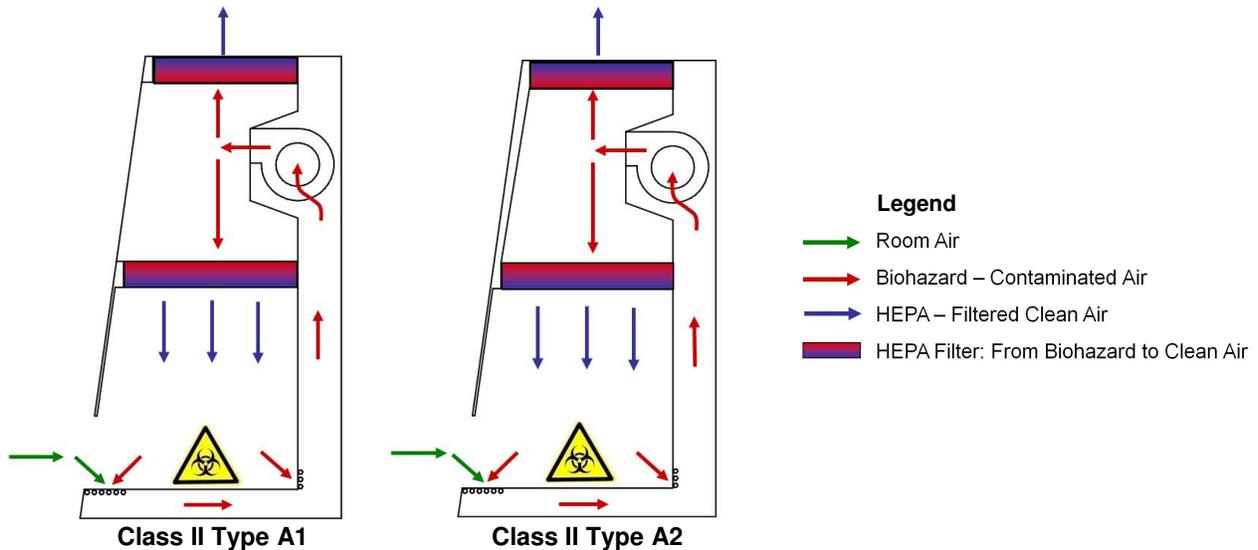


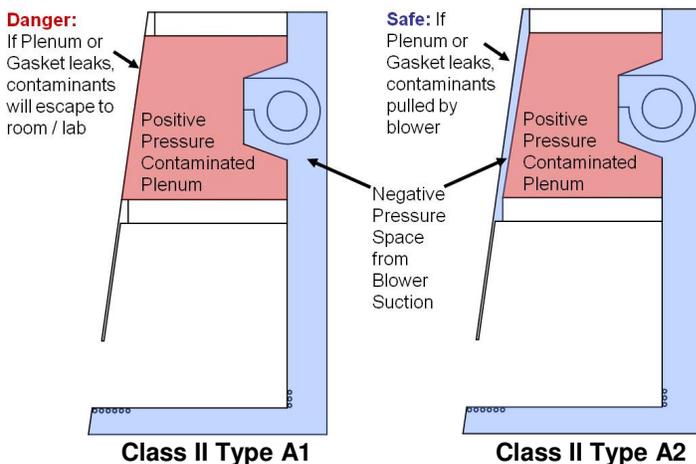
Class II Type A1 and Class II Type A2 Biosafety Cabinets

Alexander Atmadi | Esco Micro Pte. Ltd.

Class II Type A cabinets are the most common biosafety cabinets, which accounts for about 90% of all biosafety cabinets in the world. According to the 2002 version of NSF/ANSI 49 standard for biosafety cabinets, Class II Type A cabinets are divided into two variants: Type A1 and Type A2, with the airflow pattern as below:



Despite the airflow pattern is identical, the important differentiating factor is that on the A1 cabinet, the contaminated plenum is bordering ambient air, where on the A2 cabinet, it is surrounded by negative pressure, as illustrated below:



The red color indicates the contaminated plenum under positive pressure, which is the most dangerous part of the cabinet. The blue color indicates the negative pressure area created by the blower.

On the A1 cabinet, if there is a leak on the “red” plenum, HEPA filter gasket, or front cover, then the contaminants will be pushed outside to the room by the positive pressure, so this is a dangerous design.

On the A2 cabinet, the “red” plenum is surrounded by the “blue” plenum. If there is a leak, the contaminants will be pulled back by the negative pressure, back inside the plenum, so this is a safe design.

The serious danger of the A1 cabinet design is well-recognized by NSF, so in their 2008 version of the NSF/ANSI 49 standard, type A1 is deleted from the standard. For the 2008 standard, NSF make it mandatory that all biologically contaminated plenums must be under negative pressure or surrounded by negative pressure ducts and plenums. Positive pressure exterior plenums (i.e. not surrounded by negative plenum) are no longer allowed on any Class II biosafety cabinet, and no longer recognized as a biosafety cabinet.

References

- NSF International. (2002). *Standard No.49 for Class II (Laminar Flow) Biohazard Cabinetry*. Ann Arbor, MI, USA
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