

FAQ : Fabric Comfort

4. What are all the various heat transfer mechanism from to body to environment?

Answer:

The mechanisms that allow the body to lose heat to the environment to maintain the heat balance are;

1. **Conduction** : By direct contact (e.g. body in contact with any cold object)
2. **Convection** : By a moving fluid (liquid or gas) [e.g. air in contact with body takes away heat]
3. **Radiation**: By electromagnetic waves. Cloth acts to reduce
 - radiation loss by reducing the temperature difference
 - between the body and its immediate surroundings
 - As the clothing effectively becomes the immediate surroundings.
4. **Evaporation**: BY evaporation of sweat through the cloths.

Hot + Dry - Good

Hot + Humid –Problematic

5. Explain the measurement of Thermal resistance with help of Guarded Hot Plate Method?

Answer:

Refer: Fabric Comfort → Measurement → Guarded hot plate method

6. Define Fabric Porosity? And calculate the pore volume wool fabric with help of the following details

Fabric weight	- 200 g/m ²
Fabric thickness	- 0.53 mm
Wool fiber density	- 1.31 g / cc

Answer:

Fabric porosity:

- The percent of open space per unit volume of a fabric.
- Porosity 'h' of a fabric is defined as the ratio of open space to the total volume of porous material calculated from the measured fabric thickness and weight per unit area of fabric using the equation:
- Air permeability and porosity are very closely related properties, although the relationship is not so simple.

Pore Volume

$$= [(S - S')/S] * 100$$

Where S = Specific gravity of fiber

S' = Apparent specific of fabric

$$\begin{aligned} \text{Apparent specific gravity of fabric} &= W / (1000 * t) \\ &= 200 / (1000 * 0.53) = 0.3774 \\ &= [(1.31 - 0.3774)/1.31]*100 = 71.12 \% \end{aligned}$$