

COOL PAVE Heat Reflective, Vehicle Resistant Paving

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INTRODUCTION:

Dark Coloured Paving no longer need to be HOT.....!

A coating doesn't have to be white to be cool..... As an Architect, Builder or Homeowner rich, dark colour is an important part of your building design and decoration. Unfortunately, dark colours soak up the sun and get hotter and hotter as the day progresses. As a result, building temperature and power consumption are increased and greater demand is placed on our environment and global resources.

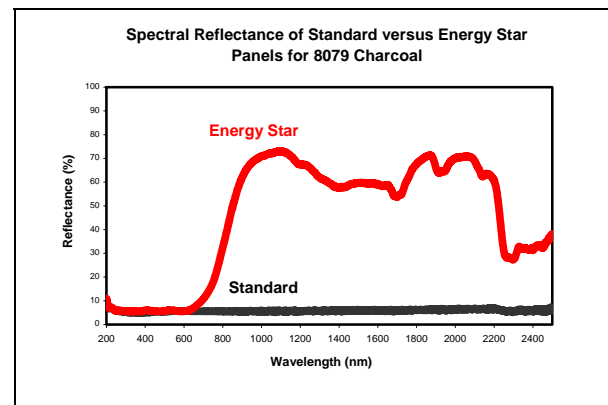
In a world that now demands we be more energy efficient and resource conscious, the use of dark colour, although attractive, presented a design challenge for our industry to overcome. It would be the "holy grail" in coating technology, to achieve a black or deep tone that would reflect solar heat and stay cool.

As a result of ongoing research and development into heat reflective coatings Astec developed a new technology of colour infused nano ceramics that reflect heat by selective reflection of infrared light. This technology has enabled us to offer dark colour tile coatings that reflect fully 50% of Solar energy and provide positive results for our environment and consumers.

The successful development of Energy Star Cool Pave enables you to make choices to provide positive contributions to our global environment with reductions in Urban Heat, Smog and through it's energy efficiency, help reduce CO2 emissions.

Our environment is constantly changing and we are all making choices that have an impact now and into the future. Choose Energy Star Cool Pave with confidence and *Paint with Pride*.

The comparative data represented on the graph below is actual Spectral results printed during tests conducted to ASTM E-903 on a Lambda 9000 Solar Reflectometer. The graph shows the difference in heat reflection between a standard Charcoal paving paint and Cool Pave Charcoal.



See: T.S.R. test reports to ASTM C-1549. Available at www.astecpaints.com.au

PRODUCT TYPE:

Waterbased, Second Generation 100% acrylic pavement coating with high Infrared Heat Reflectivity, good resistance to automotive chemicals and hot tyres pick-up.

Solar Reflectance Index to ASTM 1980-01
S.R.I.=113.89 medium wind conditions.

DESCRIPTION:

A tough, durable water based pavement coating that is tolerant to chemicals released from vehicle engines, transmissions and break systems and offers outstanding resistance to softening and pick-up from hot vehicle tyres.

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Energy Star Cool Pave remains COOL even in dark colours. The product is manufactured using colour infused nano ceramics that reflect fully 50% of Solar heat by selective reflection of infrared light.

The product is available in a gloss, low sheen and non skid finish and can be used on most correctly prepared concrete and asphalt surfaces.

PROPERTIES:

The product is polyurethane modified for added surface durability. It is a high solid, low V.O.C and low a odour formulation and contains no harmful solvents making it environmentally friendly and safe for applicators during application.

The product is designed on internally plasticized acrylic technology, which means, it does not contain plasticizers that can leach from the cured film over time and detract from the product's long-term adhesion.

Cool Pave is highly water repellant, has excellent flexibility and is adhesion promoted, providing a strong bond to the substrate.

The cured film is tough yet highly flexible, and because it remains cool, testing has shown that it will retain it's flexibility eight times longer than all conventional paving paints



KEY PROPERTIES

- **High Solar Reflectivity in dark colours.**
- Cool to walk on.
- Excellent resistance to ponded water.
- Reduces Urban Heat output
- Plasticizer free, (internally plasticized).
- Outstanding vehicle chemical resistance
- Excellent hot tyres pick-up resistance.
- Will form films at temperatures as low as 10°C.

- High volume solids.
- Outstanding Durability.
- Low V.O.C. Low odour.
- Rapid cure and bond strength.
- Excellent resistance to alkali and efflorescence and bitumen bleed.

PRINCIPLE USE:

Gloss, Low Sheen or non skid pavement coating with very high Solar Reflectivity for;

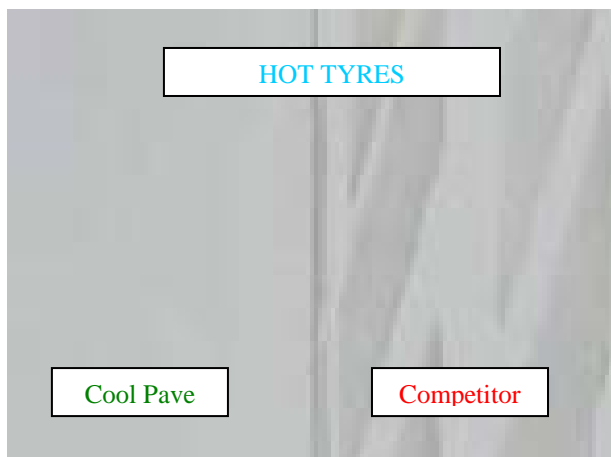
- Car park and bike track asphalt.
- Tennis courts.
- Workshop floors and Factory floors.
- Garage floors and pavers
- Patios and verandah floors.
- Concrete or steel stairs.
- Swimming pool surrounds.
- Commercial kitchen floors.

HOT TYRES PICK-UP RESISTANCE:

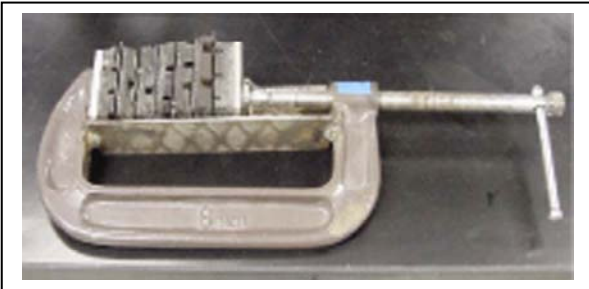
As a result of ongoing research and development into hot tyres pick-up resistance for water based pavement coatings, Astec developed a new silicone technology that was developed throughout a decade of R&D. This research and development was driven by the need to reduce V.O.C. release to the environment and make flooring products safe and low in odour for applicators.

This new technology has enabled us to provide water based pavement paints with superior performance and durability compared to conventional alkyd floor coatings but without the need for harmful solvent release.

Special Silicones that form part of Cool Pave provide added durability and high water resistance to the cured film. The silicones used to modify Cool Pave were selected through years of exterior and laboratory trials and provides excellent block resistance to hot vehicle tyress even under conditions of high humidity.



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Hot-Tyres-Pickup Test is done in 120F oven over period of 90 minutes. 2x2 inch squares of tyres and paint coated substrate are pressed together by way of 6-inch industrial clamp - as on the attached picture. Compression pressure = 5 x 360 deg twists of screw. The substrate that we use is: Black Leneta Wet Adhesion/Scrub Test Panels.



DURABILITY:

Heat and moisture are the two main contributing factors that accelerate the degradation of exterior coatings. In highly humid, tropical environments, conventional alkyd's have been known to last as little as three years. In Australia some dark metal pavement coatings can start to change colour and fade from it's original depth within 3 years.

Energy Star coatings have increased durability and life expectancy compared with conventional paints. Independent laboratory testing to ASTM Standards confirmed Solar Reflectance Indexes of 241% greater than normal paints on a dark colour of Slate Grey.

Heat generated by Solar Radiation from the sun is a major contributing factor to exterior coating degradation, especially in a standard dark colour.

Cool Pave will remain cool even in a Black. After exposure to 2400hrs of UVB 313/Moisture testing, in accordance to ASTM G53-96, the, gloss, depth of colour, adhesion and film integrity remained un-changed, providing a performance increase of

more than 400% when compared to a standard pavement coatings. Quite simply, the less heat on the coating the longer they last.

Moisture is the second major contributing factor to exterior coating degradation, especially in water based coatings. Atmospheric moisture enters the coating film on a daily basis and swells the coating, greatly reducing it's life.

Because the silicones used in Cool Pave stop the ingress of moisture to the coating film, the coating does not swell and will last 400% longer than standard water based pavement coatings. Simply put, the less moisture that the coating film has to tolerate the longer it will last.

Cool Pave is the most advanced and functional pavement coating available in Australia. It provides high Solar reflectivity in dark colours, excellent resistance to moisture, hot tyres pickup and vehicle chemicals.

SUBSTRATE:

- Correctly prepared new or aged concrete.
- Correctly prepared new or aged asphalt.
- Correctly prepared new or aged metal.
- Correctly prepared new or aged fibro.
- Correctly prepared new or aged timber.

PREPARATION:

Contact Astec for the relevant a-Spec system specification.

- All surfaces must be clean, dry, structurally sound and correctly sealed prior to any topcoat application.
- The surface should be high pressure water cleaned to remove the moss, lichen and chalky surfaces. Ensure that all mould deposits are removed. Any deposits of grease, oil or silicone must be removed.
- Structural defects should be correctly repaired.

MOULD TREATMENT:

- Apply one coat of **Astec Barrier** to the entyres surface with a back pack, low pressure or airless spray unit. When applying **Barrier** you need only to dampen the surface

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- edges of the surface. **Astec Barrier** will effectively retard any dormant mould spores in the substrate that can cause under film mould spoilage, **Barrier** is an extremely low cost solution that adds years of service free life to the system.

SEALING/PRIMING;

- The pressure cleaned surface should be checked for surface integrity before the selection of the correct sealer.
- If the surface is clean, but when rubbed continues to produce a powder on your finger. It means that the surface has weathered to a point where it is under-bound. This is most common with pre-coated factory finishes and needs to be re-bound to ensure top-coat and or primer adhesion.
- Powdery surfaces require the application of one coat of Astec Multi-Seal. Multi-Seal has a very low surface tension and will penetrate and bind the chalky surface prior to top-coating. Apply one coat of Astec **Multi-Seal** at a coverage rate of no more than 6 m² per litre.
- Surfaces that do not produce a powder when rubbed are seen as normal and should be primed with one or more coats of **Epitec Primer**.

APPLICATION:

TOP-COATING;

- Apply one full wet coat of Cool Pave. , to the entire surface. (Coverage rate not to exceed 6m² per litre). WFT 168 microns.
- Apply a second full wet coat of Cool Pave straight from the drum at a coverage rate of no more than 6m² per litre. WFT 168 microns.
- Total D.F.T. 184 microns.
- The above coverage rates include average substrate profile.

If Unsure, contact Astec for the correct preparation technique, sealers, primers and undercoats before proceeding.

COLOUR RANGE;

44 standard exterior colours.

NOTE;

Care should be taken to minimise vehicle traffic for the first 3 days following application.

MIXING;

Thoroughly mix before use with a paint wacker or broad flat stick.

PRECAUTIONS FOR USE;

Avoid contact with skin and eyes; always use a respirator during spray applications.

LIMITATIONS

Cool Pave is a waterbased material, therefore should not be applied during inclement weather or when precipitation or freezing are imminent.

PACKAGING

20L open top pail.

WARRANTY

The technical data furnished herein is based upon data believed by Astec Paints to be true and accurate at the time of writing, however, no guarantee of accuracy is given or implied and is subject to change without notice. It is given in good faith for the assistance of users. No legal warranty expressed or implied is made as to its accuracy, completeness or otherwise. Every person dealing with this material herein does so at their own risk absolutely and must make independent determinations of suitability and completeness from all sources to ensure their proper use. We have no control over the condition under which these products are stored, handled or used, therefore our recommendations must not be regarded as a mounting to legal warranty or as involving any liability on us.

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Cool Pave comparative performance data

Product	Behr	Insl-x	Seal Krete	Richards	Coronado	Cool Pave
VOC (g/l)	250	203	100	250	240	240
Gloss 60/85 deg	13/18	5 / 6	19 / 34	28 / 64	8 / 14	5 / 16
MEK Double Rubs to remove	40	50	20	20	200+	100
Hot Tyre Pick Up 120F(clamp)	3 - 4	3 - 4	4	5	5	1 - 2
Abrasion Resistance (mg lost)	120	90	140	120	160	100
Cleveland Humidity 140F (16 Hrs)	0	0	5	0	0	0
Water Soak 77F (16 Hrs)	0	0	0	0	0	0
Org Fluids Res-Spot Tests (48/16)						
Xylene	5	1	5	5	0	0
Gasoline	0	1	0	1	0	0
Diesel	5	0	3	3	0	0
Motor Oil	0	0	0	0	0	0
Transmission Fluid	0	0	0	0	0	0
Misc. Stain Res-Spot Tests (24 Hrs)						
Windshield Washer Fluid	2	1	3	2 - 3	3	1
Engine Coolant	2	1	3	0 - 1	5	0
Mustard	3	3	5	5	5	1 - 2
Acid/Base Res-Spot tests (24 Hrs)						
HCl (10%)	2	2	4	2	3	1
NaOH (10%)	3 - 4	0 - 1	3	0 - 1	5	1

Rating 5: Total deterioration of coating, film can be easily removed by gouging with fingernail, severe colour change, blisters.

Rating 0: Film is untouched

Taber Abrasion Resistance: 6 mils draw-down/48 hrs cure CS-10 wheel, 1000 grams/1000cycles (milligrams lost).

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PRODUCT DATA;	
%T.S.R. <i>Total Solar Reflectance</i> (White) to ASTM	89.60
Emittance to ASTM C-1371	0.8664
%T.S.R. 44 standard colours	See test reports or exterior colour card
S.R.I. 44 standard colours	See test reports or exterior colour card
Gloss level	Low Sheen / Gloss / Non Skid
Drying Time at 25°C @ 100 MIC W.F.T.	45 min dry and block resistant
Recommended thinners	Water / Thinning not recommended.
Wash up	Water
Recoat time at 25°C	1 to 2 hrs
Theoretical spread rate at D.F.T (30 microns Dry)	18.33 m ² per ltr
Spread rate at recommended D.F.T (184 D.F.T.)	3.0 m ² per ltr
Specific Gravity.	1.224
Volume Solids.	52% V/V
P.V.C.	18% V/V

Table 1 - Physical resistance properties compared to a Premium Acrylic Pavement Paint.

TEST DESCRIPTION	PREMIUM ACRYLIC	Cool Pave.
1 Boiling Water Test	Fail Severe whitening	Pass – 1
2 Water Resistance -Blistering -Whitening	Dense poor 8 DL + 4.88 (Whitening did not recover)	Spars good 2 -0.326
3 Crosshatch Adhesion	OB,c	OB,c
4 Accelerated Weathering (ASTM G53-96)	Moderate chalking and surface whitening.	Excellent gloss retention with little to no surface change.

Test Procedures;

1 Boiling Water Test

Place 24hr old test panel into boiling water for 30 minutes. Removed and dried panel then noted blistering and adhesion loss.

2 Water Resistance Test

Placed 24hr old test panels into lab temperature water, 25 deg C, for 48 hrs. Remove, dry and measure for water whitening and blisters.

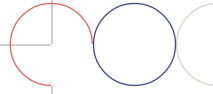
3 Cross Hatch Adhesion Test

A test panel has lines scribed through the coating to the substrate at 3mm intervals in a cross hatch pattern. Adhesive tape is applied and remove noting any failure.

Rating:- OB = 90% squares removed.
C = Cohesive substrate failure.

4 Accelerated Weathering (ASTM G53-96)

2800hrs of UVB 313 Lamps/Moisture testing, in accordance to ASTM G53-96. Samples were exposed to four hour cycles of U.V.B. at an irradiance of 1.05 then moisture at 60 deg C for a total period of 2800 hrs.



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