

PERFORMANCE DATA – InfraCOOL® CHARCOAL vs Std Charcoal

KEY FACTS : HEAT REFLECTIVE COATINGS

- Due to their large surface area and exposure, Roof Surfaces can capture large amounts of the Sun's energy and thus COOL ROOFS offer potential energy savings.
- Dulux® InfraCOOL® Technology works by maximising the TOTAL SOLAR REFLECTION including the (invisible) infra-red portion of the Sun's energy which accounts for approx. 50% of the suns total light energy.
- Various internationally accepted verification methods demonstrate the potential benefits of InfraCool® Technology in comparative testing vs comparable std colour and/or surface materials.

ASTM E1980-01 : SOLAR REFLECTANCE INDEX

The following comparative test data (based on constant solar conditions as defined) demonstrates the estimated surface temperature cooling benefit using Dulux® InfraCOOL® technology against the nominated system.

Total Solar Reflectance (TSR) and Thermal Emittance are measured and then used to estimate resultant Surface Temperature		Std Charcoal	Dulux® AcraTex® COOL ROOF Charcoal
Total Solar Reflectance	ASTM C1549 (% TSR)	6.8 %	26.9%
<i>Reflectance of light across the broad solar spectrum inc. visible (colour) and invisible InfraRed radiation</i>			
Thermal Emittance	ASTM C1371 (0-1 scale)	0.85	0.90
<i>The ability of a material to release (ie. emit) captured heat energy. Higher number = Faster Heat release</i>			

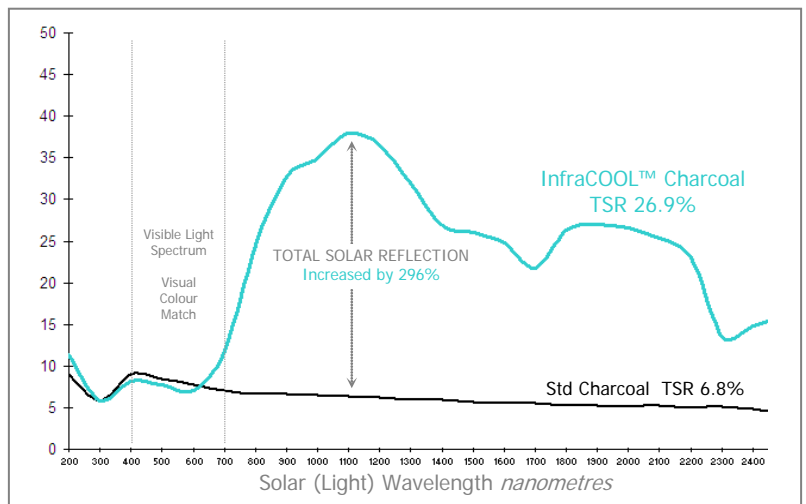
ASTM E1980 defines a mathematical equation for Calculating Solar Reflective Index and Estimating resultant Surface Temperature		Test Method defines reporting to 3 wind speeds : Low, Medium & High Medium wind conditions are most typically observed in Australia					
		Low	Medium	High	Low	Medium	High
Calculated Solar Reflectance Index	<i>relevant to wind conditions</i>	-2.36	-0.27	1.59	27.61	28.13	28.59
Estimated Surface Temperature	<i>Maximum relevant to wind conditions</i>	104	83	61	88	72	55
InfraCOOL™ effect	<i>Maximum Potential surface temp. COOLING relevant to wind conditions</i>	Low Wind potential		Medium Wind potential		High Wind potential	
<i>Calculations based on constant conditions and 3 wind categories in accordance with ASTM E1980 Air temp (37°C), Solar flux (1000 W/m2), Wind Speeds Low, Medium, High corresponding to (5, 12, 30 W·m⁻²·K⁻¹) respectively.</i>		16 °C		11 °C		6 °C	

ASTM E903: SOLAR ABSORPTANCE :

Total Solar Reflectance (TSR) and Spectral Reflectance of 2 visually equal panels is measured at individual wavelengths from 200-2500 nanometers

Results:

- ❖ Matching reflectance (intersecting lines) in the visible light region confirm the colours are close visual matches.
- ❖ Significantly higher reflectance of InfraCool® across the infrared region (separation of the lines above 700 nm).
- ❖ TSR (Total Solar Reflectance) increased from 6.8% to 26.9% (296% increase) with InfraCool® Technology.



COLOUR CLASSIFICATIONS :

Solar Absorptance (SA)	
Std (SA)	InfraCOOL® (SA)
0.932	0.731

Building Code of Australia (BCA) Classification		
Criteria (SA)	STD rating	InfraCOOL® rating
Very Light : <0.4 Light : 0.4-0.60 Dark : >0.6	DARK	DARK

NSW Building & Sustainability Index (BASIX) Classification		
Criteria (SA)	STD rating	InfraCOOL® rating
Light: <0.475 Medium: 0.475-0.70 Dark : >0.70	DARK	DARK

InfraCOOL®...Colours that shield from the sun