

CLEAN ROOM TECHNOLOGY



FOR CRITICAL ENVIRONMENT

Biotechnology ■

Pharmaceutical ■

Medical ■

Microelectronics ■

Industrial Manufacturing ■

Science ■

Food & Beverages ■

Cosmetics ■



THE COMPANY

Established in 1992, Newtech Technology Company Limited is a full service Consulting and engineering service provider; specializing in turnkey design, implementation, project/system management and support services for:

- > Infrastructure for Critical Environments:
Clean Room, Data Centre, Switching Centre, Network Control Centre
- > Datacom Solutions
- > Enterprise Solutions
- > e-Business Applications

The Newtech headquarters in Hong Kong, directs a steadily expanding network of offices in the Asia Pacific region including Mainland China. With over a decade of experience, Newtech is considered one of the region's leading critical environment and e-Business infrastructure specialists. Our team is experienced, professional and dynamic; we are dedicated to providing quality and cost effective services that exceed our clients' expectations.

WHAT IS A CLEAN ROOM?

Clean rooms are generally classified by one of two internationally accepted standards for cleanliness. One-design criteria, is the ISO 14644-1 Standard; this international standard was adopted by the European Union in 1999, and the USA in 2001.

Table 1 : ISO 14644-1 airborne particulate cleanliness classes

ISO Classification number	Maximum concentration limits (particles/m ³ of air) for particles equal to and larger than the considered sizes shown below					
	≥0.1µm	≥0.2µm	≥0.3µm	≥0.5µm	≥1µm	≥5.0µm
ISO Class 1	10	2				
ISO Class 2	100	24	10	4		
ISO Class 3	1,000	237	102	35	8	
ISO Class 4	10,000	2,370	1,020	352	83	
ISO Class 5	100,000	23,700	10,200	3,520	832	29
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

However, the most widely used and easily understood clean room classification is the United States Federal Standard 209E; the classification of cleanliness as defined by Standard 209E is:

"Specially constructed room in which the air supply, air distribution, dust and airborne particles, room pressure, and temperature and humidity are environmentally regulated to meet appropriate cleanliness levels."

In other words, a well designed and well built clean room will maintain the designed standards for cleanliness, temperature and humidity regardless the external ambient conditions.

Table 2 : Federal Standard 209 class limits

Class	Particles / ft ³					
	≥0.1µm	≥0.2µm	≥0.3µm	≥0.5µm	≥5.0µm	
1	35	7.5	3	1	NA	
10	350	75	30	10	NA	
100	NA	750	300	100	NA	
1,000	NA	NA	NA	1,000	7	
10,000	NA	NA	NA	10,000	70	
100,000	NA	NA	NA	100,000	700	



CODES OF CLEAN ROOMS CONTROL

The 4 Principles of Clean Rooms Control

To maintain the clean room operation environment, the 4 principles are the critical control process for design and operation discipline.



NO INTRODUCTION OF DUST

- > No dust leakage from HEPA filters and frames.
- > Positive pressure maintained in room.
- > Persons must change clothes and shoes, and passing through air shower when enter into room.
- > Materials and equipment must be cleaned before bring into the room

NO GENERATION OF DUST

- > Persons must wear dust-free garment.
- > Materials and equipment that easily generate dust must not be used.
- > No unnecessary movement.
- > No unnecessary articles.

NO ACCUMMULATION OF DUST

- > No corners or locations around equipment, which makes cleaning difficult.
- > Reduction of duct and piping exposure in room.
- > Observation of standardized routine cleaning work.

ELIMINATION OF DUST

- > Increase air change rate.
- > Exhaust apparatus to be installed near duct generating sources.
- > Appropriate airflow patterns to prevent dust adhesion to products.

1

2

3

4

SERVICES

With the professional design and installation experience, Newtech offers our clients a comprehensive choice of services ranging from consultation to conceptual design, through complete turnkey construction and final certification. We will design your project with balance, addressing the client objectives: quality, cost, schedule and facility performance.

Our professional services include

1. Concept Development
2. Design Planning
3. Material & Equipment Supply
4. Construction Service
5. Test and Certification
6. Maintenance and Operation Services



DESIGN PLANNING

Newtech engineers are available for consultation to assist your company in the planning of your clean room project. Newtech designs each and every project in accordance with the proper consideration given to all applicable design codes and standards. The clean room construction planning is divided into two major components, building and facilities planning.

Building Planning In designing any building, consideration must be given to the following key factors:

- > Manufacturing process
- > Environmental Impact
- > Safety
- > Supply routes of materials and equipment
- > Moving routes of workers
- > Maintenance
- > Vibration and noise countermeasures
- > Economy of operation
- > Future development

Facilities Planning In planning and design of a "world class" clean environment, the following should be taken into account:

- > Ambient conditions
- > Flexibility
- > Reliability
- > Energy saving
- > Maintenance
- > Environmental concerns



MATERIAL & EQUIPMENT SUPPLY

Newtech offers a range of specialty products, specifically designed for use in the construction and operation of critical clean environments. These products are engineered and utilized to enhance the capability of Newtech designs; in meeting the critical environmental conditions required, for successful clean room operations. These items include:

- > Panel wall systems
- > Ceiling systems
- > Raised floor
- > Stainless Steel clean room furniture and fixtures
- > Air shower
- > HEPA filter
- > Precise control air conditioning unit
- > Lay-in type fluorescent light fixture
- > Teardrop light fixture
- > Mini Environments
- > Positive pressure relief damper
- > Pass box
- > "Tacky" mats
- > Power conditioner
- > Active harmonic filter
- > Uninterruptible power supply system
- > N2 Generator
- > DI water plant

CONSTRUCTION SERVICE

Newtech will design, construct and install everything; from Mini manufacturing environments to the most sophisticated clean rooms. The Newtech team will participate as a specialty partner in renovations and remodeling of existing clean environments or develop complete new construction "turnkey" projects. Newtech's concept of project continuity allows our experienced project engineers to be assigned, and follow the entire project from conceptual preparation to certification and handover.



TEST, CERTIFICATION & MAINTENANCE SERVICES

A well-conceived, properly administered maintenance program is necessary for the efficient, cost effective operation of today's clean facility. The effectiveness of the maintenance program can be directly measured by a combination of regular testing and performance evaluations of facility performance, by a team of Newtech engineering specialists. A program of periodic inspection can be established on a quarterly, semi-annual or annual basis. Upon completion of the test procedure, a Certificate of Conformance and supporting test report will be submitted. Facility indices measured and evaluated by our engineering teams include, but are not limited to the following:

- > Cleanliness levels as indicated by design classification
- > Particle size and quantity count
- > Temperature control range tests
- > Humidity control range tests
- > Filter pressure drop measurements
- > Air flow quantity measurements
- > Air flow velocity measurements
- > Air changes
- > Noise level checks
- > Air handler efficiency
- > Chiller efficiency
- > Light level checks
- > Room pressurization

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Newtech provides one-stop-shop infrastructure solutions for

- > Infrastructure for Critical Environments: Clean Room,
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- > Datacom Solutions
- > Enterprise Solutions
- > e-Business Applications