Office 1, 1 Coldbath Square,
Farringdon, London, EC1R5HL

www.transatlanticsafety.com

TransAtlanticSafety

THERMAL COMFORT (ISO 7730)

Thermal comfort is a subjective perception of the surrounding environment influenced by the level of physical activity (W/m2) and clothing (clo), as well as the environmental parameters such as air temperature (°Ca), mean radiant temperature (°Cr), air velocity (m/s) and air humidity (RH%).

When these factors have been estimated or measured, the thermal sensation for the body as a whole can be predicted by calculating the predicted mean vote (PMV). Thermal comfort is different to thermal stress as it is not considered to have serious adverse health effects but instead produce discomfort leading to complaints and loss of productivity.

Once the PMV is calculated, the predicted percentage dissatisfied (PPD) can be determined. The ideal PMV score is 0, leading to only 5% of occupants being dissatisfied. This, however, is very difficult to achieve, and a more realistic PPD of <15% is often adopted. The nature of the building dictates the desired level of comfort.

For example, spaces occupied by very sensitive and fragile persons with special requirements (e.g. kindergarten, retirement home) should have $-0.2 < PMV < 0.2$ resulting in PPD <6%. On the other hand, the existing building used by mostly healthy population (e.g. department store) can have $-0.7 < PMV < 0.7$ resulting in PPD <15%.

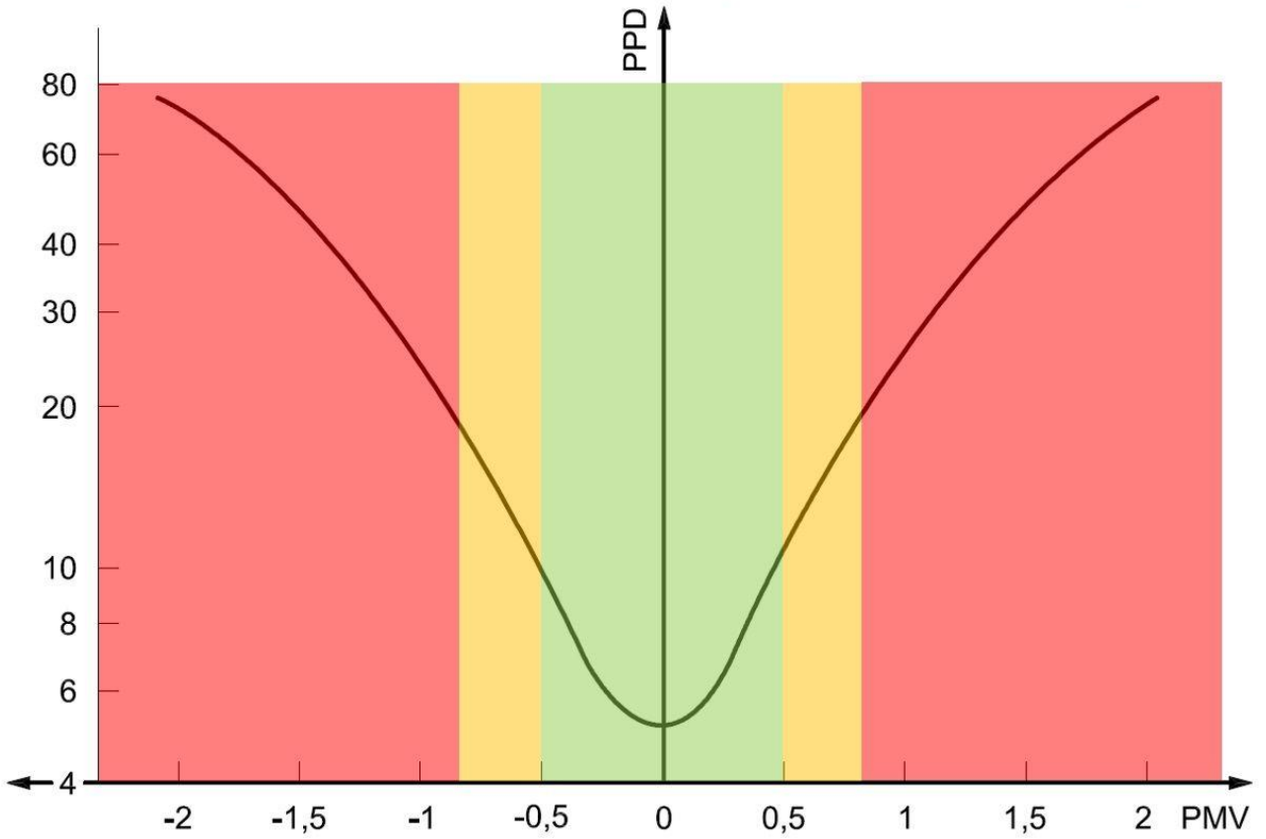
Occupational Hygienists are often asked to assess the indoor air quality or a “sick building” syndrome. The ISO 7730:2005 standard can equip you with a tool to evaluate built environments and advise on the best course of action to reduce the number of dissatisfied employees. An online calculator designed by Chuansi Gao will help you complete calculations and predict how the change in environmental parameters will affect the PPD.

PMV and PPD Calculator https://www.eat.lth.se/fileadmin/eat/Termisk_miljoe/PMV-PPD.html

Source: ISO 7730:2005 “Ergonomics of the thermal environment”.

#Thermal #Comfort #ISO7730 #OH #IH #Health #Safety

THERMAL COMFORT (ISO 7730:2005)



Calculation of PMV and PPD

70	M (W/m2), Metabolic energy production (58 to 232 W/m2)
0	W (W/m2), Rate of mechanical work, (normally 0)
22	Ta (C), Ambient air temperature (10-30)
22	Tr (C), Mean radiant temperature (often close to ambient air temperature)
0.1	v (m/s), Relative air velocity (0.1 to 1 m/s)
50	rh (%), Relative humidity
1.0	Icl (clo), basic clothing insulation (1 clo = 0.155 W/m2K)

Calculate | Interpret PMV and PPD

PMV and PPD

PMV 0.08 -3 cold to +3 hot

PPD 5.1 (%)

CALCULATION READY!

+ 3	Hot
+ 2	Warm
+ 1	Slightly warm
0	Neutral
– 1	Slightly cool
–2	Cool
– 3	Cold