

**Heating Load Computations for Buildings****Heat Loss in Buildings****Building Heat Load**

- ☐ Heat flows to colder areas.
- ☐ Because a difference in temperature exists between inside and outside, heat will move through walls, floors, ceilings, windows, and doors at a rate related to temperature difference and the ability of the structure's materials to transfer heat.

**Heat loss** is the amount of heat that a building or building space loses from heat transfer during cold weather.

- ☐ It is dependent on the size, type, and quality of construction, weather conditions, and the climate in the geographical area where the building is constructed.
- ☐ The rate of heat loss from the building will determine the size of the heating plant (e.g., furnace or boiler), the size of terminal heating units (radiators, ducts, and so on), and ultimately, the heating cost.
- ☐ The heating load is the heat that the HVAC equipment must generate and introduce into the building to maintain comfortable conditions in the building interior.
- ☐ A designer needs to know the peak heating load so that a space heating system can be designed.

Heat losses that contribute to the heating load in a building occur generally through:

**Transmission**

Transmission heat losses are the result of heat passing through a material in the building envelope (e.g., glass) or through an assembly of materials (e.g., walls, ceilings, floors, and so forth).

**Infiltration**

Infiltration heat losses relate to air leakage through the building envelope and the energy required to heat unconditioned air that has leaked into the structure.

Certain amount of cold air leaks into the building and an equal amount of hot air leaks out. Doors and windows!

**Ventilation**

Ventilation is the introduction of outdoor air into the building, or parts of the building, at a controlled rate with the intent to maintain or improve indoor air quality.

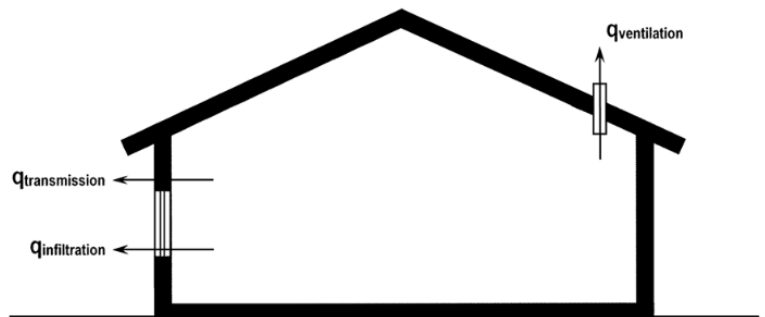


Figure 1. Heat losses from a building consists of transmission heat loss ( $q_{\text{transmission}}$ ), infiltration heat loss ( $q_{\text{infiltration}}$ ), and ventilation heat loss ( $q_{\text{ventilation}}$ ).