Airtightness measurement in clean rooms

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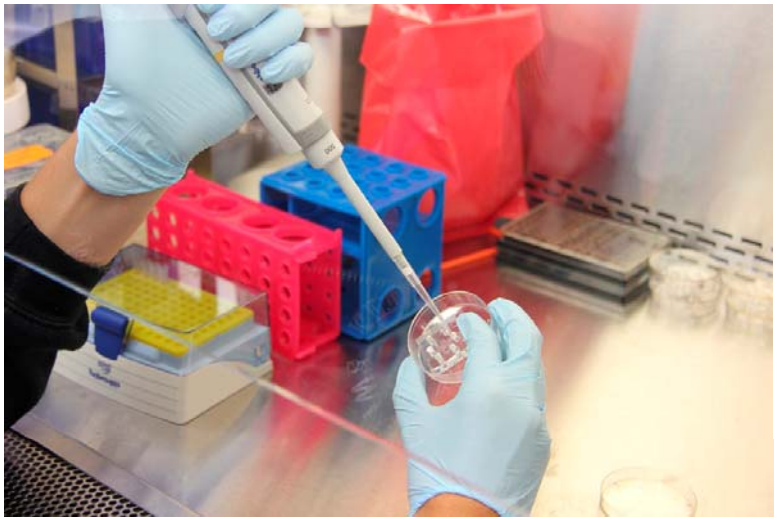
What are clean rooms?

In clean rooms the air should be as clean as possible, i.e. the number of "particles" (airborne solid or liquid particles) or germs should be kept as low as possible.

Rooms of this kind exist in the electrical industry (production, research), medical and food research, among others.



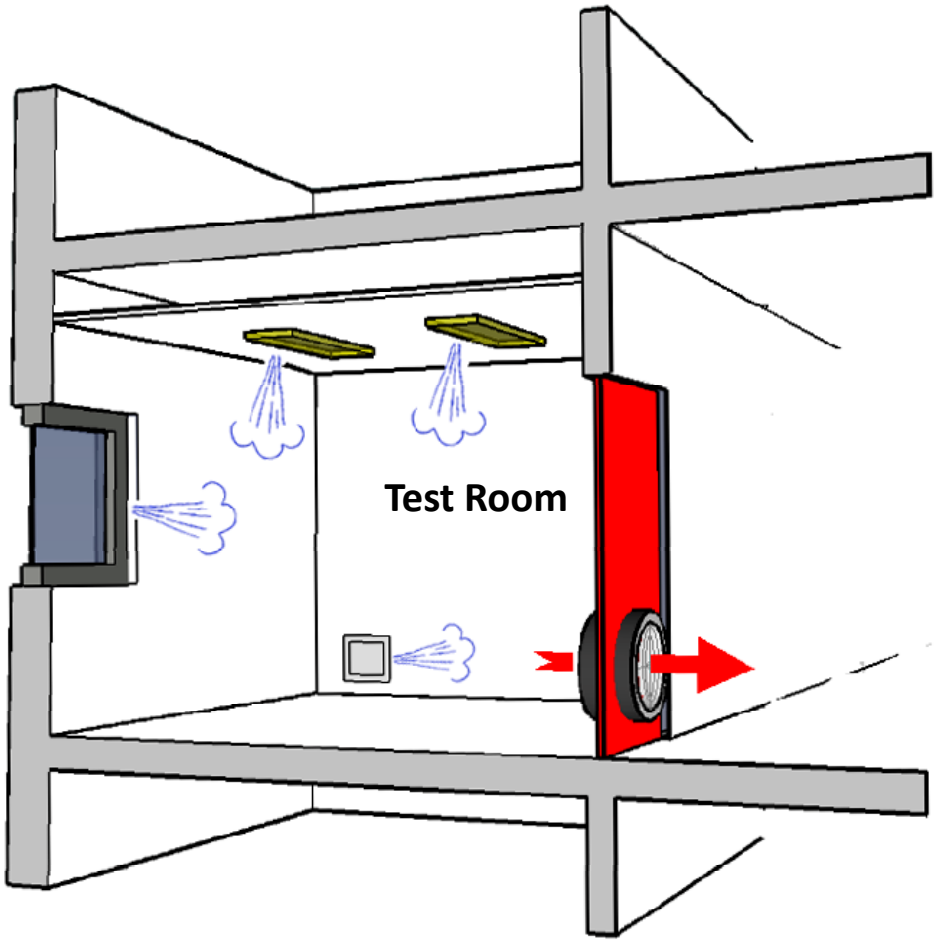
The envelope of these rooms must be particularly tight to prevent the ingress of harmful substances from the outside.

Fotos: pixabay.com

Application

If the exposure to e.g. particles or germs in the test object is too high, the BlowerDoor measurement can be used to locate leaks in the room envelope. According to VDI guidelines, the tightness of these rooms can be measured.

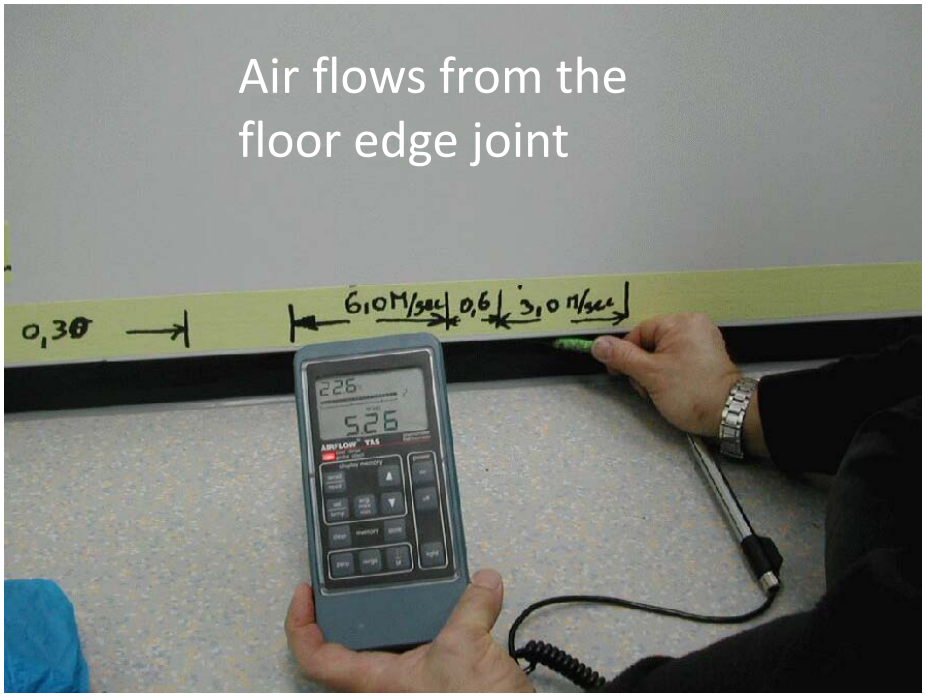
Measurement set-up

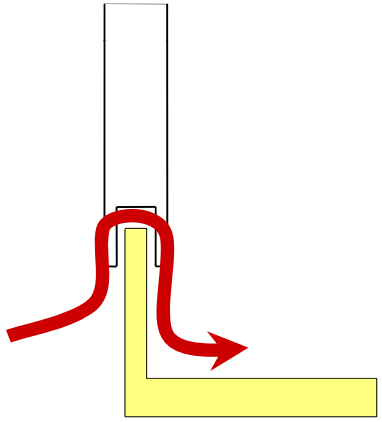


- Installation of the measuring device in a (sluice) door or window
- For leakage location: Set test chamber to negative pressure

Locate leaks at negative pressure

Connection joint wall panel to floor

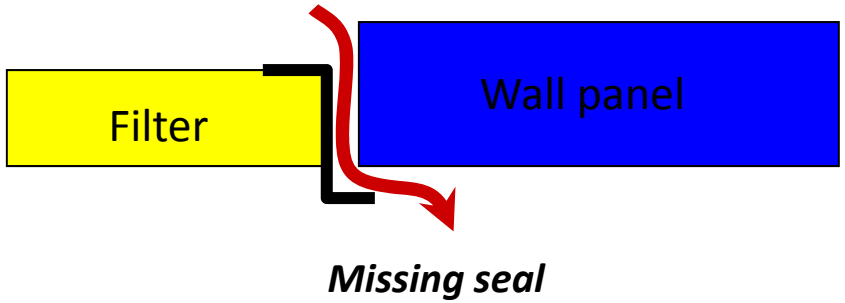




Missing seal

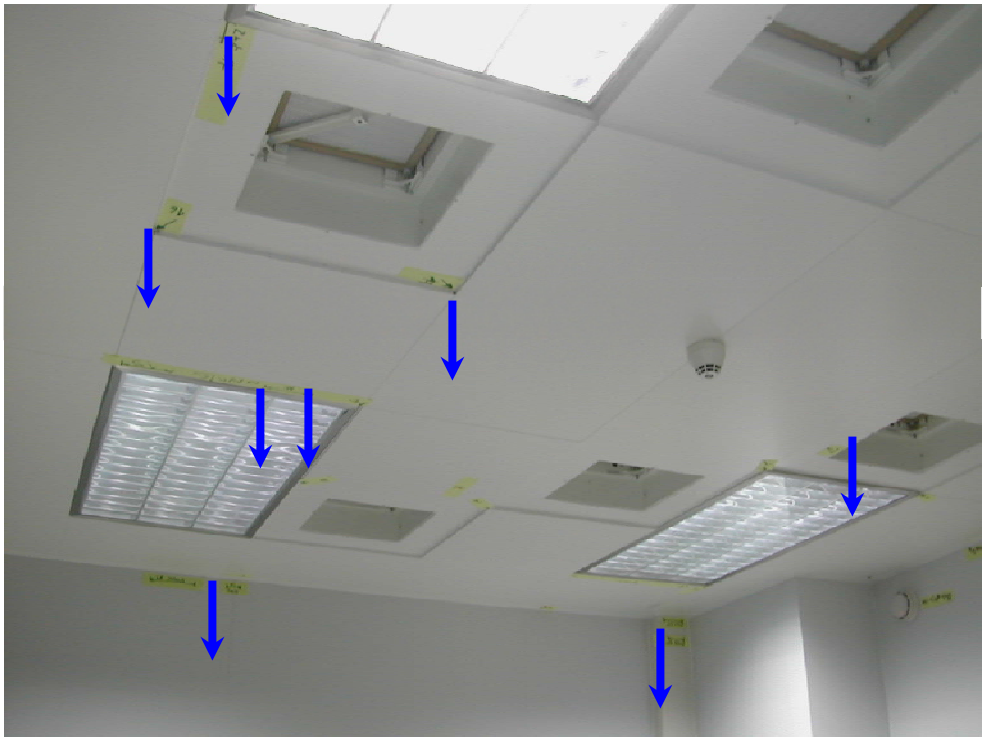
Locate leaks at negative pressure

Connection joints wall panel on filter frame



Locate leaks at negative pressure

Connection joints in room ceiling



Note:
Check each individual joint

Suitable measuring equipment

- Measuring system BlowerDoor Standard, BlowerDoor MiniFan and Minneapolis Micro Leakage Meter
- Fogger or anemometer for leakage detection

Basics

- VDI 2083 Part 19: Cleanroom technology – Tightness of containments – Classification, planning, and testing, Issue German/English; 2018-08

Literature and links

- Daniel Jung: Trotz neuer Norm Unsicherheiten bei der Dichtheit von Reinräumen; in: Ernst & Sohn Spezial 2017 Bauten des Gesundheitswesens
- Michael Kuhn: VDI 2083 Blatt 19 Dichtheit von Containments – Klassifizierung, Planung, Prüfung; in: Ernst & Sohn Spezial 2018 Bauten des Gesundheitswesens

  Both papers are available in German language for free download: https://www.blowerdoor.de/de/training/dichtheit-von-reinraeumen/
- www.cleanroom-online.com