REQUIREMENTS AND COMPETENT TESTER SCHEMES FOR BUILDING AIRTIGHTNESS MEASUREMENT

Comparison of approaches in various European countries

Analysis of answers of airtightness associations representatives performed by:
Valérie Leprince, Maria Kapsalaki, Rémi Carrié
Airtightness Testers Association Committee

- Set up and hosted within TightVent
  - At present, the participants are from
    - Belgium, Czech Republic, Denmark, France, Germany, Ireland, Poland, Sweden, and the UK
    - Contacts with Estonia, Norway, Netherlands, Italy

- The scope includes various aspects:
  - airtightness requirements in the countries involved
  - competent tester schemes in the countries involved
  - applicable standards and guidelines for testing
  - collection of relevant guidance and training documents

- Since September 2012, the committee has met four times (via internet) and first physical meeting held in June 2013
Competent tester schemes

• Specific interest among the Airtightness Testers Association Committee

• Why?
  • Legal issues arising with requirements
  • Motivations for cheating test results
  • Competition between builders and between testers
Presentation

- The objective of this study is to compare approaches for requirements and competent tester schemes for building airtightness in various European countries.
- Most of questions were yes/no questions to ease the comparison

- Special thanks to the persons who have kindly answered the questionnaire:
  - Xavier Loncour (CSTC), Belgium
  - Jiri Novak (FSV, CVUT), Czech Republic
  - Walter Sebastian (Klimaskaerm), Denmark
  - Valerie Leprince (PLEIAQ), France
  - Oliver Solcher (FliB), Germany
  - Eva Sikander (SP), Sweden
  - Rob Coxon (ATTMA), UK
Answers from 7 countries

- A competent tester scheme exists in:
  - **Denmark**: Klimaskerm in collaboration with Byggeriets Kvalitetskontrol* and DS Certificering**
  - **France**: Qualibat mesureur bâtiment 8711
  - **Germany**: Zertifizierter Prüfer der Gebäude-Luftdichtheit im Sinne der Energieeinsparverordnung (FliB e.V.)
  - **UK**: BINDT/ATTMA

- No tester scheme but association with ethical code in:
  - **Czech republic**: membership in the Association Blower Door CZ

- No scheme yet in:
  - **Belgium** and **Sweden** but early plan to develop a “competent tester scheme”
• 6 out of 7 countries have at least one indicator that use the envelope area as reference value
• 6 out of 7 countries have a reference pressure value at 50 Pa
Minimum requirement

- **Czech republic**
  - minimum recommendation for new* buildings of all type but not have to be justified

- Only **France** proposes an alternative to testing to justify compliance with airtightness requirements

- **Scotland** has some specificities

* Only for specific cases such as Passive houses, low-energy buildings, funding programs

* Czech republic has also requirement for refurbishment
If the qualification is required by a regulation or a label, it always requires independent testing.
Qualified testers

Who is qualified?

- FR, DK
- UK-D, CZ, DE
- Compani es are qualified
  1
- Testers are qualified
  3
- Both companies and testers are qualified
  2

In UK, testers are qualified for domestic buildings and companies for non-domestic
Technical documents beyond measurement standards

Exist in every country except in Denmark (in preparation)

Technical document specify...

- The building preparation procedure: 6
- The input values that are used for derived quantities (area, volume, ...): 4
- Sampling rules for multi-family or large buildings: 4
- Sampling rules for housing developments: 4
Training programme

- **Duration:**
  - 2 to 4 days

- **Cost:**
  - 1000 to 2100 €

- **Validity limit:**
  - only for Germany: 12 month

- Qualification scheme does not include training in CZ

- In UK no scheme for non-domestic: depends on the company (UKAS)

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### Training validations include

- **DK, UK-ND**
  - A theoretical examination: 3
  - An examination of test report(s): 4

- **UK-ND**
  - On site evaluation of the testers’ skills: 3

- **DK, UK-ND**
Additionnal information in annexes

- Non systematic testing and cross-checking
- Testers profiles
- Qualification requirements
- Airtightness networks
- Training content
THANK YOU FOR YOUR ATTENTION

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ANNEXES
Default values

• 5 out of 6 countries have defaults values for various cases
  • Non-Domestic buildings (France)
  • Small developments: 1 or 2 dwelling and less than 500 m² non-residential buildings (UK)
  • In all cases (Belgium, Germany)
  • To be used in the calculation before the test is done (Czech passive and low energy buildings)

• For all of them if a different value is used in the EP-calculation it has to be justified in general with testing
Non-systematic testing and cross-checking

Allowances for non-systematic testing in multi-family buildings
- BE
- DE*, DK
- FR, UK, CZ

Allowances for non-systematic testing in housing developments buildings
- BE, DE, CZ
- DK
- FR, UK

*: No regulation for Sampling in Germany, but there is common practices in funding programs
Cross-checking

- Sweden: usually only a check by the developer
- Germany: cross-checking only for passiv’haus
Testers profile

- Building services/Building physics/Consultants: 6
- Housing inspector: 5
- Architect: 5
- Industry service: 4
- Craftsman: 3
- *Other: 3
- General contractor: 3
- Foreign testers: 3

Number of respondents

*people in career change, researchers, any background
## Qualification requirements

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<td>Education requirements, 1</td>
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**Number of respondents**

- Yes: DK, DE, UK-D
- No: CZ, UK-ND, DE, CZ, FR, UK-ND, FR, CZ, DK
### Scheme requirements

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<td>Specific reporting format for the test reports</td>
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<tr>
<td>Specific reporting procedures</td>
<td>FR, DE, CZ, BE, DK, UK-ND</td>
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- For Germany, the proof of calibration is not required, tester must give calibration date.
- For UK non-domestic, companies have to be accredited by UKAS.
Qualification requirements

Tester must justify experience to be qualified for certain types of buildings:

- For single family houses: 4 responses (Yes)
- For multi-family buildings: 3 responses (Yes)
- For non-residential buildings: 4 responses (Yes)
- In other cases: 2 responses (Yes)

- In France the qualification for multi-family and non-domestic buildings is optional and not required in the EP-regulation context.
Airtightness networks

Network presence and activities

- Impact in national regulation indirectly for UK and Czech Republic
- No answer for Belgium as far as there is no group (under discussion in Wallonie)

Network origin

- Professional unions: 1 Yes, 1 No
- Associations: 3 Yes, 2 No
- Networks set up by a certification body: 2 Yes, 2 No
- Informal networks: 4 Yes
- Other (Scientists & Testers): 1 Yes, 0 No
Network members

6 out of 7 respondents have at least one national network dealing with airtightness
Training programme always include...

- Purpose and steps of the tests, including preliminary information to obtain and analysis of...
- The rules: building preparation, calculation of derived quantity, calibration, etc....
- How to use the equipment on site
- How to write/file a report 5
- Staying up-to-date with rule changes 5
Training programme sometimes include...

- Performing practice measurements (4)
- General knowledge on national regulation (3)
- How to identify leakage on site (3)
- General knowledge on ventilation (2)
- General knowledge on heat transfer (2)

Legend:
- Green: Yes
- Orange: Depends
- Red: No