Ansitz Kofler

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Airtightness thanks to detailed planning and vapour retardant layer – Solution B

HVAC

What is the solution?

To reach a continuous air-tight layer at Ansitz Kofler, the vapor barrier on the walls was (i) well connected to the vapor retarder on the roof, (ii) turned around the border of the lean concrete in the floor, and (iii) well connected with tape to the window sub-frame and other openings. All electric and hydraulic ducts and cables were installed on the inner side of the vapor barrier in order to prevent punctures. To check the tightness of the vapor barrier and to discover any leaks, a preliminary blower door-test was done before the application of wooden battens and plaster boarding. The final Blower Door test following European Standard UNI EN 13829, procedure B, resulted in a very good value of n50= 0,66/h (for comparison: 0.6 needed for PH certification, 1.0 for EnerPHIT). The new windows are obviously also part of the measures to guarantee airtightness. Details on the connections can be found in the External Wall sections and the windows of the best practice example "Ansitz Kofler".

Why does the solution work?

Increasing the airtightness was in this specific case a "side effect" of other measures: new windows to reduce heat losses and insulation of the envelope - where for the ceiling and the parts with interior insulation anyway a moisture barrier resp. retarder was needed. Increasing the airtightness was reached by planning and implementing well the details - especially at connection points.

Pros and cons of the solution:

Pro: Avoiding damage in the construction due to (humid) indoor air penetrating into the (cold) construction. Energy saving Con: Compared to the airtight layer

with board materials, special attention must be paid to the connections and transitions of the foils. The processing is somewhat more complex and complicated. It is however mainly a question of well planned and implemented details rather than considerable additional parts. What might be an issue: if the overall air tightness is increased without guaranteeing proper ventilation indoor air quality might decrease and the increased humidity might condensate on cold walls (not in this case, as the envelope is insulated, and there is a ventilation system ...) Experience in this and other cases has shown, how important it is to do a first Blower Door test already in the construction phase, when weak points can be recognized and corrected - in this specific case e.g. a chimney not visible in the plans was found, which would have compromised the air-tightness and brought humid air to cold areas .

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

Blower Door Test and comprehensive documentation of the overall intervention in the master thesis of Hannes Mahlknecht (attached)

Are there any related publications or pictures of the solution?

Air-tight connection to the window frame
(c) Manuel Benedikter

Vapour barrier on the walls and its connection to the vapour retarder in the ceiling (c) Manuel Benedikter

Battens for installation layer, which avoids penetrating the vapour barrier with pipes and cables (c) Manuel Benedikter

Blower Door test with smoke test, done during construction phase (c) Manuel Benedikter

Air-tight connection thanks to concrete screed on the floor (c) Manuel Benedikter