



Requirements for ventilation and air cleaning in Nordic regulations – a short overview

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Boverket

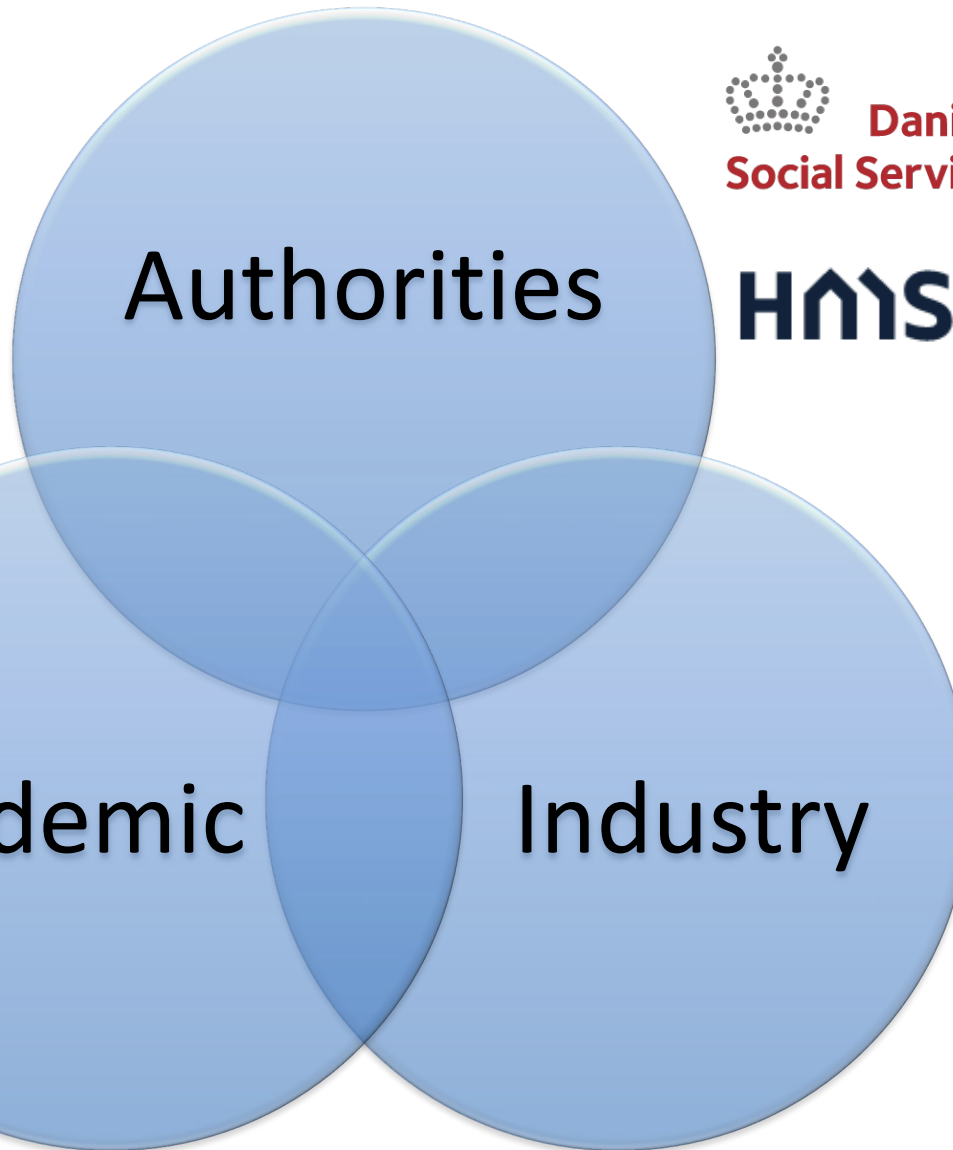


**Danish Authority of
Social Services and Housing**

HMS Húsnæðis- og
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DIREKTORATET
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Why cooperate in Nordic countries?

- similar climate
- similar culture
- building construction are alike



Sharing of information



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Observations

- the structure of regulations/guidelines is different between countries
- several national authorities give regulations for same parameters
- use of standards and references to them is different between countries
- parameters which are regulated are not the same between countries
- large variation between countries regarding which parameter are regulated as mandatory and which are on the guideline level



Minimum ventilation rate per person

- DK: For schools and childcare facilities (where people are the most significant source of pollution): Depends on CO₂ level, that has to be designed under 1000 ppm.
- FI: 6 l/s/pers
- NO: Residential buildings: bedroom at least 26 m³/h/pers (when in use)
Public/commercial buildings: 26 m³/h/pers when in use
= 7,2 l/s per person
- SE: No quantitative requirements in BBR, intended use is to be considered.
Occupational health: 7 l/s per person + 0,35 l/s,m²



Minimum ventilation rate per m² for the whole building

- DK: In childcare and teaching facilities 0,35 l/s per m² floor (when no occupants). For residential buildings 0,30 l/s,m² (in use)
- FI: 0,35 l/s,m² + intended use is to be considered
- NO: Residential buildings: 1,2 m³/h/m² (in use)
Public/workplace buildings: 2,5 m³/h/m² (in use)
- SE: 0,35 l/s,m² + intended use is to be considered



Minimum ventilation rate per apartment

DK: 0,30 l/s per m² heated floor area (in use)

FI: 18 l/s, apartment

NO: 1,2 m³/h/m² (in use)

SE: No quantitative requirements in BBR, intended use is to be considered



Control of ventilation rate by demand in residential buildings

- DK: If neither occupancy nor demand, ventilation rates may be reduced to $0,15 \text{ l/s/m}^2$
- FI: possibility to increase ventilation rate + 30% and decrease down to – 60%
- NO: can be reduced to $0,7 \text{ m}^3/\text{s/m}^2$ in rooms not in use all the time
- SE: No quantitative requirements in BBR, possibility to increase or open window or shutter



Maximum value of CO₂ for ventilation in design conditions

- DK: In childcare facilities and rooms for teaching in schools (where people are the most significant source of pollution); 1000 ppm
- FI: 1450 mg/m³ (800 ppm) above the outdoor CO₂ level
- NO: No quantitative requirements, ventilation must be adapted to the pollution load from people
- SE: No quantitative requirements in BBR, intended use is to be considered



Air filtration / air cleaning

DK: -

FI: No numeric requirements, but the level of air filtration must be designed based on the quality of outdoor air and the indoor air quality targets set

NO: No requirements in TEK17, but information is given in another instruction which is supporting TEK17 (Byggdetaljer 552.331 Filter of air in ventilation system)

SE: No quantitative requirements in BBR, advice on standard



Air recirculation (use of return air)

- DK: No requirements, but the air volumes mentioned are all to primary air, not recirculation.
- FI: No recirculation of exhaust air categories 2,3 and 4 at all
- NO: No recirculation if it contaminates rooms where people are present. Recirculated air can be used as part of the ventilation in rooms that are not in use by humans, and it does not cause unwanted spread of pollution. Recirculation must be filtered.
- SE: Recirculation is allowed in public buildings if IAQ is guaranteed.
Ok in dwellings within the same apartment if IAQ is guaranteed.



No air recirculation from

DK: -

FI: Residential buildings, commercial kitchens, hotel rooms, classrooms, daycare centers, hospital wards, restaurants, and other rooms with specific requirements for air quality.

NO: Rooms with poor air quality; copy rooms, toilets, kitchens, must have negative pressure in relation to surrounding rooms.

Garages and rooms with polluting industrial activities must be technically separated rooms.

SE: No recirculation from bathroom, kitchen and similar room types.



Observations

Functional requirements are more widely used.

Less number values, however, conflicts with digitalization.



Thank You!



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