

PROJECT CASE HISTORY – WESTFIELD DONCASTER

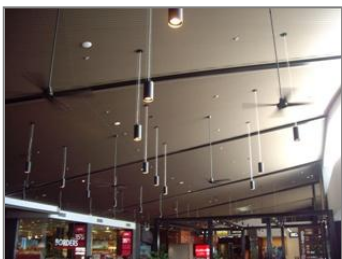
COOLROOF COATINGS – Core Function

Due to their large surface area and exposure, Roof Surfaces capture enormous amounts of the sun's energy and thus COOL ROOFS offer potential cooling energy savings of 20-40%*, resulting in direct cost and green house gas emission savings

❖ Dulux® InfraCOOL™ technology works by maximising TOTAL SOLAR REFLECTION including the (invisible) infra-red portion of the sun's energy which accounts for over 50% of the sun's total solar energy



Project Aspect:
Flat Deck Roof Structure – MAXIMUM SOLAR ABSORPTION



Internal Zone: Food Court Area :
High People Traffic, Natural cooling (Ceiling Fans)

PROJECT INFORMATION

Project Name : WESTFIELD DONCASTER
Upper Food Court Area

ROOF AREA : 5000m² – Stage 1

Location : 619 Doncaster Rd,
Doncaster, Melbourne

Application Date : January 20, 2010 (completion)

CoolRoof Applicator : DEC Group
3/29 Cameron St,
Brunswick VIC

Contacts : John De Cesare
(03) 9386 5144

PROJECT OBJECTIVES & SCOPE

Improve Customer Comfort in the upper food court level.

The area is not fully serviced by the centres air-conditioning, essentially relying on air movement via ceiling fans for natural ventilation and cooling.

EXTERNAL ROOF : Weathered zinc & aluminium flat deck
With sislitation

CEILING : Various : Corrugated decorative sheet
or Plasterboard

COATING SPECIFICATION

Surfaces – Weathered galvanised Iron, colorbond and aluminium were all generally in good condition with no corrosion.

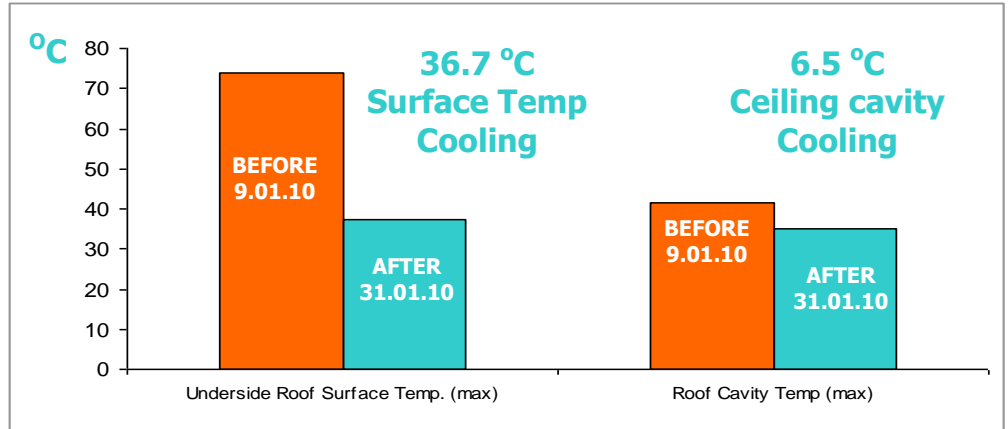
"Flat" deck sections provided adequate run-off to prevent water ponding.

Surfaces	Weathered Galvanized	Weathered Colorbond	Weathered Aluminium
Surface Preparation	High Pressure Wash	High Pressure Wash	High Pressure Wash
PRIMER	N/R	Dulux MetalShield Etch Primer	Dulux MetalShield Etch Primer
HEAT REFLECTIVE MEMBRANE	Dulux COOLROOF White with InfraCOOL™ Technology		

InfraCOOL™...Colours that shield from the sun

WESTFIELD DONCASTER – ACTUAL DELIVERED BENEFITS

- ❖ Immediate drop in Roof Surface and Ceiling cavity temperatures as evidenced from actual project Temperature Data monitoring
- ❖ Improved Occupancy comfort levels :
 - Immediate feedback from centre staff acknowledge the internal cooling effect of between 5-10°C cooler



PROJECT TEMPERATURE MONITORING

Temperature Data loggers were installed to monitor PRE and POST application conditions including

- ❖ ROOF SURFACE (underside)
- ❖ CEILING CAVITY

Data loggers recorded temperatures at 30 minute intervals from the period

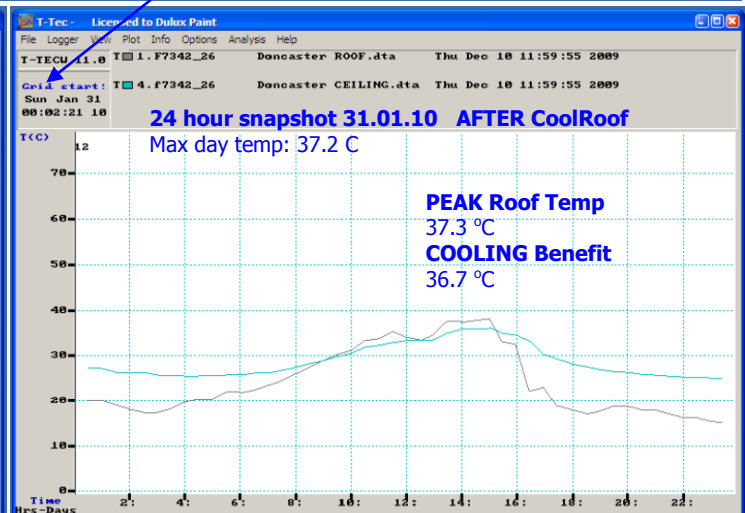
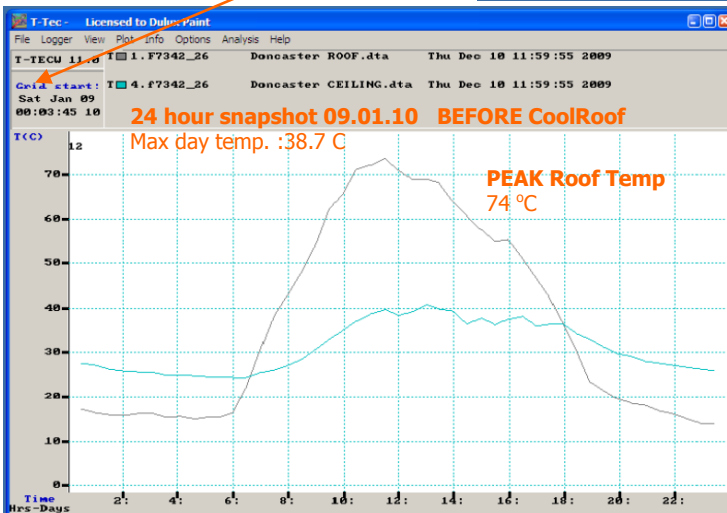
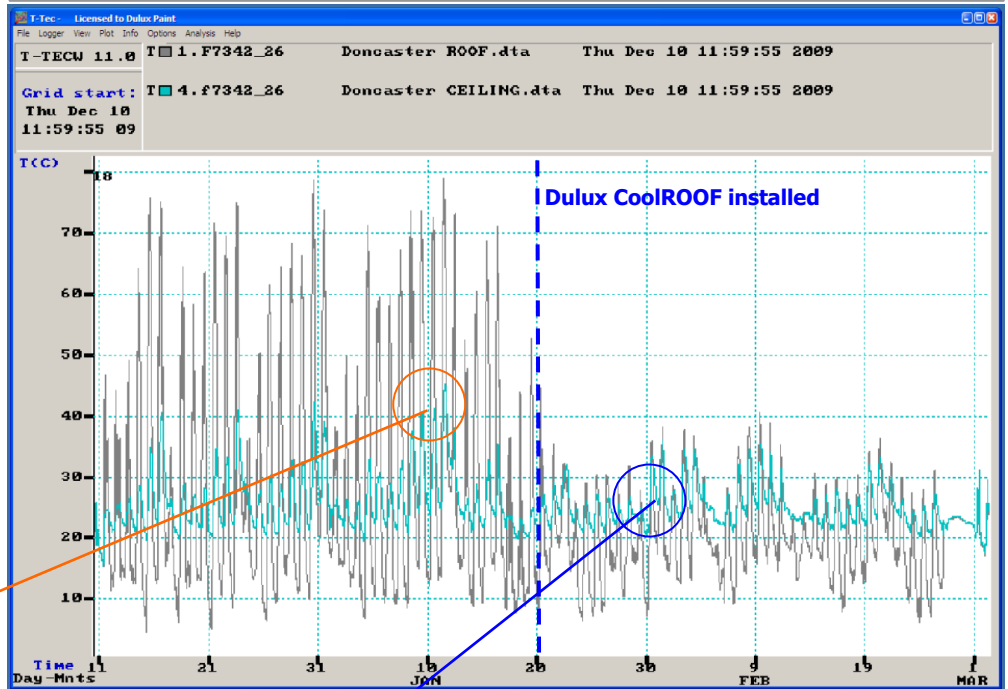
- ❖ Start : 10.12.2009
- ❖ End : 22.02.2010

Bureau of Meteorology records for air temperature, wind speed & sunshine hours were accessed to correlate data for the purpose of like day comparisons

- ❖ 9.01.2010 (Before CoolRoof) vs.
- ❖ 31.01.2010 (After CoolRoof)

were selected for specific 24 hour "like for like" comparisons

- ❖ Ave Day Temperatures : 38 °C



InfraCOOL™ ... Colours that shield from the sun

THE NEED FOR COOL ROOFS

What is a COOL ROOF

- ❖ COOL ROOFS reflect the sun's light back into space BEFORE it can be absorbed and transferred as heat to the building below.
- ❖ Reflection in the first instance should be the primary control of Radiant heat gain (Sun light) rather than relying on "after the event" insulation to hold back the heat load otherwise absorbed.
- ❖ Highlighting the importance of COOL ROOFS, in climates like Australia, where the prominent source of a buildings heat gain is Radiant Sunlight and up to 93% of a buildings heat gain in summer is attributable to Radiant heat, REFLECTIVE COOL ROOFS should be a key focus in combating heat gain, reducing energy costs and its associated greenhouse (power) emissions.
- ❖ Over 50% of the suns energy (sunlight) is invisible InfraRed energy and thus COOL ROOF technology is effective on both the light we see (colour) and invisible InfraRed light, delivering maximum TOTAL SOLAR REFLECTION for the selected colour – meaning even dark colours can be made cooler.
- ❖ Dulux COOL ROOF White delivers maximum cooling benefits reflecting over 90% of the Suns total light energy

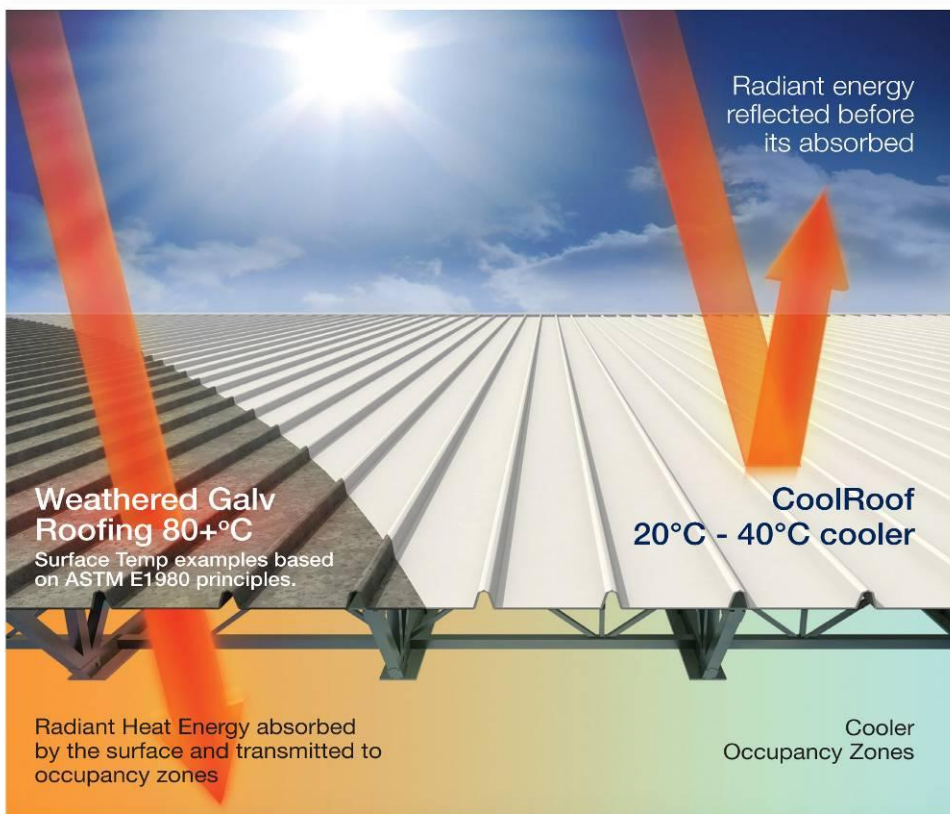
URBAN HEAT ISLAND EFFECT

- ❖ The term "heat island" describes built up areas (eg cities) that are hotter than nearby rural areas.
- ❖ The annual mean air temperature of a city with 1 million people or more can be 1–3°C warmer than its surroundings.
- ❖ In the evening, the difference can be as high as 12°C as the built environs' absorbed heat is released back as it cools.
- ❖ Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions.
- ❖ COOL ROOF technology reduces HEAT ABSORPTION in the first instance, minimising the built environs stored heat energy and thus its ability to artificially increase surrounding air temperatures.

Put in context by US Energy Secretary Stephen Chu - COOL ROOFS :

"Indeed, it is almost certainly the single cheapest of the 12 to 14 wedges needed to stabilize near 2°C total warming - the equivalent to taking the world's approximately 600 million cars off the road for 18 years, while quickly paying for itself in direct energy savings!"

The benefits of CoolRoofs



Maximum Solar Reflection

Weathered Galv and Dark Coloured roofs absorb massive amounts of solar radiation which in-turn transmit heat into occupancy zones. CoolRoofs reflect heat energy in the first instance - before heat is absorbed, meaning insulation & cooling efficiencies are maximised

Reduced Cooling Costs

Less Heat penetration means lower cooling costs. Comparative studies identify cooling energy savings of 20-40% are possible using CoolRoof technology.

Improved Occupancy Comfort

In non-airconditioned facilities such as workshops and warehousing, cool roofs translate immediately to cooler working and warehousing facilities, improving productivity and stability of stored goods.

Lowers Carbon Footprint

Less use of airconditioning reduces power consumption and associated greenhouse gasses which is good for the environment and for you.

Further reading : Reducing Urban Heat Islands : Compendium of Strategies – US EPA
Geo-engineering, adaption and CO2 mitigation – Climate Progress US

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