Ångström Technology
Cleanroom Experts

The Ultimate Guide to Cleanroom Design

Step-by-step instructions on what you need to know **BEFORE** ordering your cleanroom.

Thomas Scientific

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GETTING STARTED

Cleanroom design is informed by a variety of different factors ranging from **the technical to the practical.** If this is your first cleanroom design or redesign project, knowing where to begin and all the things you need to consider can be a difficult and daunting task. This is especially true since much on the information available on the subject is highly technical and virtually incomprehensible.

We've created this guide to help you determine the type of cleanroom you need, along with all of the other necessary components, lighting, wall material, equipment, and more.

IMPORTANT: This document contains fillable fields to allow you pick the options needed for your cleanroom. Following this proccess will allow you to easily determine which type of cleanroom you need, and what sort of features your specific cleanroom will require to meet class standards.

Once you have completed the document, save a copy and send it back to your Angstrom representative to start your custom cleanroom process.

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GUIDEBOOK OUTLINE

READ ON TO GET STARTED WITH THE CLEANROOM DESIGN PROCESS

01. DETERMINE YOUR CLASSIFICATION

The classification of your cleanroom will affect all other components, from the wall material you'll need to your HVAC system. Cleanrooms are classified by the maximum number of particles of various sizes that are allowed in the air of the room. Each industry and institution varies as to the required classification.

Maximum Number of Particles in Air (Particles per cubic meter)							
ISO Class	Fed-Std 209E Class	Particle Size ≥ 0.1µm	≥ 0.2µm	≥ 0.3µm	≥ 0.5 µm	≥ 1µm	≥ 5 µm
ISO 1		10	2				
ISO 2		100	24	10	4		
ISO 3	(Class 1)	1,000	237	102	35	8	
ISO 4	(Class 10)	10,000	2,370	1,020	352	83	
ISO 5	(Class 100)	100,000	23,700	10,200	3,520	832	29
ISO 6	(Class 1,000)	1,000,000	237,000	102,000	35,200	8,320	293
ISO 7	(Class 10,000)				352,000	83,200	2,930
ISO 8	(Class 100,000)				3,520,000	832,000	29,300

EXAMPLE: For many manufacturing applications, an ISO Class 7 or Class 8 cleanroom is acceptable. For more critical and delicate components, like semiconductors and microelectronics, a more controlled environment, an ISO Class 1 to Class 6 cleanroom, is necessary.

What cleanroom class do you need?

02. DETERMINE ROOM SIZE

This is necessary for any sort of construction, but you'll need to know exactly and with a high degree of accuracy the dimensions of the cleanroom space. Since contamination is determined by number of particles per cubic foot or meter, you'll need to know exactly how many cubic feet/meters your cleanroom is.

What dimensions do you need for your cleanroom?

(Dimensions in feet)

ROOM DIMENSIONS

CLASSIFICATION

ROOM DIMENSIONS

03. DETERMINE TEMPERATURE & HUMIDITY REQUIREMENTS

When working with sensitive materials or processes, controlling temperature and humidity in the cleanroom space is vital. While typical temperature standards for cleanrooms state 68°F with a ± of 5°F, you'll need to consider the specifics of your application as well as any conditions that may affect that number, such as a large number of bodies in the space emitting heat or equipment that gives off a lot of heat.

Does your cleanroom need temperature and humidity control?

If yes, what temperature do you need to maintain inside the cleanroom? *(Degree and +/- range)*

What humidity range do you need to maintian inside the cleanroom? % - %

REMEMBER: Not all cleanroom applications require humidity control, but most standard humidity designs allow for the RH control through the air handler cooling coil and maintain ambient to 60% RH. Humidity control can be expensive, so knowing your needs here can help you budget effectively.

04. SELECT WALL MATERIAL

Wall types and materials can vary greatly depending on your application, classification, and budget. Clean storage applications can make use of soft walls, which are a low price point and have flexibility, whereas cleanrooms with high classifications will make use of hard walls, which ensure greater control over the space. The material used for these walls is also something to consider, along with the number and type of doors/entrances/exits, windows or viewing panels, or other unique features like pass-through chambers.

What wall material does your cleanroom need?

WALL MATERIAL OPTIONS

SOFT WALLS: These are cost effective and flexible, allowing for easy moving, positioning them virtually anywhere in your facility.

HARD WALLS: These are great for temperature and humidity control. They are durable, portable, and give additional privacy.

05. SELECT FLOORING MATERIAL

The material you select for your cleanroom floor will affect the air contamination of the space as well as other concerns like static or chemical resistance. Depending on your application and budget, there are many flooring options to choose from including what's listed here.

What type of flooring does your cleanroom need?

FLOORING OPTIONS

SEAMLESS VINYL: Which is cost effective & does not trap particles.

PERFORATED RAISED FLOORING: Which helps maintain laminar airflow through the perforations.

EPOXY PAINT ON CONCRETE: Which allows you to seal over your existing floor, resists trapping particles, & comes in a variety of finishes & colors.

06. DETERMINE LIGHTING

Good lighting is essential, especially in cleanrooms where small objects are manufactured or tested. You'll need to decide on a type of lighting, fluorescent or LED, tubes or panels or light strips, whether your process will tolerate UV lighting or if you'll have to compensate for the absence of it with more fixtures.

WHAT YOU NEED TO KNOW

- The number of fixturess needed
- The placement of the light fixtures
- The brightness requirements

Does your cleanroom require special lighting?

If yes, please specify conditions needing to be met.

07. APPLICATION SPECIFIC CONSIDERATIONS

Some cleanroom applications will have requirements other than those we've already discussed, such as static control, a major consideration for electronics manufacturing. Your application may also require special utilities or components, such as air locks, gowning rooms, air showers, defined shielding levels, intercom stations, telephone conduits, etc. At Angstrom Technology, we offer all the items that go inside of the cleanroom. You'll want to know about these special requirements in advance to ensure that they're included in the design and you budget for them appropriately.

List any special items needed in your cleanroom.

08. CONTACT US

No matter your industry or required cleanroom classification, Angstrom Technology can design and install a cleanroom that will work for your space and application. We're cleanroom experts and we've designed the nation's premier cleanroom solutions since 1989. Angstrom Technology has the tools, knowledge, and materials to design a cleanroom to your specifications and trained technicians who will install your cleanroom properly, quickly, and efficiently.

ARE YOU READY TO START YOUR CLEANROOM PROJECT DESIGN?

Thomas Scientific and Angstrom Technology can help!
Visit **Thomassci.com/Cleanroom-Construction**
to request your cleanroom quote!

GENERAL NOTES