

Building and ductwork airtightness in France: national trends and requirements

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FOREWORD

The AIVC is preparing a series of VIP on national regulations and trends in airtightness for various countries (numbered VIP 45.XX), detailing for both building and ductwork airtightness:

- the national requirements and drivers (regulations, incentives, justifications and sanctions)
- whether it is taken into account in the energy performance calculations and how;
- the test protocol (testers qualifications, national guidelines, requirements on measuring devices);
- the tests already performed and whether there is a results database;
- key documents.

This presentation focuses on the airtightness trends in France.

BUILDING AIRTIGHTNESS

Undoubtedly, the regulatory measures and control procedures have profoundly changed the building airtightness market in France. Within a few years, they have led to significant improvements in airtightness test results. Note however that this change is the result of a number of measures and procedures that have been implemented, including:

- Minimum requirement for residential buildings and substantial reward for better-than-default values for non-residential buildings;
- Compulsory justification for residences and better-than-default values with 2 routes: systematic testing or application of a certified QMA;
- Mandatory qualification of testers and certification of QMA to justify airtightness values;
- Follow-up of test results, including statistical analysis to monitor the impact of the regulation.

In addition, the BBC-Effinergie label in 2006 has been a fundamental step both to raise awareness and to experiment measures to revise the regulation. Given the number of simultaneous changes, the impact of each one is difficult to isolate from the others.

The overall approach has produced very positive results with regard to its original objectives; however, several points merit further attention, in particular:

- Testers are under pressure to please their clients with the present third-party testing requirement. They are also under time pressure, which may affect the quality of their measurements. This calls for dissuasive controls by the scheme holder. Improvements have been done by Qualibat to strengthen control of testers.

- Test performed at commissioning do not reflect the airtightness during the buildings' lifetime, especially when last-minute corrections are implemented to meet the target value. Durability issues are considered thanks the research project Durabilit'Air that concluded that airtightness of houses may deteriorate mainly during the first two years (a mean increase of around +20% in the air permeability observed from two samples of 30 low energy houses each) (Moujalled et al. 2021).

Now with the latest regulation RE2020, the French authorities strengthen building airtightness requirements by adding a new minimum requirement for non-residential buildings. It also focuses on ventilation performance in order to ensure that new airtight dwellings are ventilated right. Therefore, it includes mandatory requirements to control ventilation systems in new residential buildings based on what has been done for building airtightness (tester qualification scheme, national database).

DUCTWORK AIRTIGHTNESS

The Effinergie certifications, with their mandatory tests of ductwork airtightness since 2013, have participated in France to the development of the ductwork airtightness tests with the creation of the tester's scheme qualification and the database. The possibility to use in the EP-calculation a class better than default (A, B or C) and thus, advantage airtight ductwork regarding energy performance of the buildings, is also a driver for the ventilation performance.

With the new regulation RE2020 and the mandatory inspection and measurements of the ventilation systems in residential buildings, the ventilation system is finally identified in the construction process and we can hope that the quality of the ductwork will improve, even if the airtightness test is not mandatory. A dedicated observatory will be developed, gathering all inspections and measurements regarding ventilation systems. It will be on-line and will be directly filled by the testers: some analyses will be public and the data will be automatically updated.

KEYWORDS

Building airtightness, ductwork airtightness, regulation, trends, France