



COOLING
OUR URBAN
ENVIRONMENT

INFRARED HEAT REFLECTIVE

Tileshield S.M. GLS/LS Cool Roof Solutions

Astec TILESIELD S.M. is labeled with the Energy Star® logo and is a qualified Energy Star® product. TILESIELD S.M. meets the Energy Star® specifications for cool roof coatings and strict energy efficient guidelines set by the (E.P.A.), Environmental Protection Agency.



INTRODUCTION:

Dark Coloured Coatings for Concrete Tiles 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.

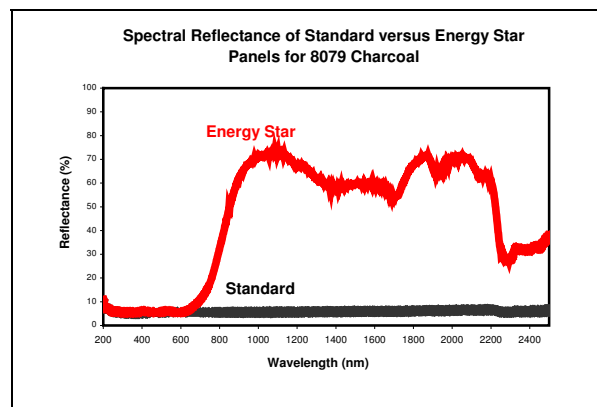
In a world that now demands we be more energy efficient and resource conscious, the use of dark colour, although attractive, presented a design challenge for our industry to overcome. It would be the "holy grail" in coating technology, to achieve a black or deep tone that would reflect solar heat and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



PRODUCT TYPE:

Waterbased, Infrared Heat Reflective, Silicone Modified, 100% acrylic coating for concrete roof tiles.

DESCRIPTION

Tileshield S.M is a premium grade water-based 100% acrylic coating, designed for use on all correctly prepared concrete roof tiles.

Tileshield S.M is low in V.O.C. and available as both an Ultra High Gloss and a Low Sheen finish.

Tileshield S.M is highly water repellent, has excellent flexibility and is adhesion promoted to provide a strong, long-term bond to concrete tiles.

The product was originally designed to tolerate the demanding environments of Asian cities .



Environmental Leadership is Everyone's Responsibility

The applied film offers rapid resistance to environmental dirt pick-up when applied to concrete roofing tiles. It is an excellent replacement for Solvent-borne acrylics and polyurethane, providing many of the same performance properties without harmful solvent release to the atmosphere.

The product has excellent flow and leveling properties and levels to a smooth, uniform decorative and protective film. It has very good edge cover and wet hold during brush application which insures "thin edge lifting" of the cured film is eliminated.

The applied film is resistant to mould and dirt pick-up, is tough, yet flexible and because they remain cool, testing has shown that they will last eight times longer than all conventional exterior acrylic roof paints.

DIRT PICK-UP RESISTANCE:



As a result of ongoing research and development into dirt pick-up resistance for exterior coatings, Astec developed a new technology now registered to Astec as **Dirtguard**.

Dirtguard technology was developed throughout a decade of R&D that was driven by products exported by Astec to the Asian regions. In some Asian cities environmental contaminants can deface a coating within months of its application.

Astec now use Dirtguard technology in all Energy Star products. The products remain cleaner far longer than conventional coatings, a necessary requirement for maximum retention of their Solar Reflectivity.

Coatings based on Astec **Dirtguard** technology incorporate the latest in surface curing and nano particle technology. The surface of the film cross links around nano particles to provide an extremely tight surface pack ensuring dirt will not become lodged within the cured film.

Special Silicones also form part of Dirtguard technology and provide added durability and high water resistance to the cured film. The silicones used to modify Tilesield S.M were selected through years of exterior weathering and dirt pick-up resistance trials that were conducted on exposure racks in Asian cities.

The Silicone modification provides excellent block resistance to environmental contaminants and adds strong water repellency for rapid rain water run off that carries dust and contaminants from the roofing surface. Tilesield S.M fully develops these properties even under conditions of high humidity.

The Silicone Modification combined with gloss modifiers used in Tilesield S.M Gloss provide one of the highest sheen levels available for an exterior grade acrylic and further adds to the long-term durability of the product.

DURABILITY:

Heat and moisture are the two main contributing factors that accelerate the degradation of exterior coatings. In highly humid, tropical environments, conventional acrylics have been known to last as little as three years. In Australia some dark metal roofing can start to change colour and fade from its original depth of colour 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 one major contributing factor to exterior coating degradation, especially in a standard dark colour.

Because Tilesield S.M will remain cool even in a Black. After exposure to 2800hrs 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 roofing acrylic. 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 acrylic coatings. Atmospheric moisture enters the coating film on a daily basis and swells the coating, greatly reducing its life.

Because the silicones used in Tilesield S.M stop the entry of moisture to the coating film, the coating does not swell and will last 400% longer than standard roofing acrylics. Simply put, the less moisture that the coating film has to tolerate the longer it will last.

Environmental Leadership is Everyone's Responsibility

Tileshield S.M. is the most advanced and functional roof coating available in Australia. It provides high Solar reflectivity in dark colours, excellent resistance to moisture and remains cleaner than any other roofing acrylic available.

KEY PROPERTIES

- **High Solar Reflectivity in dark colours**
- Energy efficient.
- Cooler internal building temperatures.
- Reduces Urban Heat output
- Suitable for rain water collection (after 3 rains)
- Outstanding Durability.
- Excellent dirt pick-up resistance.
- Outstanding face to face block resistance.
- Excellent water whitening resistance.
- Plasticizer free.
- Rapid cure and bond strength.
- Excellent resistance to alkali

PRINCIPLE USE;

- Concrete Roof Tiles.

SUBSTRATE:

Correctly prepared aged concrete roof tiles.

COLOUR RANGE:

44 standard exterior colours.

PREPARATION;

- All surfaces must be clean, dry, structurally sound and correctly sealed prior to any topcoat application.
- Ensure down-pipes to rain-water tanks and storm water are disconnected before cleaning
- The surface should be high pressure water cleaned to remove the moss, lichen and chalky surface, ensuring that all mould deposits are removed from the leading edge and shoulders of the tiles. The most suitable nozzle to achieve the best results on concrete tiles is a Kranze Turbo Nozzle. Any deposits of grease, oil or silicone must be removed.
- Structural defects to areas such as the ridge capping should be correctly repaired by re-bedding or re-pointing. Any defective tiles should be replaced.

APPLICATION;

MOULD TREATMENT;

- Apply one coat of **Astec Barrier** to the entire roof surface with a back pack, low pressure or airless spray unit. When applying **Barrier** you need only to dampen the surface ensuring efforts are made to contact all shoulders and edges of the tiles. **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 concrete roof restoration.

SEALING;

- The pressure cleaned surface of the tile 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 original factory finish has weathered to a point where it is under-bound. This is most common with Monier roofing tiles and needs to be re-bound to ensure top-coat 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 sealed with one coat of Astec Tile Sealer. Apply one coat of Astec **Tile Sealer** at a coverage rate of no more than 6 m² per litre.
- Apply one full, wet coat of **Astec Cap Seal** to any fresh mortar repairs. **Cap Seal** is highly resistant to alkali attack from green mortar, and when applied to fresh cement, protects the topcoats from lime burn and leaching salts. It is imperative that **Cap Seal** is used under **Tileshield S.M.** on fresh mortar repairs to eliminate any chance of unsightly top-coat white out.

Environmental Leadership is Everyone's Responsibility

TOP-COATING;

- Apply one full, wet coat of **Tileshield S.M.**, to the entire roof surface. (Coverage rate not to exceed 5m² per liter). WFT 200 microns.
- Apply a second full wet coat of **Tileshield S.M.** straight from the drum at a coverage rate of no more than 5m² per liter. WFT 200 microns.
- The above coverage rates include average substrate profile area for concrete tiles.

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

NOTE:

If the roof is to be used for the collection of drinking water, the down pipes should only be reconnected after exposure to 3 or 4 heavy rains.

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

Tileshield S.M. 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.

PRODUCT DATA;	
S.R.I. <i>Solar Reflectance Index</i> (White) to ASTM E 1980-01	112.33 (Medium wind conditions)
%T.S.R. <i>Total Solar Reflectance</i> (White) to ASTM	89.20
Emittance to ASTM C-1371	0.90
%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	Full Gloss and Low Sheen
Drying Time at 25°C @ 100 MIC W.F.T.	35 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)	12.68 m ² per ltr
Spread rate at recommended D.F.T (150 D.F.T.)	2.5 m ² per ltr (including two coats and profile)
Specific Gravity. Gloss	1.210
Volume Solids. Gloss	38% V/V
P.V.C. Gloss	15% V/V
Specific Gravity. Low Sheen	1.34
Volume Solids. Low Sheen	38% V/V
P.V.C. Low Sheen	37% V/V

Environmental Leadership is Everyone's Responsibility

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

TEST DESCRIPTION	PREMIUM ACRYLIC	TILESHIELD S.M.
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 -0.318
3 Crosshatch Adhesion	OB,c	OB,c
4 Face to face Block Resistance	Separation caused severe damage	Separated easily with minimal damage.
5 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 Face to Face block Resistance Test

24 hour old coated M.D.F. test panels were stacked face-to-face with a 245kg weight applied to the stack for 24hours at room temperature. At the end of the test stack was noted for ease in separation.

5 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.