

Ventilation of building envelope

When building codes permit conditioned building envelopes should not be vented to the outside. Ventilation in heated and/or cooled buildings may reduce energy efficiency. It also increases the potential for moisture either through wind driven rain or through introduction of humid ambient air. Moisture in bulk insulation reduces its insulation rating and should be avoided. Ventilation increases the risk of wind damage to the building through increased lifting forces; it increases fire damage through easier spread of fire; it increases corrosion of metal framing and fixtures due to access of salt and pollution in the air.

Radiant barriers should be included whenever radiation is a problem. This includes all of Australia. The reflective side must be used in conjunction with an adjacent air space (or two adjacent air spaces if double sided). Often one side is semi-reflective ("anti-glare") and may have a reduced infra-red emittance.

Reflective insulation typically tests at below 0.03 emittance in Australia. Low emittance insulation is taken to range from 0.03 to 0.05.

When timber construction components in building cavities, such as walls or under floors, are exposed to the outside air through vents, there should be adequate ventilation openings in these vents to prevent build up of moisture in these cavities. There should not be any connection from these cavities to the inside of the building, nor to the roof spaces from these areas.

Infrared emittance values of selected materials

Material	Temperature (°C)	Emittance @8-14 µm (average measurements)
Aluminium foil (bright)	25	0.02
Aluminium foil (bright)	100	0.03
Aluminium foil (oxidised)	93	0.09
Aluminium foil (anti-glare)**	38	0.03–0.25
Aluminium foil (slight dust)*	38	0.08
Aluminium foil (mod. dust)*	38	0.28
Aluminium paint (26%)	38	0.30
Brick (red, rough)	21	0.93
Clay tiles (fired)	70	0.91
Concrete (rough)	38+	0.94
Copper (polished)	38	0.03
Galvanising (bright)	38	0.23
Galvanising	38	0.28
Ice (smooth)	0	0.97
Paint (any colour)	93	0.90–0.96
Paper	38+	0.93
Sand	20	0.76
Shale	20	0.69
Soil	38	0.38
Soil (black loam)	20	0.66
Water	38	0.67
Wood	low	0.80–0.90
Wood- beech (planed)	70	0.94
Wood – oak (planed)	70	0.91

Source for most items (with permission) Newport Electronics: <http://www.newportus.com/Products/Technical/MetlEmty.htm>

* Based on average measurements

** Based on AS/NZS 4859.1
– Materials for the thermal insulation of buildings.



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