

SAFETY EQUIPMENT OVERVIEW

BSL 3 Facilities require a Class II Biosafety Cabinet with ducting system (Type B) to ensure product, sample, and environment protection.

Biosafety Cabinet is an engineering control designed to contain potentially hazardous biological agents. This equipment utilizes ULPA or HEPA filters known to remove particles efficiently.

Labculture® Class II, Type B2 Biological Safety Cabinets



Airstream® Class II Type B2 Biological Safety Cabinets



EQUIPMENT MAINTENANCE

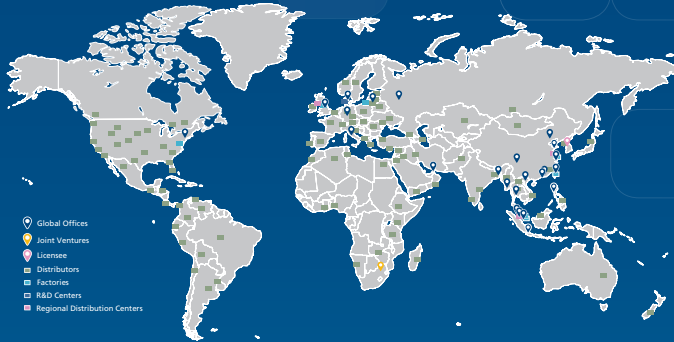
Biosafety cabinets should be field tested and certified upon installation and at least annually by using NSF Standard 49 methods. The standard is critical to provide personnel, product and environmental protection. It includes basic requirement for design, construction, and performance. It also has the 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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BSL 3 LABORATORY CERTIFICATION/VALIDATION



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Introduction

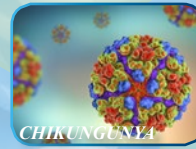
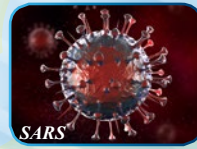
Biosafety Level 3 (BSL 3) facilities are frequently used for research, handling, or testing microbes that are classified as Risk Group 3 (RG3) agents. These biological agents can be easily transmitted by aerosols and constant exposure may lead to serious illness. RG3 agents represent high risk to the individual but a low risk to the community and some preventive interventions are available.

BIOSAFETY LEVEL 3 CHECKLIST:

- **Facilities should have:**
 - ✓ Controlled access
 - ✓ Restricted Work Areas
 - ✓ Self-closing, double door access
 - ✓ Proper signage (Biohazard Symbol)
 - ✓ Handwashing facilities and eye station
 - ✓ Decontamination of all waste and linens
 - ✓ Medical Surveillance
 - ✓ Negative Airflow



- **Biological Agents: Risk Group 1, 2, 3**
 - ✓ Ex. *Mycobacterium tuberculosis*
 - ✓ *Brucella* sp.
 - ✓ Yellow Fever
 - ✓ Chikungunya
 - ✓ SARS corona virus



- **Safety Equipment:**
 - ✓ Biological Safety Cabinet
 - ✓ HEPA / ULPA Filters

- **Personal protective equipment:**
 - ✓ Laboratory Coat, Gloves
 - ✓ Face / Eye Protection



BSL 3 LABORATORY VALIDATION

Laboratory Validation conducted by an NSF certified Test Engineer, Microbiologist, and an HVAC Engineer. These personnel perform a series of test to check whether the laboratory complies to the requirements of having a BSL3 facility.

- **The following test procedures are done:**
 - ✓ Fumigation
 - ✓ Air volume and ventilation volume measurement
 - ✓ Pressure measurement
 - ✓ Filter leak test
 - ✓ Laboratory airtight test
 - ✓ Airflow smoke test
 - ✓ Temperature and humidity test
 - ✓ Noise test
 - ✓ Illumination test
 - ✓ Pressure alarm system test
 - ✓ Dust test
 - ✓ Cleanliness test

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>Eschericia 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

Laboratory biosafety describes the containment principles, technologies and practices that are implemented to prevent the unintentional exposure to pathogens and toxins, or their accidental release.¹



¹World Health Organization. Laboratory biosafety manual. Third Edition. Geneva, World Health Organization, 2004