



COMFORTABLE INDOOR CLIMATE IS IMPORTANT

The user perception of a building's quality depends largely on a comfortable indoor climate. A pleasant environment is determined by a number of variables, such as the amount of daylight, acoustic performance and a comfortable room temperature. Climate control, which includes heating, cooling and ventilation, is of major influence on the feeling of well-being. Determining factors in the selection of the appropriate climate control solution are capacity, individual adjustment, ease of use and energy consumption. One of the available solutions, thermal activation, can be either a single (in the ceiling or the floor) or a double system. This leaflet summarizes the benefits of climate control by double thermal activation, a high quality solution which can be utilized best when applied to the Slimline Floor system.

HIGH CAPACITY AND AUTOMATIC ADJUSTMENT

The ultimate climate control solution offers a flexible capacity, which allows the system to react swiftly even when faced with extreme cold or heat. Due to the high isolation standards and large glass facades in today's (office) buildings, the heat load generated by users and equipment calls for efficient cooling, which tends to be even more important than heating these days. Natural processes cause double thermal activation to offer triple capacity when compared to single CCA. Therefore, the application of a dual distribution system deserves a recommendation. Moreover, the double system offers the possibility for a swift and automatic capacity adjustment when the difference between the water temperature in the pipes and the air temperature in the room (ΔT) rises.

EXCELLENT USER COMFORT WITHOUT DRAUGHT

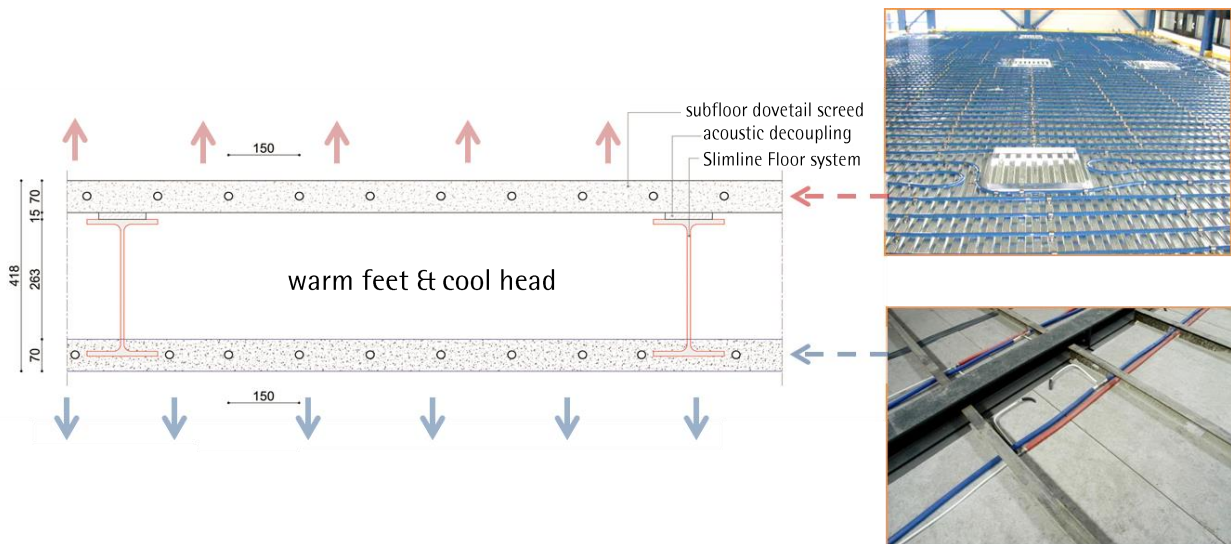
When it comes to user comfort, thermal activation is often the solution of choice. Combining radiant heat from a large surface with the possibility to cool without cold air flowing in the room (and with it a sense of draught), thermal activation offers excellent user comfort. Not surprisingly, double thermal activation is consistent with the 'cool head, warm feet' philosophy for human comfort. By temperature conditioning structural elements, the user perceptiated temperature is improved. Moreover, air change can be reduced by 60% when using thermal activation.

LOW ENERGY CONSUMPTION, HIGH SUSTAINABILITY

Heating and cooling by air ventilation leads to relatively high energy consumption. Adding heat to or removing heat from a room utilizing both the ceiling and the floor is a highly efficient solution. Because of the large available surface, heating a room is possible with relatively low temperatures, while cooling can be achieved at relatively high temperatures. Aforesaid surface is doubled still with thermal activation of both the ceiling and the subfloor. This leads to substantially lower energy consumption when compared to traditional climate control systems.

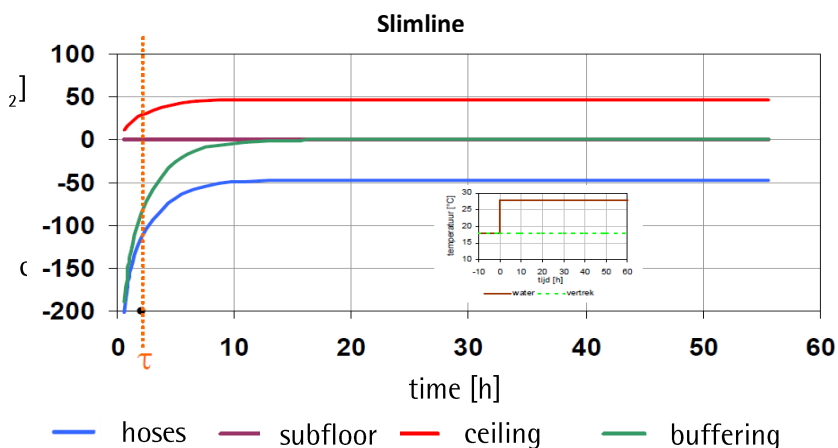
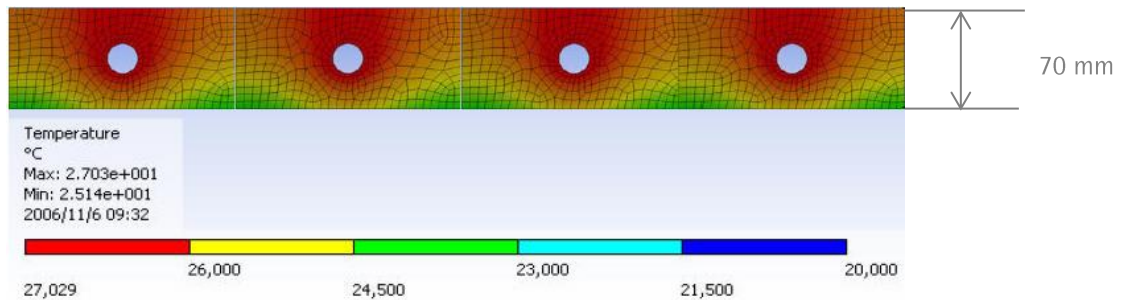
DOUBLE THERMAL ACTIVATION WITH SLIMLINE

The Slimline Floor system offers the opportunity to thermally activate both the ceiling as well as the subfloor. To this end, hoses are integrated in the prefabricated concrete slab and subfloor. This results in a very flexible solution with a high capacity but low energy consumption.



LOW MASS RESULTS IN HIGH CAPACITY AND ADJUSTABILITY

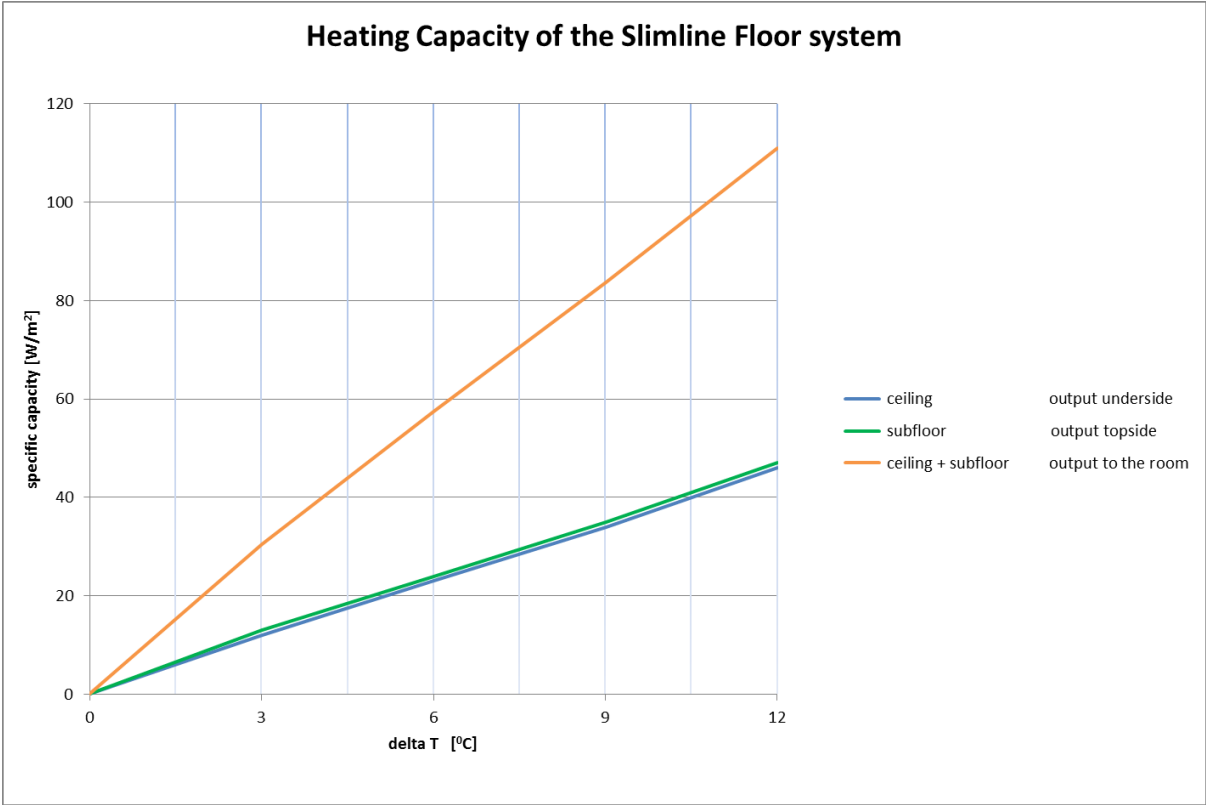
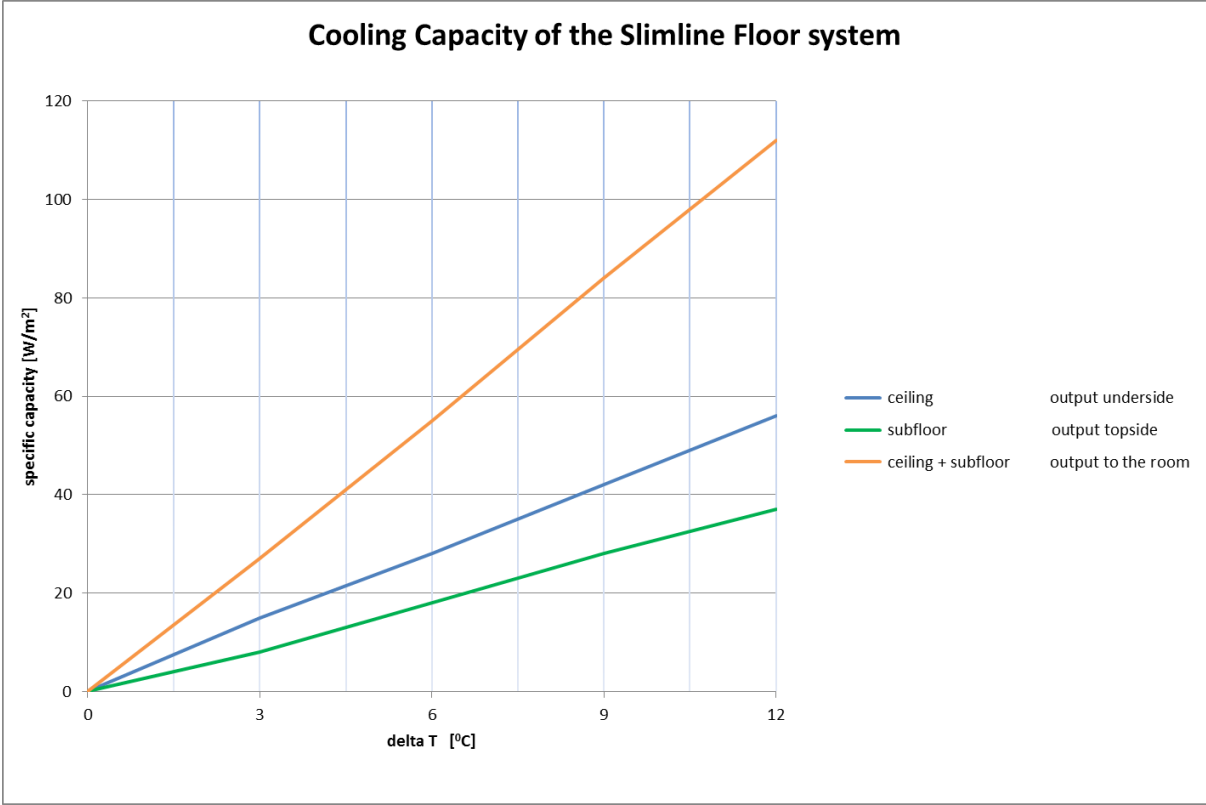
The Slimline Floor system offers a thin solution with a low mass. The actual capacity transferred to the room is much higher than when using heavy building systems. Another advantage is the improved ability to swiftly respond to a changing ΔT .



Source: Research by DWA 'Thermally Activated Floors' (2006): Buffer Capacity versus Response Time

SLIMLINE DOUBLE THERMAL ACTIVATION = 3X CAPACITY FOR HEATING








When both the floor and the ceiling are fitted with hoses for thermal activation, the heating capacity is three times higher.



The actual resulting capacity also depends on the selected type of floor finishing.

THE HIGHEST CAPACITY WITH SLIMLINE

The table below shows the thermal capacity for cooling and heating with thermal activation for a number of floor systems. It's sourced from the Dutch ISSO-85 publication and translated to English.

Floor type	Hose spacing [mm]	Hose depth [mm]	Delta T [K]	Output Capacity for Cooling [W/m ²]	Requested Capacity for Cooling [W/m ²]	Feasibility
Wide slab floor, output both sides	200	60	9	51	40	Feasible
Wide slab floor, output underside, raised floor	150	60	9	43	46	Borderline
Wide slab floor, lowered ceiling, output floorside	150	260	9	20	46	Not feasible
Prefab floor, output both sides, double hose system 	-	-	9	72	40	Feasible
Prefab floor, output ceiling side 	-	-	9	42	46	Borderline
Prefab floor, output both sides, double hose system 	-	-	9	46	40	Feasible
Prefab floor with raised floor 	-	-	9	35	46	Not feasible
Floor type	Hose spacing [mm]	Hose depth [mm]	Delta T [K]	Output Capacity for Heating [W/m ²]	Requested Capacity for Heating with/without internal heat load [W/m ²]	Feasibility
Wide slab floor without finishing, output topside subfloor (option for lowered ceiling)	200	260	9	33	12/32	Feasible
Wide slab floor with carpeting, output topside subfloor (option for lowered ceiling)	200	260	9	20	12/32	Feasible (when internal heat load is added)
Prefab floor with carpeting, output both sides, double hose system 	-	-	9	62	12/32	Feasible
Prefab floor with carpeting, output both sides 	-	-	9	44	12/32	Feasible
Prefab floor with carpeting, output both sides 	-	-	9	41	12/32	Feasible

As the above data shows, double thermal activation of the Slimline Floor (Prefab floor, activation ceiling and subfloor, double hose system) offers the highest capacity by far.

Would you like to know more about the Slimline Floor? Please contact us to discuss the possibilities for your next project or visit our website.

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