

## Information Regarding Modular versus Conventional Stick-Built Cleanrooms

## Why Modular Cleanrooms?

Cleanrooms are generally constructed using two methods. First, the conventional way is to employ traditional construction techniques and these are termed "Stick-Built" facilities - concrete blocks with a specified finish coating and metal studs with gypsum board facings are techniques which are commonly used. Secondly, a more flexible method of construction is possible using factory built modular components which form the basis of a complete cleanroom system comprising the walls, ceilings, doors, windows and flooring envelope. Such a system is termed a modular cleanroom. The pharmaceutical, life sciences and biotechnology industries have been relatively slow to embrace the modular cleanroom construction technique, whereas for the semiconductor and electronic manufacturers and almost all other users of cleanrooms, this method of



construction has been the preferred choice for over twenty years. However, there are many inherent advantages to modular cleanroom construction and many pharmaceutical companies are now adopting the technique especially for large-scale production facilities. The modular construction method can also be used when building Level 3 Containment Facilities.

Modular construction implies flexible floor and ceiling plans, that changes can be made in the future with relative ease, that a greater choice of materials/finishes are available and that the facility has a residual value associated with it because large sections of a modular cleanroom can be readily dismantled and relocated elsewhere or even sold.

Some of the many advantages of modular construction are:

- Assembly/installation processes can be carried out concurrently as opposed to sequentially, resulting in fast tracking construction of the facility
- Pre-Engineered, Pre-Fabricated and Pre-Tested Solutions
- Wall and ceiling materials are mildew, moisture and fungal resistant
- Wall and ceiling systems may be dismantled and relocated or temporarily removed for the introduction of large equipment
- The wall systems have proven performance
- Controlled air leakage is relatively easy to obtain
- The complementary ceiling systems have proven performance and are far superior to stick-built solutions
- Changes to service requirements can be made as the project proceeds in a cost effective manner
- Integration with process piping and process service requirements is very straightforward
- Site conditions throughout the installation phase are easier to control and clean construction techniques may be employed
- Standard fittings/components are available which are compatible with the modular systems
- There are no hidden surprises at the testing, certification, commissioning and validation stages

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- Critical paths are more clearly defined in advance
- Ultimate in flexibility (i.e. floor & ceiling plans, changes at a later date, compatibility with standard fittings & components etc...)
- When completed the whole facility achieves a homogeneous and integrated appearance
- The doors, frames and windows are flush with the walls
- Relatively maintenance free and easy to clean
- Real property has a residual value
- Leasing arrangements are available

The modular cleanroom wall, ceiling, door and window systems are pre-engineered and tested to exacting standards so that the client receives superior products, better value for money and benefits from existing expertise. Generally, the manufacturer has previously confronted a client's perceived problem and has a viable solution at hand. The products are manufactured in controlled environments and the components are consistent in form, fit and function. The component templates enable architects and engineers to readily adopt the process to any requirement and quickly draw up flexible and creative floor plans. Most suppliers of modular cleanrooms work closely with the architects and engineers so that the products are seamlessly integrated into the design process together with added specialized expertise and knowledge.



Modular cleanroom wall and ceiling systems are evaluated by independent testing agencies and meet the stringent requirements of FDA, NIH and international cGMPs. All components come with a performance guarantee. Modular cleanroom panels consistently outperform stick-built construction even when additional (and sometimes redundant) surface treatments are applied to the concrete or gypsum board. In particular, the wall and ceiling components are very stable whereas significant problems (e.g. wall, ceiling and floor cracking) have arisen over time with stick-built facilities. Some all-metal wall surfaces are coated with one of the most durable, chemically resistant finishes available and all seams and joints can be readily inspected and tested. Furthermore, a unique pedestal/base rail is available which allows a completely sealed transition from the cove of the floor to the wall. When combined with the enhanced ceiling systems, the facility is essentially airtight and capable of meeting the most stringent cGMP requirements.

Modular cleanrooms are conducive to fast-track project schedules because the manufacturer can control both the manufacturing and the installation phases and thereby guarantee a completion schedule. To shorten the actual project installation time frame, other trades can work concurrently alongside the cleanroom installers. In order to keep the work site reasonably clean, stick-built installations require special attention during every aspect of the construction phase. However, the installation of pre-built systems is very easy to control and therefore clean construction techniques are relatively straightforward.



The modular cleanroom components are impact resistant, chemical and water resistant, non-shedding, non-out-gassing, have excellent fire ratings, can be sterilized and are essentially maintenance free. In addition, the systems may be easily demounted and reconfigured enabling the client to respond to market changes with the minimum of disruption. Similarly, process support and utility services can be added, deleted or relocated even while production is maintained. Moreover, materials used in the construction of the wall and ceiling systems do not support the growth or survival of microbial organisms.

When one takes into account all the advantages of modular cleanrooms, the additional operational costs of stick-built constructed cleanrooms and the costs involved in bringing stick-built constructed cleanrooms into cGMP compliance, then the real value of the modular approach is readily apparent.

For further information and details regarding modular cleanroom components and systems available from Microzone Corporation visit [www.microzone.com](http://www.microzone.com).

