

SAFETY EQUIPMENT OVERVIEW

Biosafety Level 2 (BSL-2) facilities typically require Class II biosafety cabinets as a primary containment barrier system to ensure user, environment, and sample protection from hazardous materials.

Airstream® Gen 3 Class II Biosafety Cabinet



AC2-_E_

Airstream® Class II Type A2 Biosafety Cabinet, NSF 49-certified



AC2-_S_-NS

Airstream® Class II Type B2 Biosafety Cabinet



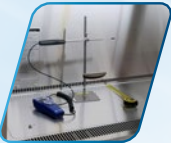
AB2-_S_

EQUIPMENT MAINTENANCE

Biological Safety Cabinets (BSC) should be properly maintained and certified annually to ensure performance and effectiveness using NSF 49 or EN12469 standard methods. These standards include basic requirements for the design, construction, and performance of BSC. They also have the groundwork procedure for certification tests and the decontamination process.

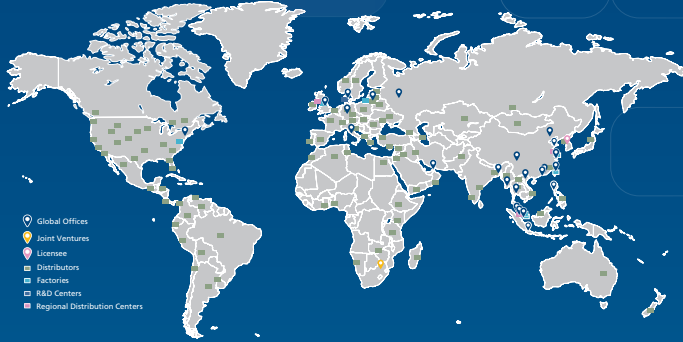
Field Certification includes:

Inflow Velocity Test Downflow Velocity Test Smoke Pattern Test Filter Integrity Test



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BIOSAFETY LEVEL 2 CERTIFICATION



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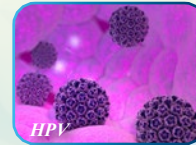
Introduction

Biosafety Level 2 standard practices, safety equipment, and facility specifications apply to laboratories that deal with indigenous moderate-risk agents linked with human disease and are present in a community. Work done where the presence of a biological agent or toxin may be unknown can often be safely handled under conditions typically associated with BSL-2.

Note: Risk group of an agent does not directly correspond to the biosafety level.

BIOSAFETY LEVEL 2 CHECKLIST:

- **Facilities should have:**
 - ✓ Biosafety manual
 - ✓ Self-closing doors
 - ✓ Sink (for handwashing & located near exit)
 - ✓ Laboratory bench
 - ✓ Windows fitted with screens
 - ✓ Adequate lighting for all activities
 - ✓ Autoclave available
- **Risk Group 1 and 2 Biological Agents:**
 - ✓ *Escherichia coli*
 - ✓ *Corynebacterium diphtheriae*
 - ✓ *Yersinia enterocolitica*
 - ✓ Influenza viruses
 - ✓ Human papilloma viruses
 - ✓ SARS-CoV-2
 - ✓ Clinical samples



- **Safety Equipment:**
 - ✓ Biological Safety Cabinet
 - ✓ Personal Protective Equipment (PPE) such as lab gowns, gloves, safety glasses, respiratory protection, etc.



BIOSAFETY LEVEL 2 CERTIFICATION

Certification of a BSL-2 laboratory applies to its engineering controls such as biosafety cabinets and the ventilation system.

A series of tests are performed by a qualified and certified engineer during the yearly certification of biosafety cabinets in accordance with international standards that includes:

- ✓ Inflow velocity test
- ✓ Downflow velocity test
- ✓ Filter integrity test
- ✓ Light intensity test
- ✓ Noise level test*
- ✓ UV intensity test*

* Optional for field testing

DECONTAMINATION

Decontamination guarantees ready and safe usage of BSC (after installation, relocation, or filter replacement) and laboratory to reduce microbial agents on surfaces. It is done by using formaldehyde, hydrogen peroxide, or other agents by trained service engineers.

OTHER TESTS AND PROCEDURES AVAILABLE**

- ✓ Fumigation
- ✓ Air volume and ventilation
- ✓ Pressure measurement
- ✓ Temperature and humidity test
- ✓ Pressure alarm system test
- ✓ Dust test
- ✓ Cleanliness test

** Where applicable

Reference:

Centers for Disease Control and Prevention. 2020. *Biosafety in Microbiological and Biomedical Laboratories. Sixth Edition.* https://www.cdc.gov/labs/pdf/SF_19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf

HAZARD IDENTIFICATION

Classification of Biological Agents

Risk Group	Implications	Availability of Prevention and Cure	Example
1	Low Risk, Unlikely to cause disease in healthy adult human	Readily available	<i>Escherichia coli</i> -K12 <i>Bacillus subtilis</i>
2	Moderate Risk, Rarely causes serious human disease	Readily available	<i>E. Coli</i> O157:H7 Clinical Samples Influenza viruses
3	High Risk, May cause serious disease	Some are available	<i>Mycobacterium tuberculosis</i> <i>Brucella</i> sp.
4	Very High Risk, Likely to cause very serious disease	Not usually available	Ebola virus

RISK CONTROL

The fundamental objective of laboratory biosafety is the containment of potentially hazardous biological agents and toxins. Containment describes as a combination of primary and secondary barriers, facility practices and procedures, and other safety equipment, including personal protective equipment (PPE), for managing the risks associated with handling and storing hazardous biological agents and toxins in a laboratory environment.

