

## PROJECT CASE HISTORY – Classic Collisions Workshop

### COOLROOF COATINGS – Core Function

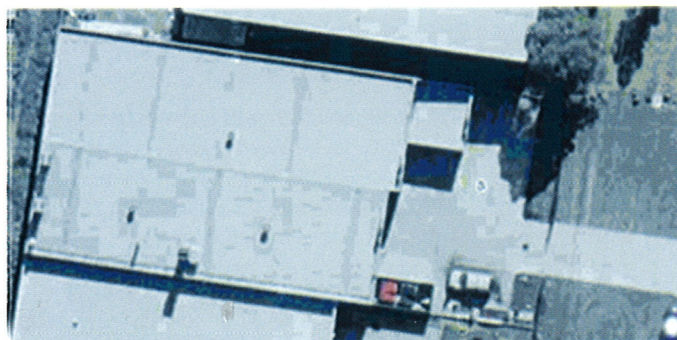
Due to their large surface area and exposure, Roof Surfaces capture enormous amounts of the sun's energy and thus COOL ROOFS offer potential cooling energy savings of 20-40%\*, resulting in direct cost and green house gas emission savings

❖ 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 INFORMATION

Project Name: Classic Collision Resto Centre Workshop areas  
 ROOF AREA: 700m2  
 Location: 45 Cranwell St Braybrook Vic 3019  
 Application Date: November 07, 01, 2010 (completion)



Project Aspect:  
Flat Deck Roof Structure – MAXIMUM SOLAR ABSORPTION

### PROJECT OBJECTIVES & SCOPE

**Improve Productivity, (Reduce Early Finishes & Equipment Hire Cost) Worker & Customer Comfort, enable the use of amenities.**

The area is a large open work shop that is not serviced by any air-conditioning. On frequent high temperature days working conditions became unbearable and workers were sent home early

EXTERNAL ROOF: Uncoated Weathered zincume flat deck With silisation

### COATING SPECIFICATION

Surfaces – Zincume generally in good condition with no corrosion.

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

Surface Preparation	High Pressure Wash
PRIMER	Dulux MetalShield Etch Primer
HEAT REFLECTIVE MEMBRANE	Dulux COOLROOF Cool Roof White with InfraCOOL™ Technology



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## Classic Collisions Workshop – PREDICTED BENEFITS

### PROJECT EVALUATION

Minimisation of heat gain requires a preliminary understanding of the dynamics of heat flow and transfer as defined by :

- Conduction : Heat transfer through a solid object (eg heat we can feel by touch on a surface and for which insulating measures are typically suitable)
- Radiation : Direct transfer of heat from one object to another without heating the airspace between (eg. Solar energy transmitted by the Sun for which REFLECTIVE measures are most effective)
  - ❖ Minimising heat gains requires a barrier designed appropriately to negate the specific heat source.
  - ❖ In Australia and most other climates, the prominent source of heat gain is Radiant (ie Suns Solar rays) with up to 93% of a buildings heat gain in summer attributable to Radiant heat

Key coating performance criteria for minimising the absorption of Radiant Heat

- ❖ REFLECT Heat in the FIRST INSTANCE before heat absorption & therefore before insulation is effective
- ❖ >90% Total Solar Reflection (TSR) is optimal for maximum cooling effect
- ❖ Must have low dirt pick-up, to maintain reflectance for maximum cooling
  - Accumulation of dirt / mould can reduce effectiveness by up to 70%

### ASTM E1980-01 : SOLAR REFLECTANCE INDEX

The following comparative test data (based on constant solar conditions) demonstrates the predicted surface temperature cooling benefit using Dulux® InfraCOOL™ technology in the specified Project System in the pre-existing Project environment.

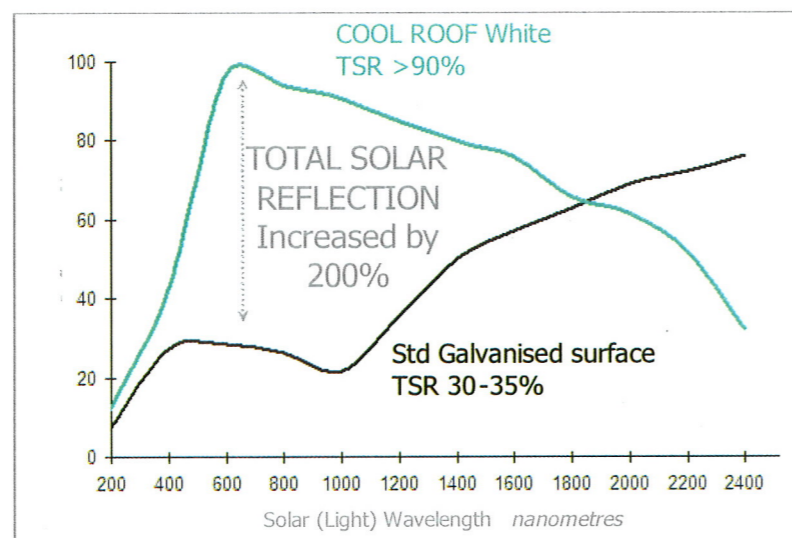
<b>Total Solar Reflectance</b> Reflectance of the suns energy across the broad solar spectrum • visible region • non visible region	% TSR ASTM E903 or C1549 (colour relevant) (Infra-red)	Dulux® AcraTex® COOL ROOF WHITE	90.0%	Weathered GALVANIZED SURFACE	30 – 35 %
<b>Thermal Emittance</b> The ability of a material to release captured heat energy	0-1 scale, ASTM C1371		0.90		0.26
<b>Solar Reflectance Index</b>	relevant to wind conditions		low medium high	low medium high	
<b>Surface Temperature</b>	constant air temperature : 37°C constant Solar flux : 1000 W/m <sup>2</sup>		113.4 113.46 113.52	-35.52 -2.7 17.39	
<b>InfraCOOL™ effect</b>	potential surface temp. COOLING		41 40 38	124 84 58	

**20 - 44°C COOLER**  
High to medium wind conditions

### ASTM E903 : SOLAR ABSORBANCE

TSR and Spectral Reflectance is tested in accordance with ASTM E-903  
% Reflectance of both versions is reported at individual wavelengths from 200-2500 nanometers

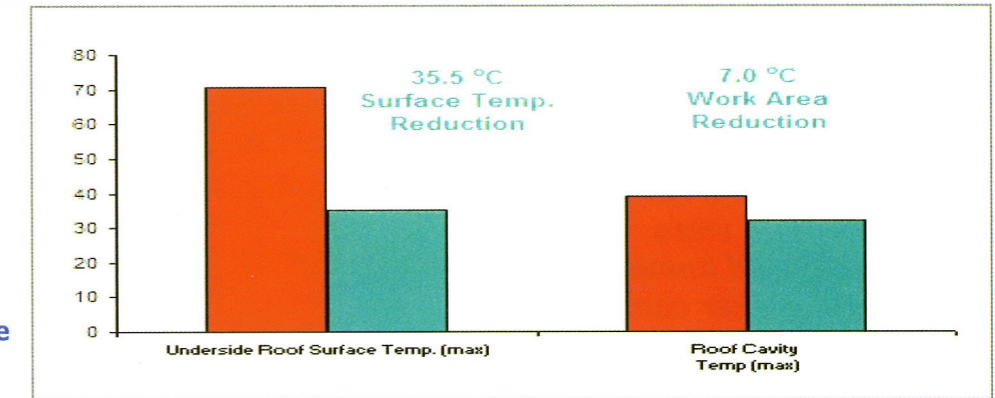
- Results:
- ❖ TSR (Total Solar Reflectance) increased from 30% to 90% (200% increase) with InfraCOOL™
  - ❖ Reflectance increase across the both the visible spectrum (300-700nm) and most significant portion of the Infra-red spectrum (700-1800nm).



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## Classic Collisions Workshop – 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)
- ❖ Upper Work Area Air Space

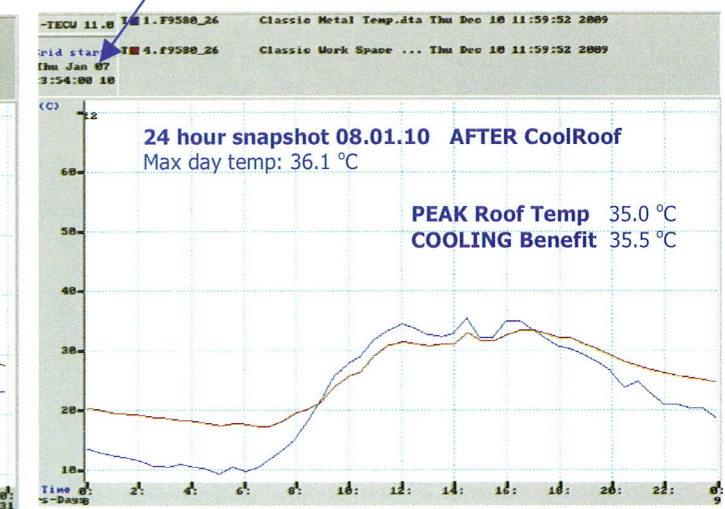
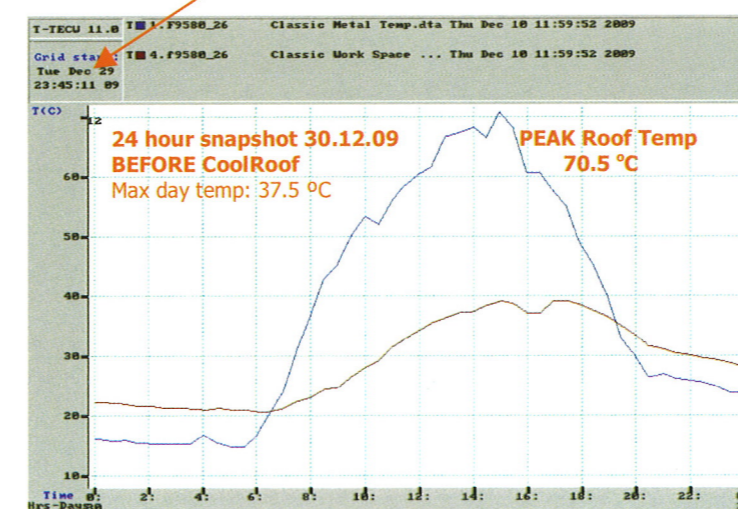
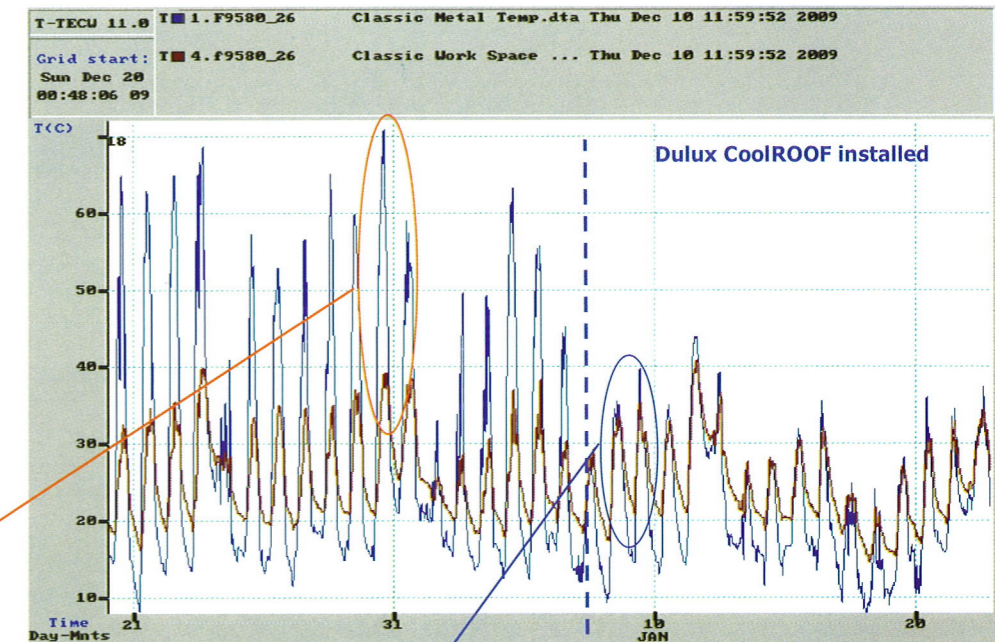
Data loggers recorded temperatures at 30 minute intervals form the period

- ❖ Start : 19.12.2009
- ❖ End : 25.01.2010

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

- ❖ 30.12.2009 (Before CoolRoof)
- vs.
- ❖ 08.01.2010 (After CoolRoof)

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



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## Customer Endorsement

*"The results from applying the coating were experienced immediately where worker comfort & productivity in the workshop area improved dramatically"*

Classic Collision Resto Centre  
45 Cranwell Street Braybrook Vic 3019  
Ph: 03 9318 8280 Fax: 03 9318 8316  
ABN: 69 129 727 251

15/01/2010

Attention Paul Augello  
Dulux Acra-Tex  
1956 Princess Hwy  
Clayton  
Vic 3168

**Comments:**

Prior to applying Dulux Acra-Tex Cool Roof "InfraCOOL" to the work shop, mezzanine and staff amenities these areas were UN bearable on high to extreme temperature days due to the amount of heat radiation coming from the metal roof and extreme internal temperatures. This resulting to lower work productivities and early finishes as well unusable staff amenities.

The results from applying the coating were experienced immediately where worker comfort & productivity in the workshop area improved dramatically due to lower internal temperatures & reduction in heat radiation and staff were able to use the staff amenities.

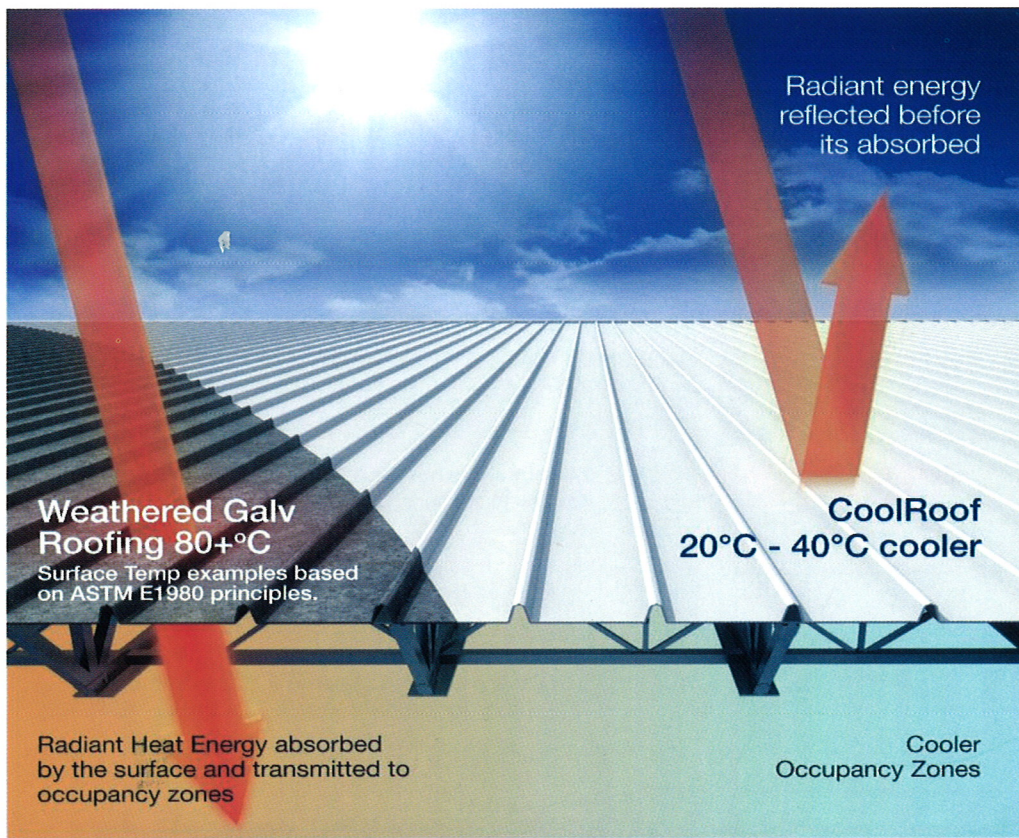
The result for our business is that the work environment is now a more comfortable work place due to lower internal temperatures, no more early finishes hence making the staff working environment a better place to work in on high temperature days.

As a business owner I would recommend the use of Dulux Acra-Tex Cool Roof product to other business owners where worker comfort & work place environment is an issue on high temperature days.

Yours Sincerely

Gino Scordo  
Proprietor

## 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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\*Energy saving potential based on Field Study of 2 identical buildings with constant state air-conditioning. High reflectance white coating vs original dark roofing surface.