Thermo-active building systems and sound absorbers: Thermal comfort under real operation conditions - DTU Orbit (30/11/2018)

Thermo-active building systems and sound absorbers: Thermal comfort under real operation conditions

Radiant systems are established today and have a high ecological potential in buildings while ensuring thermal comfort. Free-hanging sound absorbers are commonly used for room acoustic control, but can reduce the heat exchange when suspended under an active slab. The aim of this study is to evaluate the impact on thermal comfort of horizontal and vertical free-hanging porous sound absorbers placed in rooms of a building cooled by Thermo-Active Building System (TABS), under real operation conditions. A design comparing five different ceiling coverage ratios and two room types has been implemented during three measurement periods. A clear correlation between increase of ceiling coverage ratio and reduction of thermal comfort could not be derived systematically for each measurement period and room type, contrarily to what was expected from literature. In the first two monitoring periods in the larger office rooms, rooms with higher coverage ratios reported higher operative temperatures. This correlation was however not clear from the monitoring in the smaller offices and other measurement periods. In all monitored rooms, a strong influence of the user behaviour on thermal comfort has been observed. A higher temporal offset between ceiling and operative temperature was also observed in rooms equipped with absorbers.

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