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WHY IS IT IMPORTANT TO ADRESS MEASUREMENT QUALITY ISSUES IN STANDARDS? HOW STANDARDS CAN CONTRIBUTE



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AIVC WORKSHOP – QUALITY OF METHODS FOR MEASURING VENTILATION AND AIR INFILTRATION IN BUILDINGS



Poor ventilation performance and/or combined thermal complains and disturbing noise levels: who is to blame?

- Designers (installers, consultants, producers) select and project ventilation products/systems
- Installers (contractors) install HVAC&R products as part of heating, ventilating, air-conditioning and cooling systems in buildings.
- Basis of selection are the product data from producer/supplier and building performance data (thermal & airtightness)
- Are these data well interpreted, reliable and applicable?

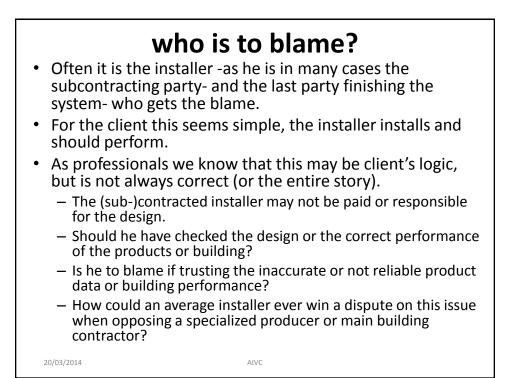
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Poor ventilation performance: who is to blame?

- The building system or sub-system will only perform according the expectation and connected contract obligations if the product data and assumed boundary conditions are correct and complete.
- The boundary conditions:
 - airtightness of the building envelope
 - thermal performance of the building elements
- If at the end the building or installation doesn't perform according the agreed design specifications, who is to blame?
 - The designer because of a poor design?
 - The installer because of poor installation work?
 - The supplier of the integrated products because of poor performance of these products?
 - The building contractor/designer because of the leakage or poor thermal quality?

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Guaranty performance: Learn through inspection and measurements Inspection and measurements of the realised ventilation and air systems are an essential factor to guaranty the performance of the system in relation to the building properties. Airtightness of the building and air systems, measuring flow rates of ATD's, measuring noise levels of ventilation devices, checking location of ATD's, checking the airway path in order to be able to report the performance of the ventilation and air systems.

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First step: Certification of ventilation products

- Product certification is a substantial step in the right direction. But are all certificates the same?
- With 3rd party certification where in-depended accredited certifiers declare that the specific declared product performance is according a specific, public available and by the accreditation body accepted, certification guide(s) and/or standard(s).
- In our EU-industry there are organizations, like EUROVENT-certification, facilitating this certification service on bases of accredited ISO17025 and EN45011 certification schemes. These accredited schemes, offer a maximal quality assurance level, they may also refer to accredited laboratories testing the products.

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Next step: from Product to System Certification to assure the system performance
A next step could be certifying the designer and installer according an EN45011 based certification scheme.
This means that a contractor or client can choose for a certified installing company where the QA is guaranteed by the system that requires regular 3rd party checks of the projects of this certified supplier (installer etc.).
These schemes are to be developed for specific application fields and refer to the relevant EN and ISO standards.
They will also include the use of certified products. By using certified products the certified installer will focus on gualifying his own process.

• By using certified products he can trust the product certificates and doesn't have to check the quality of these products again.

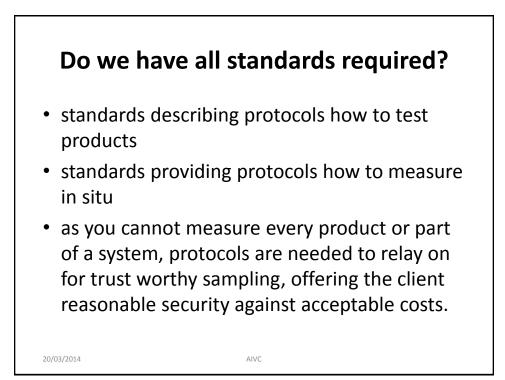
Quality of the inspection at final delivery stage

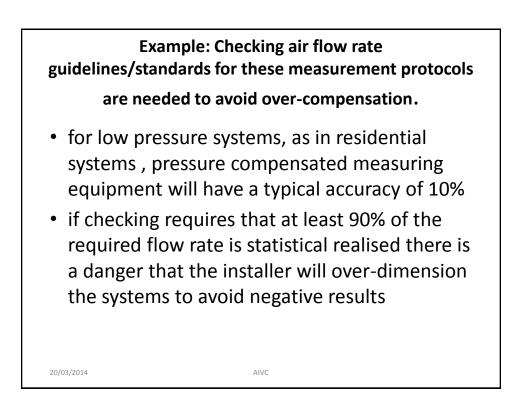
- To be able to rely on these inspection and measuring services we need to assure the quality of these processes.
- We have to describe the measurement procedures and the inspection protocols
- and additional the competence level of the qualified persons performing these assessments.
- the requirements for test-report and user-manuals

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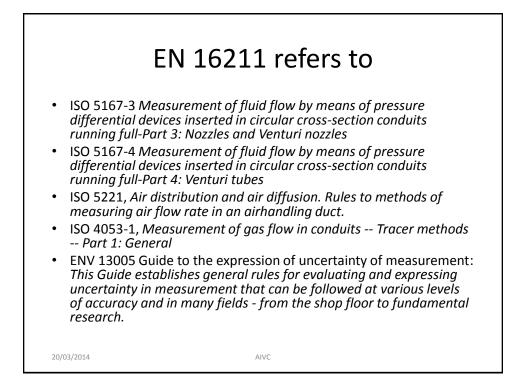
EN 16211:2011 Ventilation for buildings -Measurement of air flows on site – methods

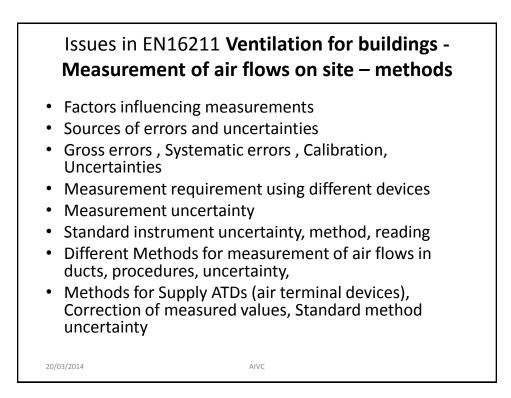
- This standard applies to measurement of airflows on site. It provides the technician with a description of the methods, their protocols, and tables for noting measured and calculated values so that the necessary measurements are performed within the margins of stipulated method uncertainties.
- The in the standard referenced documents are indispensable for the application of the standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments)

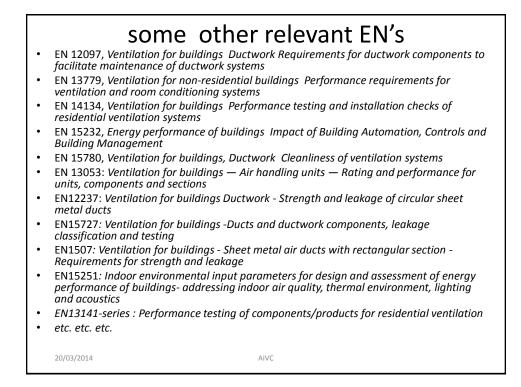
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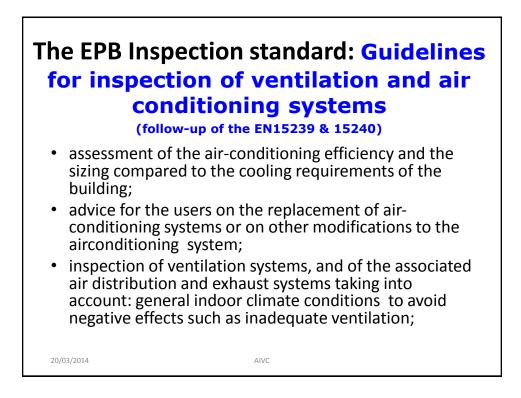
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FN 16211 refers to EN12599 Ventilation for buildings - Test procedures and measuring methods for handing over installed ventilation and air conditioning systems EN14277 Ventilation for buildings – Air terminal devices – Methods for airflow measurement by calibrated sensors in or close to ATD/Plenum boxes ISO 3966, Measurement of fluid flow in closed conduits. Velocity area method using Pitot static tubes. ٠ ISO 5167-1, Measurement of fluid flow by means of pressure differential devices. Part 1: Orifice plates, nozzles and Venturi tubes inserted in circular cross-section conduits running full. ISO 5167-2 Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full-Part 2: Orifice plates 20/03/2014 AIVC









This standard specifies the common methodology and the requirements for inspection of air conditioning systems in buildings for space cooling and/or heating and/or ventilation systems

from an energy use standpoint to fulfil the EPBD (the EU Energy Performance Buildings Directive) requirements and applies to:

- both residential and non-residential buildings equipped with:
 - air conditioning system(s) without mechanical ventilation; or
 - air conditioning system(s) with mechanical ventilation; or
 - natural and mechanical ventilation system(s).
 - fixed systems;
 - accessible parts that contribute to the cooling and mechanical ventilation services.
- is also applicable to some systems not covered by EPBD such as:
 - some systems not covered by the EPBD, such as fixed systems of less than 12 kW output;

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ventilation-only systems

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How to reach the required quality? Quality assurance of the:

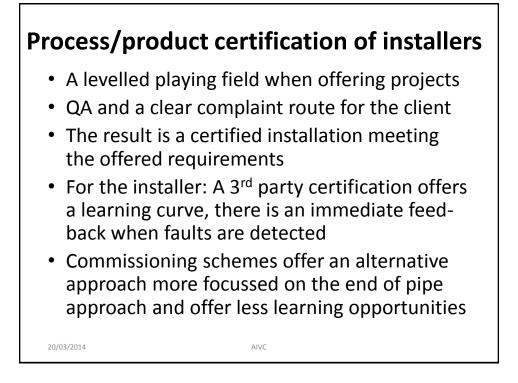
- design including the correct building performance
- ventilation products and components
- installation works including setting controls and balancing
- final delivery including

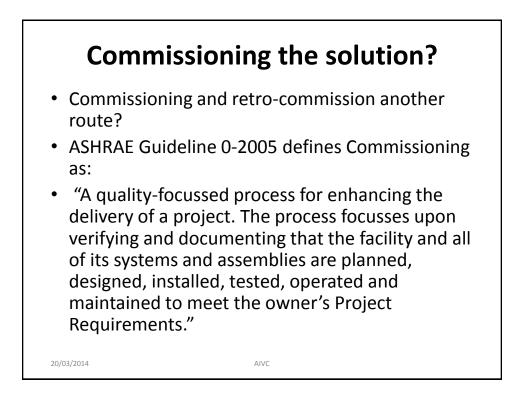
-test reports

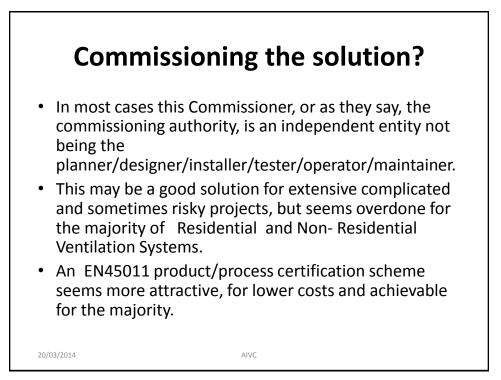
-user manual including required maintenance

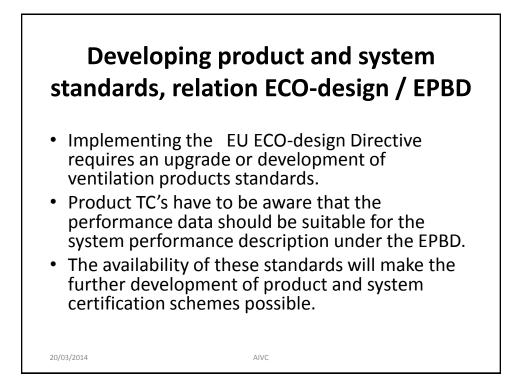
schedules

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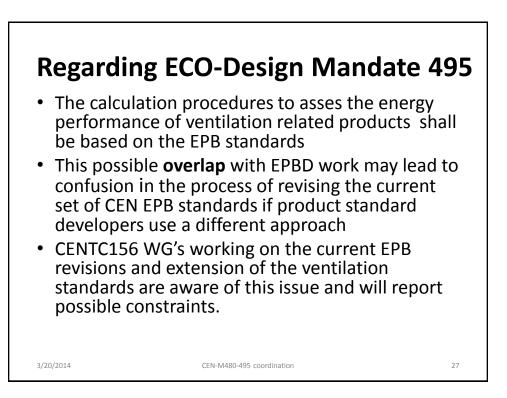






- Product TC's (at CEN or ISO level) may have a first priority for just specifying these data needed to compare products in doing so the market seems well regulated.
- System designers need more information, not always visible in the current product declarations,
- If not regulated in a standard or EU regulation, they have to rely for these data on the producer self-declaration and additional product documentation.
- Product Certification will become more welcomed by the system designer/installer if a more complete product declaration is supported.
- One should not expect that the TC, responsible for the product standard, will add this information without a clear push of the market including the regulators.

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