

January 1999

RECOMMENDATION
concerning
INDOOR AIR QUALITY

1 - This Recommendation is the first in the series of similar documents under preparation by Eurovent WG 12 "Indoor Air Quality". They are intended to be used as a Guideline and source of information for manufacturers of ventilation and air conditioning equipment.

2 - The purpose of ventilation and air conditioning is to provide a comfortable indoor environment with a low health risk for the occupants. In order to achieve this aim, all relevant aspects should be considered : design, installation, commissioning, operation, maintenance and controls.

3 - If not properly designed, built and maintained, the air distribution system and any of its components may become a source of Indoor Air Quality problems. The Eurovent Recommendations may help to prevent these problems, improve the air quality and promote the positive image of ventilating and air conditioning systems.

EUROVENT/CECOMAF
EUROPEAN COMMITTEE OF
AIR HANDLING, AIR CONDITIONING AND REFRIGERATION
EQUIPMENT MANUFACTURERS

SYSTEM REQUIREMENTS

GENERAL

The air distribution system, and almost any of its components may become a source of odours and IAQ problems in the building. This usually happens only if the system is not properly designed, built and maintained. It should be noted that odours are generally a matter of comfort and not an indicator of a real health risk.

In particular the following components should be taken in consideration : heating and cooling coils, filters, humidifiers, heat recovery units, sound attenuators, ducts and air terminal devices. Fan coil units, air handling units and air conditioners have two or more of these components installed in a casing.

Closing off the system may cause a risk of backdraught, i.e. air flow into reverse direction, resulting in transport of impurities and in problems with condensation. When different ventilation systems exist in the same building, they should be able to run without interference.

DESIGN

At the design stages, the following aspects should be taken into account :

- performance criteria for components
- location and sizes of access openings and doors, and of components to be dismantled for cleaning, taking into account thermal insulation, hours of operation, condensation risks, etc
- access routes for cleaning and maintenance ; access to shafts and suspended ceilings
- recommended method for cleaning, possible restrictions to wet cleaning methods or other methods taking into account the size of access doors, duct pressure, tightness
- basic service instructions located on the units and components
- instructions for re-adjustment and balancing, or for checking the balance of the system after cleaning

INSTALLATION

In order to ensure proper cleanliness of the installation after manufacturing of components, it is in most cases necessary to protect the components, equipment and installation against dust, moisture, mechanical damages, etc. The cleanliness of the installation shall also be checked in different stages of construction.

The following checklist gives the most common measures :

- checking and, if necessary, cleaning the products leaving the manufacturer's premises
- delivery to construction site
- storage on construction site, and working area for installation ; warm, dry, clean, dust free
- protection of installed parts of the systems before the installation is complete
- inspection, and cleaning whenever necessary, before starting the whole system.

COMMISSIONING

At the commissioning stage, the installation and documentation shall be checked. Special attention shall be paid on the checking of cleanliness of the access doors and openings and maintenance routes. The operation, service and maintenance persons shall be trained during the different phases of commissioning, as appropriate.

OPERATION, CONTROLS AND MAINTENANCE

These include :

- daily operation
- service
- cleaning
- controls of the system

Energy conservation aspects of HVAC systems usually require the use of an appropriate control system. Closing off the HVAC system for unoccupied hours may induce problems, like risk of backdraught.

All installations shall be inspected regularly. Some components, often require more service, maintenance or changing, the whole system. During these frequent operations it is recommended to at least quickly check the cleanliness of visible components.

If there are observations of high accumulation of dust, grease, debris, etc. the installation shall be cleaned (entirely or relevant parts). The functioning of the system after cleaning shall be inspected.

The following maximum intervals for system inspection are recommended. However, national regulation for health of fire safety, demands of higher level of IAQ, system functioning and/or cleanliness may require more frequent inspection and cleaning than recommended below.

- one year : ventilation for kitchens in professional use, in heavy industries like painting lines, wood processing facilities, waste conveying, centralised cleaning systems ; for rooms for handling paints and solvents, heavily used smoking rooms
- five years : ventilation systems for restaurants (excl. kitchens), laboratories, schools, sporting facilities, hospitals, kindergardens, hotels, smoking lounges
- ten years : other installations, e.g. residential and office ventilation.

For buildings not mentioned, apply the list above taking into account the level of contaminant production indoors, level and time of occupancy including type of activity. The intervals may be changed according to experiences from the first inspection, and should be reconsidered whenever the usage or occupancy is changed.

References

The indoor environment comprises the thermal environment, the air quality and the acoustic environment. Each of these aspects is treated separately but in order to achieve full satisfaction, the indoor environment should be considered as a whole. This is a difficult task to achieve.

Standards for building ventilation systems and components have been under preparation by CEN/TC 156. In several European countries standards or guidelines have been published. In the USA, ASHRAE has been working for several years on a Standard for acceptable indoor air quality.

Finally, Eurovent WG 12, bringing together manufacturers of relevant equipment collects information and issues recommendations on various aspects of indoor air quality problems.

The following useful references may be recommended :

Air Filters for Better Indoor Air Quality. Eurovent Recommendation, January 1999 (*REC 06*)

Recommendation Concerning Cleanliness of Ductwork in Ventilation Systems. Eurovent Recommendation, January 1999 (*REC 07*)

Document CEN/TC 156/WG 7 N 79 rev.1. Ventilation for buildings. System performance.

EN 12599. Ventilation for buildings. Measurements and instruments for starting and handing over the system.

ENV 12097. Ventilation for buildings. Ductwork. Requirements for ductwork components to facilitate maintenance of ductwork.

CR 1752. Ventilation for buildings. Design Criteria for the indoor environment.

ASHRAE Standard 62-89: Ventilation for Acceptable Indoor Air Quality.

WHO (1987) Air Quality Guidelines for Europe. WHO Regional Publications, European Series No. 23.

VDI 6022, Part 1. Hygienic standards for ventilation and air-conditioning systems. Verein Deutscher Ingenieure, 1997

Classification of indoor climate, construction, and finishing materials. FiSIAQ publication 5 E. Finnish Society of Indoor Air Quality and Climate.

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