Criteria of room air cleaners for particulate matter

Developed by a group of Nordic Ventilation Group

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Background

- REHVA Covid Guidance refers to the use of Room Air Cleaning but did not give any instructions how to select and use them
- Information of products at the market is often incomplete, even missleading (dB at low speed, L/s at high speed)
- Guidance for users how to select and usea an air cleaner is needed

- Simple and short – only particulate matter
- Based on existing information (standards, guidelines etc)
- Intended for building owners/users etc – not for testing procedures

Major sources of information

- (1) https://www.eurovent-certification.com/en/third-party-certification/certification-programs/acl-air-cleaners
- (2) Technical certification rules for the mark Afnor, Certification identification no.: NF 536, approved 5th of August, 2020
- (3) Criteria for recommendation of Air Purifier, Astma and Allergy Förbundet, Sweden, 2020

Ozone

- (5) ASHRAE Position Document on Filtration and Air Cleaning, 2015
- (6) https://www.epa.gov/indoor-air-quality-iaq/ozone-generators-are-sold-air-cleaners

Contents

- CADR (clean air delivery rate)
- Noise
- Energy efficiency
- Placement of the air cleaner
- By-products
- Operation
- Service and maintenance

CADR (clean air delivery rate)

- CADR = (air flow through unit)x (removal efficiency)
- CADR measured for particle size of 0.3 - 0.5 µm
- CADR should be 2 times greater than the outdoor air flow by the ventilation system
- For residential use CADR = 4 x (ventilation rate) recommendation by Swedish Asthma and Allergy Association recommends
- CADR > 2 ach if ventilation rate < 1 ach

Noise from CEN 16798-1 (Cat II)

In a room with 10 m2-sab absorption

- 30 dB(A) in bedrooms,
- 35 dB(A) in living rooms,
- 35 dB(A) in single offices,
- 40 dB(A) in landscape offices and
- 35 dB(A) in classrooms (Cat II in CEN 16798-1).

Energy efficiency

- Eurovent Certita Certification classes:

  From A class >13 m3/h/W to class E < 2 m3/h/W.

Byproducts

- If the cleaning process is using electricity there should also be a test report on the ozone levels/generation
- Ozone concentration in test room below 0,050 ppm
- The US EPA concludes also: available scientific evidence shows that, at concentrations that do not exceed public health standards, ozone is generally ineffective in controlling indoor air pollution
- The ASHRAE's position document on air cleaning concludes that any ozone emission that is non-trivial (beyond a trivial amount that any electrical device can emit) create the risk

Operation & Maintenance & Certification

- Operataion
  - Test made in ideal conditions, cleaner in the middle of the room
  - The air flow through the unit should be free of obstructions (furniture, walls etc.
- Maintenance
  - Instructions
  - Change of the filter – availabilty
- Third party certification

Other results of the work by the Nordic Ventilation Group, http://www.scanvac.eu/nvg.html

- Criteria of room air cleaners for particulate matter -also Annex of REHVA Covid Guidance
- Effects of indoor air humidity- discussion paper
- Nordic collaboration to reduce transmission of viral disease in indoor air – summary report
- Effect of Portable Air Cleaners on Indoor Air Quality: Particle Removal from Indoor Air – summary
- What we know and should know about ventilation – baseline paper for revision of current ventilation guidelines

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- https://www.rehva.eu/rehva-journal/detail/02-2021
- Cold Climate HVAC and Energy 2021 Conference

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