



## Why Flexible Demountable Modular Cleanroom Construction?

When building a cleanroom facility, there are options and choices to be made.

A new cleanroom project should be cost-effective, designed to suit needs, and meet the requirements for testing and certification.

It may seem that the decision would be between traditional construction, utilizing perhaps metal studs and drywall to create walls and ceilings that are covered with Epoxy Coating, PVC, or Fiberglass Panels, and Modular.

Modular construction uses standard components that can be configured in many different ways and assembled quickly and "CLEAN".

Total cost of ownership includes:

1. Initial Construction Cost?
2. Tax Considerations from Accelerated Depreciation.
3. Timeline for Construction?
4. Timeline for Commissioning and Validation?
5. The cost and adaptability for changes during and post construction?
6. Do the components assist in reducing particles in the Cleanroom?
7. Maintenance Considerations.
8. Is the system "Flexible" in allowing for equipment access or changes?

Modular components significantly reduce design, architecture, and engineering time and associated costs.

The perception is that the cost of modular Cleanrooms are higher because the actual building components often cost more.

Once designed, modular cleanrooms can typically be constructed 20-40% faster than cleanrooms built using traditional methods and offer much more flexibility if the cleanroom needs to be moved or re-configured. This last point is incredibly important as facility managers are faced with shorter and shorter timeframes for production start-up.

There are many advantages to using modular construction. One of the most important is that you know what you are going to get because the product is extremely consistent from one facility to the next. Modular systems are manufactured in controlled manufacturing environments and have already been validated through extensive real-world use.

Early versions of modular Cleanrooms were prefabricated offsite and utilized a panel and post design where the panels are held in place by internal brackets or posts for mechanical electrical services, typically every 4'.



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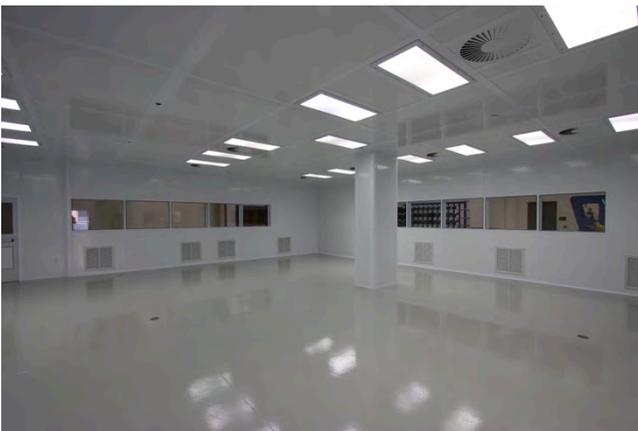


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These systems while modular, do not lend themselves to the ability to provide services where required and are typically a progressive design, starting in one corner and working your way around the structure with limited ability to make changes. This method has the room created in sections offsite and then delivered to the final facility for quicker installation. It is less disruptive to the operation, however this time frame must be added into the schedule, as detailed design is important prior to manufacture.

Consideration should be made for the time required to replace or customize wall panels or components if required.

Modular Cleanrooms especially ones that use Aluminum Components have environmental advantages over traditional construction as components can be manufactured with recycled content, extruded to reduce waste, re-configured and relocated. Recycle rates at end of life can be as high as 93%.



ISO Class ratings are mainly controlled by the mechanical (filtration) systems however construction methodology can assist in maintaining cleanliness. The monolithic surface of most Cleanroom panels assist in initial and ongoing cleanliness as well as compatibility with most cleaning and disinfection protocols and agents. Having radius corners and coves also assists in maintaining cleanliness and cleaning.

The ability to maintain the Critical Environment (temperature, humidity & pressure) control is also enhanced with modular construction. Humidity transmission can only be slowed and not halted, but utilizing modular construction, with non hygroscopic components, with tight fitting panels can assist in controlling humidity, and the tightness of the construction will assist in pressure control.

When most Cleanroom designer's talk about customizing, they want to add components like doors, pass-throughs, adapt to equipment or utilize different elevations. Where some accessories like windows that assemble flush into a wall are difficult to find in standard construction, these are standard components in many modular offering.

Flexible Demountable Modular Cleanroom construction can easily accommodate these types of customization, initially or as required by future modifications.

Contact Environmental Systems Corporation to find out if the ALUMA1 Cleanroom Wall & Ceiling System will meet all of your requirements.



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