

SIGNIFICANCE

Prevailing climate plays a major role in design and construction of a building and climate must be taken into account when calculating the thermal performance of building envelope, as it determines the cooling load and resultant energy use in a building.

Envelope experiences several loads including structural loads, both static and dynamic, air, heat or thermal, and moisture loads. Design of the envelope is complex in nature as several factors are to be evaluated and balanced to ensure required level of thermal, acoustic and visual comfort together with safety, accessibility and aesthetic excellence. Improper selection of building envelope can lead to inefficient design of HVAC systems, building operation inefficiencies, inadequate condensation resistance at intersections of components and poor occupant comfort.

Considering Dubai's climate, improving the performance of a building's thermal envelope will result in lowered air conditioning requirements, reduced energy use and reduced load on building machinery. This further results in reduced energy costs, lower maintenance costs and better comfort for building occupants.

APPLICABILITY

This regulation is applicable to all building types. Refer to Table 101.07(1) in Section One - Administration for detailed applicability levels.

IMPLEMENTATION

The implementation strategy for this regulation is to minimise heat gain through the envelope, by enhancing its design and choosing the appropriate building materials.

The building envelope consists of both opaque and transparent parts of the walls and roof which in addition to the floor are connected to the external environment. These may be single or multilayer and represent the partition between the external and internal environment.

Primary heat transfer modes in a building are conduction, convection and radiation (fig. 501.01(1)). The mode of heat transfer can change, as the heat flows through and within the building. Heat radiated by the sun gets absorbed by the building wall. By conduction, this heat gets transferred through the wall, which gets further transferred by convection to the indoor air and by radiation to the indoor surfaces.

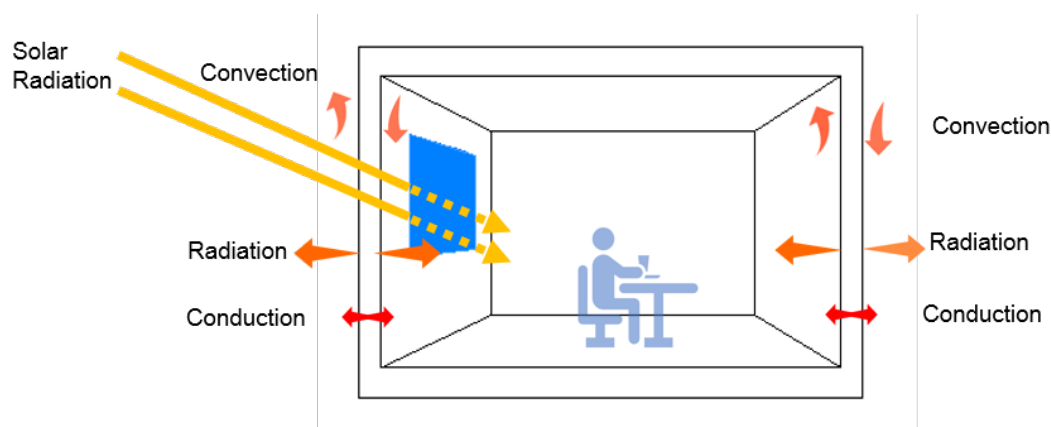


Fig. 501.01(1): Forms of Heat Transfer Through Building Envelope