

Biological Safety

Assoc. Prof. Dr. İlber BÇYUK Wednesday, March 15, 2017

What is Biological Safety?

A Biological Safety is

The prevention of escape and the containment of biological agents, the handling of which are considered to be hazardous.

These procedures and measures include the handling of biological agents, safety as well as their production, isolation.

BioSafety is used to protect us from harmful organisms.





Why is it important?

Prevention of escape and containment of biological agents, the handling of which are considered to be hazardous.

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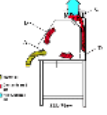
Biological Safety

Assoc. Prof. Dr. İlber BÇYUK Monday, November 2, 2016

What Are Biosafety Cabinets?

A Biosafety Cabinets Are:

Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials.



How to Open? (Always) Closing?

Always use the front panel controls to open and close the biosafety cabinet.

How to Close?

Always use the front panel controls to close the biosafety cabinet.

Biosafety is related to several fields:

There are five types of biosafety cabinets:




Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Wednesday, March 13, 2019

What Is Biological Safety?

A Biological Safety is :



The prevention of large-scale loss of biological integrity, focusing both on ecology and human health.

These prevention mechanisms include conduction of regular reviews of the biosafety in laboratory settings, as well as strict guidelines to follow.

Biosafety is used to protect us from harmful incidents.

Biosafety is related to several fields :



Biosafety Level :



- Any Question ?
Thank You ...

Biosafety level 4

BSL-4 is the highest level of biosafety. It is used for the most dangerous biological agents, which are highly infectious, cause severe disease, and are often fatal. BSL-4 laboratories are designed to prevent any release of the agent into the environment.

Biosafety level 3

BSL-3 is used for the most dangerous biological agents, which are highly infectious, cause severe disease, and are often fatal. BSL-3 laboratories are designed to prevent any release of the agent into the environment.

Biosafety level 2

BSL-2 is used for biological agents that are moderately hazardous. BSL-2 laboratories are designed to prevent any release of the agent into the environment.

Biosafety level 1

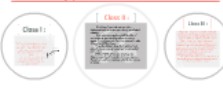
BSL-1 is used for biological agents that are not known to cause disease in healthy humans. BSL-1 laboratories are designed to prevent any release of the agent into the environment.

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2017

Show the 3 Types of Biological Safety Cabinets :



Biosafety level 3

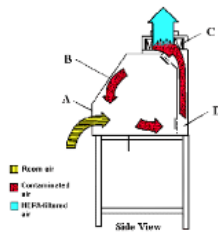
The cabinet is designed to contain and destroy all aerosols that are produced in the work area. The cabinet is designed to prevent any release of the agent into the environment.

Reference :

<https://www.cdc.gov/eids/content/default.asp?hl=BSL3>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL4>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL2>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL1>

What Are Biosafety Cabinets ?

A Biosafety Cabinets Are :



Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials.

Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :



Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

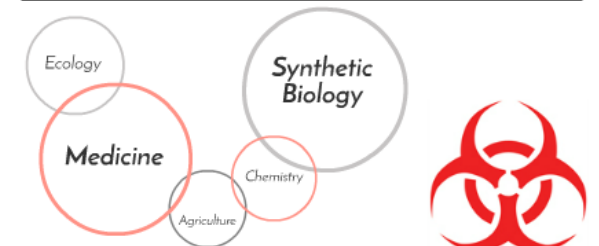
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Biosafety Level :



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Assoc. Prof. Dr. Ilker BUYUK

What Is Biologica

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

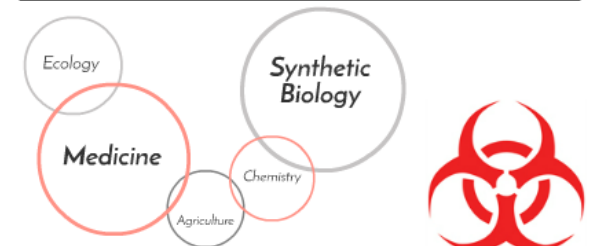
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Biosafety Level :

Biological Safety

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What Is Biological Safety?

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The prevention of large-scale loss of biological integrity, focusing both on ecology and human health.

These prevention mechanisms include conduction of regular reviews of the biosafety in laboratory settings, as well as strict guidelines to follow.

Biosafety is used to protect us from harmful incidents.

Biosafety is related to several fields :



Biosafety Level :



- Any Question ?
Thank You ...

Biosafety level 4

BSL-4 is the highest level of biosafety. It is used to handle the most dangerous and exotic agents that pose a high individual and community risk via inhalation exposure. Agents are not shared with other laboratories. Personnel are protected by wearing full-body, air-supplied, positive-pressure, chemical- and biological-resistant suits. All work is performed in Class II, Type A, biosafety cabinets. All waste is incinerated.

Biosafety level 3

BSL-3 is used to handle biological agents that are indigenous to humans and that may cause severe disease through inhalation. Personnel are protected by wearing lab coats, gloves, and face shields. All work is performed in Class II, Type B, biosafety cabinets. All waste is autoclaved.

Biosafety level 2

BSL-2 is used to handle biological agents that are commonly found in nature and that may cause moderate to severe disease. Personnel are protected by wearing lab coats, gloves, and face shields. All work is performed in Class II, Type A, biosafety cabinets. All waste is autoclaved.

Biosafety level 1

BSL-1 is used to handle biological agents that are not known to cause disease in healthy humans. Personnel are protected by wearing lab coats and gloves. All work is performed in Class II, Type A, biosafety cabinets. All waste is autoclaved.

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2017

Show Me 3 Types Of Biological Safety Cabinets :



Biosafety level 3

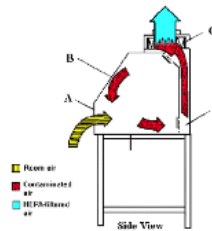
The purpose of BSL-3 is to handle biological agents that are indigenous to humans and that may cause severe disease through inhalation. Personnel are protected by wearing lab coats, gloves, and face shields. All work is performed in Class II, Type B, biosafety cabinets. All waste is autoclaved.

Reference :

<https://www.fda.gov/oc/ohrt/biosafety.html>
<https://www.cdc.gov/biosafety/biosafety.html>
<https://www.nidcd.nih.gov/health/biosafety>
<https://www.biosafety.com>

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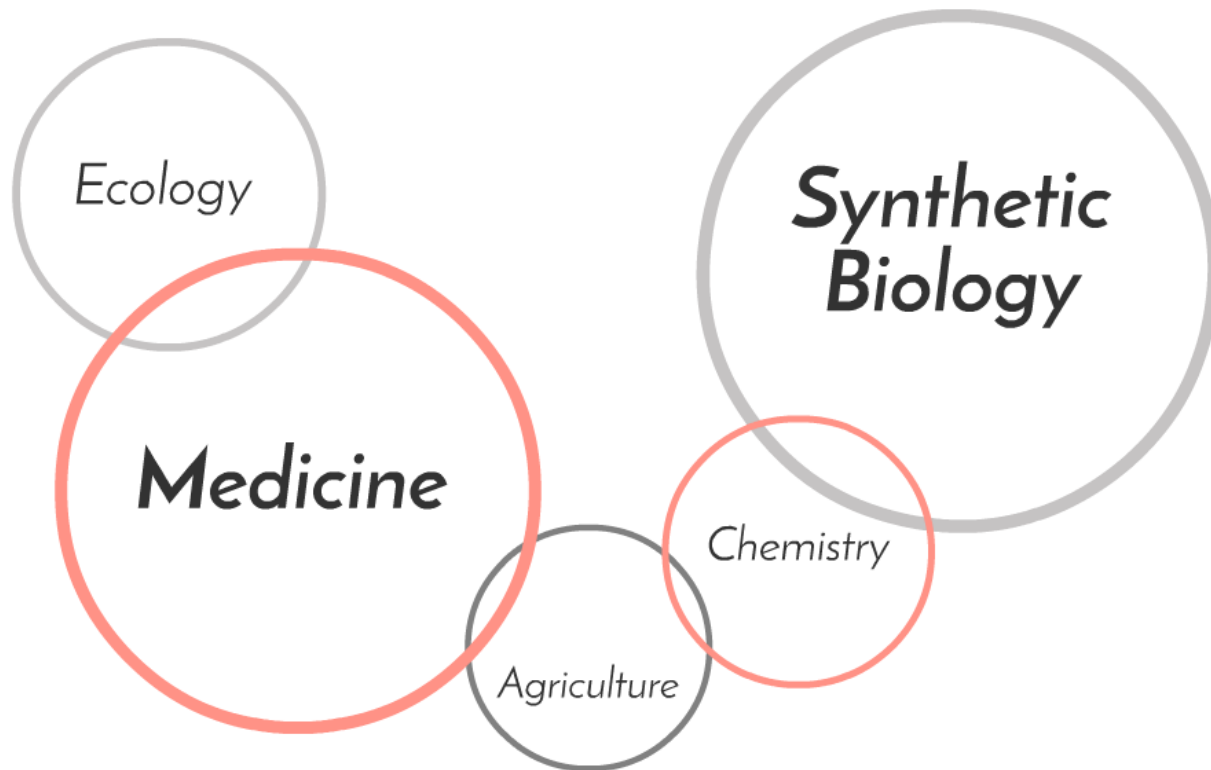
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Biosafety is related to several fields :





Ecology

Ch

Agriculture



Medicine

Agriculture



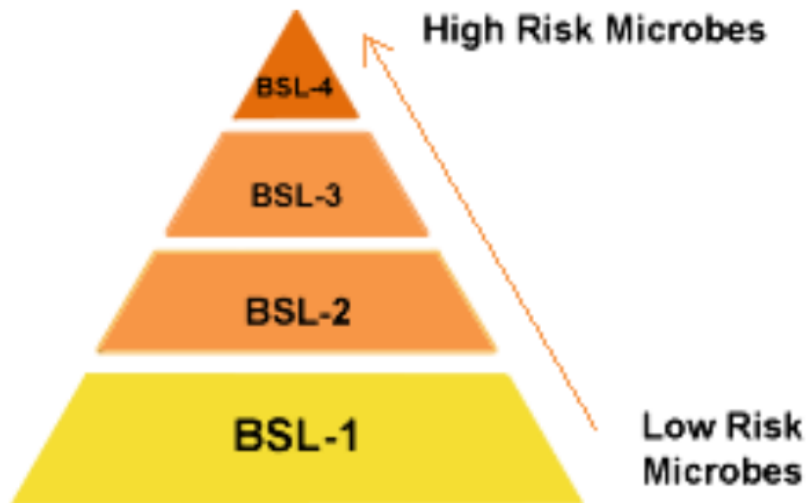
Chemistry

ulture



Synthetic Biology

Biosafety Level :



A biosafety level is a level of the biocontainment precautions required to isolate dangerous biological agents in an enclosed laboratory facility. The levels of containment range from the lowest biosafety level 1 (BSL-1) to the highest at level 4 (BSL-4).

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Biosafety Level :



Biosafety level is a level of the biocontainment or containment required to safely manage biological agents in an enclosed laboratory facility. The levels of containment range from the lowest biosafety level 1 (BSL-1) to the highest or level 4 (BSL-4).

- Any Question ?
Thank You ...

Biosafety level 4

BSL-4 is the highest level of biosafety. It is used to handle the most dangerous biological agents, which are capable of causing severe disease in humans and are transmitted through the air. BSL-4 laboratories are designed to prevent any release of these agents into the environment. They feature multiple layers of containment, including airlocks, HEPA filters, and a dedicated exhaust system.

Biosafety level 3

BSL-3 is used to handle biological agents that are highly infectious and can be transmitted through the air. BSL-3 laboratories are designed to prevent the escape of these agents into the environment. They feature airlocks, HEPA filters, and a dedicated exhaust system.

Biosafety level 2

BSL-2 is used to handle biological agents that are highly infectious and can be transmitted through the air. BSL-2 laboratories are designed to prevent the escape of these agents into the environment. They feature airlocks, HEPA filters, and a dedicated exhaust system.

Biosafety level 1

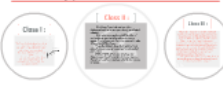
BSL-1 is the lowest level of biosafety. It is used to handle biological agents that are not highly infectious and are not transmitted through the air. BSL-1 laboratories are designed to prevent the escape of these agents into the environment. They feature airlocks and a dedicated exhaust system.

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Show the 3 Types of Biological Safety Cabinets :



Biosafety level 3

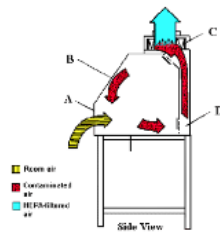
The biosafety level 3 (BSL-3) is used to handle biological agents that are highly infectious and can be transmitted through the air. BSL-3 laboratories are designed to prevent the escape of these agents into the environment. They feature airlocks, HEPA filters, and a dedicated exhaust system.

Reference :

<https://www.cdc.gov/eids/content/default.asp?hl=BSL3>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL2>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL1>

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Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :



Biosafety level 1

1

This level is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment .

Research with these agents may be performed on standard open laboratory benches without the use of special containment equipment and it is not necessary for Biosafety Level 1 labs to be isolated from the general building

It includes several kinds of bacteria and viruses including canine hepatitis, non-pathogenic *Escherichia coli*, as well as some cell cultures and non-infectious bacteria.

At this level, precautions against the biohazardous materials in question are minimal and most likely involve gloves and some sort of facial protection.



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At this level, precautions against the biohazardous materials in question are minimal and most likely involve gloves and some sort of facial protection.

Biosafety level 2



This level is similar to Biosafety Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It includes various bacteria and viruses that cause only mild disease to humans, or are difficult to contract via aerosol in a lab setting, such as hepatitis A, B, and C, orthopoxviruses (other than smallpox), influenza A, Lyme disease, Salmonella, mumps, measles

.. BSL-2 differs from BSL-1 in that:
laboratory personnel have specific training in handling pathogenic agents and are directed by scientists with advanced training;
access to the laboratory is limited when work is being conducted;
extreme precautions are taken with contaminated sharp items; and
certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment.

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or other physical containment
equipment.

Biosafety level 3

This level is applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal disease after inhalation.

It includes various bacteria, parasites and viruses that can cause severe to fatal disease in humans but for which treatments exist, such as, *Leishmania Donovanii*, SARS Coronavirus, Rabies Virus, Yellow Fever Virus, West Nile Virus.



Laboratory personnel have specific training in handling pathogenic and potentially lethal agents, and are supervised by competent scientists who are experienced in working with these agents.

- All procedures involving the manipulation of infectious materials are conducted within biological safety cabinets, specially designed hoods, or other physical containment devices, or by personnel wearing appropriate personal protective clothing and equipment. The laboratory has special engineering and design features.

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Laboratory personnel have specific training in handling pathogenic and potentially lethal agents, and are supervised by competent scientists who are experienced in working with these agents.

- All procedures involving the manipulation of infectious materials are conducted within biological safety cabinets, specially designed hoods, or other physical containment devices, or by personnel wearing appropriate personal protective clothing and equipment. The laboratory has special engineering and design features.

Biosafety level 4

4

This level is required for work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections, agents which cause severe to fatal disease in humans for which vaccines or other treatments are not available, such as Ebola virus, Lassa virus, Crimean-Congo hemorrhagic fever, and various other hemorrhagic diseases.

This level is also used for work with agents such as smallpox that are considered contagious enough to require the additional safety measures, regardless of vaccination availability. When dealing with biological hazards at this level the use of a positive pressure personnel suit, with a segregated air supply is mandatory. The entrance and exit of a level four biolab will contain multiple showers, a vacuum room, an ultraviolet light room, and other safety precautions designed to destroy all traces of the biohazard.

Members of the laboratory staff have specific and thorough training in handling extremely hazardous infectious agents and they understand the primary and secondary containment functions of the standard and special practices, the containment equipment, and the laboratory design characteristics.

Access to the laboratory is strictly controlled by the laboratory director.

The facility is either in a separate building or in a controlled area within a building, which is completely isolated from all other areas of the building

Building protocols for preventing contamination often use negatively pressurized facilities, which, even if compromised, would severely inhibit an outbreak of aerosol pathogens.

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Biosafety is related to several fields :



Biosafety Level :



- Any Question ?
Thank You ...

Biosafety level 4

BSL-4 is the highest level of biosafety. It is used to handle the most dangerous biological agents, which are capable of causing severe disease in humans and are transmitted through the air. BSL-4 laboratories are designed to prevent any release of these agents into the environment.

Biosafety level 3

BSL-3 is used to handle biological agents that are capable of causing severe disease in humans. These agents are not transmitted through the air. BSL-3 laboratories are designed to prevent any release of these agents into the environment.

Biosafety level 2

BSL-2 is used to handle biological agents that are capable of causing moderate to severe disease in humans. These agents are not transmitted through the air. BSL-2 laboratories are designed to prevent any release of these agents into the environment.

Biosafety level 1

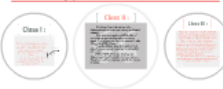
BSL-1 is the lowest level of biosafety. It is used to handle biological agents that are not known to cause disease in humans. BSL-1 laboratories are designed to prevent any release of these agents into the environment.

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2017

Show the 3 Types of Biological Safety Cabinets :



Biosafety level 3

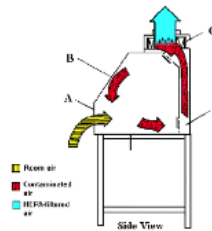
The cabinet is designed to handle biological agents that are capable of causing severe disease in humans and are transmitted through the air. BSL-3 cabinets are designed to prevent any release of these agents into the environment.

Reference :

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Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :



“ - Any Question ?
Thank You .. ”

Biosafety level 4 4

- # This level is required for work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections, agents which cause severe to fatal disease in humans for which vaccines or other treatments are not available, such as Ebola virus, Lassa virus, Crimean-Congo hemorrhagic fever, and various other hemorrhagic diseases.
- # This level is also used for work with agents such as smallpox that are considered contagious enough to require the additional safety measures, regardless of vaccination availability. When dealing with biological hazards at this level the use of a positive pressure personnel suit, with a segregated air supply is mandatory. The entrance and exit of a level four lab will contain multiple showers, a vacuum room, an ultraviolet light room, and other safety precautions designed to destroy all traces of the biohazard.
- # Members of the laboratory staff have specific and thorough training in handling extremely hazardous infectious agents and they understand the primary and secondary containment functions of the standard and special practices, the containment equipment, and the laboratory design characteristics.
- # Access to the laboratory is strictly controlled by the laboratory director.
- # The facility is either in a separate building or in a controlled area within a building, which is completely isolated from all other areas of the building.
- # Building protocols for preventing contamination often use negatively pressurized facilities, which, even if compromised, would severely inhibit an outbreak of aerosol pathogens.

Biosafety level 3 3

- This level is applicable to clinical diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal diseases after inhalation.
- It includes various bacteria, parasites and viruses that can cause severe to fatal disease in humans but for which treatments exist such as, Listeriosis, Diphtheria, SARS, Coronavirus, Rabies Virus, Yellow Fever Virus, West Nile Virus.
- Laboratory personnel have specific training in handling pathogenic and potentially lethal agents, and are supervised by competent workers who are experienced in working with these agents.
- All procedures involving the manipulation of infectious materials are conducted within biological safety cabinets, specially designed hoods, or other physical containment devices, or by personnel wearing appropriate personal protective clothing and equipment. The laboratory has special engineering and design features.

Biosafety level 2 2

- This level is similar to Biosafety Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It includes various bacteria and viruses that cause only mild disease to humans, or are difficult to contract via aerosol in a lab setting, such as hepatitis A, B, and C, orthopoxviruses (other than smallpox), influenza A, Lyme disease, Salmonella, mumps, measles.
- BSL-2 differs from BSL-1 in that laboratory personnel have specific training in handling pathogenic agents and are directed by scientists with advanced training. access to the laboratory is limited when work is being conducted, extreme precautions are taken with contaminated sharp items, and certain procedures in which infectious aerosols or splashes may be created are conducted in biological safety cabinets or other physical containment equipment.

Biosafety level 1 1

- This level is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment.
- Research with these agents may be performed on standard open laboratory benches without the use of special containment equipment and it is not necessary for Biosafety Level 1 labs to be isolated from the general building.
- It includes several kinds of bacteria and viruses including certain hepatitis, non-pathogenic Escherichia coli, as well as some cell cultures and non-infectious bacteria.
- At the least, procedures against the biohazardous materials in question are minimal and wear body-protection gloves and some sort of facial protection.



Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2015

There Are 3 Types Of Biological Safety Cabinets :



Class I :

The Class I biological safety cabinet is an open fronted cabinet. The cabinet provides a HEPA filtered outlet of air and the recirculation of air. The cabinet is filtered by HEPA filter.

The Class I biological safety cabinet will provide personnel, environmental and product protection.

While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture viable chemical agents.

Class II :

The Class II biological safety cabinet is an open fronted cabinet. The cabinet provides a HEPA filtered outlet of air and the recirculation of air. The cabinet is filtered by HEPA filter.

The Class II biological safety cabinet will provide personnel, environmental and product protection.

While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture viable chemical agents.

Class III :

The Class III biological safety cabinet is a totally enclosed cabinet. The cabinet provides a HEPA filtered outlet of air and the recirculation of air. The cabinet is filtered by HEPA filter.

The Class III biological safety cabinet will provide personnel, environmental and product protection.

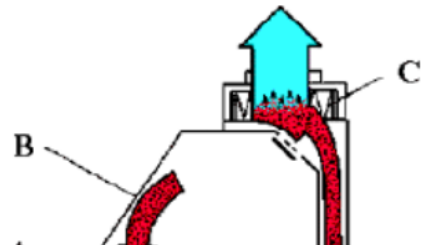
While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture viable chemical agents.

Biosafety level 3

Personnel protection provided by Class I and Class II cabinets is dependent on the inward airflow. Since the flow velocities are similar, they generally provide an equivalent level of personnel protection. The use of these cabinets, however, is not appropriate for containment of highly-risk infectious agents because aerosols may accidentally escape through the open front. When Class III cabinets are required, all procedures involving infectious agents should...

The majority of biological safety cabinets purchased at Ankara University are the

What Are Biosafety Cabinets ?

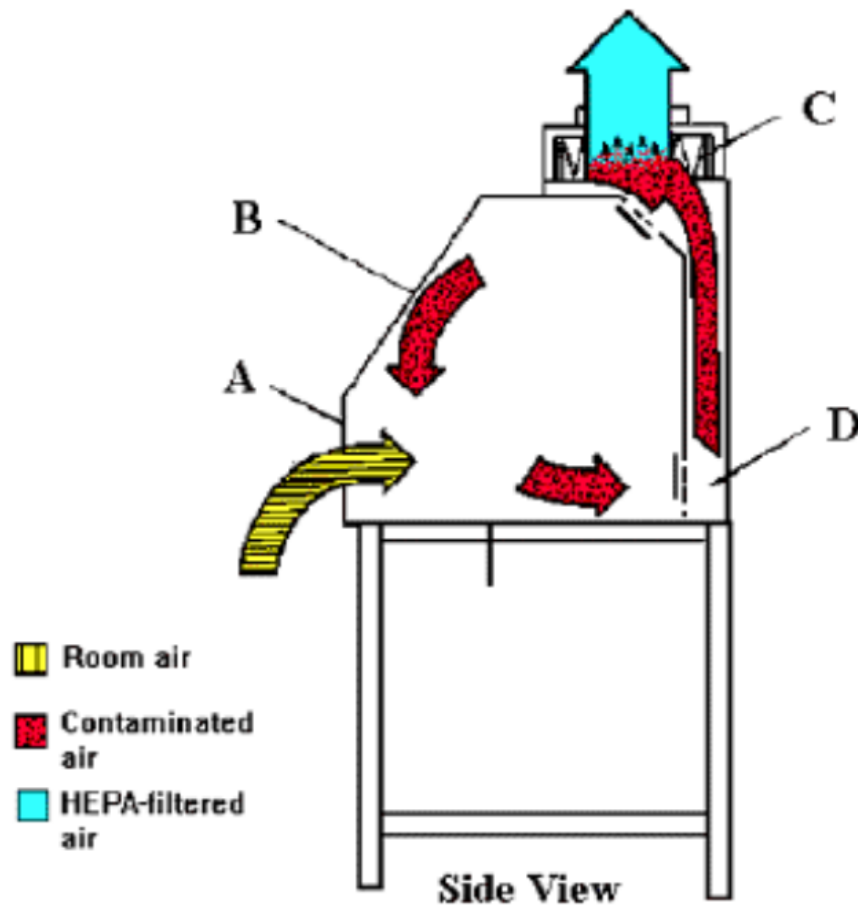


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Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials

There Are 3 Types Of Biological Safety Cabinets :



Class I :

The Class I biological safety cabinet is an open front negative pressure cabinet. The exhaust air from the cabinet is filtered by a high-efficiency particulate air (HEPA) filter.

The Class I biosafety cabinet will provide personnel and environmental protection, but not product protection.



Class II :

The Class II vertical laminar flow biological cabinet is an open front, ventilated cabinet.

This cabinet provides a HEPA filtered, recirculated mass airflow within the work space. The exhaust air from the cabinet is also filtered by HEPA filters.

Thus, the Class II biosafety cabinet will provide personnel, environment and product protection.

While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture volatile chemicals or gases.

Class III :

The Class III cabinet is a totally enclosed ventilated cabinet of gas-tight construction. Operations within the Class III cabinet are conducted through attached rubber gloves.

When in use, the Class III cabinet is maintained through negative air pressure of at least 0.5 inches water gauge. Supply air is drawn into the cabinet through HEPA filters. The cabinet exhaust air is filtered by two HEPA filters, installed in series, before discharge outside of the facility.

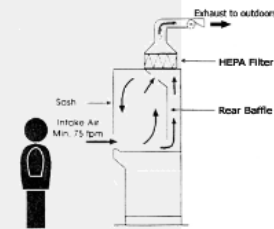
The exhaust fan for the Class III cabinet is generally separate from the exhaust fans of the facility's ventilation system.

Biosafety level 3

Class I :

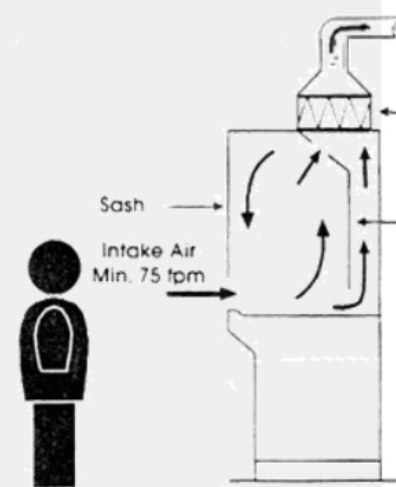
The Class I biological safety cabinet is an open front negative pressure cabinet. The exhaust air from the cabinet is filtered by a high-efficiency particulate air (HEPA) filter.

The Class I biosafety cabinet will provide personnel and environmental protection, but not product protection.



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The Class I biosafety cabinet will provide personnel and environmental protection, but not product protection.



Class II :

The Class II vertical laminar flow biological cabinet is an open front, ventilated cabinet.

This cabinet provides a HEPA filtered, recirculated mass airflow within the work space. The exhaust air from the cabinet is also filtered by HEPA filters.

Thus, the Class II biosafety cabinet will provide personnel, environment and product protection.

While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture volatile chemicals or gases.

The Class II vertical laminar flow biological cabinet is an open front, ventilated cabinet.

This cabinet provides a HEPA filtered, recirculated mass airflow within the work space. The exhaust air from the cabinet is also filtered by HEPA filters.

Thus, the Class II biosafety cabinet will provide personnel, environment and product protection.

While HEPA filters are effective for trapping particulates and infectious agents, these filters will not capture volatile chemicals or gases.

Class III :

The Class III cabinet is a totally enclosed ventilated cabinet of gas-tight construction. Operations within the Class III cabinet are conducted through attached rubber gloves.

When in use, the Class III cabinet is maintained through negative air pressure of at least 0.5 inches water gauge. Supply air is drawn into the cabinet through HEPA filters. The cabinet exhaust air is filtered by two HEPA filters, installed in series, before discharge outside of the facility.

The exhaust fan for the Class III cabinet is generally separate from the exhaust fans of the facility's ventilation system

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Biosafety level 3

Personnel protection provided by Class I and Class II cabinets is dependent on the inward airflow. Since the face velocities are similar, they generally provide an equivalent level of personnel protection. The use of these cabinets alone, however, is not appropriate for containment of highest-risk infectious agents because aerosols may accidentally escape through the open front. When Class III cabinets are required, all procedures involving infectious agents (usually Classes 3, 4 or 5) are performed within them.

The majority of biological safety cabinets purchased at Ankara University are the Class II cabinet. The Class II cabinet is the most versatile and economical one available on the market. It is suitable for the containment of biohazardous materials and unlike the Class I biosafety cabinet, it is also suitable as a sterile environment for cell cultures

Some laboratories have purchased laminar flow clean benches for work which may have to be performed in a Class II biosafety cabinet. A laminar flow clean bench will not provide personnel protection since the air is not HEPA-filtered prior to exhaust across the work area. A laminar flow clean bench **MUST NOT BE USED** for any work with Class 2 or 3 agents.

Personnel protection provided by Class I and Class II cabinets is dependent on the inward airflow. Since the face velocities are similar, they generally provide an equivalent level of personnel protection. The use of these cabinets alone, however, is not appropriate for containment of highest-risk infectious agents because aerosols may accidentally escape through the open front. When Class III cabinets are required, all procedures involving infectious agents (usually Classes 3, 4 or 5) are performed within them.

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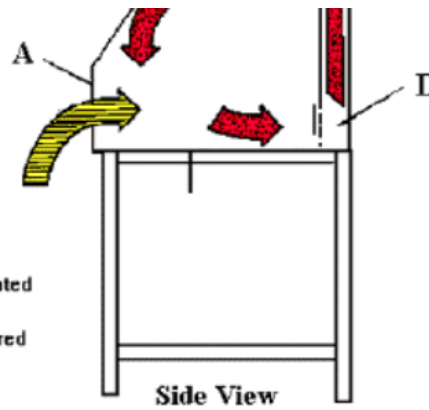
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agents may be exposed to a chemical agent may incidentally escape through the open front. When Class II cabinets are required, all procedures involving infectious agents (except Class I, type B) are performed within them.

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- Room air
- Contaminated air
- HEPA-filtered air

Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials

Reference :
https://web.stanford.edu/dept/EHS/prod/researchlab/bio/docs/types_biosafety_cabinets.pdf
<http://www.kacst.edu.sa/en/about/stc/Pages/BiologicalSafety.aspx>

Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :

Class II, type A:

This does not have to be vented, which makes it suitable for use in laboratory rooms which cannot be ducted. This cabinet is acceptable for use of low to moderate risk agents in the absence of volatile toxic chemicals and volatile radionuclides.

Class II, type B1:

This cabinet must be vented, with 30% of the air exhausted from the cabinet while 70% is recirculated back into the room. This cabinet may be used with etiologic agents treated with minute quantities of toxic chemicals and trace amounts of radionuclides required as an adjunct to microbiological studies if work is done in the directly exhausted portion of the cabinet, or if the chemicals or radionuclides will not interfere with the work when recirculated in the downflow air.

Class II, type B2:

This cabinet must be totally exhausted, with 100% of the air exhausted through a dedicated duct. This cabinet may be used with etiologic agents treated with toxic chemicals and radionuclides required as an adjunct to microbiological studies.

Class II, type B3:

This must be vented, 70% of the air is exhausted from the cabinet while 30% is recirculated. This cabinet may be used with etiologic agents treated with minute quantities of toxic chemicals and trace quantities of radionuclides that will not interfere with work if recirculated in the downflow air.





Class II, type A:

Class II, type A:

This does not have to be vented, which makes it suitable for use in laboratory rooms which cannot be ducted.

This cabinet is acceptable for use of low to moderate risk agents in the absence of volatile toxic chemicals and volatile radionuclides.

DEFINITION III.



Class II, type B1 :

This cabinet must be vented, with 30% of the air exhausted from the cabinet while 70% is recirculated back into the room.

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Class II, type B1 :

Class II, type B2 :

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uch a

Class II, type B2 :

This cabinet must be totally exhausted, with 100% of the air exhausted through a dedicated duct. This cabinet may be used with etiologic agents treated with toxic chemicals and radionuclides required as an adjunct to microbiological studies

Class B1 :

A thick black diagonal line enters from the left side of the frame and passes through a light gray circle. The line is solid and has a consistent thickness. The circle is a thin, light gray outline. The text 'Class II, type B3 :' is centered within the circle.

Class II, type B3 :

type B2 :

This must be vented. 70% of the air is exhausted from the cabinet while 30% is recirculated. This cabinet may be used with etiologic agents treated with minute quantities of toxic chemicals and trace quantities of radionuclides that will not interfere with work if recirculated in the downflow air.

Class II, type B3 :

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Wednesday, March 13, 2019

What Is Biological Safety?

A Biological Safety is :



The prevention of large-scale loss of biological integrity, focusing both on ecology and human health.

These prevention mechanisms include conduction of regular reviews of the biosafety in laboratory settings, as well as strict guidelines to follow.

Biosafety is used to protect us from harmful incidents.

Biosafety is related to several fields :



Biosafety Level :



- Any Question ?
Thank You ...

Biosafety level 4

BSL-4 is the highest level of biosafety. It is used for the most dangerous biological agents, which are highly infectious, cause severe disease, and are resistant to standard disinfectants. Work is performed in a Class III biosafety cabinet.

Biosafety level 3

BSL-3 is used for work with agents that are highly infectious, cause severe disease, and are resistant to standard disinfectants. Work is performed in a Class II biosafety cabinet.

Biosafety level 2

BSL-2 is used for work with agents that are moderately infectious, cause moderate disease, and are not resistant to standard disinfectants. Work is performed in a Class II biosafety cabinet.

Biosafety level 1

BSL-1 is used for work with agents that are not highly infectious, cause mild disease, and are not resistant to standard disinfectants. Work is performed in a Class I biosafety cabinet.

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2017

Show the 3 Types of Biological Safety Cabinets :



Biosafety level 3

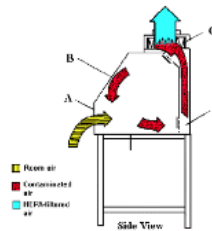
BSL-3 is used for work with agents that are highly infectious, cause severe disease, and are resistant to standard disinfectants. Work is performed in a Class II biosafety cabinet.

Reference :

<https://www.cdc.gov/eids/content/default.asp?hl=BSL3>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL2>
<https://www.cdc.gov/eids/content/default.asp?hl=BSL1>

What Are Biosafety Cabinets ?

A Biosafety Cabinets Are :



Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials.

Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :



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https://web.stanford.edu/dept/EHS/prod/researchlab/bio/docs/types_biosafety_cabinets.pdf

<http://www.kacst.edu.sa/en/about/stc/Pages/BiologicalSafety.aspx>

BSL-1

LOW RISK
Microbes

laboratory facility. The levels of containment range from the lowest biosafety level 1 (BSL-1) to the highest at level 4 (BSL-4).

“ - Any Question ?
Thank you .. ”

Biosafety level 1

1

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Wednesday, March 13, 2019

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Biosafety is related to several fields :



Biosafety Level :



- Any Question ?
Thank You ...

Biosafety level 4

4

BSL-4 is the highest and most stringent level of biocontainment. It is used for the study and manipulation of dangerous and exotic agents that cause severe disease by inhalation and for which there is no vaccine or treatment. Agents are contained in a laboratory facility designed to prevent any exposure to laboratory workers, the community, and the environment.

Biosafety level 3

3

BSL-3 is used for the study and manipulation of infectious agents that cause severe disease by inhalation, but for which there is a vaccine or treatment. Agents are contained in a laboratory facility designed to prevent any exposure to laboratory workers, the community, and the environment.

Biosafety level 2

2

BSL-2 is used for the study and manipulation of infectious agents that cause moderate disease by ingestion or by contact with broken skin or mucous membranes. Agents are contained in a laboratory facility designed to prevent any exposure to laboratory workers, the community, and the environment.

Biosafety level 1

1

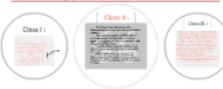
BSL-1 is used for the study and manipulation of non-hazardous biological agents. Agents are contained in a laboratory facility designed to prevent any exposure to laboratory workers, the community, and the environment.

Biological Safety

Assoc. Prof. Dr. Ilker BUYUK

Monday, November, 2017

Show Me 3 Types of Biological Safety Cabinets :



Biosafety level 3

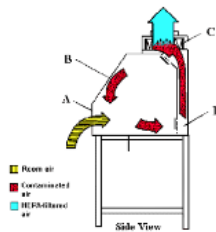
BSL-3 is used for the study and manipulation of infectious agents that cause severe disease by inhalation, but for which there is a vaccine or treatment. Agents are contained in a laboratory facility designed to prevent any exposure to laboratory workers, the community, and the environment.

Reference :

<https://www.cdc.gov/od/ohrt/ehp/ehp/ehp.html>
<https://www.cdc.gov/od/ohrt/ehp/ehp/ehp.html>
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What Are Biosafety Cabinets ?

A Biosafety Cabinets Are :



Biosafety cabinets are used to provide primary containment in the laboratory when the investigator is using potentially infectious materials

Biosafety is related to several fields :

THERE ARE FOUR TYPES OF CLASS II CABINETS :

