What is Heat Loss?

Heat loss refers to the process by which heat escapes from a building's interior to the external environment. This occurs due to temperature differences between the inside and outside of a structure, driven by conduction, convection, and radiation. Heat loss is a critical factor in energy efficiency, as it directly impacts heating demands and energy consumption.

In the UK, heat loss is a significant concern in both new builds and retrofits due to the country's temperate climate and the need for efficient heating systems. The Building Regulations Approved Document L (Conservation of Fuel and Power) provides guidelines to minimise heat loss through improved insulation, airtightness, and efficient heating systems.

Synonym(s): Thermal leakage, energy loss

Heat loss occurs through three primary mechanisms:

1. **Conduction:** Heat transfer through building materials (e.g., walls, windows, roofs).
2. **Convection:** Heat transfer through air movement (e.g., gaps around doors and windows).
3. **Radiation:** Heat transfer through electromagnetic waves (e.g., heat escaping through uninsulated roofs).

Practical Examples:

- **Windows:** Single-glazed windows have higher heat loss compared to double or triple-glazed units.
- **Walls:** Solid walls lose more heat than cavity or insulated walls.
- **Roofs:** Poorly insulated roofs can account for up to 25% of total heat loss in a home.

Related Terms:

1. **U-Value:** A measure of heat loss through a building element, expressed in W/m^2K. Lower U-values indicate better insulation.
2. **Airtightness:** The measure of how well a building prevents uncontrolled air leakage, reducing heat loss.
3. **Thermal Bridging:** Areas in a building where heat escapes more easily due to breaks in insulation (e.g., wall junctions).
4. **Fabric First Approach:** A design philosophy prioritising the building's envelope (insulation, airtightness) to minimise heat loss before considering mechanical systems.
5. **Condensation Risk:** Excessive heat loss can lead to cold surfaces, increasing the risk of condensation and mould growth.
6. **Energy Performance Certificate (EPC):** A document rating a building's energy efficiency, influenced by heat loss.
7. **Retrofit Insulation:** Adding insulation to existing buildings to reduce heat loss (e.g., loft insulation, wall insulation).