THE EFFECT OF AIR TIGHTNESS ON THE ENERGY CONSUMPTION ANALYSES OF FIELD MEASUREMENTS

Wouter Borsboom TNO, Ivo Opstelten, Willem de Gids

The energy consumption of buildings is effected by the air tightness level. Everyone can understand this statement but what are the effects of deviations from air tightness in the design on the total energy consumption of dwellings, and how can we control the quality. In the Netherlands, the Innovation-implementation program “Energiesprong” (Energyleap in dutch) focuses on the development of marketable propositions for energy neutral (on the meter) buildings which are affordable, profitable for the building industry, provide good living conditions and realize the promised performance characteristics. Integral monitoring of demonstration projects is an important part of this program. Lessons learned will be presented in this paper.

With multi-zone models, the relation between energy consumption and air tightness is estimated for a standardized dwelling. The effect of different air tightness levels is calculated for the heating load. But the effect is also highly dependent on what happens in the dwelling, what kind of ventilation system is installed and how all ventilation provisions are used. Analyses of field measurement findings in about 15 dwellings, where air tightness and energy consumption were measured, show that a simple relation is not so evident. Other parameters in practice dominate the actual energy consumption more than the air tightness levels. To better estimate and understand this effect of the user, different studies are performed in the Netherlands.

To control the quality of renovated and new dwellings where air tightness is an important aspect, the tool “Bouwtransparant” (Building Transparently) will be used in the Energiesprong program. This tool consist of calculations, inspections and awareness raising amongst the professionals in the field. First results of this approach are presented.