THE MANAGEMENT OF BUILDING AUTOMATION TEMPERATURE CONTROL

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As well know that mainly because of low investment costs and favorable comfort, the use of thermally activated building systems (TABS) for the heating and cooling of buildings in recent years has spread widely throughout Central and Northern Europe. However, due to the large thermal inertia, the control of these systems are turns out to be complicated and time-consuming in the parameterization, especially if the internal heat sources are suddenly changed. This paper presents a comparison of TABS. Through various experiments on thermally activated building systems (TABS) under different conditions, we can clearly know that TABS is economic viablility for the heating and cooling of building. This article collects and summarizes a series of more valuable and characteristic TABS experiments for comparative analysis. Summarizing and generalizing the effects of different types of buildings and their use of the TABS method.

TABS are a water-based heating/cooling system in which pipes are embedded in the concrete slabs of a building. The main advantage of using this system is to reduce the peak load by activating the heat storage capacity of the building concrete slab. [2]

TABS play an important role in the heating and cooling of currently used buildings. Heat-activated building systems have two functions: (1) they provide strength and structural rigidity to the building as part of the building structure, and (2) act as heat-activated components as part of the building's HVAC system.

t turns out that integrating building structures as energy storage can prove that the thermally-activated building system (TABS) is used for cooling and heating of buildings is energy-saving and economically viable [1].

In addition, TABS is also commonly referred to as a temperature control system, which actively integrates building quality into its corresponding house environment through on-board integrated pipe registers. Inside the pipeline, there is air or water and their mixture. A comprehensive review of general information on TABS, TABS design, TABS simulation, and TABS control strategies can be found in the next paragraph.

When planning an office or commercial building, architects and designers need to include heating, ventilation and air conditioning (HVAC). But each one is a huge task and investment, but now can be directly incorporated into the simplified building itself by the HVAC system

The thermally active building systems (TABS) are mainly used for cooling in flower boards, floors or walls, and secondly for the basic heating of buildings. The embedded pipe activates the concrete core in the building to store and discharge the heat load.

Although the TAB system is not a structure of a building, pipes carrying water for heating and cooling are embedded to take advantage of the thermal mass of the concrete. In this way, the air conditioning of the day does not replace the ventilation system, but it reduces the traditional technical tasks to a minimum. This helps to ensure that the occupants get the best comfort without any noise or hear the wind. [2]

Some benefits:

- Operate at temperatures close to the ambient environment. Suitable for integration of renewable and free cooling sources.
- Meet the requirements of LEED, BREEAM and DGNB, etc.
- Easy to combine with conventional heating, cooling and ventilation systems. [2]

In the literature, only a few have reported control of TABS: for example, Meierhans, one of the pioneers of TABS, Olesen, Antonopoulos, and Weitzmann, who briefly outlined the control concepts proposed so far. Tödtli et al. Evaluate existing control solutions and conclude that most of these solutions have the following features:

(a) They are based on external temperature-compensated flow temperature control, where according to the heating curve (HC), the set point of the flow temperature moves with changes in the external temperature, regardless of the heat gain. The cooling curve (CC) is usually a constant flow temperature set point based on the maximum load condition.

(b) No feedback variable is used for control from the area (return temperature, concrete core temperature or room temperature). The self-regulation of the concrete core conditioning system is considered sufficient.

(c) Enable or disable the system (heating, cooling, or neutral) based on seasonal and/or outdoor temperature.

(d) Natural cooling, for example, heuristically considered through the free cooling of a wet cooling tower.

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