

Cool Roofs: A City of Melbourne Guide

A cool roof reflects the sun's heat and emits absorbed radiation back into the atmosphere at a higher rate than standard materials. They reduce the amount of heat held and transferred to the building below, keeping the building cooler and at a more constant temperature.

Cool roofs have additives to the roof base material or roof paint. A simple analogy is a black car compared to a white car. On a sunny day, the white car will be cooler to touch than the equivalent black car.

Benefits of cool roofs

The net energy savings and broader benefits of cool roofs vary depending on the local climate but can include:

- reduced cooling energy load in summer
- increased heating energy load during winter
- increase the life of air conditioning systems and roofs service life
- lower roof maintenance costs
- reduce the temperature in the city due to reduced amount of heat trapped in the city
- reduced air pollution and greenhouse gas emissions
- improved human health and comfort.

Types of cool roofs

A cool roof can be installed on any building. Some cool roof elements are built into roof materials prior to construction and some are applied after installation. Both methods are effective at creating a cool roof.

The following roof types are suitable for this technology:

- corrugated iron / zincalume / colourbond
- concrete
- bitumen
- tile
- slate

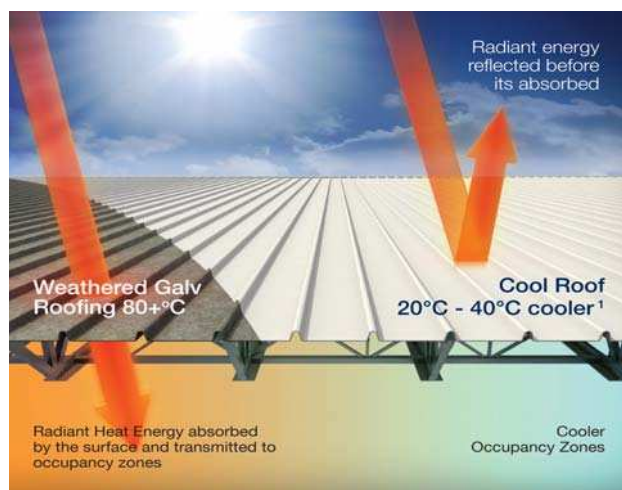


Image courtesy of Dulux

This table shows a roof's suitability for cool roof product. To be suitable for cool roof product, a roof has to match at least two of the criteria in white boxes according to roof type.

Building Age	New	Recent– last 5 years	Older than 5 years
Ceiling insulated	Yes, More than R2.5	Yes, Less than R.2.5	No
Shading level	More than 20%	Less than 20%	
Pitch of roof	Less than 23 deg	More than 23 deg	
Colour of roof	Light	Medium	Dark
Size of building	Small	Large	Tall
Type of building	Residential	Commercial	Industrial
Predominant Conditioning type	Mainly heating	Mainly cooling	No heating or cooling

Further Information

City of Melbourne 1200 Buildings Program

<http://www.melbourne.vic.gov.au/1200buildings/Pages?home.aspx>

Colours

Specialist paints used for cool roofs has the technology to maximise sun and heat reflection. Not all cool roof products are white there are many products which use darker pigments that still maintain a high solar reflectance.

Costs

Cool roof costs vary and depend on factors like the roof's current condition and material, ease of access and the type of product used. The typical cost of a coating on an existing roof is \$18 - \$25 per m²

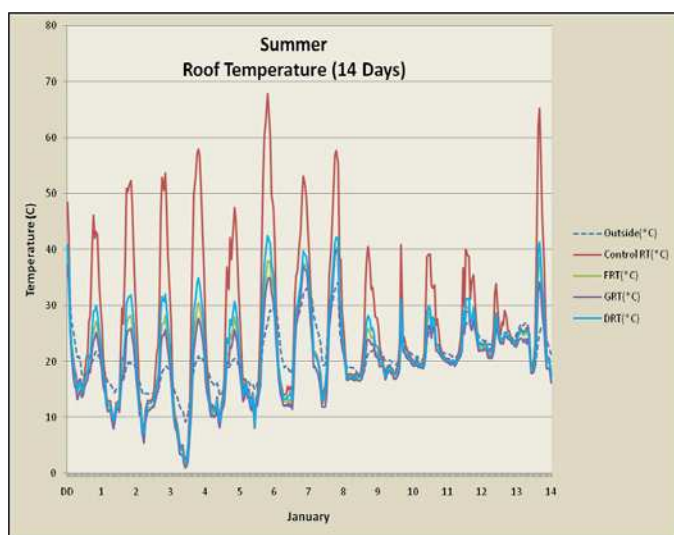
Maintenance

Pollution, foot traffic, wind-deposited debris, water, and mould or algae growth will decrease a cool roof's effectiveness. Designated walkways along these roofs or limiting access can help prevent cool roofs from accumulating pollution and reduce maintenance costs. Designing steep-sloped roofs can reduce maintenance costs because rainwater can more easily wash away dirt and debris from the roofs.

Cleaning a cool roof can restore solar reflectance close to its installed condition. Always check with your product manufacturer for the proper cleaning procedure, as some methods may damage your roof. While it is generally not cost effective to clean a roof just for the energy savings, roof cleaning can be integrated as one component of your roof's routine maintenance program.

Cool roof products

There are many cool roof products on the market. Research commissioned by City of Melbourne and conducted by University of Melbourne used the products listed below to investigate the benefits of cool roofs. For the detailed findings of this research visit the 1200 Buildings webpage on the City of Melbourne website.



The figure represents the roof surface temperature (RT) of a metal roof (control) and three cool roof products (F,G,D). The metal roof reaches nearly 70°C while cool roofs reach 40°C (courtesy of University of Melbourne).

Product Name	Suitable for roof types	Colour range	Building types suited to	Strengths
Colourbond Coolmax	New metal only	White only	New	No application required
SkyCool	All	White only	All - commercial	High reflectance
StayCool	All	White only	All - commercial	High Reflectance
Thermoshield	All	White and pastel	All - commercial	High insulation
Dulux Infracool	All	White & all colours	All – residential & Commercial	High reflectance & dirt resistance

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