IEA-EBC Annex 78: Substituting Ventilation by Gas Phase Air Cleaning. An industry webinar

Proposed plan for developing a new testing standard

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ONGONIG STANDARDISATION

- ISO TC146/SC6/WG25
  - ISO DIS 16000-44:2022: Test method for measuring perceived indoor air quality for use in testing the performance of gas phase air cleaners
- ISO TC142/WG8: Gas Phase Air Cleaning Devices and Media
  - ISO/PWI 23743 “Testing of gas phase air cleaners for improving perceived indoor air quality”.

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PERCEIVED AIR QUALITY

INTERNATIONAL STANDARD **ISO 16000-28**

First edition
2012-03-15

Indoor air —

Part 28:
Determination of odour emissions from building products using test chambers

Air intérieur —

Partie 28: Détermination des émissions d'odeurs des produits de construction au moyen de chambres d'essai

Test Panel
- Trained
- Untrained

Odour
- Acceptance
- Intensity
- Hedonic tone

Examples of diffuser and mask used for odour evaluatio

Figure C.1 — Diffuser

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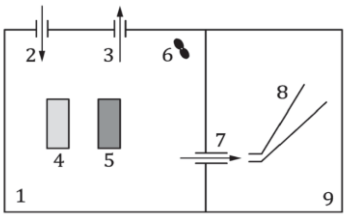
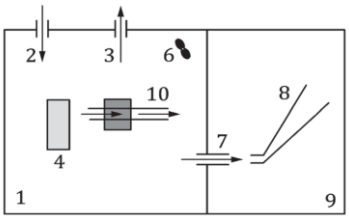
ISO DIS 16000-44:2022: Test method for measuring perceived indoor air quality for use in testing the performance of gas phase air cleaners



A test room for a stand alone air cleaner



A test room for an in duct air cleaner

1 test chamber
2 clean air supply inlet
3 exhaust outlet
4 emission source
5 An air cleaner
6 mixing fan
7 tube or duct
8 sniffing device,
9 front/anterior space in which human panel enter
10 in duct air cleaner

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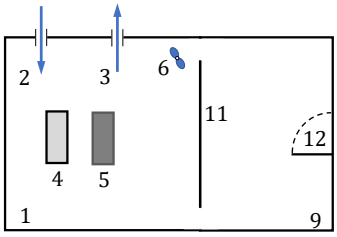
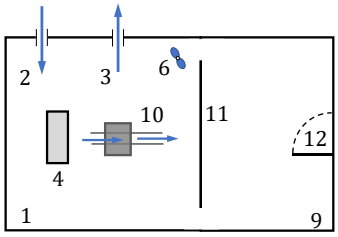
ISO DIS 16000-44:2022: Test method for measuring perceived indoor air quality for use in testing the performance of gas phase air cleaners



A test room for a stand alone air cleaner



A test room for an in duct air cleaner

1 test chamber/room
2 clean air supply inlet
3 exhaust outlet
4 odour emission source
5 standalone air cleaners
6 mixing fan
7 tube or duct
8 sniffing device,
9 front/anterior space in which human panel enter
10 in duct air cleaner
11 partition
12 door for access

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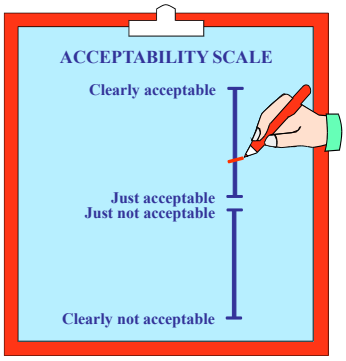
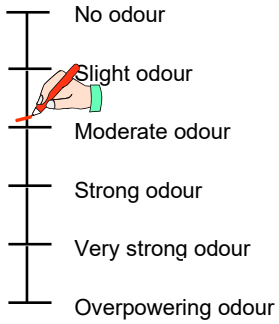
PERCEPTION SCALES





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ISO/PWI 23743 "Testing of gas phase air cleaners for improving perceived indoor air quality".

- An AdHoc/task force group under ISO TC142WG8 will based on the results from the testing at DTU start developing the concept for a standard.
- Activation of the PWI expected in September 2023
- The test method developped at DTU will be used at one or two other universities during 2023-24
- End report from Annex 78 on a test method to be available June, 2024

Issues

- International Standards for Ventilation (Indoor Air Quality) like EN16798-1, ISO17772-1 and ASHRAE 62.1 are mainly based on criteria for the Perceived Air Quality (PAQ), sometimes expressed as levels of CO_2 as a tracer for emission from occupants.
- If air cleaning is used, an equivalent level of air quality will be reached at higher CO_2 concentrations.
- It is also assumed that when ventilation is used for PAQ, the required ventilation will also dilute other substances like Radon, VOCs.
- The decreased ventilation rate when using gas phase air cleaning may not be sufficient.

ΔCO_2 levels considering a 30 % reduced ventilation rate due to air cleaners

Space type ***Single office***	*Occupancy* *[m^2per person]*	*Category*	*Derived from qtot*	
			Very low-polluting building	*Low-polluting building*
			Indoor CO_2 level above outdoor level *ΔCO_2 [ppm]*	
Without air cleaner	10	IEQI	370	278
		IEQII	**529**	**397**
		IEQIII	926	694
		IEQIV	**1389** (1010)	**1010** (794)
With air cleaner	10	IEQI	529	397
		IEQII	**756**	**567**
		IEQIII	**1323** (1029)	**992** (817)
		IEQIV	**1984** (1100)	**1443** (911)

Testing Issues

- If only a test with chemical measurements is done, should it be allowed to reduce the building component?
- How to standardise the building source?
- How to standardise the human bio effluent source?
- What if human source is Chinese persons and testing panel is Danish persons?
- It is a relative measurement, which makes some of the issues less important

Questions?
Please put your questions in the chat.

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