

Table 3. CLO and MET Conditions

Case No.	User's Condition	CLO	MET
Case 1	Before the Bath	0	1.6 (standing, light work)
Case 2	After the Bath	0	2.35 (after bath, sauna)

In order for the measured physical factors and the results by applying CLO and MET in table 3, to be within the thermal comfort PMV range -0.5~+0.5 by the ISO 7730, the MRT was calculated, and in Case 1 it was 29.6 °C (PMV= -0.484) and in Case 2 it was 27.8 °C (PMV=+0.500). Here, the wall and ceiling surface temperature was estimated to be the same as the air temperature of the middle of the room, and by using the following formula, the floor surface temperature (T_{floor}) which could satisfy the MRT value in Cases 1 and 2 was calculated.

$$MRT = \frac{T_{wall} \times A_{wall} + T_{ceiling} \times A_{ceiling} + T_{floor} \times A_{floor}}{A_{wall} + A_{ceiling} + A_{floor}} \quad [^{\circ}C] \quad (2)$$

Where, T_{wall} , $T_{ceiling}$, T_{floor} : wall, ceiling, floor surface temperature, respectively [$^{\circ}C$],

A_{wall} , $A_{ceiling}$, A_{floor} : wall, ceiling, floor area, respectively [m^2]

Calculations showed that in Case 1, the floor surface temperature was 35.7 °C and in Case 2 it was 30.8 °C. Though it is hard to satisfy users both before and after a bath, we determined that maintaining the floor surface temperature within the range of about 31~35 °C, would generally enhance thermal comfort.

Acknowledgments. Funding for this paper was provided by Namseoul university.

References

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4. http://www.eat.lth.se/fileadmin/eat/Termisk_miljoe/PMV-PPD.html