



COOLING
OUR URBAN
ENVIRONMENT

INFRARED HEAT REFLECTIVE

Dirtguard I.R. Elastic Crack-Free Masonry Protection

Astec DIRTGUARD I.R. ELASTIC is labeled with the Energy Star® logo and is a qualified Energy Star® product. DIRTGUARD I.R. ELASTIC 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.

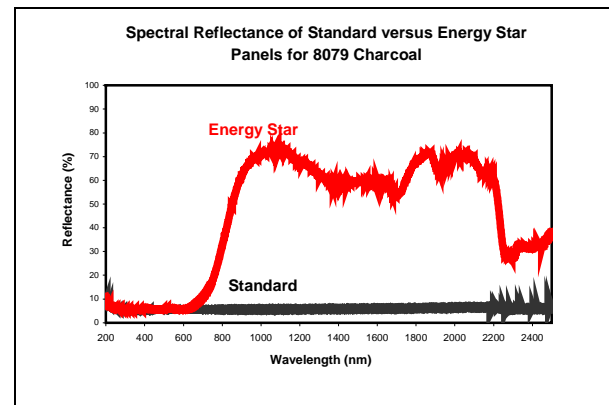
As a result of ongoing research and development into heat reflective coatings Astec developed a new technology of colour infused nano ceramics that reflect heat by selective reflection of infrared light. This technology has enabled us to offer dark colour tile coatings that reflect fully 50% of Solar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

The successful development of Energy Star Dirtguard I.R. Elastic 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 Dirtguard I.R. Elastic 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 Dirtguard I.R. Elastic Charcoal.



PRODUCT TYPE:

A Second Generation, surface curing, 100% acrylic, with high Infrared Heat Reflectivity.

Solar Reflectance Index to ASTM 1980-01
S.R.I.=112.90 medium wind conditions.

DESCRIPTION:

Substrate movement, for what-ever reason leads to cracks in a building. As a result, these cracks allow the passage of potentially destructive water and industrial gases. These contaminants must be stopped to ensure the designed lifespan of a building. Unlike conventional exterior paints that crack with substrate movement, Dirtguard I.R. Elastic has outstanding elongation, it will expand and contract over long periods of time without itself cracking or wrinkling. Cracks are easily bridged during initial application and remain bridged over extended periods of time, ensuring that your building will remain watertight, aesthetically pleasing and free from the destructive effects of environmental gases.

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Energy Star Dirtguard I.R. Elastic is a **Crack Bridging** 100% acrylic, elastomeric wall coating that exhibits outstanding exterior durability. It is semi-gloss, has excellent elongation and recovery and provides a positive waterproof seal for masonry and texture finished walls.

The product has high resistance to Carbon Dioxide Permeability making it ideal for seafront and inter city masonry wall applications.

PROPERTIES:

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

Dirtguard I.R. Elastic is low a odour formulation and contains no harmful solvents making it environmentally friendly and safe for applicators during application.

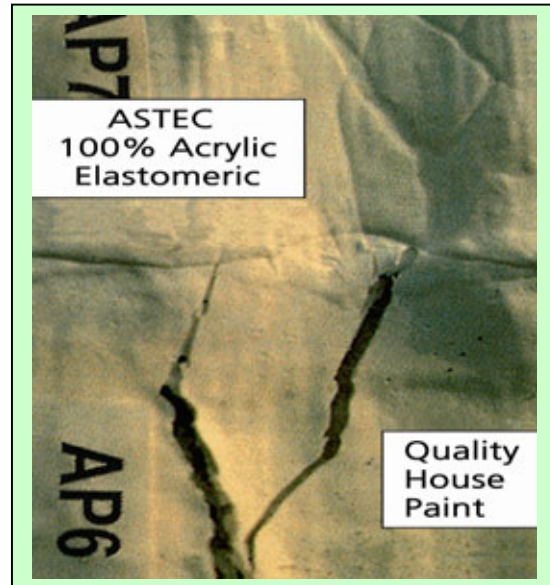
The product is designed on internally plasticized acrylic technology, which means, it does not contain plasticizers that can leach from the cured film over time and detract from the product's long-term elasticity.

Dirtguard I.R. Elastic is highly water repellent, has excellent flexibility and is adhesion 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 further enhance tensile strength and tear resistance with a subsequent increase of Elongation to break of 1400%.

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 it's 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.



FOR YOUR ABSOLUTE CONFIDENCE....

Dirtguard I.R. Elastic possesses the ability to bridge a forthcoming crack 4.9 times its dry film thickness.

(350 microns dry will accommodate a forthcoming crack of 1.75 mm).

KEY PROPERTIES

- Very high **S.R.I. 113.89.**
- **High Solar Reflectivity in dark colours.**
- Excellent Crack Bridging.
- Excellent elongation 660%.
- Excellent elongation 1400% reinforced.
- Resistance to Co2
- Energy efficient.
- Cooler internal building temperatures.
- Reduces Urban Heat output
- 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;

- Masonry and texture finished walls.
- Pre-cast, trowel finish and all block masonry walls.

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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 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 Dirtguard I.R. Elastic 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 wall surface. Dirtguard I.R. Elastic 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 by fading from its original depth of colour.

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.

Dirtguard I.R. Elastic 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 Dirtguard I.R. Elastic 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 has to tolerate the longer it will last.

Dirtguard I.R. Elastic is the most advanced and functional elastomeric wall 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 to date required the addition during manufacture of external plasticising materials to improve their flexibility, even though there are serious drawbacks to its use.

Typically, plasticizers only enhance elongation over a narrow range of temperatures and one serious disadvantage is that they will continually migrate out of the coating film until they have gone entirely. As this leaching occurs, elongation will be reduced. In addition, if the ambient temperature steps outside of the coating's narrow

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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 out-side 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. They derive elasticity from a unique combination of special composition, molecular weight, and cross linking. As a result, they retain their flexibility over extended periods of time, over a broader range of temperatures expanding and contracting over continually moving substrates without wrinkling at high temperatures or cracking at low temperatures.

Dirtguard I.R. Elastic 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.

Dirtguard I.R. Elastic resists the degrading effects of harsh freeze-thaw cycling with its uncommon low temperature flexibility and will resist these effects to temperatures as low as -20° C, ensuring crack-free adhesion to the substrate.

Most importantly, Dirtguard I.R. Elastic offers complete confidence in the long-term resistance to substrate movement.

SUBSTRATE:

- Masonry and texture finished walls.
- Pre-cast, trowel finish and all block masonry walls.

PREPARATION:

All surfaces must be clean, dry, free from surface contaminants and structurally sound. Surface preparation may be carried out by the use of high pressure water cleaning, power buffing or scraping. Scrape off any loose or flaking paint on existing painted surfaces 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 (except on asbestos sheeting). Any structural cracks should be saw cut and struck smooth with a cementitious or low shrink grouting compound.

MOULD TREATMENT;

- With the surface clean and structurally sound, apply one coat of **Astec Barrier** to the entire 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 areas. **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 coatings projects.

SEALING;

- Where it is not possible to completely remove all chalk or contaminants from the surface, or the surface is friable, new masonry or moisture laden; apply Astec Rivett or Multi-Seal which will bind the surface to a hard finish prior to painting. Contact Astec for further information on the correct sealer.

NOTE:

Where severe carbonation of the concrete substrate has occurred, (exposing any corroded metallic reinforcement) consult Astec Paints for technical details on the correct remedial action.

APPLICATION:

- Apply straight from the drum by brush, roller or spray. Apply two coats of Dirtguard I.R. Elastic, (**or as specified on the crack bridging chart at the back of this Technical Bulletin**), and allow the product to dry between coats; usually four hours. For roller application, use a medium to deep nap roller. Spray application requires a 518 to 521 tip.
- Apply one full wet coat of Dirtguard I.R. Elastic at a recommended wet film thickness of 200 microns. Coverage will be approximately 5 m² per ltr substrate dependant. Allow to dry, usually between 1/2 an hour and 3 hours is required, weather dependant.
- Apply a second full wet coat of Dirtguard I.R. Elastic at a recommended wet film thickness of 200 microns. Coverage will be between 5 m² per ltr substrate dependant.
- Recommended minimum dry film thickness is 180 microns D.F.T. including two coats.

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- Avoid contact with skin and eyes. Always use a respirator during spray applications.

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

Dirtguard I.R. Elastic 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 @ 200 MIC W.F.T.	45 min touch dry
Recoat time at 25°C	1 to 2 hrs
Recommended thinners	Water / Thinning not recommended.
Wash up	Water
Theoretical spread rate at D.F.T (30 microns Dry)	15.00 m ² per ltr
Spread rate at recommended D.F.T (350 D.F.T.)	1.29 m ² per ltr
Spread rate at recommended D.F.T (180 D.F.T.)	2.5 m ² per ltr
Specific Gravity.	1.116
Volume Solids.	45% V/V
P.V.C.	17% 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 (%) 40°C 25°C 0°C - 10°C	ASTM D412-1992	725 640 349 218
Tensile Strength (kg/cm ²) 40°C 25°C 0°C - 10°C	ASTM D412-1992	32.9 36.1 76.2 109
Low Temperature Flexibility	Excellent	No cracking over a 3mm mandrel bend at 23°C, at 0°C and at -18°C.
Crack-Bridging Ability (25°C)	4.9	EC 2000 will bridge a "forthcoming" crack, 4.9 times its dry film thickness.
Heat - Aged Stability (10 days / 60°C)	Excellent	No syneresis, settling or viscosity change greater than 10%
Moisture Vapour Transmission Rate (Perms)	156 (42.7g/m ² /24 hrs)	Low MVTR figures can cause problems on masonry substrates.
Water swelling @ 25°C, maximum, %	ASTM D471	8.8
Accelerated dirt pick-up resistance	Excellent	
Natural Exposure: North Vertical North 45° North 5°	Excellent Excellent Excellent	No dirt pick-up, chalking or other forms of degradation after one year. Some dirt pick-up in Asian tests but easily removed.
RESISTANCE TO CARBON DIOXIDE PERMEABILITY		
Air Equivalent (m) Concrete Equivalent (cm)	65 16	"Standard" recommendation minimum figures are 50m (air) and 12.5cm (concrete)

Internal Astec laboratory test procedure.

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

TEST DESCRIPTION	PREMIUM ACRYLIC	DIRTGUARD I.R. ELASTIC
1 Boiling Water Test	Fail Severe whitening	Pass – 1
2 Water Resistance -Blistering -Whitening	Dense poor 8 DL + 4.88 (Whitening did not recover)	Sparse 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.

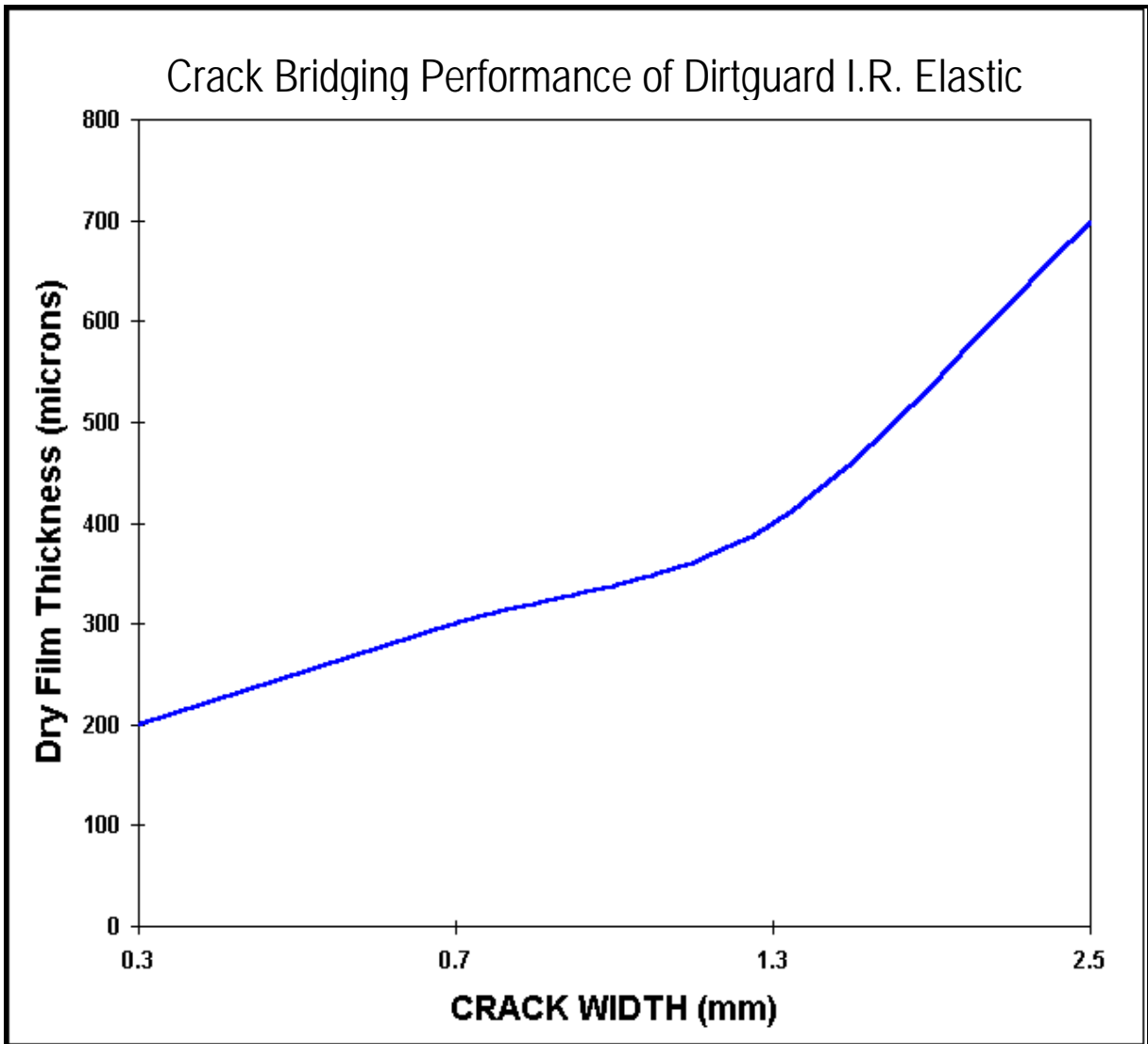
3 Cross Hatch Adhesion Test

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.



Square metres / Litre =

623.4

Dry Film Thickness (microns)

Wet Film Build =

Dry Film Thickness (microns)

0.6234