

## Raven Products – Doors and Window Sealing Systems [ECG-Premium]

### Overview

An extensive range of sealing systems include perimeter frame seals, door bottom seals, disabled access thresholds, brush strip, pile and fringe weather-stripping for all door and window types to contain energy and exclude weather, noise, fire, smoke, insects and vermin.



### Product Description

*Raven Sealing Systems* seal gaps around doors and windows to seal against a combination of intrusions and leakages. They can provide a complete and continuous seal for all door and window types without impeding normal use. The sealing systems provide sealing against the intrusion of sound, fire and smoke, rain, cold draughts, dust, embers, light, insects and vermin. They also provide sealing against the leakage of heating and air-conditioning energy to allow energy savings.

*Raven sealing systems* are tested and proven against sound, weather, smoke and fire. Seals have been designed to accommodate light, medium and heavy duty levels to suit applications in domestic, commercial and industrial buildings.

The aluminium seals essentially consist of two parts, the aluminium carrier and a flexible seal insert. Dependent on the function the inserts can be solid and closed cell neoprene sponge, EPDM (synthetic rubber), flexible PVC, nylon brush filaments, felt, polypropylene pile, silicon rubber, thermo-plastic rubber. Many of the seals also incorporate a cover strip which conceals the fasteners.

## PRODUCT SPECIFICATIONS

<b>Options</b>	<p>Products for all door and window types. Door seal sizes cover all standard door dimensions and each length may be cut down to the next smaller standard length and or between standard lengths as required.</p> <p>Range includes:</p> <ul style="list-style-type: none"><li>• Acoustic door sealing systems that provide a barrier to airborne sound.</li><li>• Fire and smoke sealing systems that meet building regulation levels for fire resistance and can be used in conjunction with fire doors.</li><li>• Weather/Energy sealing systems that prevent draught and rainwater infiltration as well as heat loss and heat gain. Additionally they will stop the ingress of airborne dust, insects, rodents, and windblown embers in bushfire areas.</li><li>• Door bottom seals of two types; mechanically lifting automatic seal and sweep seal. Used in conjunction with a threshold plate.</li><li>• Threshold plate seals independent of door bottom seals.</li><li>• Door frame or perimeter seals.</li><li>• Astragals seals that seal the joint between two swinging doors.</li><li>• Self adhesive seals for DIY applications.</li><li>• Brush strip seals suitable for sealing difficult applications.</li><li>• Silicon weather stripping for door and window joinery systems that require premium quality, low closing force compression seals.</li><li>• Pile weather stripping made from multi-filament polypropylene yarn.</li><li>• Fringe weather stripping</li></ul>
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<b>Colours</b>	<p>Finishes available are anodized, mill and color. Anodized finishes include satin silver and medium bronze. Mill finish is the raw finish of the aluminum. Color finishes are available on special request. Color matching available.</p> <p>Flexible seal inserts are generally black. The plastic trim covering is available in color on special request.</p>
<b>Warranty</b>	<p>2 years against defect in workmanship and materials if installed according to manufacturer's specifications.</p>
<b>Expected Life</b>	<p>Mechanical seals lab tested to over 2 million cycles. Compression door frame/perimeter seals lab tested to over 10 million cycles. These simulations prove life expectancy of more than 50 years.</p> <p>Flexible seal inserts will receive wear and are replaceable.</p>
<b>Indicative Costs</b>	<p>Contact supplier; indicative cost less than USD 100.00 per single door opening (perimeter seal and auto door bottom seal). Contact Raven distributor for pricing.</p>
<b>Purchase Options</b>	<p>Purchase only</p>
<b>Constituents</b>	<p>Within the various product ranges all products essentially perform the same function and are selections made from the same range of materials and components.</p> <p>Products often consist of two parts, an extruded aluminum carrier and a flexible seal insert. Depending on the function the seal inserts can be: Solid and closed cell neoprene sponge, EPDM (synthetic rubber), flexible PVC, nylon brush filaments, felt, polypropylene pile, silicon rubber, thermo-plastic rubber. Many of the seals also incorporate a cover strip which conceals the fasteners. Fasteners are zinc plated steel self tapping screws. Some seals are solid materials suitable from inserting into rebates.</p> <p>The materials of different products do deviate in mass and volume, however an indication from an example product show constituents as follows.</p> <p>Constituents of RP78 Si Door Perimeter Seal. Percentage by weight (total weight 0.93kg) of product:</p> <ul style="list-style-type: none"> <li>• Aluminum extrusion 60%</li> <li>• Extruded silicon rubber 20%</li> <li>• Steel mounting screws 2%</li> <li>• Extruded PVC 10% (decorative cover)</li> <li>• Polyester molding 2%</li> </ul> <p>General packaging:</p> <ul style="list-style-type: none"> <li>• Packaging polyethylene – low density</li> <li>• Packaging cardboard</li> <li>• Clear adhesive tape</li> </ul>



<b>National &amp; International Standards</b>	<p>Raven are quality certified under: ISO9001:2008 and operate to</p> <ul style="list-style-type: none"> <li>• Environmental ISO 14001 and</li> <li>• OH&amp;S AS 4801</li> </ul> <p>In Australia, Raven products comply with all Building Council of Australia, New Zealand NZ BIA and UK building regulations requirements for door &amp; window sealing as specified in the Raven catalogue.</p> <ul style="list-style-type: none"> <li>• Smoke seals: tested to AS/NZS1530.7</li> <li>• Fire door seals: tested to AS1530.4 for compliance to AS1905.1</li> <li>• Acoustic seals: tested to AS1191 and AS1276</li> </ul>
<b>Country of Origin</b>	<p>Aluminum – China extruded product</p> <p>Silicon rubber – China extruded product</p> <p>Polyester – China molded product</p> <p>Steel mounting screws – China supplied product</p> <p>PVC decorative cover – China supplied product</p> <p>Products are assembled in China and Australia.</p>
<b>Projects</b>	<p><i>Raven Sealing Systems</i> have been chosen for public and commercial buildings as diverse as:</p> <p>Changi Airport, Singapore</p> <p>Sydney Opera House, Australia</p> <p>Parliament House, Australia</p> <p>Shatin Hospital, Hong Kong</p> <p>Royal College of Music, London</p> <p>New Zealand Broadcasting Headquarters, New Zealand</p> <p>Queen Sirikit National Convention Center, Bangkok</p> <p>Indosiar Visual Mandiri Television Studios, Indonesia</p>
<b>Preparation</b>	<p>The majority of seals are fastened using zinc plated self tapping screws. Fixing holes are usually predrilled and many are slotted to allow the seals to be fitted accurately.</p>

## ECOSPECIFIER LIFE-CYCLE ASSESSMENT

### INTEGRATED DESIGN AND POLICY ISSUES

Door and window seals are one of the most cost effective methods for saving energy and improving climate control. In combination with double glazing and building insulation they provide very effective energy savings and climate control, particularly if using mechanical heating or cooling in any climate.



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Apart from improving energy efficiency, sealing provides weatherproofing, acoustic barrier, fire protection and obstruction to the ingress of insects, vermin, dust and fire embers. Sealing can provide specific human health benefits by reducing airborne contamination of food in warehouse storage buildings, including insects and vermin attack. Sealing doors and windows in such buildings also creates significant indirect energy saving benefits. Less food spoilage eliminates additional supply chain energy use in food growing and the subsequent replacement.

The Building Council of Australia requires all buildings with mechanical heating or cooling to install seals to external windows and doors as their inclusion reduces heating and cooling energy costs up to 15%. Sealing window and doors may reduce background ventilation in new or retro-fitted non-mechanically ventilated buildings. New and retro-fit building should therefore be designed to be able to be sealed for energy efficiency but still must be able to be efficiently ventilated when required or desired by the occupants. This will avoid the potential for poor indoor air quality and raised humidity levels. Poor ventilation, in combination with poor hygiene and large surface area of soft furnishings (e.g. carpet), can increase dust mite populations, volatile organic compounds (VOC's) and dust levels causing health complaints like Sick Building Syndrome (SBS), chemical sensitivities and asthma.

The door and window sealing requirement is addressed by other building authorities around the world and cover energy efficiency, protection from fire and smoke, prevention of noise pollution and protection against weather and draught. Items of relevance include the "International Building Code" document prepared by the Building Officials Code Administrators (BOCA), the UK Approved Document B and L1 & L2, as well as other similar European Community Directives, New Zealand Approved Document and others.

## HUMAN HEALTH

### Health

*Raven Sealing Systems* seal against the intrusion and leakage of various elements which may impact on human health. Weather/energy sealing reduces the intrusion of dust and other particulates which may impact on the respiratory systems of occupants. These seals are also a barrier insect and vermin thus reducing the presence of spiders, ants and other potentially dangerous insects and vermin.

Another positive benefit for human health achieved by the installation of sealing systems is the reduction of airborne contamination of food in warehouse storage buildings, including insects and vermin attack.

Although aluminium is a minor component in many of these seals, aluminium smelting in the production of aluminium is a known cause of fluoride emissions that can cause a variety of health impacts. The aluminium holder has a long service life exceeding 50 years. In that context the negative impact of aluminium production is reduced.

Raven also produces door seal holders from plantation timber. Life cycle impacts of plantation timber are significantly less than aluminium.



### Comfort

*Raven Sealing Systems* seal against the intrusion and leakage of noise, heating/cooling energy, light, ambient smoke, insect and vermin, draughts, dust, and rain and therefore improve the thermal and physical comfort of occupants.

### Indoor Environment Quality

*Raven Sealing systems* seal against the intrusion of various elements which may reduce indoor environment quality. Acoustic sealing reduces unwanted noise intrusion into buildings. Weather/energy sealing reduces draughts and heat-loss/heat-gain to maintain climate control. Weather/energy sealing also reduces the intrusion of dust and other particulates which may impact on occupants. These seals are also a barrier insect and vermin thus reducing the presence of spiders, ants and other disrupting insects and vermin.

### Electromagnetic Radiation

Not applicable.



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## Safety

Raven fire and smoke sealing systems, including intumescent seals, meet building fire regulations and standards and can be used in conjunction with fire doors to give fire protection and stop smoke penetration. When incorporated with fire doors, these seals can improve the safety of building occupants.

Raven Weather/Energy sealing systems prevent rainwater infiltration thus reducing the risk of injury to occupants. Additionally they will stop the ingress of airborne toxins, dangerous insects & rodents, and windblown embers in bushfire areas.

## Accessibility

Selected products (threshold plates) provide improved building access for people with a disability.

## ECOLOGICAL QUALITY

*Note: The installation of Raven sealing systems can reduce heating and cooling energy costs up to 15%. The energy savings associated with the installation of these systems means reduced terrestrial and atmospheric emissions due to electricity generation. The major benefit reaped by the use of an individual product significantly outweighs the impacts associated with the small quantities of the individual materials used to make up the products.*

### Terrestrial Pollution

*Emissions* – Product contains aluminium. 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.

Product also contains petrochemical products. The extraction of oil results in the release of toxic drilling by-products. The production of plastics and elastomers also has associated emissions to terrestrial environments.

*Physical* – Mineral extraction of bauxite will disrupt landscapes and alter ecosystems. Because bauxite deposits are found near the Earth's surface, mining requires removal of topsoil and overburden before deeper excavation occurs.

The extraction of oil is responsible for the deforestation, degradation, and destruction of lands across the globe. In addition, the construction of roads for accessing remote oil sites opens wild lands to colonists and land developers.

### Aquatic Pollution

*Emissions* – The oil extraction process and the production of plastics and elastomers have associated emissions to aquatic environments that have localised impacts around production facilities.

*Physical* – Bauxite residues of red mud are disposed of in dams. The excess alumina-rich water is discharged into marine environments.

### Atmosphere Pollution

*Greenhouse (GHG)* – *Raven Sealing Systems* seal against leakage of heated/cooled air and the attended loss of the energy expended to achieve the temperature modification. This has a significant benefit in reducing loads on heating and air-conditioning systems hence reducing energy consumption and associated GHG and other pollutant emissions.

The installation of sealing systems in food warehouse storage buildings also creates a significant indirect energy saving benefit. Less food spoilage eliminates additional supply chain energy use in food growing and the subsequent replacement.

Aluminium processing requires high energy consumption and therefore greenhouse gas emissions are associated with the production of refined alumina.



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*Greenhouse intensity* ~ Information not available but product ranges will be net positive in greenhouse emissions saved over the lifetime of the seals due to energy efficiency, dematerialization of building services and potent GGE refrigerant gases.

*Transport intensity* – Product is manufactured in China. GHG intensities for shipping product are shown below.

Product weight	Energy Intensity – Container Shipping	GHG Intensity – Container Shipping
0.93 kg / seal (RP78 Si Door Perimeter Seal)	0.000135MJ / kg.km	0.000011 kgCO <sub>2e</sub> / 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
0.001451 kgCO <sub>2e</sub> / kg.km	0.000195 kgCO <sub>2e</sub> / kg.km	0.000169 kgCO <sub>2e</sub> / 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* – *Raven Sealing Systems* lead to reduced heating/cooling energy loads by sealing against the leakage of heating/cooling energy thus improving operational efficiency of air conditioning and heating systems.

*Re-use Efficiency* – Recycling of components dramatically lowers emissions of remanufacture/recovery.

*Toxics and Pollutants* – The process of alumina refinement generates localised dust emissions around plant and smelters generate fluoride emissions that can affect animals and plants.

*Ozone Depletion* – The reduction of loads on refrigerant based heating and air conditioning systems achieved by employing *Raven sealing systems* will potentially lead to less ozone depleting substances entering the atmosphere.

*Urban Heat Island Effects* – Not applicable

*Noise* – *Raven Sealing Systems* seal against the intrusion and leakage thus resulting in less atmospheric noise.

### **Biodiversity**

The pollutant emissions avoided by the energy savings generated by the use of seals is a significant benefit. Both bauxite and sand mining lead to modified soil profiles, topography and drainage which impacts natural vegetation and biodiversity. The extraction of oil is responsible for the deforestation, degradation, and destruction of lands across the globe. The oil extraction process results in the release of toxic drilling by-products into local rivers, while broken pipelines and leakage result in persistent oil spillage. In addition, *Raven Sealing Systems* seal against the leakage of light thus reducing light pollution.

### **RESOURCE DEPLETION**

*Note: The reduction in fossil fuel consumption as a result of the energy efficiency introduced into buildings provides positive offsets against minor resource consumption in manufacture.*



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## Resource Efficiency

Bauxite is a non-renewable mineral resource with an estimated 200 year supply. Crude oil is also a finite resource and although reserve estimates vary, all agree that supply is rapidly dwindling and most predict that the world has less than 100 years supply of easily accessible crude oil.

Aluminium extrusions, plastic and rubber products with recycled content can improve the resource efficiency.

## Embodied Fossil Fuel Energy

Aluminium is a high embodied energy material (approximately 180 MJ/kg). When aluminium extrusions with recycled content are used, the products' embodied energy is reduced. The volumes used in these products are small and warranted given the exposure to wear conditions.

## Embodied Water

Information not available

## Durability

The *Raven Sealing System* range of products is highly durable with an expected life for both residential and light commercial applications of 50 years (and more). Some replacement of flexible seals may be required.

## Reusability

Can be reused on different doors of the same size or smaller.

## Repairability

Spare parts are available and flexible seal inserts are fully replaceable. Contact supplier.

## Design for Dematerialisation

The use of *Raven Sealing Systems* can reduce heating and air conditioning requirements allowing for possible downsizing of systems.

## Design for Disassembly

Can easily be disassembled and re-used elsewhere. However due to long life expectancy this is not likely before building renovations or demolition.

## Recyclability

All packaging including cardboard and plastic are recyclable. The anodised aluminium components are fully recyclable if separated from demolition stream and sent to appropriate recycling facility. Powder coated aluminium is not as easily recyclable. Likewise, the silicone EPDM rubber is not easily recycled. All other plastic and rubber products are recyclable.

## Maintenance

Periodic inspection, adjustment and cleaning are recommended for all styles and systems. Normally an annual inspection is sufficient. Any high wear rubber or plastic surfaces need to be maintained to ensure a good seal, and therefore continued energy savings. For fire and smoke sealing applications, refer to local regulatory authority standards for maintenance requirements.



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**Product Takeback Scheme**

No.

**Extended Producer Responsibility (EPR)**

No

**CORPORATE AND SOCIAL SUSTAINABILITY**

**Audits and Environmental Reporting**

Yes

**Convictions**

No

**Environmental Policy**

Yes

**Social Enhancement Programs**

No

**Technology Transfer Programs**

Yes

**Environmental Management Systems (EMS)**

Yes

**ECOSPECIFIER ISSUES OF CONCERN / RED LIGHTS**

Minor issue: Product contains a small percentage of PVC (~12%) which is based on a non-renewable fossil fuel petrochemical polymer (ethylene). However, PVC contains a reduced amount of ethylene (~46%) in comparison to other ethylene based materials. If the product were to be recycled (after usable life) this investment in resources would partially offset through reduced material use in the future.

**ECOSPECIFIER GREENRATE GREEN BUILDING SCHEME PRE-ASSESSMENT**

**LEED® for Commercial Interiors - Version 3 (see disclaimer below)**

**ENERGY AND ATMOSPHERE**

**EA Prerequisite 2: Minimum Energy Performance**

Required

Product may assist a project to comply with the ANSI/ASHRAE/IESNA Standard 90.1-2007 for the tenant’s scope or works, when appropriately included in combination with other elements, to establish the minimum energy efficiency of a tenant space in accordance with prescribed requirements.

**INDOOR ENVIRONMENT QUALITY**

**IEQ Credit 7.1: Thermal Comfort: Design**

Points Available

Product is likely to assist in a project obtaining this credit, when appropriately designed in combination with other elements, such that the project complies with ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy with Section 6.1.1 documentation.

1



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**LEED® for New Construction & Major Renovations - Version 3 (see disclaimer below)**

ENERGY AND ATMOSPHERE

**EA Prerequisite 2: Minimum Energy Performance**

Product may assist in combination with other systems in a project meeting the energy performance rating goal established using the EPA's Target Finder Rating Tool through a variety of options. Required

INDOOR ENVIRONMENT QUALITY

**IEQ Credit 7.1: Thermal Comfort: Design**

Points Available

Product is likely to assist in a project obtaining this credit, when appropriately designed in combination with other elements, such that the project complies with ASHRAE Standard 55-2004, Thermal Comfort Conditions for Human Occupancy with Section 6.1.1 documentation. 1

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**BCA Greenmark Landed Houses v1 (see disclaimer below)**

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

**BCA Greenmark Non-Residential Buildings v3 (see disclaimer below)**

MANDATORY REQUIREMENTS

**M1 Building Envelope – ETTV**

Mandatory

Product is likely to assist in a project complying with mandatory requirement by reducing heat conduction and radiation through walls and fenestrations. In order to comply, the envelope thermal transfer value (ETTV) of the building shall not exceed 50 W/m2.

**M5 Air Tightness and Leakage**

Mandatory

Product is likely to assist in a project complying with mandatory requirements by reducing or achieving air leakage rates below the specified maximums.

ENERGY EFFICIENCY

**1-1 Building Envelope - ETTV**

Points Available

Product is likely to assist in a project obtaining credit points by improving the overall thermal performance of the building envelope by reducing the envelope thermal transfer value (ETTV). Two 15 points are awarded for every reduction of 1 W/m2 from the 50 W/m2 baseline.

INDOOR ENVIRONMENT QUALITY

**4-2 Noise level**

Points Available

Product is likely to assist in a project obtaining credit points by assisting in the achievement of ambient sound levels recommended in the prescribed standard. 2

**BCA Greenmark Office Interior v1 (see disclaimer below)**

ENERGY EFFICIENCY

**1-6 Energy Efficient Features**

Points Available

Product is likely to assist in a project obtaining credit points by providing an innovative energy efficient feature that has a positive environmental impact. 7



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## INDOOR ENVIRONMENT QUALITY

### 4-5 Internal Noise Level

Product is likely to assist in a project obtaining credit points by assisting in the achievement of ambient sound levels recommended in the prescribed standard.

Points Available  
2

### BCA Greenmark Infrastructure v1 (see disclaimer below)

## ENERGY

### 2a-1 Energy Efficiency

Product is likely to assist in a project obtaining credit points by improving the energy efficiency of the project compared to code compliance facility or industry norm. Number of points awarded is determined by the percentage energy savings from the norm.

Points Available  
13

### BCA Greenmark Residential Buildings v3 (see disclaimer below)

## MANDATORY REQUIREMENTS

### M1 Building Envelope – RETV

Product is likely to assist in a project complying with mandatory requirement by reducing heat conduction and radiation through walls and fenestrations. In order to comply, the residential envelope thermal transmittance value (RETV) of the building shall not exceed 25 W/m<sup>2</sup>.

Mandatory

### M4 Air Tightness and Leakage

Product is likely to assist in a project complying with mandatory requirements by reducing or achieving air leakage rates below the specified maximums.

Mandatory

## ENERGY EFFICIENCY

### 1-1 Building Envelope - RETV

Product is likely to assist in a project obtaining credit points by improving the overall thermal performance of the building envelope by reducing the residential envelope thermal transmittance value (RETV). Two points are awarded for every reduction of 1 W/m<sup>2</sup> from the 25 W/m<sup>2</sup> baseline.

Points Available  
15

## INDOOR ENVIRONMENT QUALITY

### 4-1 Noise level

Product is likely to assist in a project obtaining credit points by assisting in the achievement of ambient internal noise levels at or below the specified levels.

Points Available  
1

### BCA Greenmark Non-Residential Existing Buildings v2 (see disclaimer below)

## ENERGY EFFICIENCY

### Energy Efficiency

Product is likely to assist in a project obtaining credit points by contributing to increased energy efficiency of the building. Number of points awarded is determined by the percentage improvement from the specified benchmarks.

Points Available  
22

## INDOOR ENVIRONMENT QUALITY

### 4-5 Internal Noise Level

Product is likely to assist in a project obtaining credit points by assisting in the achievement of ambient sound levels recommended in the prescribed standard.

Points Available  
2

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## Green Building Index Non-Residential New Construction Version 1 (see disclaimer below)

### ENERGY EFFICIENCY

#### EE1 Minimum EE Performance

Product is likely to assist in a project obtaining credit point by improving thermal performance and contributing to a maximum Overall Thermal Transmittance Value of 50, and a maximum Roof Thermal Transmittance Value 25.

Points  
available

1

### INDOOR ENVIRONMENT QUALITY

#### EQ13 Internal Noise Levels

Product is likely to assist in a project obtaining credit points by directly reducing and maintaining internal noise levels below the specified sound levels.

Points  
Available

1

## Green Building Index Residential New Construction Version 1 (see disclaimer below)

### ENERGY EFFICIENCY

#### EE1 Minimum EE Performance

Product is likely to assist in a project obtaining credit points by improving thermal performance and contributing to a maximum Overall Thermal Transmittance Value of 50, and a maximum Roof Thermal Transmittance Value 25, and appropriate roof U values depending on weight.

Points  
available

3

### INDOOR ENVIRONMENT QUALITY

#### EQ3 Sound Insulation

Product is likely to assist in a project obtaining credit points by assisting in the reduction of sound penetration between dwelling units and intra dwelling walls to levels below the established benchmarks.

Points  
Available

2

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## National Australian Built Environment Rating System (NABERS) Compatibility

Product may assist in the achievement of Energy credits in this rating tool.

## BASIX Building Sustainability Compatibility

Product may assist in the achievement of Thermal Comfort credit in this rating tool.

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

### INDOOR ENVIRONMENT QUALITY

#### IEQ-10: Internal Noise Levels

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels through sound control or minimising noise generation. Credit points are achieved where ambient internal noise levels and reverberation times meet the prescribed requirements.

Points  
Available

1

### ENERGY

#### Ene-1: Energy Efficiency

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.

Conditional



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**Ene-2: Energy Improvements**

Points Available

Product is likely to assist 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.

12

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

INDOOR ENVIRONMENT QUALITY

**IEQ-12: Internal Noise Levels**

Points Available

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels of Building Services Design or Overall Building. One Credit point is achieved where the Building Services Design meets the prescribed standards. One point is also achieved where the Overall Building meets the prescribed standards.

2

ENERGY

**Ene-1: Conditional**

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.

Conditional

**Ene-2: Energy Improvement**

Points Available

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.

15

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

INDOOR ENVIRONMENT QUALITY

**IEQ-12: Internal Noise Levels**

Points Available

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels of Building Services Design or Overall Building. One Credit point is achieved where the Building Services Design meets the prescribed standards. One point is also achieved where the Overall Building meets the prescribed standards.

2

ENERGY

**Ene: Conditional**

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.

Conditional

**Ene-1: Greenhouse Gas Emissions**

Points Available

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.

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## Green Star™ Retail Centre Version 1 Compatibility (see disclaimer below)

### INDOOR ENVIRONMENT QUALITY

#### IEQ-7: Internal Noise Levels

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels for 95% of the projects nominated area (GLA and common area) in accordance with levels of Table 1 of AS/NZS 107:2000.

Points Available  
1

### ENERGY

#### Ene-1: Greenhouse Gas Emissions

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 Retail Centre V1 Energy Calculator.

Points Available  
20

## Green Star™ Education Version 1 Compatibility (see disclaimer below)

### INDOOR ENVIRONMENT QUALITY

#### IEQ-7: Internal Noise Levels

Product is likely to assist in a project obtaining this credit by improving ambient noise levels in accordance with AS/NZS2107:2000 for the building services design and the overall building.

Points Available  
2

### ENERGY

#### Ene: Conditional Requirement

Product is likely to assist in a project obtaining the conditional requirement by meeting the green house gas emissions 'benchmark' determined by the energy calculator.

Conditional

#### Ene-1: Greenhouse Gas Emissions

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.

Points Available  
20

## Green Star™ Industrial Compatibility (see disclaimer below)

### INDOOR ENVIRONMENT QUALITY

#### IEQ-7: Internal Noise Levels

Product is likely to assist in a project obtaining this credit by maintaining internal noise levels at an appropriate level when appropriately designed in combination with other materials/elements. Two credits point are achieved when 95% of the GLA does not exceed satisfactory ambient internal noise levels in accordance with prescribed requirements.

Points Available  
2

### ENERGY

#### Ene Conditional Requirement

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.

conditional

#### Ene-1: Greenhouse Gas Emissions

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.

Points Available  
20



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## **Green Star™ Multi Residential Unit Compatibility (see disclaimer below)**

### INDOOR ENVIRONMENT QUALITY

#### **IEQ-7: Internal Noise Levels**

Points  
Available

Product is likely to assist in a project obtaining this credit by maintaining internal noise levels at an appropriate level when appropriately designed in combination with other materials/elements. One credit point is achieved when building services noise meets satisfactory design sound levels and one point is achieved where building construction exceeds the Building Code of Australia in accordance with prescribed requirements.

2

### ENERGY

#### **Ene: Conditional Requirement**

Conditional

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.

#### **Ene-1: Greenhouse Gas Emissions**

Points  
Available

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 "standard practice benchmark". This benchmark is determined by the Multi Unit Residential Centre V1 Energy Calculator.

20

## **Green Star™ Healthcare Compatibility (see disclaimer below)**

### INDOOR ENVIRONMENT QUALITY

#### **IEQ-7: Internal Noise Levels**

Points  
Available

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels for 95% of the OFA in accordance with Table 1 of the AS/NZS 2107:2000.

1

### ENERGY

#### **Ene: Energy Conditional Requirement**

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 'bench mark' building determined using Healthcare v1 Greenhouse Gas Emissions Calculator.

#### **Ene-1: Greenhouse Gas Emissions**

Points  
Available

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 'bench mark' building and zero net operating buildings receive 20 credit points.

20

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

### INDOOR ENVIRONMENT QUALITY

#### **IEQ-12: Internal Noise Levels**

Points  
Available

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels of Building Services Design or Overall Building. One Credit point is achieved where the Building Services Design meets the prescribed standards. One point is also achieved where the Overall Building meets the prescribed standards.

2



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## ENERGY

### Ene: Conditional Requirement

Points Available  
Conditional

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 Energy Efficiency in Buildings demonstrated by using the Green Star SA energy calculator or fully comply with ASHRAE Advanced Energy Design Guide for Small Office Buildings.

### Ene-1: Greenhouse Gas Emissions

Points Available

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. or

Alternatively this product may assist in a project obtaining 4 points for offices smaller than 2,000m<sup>2</sup> UA by assisting in demonstration of compliance with ASHRAE Advanced Energy Design Guide for Small Office Buildings. 4

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

## INDOOR ENVIRONMENT QUALITY

### IEQ-7: Internal Noise Levels

Points Available

Product is likely to assist in a project obtaining this credit by directly reducing internal noise levels for 95% of the projects nominated area (GLA and common area) in accordance with levels of Table 1 of SANS 10103:2004 Edition 5.1. 1

## ENERGY

### Ene: Conditional Requirement

Points Available  
Conditional

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 notional building in the same location established by the requirements of the Retail Centre PILOT Energy Calculator and the Modelling Protocol Guide.

### Ene-1: Greenhouse Gas Emissions

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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## BREEAM Gulf

## HEALTH & WELLBEING

### Hea 13 – Acoustic performance

Points Available

Product is likely to assist in a project obtaining credits by providing acoustic insulation so that the building meets the appropriate acoustic performance standards for its purpose and meets the required sound insulation between acoustically sensitive rooms. The second point can be independently awarded when areas used for speech achieve reverberation times compliant with the prescribed standard. 2



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## ENERGY

### Ene 1 – Reduction of CO2 emissions

Points  
Available

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.

15

### Ene 7 – Cold storage

Points  
Available

Product is likely to assist in a project obtaining credits as it provides a technology to increase the energy efficiency of cold storage systems. One credit point deals with the ability of the system to monitor operational variables, the next deals with minimised energy consumption in operation, and the third point can be achieved where heat recovery, free cooling or thermal storage are implemented. Points are mutually exclusive and can be awarded independently.

3

## BREEAM Issue 3 (see disclaimer below)

## HEALTH & WELLBEING

### Hea 13 – Acoustic performance

Points  
Available

Product is likely to assist in a project obtaining credits by providing acoustic insulation so that the building meets the appropriate acoustic performance standards for its purpose and meets the required sound insulation between acoustically sensitive rooms. The second point can be independently awarded when areas used for speech achieve reverberation times compliant with the prescribed standard.

2

## ENERGY

### Ene 1 – Reduction of CO2 emissions

Points  
Available

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.

15

### Ene 7 – Cold storage

Points  
Available

Product is likely to assist in a project obtaining credits as it provides a technology to increase the energy efficiency of cold storage systems. One credit point deals with the ability of the system to monitor operational variables, the next deals with minimised energy consumption in operation, and the third point can be achieved where heat recovery, free cooling or thermal storage are implemented. Points are mutually exclusive and can be awarded independently.

3

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## ESTIDAMA Pearls New Buildings Issue: July 2009 Pilot Version

## LIVEABLE BUILDINGS

### LB-34: Indoor Noise Pollution

Points  
Available

Product may assist in a project obtaining this credit by improving the noise isolation of normally occupied premises/rooms to reduce impact of unwanted noise. Credit point is achieved if internal ambient noise levels do not exceed 40 dBA for 95% of the occupied area.

1



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**LB-35: Outdoor Noise Pollution**

Points Available

Product may assist in a project obtaining this credit by minimising noise pollution associated with the building that may affect neighbouring buildings, amenities or wildlife. Credit point is achieved if the level of intruding noise at the facade of the nearest noise sensitive premises is minimised to less than 55 dB(A).

1

**RESOURCEFUL ENERGY****RE-r1: Energy Conservation: Minimum**

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 Reduction**

Points Available

Product may assist in a project obtaining this credit by contributing to a percentage reduction in energy consumption over the Budget Building or relevant Building Benchmark.

20

**ASSESSMENT COMPARISON**

External windows and doors without seals.

**KEYWORDS / ALTERNATIVES**

Air seal; butyl rubber door seals; door; draught excluder; fire safety; gaskets; seal; sealer; sealing; seals; soundproofing; stripping; thresholds; ventilation; vermin; weather strip; window; window seal

**RELATED TOPICS**

Climate Control; soundproofing; fire safety

**CSI CATEGORY & NUMBER**

08 71 00 Door Hardware

08 75 00 Window Hardware

**NBS CATEGORY & NUMBER****Building and Residential Services**

L10 Windows/Roof-lights/Screen/Louvres

L20 Doors/Shutters/Hatches

**Commercial Engineering & Services**

Z20 Fixings and adhesives

**Landscaping**

G20 Carpentry/Timber framing/First fixing

Z20 Fixings/Adhesives



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## ASSESSMENT CRITERIA SATISFIED

<b>ENERGY/GREENHOUSE</b>
<ul style="list-style-type: none"><li>• Potential less GHG / ODP down stream</li></ul>
<b>HABITAT &amp; LAND</b>
<ul style="list-style-type: none"><li>• Reduced terrestrial impact</li><li>• Reduced aquatic impact</li></ul>
<b>RESOURCE DEPLETION &amp; EFFICIENCY</b>
<ul style="list-style-type: none"><li>• Reuse potential</li><li>• Reduced material use</li></ul>
<b>HUMAN HEALTH</b>
<ul style="list-style-type: none"><li>• Reduced toxics or carcinogens</li></ul>
<b>POLLUTION TO ENVIRONMENT</b>
<ul style="list-style-type: none"><li>• Reduced Life Cycle Toxicity</li><li>• Reduced Life Cycle Carcinogen</li><li>• Reduced Smog: Reduction</li></ul>
<b>OTHER VITAL SIGNS</b>
<ul style="list-style-type: none"><li>• International Standards</li><li>• ISO 14001 Certification</li><li>• MSDS</li><li>• Documented Manufacturer Claim</li><li>• Environmental info about product</li><li>• Environmental Policy</li></ul>

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