SAFETY CABINETS FOR PROTECTED WORK IN LABORATORIES AND CLEAN ROOMS

Laboratories work with challenging substances such as microorganisms, toxins and aerosols. Equipping the laboratory with safety cabinets is essential to ensure the safety of the laboratory staff, the environment and the working material. Thus, genetic and microbiological analyses, as well as work on cell cultures, can be carried out with the greatest possible protection.

Safety cabinets have a casing, which means that microorganisms and aerosols cannot escape the air flow of the cabinet but are removed directly. Due to the limited space available on an optimally ventilated work surface, they are also referred to as sterile benches or sterile chambers.

Compliance with protection objectives is paramount for safety cabinets: the casing limits work with potentially hazardous substances to the space of the chamber. In this way, the workbench provides safety for the laboratory personnel carrying out the work, as substances that may be hazardous to health cannot easily escape from the room.

In addition, depending on the cabinets, the working materials are protected from possible contamination of the outside air. According to the respective requirements, the safety cabinets are divided into three classes.

Learn more about safety standards in the laboratory

SAFETY CLASSES FOR CABINETS

When working in the laboratory, personnel and hazardous substances are protected by various safety measures. The aim is to create a safe working environment. Depending on the requirements of the laboratory and the object of work, safety cabinets are divided into different safety levels.

- **Class I - Used exclusively to protect the laboratory personnel**
- **Class II - Used to protect the laboratory personnel and the work object**
- **Class III - Offers increased protection of the personnel as well as increased protection of the work object**

CLASS I - SAFETY CABINETS FOR THE PROTECTION OF LABORATORY PERSONNEL

In class I sterile chambers, the air is extracted from the interior of the safety cabinet through a particulate filter. This prevents the escape of airborne organisms, spores or aerosols.

Part of the extracted air is returned to the laboratory area along the front of the workbench. For this purpose, a powerful ventilation system is installed above the area, which prevents draughts in the laboratory room and ensures efficient air circulation.

Class I safety workbenches are designed to protect laboratory personnel. The air in the workbench working area is fed from the room air and is not pre-filtered.

CLASS II - SAFETY CABINETS FOR THE PROTECTION OF THE LABORATORY PERSONNEL AND THE WORK OBJECT

Class II safety cabinets have two or three filters (mostly HEPA standard). The fresh air drawn in is cleaned before it comes into contact with the work material, which prevents potential contamination.

Part of the filtered exhaust air blows downwards in a uniform flow as an "air curtain" along the partially opened front window and is fed back to the filter together with the room air drawn in. The flowing barrier minimises the risk of particles from inside the safety cabinet entering the laboratory environment through the front window.

CLASS III - SAFETY CABINETS WITH INCREASED PROTECTION OF PERSONNEL AND THE WORK OBJECT

Class III safety cabinets (also called glove boxes) are hermetically

sealed and therefore meet the highest safety requirements for laboratory personnel, working materials and the environment. They have built-in gloves and air locks through which tools and working materials are brought in. Both the supply air and the extract air are passed through a highly efficient particle filter. This maintains a negative pressure inside so that no potentially contaminated room air escapes in the event of a leak.

TROX SAFETY CABINETS TYPE TLF 4.0 - MEETS THE FOLLOWING CLASSES

SAFETY CABINET CLASS II A1

Class II A1 cabinets are suitable for handling products with low or medium biological risk and should not be used for toxic or volatile products.

In Class II A1 safety cabinets, 30% of the total volume is fed into the cabinet as an air curtain via the front sash opening and 70% is circulated as recirculation air from the cabinet via a HEPA. 30% of the total volume is released back into the room via a corresponding filter stage.

SAFETY CABINET CLASS II A2

Class II A2 cabinets are suitable for applications involving small amounts of radioisotopes or toxic volatiles.

The safety cabinets of Class II A2 correspond to Class II A1 with the difference that 30% of the air is discharged into the open air via an exhaust air system.

SAFETY CABINET CLASS II B2

Class II B2 cabinets are designed for use with harmful chemicals, radioisotopes and volatile substances that are toxic even in small quantities.

Here, 70% of the air is fed into the cabinet via a HEPA filter and 30% as an air curtain via the front sash opening. In the process, 100% of the air is led out into the open via an exhaust air system equipped with appropriate filters.

CONSULTING AND PROJECT DEVELOPMENT

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