



Ventilation: Steps towards frameworks for compliant **EPC input data** and improved **quality/compliance**

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Ventilation is often of poor quality
Also in Belgium! ...since many years!



However a Belgian standard exists since 1991

- ▣ **Before 1991:** many **problems** of dampness
- ▣ **1991:** first **standards** for dwelling ventilation
- ▣ **1996:** ventilation is **mandatory in Walloon Region**
- ▣ **2006-2008: EPBD transposition** in the 3 Regions
 - Ventilation is mandatory

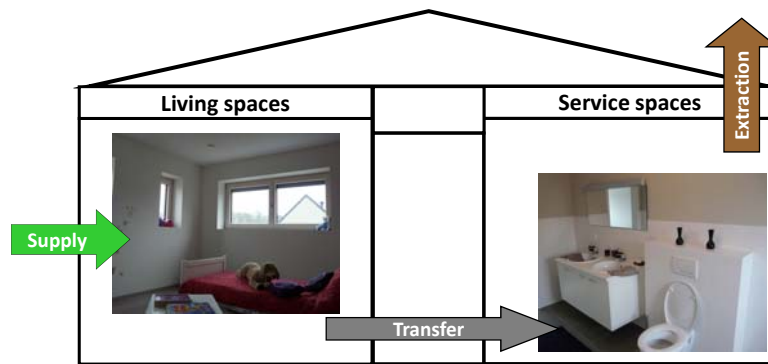
- ▣ Since 2006: many problems of conformity
 - « FAQ » developed in Flemish Region

- ▣ 2015: New project PREVENT
 - Development of new bases to upgrade ventilation requirements

Ventilation requirements

Ventilation of dwellings

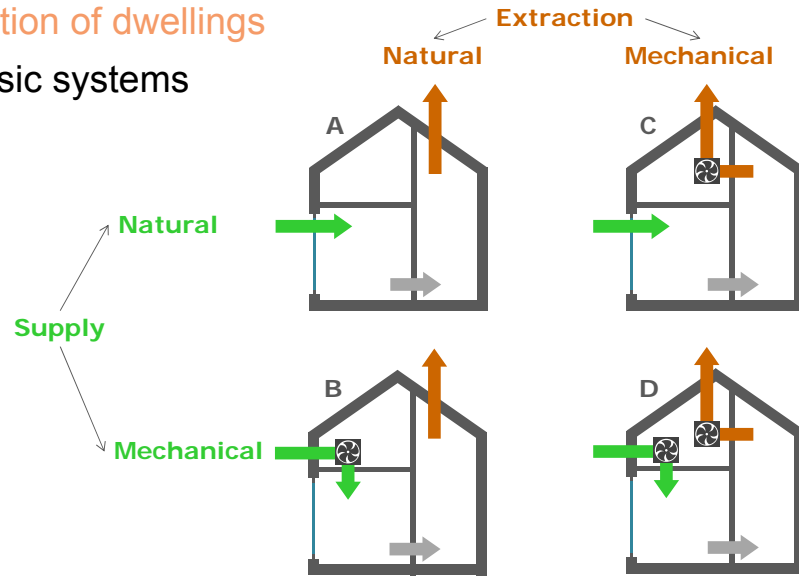
- ▣ Principles:
 - Flow rate: basis rule of $3,6 \text{ m}^3/\text{h}\cdot\text{m}^2$
 - Natural openings: sizing for pressure difference of 2 Pa
 - Supply → transfer → extraction



Ventilation requirements

Ventilation of dwellings

■ 4 basic systems



Ventilation requirements

Ventilation of offices and schools

■ Principles:

- Basis: EN 13779
- Flow rate: basis rule of 22 m³/h.pers.
- Supply in spaces for human occupation

Ventilation in EP calculation

- Ventilation consumes energy!
 - Ventilation **heat losses**
 - **Electrical consumption** of fans

- EP calculation in Belgium
 - « **as built** » approach!
 - Several calculation methods/values (often)
 - **from « default » to detailed** (e.g. measured data)
 - Input data
 - « **Product data** »
 - « **Installation data** »



EP calculation: Principle of equivalence

Largely used in Belgium for Demand Control Ventilation

- Context
 - EP calculation method is simplified
 - Cannot taken into account for “innovative products”
- Objective of the equivalence
 - Evaluate the equivalent energy savings in the EP calculation method for “innovative products”
- Summary of the principles
 - Paid and under the responsibility of the manufacturers
 - Evaluation (calculations, simulations, etc.) by an unique Third Party (Butgb – Ubatc)



« Product data »

■ Examples

- Capacity of natural openings
- Maximum power of fans
- Heat recovery efficiency



■ Some properties

- Often **measured** on a product (component or system)
- To be provided by the **manufacturer** (or supplier)
- To be checked by the **rapporteur** (responsibility)

■ Some expectations

- **Reliability** → compliant
- **Availability** → easily accessible



« Installation data »

■ Examples

- Mechanical ventilation flow rates
- Electrical power of fans
- Airtightness of the ductworks



■ Some properties

- **Measured** (or checked) on site on the fully installed ventilation system
- To be provided by the **installer or “measurer”**
- To be checked by the **rapporteur** (responsibility)

■ Some expectations

- **Reliability** → compliant

Belgian approach for compliant « product data »

General objectives of the databases

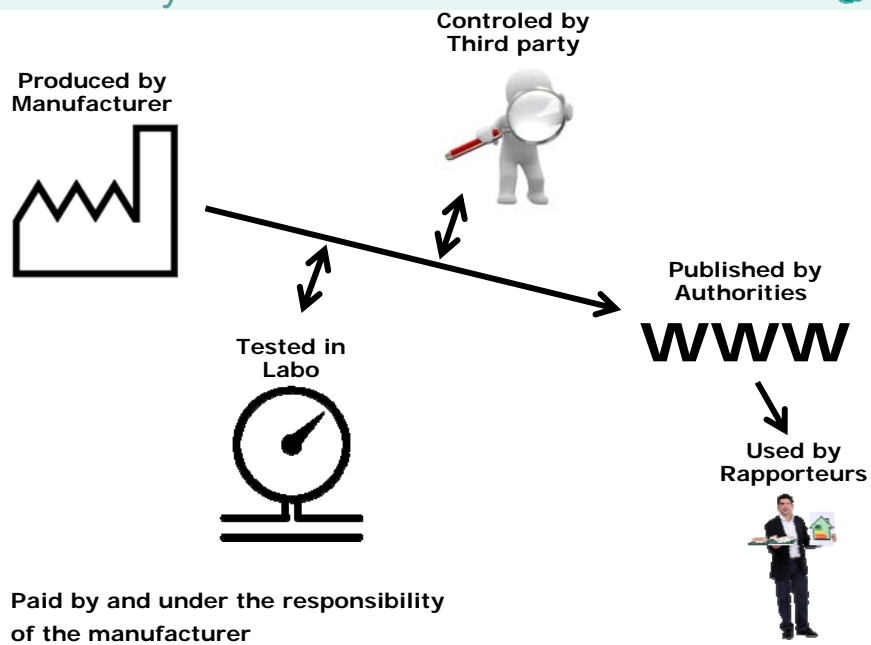
- Compliant “product data”
- Easily accessible “product data”
→ www.epbd.be



Key principles

- Compliant data
 - Standardized and clear procedures (test methods)
 - Tests in laboratories
 - **Control by a third party (Notified Body)**
- Voluntary framework
 - Manufacturers and rapporteurs are NOT forced to use it
 - **But high demand from rapporteurs → responsibility**

Summary EP databases



Many advantages for all the actors

■ For the **manufacturers**

- Higher confidence of the owners
- Higher visibility
- Compliant and unquestionably « product data »



■ For the **rapporteurs**

- No risk on the responsibility of « product data »
- Easier access to « product data »



■ For the **authorities**

- Higher compliance
- Less controls needed at the moment of EP declarations



Many advantages for all the actors (2)

■ For the **designers and installers**

- Design and preliminary EP calculation:
 - Impact of the products on EP calculation can be estimated
 - Easier comparison and selection of products on the market



■ For the **owners**

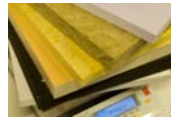
- Higher value for money:
 - They can choose which product performance they want to pay for



EP databases in Belgium

A success story since many years

- Trickle ventilators: **26 products**
- Simple fans: **36 products**
- Balanced ventilation units: **160 products**
- DCV systems: under development...
- Other EP products
 - Insulation materials
 - Construction products
 - Sunscreens



www.epbd.be

Ideas for the future

- Development of databases for other EP products
 - Boilers, Heat pumps, PV, ...
- **Development of such databases at EU level...**
 - Construction product market is international
 - Test laboratories and Notified Body available in many countries
 - Some of these « product data » are defined in EN standards
- But...
 - Need some convergences
 - Of the EP calculation methods
 - Of national standards
 - Organizational and administrative challenges

New Belgian approach for higher quality of the works and compliant « installation data » for EP

General objectives of the framework

■ Reliable **evaluation** and **declaration** of the system **performances** after installation

- **Transparent quality criteria**
(e.g. acoustic, comfort, etc.)

- **Compliant « installation data »**
for EP calculation
(e.g. measured flow rates,
measured power, etc.)



Key principles

- Declaration of the real performances
 - No minimum quality level required
 - Not a global “conform” or “not conform”
 - But report with detailed results for each criteria
- Certification of the “**ventilation tester**”, not the installer
 - Applicable whoever has installed (e.g. also for DIY)
- Voluntary framework
 - But coupling with (EP) regulation can be easy



Clear criteria and procedures

- **Performance based** criteria
 - Control **at the end**, after completion of the works
- **Standardized** and clear **procedure** (= “STS”)
 - **Defines** the performance **criteria**
 - Describes **how to determine** (measure) each criteria
 - Coherent with EP regulation and referring to EN standards

Certification of the ventilation testers

To assure the skills of the certified ventilation testers

- Who can become a certified ventilation tester?
 - Installers, designers, rapporteurs, architects, specific experts or testers, etc.
 - Not required to be independent of the project: can be the installer himself!
- Initial evaluation
 - Training + examination
- Continuous evaluation
 - by a Third Party (certification)
 - Random assessment (e.g. 5-10%) of the reports delivered by the ventilation tester
 - Paid by the certified ventilation tester



Reliable measurement methods

- Measurements
 - **Flow rates**
 - Electrical Power
 - Airtightness of ductworks
 - Noise level
 - ...
- Example of **flow rate measurements**
 - Not so easy! Many methods give unacceptable errors...
 - See AIVC Workshop 2014
 - "Measurement of airflow rates at air terminal devices: an overview"
 - <http://www.aivc.org/resource/measurement-airflow-rates-air-terminal-devices-overview>

Overview of methods at air terminal device

Vane anemometers



Small probe + specific cone

- Thermal or vane anemometer



Standard hoods



Compensation method



And more...



Many advantages for the final users/actors

■ For the building **designers** and **owners**



- Higher value for money:
 - They can choose which performance criteria they want to pay for
- Design and preliminary EP calculation:
 - Impact of the installation on EP calculation can be estimated
- Assurance of results and quality

■ For the **authorities**

- Higher compliance
- Less controls needed at the moment of EP declarations



Many advantages for professionals

■ For the ventilation **installers**

- Higher confidence of the owners
- Value for higher quality
- Compliant and unquestionably « installation data »

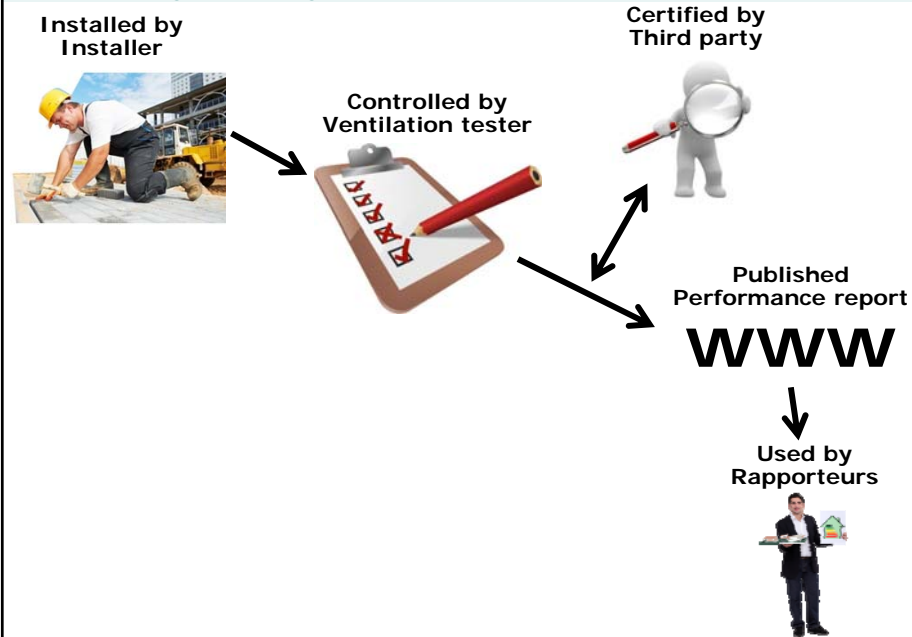


■ For the **rapporteurs**

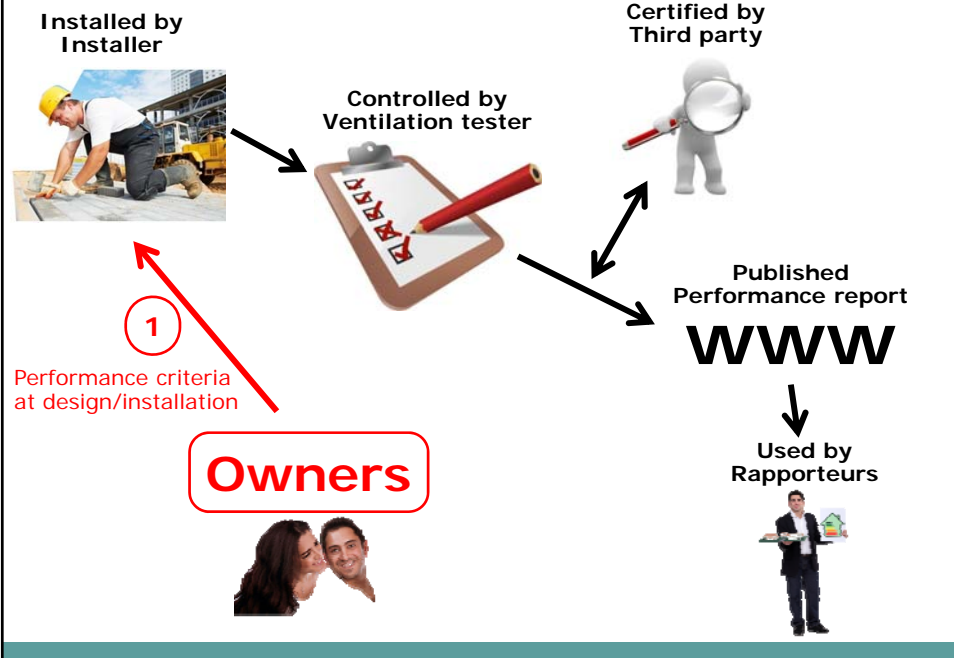
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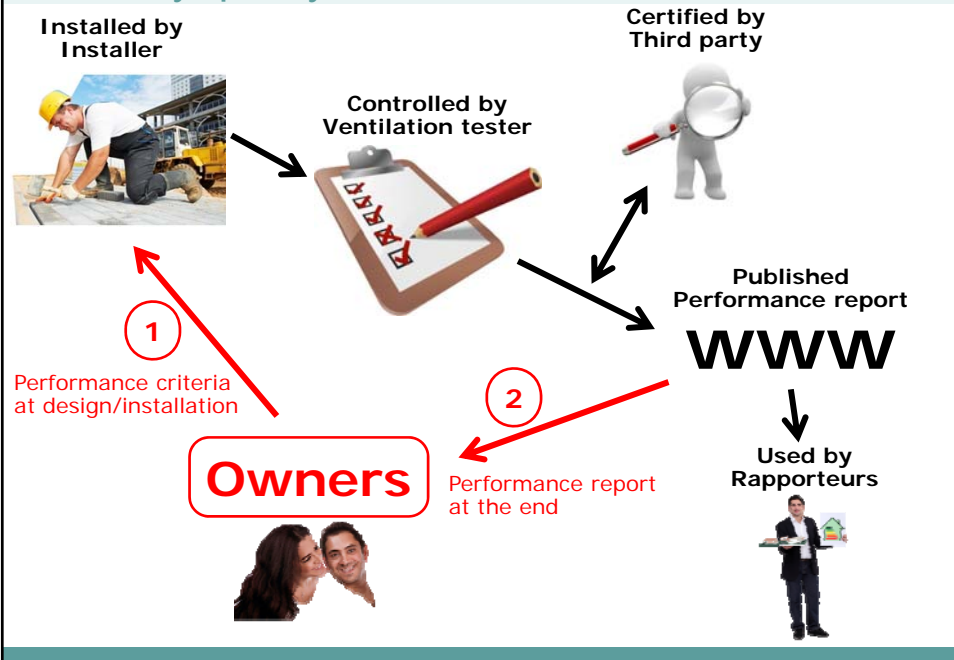
Summary quality framework



Summary quality framework



Summary quality framework



Overview of the tools/approaches for ventilation

