



EC-100 Dirtguard S.M. Cool Waterproofing

Astec EC-100 DIRTGUARD S.M. is labeled with the Energy Star[®] logo and is a qualified Energy Star[®] product. EC-100 DIRTGUARD 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 Waterproof Membranes 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.

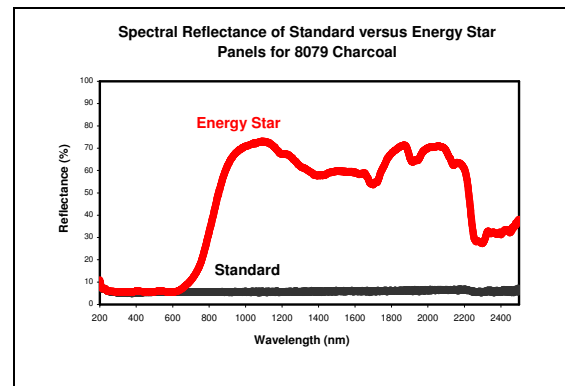
In a world that now demands we be more energy efficient and resource conscious, the use of dark colour, although attractive, presented a design challenge for our industry to overcome. It would be the "holy grail" in coating technology, to achieve a black or deep tone that would reflect solar heat and 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 EC-100 Dirtguard 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 EC-100 Dirtguard 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 EC-100 Dirtguard S.M. Charcoal.



EC-100 Dirtguard S.M. can be supplied in all 44 Energy Star, deep to light tone colours and can be used on both steep and low slope roofing. However, to conform to The Environmental Protection Agency's ENERGY STAR Specifications. The following T.S.R. *Total Solar Reflectance* values must be considered during colour selection.

Pitched roofing %T.S.R. >0.25
Flat Decks %T.S.R. >0.65

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

PRODUCT TYPE:

Waterbased, Second Generation 100% acrylic waterproof membrane coating with high Infrared Heat Reflectivity.

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



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DESCRIPTION:

A liquid applied, fully adhered, seamless waterproof membrane that is formed in situ on the substrate offering excellent resistance to ponded water.

Energy Star EC-100 Dirtguard S.M. 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 a *Crack Bridging* elastomeric waterproofing membrane with excellent resistance to ponded water. It is semi-gloss, has excellent elongation and recovery and provides a positive waterproof seal for concrete and ply decks, metal, asbestos and cement tiled roofing.

PROPERTIES:

The product is silicone modified for added water resistance and durability. It is a high solid, low V.O.C., second generation 100% acrylic with low temperature flexibility to -20°C.

EC-100 Dirtguard S.M. is 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 elasticity.

EC-100 Dirtguard S.M. is highly water repellent, has excellent flexibility and its adhesion is promoted, providing a strong bond to the substrate.

The product can be used as a stand alone membrane or it can be reinforced with Astec Sontara or Deckweb polyester cloth to enhance tensile strength and tear resistance with a subsequent increase of Elongation to break of 1220%.

The product incorporates Astec Dirtguard Technology providing excellent resistance to environmental dirt pick-up and mould, assisting the long term retention of the film's High Solar Reflectivity. **The product was originally designed to tolerate the demanding environments of Asian cities .**

The cured film is tough and highly elastic, and because it remains cool, testing has shown that it will retain its elasticity eight times longer than all

conventional acrylic waterproof membranes. Astec Energy Star coatings were the first in Australia to earn the ENERGY STAR label for energy efficient paints. As an Architect, Builder or Homeowner, cooler buildings are a positive contribution to our global environment with reductions in Urban Heat, Smog and through energy efficiency, help reduce CO2 emissions.



KEY PROPERTIES

- Very high **S.R.I. 113.89.**
- **High Solar Reflectivity in dark colours.**
- Excellent resistance to ponded water.
- Excellent elongation 640%.
- Excellent elongation 1220% reinforced..
- Energy efficient.
- Cooler internal building temperatures.
- Reduces Urban Heat output
- Suitable for rain water collection (after 3 rains)
- Plasticizer free, (internally plasticized).
- Outstanding elastic recovery.
- Low temperate flexibility to – 20°C.
- Excellent dirt pick-up resistance.
- Will form films at temperatures as low as 12°C.
- High volume solids.
- Outstanding Durability.
- Low V.O.C. Low odour.
- Rapid cure and bond strength.
- Excellent resistance to alkali and efflorescence.

PRINCIPLE USE:

Elastic waterproof membrane with very high Solar Reflectivity for;

- Concrete deck roofing.
- Ply deck roofing.
- Balcony membrane systems.
- Asbestos Roofing
- Metal Roofing
- Cement Tiled Roofing

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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 EC-100 Dirtguard 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. EC-100 Dirtguard S.M. fully develops these properties even under conditions of high humidity.

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 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.

EC-100 Dirtguard 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 EC-100 Dirtguard S.M. stop the ingress 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.

EC-100 Dirtguard 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 elastic waterproof membrane available.

Low temperature flexibility to, - 20⁰ C.

Membranes for dimensionally unstable roofing substrates must have long-term low temperature flexibility. This flexibility is necessary to accommodate thermal expansion and contraction of the substrate caused by rapid freeze/thaw weather cycling. Many products claim elastomeric performance, but do not have this main property of low temperature flexibility that is essential to a truly durable elastomeric coating.

To obtain acceptable elasticity, products that have claimed elastomeric performance, have so far required the addition during manufacture of external plasticising materials to improve their flexibility, even though there are serious drawbacks to their use.

Typically, plasticizers only enhance elongation over a narrow range of temperatures and one serious disadvantage is that they will continually

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migrate out of the coating film until they have disappeared. As this leaching occurs, elongation will be reduced. In addition, if the ambient temperature steps outside of the coating's narrow operating range on the high side, the coating risks losing its recovery properties. It becomes gummy and can flow apart from stresses caused by dimensional fluctuations in the substrate. Furthermore, if the coating steps outside its operating temperature on the low side at the, inelastic glass transition state, the coating will crack with any substrate movement.

Astec EC design technology does not rely on the need for external plasticizers to acquire the right level of softness. The right level of softness is inbuilt (internal plasticization) from the ground up. Our EC Products derive elasticity from a unique combination of special composition, molecular weight, and cross linking. As a result, they retain their flexibility for extended periods of time, over a broader range of temperatures expanding and contracting over continually moving substrates without wrinkling in higher temperatures or cracking in low temperatures.

EC-100 Dirtguard S.M. unique low temperature chemistry ensures that the system will not fail over an extended period of time under extreme weather conditions.

For example: It must be remembered that the effects of water after a sudden thunder storm on a hot day in any geographic location can rapidly drop the roof temperature as much as 100%, causing severe thermal stress on the roof surface.

EC-100 Dirtguard S.M. resists the degradative effects of harsh freeze-thaw cycling with its unique low temperature flexibility and will resist these effects to temperatures as low as -20° C, ensuring crack-free adhesion to the substrate and superior resistance to hail stone damage.

Most importantly, EC 100 Dirtguard offers complete confidence in the long-term resistance to ponded water transmission.

SUBSTRATE:

- Correctly prepared new or aged concrete and ply, flat roofing decks.
- Correctly prepared new or aged metal roofing.
- Correctly prepared new or aged fibro roofing.
- Correctly prepared aged concrete roofing tiles.

PREPARATION;

Waterproofing Systems

Contact Astec for the relevant waterproofing system specification.

Concrete Deck
(Totally Reinforced) Spec No. AP8701

Concrete Deck. Spec No. AP8715

Ply Deck Spec No. AP8723

Existing Membranes Spec No AP8764

Aged Concrete Roofing Tiles

- 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 surfaces. Ensure 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.

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.

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- 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 EC-100 Dirtguard S.M. on fresh mortar repairs, to eliminate any chance of unsightly top-coat white out.

Previously painted metal:

- All surfaces must be clean, dry and free of contaminants. Remove dirt or dust with a wire brush and any grease with Astec Enviro-green. Alternatively, the surface should be high pressure water cleaned to remove any surface contaminants. The most suitable nozzle to achieve the best results is a Kranze Turbo Nozzle.
- Any deposits of grease, oil or silicone must be removed.
- Scrape off any loose or flaking paint then sand any remaining paint to a flat finish. Any existing paint that exhibits a complete lack of adhesion should be entirely removed for the best results. Wipe down with a damp cloth to remove any dust.
- Rusted surfaces or nail heads should be treated with Astec Rus-traint and once cured spot primed with Astec B-16 I.R. Grey Primer. (See relevant technical bulletin).

- Prime the entire surface with one light, transparent coat of Astec B-16 I.R. Grey Primer. (See relevant technical bulletin).

New unpainted metal:

- Degrease thoroughly with Astec Enviro-green, while frequently changing rags.
- Prime the entire surface with one light transparent coat of Astec B-16 I.R. Grey Primer. (See relevant technical bulletin).

Previously painted fibro: **NOT ASBESTOS:**

- Remove all loose, chalked and flaky paint, sand any remaining paint to remove any gloss.
- Spot treat any bare areas with Astec Barrier, then spot seal with Astec Rivett, Multi-seal or Triple-flex to seal and condition the bare areas.

Weathered asbestos sheeting:

Do not sand or scrub the surface as the dust can be harmful to your health. Pick off any large clumps of mould or debris, apply two coats of Astec Barrier which will kill any mould growth. Apply Astec Rivett in multiple coats until all contaminants are securely locked to provide a hard bound surface, (refer to Astec Performance Spec No. 8712). Apply suitable Energy Star top coat.

APPLICATION:

LEAKS / FASTENERS / FLASHING SEALING :

- Any loose flashings, holes or sheet overlaps that may allow water ingress to the roof can be repaired by using 70 mm wide Astec Sontara tape embedded in Astec Taping Membrane.
- Allow the Taping Membrane to dry (usually four hours), and recoat any thin areas to cover any pin holing.
- Apply a dab of Astec Ultra-Flash to all fasteners with a small brush to make them water tight.

TOP-COATING;

- Apply one full wet coat of EC-100 Dirtguard S.M. , to the entire roof surface. (Coverage rate not to exceed 5m² per litre). WFT 200 microns.

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- Apply a second full wet coat of EC-100 Dirtguard S.M. straight from the drum at a coverage rate of no more than 5m² per litre. WFT 200 microns.
- Total D.F.T. 192 microns.
- The above coverage rates include average substrate profile area for concrete tiles, corrugated asbestos and metal sheet.
- Coverage rates for low slope waterproofing systems must be as specified on the relevant Astec System Specification for the individual substrate.

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

COLOUR RANGE:

44 standard exterior colours.

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

EC-100 Dirtguard S.M. 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	113.89 (Medium wind conditions)
%T.S.R. <i>Total Solar Reflectance</i> (White) to ASTM	90.03
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	Semi Gloss
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)	16.00 m ² per ltr
Spread rate at recommended D.F.T (350 D.F.T.)	1.37 m ² per ltr (Waterproofing Low Slope)
Spread rate at recommended D.F.T (192 D.F.T.)	2.5 m ² per ltr (Waterproofing Steep Slope)
Specific Gravity.	1.124
Volume Solids.	48% V/V
P.V.C.	15% V/V

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PERFORMANCE DATA		
PROPERTY	TEST METHOD	MEASURED RESULT
Moisture vapor transmission rate. @ 25°C, g/m ² /hour	ASTM E96	1.2
Elongation @ 25°C, at break, %	ASTM D412-1992	640
Elongation @ 25°C, at break, % (Reinforced)	ASTM D412-1992	1220
Tensile strength @ 25°C, MPa	ASTM D412-1992	1.2
Water ponding resistance mg passed (50 hours)	(1)	46.4
Stability, heat aged, 10 days @ 60°C	(1)	Pass
Water swelling @ 25°C, maximum, %	ASTM D471	46

Internal Astec laboratory test procedure.

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

TEST DESCRIPTION	PREMIUM ACRYLIC	EC-100 DIRTGUARD 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 -0.326
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.