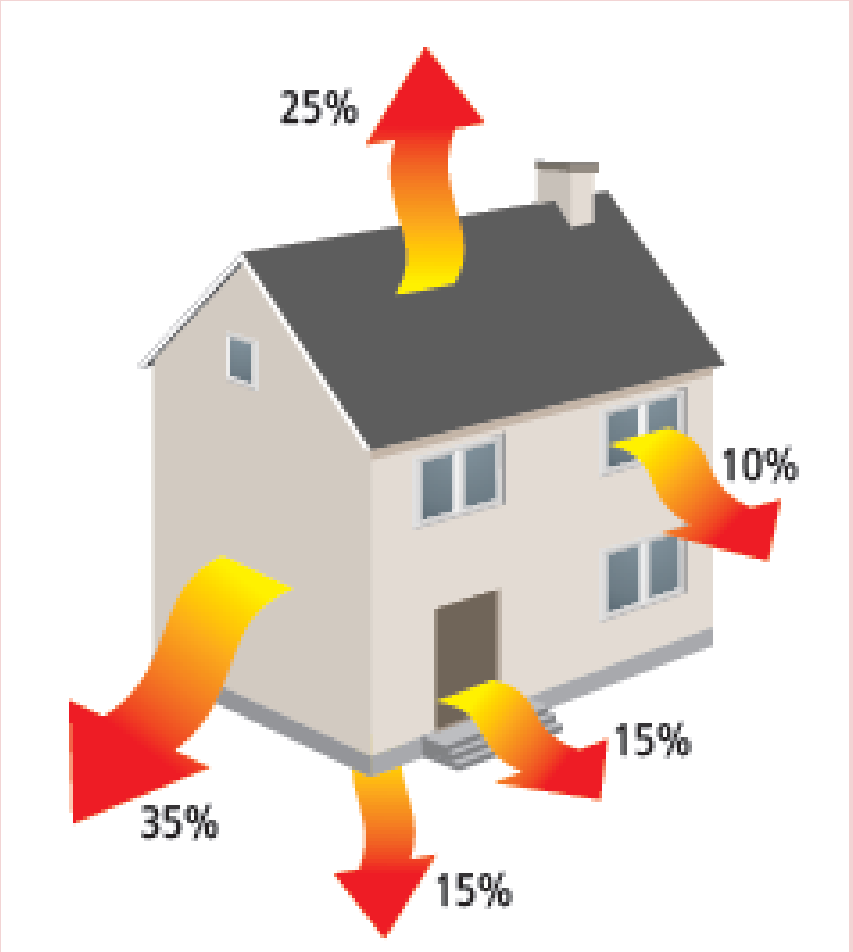
SECTION C

CHAPTER 17

INSULATION AND VENTILATION

Insulation

- Prevents heat loss in a building
- High density materials used
- Found in many areas of the home



Insulation Materials: Mineral wool

- Comes in various forms:
  - fibreglass
  - basalt rock
  - slag wool
- Works by trapping air between fibres
- Used in walls and ceilings

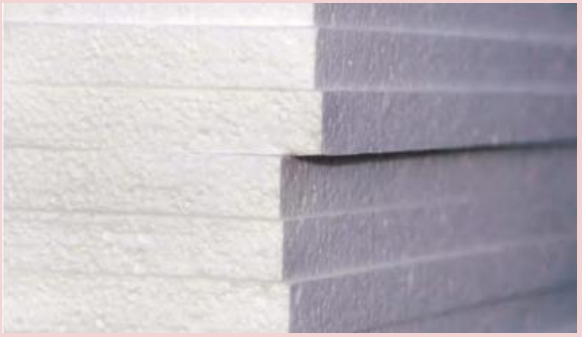
Mineral wool insulation

Insulation Materials: Cellulose

- Recycled paper products
- Paper is recycled by shredding, hammering and pulverising
- Fire retardant products mixed with the paper fibres

Insulation Materials: Cellular Plastics

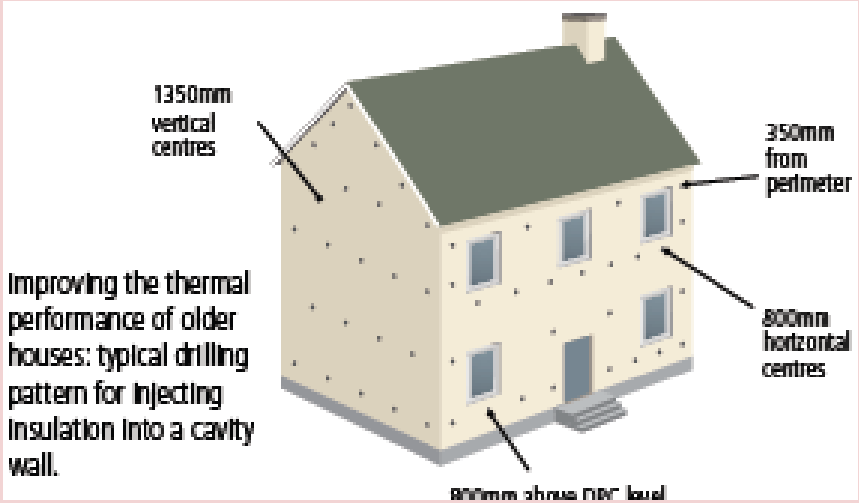
- **Expanded Polystyrene (EPS):**
  - Foam beads expanded with heat
  - Contains air pockets
  - Can be graphite coated



- **Extruded Polystyrene Foam (XPS):**
  - Close cell form
  - More moisture resistant and stiffer than EPS
  - Consistent structure throughout the board

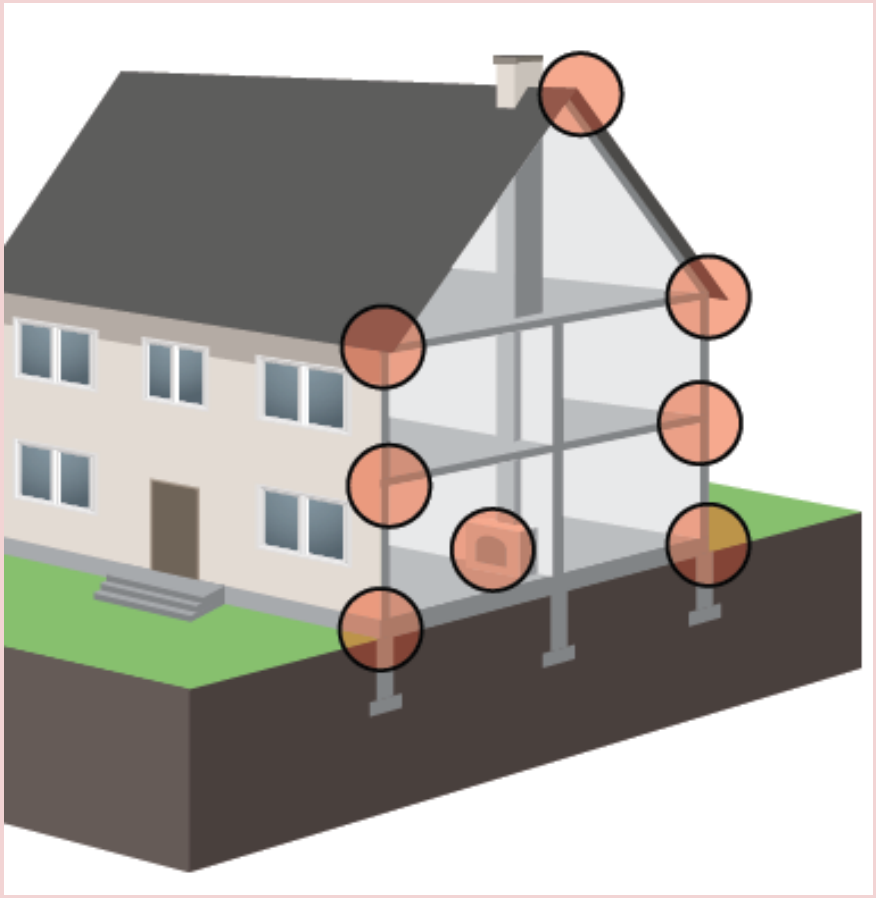
Insulation Materials: Cellular Plastics

- **Polystyrene Beads:**
  - Raw material beads which are pumped into the wall cavity
  - Hole drilled in walls and and beads pumped in under pressure with an adhesive

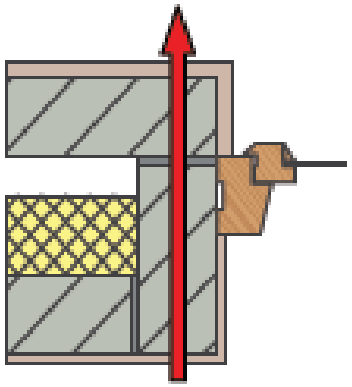


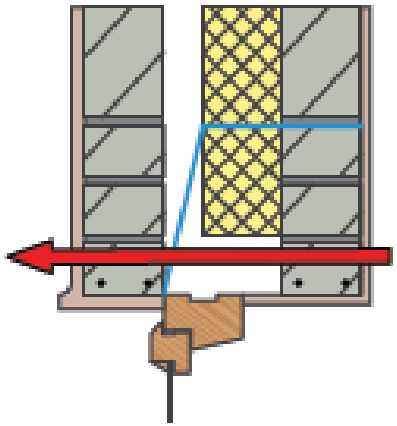
Insulation Placement

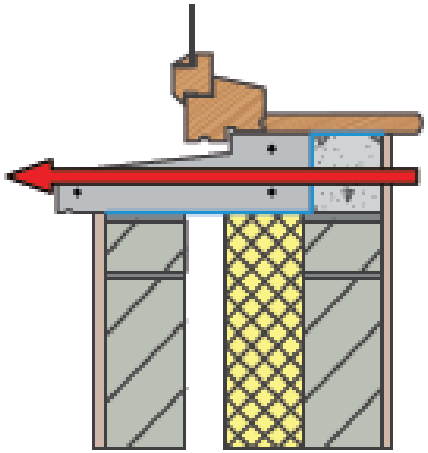
- Mainly on the external envelope of the building
- Thermal bridging can occur where two building elements meet as per diagram
- Thermal bridging is where is there is opportunity for heat to transfer between two materials



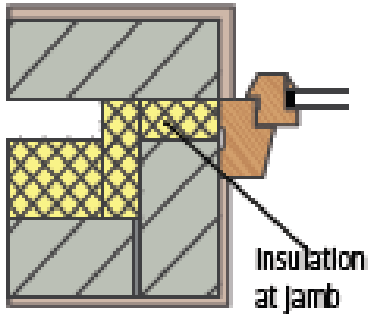
WITHOUT INSULATION (COLD BRIDGING)

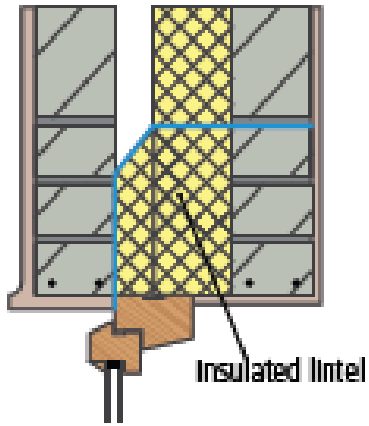


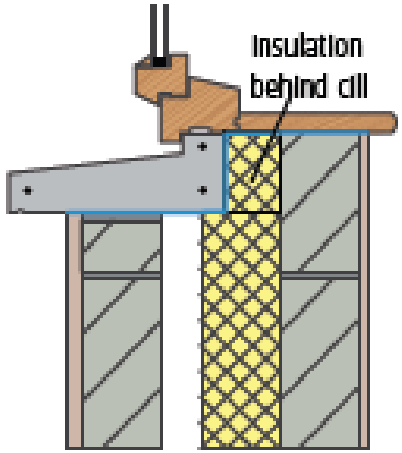




CONCRETE CAVITY (COLD BRIDGING AVOIDED)





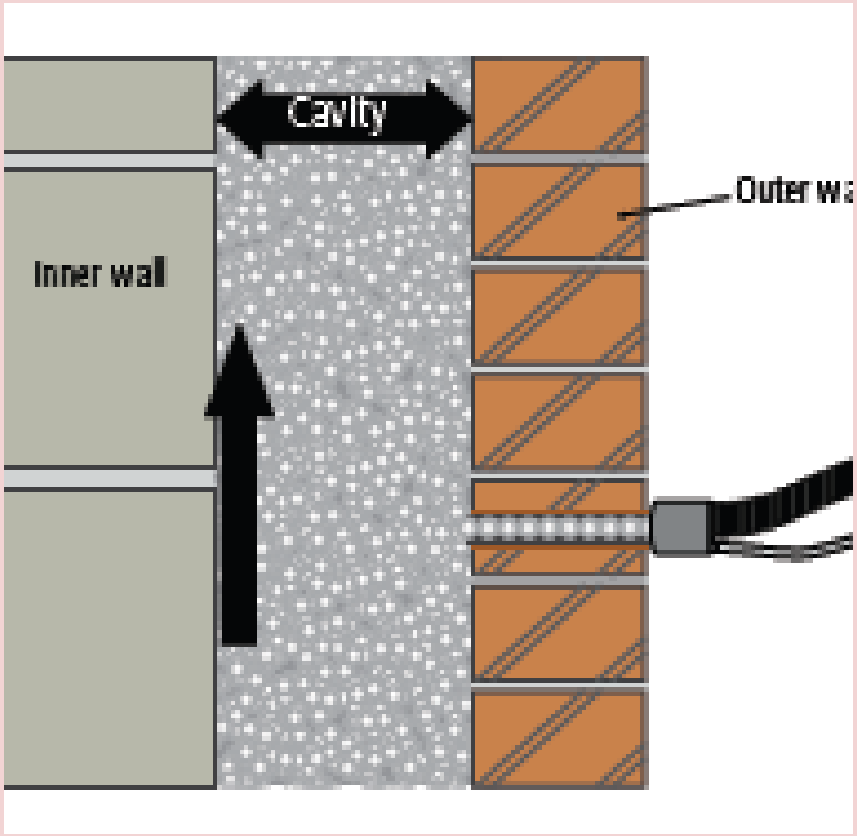


Areas of Insulation

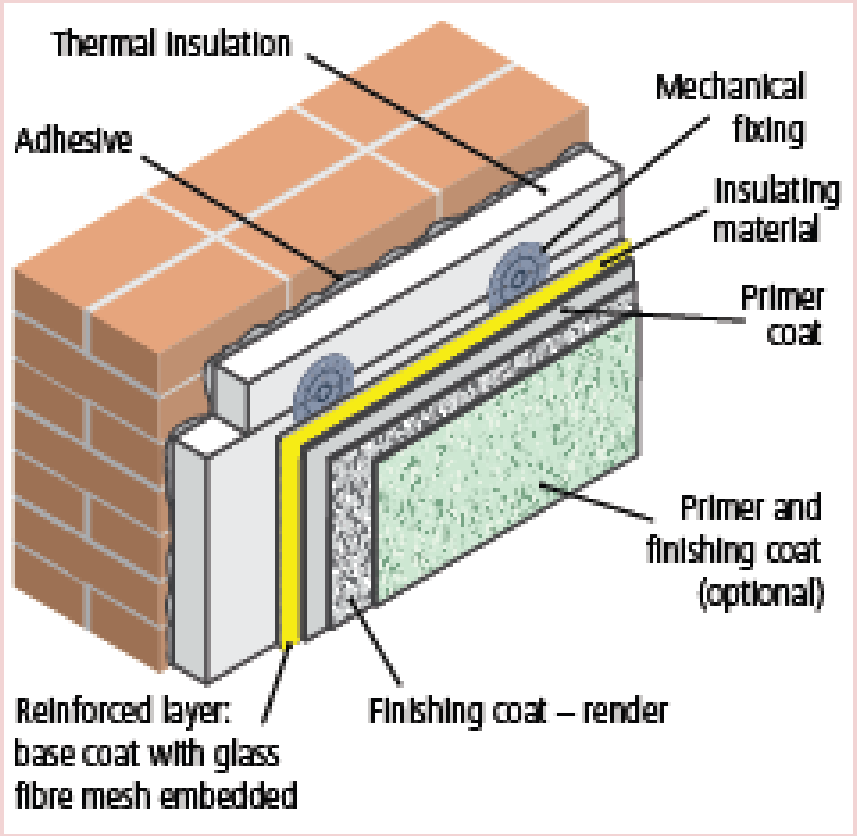
- Key locations of insulation are:
  - Ceiling joists
  - Floor joists
  - Attic space
  - Stud partitions
  - Around pipe work and services

Improving Thermal Performance of Existing Buildings

Cavity Fill



External Wall Insulation (EWI)



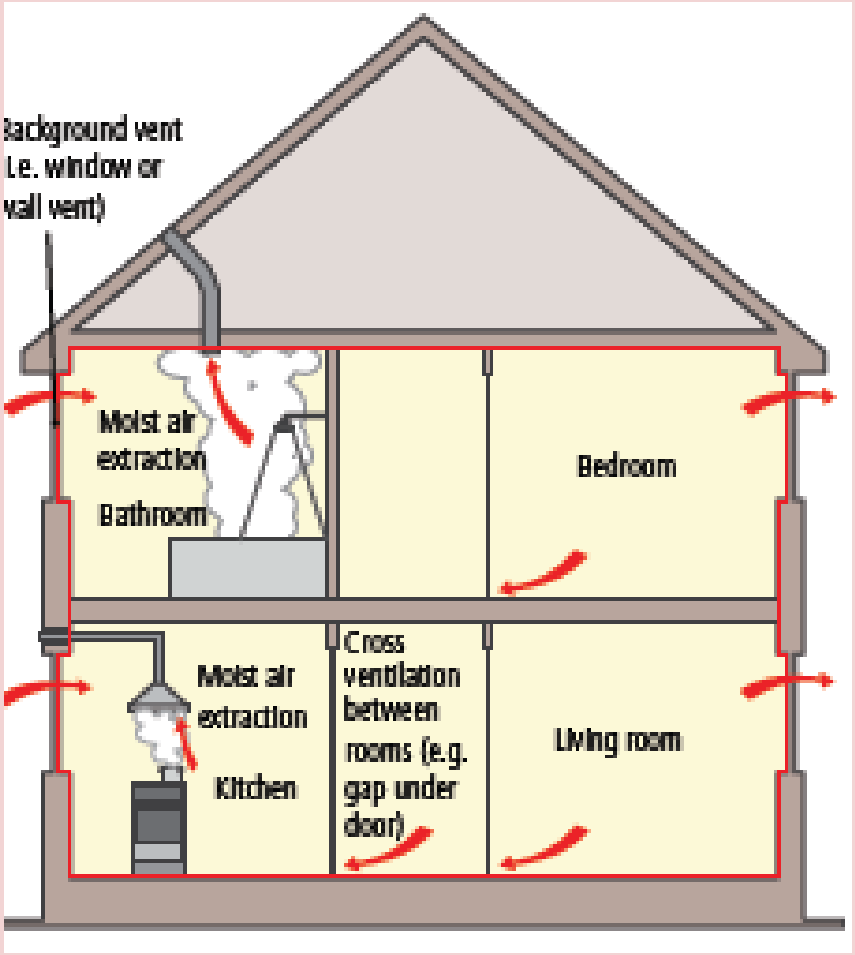
Ineffective Insulation

Interstitial condensation

Ventilation

- Ventilation is the process by which air is circulated and replaced in a building such as:
  - Windows
  - Doors
  - Vents
  - Mechanical Ventilation with heat recovery

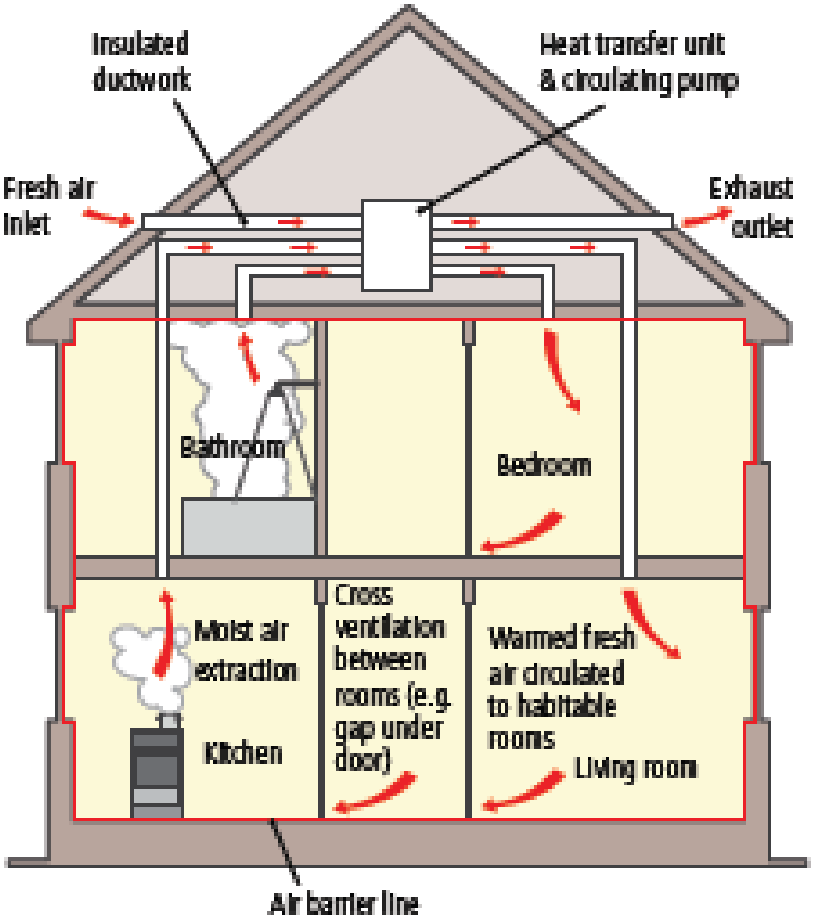
Combined Ventilation

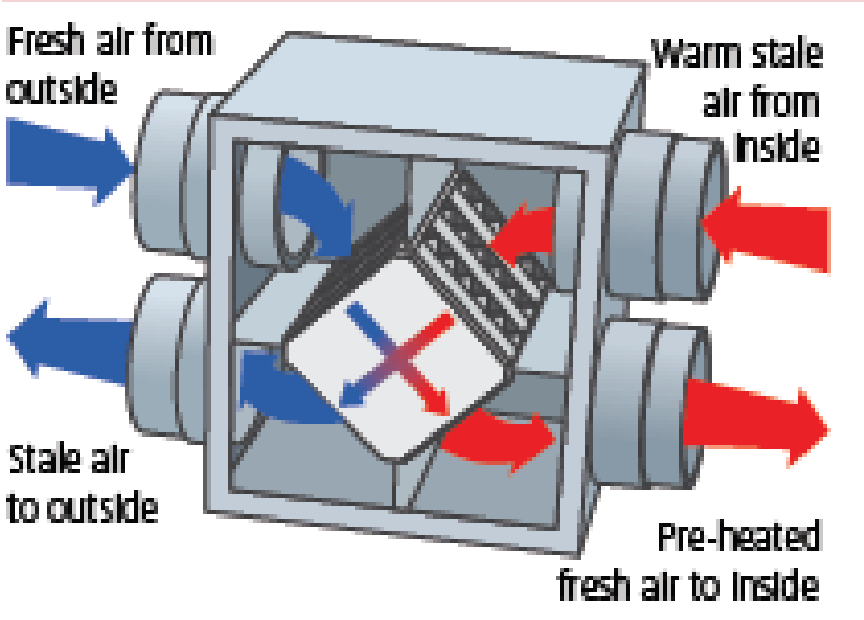


Ventilation in the home using a combination of mechanical vents and natural ventilation

Mechanical Ventilation with Heat Recovery (MVHR)

Mechanical Ventilation with Heat Recovery (MVHR)





Mould Growth

- Poor insulation and/or poor ventilation
- Leads to condensation build up
- Mould is fungi, which is made up of spores which can be found in outside air
- Can cause respiratory problems and damage furniture and building materials