

Tiger Profiles & Insulation LLC – Solasteel

Overview

Highly reflective, energy efficient, metal decking, pre-coated with water-based acrylic with a high gloss retention suitable for residential, commercial and industrial roofing, walling and many other elements.



Product Description

Solasteel is an energy efficient, pre-formed, cold-rolled metal roof and wall sheeting that is pre-coated with patented world first, water-based acrylic coating with highest solar reflectivity (74.1% in off white as tested by Queensland University of Technology). Reduces heat build up in buildings and also provides higher gloss retention over a longer period than conventional high VOC polyester coated materials, lowering energy costs in all climates where high solar insolation levels occur.

Solasteel eliminates the need to use toxic, high VOC solvent based chemicals during the coating process, which in turn reduces the need to use heaters to burn off remaining VOCs prior to sale. This will reduce operating costs and the handling of chemicals and VOC emissions to atmosphere. In addition, using *Solasteel* in Zone 1 or Hot Regions, there is no need to apply insulation to a passive building, providing additional savings in building costs.

Solasteel is suitable for use in the construction on various outdoor structures from storage tanks, houses, silos, containers, boats, walls, stadiums, gas stations to water treatment plant and storage facilities for food products.

PRODUCT SPECIFICATIONS

Options	Aluminium, Aluzinc and Galvanised Iron substrates
Colours	Off White and a range of assorted commercial colours.
Warranty	15 year performance warranty on surface coating and 30 year substrate warranty.
Expected Life	More than 20 years if the surface is kept relatively free of accumulated debris.
Indicative Costs	Contact supplier



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Purchase Options	-
Constituents	Water based acrylic coating + primer (constituents proprietary – sighted by ecospecifier for assessment)
National & International Standards	<ul style="list-style-type: none"> • Australian Paint Approval Scheme (APAS) accredited • Manufactured in NATA approved laboratory
Country of Origin	Brisbane, Australia
Availability	<p><i>Asia</i></p> <ul style="list-style-type: none"> • Malaysia, Philippines, Thailand, China, Japan, India, Pakistan, Singapore <p><i>Middle East</i></p> <ul style="list-style-type: none"> • UAE, Afghanistan, Iran and Saudi Arabia, Egypt <p><i>Africa</i></p> <ul style="list-style-type: none"> • South Africa
Projects	Tiger Profiles and Insulation, Dubai
Preparation	Installation is same as any existing pre-coated coil. No pre-finishing requirements required to be done.

ECOSPECIFIER LIFE-CYCLE ASSESSMENT

INTEGRATED DESIGN AND POLICY ISSUES

Solasteel can be used independently or form part of an overall building design to reduce heat absorption, which will increase both interior and exterior thermal comfort. This will likely impact on the reduction of urban heat island effects, minimising loads placed on air-cooling devices and increasing the overall energy performance levels of a building.

HUMAN HEALTH

Health

Coating on product contains a small percentage of formaldehyde, which is carcinogenic to humans. However, the product is for external use and the small volume of formaldehyde



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based compounds present should emit extremely small volumes of free formaldehyde and this does not constitute an issue of concern. However in applying Solasteel Coatings during the coating process to steel coil also eliminates the use of applying chromate a very toxic chemical, which provides additional safety and environmental levels for all workers in the coating plant.

Comfort

Product reduces radiant heat transmission, increasing comfort and reducing or eliminating the need for additional cooling depending on climatic conditions. This reduces greenhouse gas emissions. Its water-based acrylic system also minimises toxic or hazardous content.

Indoor Environment Quality

Not applicable

Electromagnetic Radiation

Product is EMC compliant to EU EMC Directive immunity requirements.

Safety

Product is completely water-based, which reduces the content of VOCs and hazardous substances that are often present in solvents.

Accessibility

Not applicable

ECOLOGICAL QUALITY

Terrestrial Pollution

Emissions – The predominant raw materials used in the product base sheeting are steel and aluminium. The production of steel used to make the product leads to localised emissions to terrestrial environments around production facilities. Similarly, the production of alumina from bauxite ores uses a chemical treatment, known as the Bayer Process (see [Glossary](#)). The alkaline mist associated with this process may have adverse land and vegetation impacts.

Physical – The extraction of iron and other ores used to make steel does disrupt local landscapes and alter local ecosystems. Similarly, mineral extraction of bauxite used to make aluminium will disrupt landscapes and alter ecosystems.

Aquatic Pollution

Emissions – The extraction of iron and other ores used in the production of steel have associated emissions to aquatic environments that have localised impacts around production facilities.

Physical – The extraction of iron and other ores used in the production of steel have associated minor localised physical impacts on aquatic environments around production facilities. Bauxite residues of red mud are often disposed of in tailing dams where the mud is allowed to settle. The excess water is discharged into marine environments.

Atmosphere Pollution

The coatings have low volatile organic compound (VOC) content, minimising VOC emissions. Content for each coating is:



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- *Solasteel* Topcoat – 98g / Litre
- *Solasteel* Coil Primer – 107g / Litre

Greenhouse (GHG) – The product has been pre-coated with an energy efficient heat reflective coating that ultimately lowers the need for cooling systems and subsequently reduces greenhouse gas emissions especially in tropical climates. However, steel and aluminium are the predominant component in the product.

The processes of manufacturing steel and aluminium are very high energy requirements and subsequent greenhouse gas levels, particularly aluminium. The production of steel creates CO₂ emissions of which approximately 80% come from the chemical process of making iron. Alumina processing requires high-energy consumption and significant greenhouse gas emissions are associated with the production of refined alumina.

Greenhouse intensity –

- *Solasteel Topcoat* – approximately 0.14kg.CO_{2e} / m^{2*}

*based on average coverage of ~ 0.077kg / m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- *Solasteel Coil Primer* – approximately 0.54kg.CO_{2e} / m^{2*}

*based on average coverage of ~ 0.022kg / m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Aluminium – approximately 35.12 – 100kg.CO_{2e} / m^{2*}

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to produce 228m² of metal sheet. Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Galvanised iron – approximately 12.38 – 35.25kg.CO_{2e} / m^{2*}

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to produce 228m² metal sheet. Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Aluzinc – approximately 35.12 – 100kg.CO_{2e} / m^{2*}

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to produce 228m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

Transport intensity – Product is manufactured in Brisbane, Australia. Energy and GHG intensities for shipping product are shown below.



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Product weight	Energy Intensity - Container Shipping	GHG Intensity - Container Shipping
<ul style="list-style-type: none"> • Solasteel Top Coat - ~ 0.077kg / m² • Solasteel Coil Primer - ~ 0.022kg / m² • Aluminium – 4.39 – 12.5 kg / m² • Galvanised iron - 4.39 – 12.5 kg / m² • Aluzinc - 4.39 – 12.5 kg / m² 	0.000135MJ / kg.km	0.000011kgCO _{2e} / kg.km

Table below provides land transportation greenhouse intensity figures to help calculate the greenhouse gas intensity of land transportation from shipping port.

Light commercial vehicle	Rigid Truck	Articulated Truck
0.001451kgCO _{2e} / kg.km	0.000195kgCO _{2e} / kg.km	0.000169kgCO _{2e} / kg.km

Transport intensity figures sourced from Australian National Greenhouse Gas Inventory 1990, 1995 and 1999 and WWF International, Inland Navigations and Emissions, 2005.

Operational efficiency – Product has highly efficient radiant heat reflection capabilities. This lowers the need for cooling systems especially in hot and tropical climates and subsequently significantly reduces the amount of energy consumed within the building.

Re-use Efficiency – Can be re-used if removed carefully and fixing hole centres are consistent between projects.

Toxics and Pollutants – Curing of coating produces small volumes of volatile organic compounds (VOCs). Solvent based VOCs combine with other air pollutants to form photochemical smog, however, the solvents used in this water based coating does not create these problems.

Ozone Depletion – Product results in potentially less ODP in production, transport, application and use than current solvent based alternatives.

Urban Heat Island Effects – Product reduces the amount of power needed for cooling and subsequent greenhouse gas emissions due to urban heat island effects if used over thermally massive roof and wall surfaces, particularly with insulation behind.

Noise – Not applicable.

Biodiversity



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The process of mining for metal ores modifies soil profiles, topography and drainage patterns which impacts natural vegetation and biodiversity.

Titanium dioxide (TiO₂), contained in the pigmented lacquers and waterborne primer, is sourced as a result of sand mining, a high biodiversity impact process.

RESOURCE DEPLETION

Resource Efficiency

Steel and aluminium are the predominant materials used in the product.

Steel is an alloy metal with its primary constituent being iron, the most abundant element on Earth and the sixth in the Earth's crust. However, iron ore is still a non-renewable resource. Globally, steel is the most recycled building material.

The aluminium used is also an alloy, the third most abundant metal on Earth and the most abundant in the Earth's crust, the primary mineral source for aluminium is bauxite ore, a non-renewable mineral resource with an estimated supply of 180 years based on current Reserve Life Index (RLI) (Source: Meyer, 2004, Availability of bauxite reserves, Journal of Natural Resources Research, p. 161).

Embodied Fossil Fuel Energy

- *Solasteel* Top Coat – approximately 5 MJ / m²*

*based on average coverage of ~ 0.077kg / m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- *Solasteel* Coil Primer – approximately 3.04 MJ / m²*

*based on average coverage of ~ 0.022 kg / m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Aluminium – approximately 781.42 - 2225 MJ / m²*

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to produce 228m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Galvanised iron – approximately 157.16 – 447.5 MJ / m²*

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to produce 228m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

- Aluzinc – approximately 781.42 - 2225 MJ / m²*

*based on calculations using average measurements for metal sheets with dimensions of 940mm (width) x 0.42-1.2mm (thickness) x 300 linear metre (length), that are corrugated to



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produce 228m². Intensity figures used for constituents are a combination of specific and proxy data sourced from Alcorn, New Zealand and Bath University, United Kingdom.

Embodied Water

Information not available

Durability

Solasteel coating has an acrylic base, which outlasts and outperforms polyester alternatives.

Reusability

Not applicable

Repairability

Product is unlikely to be repaired but if necessary, it can be repaired with *Solacoat* to maintain its heat abatement properties.

Design for Dematerialisation

Product's ability to reflect solar radiation minimises the need for cooling systems, which in turn reduces the energy consumption within a building.

Design for Disassembly

The roof sheet is able to be removed by unscrewing. The components of *Solasteel* are not designed for disassembly.

Recyclability

Steel is an efficient and readily recycled material. This can be attributed to steel being economically cheaper to recycle, than to create virgin steel, and that it can be endlessly recycled without loss of its key properties. However, in the context of standard practices in the recycling industry, steel grades and varying alloys of steel can become mixed in the recycling process resulting in the possibility of 'downcycling' higher grade steel into lower grade steel.

Maintenance

Keeping the surface free of debris will enhance solar reflectivity and durability.

Product Takeback Scheme

No

Extended Producer Responsibility (EPR)

No

CORPORATE AND SOCIAL SUSTAINABILITY

Audits and Environmental Reporting



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No

Convictions

No

Environmental Policy

No

Social Enhancement Programs

No

Technology Transfer Programs

No

Environmental Management Systems (EMS)

Yes

ECOSPECIFIER ISSUES OF CONCERN / RED LIGHTS

Issues of Concern

- *Solasteel* Top Coat

Coating contains a small percentage of 2-Octyl-2H-isothiazol-3-one (0.12%). It can be irritating to eyes and may cause sensitisation by skin contact. Ways to mitigate these upon exposure at an occupational level include the use of personal protective equipment, such as complete face protection and rubber gloves with long overalls. While this substance is classified as very toxic to the aquatic environment, given it is bound in the acrylic topcoat - this is unlikely to be of any consequence.

- *Solasteel* Coil Primer

Coating contains a small percentage of 4.16% of Butyl Icinol. Short term exposure by inhalation, skin contact or ingestion is considered to be harmful. Inhalation of high concentrations (more than 300-600 ppm) can produce central nervous system depression. Workers exposed to the substance at an occupational level should ensure there as adequate ventilation and the use of personal protective equipment such as safety boots, safety glasses and gloves. Given it is bound in the acrylic topcoat - this is unlikely to be of any consequence.

Coating contains a small percentage of Melamine formaldehyde (1.6%), which triggers the IARC classification Level 3 Not Classifiable as to Carcinogenicity to Humans. Exposure to melamine formaldehyde at an occupational level can cause sensitisation by skin contact. It is also harmful to aquatic organisms (R52/53). However, given it is bound in the primer body under the topcoat - this is unlikely to be of any consequence.

Red Light Comment

- *Solasteel* Top Coat



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Coating contains a moderate percentage of titanium dioxide, approximately 22.8% for *Solasteel* Top Coat. In 2006, the IARC reclassified titanium dioxide as possibly carcinogenic to humans (Group 2B). This issue relates to the inhalation of powdered and ultra-fine titanium dioxide dust during manufacture and is not considered a risk, as the TiO₂ is not in a respirable form when bound into the product.

Accordingly the sanding, grinding and other occupational production activities of products containing titanium dioxide may present issues if appropriate precautions are not taken. Precautions for workers such as reducing exposure to product in dust form and using appropriate Personal Protective Equipment (PPE) mitigate potential issues to *low* risk in accordance with an **ecospecifier** Risk Assessment. Refer to Material Safety Data sheet for further information.

- *Solasteel* Coil Primer

Coating contains 1.65% of Strontium Chromate. It has a Risk Phrase of R50, which means it is very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment. It should be disposed off as a hazardous substance. At an occupational level, it is harmful when swallowed but symptoms are not available. However, it is unlikely to cause anything more than transient discomfort. If in contact with eyes, it may serve as an eye irritant but should disappear once exposure has ceased. Precautions for workers include the use of Personal Protective Equipment to prevent inhalation and the wearing of suitable respiratory equipment to ensure adequate ventilation. Refer to Material Safety Data Sheet for more details. However, given it is bound in the primer body under the topcoat- this is unlikely to be of significant consequence in the use/disposal/re-use of the finished product.

ECOSPECIFIER GREENRATE GREEN BUILDING SCHEME PRE-ASSESSMENT

LEED® for Commercial Interiors - Version 2.0 (see LEED® disclaimer below)

ENERGY & ATMOSPHERE

<u>EA Prerequisite 2: Minimum Energy Performance¹</u>	<i>Points Available</i>
Product may assist a project meet the Rating System Energy Prerequisite, when appropriately included in combination with other elements and assessed using a computer simulation model, to comply with the nominated standard or the local energy code (whichever is more stringent).	Required

LEED® for New Construction & Major Renovations - Version 2.2 (see LEED® disclaimer below)

ENERGY & ATMOSPHERE

<u>EA Prerequisite 2: Minimum Energy Performance¹</u>	<i>Points Available</i>
Product may assist a project meet the Rating System Energy Prerequisite, when appropriately included in combination with	Required



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other elements and assessed using a computer simulation model, to comply with the nominated standard or the local energy code (whichever is more stringent).

EA Credit 1: Optimised Energy Performance¹

Product may assist in a project obtaining credits, when appropriately designed in combination with other elements and assessed using a computer simulation model, for increasing the level of energy performance above the nominated baseline prerequisite standard.

Exemplary Performance: Innovation in Design & Process: Optimise Energy Performance¹ (additional 1 point)

Possible achievement when minimum energy cost savings of 45.5% for New Buildings and 38.5% for Existing Buildings are obtained when using EA Credit 1 Option 1. An Innovation in Design & Process credit point is not available for Option 2, 3 or 4.

Points Available

10*

* 2 points mandatory performance level

1

SUSTAINABLE SITES

SS Credit 7.2: Heat Island Effect: Roof

Product is likely to assist in a project obtaining this credit as it reduces heat island effects. Credit point is achieved when the prescribed requirements for one of the three following options are met;

- *Option 1* includes using roofing materials with a high Solar Reflective Index (SRI).
- *Option 2* includes installing a vegetated roof.
- *Option 3* includes installing high albedo and vegetated roof surfaces.

Exemplary Performance: Innovation in Design & Process: Heat Island Effect: Roof (additional 1 point)

Possible achievement when 100% of the projects roof area (excluding mechanical equipment, photovoltaic panels, and skylights) is comprised of a green roof.

Points Available

1

1

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Green Star™ Office Interiors Version 1.1 Compatibility (see Green Star™ disclaimer below)

Product does not assist in the achievement of credits for this rating tool.

Green Star™ Office Design Version 2 Compatibility (see Green Star™ disclaimer below)

ENERGY

Ene-1: Energy¹

Product is likely to assist in a project obtaining the conditional requirement for the design of a base building that achieves a predicted rating of 4 stars or greater using the Australian Building Greenhouse Rating (ABGR) scheme's *Validation Protocol for Tenancy Energy Estimation Version 2005-02*.

Points Available

Conditional

Ene-2: Energy Improvement¹

Product is likely to assist in obtaining credits for improvement in the overall energy efficiency of a project. Credit points achieved are determined by the star rating achieved above the conditional 4 star Australian Building Greenhouse Rating (ABGR). Product contribution to credit points is determined by project energy load simulation and needs to be included in the model to provide beneficial credits.

Points Available

15

Green Star™ Office Design Version 3 Compatibility (see Green Star™ disclaimer below)

ENERGY

Ene: Conditional Requirement¹

Product is likely to assist in a project obtaining the conditional requirement for the design of a base building in which the project's greenhouse gas emissions do not exceed 110 kgCO₂/m²/annum as determined using the Australian Building Greenhouse Rating (ABGR) *Validation Protocol for Computer Simulations* or by using the final and current version of the Green Star™ Energy Calculator.

Points Available

Conditional

Ene-1: Greenhouse Gas Emissions¹

Product is likely to assist in obtaining credits for minimising the greenhouse gas emissions of a project. Credit points achieved are determined by determining the reduction in predicted greenhouse gas emissions below the Conditional Requirement of 110 kgCO₂/m²/annum. Full points are available for carbon-neutral base buildings.

Points Available

20



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Green Star™ Retail version1 2008 Compatibility (see Green Star™disclaimer below)

INDOOR ENVIRONMENT QUALITY

<p><u>IEQ-8: Volatile Organic Compounds: Paint²</u></p> <p>Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.</p>	<p><i>Points Available</i></p> <p>1</p>
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ENERGY

<p><u>Ene-1: Greenhouse Gas Emissions¹</u></p> <p>Product is likely to assist obtaining credits for improvement in the operational energy consumption of a project. Credit points achieved are determined by the predicted percentage of greenhouse gas emissions reduction below the “standard practice benchmark”. This benchmark is determined by the <i>Retail Centre V1</i> Energy Calculator.</p>	<p><i>Points Available</i></p> <p>20</p>
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Green Star™ Education version1 2008 Compatibility (see Green Star™disclaimer below)

INDOOR ENVIRONMENT QUALITY

<p><u>IEQ-8: Volatile Organic Compounds: Paint²</u></p> <p>Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.</p>	<p><i>Points Available</i></p> <p>1</p>
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ENERGY

<p><u>Ene: Conditional Requirement¹</u></p> <p>Product is likely to assist in a project obtaining the conditional requirement by meeting the green house gas emissions ‘<i>benchmark</i>’ determined by the energy calculator.</p>	<p>Conditional</p>
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<p><u>Ene-1: Greenhouse Gas Emissions¹</u></p> <p>Product is likely to assist obtaining in a project obtaining credits for designs that minimise greenhouse gas emissions associated with operational energy consumption. Credit points achieved are determined by the predicted % reduction of greenhouse gas emissions below the conditional requirement.</p>	<p><i>Points Available</i></p> <p>20</p>
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Green Star™ Industrial Compatibility (see Green Star™disclaimer below)

INDOOR ENVIRONMENT QUALITY



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<u>IEQ-8: Volatile Organic Compounds: Paint</u> ²	<i>Points Available</i>
Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.	1

ENERGY

<u>Ene Conditional Requirement</u> ¹	conditional
Product is likely to assist in a project obtaining the conditional requirement by meeting the green house gas emissions bench mark, determined by the Green Star Industrial Pilot Energy Calculator.	

<u>Ene-1: Greenhouse Gas Emissions</u> ¹	<i>Points Available</i>
Product is likely to assist obtaining credits for improvement in the operational energy efficiency of a project. Credit points achieved are by the further reduction below the conditional requirement determined by the Energy Calculator.	20

Green Star™ Multi Unit Residential version1 2009 Compatibility (see Green Star™ disclaimer below)

INDOOR ENVIRONMENT QUALITY

<u>IEQ-8: Volatile Organic Compounds: Paint</u> ²	<i>Points Available</i>
Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.	1

ENERGY

<u>Ene: Conditional Requirement</u> ¹	<i>Conditional</i>
Product is likely to assist in a project obtaining the conditional requirement for energy consumption and minimisation of greenhouse gases, through improved thermal performance. Average thermal performance for dwellings must be improved by 10% compared to the thermal performance standard in the relevant jurisdiction.	

<u>Ene-1: Greenhouse Gas Emissions</u> ¹	<i>Points Available</i>
Product is likely to assist obtaining credits for improvement in the operational energy efficiency of a project. Credit points achieved are determined by the predicted percentage of greenhouse gas emissions reduction below the “ <i>standard practice benchmark</i> ”. This benchmark is determined by the <i>Multi Unit Residential Centre V1</i> Energy Calculator.	20



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Green Star™ Healthcare version1 2009 Compatibility (see Green Star™ disclaimer below)

INDOOR ENVIRONMENT QUALITY

<u>IEQ-8: Volatile Organic Compounds: Paint</u> ²	<i>Points Available</i>
Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.	1

ENERGY

<u>Ene-Con: Energy Conditional Requirement</u> ¹	Conditional
Product is likely to assist in a project meeting the energy conditional requirement. The project's predicted greenhouse gas emissions must be equal to or an improvement, in the ' <i>bench mark</i> ' building determined using <i>Healthcare v1 Greenhouse Gas Emissions Calculator</i> .	
<u>Ene-1: Greenhouse Gas Emissions</u> ¹	<i>Points Available</i>
Product is likely to assist in a project obtaining credits for reduction in operational energy consumption and greenhouse gas emissions of the base building. One point is achieved for every 5% reduction against the ' <i>bench mark</i> ' building and zero net operating buildings receive 20 credit points.	20

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Green Star SA™ Office Version 1 Compatibility (see disclaimer below)

INDOOR ENVIRONMENT QUALITY

<u>IEQ-13: Volatile Organic Compounds: Paints</u> ²	<i>Points Available</i>
Product is likely to assist in a project obtaining a credit point as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve the credit point 95% of all painted surfaces in the project must be in accordance with the prescribed standard.	1

ENERGY



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<p><u>Ene: Conditional Requirement</u>¹</p> <p>Product is likely to assist in a project obtaining the conditional requirement by improving energy performance equal to or better than a notional building constructed to the 'deemed to comply' fabric and building services clauses of SANS 204:2008 <i>Energy Efficiency in Buildings</i> demonstrated by using the Green Star SA energy calculator or fully comply with ASHRAE <i>Advanced Energy Design Guide for Small Office Buildings</i>.</p>	<p>Conditional</p>
<p><u>Ene-1: Greenhouse Gas Emissions</u>¹</p> <p>Product is likely to assist in obtaining credits for minimising the greenhouse gas emissions of a project. Credit points achieved are determined by demonstrating the reduction in predicted greenhouse gas emissions below the Conditional Requirement. Full points are available for carbon-neutral base buildings.</p> <p>Alternatively this product may assist in a project obtaining 4 points for offices smaller than 2,000m² UA by assisting in demonstration of compliance with ASHRAE <i>Advanced Energy Design Guide for Small Office Buildings</i>.</p>	<p><i>Points Available</i></p> <p>20</p> <p>or</p> <p>4</p>

Green Star SA™ Retail Pilot Compatibility (see disclaimer below)

INDOOR ENVIRONMENT QUALITY

<p><u>IEQ-8: Volatile Organic Compounds: Paint</u>²</p> <p>Product is likely to assist in a project obtaining credits as it meets the prescribed Volatile Organic Compound (VOC) content standard for paints. To achieve credit points 95% of all painted surfaces in the project must be in accordance with the prescribed standard.</p>	<p><i>Points Available</i></p> <p>1</p>
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ENERGY

<p><u>Ene: Conditional Requirement</u>¹</p> <p>Product is likely to assist in a project obtaining credits by reducing operational energy consumption and maximising operational energy efficiency so that the predicted carbon emissions of the building are less than or equal to the predicted carbon emissions of the notational building in the same location established by the requirements of the <i>Retail Centre PILOT Energy Calculator</i> and the <i>Modelling Protocol Guide</i>.</p>	<p>Conditional</p>
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Ene-1: Greenhouse Gas Emissions¹

Points Available

Product is likely to assist in a project obtaining credits for improvement in the operational energy consumption of a project. Credit points achieved are determined by the predicted percentage of greenhouse gas emissions reduction below the "standard practice benchmark". This benchmark is determined by the *Retail Centre PILOT* Energy Calculator.

20

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The ESTIDAMA Pearls New Buildings Rating Method Vol- 4

RESOURCEFUL ENERGY

RE-r1: Energy Conservation: Minimum¹

Points Available

Product may assist in a project obtaining this requirement if the building meets the prescribed energy performance requirements, such as the required Prescriptive or Performance Requirements.

Requirement

RE-1: Energy Conservation Improvement: Carbon Reduction¹

Points Available

Product may assist in a project obtaining this credit for Energy Conservation Improvement to reduce energy consumption and carbon emissions during building operation compared to either Budget Building or Benchmark building including renewable energy inputs or offsets.

20

Up to 3 credit points may be achieved by products/materials in combination for passive environmental design.

LIVEABLE BUILDINGS

LB-1 Community Walkability

Points Available

Product may assist in a project obtaining this credit where the ground floor level of the building is integrated into the surrounding urban fabric and supports a pedestrian-oriented urban environment by achieving measures determined in EPDS.

2

BREEAM Gulf Issue 2.0

ENERGY



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Ene 1 – Reduction of CO₂ emissions¹

Product is likely to assist in a project obtaining credits as it demonstrates an improvement in the energy efficiency of a building's systems and therefore achieves lower operational related CO₂ emissions. Number of points awarded is dependent on percentage improvement over the established baseline.

Points Available

15

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¹Thermal benefits of coatings are not applicable when used in interior applications not exposed to solar radiation.

ASSESSMENT COMPARISON

Non-reflective and solvent based metal roof and wall sheeting

RELATED TOPICS

Reflective insulation, emissivity, reflectivity, absorption, solar radiation

CSI CATEGORY & NUMBER

07410	Metal Roof and Wall Panel
07610	Sheet Metal Roofing
09900	High Performance Coating
09 90 00	Painting and Coating
09920	Exterior Paints
13200	Storage Tanks

NBS CATEGORY & NUMBER

Commercial Engineering & Services

G30	Metal profiled sheet decking
H31	Metal profiled/flat sheet cladding/covering
H43	Metal panel cladding/features
M60	Painting / Clear finishing
Q55	External decks, boardwalks and pergolas
Z22	Sealants



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NATSPEC CATEGORY & NUMBER

0183	Metals and prefinishes
0345	International Paint steel – protective paint coating
0423	Colorbond and Zinalume roofing
0423	Roofing – profiled sheet metal
0671	Painting

ASSESSMENT CRITERIA SATISFIED

ENERGY/GREENHOUSE
<ul style="list-style-type: none">• Potential less GHG / ODP down stream
HABITAT & LAND
<ul style="list-style-type: none">• Reduced terrestrial impact
RESOURCE DEPLETION & EFFICIENCY
<ul style="list-style-type: none">• Reduced material use
HUMAN HEALTH
<ul style="list-style-type: none">• Low/Reduced Offgassing• Reduced toxics or carcinogens
POLLUTION TO ENVIRONMENT
<ul style="list-style-type: none">• Reduced Life Cycle Toxicity• Reduced Life Cycle Carcinogen• Reduced Smog: Reduction
OTHER VITAL SIGNS



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- National / International Standard
- MSDS
- ISO 14001 Certification
- Documented Manufacturer Claim
- Environmental info about product

SUPPLIER DETAILS

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