

Airtightness requirements for High Performance Buildings

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International building legislation is setting stronger and stronger requirements for the energy performance of buildings. An actual example is the Energy Performance of Buildings Directive in the European Union (EPBD). The improved energy performance of buildings can't be achieved by additional insulation or more effective buildings systems only. A major influence factor on the energy quality is the ventilation technology and also the airtightness of the building envelope. Some countries include in their energy decree already maximum air change rates, partly for all building types, partly only for those that include a mechanical ventilation system. Especially for high performance buildings which go beyond the national requirements, the infiltrations losses become a significant factor to the energy performance.

The paper is based on the work in the EU project ASIEPI (Assessment and Improvement of the EPBD Impact (for new buildings and building renovation) and presents an overview on the existing airtightness requirements in different European countries and the US. These requirements are opposed to airtightness requirements for high performance buildings in Germany (passive house), France (effinergie label) and the US (energy smart home, RESNET). Measurements of the envelope airtightness right after construction and some years later show the practicability of the requirements.