

ENVELOPE AND DUCTWORK AIRTIGHTNESS IN THE REVISION OF THE FRENCH ENERGY REGULATION: CALCULATION PRINCIPLES AND POTENTIAL IMPACTS

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ABSTRACT

The revision of the energy performance regulation is scheduled to be gradually in force between 2011 and 2013 depending on building types. The objective is to generalize low-energy buildings whose market share is increasing rapidly with the current regulatory label named BBC-Effinergie. The threshold is set to 50 kWh-pe/m²/year for residences, with some modulation depending on climate zone and altitude; this number includes the primary energy use for heating, cooling, domestic hot water, auxiliary equipment, and lighting. Given that envelope and ductwork airtightness are key in these types of buildings, significant efforts are made to better take into account these issues in the calculation methods as well as to define schemes to encourage better airtightness. These include the tuning of the default values and minimum requirements as well as quality management approaches or craftsmen and measurement technicians certification. This paper analyses the energy impact of envelope and ductwork leakage estimated with the regulatory calculation method for different building and ventilation system types. The large energy impacts and today's field data suggest that building professionals will have to pay particular attention to these aspects to comply with the regulation. In residential buildings, the energy impact is in the region of 5 to 15 kWh-pe/m²/year, i.e., 10 to 30% of the total primary energy use of the building.

KEYWORDS

air infiltration, envelope, ductwork, leakage, energy use, low-energy buildings