Quality management and building airtightness: the French approach

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A quality management scheme allowing builders to justify for a given building airtightness without systematic testing has been introduced in the French regulation since 2005. At the end of 2014, 81 such quality management approaches have been approved representing a production of about 15 500 buildings per year.

The Quality Management (QM) scheme was introduced in the 2005 regulation considering the difficulties building professionals had to achieve good airtightness and the hope that cost abatements due to allowance for non-systematic testing could encourage building professionals to engage in a QM approach (QMA) for building airtightness.

This scheme has become increasingly popular with the increased requirements in the regulation. In fact, the regulation now requires the justification of a given airtightness level for all residential buildings. This requirement was first experimented within the Effinergie label which was firmly based on the regulation. A similar approach is adopted for the Effinergie+ label with the aim to experiment possible changes for the next regulation update (see **Figure 1**).

Justification of a given airtightness level can be provided either with a measurement by a certified tester or with a certified quality management approach.

The underlying idea of the QMA is to push professionals to get organized to properly design airtightness, to implement adequate solutions, to trace critical steps, and to monitor their performance. The QMA requirements detailed in the energy regulation are summarized in **Figure 2**. Applicants must propose a scheme to address each step listed in Figure 2 and to ensure that the approach will remain effective with time, based on measurements on a sample, by independent certified measurers. They also must have their system audited according to ISO 19011 (Guidelines for quality and/or environmental management systems auditing) by an independent ISO 9001 certified organisation.

After approval of their application by a committee of experts, successful applicants are not required to perform tests systematically but only on samples (typi-

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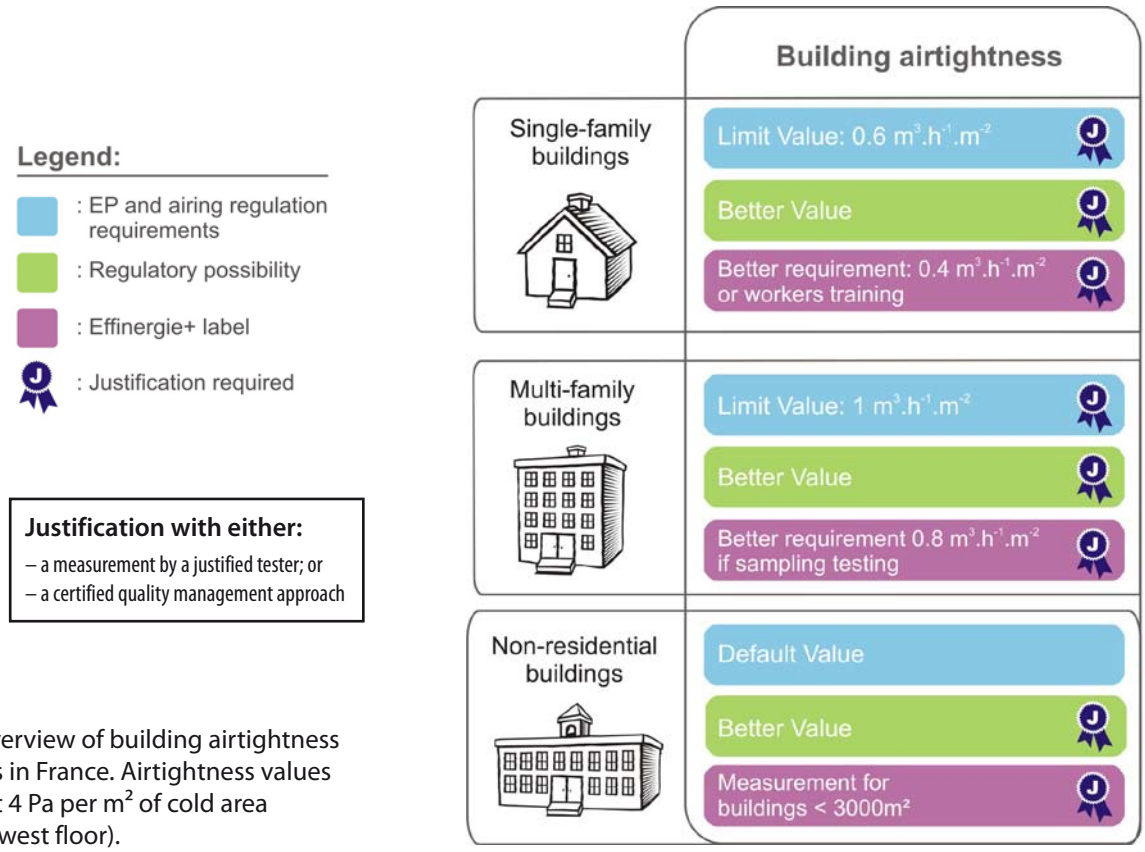

Figure 1. Overview of building airtightness requirements in France. Airtightness values are in m^3/h at 4 Pa per m^2 of cold area (excluding lowest floor).

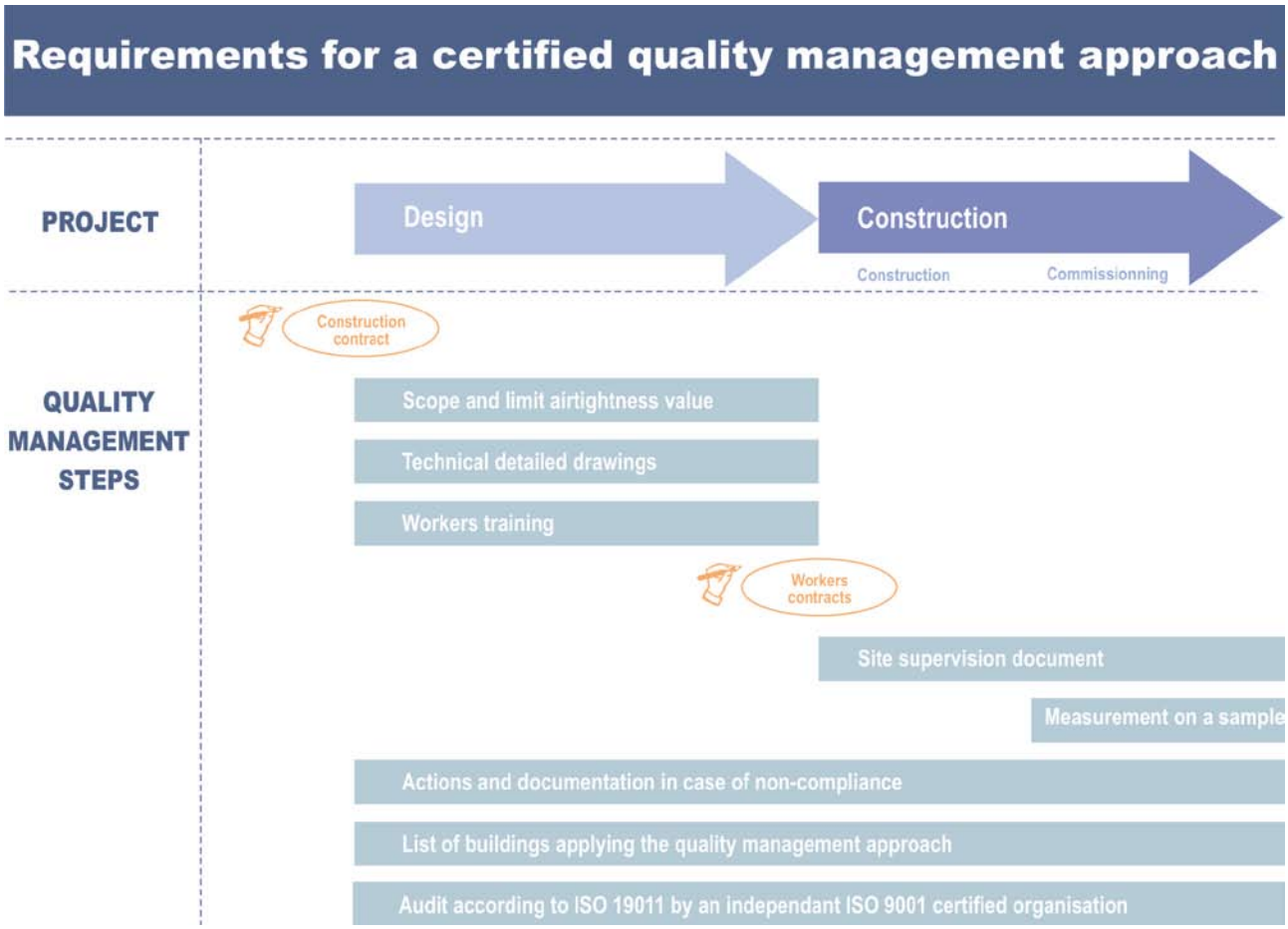

Figure 2. Overview of requirements for a certified quality management approach.

cally 5% to 10% of their production for single-family dwellings with a third-party certified tester) to comply with the justification for the airtightness level used in energy performance calculation.

Despite legitimate concerns about its market penetration, its effectiveness, and its potential biases to competition, the current approach has proved to be successful among builders, to positively question applicants about their methods to reach good or at least required airtightness levels, and to be consistent with the achievement of better airtightness levels (**Figure 3**). The evaluation of the process conducted by the state authority has confirmed the effectiveness of the approach; it has also shown weaknesses that should be dealt with and strongly suggests reinforcing in situ controls to avoid deviations which may in turn question the relevance of the approach. ■

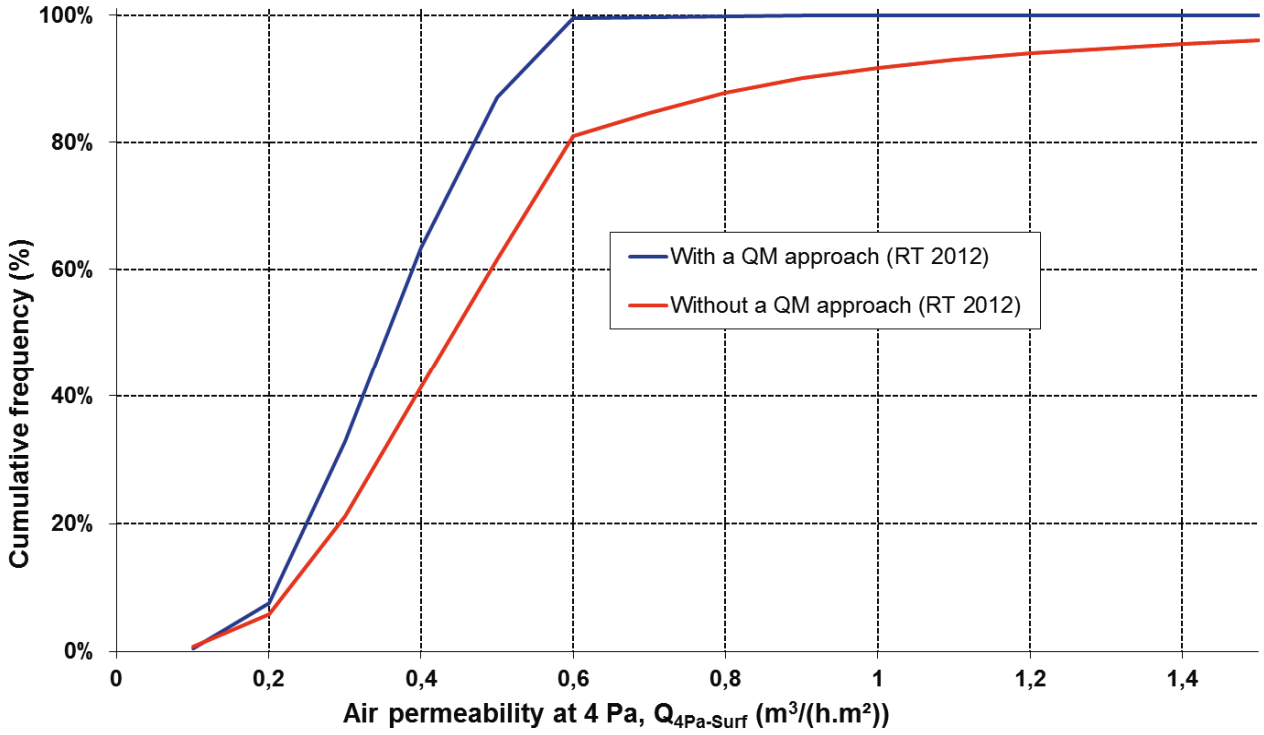

Figure 3. Distribution of measured airtightness of houses with and without implementation of a certified Quality Management Approach (QMA).

Additional information can be found in QUALICHeCK fact sheet #01:
http://qualicheck-platform.eu/wp-content/uploads/2015/02/QUALICHeCK-Factsheet-01.pdf