



**MINISTRY OF HEALTH
AND
ROYAL SCIENTIFIC SOCIETY**

***Certification & Training for
Biosafety Cabinets According
to NSF Standards***

Biological Safety Cabinets (BSCs) are the primary means of containment used in laboratories worldwide for the safe handling of

infectious microorganisms. They provide protection to the laboratory worker and the surrounding environment from pathogens. To ensure the correct functioning of BSCs, they need to be properly maintained beyond the daily care routines of the laboratory. This involves annual maintenance and certification by a qualified technician in accordance to the NSF/American National Standards Institute 49-2016 Biosafety Cabinets:

Design, Construction, Performance, and Field Certification. Ministry of Health (MOH) in Jordan has now internationally certified engineers who can install, maintain, and certify BSCs in a cost-effective and practical manner. In this regard, the Royal Scientific Society (RSS) in collaboration with MOH conduct a program For Training , repair, maintenance, and certification of Bio Safety cabinets



**DIRECTORATE OF BIOMEDICAL
ENGINEERING (DBE)**

Through agreement between RSS & MOH ; The directorate of bio-medical engineering with shared resources from RSS & MOH is responsible for all issues concerning medical equipment related to Jordanian Ministry of Health (MOH) Hospitals . The directorate includes 25 Peripheral workshops of medical equipment at the Ministry of Health hospitals and central workshop at the directorate which contains 9 specialized technical groups . It employs 200 biomedical engineers and technicians providing maintenance & technical services for about 40000 medical devices in 30 MOH Hospitals and 1000 Medical centers providing them with corrective , preventative and inspection maintenance services ,in addition to of training of users and medical staff .



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**OVERVIEW OF TRAINING IN
BIO SAFETY CABINETS (BSC)**

The training of BSC will include theoretical and practical aspects of laboratory BSC operation and maintenance following international standards and recommendations , by specialized and certified Engineers . Subsequently the trainees will have the opportunity to follow the trainer in real-life situation during the maintenance of one of the BSC .

The training program will include two courses :

Basic course

- 1.Safe Use of Biological Safety Cabinets designed to instruct Users on how to protect themselves and their products from contamination by learning how BSCs work and how to use them effectively.
- 2.An overview about BSCs including the different types of cabinets, how they work, and how to properly use a cabinet ;

advanced course

This is an intermediate to advanced course, designed for biological safety professionals who are interested in advanced training.

- 1.The course teaches professionals about the different types of ventilation equipment and exhaust and maintenance requirements.
- 2.An overview of laboratory ventilation equipment and the differences between chemical fume hoods, clean benches, isolators, and BSCs.
3. A description of how BSCs work including animations of particulate capture mechanisms and airflow.
- 4.The different types of BSCs and animated airflow diagrams. Procedures for using BSCs including the preparation of work materials, work techniques, and clean-up procedures.
- 5.The types of tests used to certify a BSC including microbiological testing to verify sterility of environment.

Another course is Fumigation of BSCs and Certification of BSC according to NSF standards .

What is NSF / ANSI standard?

NSF: the National Standard Foundation. ANSI: American National Standards Institute NSF is recognized throughout North America as the leader in the certification of Class II biological safety cabinets. The majority of users in hospital and research laboratories demand certification to the NSF standard. The industry, recognizing the need for demonstrated performance to ensure protection of public health, safety and the environment, pursues the NSF mark as a symbol of their commitment to producing quality, reliable products. NSF is a third-party organization with over 40 years of commitment and service to the biosafety cabinet community. The NSF mark demonstrates that your product meets the design, construction and performance requirements of NSF/ANSI 49. In addition, they use their industry expertise to evaluate and accredit biosafety cabinet field certifiers to meet stringent requirements for experience, training and job performance.



HOW WE CERTIFY & TEST BSC IN DIRECTORATE OF BIOMEDICAL ENGINEERING ACCORDING TO NSF STANDARDS

The directorate of biomedical engineering has a group of specialized engineers trained and certified in the field of certification and accreditation of biosafety cabinet, according to NSF (National Standard Foundation), using modern inspection equipment.

Each cabinet should be field tested at the time of installation and at least annually thereafter, the tests are:

1. Test directly related to containment (personal, product, and environment)
 - Downflow velocity test
 - Inflow velocity test
 - Hepa filter leak test
 - Site installation assessment test
 - Airflow smoke patterns test
2. Test related to worker comfort and safety
 - Lighting intensity
 - Vibration
 - Noise level

When inspecting any biosafety cabinet and ensuring that they work properly, the directorate of biomedical engineering will submit a certificate with a logo on it (NSF & RSS)



Definition of Biosafety Cabinet (BSC):

A biosafety cabinet (BSC)—also called a biological safety cabinet or microbiological safety cabinet—is an enclosed, ventilated laboratory workspace for safely working with materials contaminated with (or potentially contaminated with) pathogens requiring a defined biosafety level. Several different types of BSC exist, differentiated by the degree of biocontainment required.

Purposes:

1. The primary purpose of a BSC is to serve as a means to protect the laboratory worker and the surrounding environment from pathogens. All exhausted air is HEPA-filtered as it exits the biosafety cabinet, removing harmful bacteria and viruses.
2. The secondary purpose is to maintain the sterility of materials (the "product") inside the cabinet.

Personnel protection from harmful agents inside the cabinet.

Product protection to avoid contamination of the work, experiment, or process.

Environmental protection from contaminants contained within the cabinet

