
PRACTICAL CLEANROOM TECHNOLOGY AND FACILITIES FOR ENGINEERS AND TECHNICIANS



YOU WILL LEARN:

- About contamination control, improving yield, product quality and performance
- The importance of cleanrooms in improving product yield in today's manufacturing climate
- The Cleanroom concepts, how to design, operate and maintain cleanrooms
- Techniques for the control of air temperature, air humidity, vibration, static electricity, particle levels and other contaminants
- The maintenance and work practices allowed in Cleanrooms
- The utility and service requirements for Cleanrooms
- The statutory codes safety, fire and environmental practices
- The codes and legislation used for regulation of Cleanroom design and operation
- About Hi Purity Water - its uses, generation and distribution
- Techniques for waste water treatment
- About personal safety work practices and general behaviour in a Cleanroom

WHO SHOULD ATTEND:

- Engineers & Technicians
- Process Engineers
- Operators
- Project Engineers
- Electronic Engineers
- All personnel who work in a controlled environment
- All personnel involved with the design and maintenance in and around a controlled environment
- Scientists
- Production Engineers
- Research Engineers
- Maintenance Personnel
- Data Storage Personnel

The Workshop

Contamination can cause a variety of problems to materials, processes and products and it is for this reason that cleanrooms are becoming a regular feature of modern industry in its battle to control contamination. With the demand for higher productivity and reliability of the manufacturing process and the ever-increasing miniaturisation of equipment, Cleanrooms have become integral to the success of the manufacturing process.

It is essential for productivity that people are trained to work with Cleanroom technology and facilities. An effective Cleanroom requires the effective functioning of many different and complex systems. It is imperative that these dynamic systems are operated and maintained correctly so that their interaction creates a stable controlled environment.

This workshop will not only teach you how to create a Cleanroom but also how to effectively operate, maintain and work within this controlled environment. This workshop will help you manage your cleanroom investment more efficiently thereby increasing your productivity through greater product yields.

Pre-requisites

A fundamental knowledge of basic mechanical issues.

Workshop Objectives

After attending this workshop you will know how to:

- Work in a controlled environment
- Handle, store and use hazardous materials, wet chemicals and gases
- Increase your product yield
- Understand different Cleanroom concepts
- Control contamination from interfering with the production of your product and its end-use performance
- Codes and legislation governing the design and operation of Cleanrooms
- Hi Purity Water; its uses, generation and distribution
- Waste water treatment
- Personnel safety practices in the Cleanroom environment

Practical Sessions

Practical sessions include:

- Air balance calculations
- Heat load calculations
- Particle loadings

To gain full value from this workshop, please bring your laptop/notebook computer.

The Program

OVERVIEW OF CLEANROOM TECHNOLOGY

- The need for a Cleanroom
- History of Cleanrooms
- Cleanrooms and the semi-conductor industry
- Cleanrooms and the pharmaceutical industry
- Overview of the wafer fabrication process
- The Cleanroom as a system and unit operations

CLEANROOM CONTROLLED ENVIRONMENT CONCEPTS

- Cleanroom basics
- Particulate standards
- Gas and vapour standards
- Contamination

MICRO CONTAMINATION (PARTICULATE)

- The nature of particulate contamination
- Particulate contamination flow
- Particulate contamination sources
- Particulate transport
- Particle retention
- Contamination monitoring/identification for particulate contamination

CREATING A CLEANROOM

- Construction materials
- Construction practices (Protocols)
- Air flow (basics)
- Typical Cleanroom layout/configurations
- Designing for Cleanroom class level

FACILITIES & SERVICES

- Electrical systems
- Power conditioning
- Compressed air
- Air conditioning
- Air wet side
- Air dry side

VIBRATION

- External vibration sources (natural and man-made)
- Internal vibration sources

CLEANROOM CODES & LEGISLATION

- Fire protection
- Smoke removal

HI PURITY WATER GENERATION & DISTRIBUTION

- The uses of ultra-pure water
- Raw water constituents
- Water quality standards
- Hi Purity Water Systems: typical block diagrams

PRODUCTION MATERIALS

- Bulk Chemical Storage and Distribution Systems (BCDS)
- Hazardous production materials
- The safe storage, handling and use of wet chemicals and gases
- Personal protective equipment (PPE)
- Wet chemicals (bulk and speciality)
- Gases (bulk and speciality)

WASTE TREATMENT

- Waste water plant
- Acid waste neutralisation plant
- Hydrofluoric acid waste treatment
- Phosphoric acid waste treatment

PEOPLE & CONTAMINATION

- Apparel
- The use of apparel
- Work practices and general behaviour
- Cleanroom facilities & practices
- Typical specification sheets