

Sector Snapshot

Cleanroom Technology

Equipment

ARGONAS

Sector Segmentation

Construction and Design

Customized Cleanrooms

Modular and Mobile
Cleanrooms

Equipment

HVAC-Systems, HEPA- and
ULPA-Filters, FFUs, Laminar
Airflow Systems, Furniture

Controls, Validation and Certification

Real-time monitoring systems, access control systems,
environmental sensors, measurement & certification

Consumables

Mainly protective clothing and cleaning supplies



Sector Definition

- **Purpose:** Technology & components to set up and operate cleanrooms and controlled environments
- **Key Customers & Applications:** Industries like biotech, pharma, medical devices, semiconductors, electronics and food production
- **Products/Services:** HVAC systems, HEPA/ULPA filters, FFUs, laminar airflow systems, biosafety cabinets, air diffusers, showers, and cleanroom-compatible furniture among others



Key Standards

- **Industry Requirements:** Standards vary by product, affecting airflow, filtration, and handling; focus on particles (semiconductors), micro-organisms (food), and germs (medicine)
- **Standards:** ISO 14644 (ISO 1-9), VDI 2083, GMP Guide (EU, classes A-D)
- **Compliance:** Independent audits by e.g. TÜV, Fraunhofer ensure standards, purity, and competitiveness



Market Size & Growth

- **Global Cleanroom Market***: Valued at USD 7.6 bn in 2023, projected to reach USD 14 bn by 2033 (CAGR 6.2%)
- **Main Growth Areas**: Pharma (largest, fastest-growing), biotechnology (rising in pharma production), and semiconductors & electronics (consumer electronics, defence)
- **By Segment**: HEPA systems expected to lead due to their critical role in regulating temperature, humidity, air pressure, and airflow



Market Structure

- **Fragmented Market with Key Players:** The market remains fragmented with numerous specialized and global players, though major companies like Freudenberg or Mann+Hummel dominate, particularly in the filter segment. Smaller regional providers also contribute to the diversity.
- **Regional Diversity:** Market structure varies by region, influenced by semiconductors, biotechnology, and pharmaceuticals



Selected Key Players



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Underlying Key Drivers

- **Industry Growth:** Driven by innovations in 5G, AI, personalized medicine, and advanced manufacturing, with rapid growth in Asian markets
- **Regulatory Compliance:** Strict government standards for contamination control in critical industries
- **Global Investments & Healthcare Growth:** Government initiatives like the U.S. CHIPS Act and expanding biopharma/healthcare sectors



Recent Key Trends

- **Technological Advancements:**
Growing use of automation, real-time monitoring, modular designs, and energy-efficient systems for better efficiency and scalability
- **Critical Role in Manufacturing:**
Advanced, sustainable, and modular cleanroom solutions, featuring IoT, automation, and high-performance filtration, drive innovation across biopharma, semiconductors, and advanced manufacturing



Transaction Market

Historical Activity:

- In the Equipment subsegment absolute transaction volumes have been moderate so far, however with a steady growth trend, reflecting growing general interest in the sector
- The US leads the deal activity, driven by advanced industries like semiconductors, while Europe, particularly Germany, holds strong potential due to its regulatory framework and industrial base



Transaction Market

Key Drivers of Potential Deal Activity:

- Relevance and growth dynamics of key end-industries are increasing in Germany and broader Europe
- Regulatory frameworks drive the need for significantly more cleanroom solutions
- Cost as well as innovation pressures in the space should encourage consolidation into larger and more competitive organisational structures



Transaction Market

Outlook & Potential Opportunities:

- We generally expect a clear case for consolidation amongst the fragmented universe of smaller players
- Next to industry trends, succession issues will also play into deal rationales
- So far, there is limited activity of buy- & build platforms specifically focused on the space. In this context, consolidation angles may also stretch into the technical building services or related technology segments



Selected Deals



Life Science Engineering GmbH

Sale to




16/08/24



SALLES PROPRES & ESPACES BUREAUX

Sale to




19/12/23



Cleanrooms & Supply

Sale to






25/01/24



Merge into




03/02/23

Sale to



30/01/23






Sale to




01/02/23



Sterile Technology

Sale to

30/11/22



Micro CleanRoom Technology GmbH

Sale to




04/05/21

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