1

CTE
CÓDIGO TÉCNICO DE LA EDIFICACIÓN

Content

Requirements on ventilation of dwellings

Ventilation systems in residential buildings stock and market

Requirements on ventilation of non-residential buildings

Ventilation systems in non-residential buildings stock and market

Trends in the inspection of ventilation systems

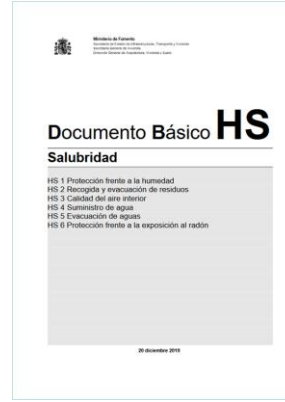
Trends in innovative systems and market

Conclusions

2

Requirements on ventilation of dwellings

Goal



Buildings shall be provided with means so that they can be suitably ventilated, and contaminants produced during normal use can be removed. A sufficient flow of external air must be provided and indoor polluted air must be extracted

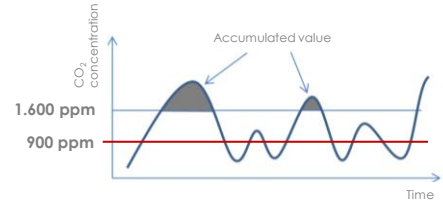
Requirements on ventilation of dwellings

Performance

Maximum CO_2 yearly average concentration — 900 ppm

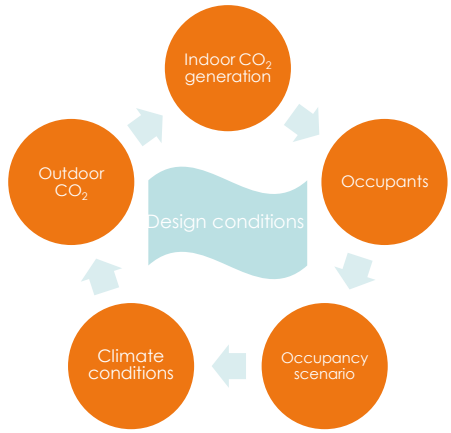
Minimum constant Flow rate — 1.5 l/s

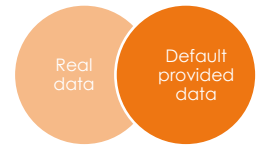
Maximum CO_2 accumulated value per year — 500000 ppm per hour accumulated above 1600 ppm



Requirements on ventilation of dwellings

Simulation





5

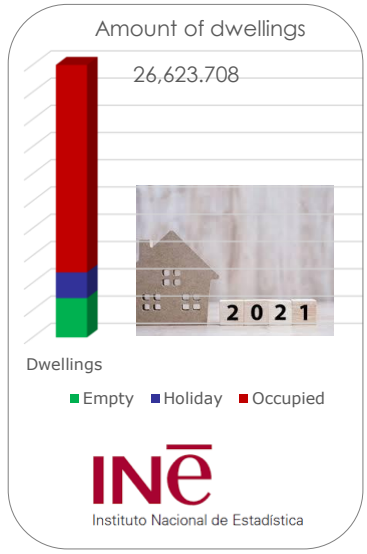
Requirements on ventilation of dwellings

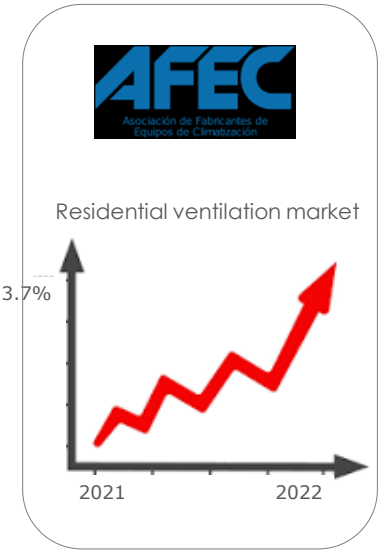
Deemed-to-satisfy solutions

Type of dwelling	Minimum constant ventilation flow [l/s]				
	Dry rooms			Wet rooms	
	Master bedroom	Bedrooms	Dining and living room (1)	Global minimum	Minimum per room
0 or 1 bedrooms	8	-	6	12	6
2 bedrooms	8	4	8	24	7
≥ 3 bedrooms	8	4	10	33	8

6

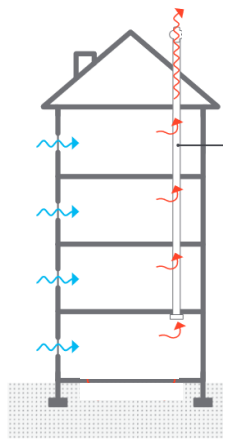
Ventilation systems in residential buildings stock and market

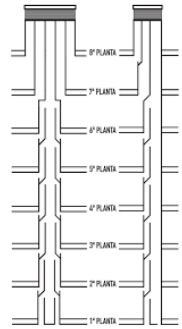


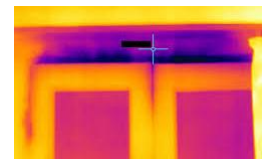


Ventilation systems in residential buildings stock and market

Before 2006: passive stack ventilation





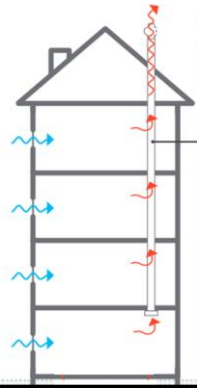


Ventilation systems in residential buildings stock and market

From 2006:

- mechanical or hybrid ventilation (fully natural ventilation not allowed)
- specific air inlets: microventilation or trickle vents

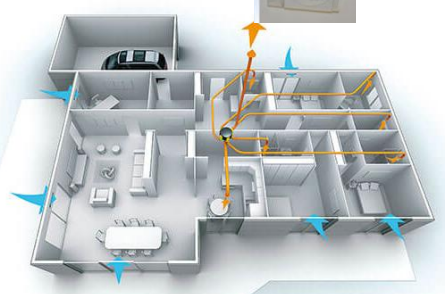
Most common: hybrid ventilation



9

Ventilation systems in residential buildings stock and market

Second most common: mechanical extraction (single flow)



10

Ventilation systems in residential buildings stock and market

Increasingly more common: mechanical extraction and supply with heat recovery (double flow)

Requirements on ventilation of non-residential buildings

Objective

Ventilation system must provide for enough outdoor air flowrate that avoids the accumulation of high concentration of pollutants according to table

Table. IAQ categories (RITE)

IAQ categories	Examples
IDA 1 (optimal)	Hospitals, kindergardens
IDA 2 (good)	Offices, museums, classrooms
IDA 3 (average)	Shops, cinemas, restaurants, gyms
IDA 4 (poor)	Laundry rooms

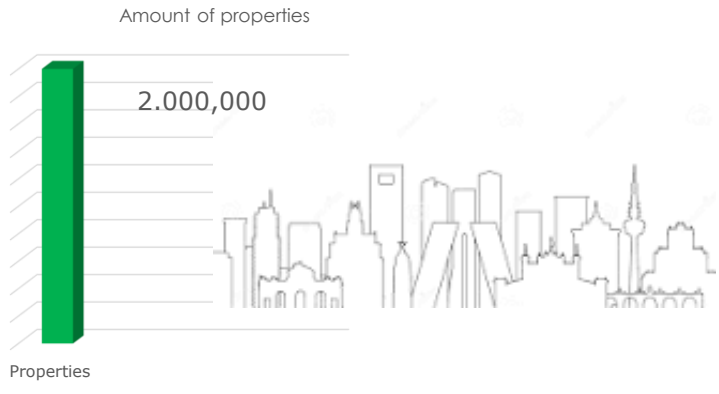
Requirements on ventilation of non-residential buildings

Verification methods

5 methods:

- airflow per occupant indirect method
- airflow per net floor area indirect method
- perceived air quality direct method
- CO_2 concentration direct method
- dilution method.

Ventilation systems in non-residential buildings stock and market



GOBIERNO DE ESPAÑA MINISTERIO DE HACIENDA SECRETARÍA DE ESTADO DE HACIENDA DIRECCIÓN GENERAL DEL CATASTRO

Ventilation systems in non-residential buildings stock and market

From 2021 to 2022:

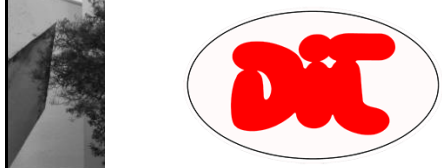
- the market in air distribution and diffusion increased by 19.7%
- the air handling units and ventilation units market also increased by approximately 10%
- the industrial/tertiary ventilation market increased 17.5%
- the residential and tertiary market represent 20.3% of the total revenue in 2022 from HVAC products

Trends in the inspection of ventilation systems

- Initial and periodic inspections
- Authorised companies or inspection entities
- Every 4 years
- Comprehensive every 15 years

Trends in innovative systems and market

Innovative systems must demonstrate compliance with the essential requirements of CTE by **technical approval**



17

Conclusions

IAQ regulations in Spain are performance-based

The IAQ requirement in dwellings is identified in terms of CO2 concentration

Performance-based regulations allow the use of innovative, energy efficient systems

The requirements may be met through simulation or deemed-to-satisfy solutions

Ventilation market in Spain is strong and keeps increasing

18


The IAQ performance-based regulation in Spain
October 2025
Pilar Linares Alemparte
Architect MSc. PhD.
Thank you for your attention
Any questions?
CSIC
90 ANIVERSARIO
Instituto de Ciencias de la Construcción
Eduardo Torroja