	Photovoltaic
Flat panel displays	Battery cells



Splint Extraction Systems 1912



Chemical Laboratory



Outdoor Air System



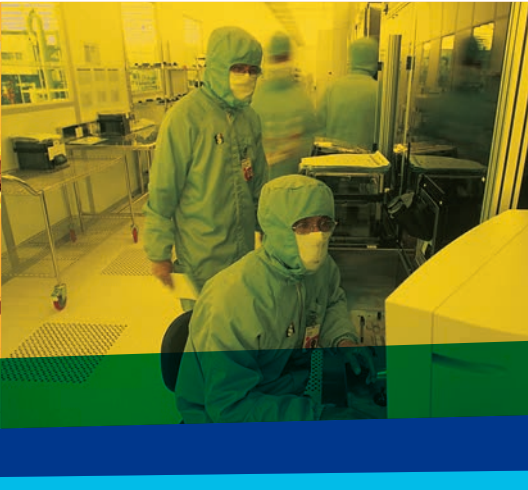
Clean Working-Area



Cleanroomhall



Clean testrigrs



Approaching your Atmosphere of Trust ...

... for Advanced Technology Facilities

Protecting your Products, Employees and Processes

Exyte Technology is the recognized leader in cleanroom technology for modern factories and application-specific development and production environments.

Our innovative technologies and outstanding solutions make it possible to meet the requirements of our customers and implement complex turnkey solutions with the best possible products.

Air Handling Units

- Filtration (particulate / molecular)
- Temperature- /moisture control
- Decontamination
- Ionisation

Cleanroom Products

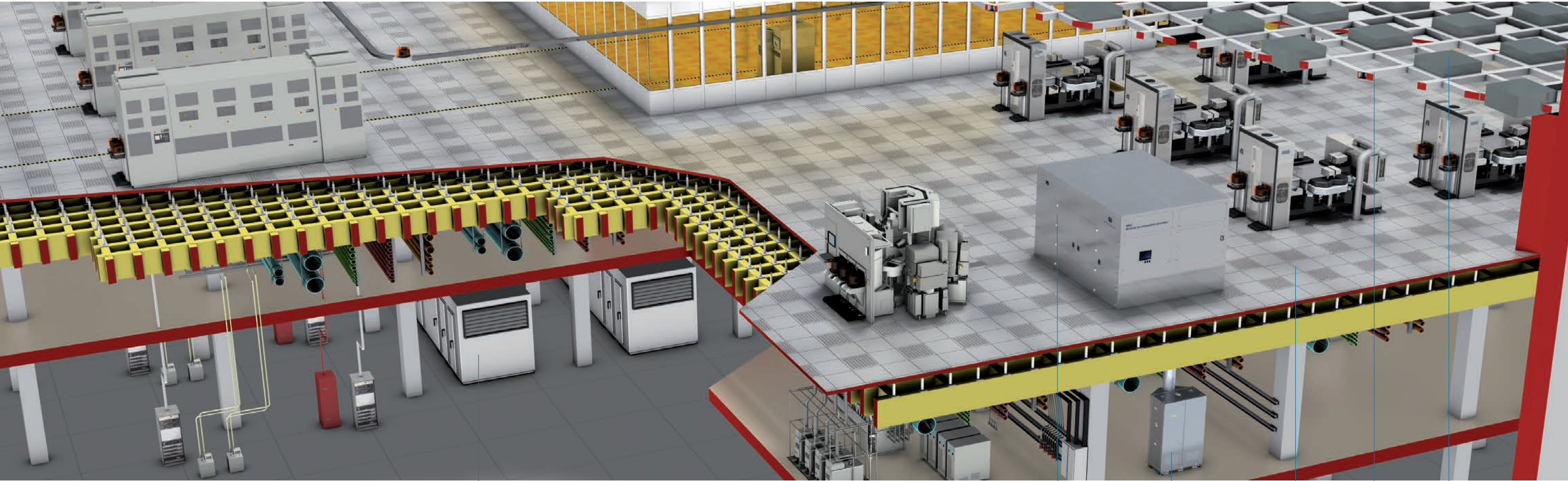
- Filter fan units
- Ceilings, walls, floors, accessories
- Lighting
- Air shower systems
- Mobile laminar flow cabins
- Mobile trolley
- Modular construction

Controlled Environments

- Stable temperature control
- Ultra pure water cabinets
- Precision climate systems
- Reliable process control
- Acoustic enclosures
- Cooling water cabinets
- Electro magnetic shielding

Solutions

- Design & engineering
- Production
- Installation
- Validation
- Documentation
- Monitoring
- Customer support
- After sales service
- Contamination consulting



Air handling units

Modular environmental control chambers

Precision climate solutions unit

Raised floors

Ceiling systems

Filter fan units



Controlled Environments

Outstanding product quality through precise climate control

The most demanding and critical manufacturing processes such as surface treatment in the semiconductor industry, nanotechnology or the production of optical storage media often require a precise climate, coupled with an ultra high pure manufacturing environment.

Whether a complete package or individual services, we offer customized solutions for the different processing steps to precisely control and maintain physical parameters such as air temperature, humidity and chemical contamination within the process.

Thus, we meet the individual requirements of our customers in every way and secure them decisive advantage in research and development, process and product quality.

Modularity

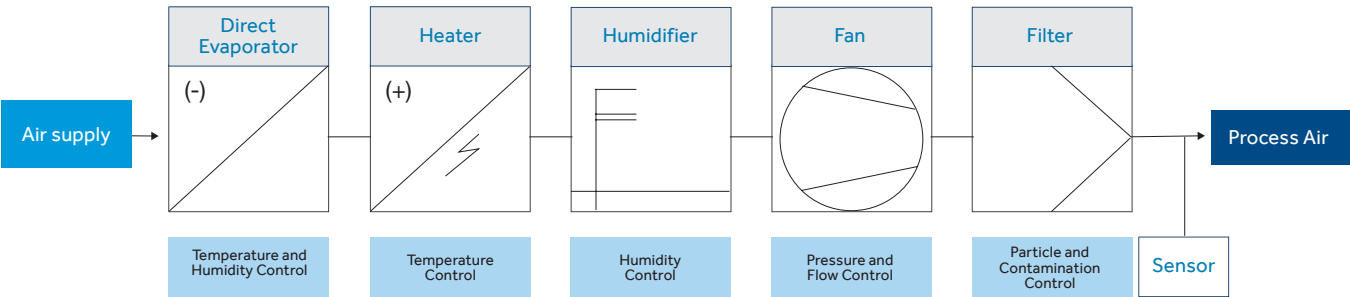
Modular solutions enable flexible and targeted response to individual customer needs. We offer scalable systems that can be configured according to each specific requirement. Such modular design is implemented in our MEC System (Modular Environmental Chamber) through the combination of individual modules assembled together.



Precision Climate System KS



Modular Environmental Chamber MEC



Our Capabilities

Leading technologies for tomorrow's needs

We take measurements such as temperature, humidity and pressure of air and water under the purest conditions. Due to our years of experience and close cooperation with our customers, we know the needs of today and the demands for future technologies.

High-End Technologies

			Our Capabilities
01 Air Temperature	± 0,1 K	± 0,005 K	± 0,001 K
02 Magnetic Fields	500 nT	100 nT	10 nT
03 Water Temperature	± 0,05 K	± 0,001 K	± 0,0005 K
04 Noise Insulation	<30 dB	<35 dB	<50 dB
05 Humidity	± 5 % r.H.	± 1 % r.H.	± 0,1 % r.H.
06 Differential Pressure	± 1,0 Pa	± 0,8 Pa	± 0,5 Pa
07 Humidity Reduction	-30°C	-40°C	-50°C
08 Air Quality (Particles)	ISO 5	ISO 3	ISO 1
09 Air Quality (Bacteria)	GMP C	GMP B	GMP A
10 AMC (Acids, Bases, Dopants)	2 ppb	0,5 ppb	0,1 ppb
11 VOC (Condensables)	20,0 ng	5,0 ng	1,0 ng

Temperature, humidity and pressure control of air and water under cleanroom conditions by Exyte Technology

From-Pick-and-Place-Orders ...

... to complete solutions

Air Handling Units

Exyte Technology air handling units are characterized by an energy-efficient design. They include the latest technical features available and are backed by a strong R&D team.

Our units have been designed for high tech industries such as electronics. Commonly handling air volumes between 1,000 and 200,000 cmh they treat air for:

- Particulate contamination
- Thermal air treatment
- Humidification and dehumidification

Furniture

We offer cleanroom furniture and equipment which is produced to a high quality design and manufactured to equally high standards.

Stainless Steel material:

- Trolleys and racks
- Containers and sinks
- Working and washing tables

Floor Finishes

We advise and offer a wide range of aluminium raised floor system finishes whereby with all we are equally focused on both the process and project needs and on our clients requirements. The possibilities of coating include:

- PVC or Caoutchouc
- Single and double component epoxy coating
- Conductive or non-conductive

Wall Systems

Fully modular solutions including stud and stud less design; a range from 13 mm to 50 mm thickness and up to 7,500 mm height. Options in glass materials. With an unlimited range of accessories our wall system is the perfect solution for your cleanroom requirements.

- Single and double sided partitions
- (stainless) sheet steel infillings
- Powder coated surfaces
- Wide RAL / NCS colour range
- Swinging and sliding doors
- Material pass throughs

Ceiling Systems

All parts of our ceilings are designed to match one another and all built-in components fit perfectly together. Total modularity means we meet all of our clients needs:

- Vertical and horizontal bulkheads
- Walkable and non-walkable
- Crosspoint systems
- T-bar systems
- Coffered systems
- Heavy-duty ceiling (suitable for transport systems)

Sprinklers & Accessories

- Recessed sprinkler systems integrated into ceiling grid system
- Flexible hose pipe
- PuridraI Air Outlets for turbulent air stream
- PVC curtains with smart railing system

Light Fixtures

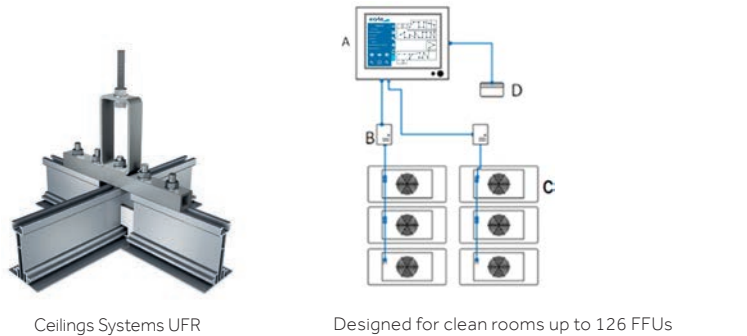
Luminaires and ceilings should always accompany each other. Our lights and ceilings are designed to form one single unit. We meet all demands of modern lighting:

- LED and conventional Technology
- VDU workstation suitable
- Integrated fully flush into the ceiling
- Surface mounted
- Customized calculation of Lighting
- Emergency lamp

Control Systems and Monitoring

From simple solutions such as a speed controller for a single filter fan unit via a “closed loop regulation” through to complex controlling and monitoring systems for a large cleanroom, Exyte Technology offers a wide range of products and services for operating cleanroom components and facilities. Our professional experience in control systems includes more than 50 years in design and installation of cleanrooms and a broad installed base around the world.

Besides hardware like manual speed controllers and pre-manufactured power supply and bus-cabling systems for filter fan units, we also provide control and monitoring systems, including all hardware and software required to monitor the cleanroom conditions such as air humidity and temperature as well as the overall air handling technology from a monitoring desk. Customized software applications allow online visualization and monitoring of the operating state of cleanroom facilities through a graphical user interface.



Air Handling Unit

Raised Floor

Installation Filter Fan Unit

Control Panel



The Atmosphere of Trust ...

Filter Fan Unit RETURN AIR

Particularly suitable in the field of electronics, microelectronics and high-tech industries for:

- Turbulent clean rooms with a maximum filter cover of 50%
- Large clean room areas
- Air pollution classes 5–8 according to ISO 14644-1

FFU COMPACT with air cooler

For local removal of heat loads, the FFU can optionally be equipped with an air cooler on the fan inlet. Therefore, the supply air of the clean room can be cooled. Generally, the cooler will run with a feed temperature of about 14° C or higher.

Air Shower System

Rotational air showers minimize the transfer of dust particles on clean room clothing into cleanrooms and are suitable for low frequency single personnel use; similarly, our tunnel air showers can be used for applications where there is a high volume of personnel traffic or can even be used for the de-dusting of equipment or goods which are to be taken into the cleanroom.

These air showers offer a high cleaning effect and are designed for use with all cleanroom classes.

- Simple integration into cleanroom wall system
- Programmable and fully automated functionality
- Low space requirements and choice of materials of construction

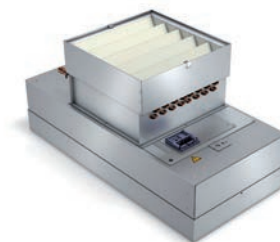
... from one source: Exyte Technology

Filter Fan Unit (FFU) SILENT

- Optimized regarding sound power level and airflow
- Uni-directional airflow (laminar) cleanroom areas
- Advanced requirements on the uniformity of the uni-directional airflow
- Advanced sound pressure level requirements in the room



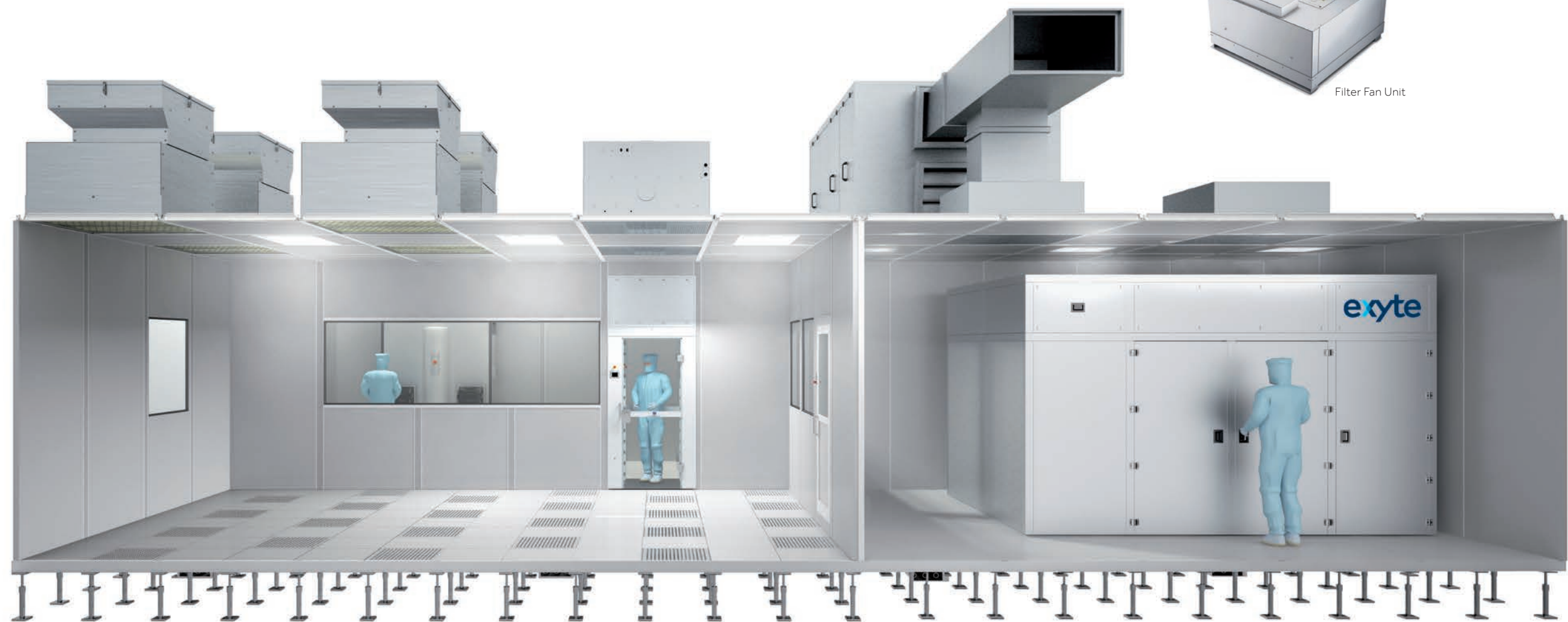
Filter Fan Unit (FFU)



FFU COMPACT



Filter Fan Unit



Most sophisticated Product Solutions

AMC Filter

A special challenge in Advanced Technology Facilities such as semiconductor manufacturing is the control of AMC's (Airborne Molecular Contamination) in form of acids, bases, condensables (VOC's) and dopants. These contaminants can lead to undesired chemical reactions on wafer surfaces and process equipment.

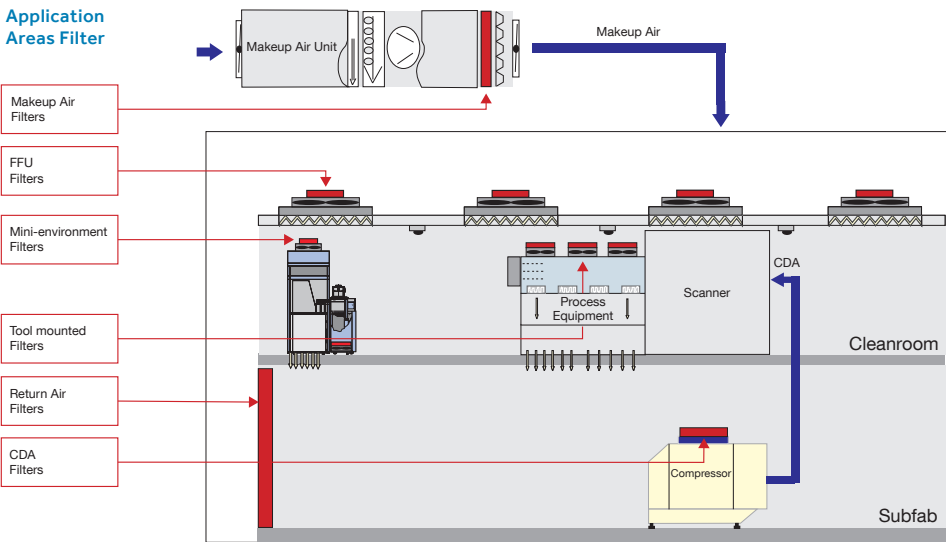
In order to protect these processes, Exyte Technology has developed a comprehensive set of suitable filter products

and is one of the leading manufacturers in this area, supplying to tier one semiconductor companies. Besides the actual product itself, Exyte Technology can also help during the analysis stage to final certification, i.e. via measurements carried out by the house-internal test units and analysis devices.

Our Services at a glance:

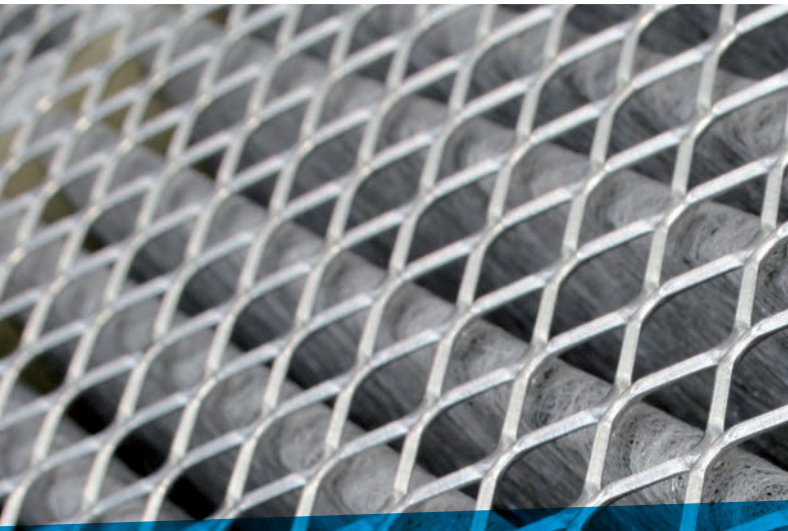
- AMC-consulting
- AMC-measurement
- Analysis of new or used chemical filters
- Adaptation of AMC filters for specific applications
- Step by step to a complete contamination control concept

Application Areas Filter



Activated Carbon Filter with Protective Grid

Filter with Metal Framework



Cleanroom Quality in dry Conditions

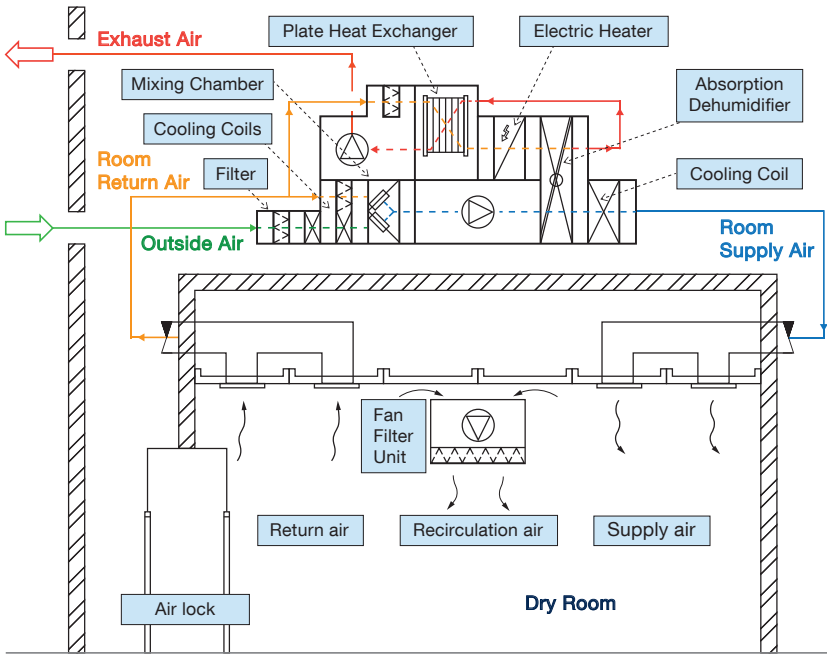
Dry Room Technology

The extremely low humidity requirements during cell assembly and especially for the electrolyte filling step are a challenge in the manufacturing of Lithiumion batteries.

Depending on the product quality requirements, a dew-point more than -60°C is required, which corresponds to a relative humidity of less than 0.1% in the temperature range of 21°C ± 1K.

Scheme of a dry room system

A typical dry room system is shown in Figure. The installation consists of an air dehumidifier, the sealed dry room, diffusion resistant duct work, customized personal and material locks and Filter-Fan-Unit to achieve a clean environment through air circulation within the dry room.



Li-Ion Battery Production Dry-Room

Filter Fan Unit SILENT



Manufacturing and Testing

Excelling at the extra in Cleanroom Products and Controlled Environments

Our centers of excellence and manufacturing in Stuttgart and Shanghai leverage our best-in-class capabilities. In more than 24,000 square meters of production space these facilities offer scalable manufacturing resources and have been optimized for maximum process efficiency through our Just-in-Time and Kanban systems.

Renningen

- Manufacturing Plant 95,000 sq ft (8,800 m²)
- Cleanroom Class 7
- Cleanroom Class 5
- Cleanroom Class 1–3
- Technology Center

Teplice

- Manufacturing Plant 75,000 sq ft (7,000 m²)

Shanghai

- Manufacturing Plant 97,000 sq ft (9,000 m²)
- Cleanroom Class 6
- Cleanroom Class 1–3
- Regeneration Plant
- Technology Center

Exyte Technology offers more than just Products

Customer demands for highly reliable systems are more than satisfied by our comprehensive and worldwide **After Sales Service**. This is based on our experienced and highly qualified specialists in the areas of service, product management and development.

After Sales Service
Engineering
Manufacturing
Installation
Commissioning

Trace Analysis & Technology Center

Validating new Ideas for Evolving Markets

Our modern cleanroom analysis area have the latest analytical equipment that is ideal for trace analysis meaning we can attain detection limits and degrees of precision that few laboratories worldwide can offer.

Ultra-trace analysis for ions, metals and organic compounds in UPW
Cleanroom qualification and contamination control / trouble shooting
AMC Filter development and filter testing
Particle detection and particle removal
Component and material testing and qualification

Our technology center is installed with test benches and climate simulation rooms and equipment for the purpose of the following:

- Validation of new processes
- Inspection of equipment and functional tests
- Testing under specified conditions
- Temperature and air conditioning
- Precision tempering of ultrapure water for critical processes
- Optimisation optimize of sound performance in terms of sound insulation and sound reduction

Test Rigs

- Cleanrooms ISO class 1–7
- Filter test rigs
- Air handling units
- Climate chambers
- UPW facilities
- Development of filters

Production Lines



Final Assembly



Trace Analysis



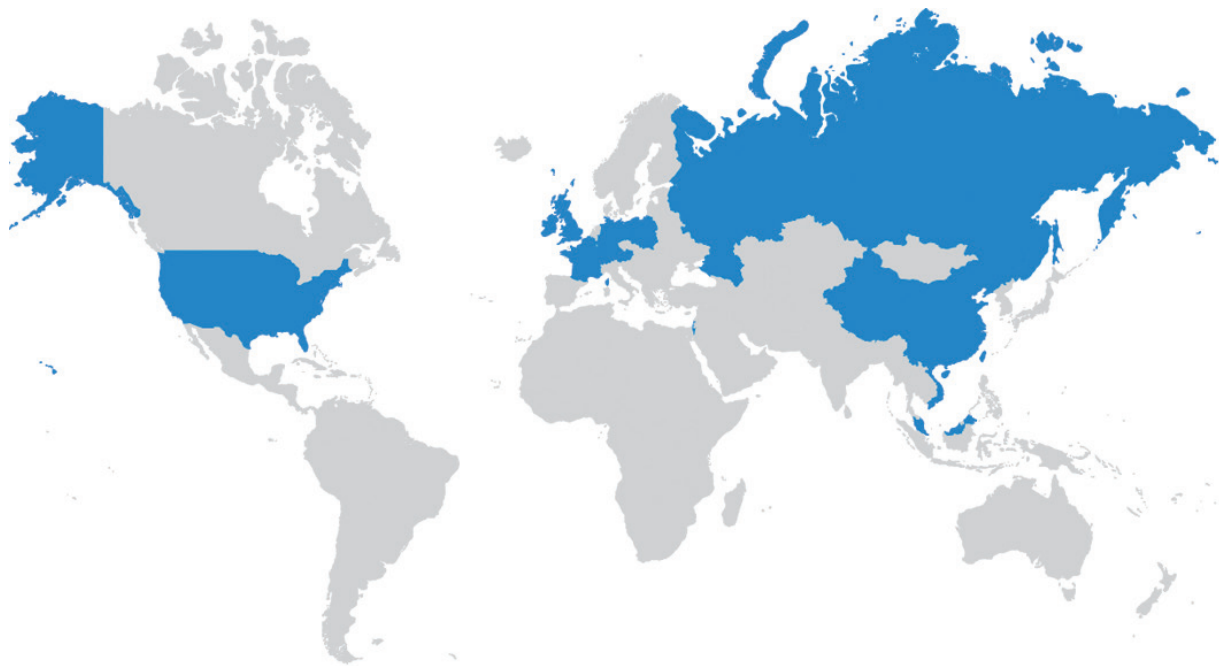
Material Testing



Approval and Qualification



Local Support Wherever You Need Us



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