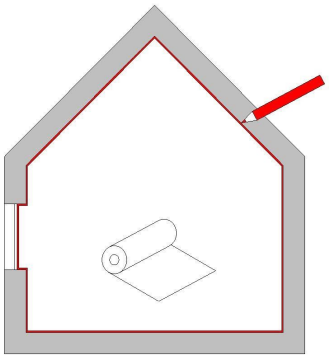

Giatlahaus - Airtightness

Author: Alexander Rieser (UIBK)

Airtightness thanks to detailed planning and foils

HVAC

What is the solution?

Airtightness is an important parameter for the quality of a building. If it is sufficient, it stops warm humid air penetrating through cracks and gaps into the construction, condensing there and leading to moisture damage. An airtight level also prevents drafts and the associated energy loss. The convective entry of warm humid air into the insulation layer is a major problem, especially in the case of interior insulation, because this moisture transport mechanism transports much more moisture than pure diffusion. Such an entry would be fatal, especially with diffusion-tight interior insulation systems. In the case of the "Giatlahaus", the airtight level in the area of the walls was achieved by using a polypropylene foil (Ampatex® DB 90). All joints were glued and sealed with a designated airtight adhesive tape. The connections to the floor, the ceilings and the windows were made with great care.

Why does the solution work?

In connection with diffusion-retarding interior insulation systems, vapour barriers in form of foils are used in many cases. These foils can vary strongly in their properties (diffusion resistance, moisture-adaptive properties, etc.). The installation of this vapour barrier layer also creates an airtight layer. All connections to other components must be made very carefully and professionally to avoid convective moisture entry into the insulation layer. Especially with foils, the processing instructions of the individual manufacturers must be observed. Expansion joints and overlaps must be carried out according the manufacturer's instructions, as otherwise stresses

and in the worst case even gaps can form in the airtight layer due to component movements. All connections must be made with suitable products depending on the type of substrate. Ideally, the products of one manufacturer are used to ensure that the construction works within the system. Especially penetrations (pipes, cables etc.) and corner connections are often poorly executed. Special cuffs and processing techniques guarantee a faultless finish here as well.

Pros and cons of the solution:

One of the main advantages of using foils for airtight layers is their simultaneous use as a vapour barrier. Depending on the type of foil, different Sd - values (equivalent air layer thickness) can be achieved. Furthermore, there are also foils where the Sd - value can vary depending on the boundary conditions (moisture-adaptive foils). They can help the construction to dry out during the summer months, compared to static foils or panels, and at the same time reduce diffusion in winter. Due to the relatively large format, rapid assembly can be carried out for large areas. Also, the low weight facilitates the installation compared to e.g. OSB boards. However, foil installation must be practiced and requires a comprehensive knowledge of the correct processing. Especially on soft insulation, gluing the joints and making corners requires a little more practice. The mechanically low resistance is also often a problem, especially on the construction site. However, holes and cracks can easily be repaired with adhesive tape. To protect the foil, a facing shell is usually applied to the inside. On the one hand, this facilitates the assembly of installations and, on the other hand, serves as mechanical protection for the future users.

Type of data available (level of information, simulation):

The solution is practically tested and has been implemented in countless projects and verified by blower door measurements.

Are there any related publications or pictures of the solution?

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© Madritsch und Pfurtscheller Architekten, especially the details must be executed with great care

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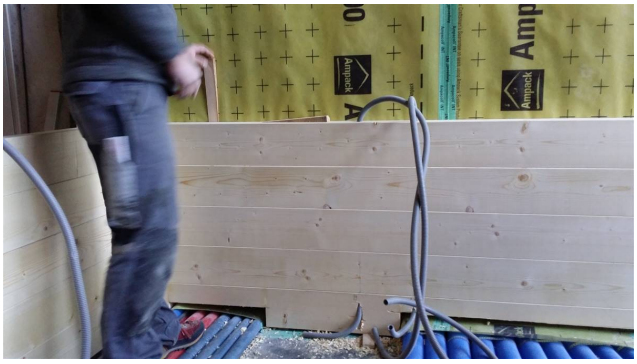

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