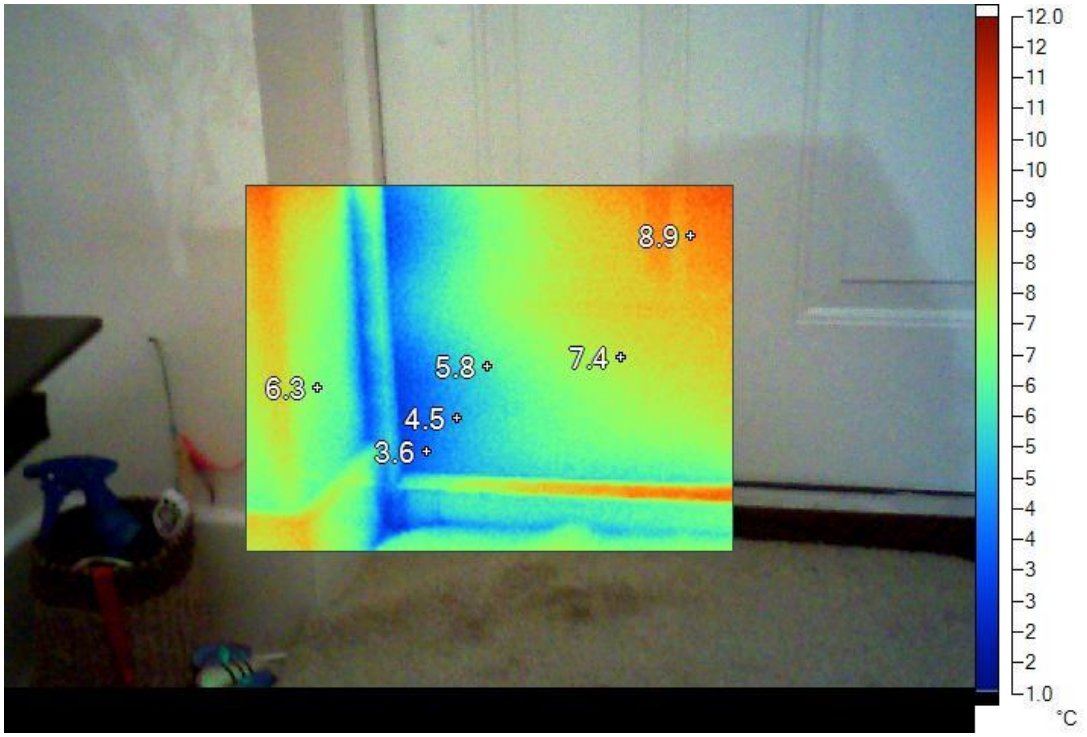
Thermal Images: reveal draughts (when air flows in)

Infiltration at the top of the window frame

This is a badly fitted window. The feathery edge to the cold patch is a key feature of draughts.

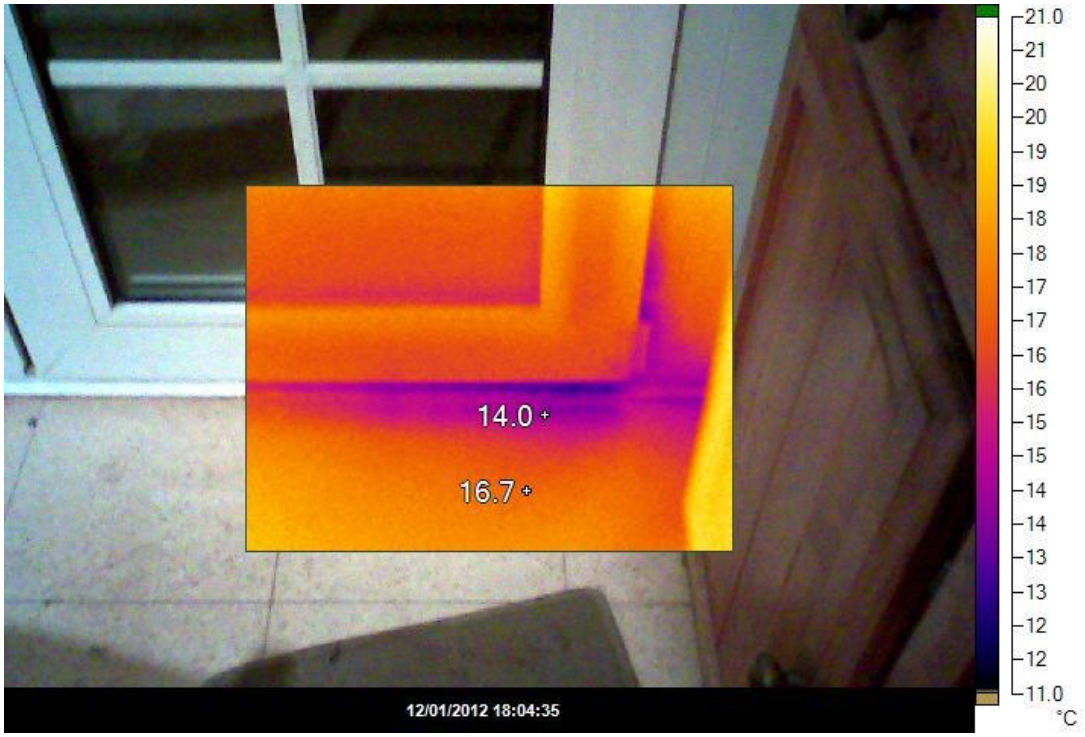
Thermal Images: shows draughts (where air flows in)



Infiltration around an external door

Some draught stripping would help here.

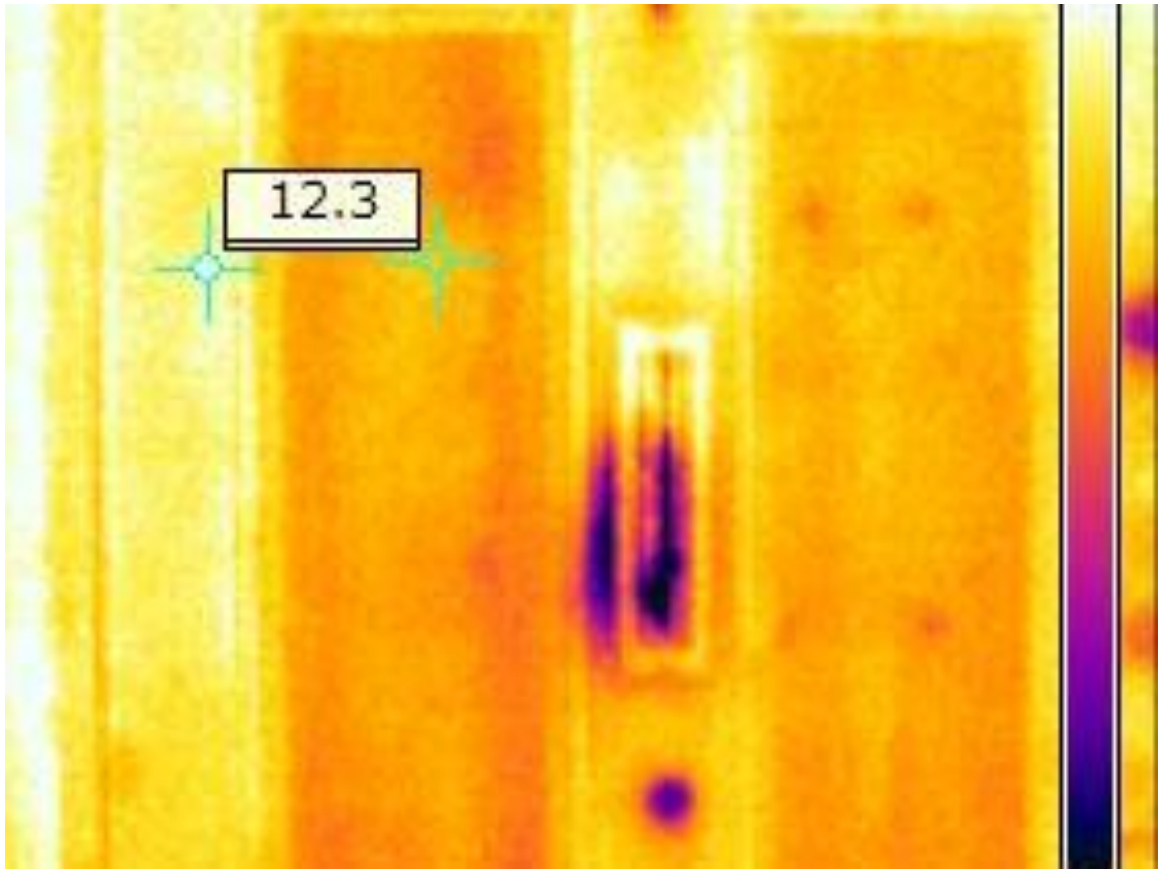
Thermal Images: find draughts



Draught at the bottom of the door

This door is not closing properly against the step. Draught stripping would help but actually this is not too bad.

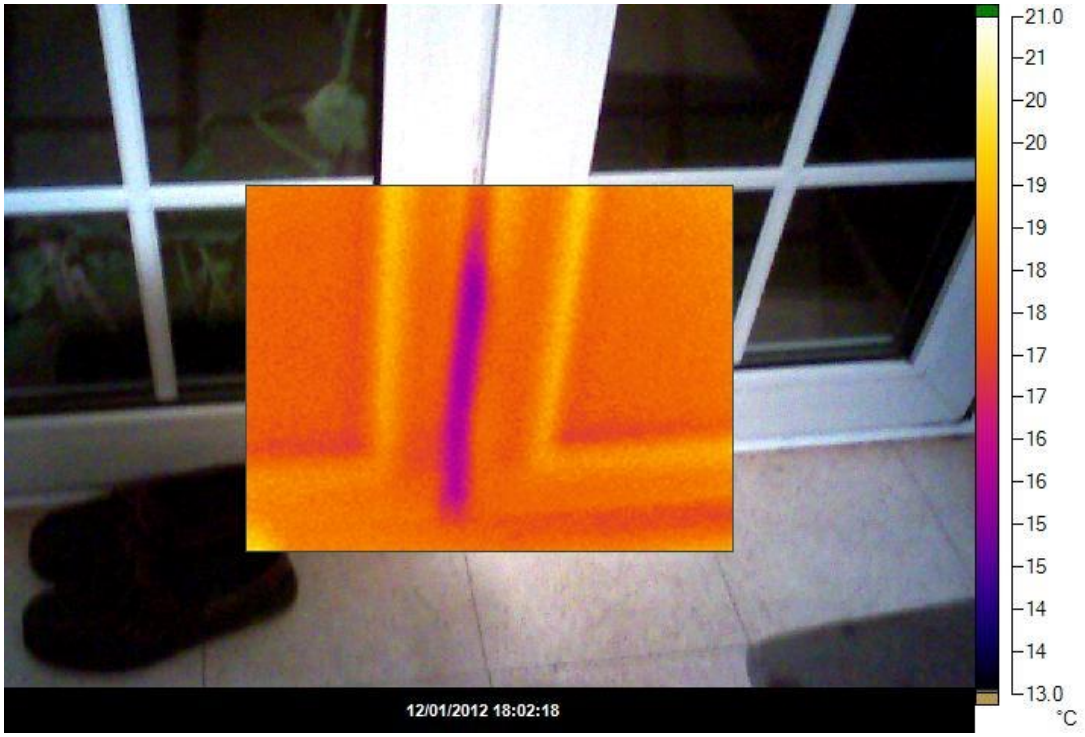
Thermal Images: find draughts



Draught through a letter box

This letterbox is not closing properly and air is leaking through and around the frame.

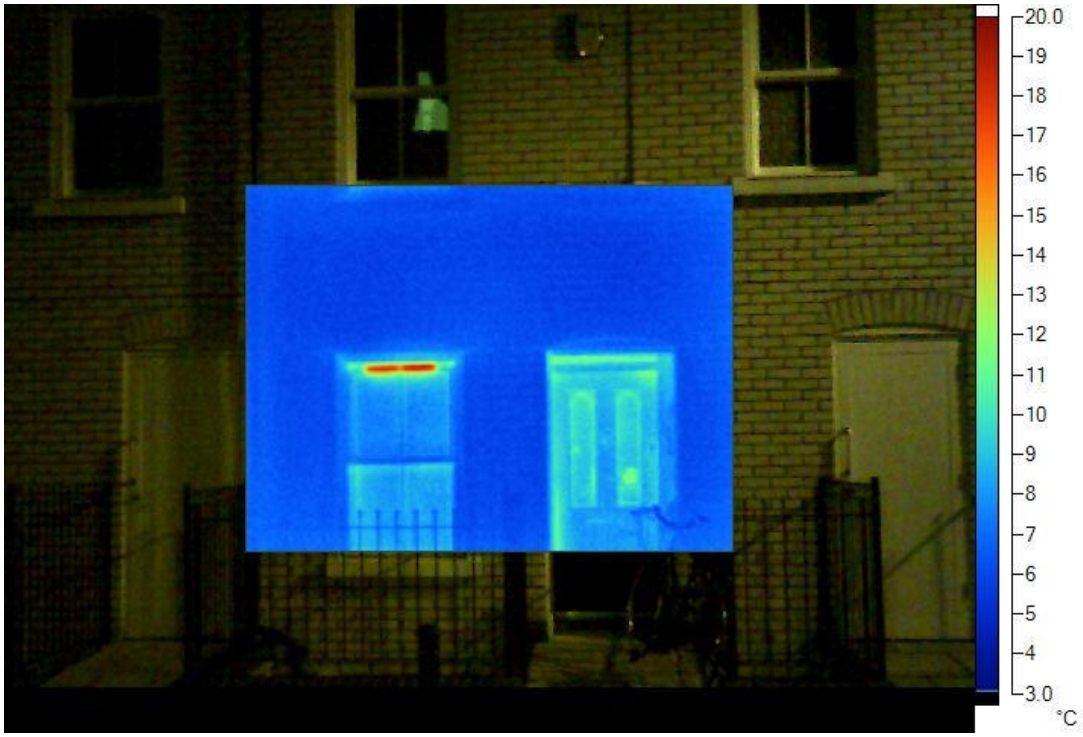
Thermal Images: find draughts



Infiltration through french windows

It is tricky to fix draughts in french windows - in this case there is a problem just in the lower part of the door.

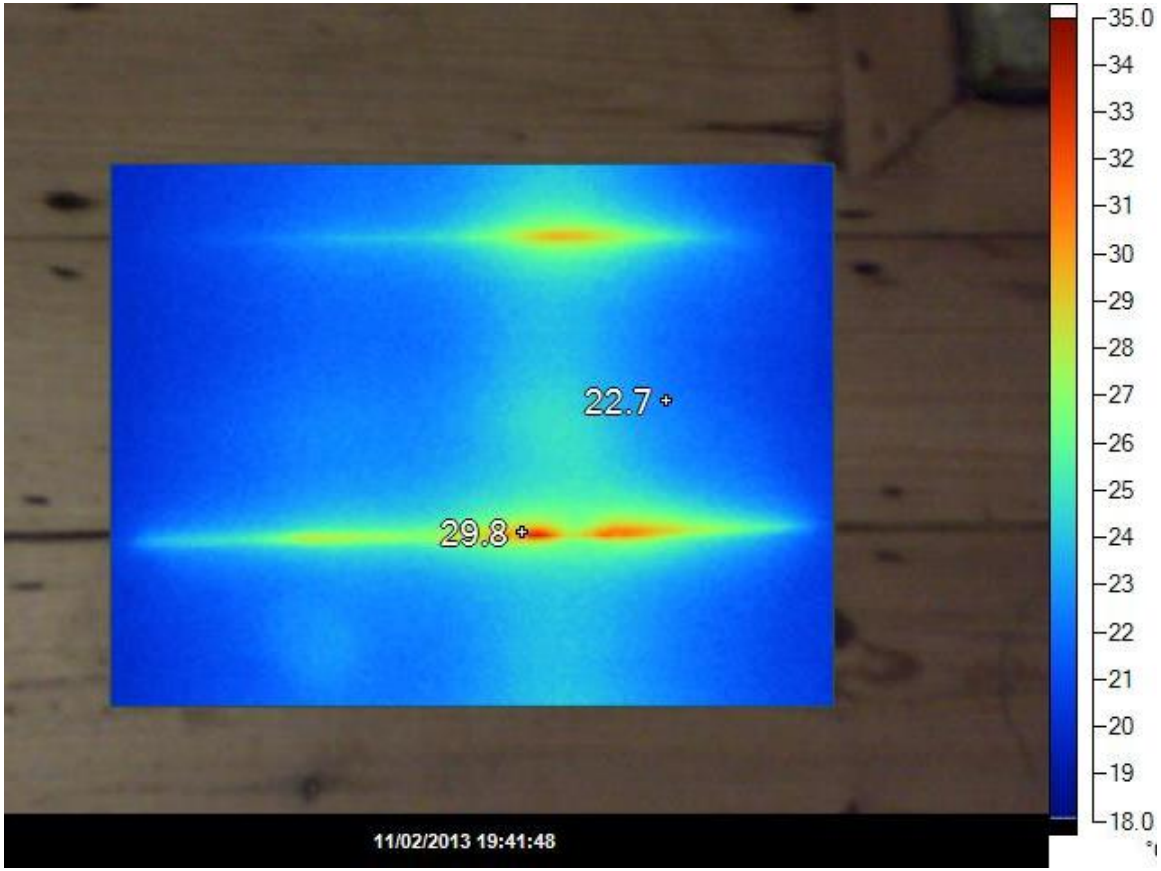
Thermal Images: find open vents



The vent above the window is open

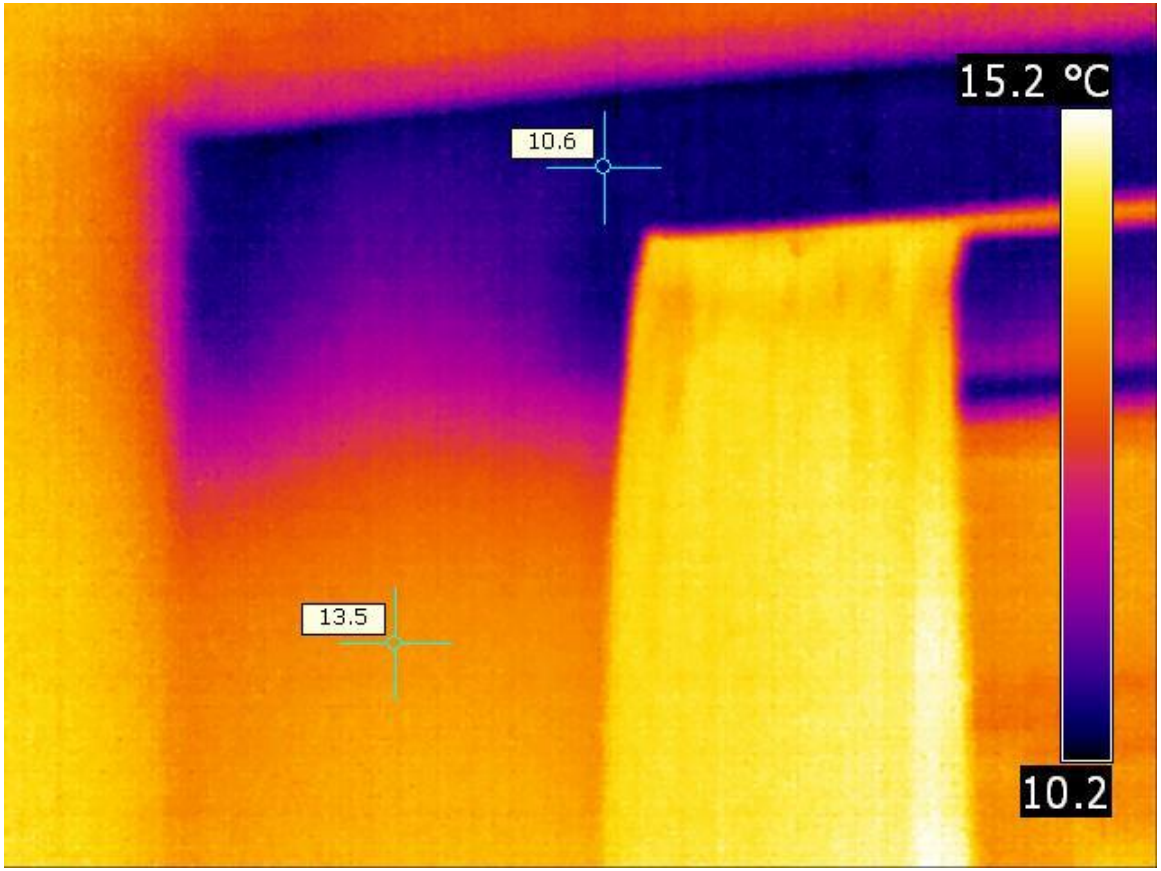
Heat is streaming out through the vent above this window. Some windows have fixed vents, in other cases you can close the vent. But you do need some ventilation in each room so you may want to leave it open.

Thermal Images: find missing insulation



Unlagged heating pipes

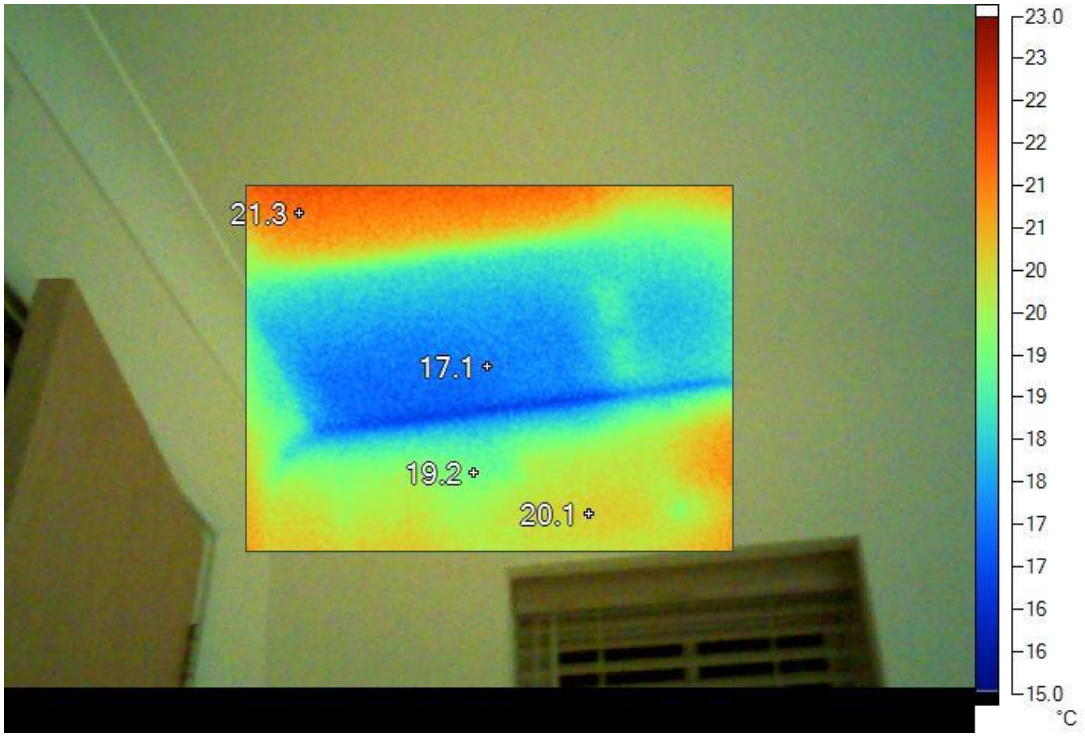
The heat is leaking up from under the floor - pipes under the wooden floor are heating the underfloor void and need to be lagged.



Slumped cavity wall insulation

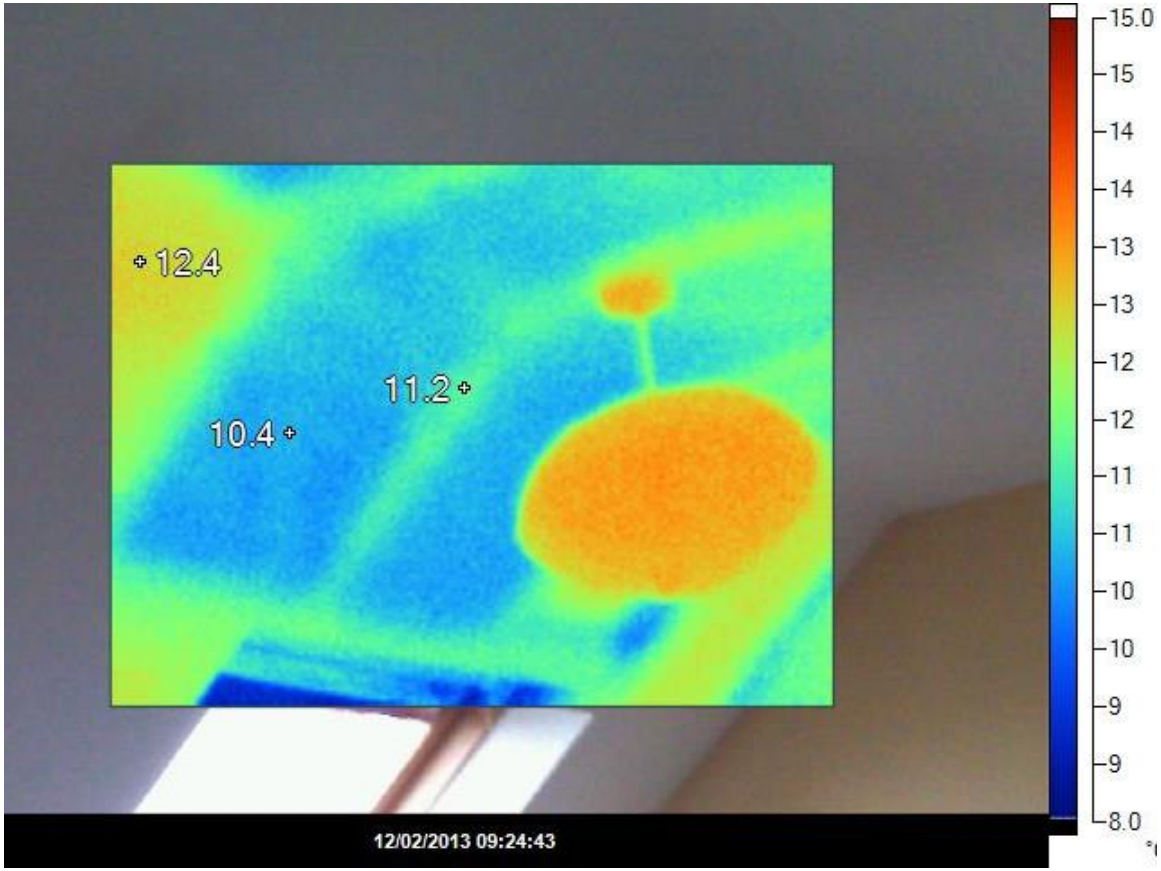
The top of this first floor bedroom wall is much colder than the rest. It could be that cavity wall insulation has slumped, or it was never filled properly.

Thermal Images: find missing insulation



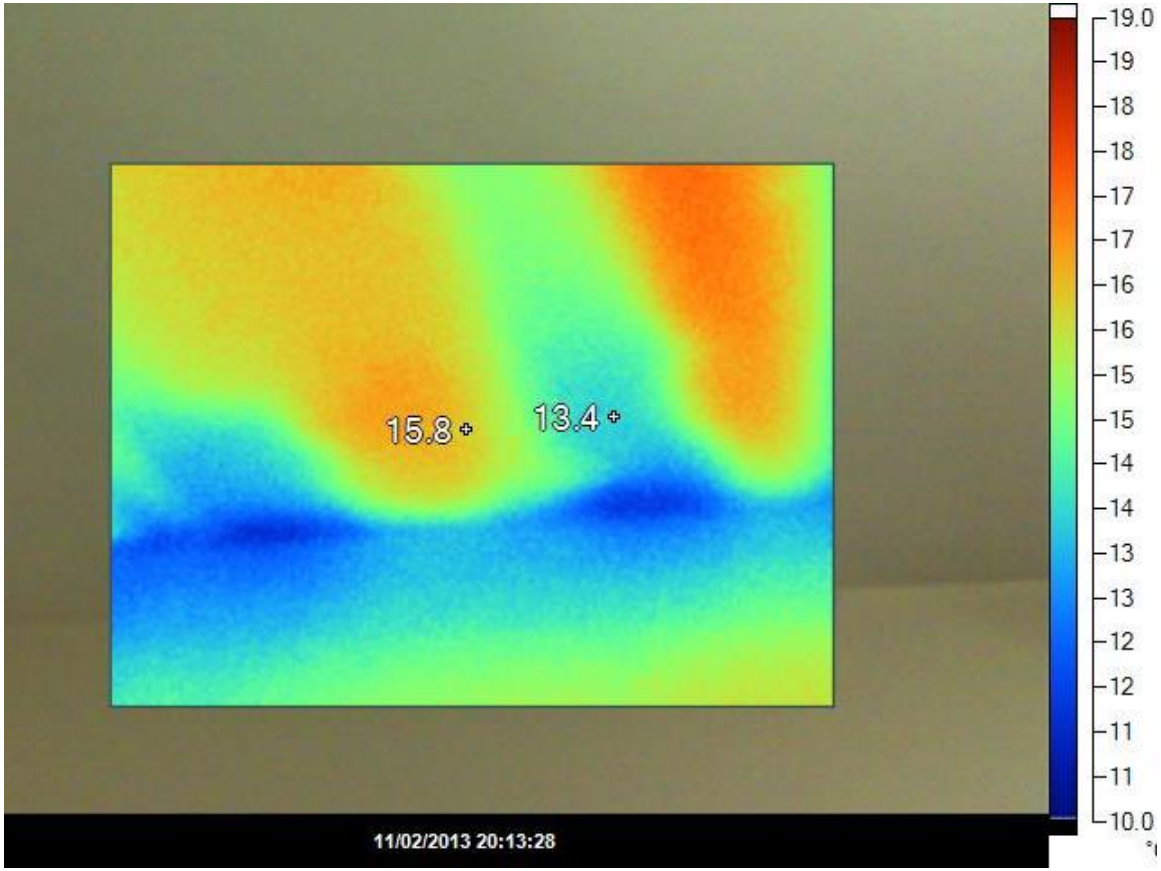
Insulation not taken to the edge of the roof

This is a first floor room below the loft above which is insulated – but not to the edge. Sometimes this is necessary to make sure there is enough ventilation around the wooden roof beams but this gap is larger than usual.



Missing insulation panels

This is in the sloping ceiling of an attic room. There is insulation on the left but two large cold sections are missing to the right of it. That is a large area with 2C difference in temperature which is a significant heat loss.

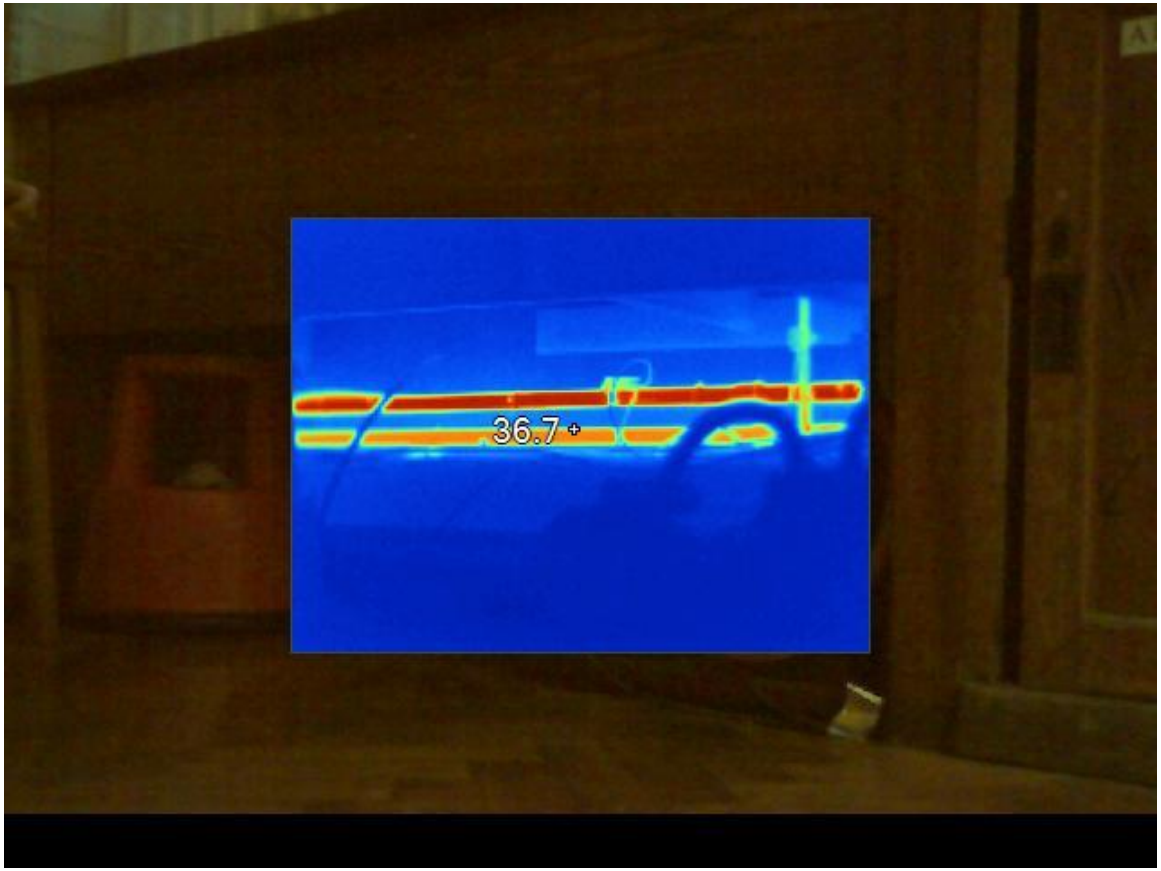


Insulation not to the edge of the roof

This is not so clear but it looks like missing insulation at the edge of the roof, It may or may not be possible to fix it while retaining ventilation around the rafters.

Missing radiator panels,

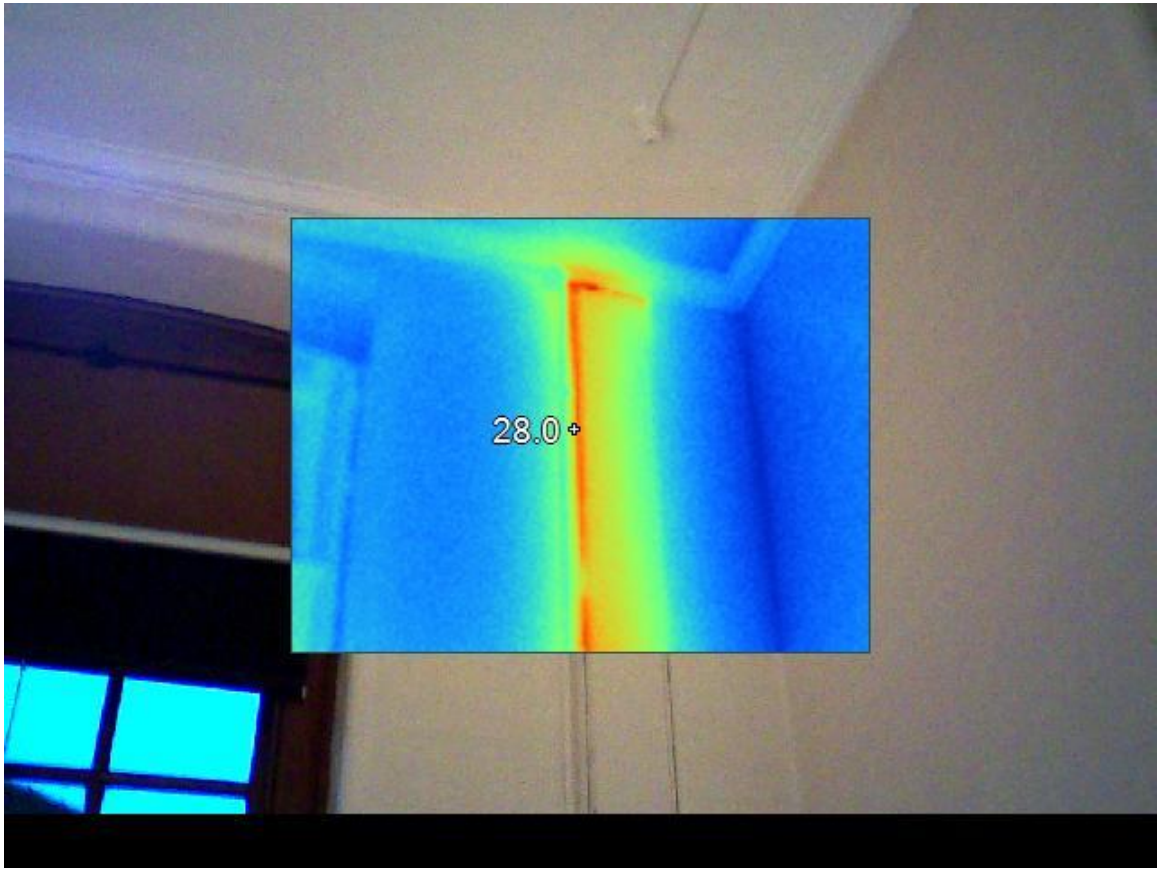
There is heat loss from under the windows, where radiators are warming the walls. Radiator panels would help. This picture was taken in the morning and curtains were open. You can see the windows are warm, especially the front sitting room.



Unlagged pipes

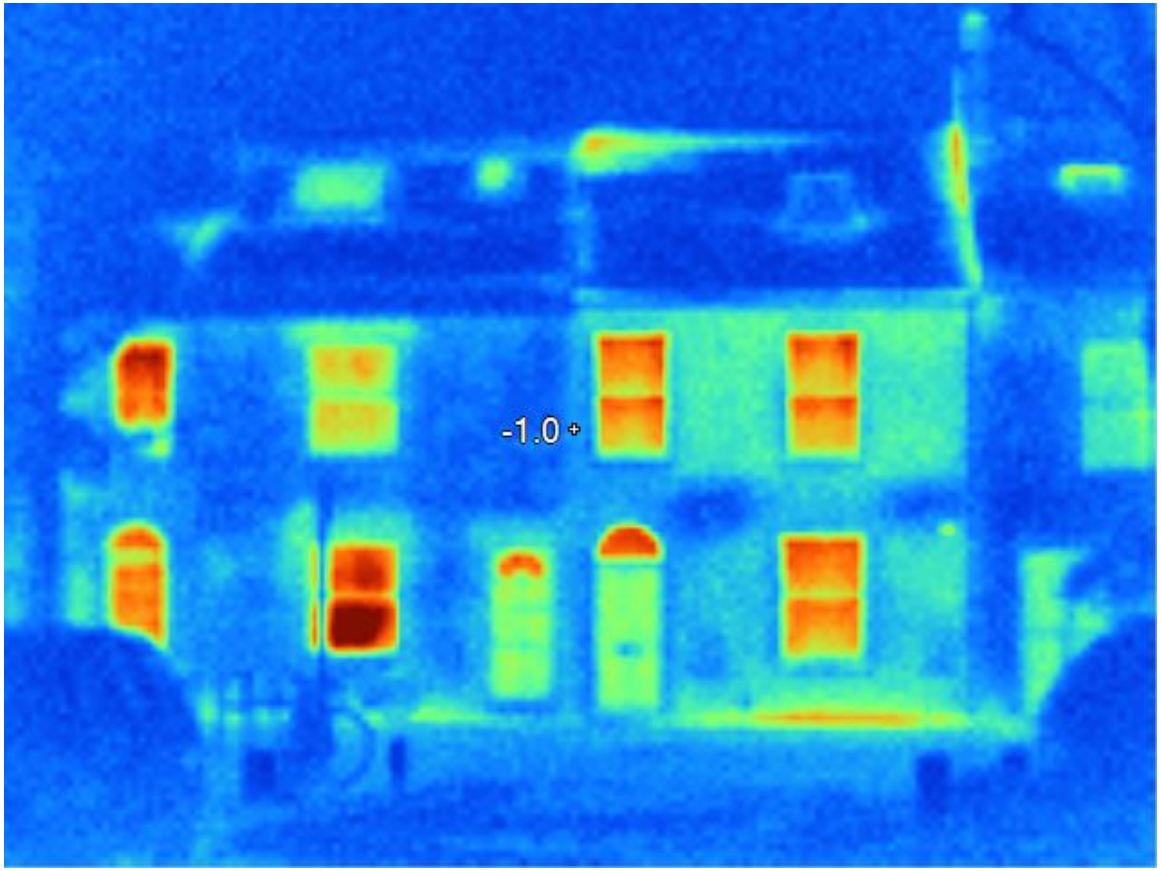
These pipes (at the back of kitchen cupboards) are not lagged.

Thermal Images: find missing insulation



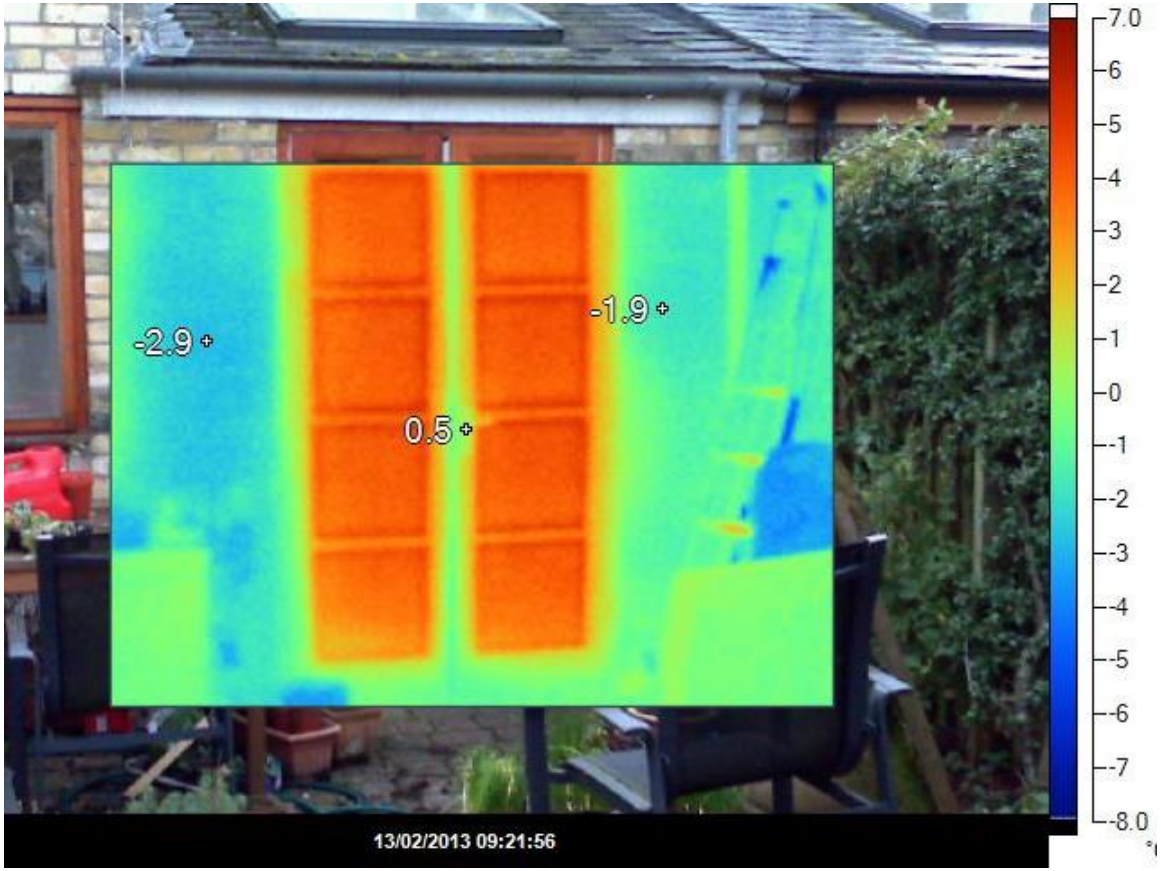
Heat leaking from hot water pipes

The heat loss from the pipes shows they need more insulation to stop the heat leaking out. If these are radiator pipes and the heat loss is useful then there is no problem. If they feed taps then the heat loss is definitely not wanted especially in summer.



Several heat leaks from the outside

Note the high heat loss at ground level, especially on the right, probably from the underfloor void. Floor insulation would reduce this. Also heat leaking from the chimney - could be bad pointing. If the hot spot on the ridge is not a vent this needs checking.



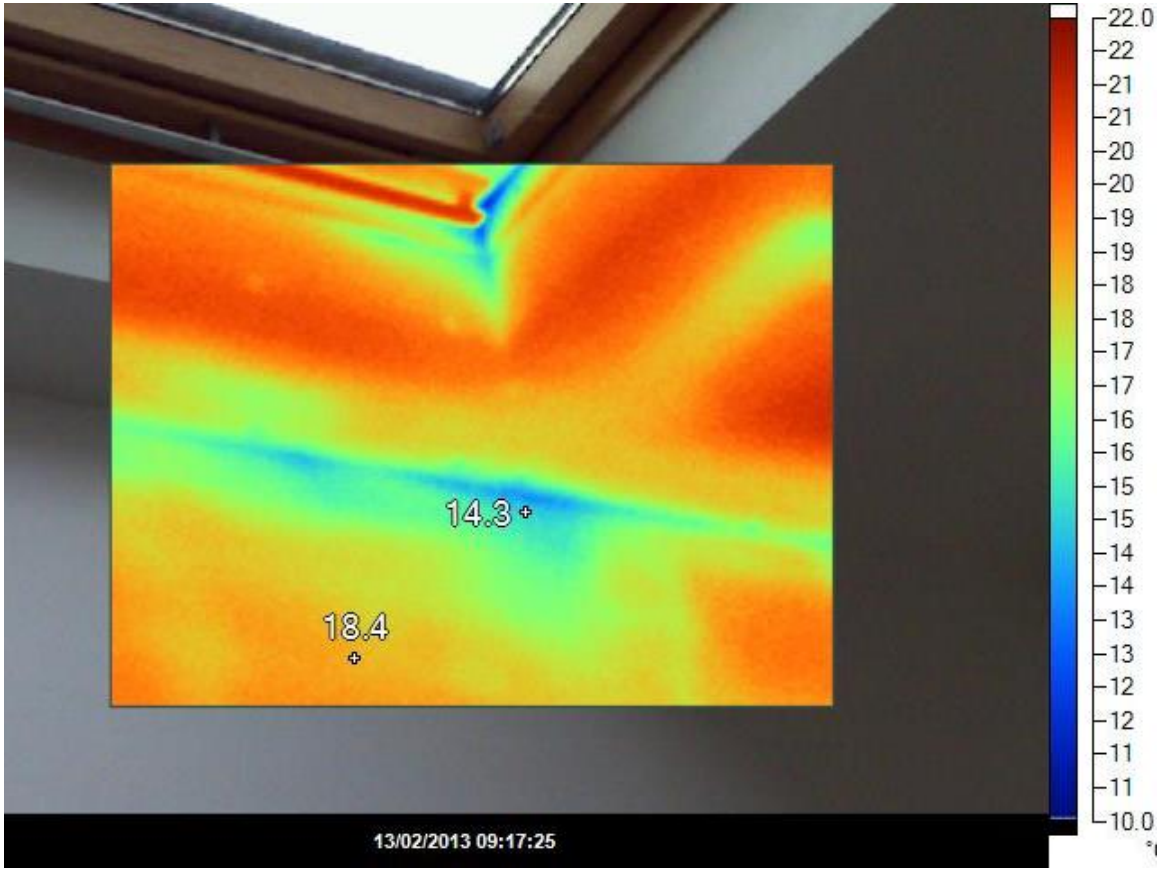
Windows leaking heat

These French windows are double glazed. The windows are much warmer than the walls, though still much cooler than inside. Maybe they need an upgrade.

Thermal Images: show thermal bridges

Heat leakage around insulation

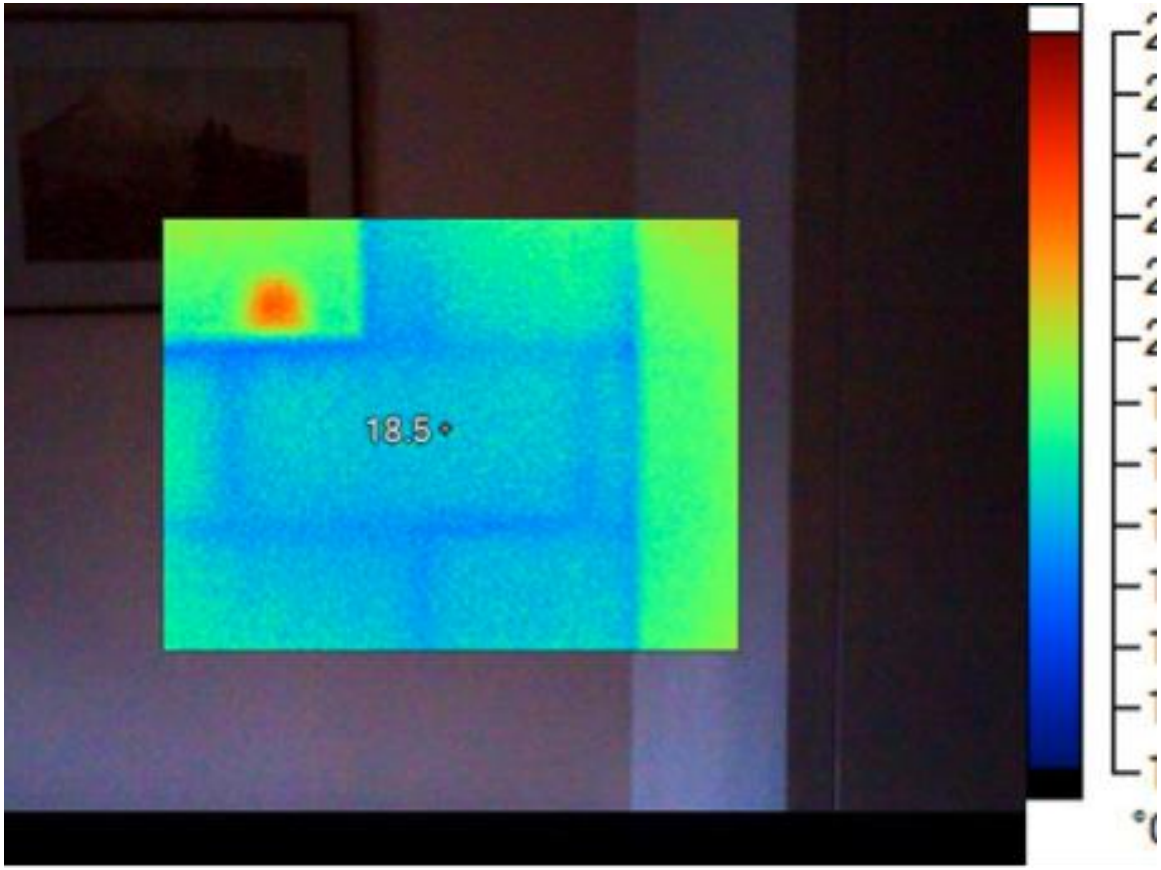
The front wall of this house is insulated externally but the neighbour's house is not. The party wall is cold in the corner because the heat leaks through from the front wall of the next house.



Thermal bridge at the top of the wall

There seems to be a cold bridge at the junction between the wall and the sloping roof. (The window is fine).

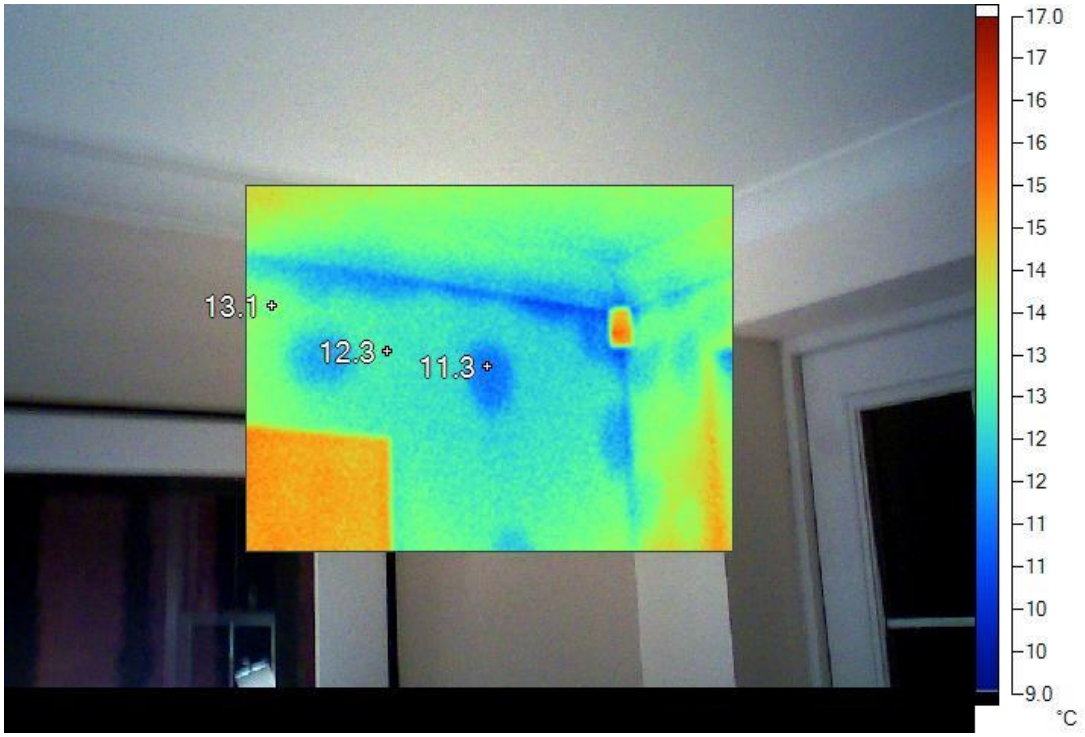
Thermal Images: reveal structure



Breeze blocks in the wall

This was a dormer room which has been plastered straight over the masonry: you can see the outline of the breeze blocks under the plaster. This is not a problem that needs fixing but it is interesting to see it.

Thermal Images: reveal structure



Plasterboard adhesive

The regular splodges are dabs of glue holding the plasterboard in place. The glue transmits heat effectively to the masonry behind. Between the splodges the plaster doesn't quite touch the solid wall so there is a small air gap. This is not a defect that needs fixing – the areas are small and the temperature difference is only 1C.

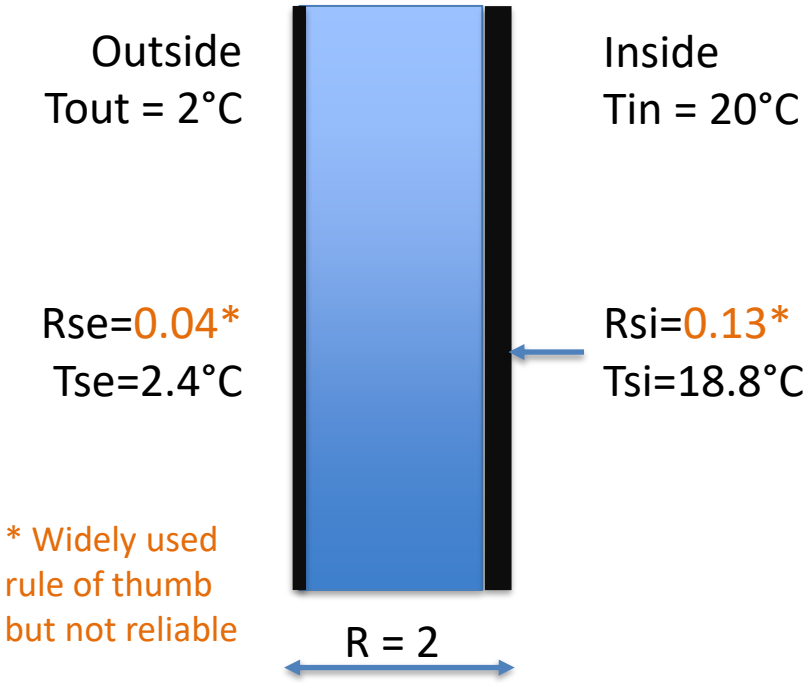
What is a reasonable surface temperature?

(rough guidelines)

- The surface temperatures depend on factors including
  - Internal and external air temperature
  - Air speed, moisture, radiant heat
  - Surface texture.
- Outside, the weather is variable and temperature differences are smaller: less accuracy, less useful.
- As a rough guide:
  - Walls (insulated) – not more than 2°C difference between inside surface of internal and external walls.
  - Windows (double glazing or better) – not more than 5°C difference between inside surface and internal walls

What is a reasonable surface temperature?

(how the calculation works)



The air temperature is 2°C on the outside and 20°C on the inside. Through the wall the temperature gradient depends on resistance. Surface resistance on the outside (Rse) depends on the weather!

Consider a wall with U-value 0.5 W/K,

Total R = 1/U = 2

Tdiff = 20 – 2 = 18

Tout - Tse = Tdiff*Rse/R

Tin - Tsi = Tdiff*Rsi/R

	U (W/K)	Rse/R	Rsi/R	Te -Tse (°C)	Ti - Tsi (°C)
Single glazed window	4.8	0.19	0.62	3.5	11.2
Double glazed window	2	0.08	0.26	1.4	4.7
Solid wall	1.6	0.06	0.21	1.2	3.7
Cavity wall	0.5	0.02	0.07	0.4	1.2

Only 1-2°C below Ti