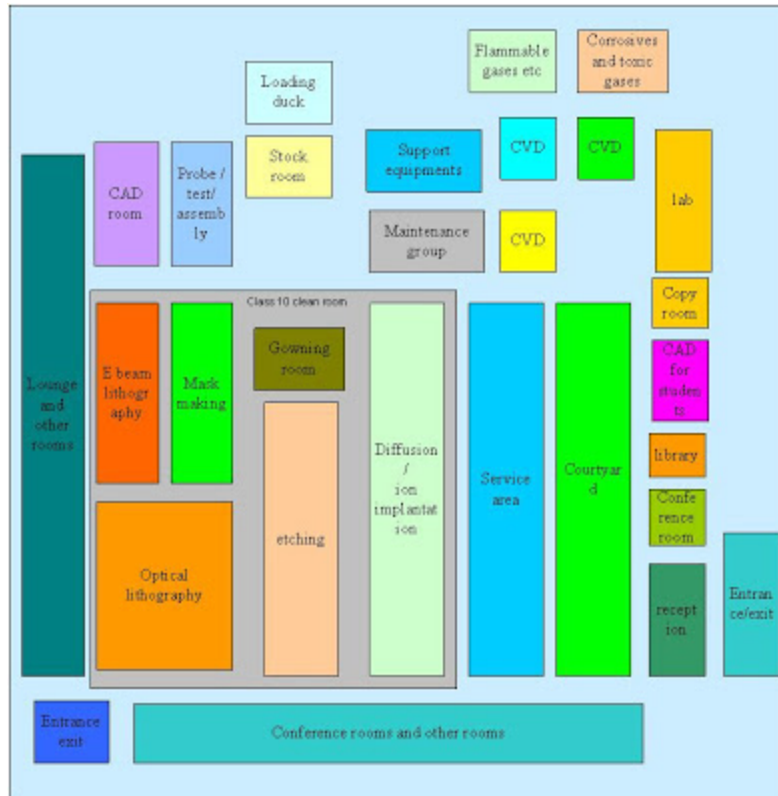


FABRICATION PLANT LAYOUT AND LOCATION OF EQUIPMENTS

A general layout of the fabrication plant is shown in the Figure. The layout shows a general distribution of area for different processes and facilities. Fluorescent lighting system is used for the fabrication building. Class 10 clean room is lighted with yellow fluorescent light. Photo resists are less sensitive to the yellow light. All other areas of the building are lighted with fluorescent lamp. Fire protection systems are installed all over the fabrication plant. The layout for the lithography, etching and diffusion operation are kept nearer to each other as these processes are repeated several times. Conference rooms, library and other office rooms are outside the clean room. The clean room quality for these areas can be up to class 10,000. Temperature and humidity are controlled to 73.4F +/- 5.0 F, 50% +/- 10% RH. The clean room maintains at least .05" H₂O over atmospheric.

Placement of equipment in the fabrication plant is a very critical issue. Airflow and the ultimate cleanliness capability of the area surrounding the equipment have to be maintained adequately as per the standard requirement of the fabrication plant. For the placement of the equipment several factors have to be considered. Size and the shape of the equipment mainly decide the area requirement of the equipment. In addition to this the other factors to be considered are the access required to operate and service the equipment, the location and number of utility connections to the equipment, and the amount of support equipment located near the equipment and how it connects to the equipment. Equipment locations must satisfy all safety related standards.

Today, bulk head mounting design methodology is used for most of the semiconductor equipments. In this design bulk of the equipment resides in the chase and remaining small portion of the equipment is located in clean room. The preferred method for equipment placement is to keep the equipment face is flush with the clean room wall. This design allows easy air flow, the best possible easy access to the equipment. Utilities are well connected to the system. Highest level of cleanliness can be maintained.



Layout of the fabrication facility [3] (click on the figure to enlarge it)

In addition to the main equipments many supporting equipments are used in the fabrication plant. Location for such support equipments must be carefully planned. It is good practice to keep supporting equipments in chase. If they are kept in clean room they disturb the airflow and also require additional maintenance activities. This eats up clean room floor area.

Airflow requirement has to be considered when equipment can't be bulkhead mounted. The key in the equipment placement is to ensure that the cleanest air coming from ULPA filters is directed to the critical areas of the equipment.

The floor above the clean room is used for air handlers and heat exchangers. Support equipments such as air compressors, chilled water, vacuum pumps and acid neutralizers are kept away from the clean room. Storing corrosive and toxic gases in clean room is hazardous. Hence they are stored and monitored away from the main laboratory itself. An outdoor area, known as facility area, is utilized for storing the DI water, chilled water, liquid gases and emergency power generators. Support facilities are essential for the

smooth clean room operation. Stock room, semi clean laboratory, maintenance work areas and staff offices are located near to the clean room.

Fire suppression systems are installed such that they provide suitable fire protection to the equipment, contribute no contamination to the equipment, and allow proper airflow to the product-wafer areas. Fire extinguishers are located at strategic locations throughout the clean room and other sub laboratory areas. Generally preferred area is the chase. Location of extinguishers should not be in the airflow path leading to product-wafer areas.

Source : <http://asic-soc.blogspot.in/search/label/VLSI%20fabrication>