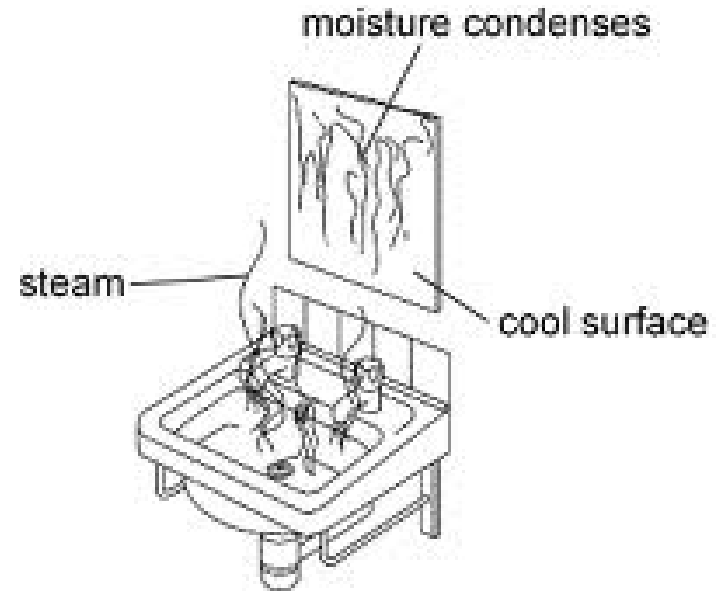
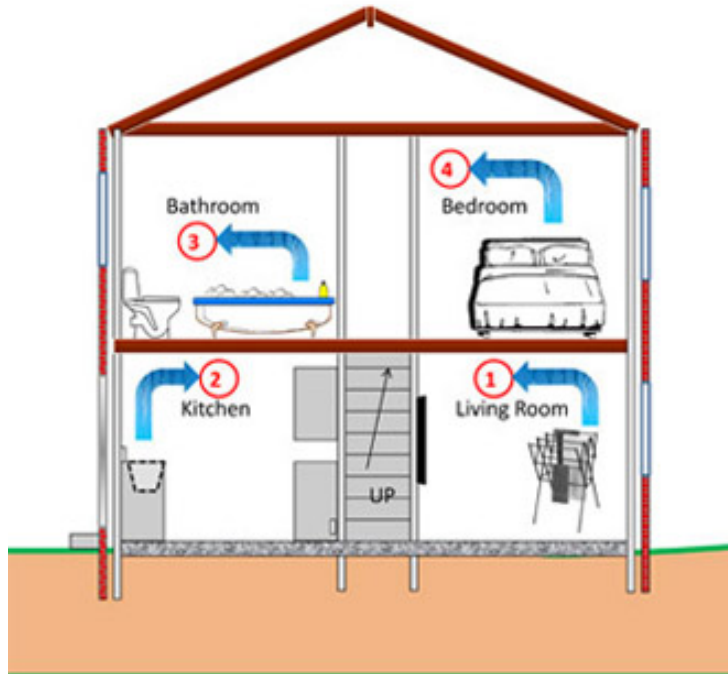




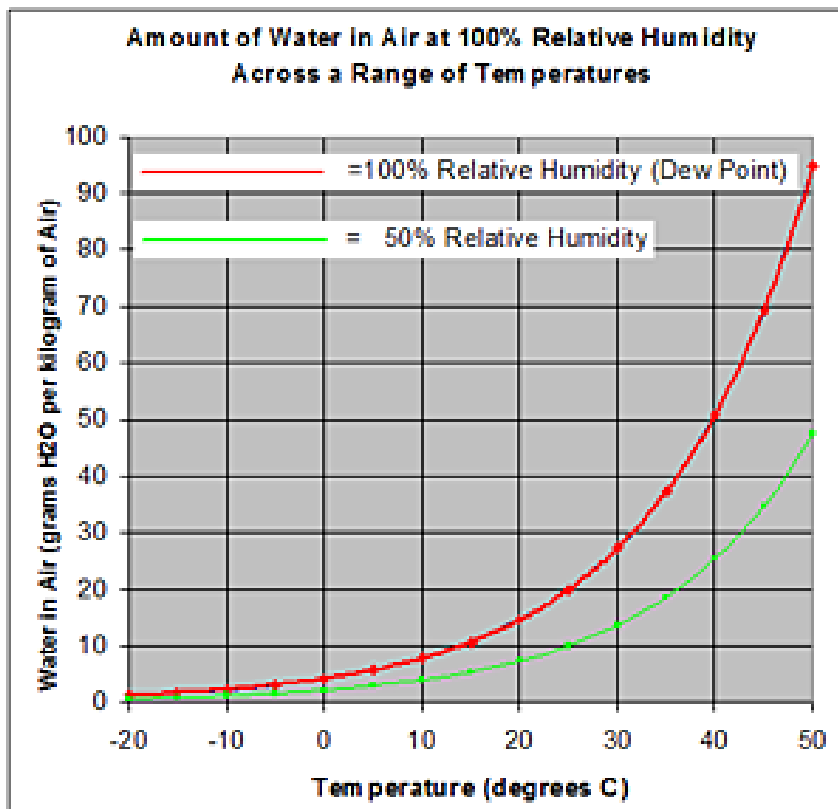
Condensation & fuel poverty: causes & cures

Condensation is caused when water vapour comes into contact with surfaces below dew point.



Sources of water vapour:

- non-optional living activities: breathing, cooking, washing, drying
(size of family) (means of ventilation)
- constructional defects: penetrating damp, rising damp, traumatic damp, damp soliums, ineffective communal extracts
- (- optional life choices)

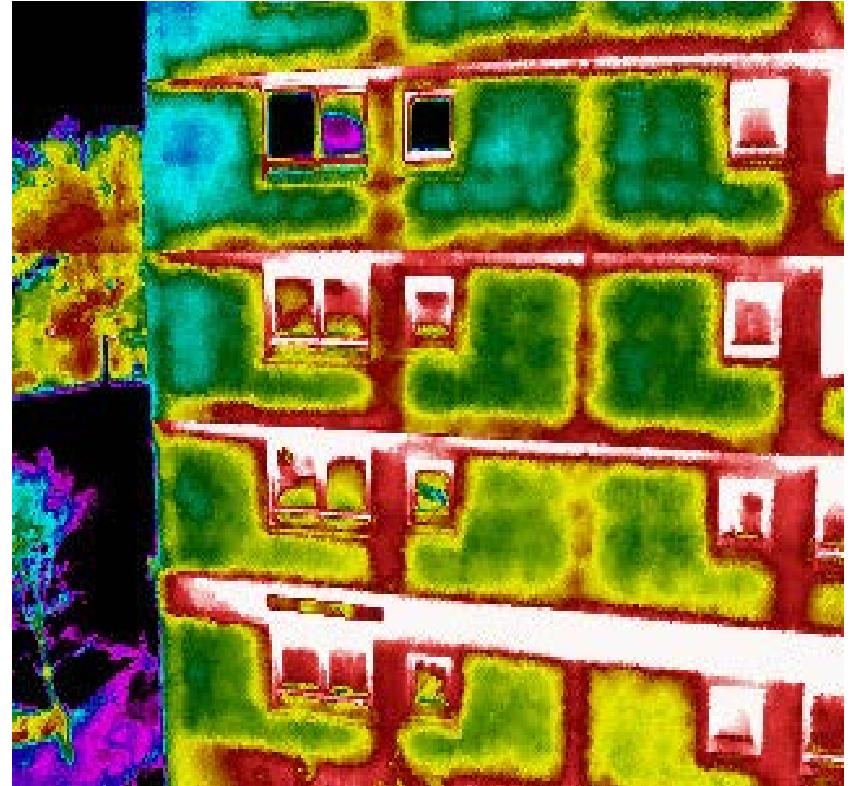


Warm air can hold more water vapour than cold air.

When warm air comes into contact with a surface below dew point, it cools down and forms condensation

Cold surfaces often arise due to:

- falling temperatures at night time, or
- excessive heat loss, in particular locations.



Factors affecting surface temperatures:

- **heat input to home:**
affordability, pattern of occupancy, time of day
- **heat loss from home:**
draughts (windows, doors, floors), ventilation strategy & thermal insulation (roofs, walls, windows, floors)
- **location within home:**
corners, thermally isolated locations, cold bridges & gaps in thermal insulation improvements (balconies, stairs etc)

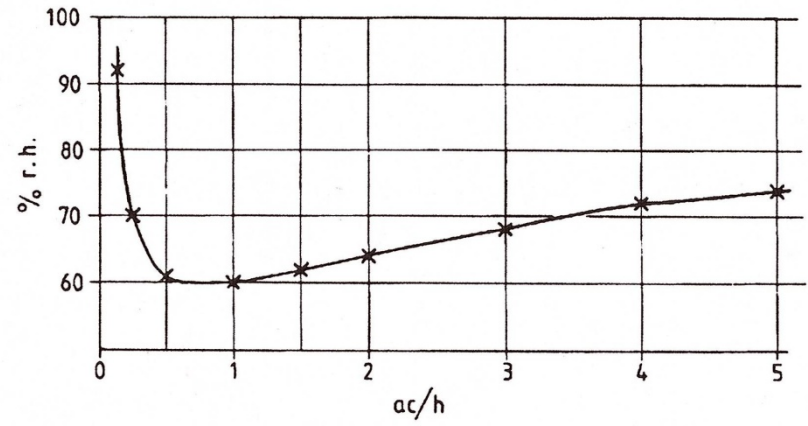
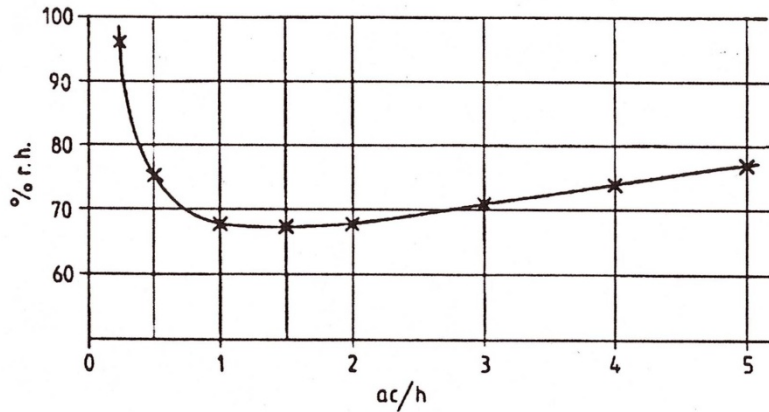
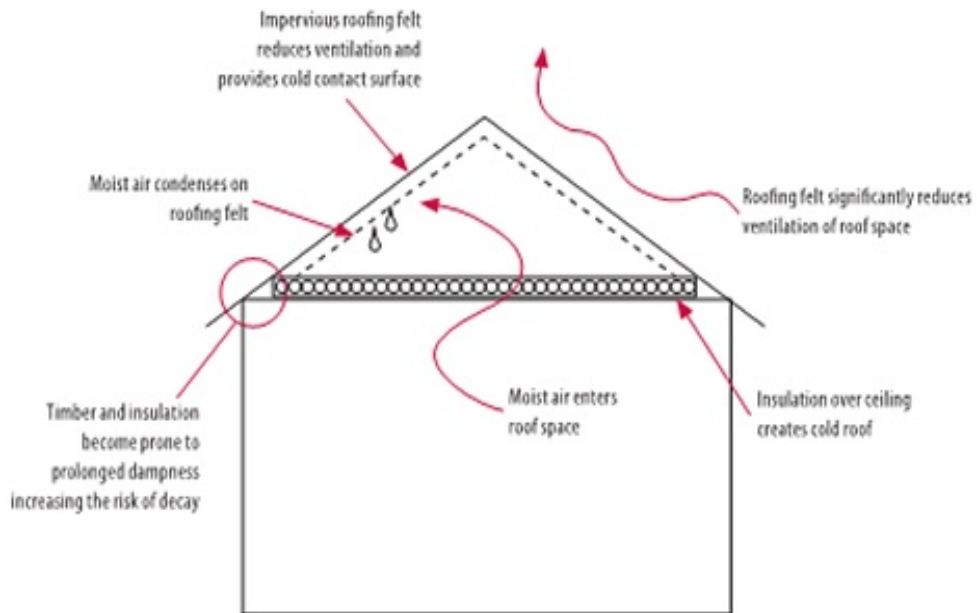


Figure 48. Relationship between r.h. and ventilation rate for HIGH moisture input

Figure 49. Relationship between r.h. and ventilation rate for LOW moisture input

Effects of excessive ventilation and draughts on surface temperatures and therefore relative humidity
 Effects of inadequate ventilation on absolute air moisture content and therefore relative humidity

'COLD ROOF': simplified cross section of a building provided with insulation and roofing felt



Interstitial condensation

- walls
- roofs

Preventing condensation

Factors affecting surface temperatures:

- **heat input to home (affordability):**
gas fired central heating: modern combi condensing boilers, district heating
- **heat loss from home:**
new windows, loft insulation, cavity insulation, external wall insulation, dry lining, rain screen with insulation,

Factors affecting **absolute air moisture content**:

- controllable trickle vents, kitchen extract ventilation, bathroom extract ventilation
- communal extract cleaning



Barriers to preventing condensation:

- mixed tenure blocks : scheme decisions
- deck egress blocks : cost & decanting challenge

Causes of fuel poverty:

- poor energy efficiency of homes
- high and rising cost of heating
- low and falling household income for certain classes of tenants

Progress Report on the Scottish Fuel Poverty Statement 2002

November 2010

“The Scottish Government believes that no-one should have to live in fuel poverty and has a specific objective to eradicate fuel poverty as far as is reasonably practicable by 2016”.

“Recent fuel price increases will undoubtedly have an impact upon the numbers of fuel poor in Scotland. as many as 46,000 more households (i.e. 2% of households) will be pushed into fuel poverty every time energy prices rise by 5%.”

“At a time when incomes are depressed for those in work due to pay freezes and unemployment is rising, the ability to reduce fuel poverty through increasing income is difficult”.



ABERDEEN
CITY COUNCIL

Preventing fuel poverty:

Energy efficiency of homes:

- loft insulation
- window replacements
- cavity insulation
- external wall insulation to hard-to-treat properties
- rain screen and insulation to system-built high rise blocks

Cost of heating:

- replacing electrical storage heating with central heating to low rise, and district heating to high rise blocks
- replacing old boilers with combi condensing gas boilers

Countering the effects of low incomes:

- energy efficiency
- district heating
 - savings by buying energy in bulk
 - flat rate "Heat with Rent"





Barriers to preventing fuel poverty:

- mixed tenure blocks :
scheme decisions
- deck egress blocks :
cost & decanting challenge
- granite tenements :
technical & planning challenge

