

CLEANROOM CONSTRUCTION PROTOCOL AND CERTIFICATION

Build 'em Clean? You gotta be kiddin'

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Abstracts:

As you recall for our past articles, the cleanroom is a specially constructed, enclosed area that is environmentally controlled with respect to airborne particulates, temperature, humidity, airflow patterns, air motion, sound, vibration and lighting. The cleanroom is intended to provide an ultra clean manufacturing environment specially designed to prevent or reduce contamination of the product. Consequently, we must provide a method of constructing the facility to meet these ultra clean requirements and then we must test and certify the cleanroom to prove that the final project meets the needs of the owner.

To assure the effectiveness of the cleanroom as a manufacturing tool, various training programs for contamination control have been developed and implemented for the cleanroom personnel. These training programs include safety, personal attitude/discipline, general housekeeping, custodial concerns and preventive maintenance for all manufacturing equipment within the cleanroom and it's associated support equipment. A good contamination control program is considered essential for increasing the awareness of all people involved in the process to ensure good product yield, reduced rework, increased quality and reliability of product. As a result of the training for the

operational personnel, elaborate construction methodologies have evolved over the last fifteen years to deal with contamination control during the construction of cleanroom facilities. This methodology resulted because of the concern that contaminants left behind from construction activities would affect the operation of a cleanroom after project completion.

To help control construction contamination, two primary cleaning methodologies have been developed. One method is to clean the facility at the end of the construction, called “final super clean,” while the other method, called “clean-build,” requires continuous cleaning during construction. “Clean-build” protocols attempt to prevent contamination or capture contaminants at their source during the construction process. This clean construction protocol concept stresses the importance of exercising the discipline to build clean because it was widely believed that ultra-low levels of contamination cannot be reached using normal construction techniques and then cleaning the facility afterwards.

With the enormous investment of over \$2 billion firms are making in state-of-the-art wafer fabrication facilities, a well-managed “clean-build” protocol is considered a small price to pay to reduce the risk that the cleanroom will not start on schedule due to contamination problems. “Clean-build” protocol also reduces the risk that some insidious sources of contamination will have a small impact on yields or on the ability to use the cleanroom for a more demanding process in the future.