Conceptual design and layout of ventilation systems with high heat recovery

Konzeptionierung und Auslegung von Lüftungsanlagen mit hoher Wärme-rückgewinnung

TECHNISCHE UNIVERSITÄT DARMSTADT

ISM+D
Institute of Structural Mechanics and Design
Institut für Statik und Konstruktion

Master-/Bachelorthesis
in the field of energy efficient construction and energy networking

Topic:

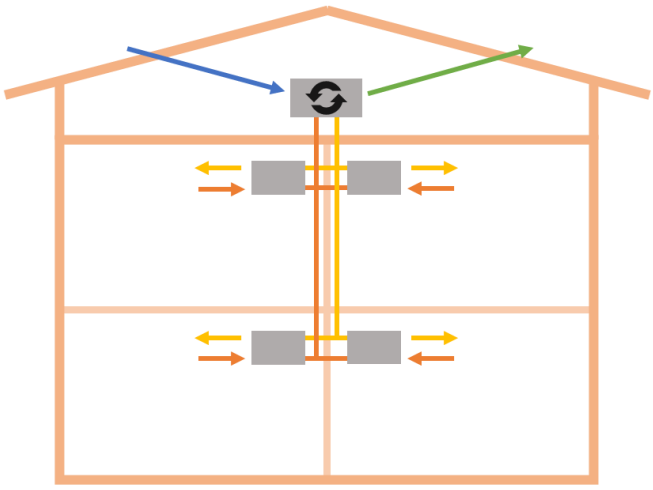
The design of ventilation systems in multi-storey residential buildings holds great potential for saving energy and increasing living comfort. Especially bad ventilation behaviour leads to a significant increase in heat loss. Nevertheless, the ventilation of the rooms is very important for preventing the formation of mold. It also increases fresh air for the well-being of the occupants and reduces the concentration of harmful aerosols or particles. So how can a high level of occupant comfort be ensured with good ventilation of the building, while keeping heat loss to a minimum?
In context of the new construction of the Ludwighöhenviertel in Darmstadt (ludwigshoehviertel.de), exactly this problem is to be investigated. Systems with high heat losses are often installed because high investment costs and a high maintenance effort are associated with energetically optimized ventilations systems.

Task:

An energy-optimized ventilation concept is to be designed for the Ludwigshöhenviertel. In particular, the criteria for the dimensioning of active and passive heat recovery are to be worked out. These include, e.g., the parameters of costs, maintenance effort or the ventilation's own energy demand.

Method:

- Research on current technologies (state of the art) regarding ventilation systems with heat recovery
- Development of criteria for the design and planning of a successful ventilation concept
- Elaboration of different ventilation concepts and determination of the system type (central/decentral, active/passive)
- Development of the optimal plant constellation (e.g. TRNSYS)



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