

Summary

Limits of recognizability of leakages by means of thermography!

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Thermography is a helpful means at the visualisation of leakages on the wind and air tightness level. However on the one hand not always the theoretically necessary physical boundary conditions are available and on the other hand the construction progress not always the make an optimal building preparation possible. In principle also a low n50-Wert during the air tightness measurement does not give a conclusion about the wind tightness and about the construction unit qualities. As already many claims prove, the compliance with the air change rate, which represents an evaluation from energetic view, is not (alone) decisive for the function of a construction unit or a building. Deficiency complaints about bad or insufficient heatableness increase and end usually in a law suite.

A reason is also the missing specialized knowledge of some „Blower Door specialists“, who neglect to inform there customers about the complete requirements of construction physics. About requirements of construction physics, which are unknown to the not competent Blower Door tester. Particularly in the very low energy house or passive house range all needs of construction physics are important for the function and therefore also to be followed. But just there often substantial errors appear, however only in the tenth part of a degree, and so it is not possible to find these sources of error without sufficient knowledge of thermodynamics and building physics.

Which influence however the deficiencies have on the construction unit, which are in a great measure not noted and which are not recognizable exclusively by means of air tightness measurement.

In order to be able to illustrate the correlations to some extent, a leakage pattern was fabricated and furnished with different errors. Afterwards we tried to seize these errors metrological.

Likewise these errors were designed by means of a simulation routine for thermal bridges called FLIXO, to describe the necessary procedures on the inside and the metrological effects at the surface of the construction unit and/or to receive theoretical approaches for further work.

3. Conclusions

From the conducted test measurements and simplified simulations the following clues can be extracted, which are to be considered during the investigation of buildings (and which naturally may again be of a different kind in individual cases):

- Temperature differences of leakages often appear only in the tenth part of a degree
- The extent of the temperature difference does not give a conclusion about the quantity to the defect

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- Tenth parts of a degrees can already refer to a multiplication of the U-value or of the heat flow
 - The air change rate alone does not give reliable information about the construction unit quality.
 - Wind leakages are to be detected (usually) directly on the vapour barrier level
 - Air leakages can be recognized (usually) also behind linings.
 - The minimum temperature difference between inside and outside depends on the measuring task, the camera equipment and that insulation standard of the building.
 - For the location and particularly for evaluation deepened knowledge of thermography, in particular of the recording technology, and of the structural constructional expertise is necessary.