



Active overflow system

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Active Overflow - System

HVAC

What is the solution?

With the concept of "active overflow system", the entire supply air is brought into the corridor or living room. This area practically functions as a "fresh air reservoir" and distribution zone. From there the air is conveyed into the living rooms by means of active overflow. The return flow also takes place back into the distribution zone; this is mixed air. The exhaust air is discharged via rooms such as the bathroom, toilet and kitchen.

Why does the solution work?

Thanks to the active overflow system, sufficient fresh air is transported from the distribution zone into the bedrooms and living rooms. The return flow is passive via sound-absorbing overflowers. The passive overflow elements should be designed in such a way that they create a pressure drop of maximum 1 to 2 Pascal. Otherwise, a slight overpressure is generated in the common rooms which can lead to building damage. (Warm humid air is pressed into leakages of external wall components and can condense there). In case of leaky buildings (historical buildings) it is recommended not to blow fresh air from the "mixed air room" into the bedrooms. Instead, the exhaust air should be extracted from the bedroom and the fresh air should flow in through passive overflow openings (Figure 2). Blowing in can cause overpressure in the bedrooms and moist warm air can be forced into the construction, which can lead to condensate and damage. The great advantage of this ventilation system is that a suspended ceiling can be completely renounced. Despite the barely visible distribution of fresh air, every room is ventilated and also exhausted. Therefore, the same advantages of a conventional comfort ventilation are achieved with the active overflowers.

Pros and cons of the solution:

One big advantage is that there is no suspended ceiling required and a minimal installation of ducts. A disadvantage is if the pressure drop of the passive overflow valves is too high, building damage is possible.

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

The solution was presented and investigated in the course of Elisabeth Sibille's dissertation. Furthermore, a system was implemented at the Brännengut mansion in Bern (Switzerland).

Additional information about the solution:

Pfluger Rainer (2019) - Domestic ventilation in existing buildings. Highly efficient and cost-effective solutions for the modernisation of old buildings.
Elisabeth – Sibille (2015) - Optimized integration of ventilation with heat recovery in residential buildings through the implementation of innovative air distribution strategies and pre-fabricated components Page 30

