

## Australian Innovative Systems – Ecoline™

### Overview

Unique in-line disinfection system for any water source, including drinking water, process and waste water that requires no added chemicals. Suitable for industrial, commercial and residential application.



### Product Description

*Ecoline™* is a world first alternative to conventional off-line chlorine generation systems. It is an in-line chlorination technology with a closed electrolysis process that requires no added chemical. Product functions by deriving the required two active ingredients from natural water or salt water supplies. It requires only water and electricity to power the system.

*Ecoline™* does not require any chemical/salt additives for disinfection of water sources. It works on the process of electrolysis by fresh water passing through the cell with a minimum TDS of 50ppm generating the chlorine from the small amounts of natural mineral salts (TDS) already present in natural water, this chlorine is diluted immediately into the passing water, and the cycle continues as a closed process.

Applications include drinking water, food processing plants, swimming pools, agricultural lagoons, recycled water, sewerage and waste water, reverse osmosis/desalination, water features, cooling towers, irrigation water and grey water.

### PRODUCT SPECIFICATIONS

<b>Options</b>	<ul style="list-style-type: none"> <li>• Bypass Installation system</li> <li>• Inline Installation System</li> <li>• Bypass Installation System with pump</li> <li>• Skid-mount or modular option</li> </ul>
<b>Colours</b>	<ul style="list-style-type: none"> <li>• Cell housing – deep aqua</li> <li>• Supporting frame – silver metallic finish</li> </ul>
<b>Warranty</b>	3 years full warranty.
<b>Expected Life</b>	75,000 hours (8.5 years).
<b>Indicative Costs</b>	Cost of supply - \$4,720 to \$5,000,000
<b>Purchase Options</b>	<p>For projects up to \$1,000,000:</p> <p>50% advanced payment</p> <p>50% balance before shipment</p> <p>For projects from \$1,000,000:</p> <p>20% 1st instalment advanced payment</p> <p>50% 1st instalment advanced payment</p> <p>30% balance before shipment</p>
<b>Constituents</b>	PVC plastic – 20.59%



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	<p>Teflon Plastic – 0.40%</p> <p>Acrylic Plastic – 6.56%</p> <p>Copper – 5.85%</p> <p>Aluminium – 11.82%</p> <p>Brass – 2.28%</p> <p>Titanium – 10.89%</p> <p>Ruthenium salt based ceramic coating – 0.14%</p> <p>Black Steel – 2.97%</p> <p>Hot Galvanized Steel – 33.48%</p> <p>Process Control Board &amp; Components – 4.27%</p> <p>Rubber – 0.14%</p> <p>Powder coating – 0.61%</p>
<b>Technical Specifications</b>	Click here for technical specifications.
<b>National &amp; International Standards</b>	<p>ISO 9001</p> <p>According to the Queensland Water Recycling Guidelines and based on the bacteriological analysis the Ecoline disinfection system produced Class C recycled water.</p>
<b>Country of Origin</b>	<ul style="list-style-type: none"> <li>• Australian Manufacture</li> <li>• Ruthenium sourced from Russia</li> <li>• Titanium sourced from China</li> </ul>
<b>Projects</b>	<p>Australia:</p> <ol style="list-style-type: none"> <li>1. Chlorine Generator <i>Ecoline™</i> of the FSRC-100 model with 100 g/h capacity in the water with 500+ ppm TDS, Orbitbase Pty Ltd.</li> <li>2. Chlorine Generator <i>Ecoline™</i> of the FSRC-50 model with 50 g/h capacity in the water with 500+ ppm TDS, Marina Pools.</li> <li>3. Chlorine Generator <i>Ecoline™</i> of the FSRC-425 model with 425 g/h capacity in the water with 500+ ppm TDS, Baldwin Water Technologies Pty. Ltd.</li> <li>4. Chlorine Generator <i>Ecoline™</i> of the FSRC-50 model with 50 g/h capacity in the water with 500+ ppm TDS, Multi Span Australia Pty Ltd.</li> <li>5. Chlorine Generator <i>Ecoline™</i> of the FSRC-500 model with 500 g/h capacity in the water with 500+ ppm TDS, Swimplex Aquatics.</li> </ol> <p>Other:</p> <ol style="list-style-type: none"> <li>6. India, Chlorine Generator <i>Ecoline™</i> of the FSRC-100 model with 100 g/h capacity in the water with 500+ ppm TDS, KAL Envirotek Pool and Spa Specialists.</li> <li>7. Thailand, Chlorine Generator <i>Ecoline™</i> of the FSRC-100 model with 100 g/h capacity in the water with 500+ ppm TDS, Water Works Warehouse CO LTD.</li> <li>8. Korea, Chlorine Generator <i>Ecoline™</i> of the FSRC-300 model with 300 g/h capacity in the water with 500+ ppm TDS, Seokum Aqua CO LTD.</li> <li>9. Spain, Chlorine Generator <i>Ecoline™</i> of the MFSRC-110X2 model with 220 g/h capacity in the water with 500+ ppm TDS, Naturalchlor.</li> </ol>



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<b>Preparation</b>	Contact supplier
<b>Awards</b>	2005 Yellow Pages® Business Ideas Grants - winner 2008 Gaia Award - silver medal 2009 QLD Telstra Business Awards -Winner 2009 International Stevie Award - Most Innovative Company in Asia - Winner 2009 Gaia Awards - Gold winner 2009 Piscina Innovation Award BCN - Winner 2010 ATS QLD technology pitch 2010 SPLASH! 2010 Environmental Awards:Most Environment – Friendly Sanitisation Product - winner Environment-Friendly Water Saving Category - finalist

## ECOSPECIFIER LIFE-CYCLE ASSESSMENT

### INTEGRATED DESIGN AND POLICY ISSUES

*Ecoline™* has several design features which reduce chemical and electricity consumption material usage and water saving. *Ecoline™* avoids the use of added chemicals and salt to produce chlorine to disinfect fresh water.

*Ecoline™* is energy efficient operating, on average, six watts of energy from mains for every gram of chlorine generated compared to conventional off-line systems which requires thirteen watts of energy for every gram of chlorine, as no extra chlorine is added into the system.

Due to voltage/ampereage controls of the cell, mechanical dosing pumps and chlorine storage tanks are no longer required compared to conventional systems. Therefore, both materials and bulk storage used to effect water disinfection are greatly reduced with significant cost savings.

As *Ecoline™* operates with no extra chemicals/salt required for disinfection of water, Total Dissolved Solids (TDS) remains constant. This effectively minimises the amount of backwash cycles needed in swimming pools and saves on water. See Resource Efficiency section below for more details.



### HUMAN HEALTH

#### Health

Polyvinyl chloride (PVC) in its plasticised form contains softeners including a range of chemicals known as Phthalates. There are upstream Occupational Health and Safety and environmental issues and downstream disposal issues as very few recycling opportunities exist. Issues mostly surround problematic and persistent chlorinated organic compounds. However, PVC components do not come in contact with the water source, minimising associated health concerns.



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The un-reacted raw materials of this product include Titanium Dioxide .In 2006, the IARC reclassified Titanium Dioxide as possibly carcinogenic to humans (Group 2B). This issue relates to the inhalation of pure powdered and ultra-fine Titanium Dioxide dust during manufacture and is not considered a risk, as the TiO<sub>2</sub> 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.

*Ecoline™* has positive aspects on healthy disinfection of water.

### Comfort

Not applicable.

### Indoor Environment Quality

Not applicable.

### Electromagnetic Radiation

Product features a built in EMR filter to reduce radiation emissions.

### Safety

No impact. Product eliminates need to handle and store chlorine. Chlorine emits a toxic gas.

### Accessibility

Not applicable.



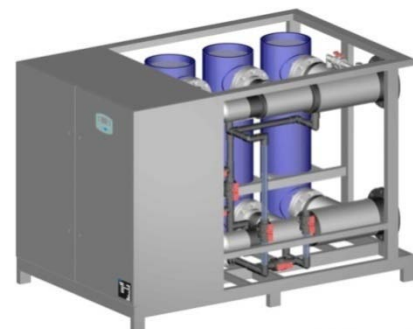
## ECOLOGICAL QUALITY

### Terrestrial

*Emissions* – *Ecoline™* contains a percentage of aluminium (~ 12%). 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* – Extraction of copper and brass results in the removal and stockpiling of topsoil, and removing overburden and inter-burden, resulting in modified soil profiles, topography and drainage.

*Ecoline™* contains plastics (PVC, acrylic and rubber) originally derived from petroleum based polymers. Petrochemical extraction can cause localised terrestrial disturbance around oil fields, via miming infrastructure and subsidence.



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## Aquatic

*Emissions* – *Ecoline™* minimises the amount of chlorine used for water disinfection and avoids the use of added chemicals, keeping water sources cleaner if they need to be discharged.

The extraction of copper and brass in the production of metals has localised emissions to aquatic environments around production facilities.

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

## Atmosphere

*Greenhouse (GHG)* – *Ecoline™* reduces electricity consumption compared with conventional off-line systems and therefore associated greenhouse gas emissions.

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

*Greenhouse intensity* – for *Ecoline™* is of 719.31 (kgCO<sub>2e</sub>/unit for FSRC-75 (indicative).

*Transport intensity* – Product is manufactured in Brisbane, Australia. Local manufacture reduces embodied energy and greenhouse gases associated with international transportation of *Ecoline™*, however some materials used to manufacture *Ecoline™* are sourced from overseas.

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 <sub>2e</sub> / kg.km	0.000195kgCO <sub>2e</sub> / kg.km	0.000069kgCO <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* – Manufacturer claims that only 6 Watts in average from mains of energy is required per gram of pure chlorine, compared to conventional systems which use 13 Watts per gram of pure chlorine.

*Re-use Efficiency* – System can be easily disassembled and reinstalled. Part can be reconditioned and sold as second-hand reconditioned parts.

*Toxics and Pollutants* – PVC is highly toxic in small quantities if burnt and is known to generate Hydrochloric acid (HCl) and dioxin emissions. Emissions from ethylene production consist primarily of ethylene and propylene.

*Ozone Depletion* – Not applicable.

*Urban Heat Island Effects* – Not applicable.

*Noise* – Information not available.



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## Biodiversity

Plastic components of *Ecoline™* create biodiversity impacts although the atmospheric emissions generated during the extracting and manufacturing processes. These have not been quantified in terms of impacts on biological systems, except in the case of oil-spill impacts which, while rare, can have significant long-term, localised impacts.

## RESOURCE DEPLETION

### Resource Efficiency

*Ecoline™* has the ability to save on use of fresh water required for swimming pools and backwash water can be down cycled for use in irrigation. When *Ecoline™* is used to disinfect water for swimming pools, TDS remains constant or grows at a slower rate (up to 10 times less compared with an off line system, manufacturer claim) due to the use of Hydrochloric acid to balance pH as no extra chemical additives or salt are required to disinfect water. Therefore, backwash cycles are not required to maintain TDS, and when water change is required TDS is still at acceptable levels to be used for irrigation purposes.



System contains aluminium. Aluminium is 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). Aluminium is a very efficient material to recycle with significant energy savings over virgin material.

System contains copper. Recent research suggests that by 2100, the global demand for copper will have surpassed the amount actually extractable from the ground (Source: Cohen, D. 2007, Earth's Natural Wealth: An Audit, New Scientist, Issue 2605). However, due to copper's value, it is commonly recycled.

System contains Titanium and steel. Both metals are relatively abundant in comparison to other non-renewable metals. Globally, steel is the most recycled building material. However, while recycling Titanium is common, typical Titanium applications, such as electrodes, require high purity and therefore a high percentage of virgin material to be added to recycled content.

A small percentage of Ruthenium is added to the Titanium used in the electrodes of the electrolytic cells to act as a catalyst during the process of electrolysis. Ruthenium is a non-renewable resource and is considered as a very rare metal. World production is 12 tones per years and reserves estimated at around 5000 tones. (source: [www.lenntech.com/Periodic-chart-elements](http://www.lenntech.com/Periodic-chart-elements) 12.08.07)

Plastic are principally based on polymers derived from petroleum, a finite and limited resource.

### Embodied Fossil Fuel Energy

Total Embodied Energy of *Ecoline™* is 13026.17 MJ/ unit for FSRC-75 (indicative).

*Transport intensity* – Product is manufactured in Brisbane, Australia. Local manufacture reduces embodied energy and greenhouse gases associated with international transportation of *Ecoline™*, however some materials used to manufacture *Ecoline™* are sourced from overseas.



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### **Embodied Water**

Information not available.

### **Durability**

Electrolytic Cell and Power Supply components have a life of 75,000 hours (8.5 years) years and are replaceable after end of life. Structural components such as frame are highly durable.



### **Reusability**

No.

### **Repairability**

Product can be repaired as required.

### **Design for Dematerialisation**

Yes, the product is designed to use less electricity and significantly reduces materials content of installation and operation as no added chemicals are required for operation, compared to other disinfection systems. Also it eliminates the need for bulk storage area and related tanks, pumps and controls.

### **Design for Disassembly**

System is able to be fully disassembled.

### **Recyclability**

Products major components are able to be commercially recycled, except for the Process Controller and ceramic anode coating.

### **Maintenance**

Limited maintenance, if the calcium level in the water is high, the electrode may need periodic acid cleaning.

### **Product Takeback Scheme**

No.

### **Extended Producer Responsibility (EPR)**

No.

## **CORPORATE AND SOCIAL SUSTAINABILITY**

### **Audits and Environmental Reporting**

No.



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**Convictions**

No.

**Environmental Policy**

Yes.

**Social Enhancement Programs**

Yes -AIS participated in various programs run by Rotary International.

**Technology Transfer Programs**

No.

**Environmental Management Systems (EMS)**

No.

**ECOSPECIFIER ISSUES OF CONCERN / RED LIGHT**

None.

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

**The Pearls Design System for ESTIDAMA**

**PRECIOUS WATER**

<p><b>PW-1: Improved Interior Water Use Reduction</b></p> <p>Product may assist in a project obtaining this credit by the reduction of potable water consumption through the use of efficient fixtures and appliances and the use of recycled water. Number of points achieved is determined by the percentage reduction from the baseline.</p>	<p><i>Points Available</i></p> <p><b>15</b></p>
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<p><b>PW-2.1: Exterior Water Use Reduction: Landscaping</b></p> <p>Product may assist in a project obtaining this credit by minimizing the landscaping water demands through efficient irrigation and the use of recycled water. Credit points are determined as follows:</p> <p>2 Credit Points: landscape irrigation demand &lt; 4 liters/m2/day or 4 Credit Points: landscape irrigation demand &lt; 2 liters/m2/day based on plant species selection And 1 Credit Point for Water Efficient Irrigation System 1 Credit Point for an Irrigation Operation and Maintenance Plan And 2 Credit Points: 100% of the exterior irrigation demand can be served using the Exterior Water Allowance (as outlined in the Calculations and Methodology section) and the design of the recycled water system complies with the prescribed requirements. And For Schools Only 2 Credit Points: all playing fields use turf substitutes requiring no irrigation water</p>	<p><i>Points Available</i></p> <p><b>10</b></p>
<p><b>PW-2.3 Exterior Water Use Reduction: Water Features</b></p> <p>Product may assist in a project obtaining credit points by minimizing evaporative loss or using recycled water in exterior water features. 2 Credit Points are awarded when the water make-up requirements for all exterior water features can be served using the Exterior Water Allowance. 1 Credit point is awarded when external swimming pools are supplied with retractable pool blankets. Maximum points are available when no swimming pools or exterior water features are provided.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>
<p><b>PW-6: Stormwater</b></p> <p>Product may assist in a project obtaining this credit by improving actual stormwater quality and/or reducing peak stormwater flows draining from the project site. Up to 4 credit points are achieved where the project design achieves the performance related to its stormwater determined in EPDS.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>

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**WATER EFFICIENCY**

<p><b>WE Prerequisite 1: Water Use Reduction</b></p> <p>Product is likely to assist in a project obtaining this requirement by increasing water efficiency within building which reduces the burden on municipal supply and wastewater systems. Strategies must be used to reduce water consumption by 20% under the calculated baseline (excluding irrigation).</p>	<p><i>Required</i></p>
<p><b>WE Credit 1: Water Use Reduction</b></p> <p>Product is likely to assist in a project obtaining credits by increasing water efficiency within building which reduces the burden on municipal supply and wastewater systems. Strategies must be used to reduce water consumption by 20% under the calculated baseline (excluding irrigation). Credit points are achieved by the reduction (by percentage – 30/35/40) of water use under the baseline.</p>	<p><i>Points Available</i></p> <p><b>11</b></p>



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SUSTAINABLE SITES

<p><b>SS Credit 6.1: Stormwater Design: Quantity Control</b></p> <p>Product is likely to assist in a project obtaining this credit, when appropriately implemented in the context of a site stormwater management plan, such that natural water hydrology disruption is limited through reducing impervious cover, increasing on-site filtration, reducing or eliminating pollution from stormwater runoff and elimination contaminants, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p>1</p>
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WATER EFFICIENCY

<p><b>WE Credit 1: Water Efficient Landscaping:</b></p> <p>Product is likely to assist in a project obtaining this credit, when appropriately incorporated in combination with other relevant systems in reducing the use of potable water or other natural surface or subsurface resources available for landscape irrigation, through one of the two following options.</p> <p>Option 1: Reduce by 50%: reduce water consumption for irrigation by 50% in accordance with the prescribed requirements through one of the following – plant species, density and microclimate factor, use of captured rainwater, use of recycled wastewater, use of water treated and conveyed by a public agency specifically for non potable uses.</p> <p>Option 2: No Potable Water Use for Irrigation: meet the requirements of option 1 and either Use only captured rainwater, recycled wastewater, recycled greywater or water treated and conveyed by a public agency specifically for non-potable uses for irrigation or Install landscaping that does not require permanent irrigation systems. Temporary irrigation systems used for plant establishment are allowed only if removed within 1 year of installation.</p>	<p><i>Points Available</i></p> <p>4</p>
<p><b>WE Credit 2: Innovative Wastewater Technologies</b></p> <p>Product is likely to assist in a project obtaining credits for reducing the generation of wastewater and demand for potable water. Credit is achieved by one of the two following options.</p> <p>Option 1: Credit is achieved by reducing use of potable water for building sewage conveyance by 50% through the use of water-conserving fixtures (e.g., water closets, urinals) or non-potable water (e.g. captured rainwater, recycled greywater, on-site or municipally treated wastewater).</p> <p>Option 2: treating 50% of wastewater on-site to tertiary standards (treated water must be infiltrated or used on-site).</p>	<p><i>Points Available</i></p> <p>2</p>
<p><b>WE Credit 3: Water Use Reduction</b></p> <p>Product is likely to assist in a project obtaining credits by reducing water use under the water use baseline calculated for the building (excluding irrigation). Credit points are achieved by the minimum water savings percentage for each point threshold is as follows:</p> <p>30% - 2 points 35% - 3 points 40% - 4 points</p>	<p><i>Points Available</i></p> <p>4</p>



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**BREEAM Issue 3 (see disclaimer below)**

WATER

<p><b>Wat 1 – Water Consumption</b></p> <p>Product is likely to assist in a project obtaining credits by minimising the consumption of potable water in sanitary applications especially by the use of low water use fittings. Number of points awarded is dependent on effective flush volume of WC’s, flow rates for taps, and specification of a delayed action inlet valve on WC’s and automatic shut-off taps or electronic sensor taps.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
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**BCA Greenmark Landed Houses v1 (see disclaimer below)**

WATER EFFICIENCY

<p><b>2-2 Water Efficient Landscaping</b></p> <p>Product is likely to assist in a project obtaining this credit as it provides a water efficient irrigation system and facilitates the use of rainwater or recycled water to reduce potable water consumption.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
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**BCA Greenmark Non-Residential Buildings v3 (see disclaimer below)**

ENERGY EFFICIENCY

<p><b>1-9(b) Energy Efficient Practices &amp; Features</b></p> <p>Product is likely to assist in a project obtaining credit points through the use of energy efficient features that translate into energy savings over the total building energy consumption. Number of points awarded is determined by percentage of energy savings.</p>	<p><i>Points Available</i></p> <p><b>11</b></p>
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WATER EFFICIENCY

<p><b>2-3 Irrigation System</b></p> <p>Product is likely to assist in a project obtaining this credit as it provides a water efficient irrigation system and facilitates the use of rainwater or recycled water to reduce potable water consumption.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
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**BCA Greenmark Office Interior v1 (see disclaimer below)**

ENERGY EFFICIENCY

<p><b>1-6 Energy Efficient Features</b></p> <p>Product is likely to assist in a project obtaining credit points by providing an innovative energy efficient feature that has a positive environmental impact.</p>	<p><i>Points Available</i></p> <p><b>7</b></p>
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**BCA Greenmark Infrastructure v1 (see disclaimer below)**

WATER

<p><b>3-1 Rainwater Harvesting and Grey Water Recycling</b></p> <p>Product is likely to assist in a project obtaining credit points through the collection and use of rainwater or grey water for irrigation.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>
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**BCA Greenmark Residential Buildings v3 (see disclaimer below)**

ENERGY EFFICIENCY

<p><b>1-7 Energy Efficient Practices &amp; Features</b></p> <p>Product is likely to assist in a project obtaining credit points through the use of innovative energy efficient features that translate into energy savings over the total building energy consumption. Number of points awarded is determined by the level of impact of the item.</p>	<p><i>Points Available</i></p> <p><b>7</b></p>
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WATER EFFICIENCY

<p><b>2-3 Irrigation System</b></p> <p>Product is likely to assist in a project obtaining this credit as it provides a water efficient irrigation system and facilitates the use of rainwater or recycled water to reduce potable water consumption.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
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**BCA Greenmark Non-Residential Existing Buildings v2 (see disclaimer below)**

ENERGY EFFICIENCY

<b>1-9(b) Energy Efficient Practices &amp; Features</b> Product is likely to assist in a project obtaining credit points through the use of energy efficient features that translate into energy savings over the total building energy consumption. Number of points awarded is determined by percentage of energy savings.	<i>Points Available</i> <b>11</b>
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WATER EFFICIENCY

<b>2-3 Irrigation System</b> Product is likely to assist in a project obtaining this credit as it provides a water efficient irrigation system and facilitates the use of rainwater or recycled water to reduce potable water consumption.	<i>Points Available</i> <b>2</b>
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**Green Building Index Non-Residential New Construction Version 1 (see disclaimer below)**

WATER EFFICIENCY

<b>WE1 Rainwater Harvesting</b> Product may assist in a project obtaining credit points as it contributes to the reduction of potable water consumption through the use of rainwater harvesting. Number of points awarded is determined by the percentage reduction in potable water consumption resulting from use of rainwater.	<i>Points Available</i> <b>2</b>
<b>WE2 Water Recycling</b> Product is likely to assist in a project obtaining credit points as it contributes to the projects use of recycled water to reduce potable water. Number of points awarded is determined by the percentage reduction in potable water consumption resulting from use of reclaimed wastewater.	<i>Points Available</i> <b>2</b>
<b>WE3 Water Efficient Irrigation/Landscaping</b> Product is likely to assist in a project obtaining credit points as it contributes to the reduction of potable water consumption for landscape irrigation, or facilitates the use of rainwater or wastewater for irrigation/landscaping.	<i>Points available</i> <b>2</b>



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<p><b>WE4 Water Efficient Fittings</b></p> <p>Product is likely to assist in a project obtaining credit points as a water efficient fitting that results in the reduction of potable water consumption. Number of points awarded is determined by the percentage reduction in annual potable water consumption.</p>	<p><i>Points available</i></p> <p><b>2</b></p>
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**Green Building Index Residential New Construction Version 1 (see disclaimer below)**

**WATER EFFICIENCY**

<p><b>WE1 Rainwater Harvesting</b></p> <p>Product may assist in a project obtaining credit points as it contributes to the reduction of potable water consumption through the use of rainwater harvesting. Number of points awarded is determined by the percentage reduction in potable water consumption resulting from use of rainwater.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>
<p><b>WE2 Water Recycling</b></p> <p>Product is likely to assist in a project obtaining credit points as it contributes to the projects use of recycled water to reduce potable water. Number of points awarded is determined by the percentage reduction in potable water consumption resulting from use of reclaimed wastewater.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>WE3 Water Efficient Landscaping</b></p> <p>Product is likely to assist in a project obtaining credit points as it contributes to the reduction of potable water consumption for landscape irrigation, or facilitates the use of rainwater or wastewater for irrigation/landscaping.</p>	<p><i>Points available</i></p> <p><b>2</b></p>
<p><b>WE4 Water Efficient Fittings</b></p> <p>Product is likely to assist in a project obtaining credit points as a water efficient fitting that results in the reduction of potable water consumption. Number of points awarded is determined by the percentage reduction in annual potable water consumption.</p>	<p><i>Points available</i></p> <p><b>4</b></p>

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

Product may assist in the achievement of WATER and ENERGY credits in this rating tool.

**BASIX Building Sustainability Compatibility**

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

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

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

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

**WATER**

<p><b>Wat-1: Occupant Amenity Water</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits where design of systems reduce consumption of potable water used for landscape irrigation. One credit point is awarded where <i>potable water consumption used for landscape irrigation is reduced by 90%</i> or one credit point is awarded where <i>a xeriscape garden has been installed</i>, in accordance with prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in achieving reduction of potable water used for landscape irrigation that complies, in whole or in part, with the prescribed requirements.</i></p>	<p><i>Points Available</i></p> <p><b>1</b></p>

**EMISSIONS**

<p><b>Emi-5: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
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<p><b>Emi-6: Reduced Flow to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimizing discharge to municipal sewerage system. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>
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**Green Star™ Office Version 3 Compatibility (see disclaimer below)**

WATER

<p><b>Wat-1: Occupant Amenity Water</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits where design of systems reduce consumption of potable water used for landscape irrigation. One credit point is awarded where potable water consumption used for landscape irrigation is reduced by 90% or one credit point is awarded where a <i>xeriscape</i> garden has been installed, in accordance with prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in achieving reduction of potable water used for landscape irrigation that complies, in whole or in part, with the prescribed requirements.</i></p>	<p><i>Points Available</i></p> <p><b>1</b></p>

EMISSIONS

<p><b>Emi-5: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>Emi-6: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimizing discharge to municipal sewerage system. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Emi-6 Note-1: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimizing discharge to municipal sewerage system. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>



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

WATER

<p><b>Wat-1 Note 1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the reduction of water consumption for sanitary water use against a “best practice <i>benchmark</i>”. This is determined by using the potable water calculator.</p> <p><i>Product may assist individually or in combination with other products in potable water consumption as described above.</i></p>	<p><i>Points Available</i></p> <p><b>10</b></p>
<p><b>Wat-3 Landscape Irrigation</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit point is awarded where either potable water used for landscape irrigation is reduced by 90%, or where a xeriscape garden has been installed.</p>	<p><i>Points Available</i></p> <p><b>1</b></p>

EMISSIONS

<p><b>Emi-5 Note 1: Watercourse Pollution</b></p> <p>Product is likely to assist in part or in combination with other products to a project obtaining credits by minimising stormwater run-off to, and the pollution of natural watercourses, in accordance with the prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>Emi-6 Note-1: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems. Credit points are achieved by % reduction of building out flows to the sewerage system, against an ‘<i>average-practice benchmark</i>’. An additional point is awarded where a blackwater treatment system is installed in accordance with the prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>

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

WATER

<p><b>Wat-1 Note 1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the predicted reduction of potable water consumption against a “<i>best practice</i>” benchmark. This is determined by using the potable water calculator.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-1: Occupant Amenity Water.</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>
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<p><b>Wat-3 Note 1: Landscape Irrigation</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit points are awarded where either potable water consumption used for landscape irrigation is reduced by 90%, or a xeriscape has been installed, in accordance with the prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-3: Landscape Irrigation.</i></p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Wat-6 Note 1: Potable Water Use in Laboratories</b></p> <p>Product is may assist in a project obtaining credits by reducing amount of potable water consumption from laboratory equipment cooling. Credit points are achieved where 95% of water used for once through cooling is sourced from non-potable water, or no once through cooling system is needed.</p> <p><i>Product may assist as an individual component, in combination with other components in meeting the requirements of Wat-6: Potable Water Use in Laboratories.</i></p>	<p><i>Points Available</i></p> <p><b>2</b></p>

EMISSIONS

<p><b>Emi-5 Note 1: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by minimising storm water run-off and pollution of natural water courses, in accordance with prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Emi-5: Watercourse Pollution.</i></p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Emi-6 Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems. Credit points are achieved by % reduction of building out flows to the sewerage system, against an '<i>average-practice benchmark</i>'. An additional point is awarded where a blackwater treatment system is installed in accordance with the prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Emi-6 Note-1: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems. Credit points are achieved by % reduction of building out flows to the sewerage system, against an '<i>average-practice benchmark</i>'. An additional point is awarded where a blackwater treatment system is installed in accordance with the prescribed requirements.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p><b>3</b></p>



**Green Star™ Industrial Version 1 Compatibility (see disclaimer below)**

**WATER**

<p><b>Wat-1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the reduction of water consumption for sanitary water use against a “best practice benchmark”. This is determined by using the potable water calculator. See Calculator results under the ecospecifier Green Star™ Pre-Assessment section in relevant product listing.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit point is awarded where either potable water used for landscape irrigation is sourced from non potable water, or a water efficient sub soil drip system with timers and/or soil moisture sensor control is installed or where a xeriscape garden has been installed.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-3: Landscape Irrigation Water Efficiency.</i></p>	<p><i>Points Available</i></p> <p><b>1</b></p>

**EMISSIONS**

<p><b>Emi-5: Stormwater</b></p> <p>Product is likely to assist in part or in combination with other products to a project obtaining credits by minimising stormwater run-off to, and the pollution of natural watercourses by implementing the principles of Water Sensitive Urban Design (WSUD). 1, 2 or 3 points are awarded based on the level of stormwater used on site and/or level of pollutants removed from discharge.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Emi-6 Note-1: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems. Credit points are achieved by % reduction of building out flows to the sewerage system, against an ‘<i>average-practice benchmark</i>’. An additional point is awarded where a blackwater treatment system is installed in accordance with the prescribed requirements. This additional credit point is not applicable if no blackwater treatment is installed.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>



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**Green Star™ Multi Unit Residential Version 1 Compatibility** (see disclaimer below)

WATER

<p><b>Wat-1 Note-1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the reduction of water consumption for sanitary water use against a “<i>best practice benchmark</i>”. This is determined by using the potable water calculator.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-1 Occupant Amenity Water</i></p>	<p><i>Points Available</i></p> <p>5</p>
<p><b>Wat-3 Note-1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit point is awarded where either potable water used for landscape irrigation has been reduced by 90%, or a xeriscape garden has been installed.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-4: Landscape Irrigation Water Efficiency.</i></p>	<p><i>Points Available</i></p> <p>1</p>

EMISSIONS

<p><b>Emi-5 Note-1: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses. Two points are available for reduction in peak stormwater flows and treatment and filtration in accordance with prescribed requirements, and an additional point is awarded for the installation of a riparian buffer zone in accordance with prescribed requirements.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Emi-5: Watercourse Pollution.</i></p>	<p><i>Points Available</i></p> <p>3</p>
<p><b>Emi-6 Note-1: Discharge to Sewer</b></p> <p>Product is likely to assist in a project obtaining credits when used in combination with other appropriate materials/technologies for reduction in discharge to the municipal sewerage system due to building occupant use. Points are awarded by the percentage reduction again an ‘<i>average-practice benchmark</i>’ as determined by the <i>Green Star™ Multi Unit Residential v1 Sewerage Calculator</i>. An additional point is awarded where a blackwater treatment facility is used in accordance with the prescribed requirements.  <i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p>4</p>



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

### WATER

<p><b>Wat-1 Note-1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the reduction of water consumption for sanitary water use against a “best practice benchmark”. This is determined by using the <i>Healthcare v1 potable water calculator</i>.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-1 Occupant Amenity Water</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credit points by reducing potable water consumption for landscape irrigation. Credit points are awarded where potable water consumption used for landscape irrigation is reduced by 90% or xeriscape garden has been installed.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-3: Landscape Irrigation Water Efficiency.</i></p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>Wat-6: Potable Water Use for Equipment</b></p> <p>Product may assist in a project obtaining credit point by reducing potable water consumption for of cooling medical and laboratory equipment. Credit point is awarded where either 95% of water used for once through cooling is sourced from non potable water, or 95%of medical and laboratory equipment does not use a once through cooling system.  <i>Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-6: Potable Water Use for Equipment.</i></p>	<p><i>Points Available</i></p> <p><b>1</b></p>

### EMISSIONS

<p><b>Emi-5: Watercourse Pollution</b></p> <p>Product is likely to assist in part or in combination with other products/technologies/systems of a project obtaining credits by minimising stormwater runoff and pollution of natural watercourses. Two points are achieved where development does not increase peak stormwater runoff and stormwater is treated and filtered in accordance with prescribed requirements. An additional point is also awarded where the above criteria are met and a Riparian Buffer zone is completed in accordance with the prescriber requirements.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>Emi-6 Note 1: Discharge to Sewer</b></p> <p>Product is likely to assist in combination with other suitable products/technologies/systems in a project achieving credit points by minimising discharge to the municipal sewerage system. Four points are awarded by the percentage reduction in outflows to the sewerage system from occupant usage against an ‘<i>average practice benchmark</i>’ determined by the <i>Healthcare v1 Sewerage calculator</i>. An additional point is awarded where the above was achieved through the use of a blackwater treatment facility in accordance with prescribed requirements.  <i>Product may contribute as an individual component, in combination with other suitable components, in providing reduced water flows to sewage systems.</i></p>	<p><i>Points Available</i></p> <p><b>5</b></p>



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

**WATER**

<p><b>Wat-1: Occupant Amenity Water</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star SA Potable Water Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits where design of systems reduces consumption of potable water used for landscape irrigation. One credit point is awarded where <i>potable water consumption used for landscape irrigation is reduced by 50%</i>, two credit points are awarded where <i>potable water consumption used for landscape irrigation is reduced by 90%</i> or where <i>a xeriscape garden has been installed</i>, in accordance with prescribed requirements. An additional point is available where 30% or more of the site is landscaped and the criteria for 90% or above reduction has been met.</p> <p><i>Product may contribute as an individual component, in combination with other suitable components, in achieving reduction of potable water used for landscape irrigation that complies, in whole or in part, with the prescribed requirements.</i></p>	<p><i>Points Available</i></p> <p><b>3</b></p>

**EMISSIONS**

<p><b>Emi-5: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water runoff from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Emi-6: Discharge to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimizing discharge to municipal sewerage system. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star SA Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>



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

### WATER

<p><b>Wat-1: Occupant Amenity Water</b></p> <p>Product is likely to assist in a project obtaining credit points by reducing potable water consumption of building occupants. Credit points are achieved based on the reduction of water consumption for sanitary water use against a “best practice benchmark”. This is determined by using the potable water calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
<p><b>Wat-3 Landscape Irrigation</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. One credit point is awarded where either potable water used for landscape irrigation is reduced by 50%, two points are awarded for a 90% reduction or where a xeriscape garden has been installed. An additional point is awarded where 30% or more of the site is landscaped and the consumption of potable water for irrigation is reduced by 90%.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>

### EMISSIONS

<p><b>Emi-5: Watercourse Pollution</b></p> <p>Product is likely to assist in part or in combination with other products to a project obtaining credits by minimising stormwater run-off to, and the pollution of natural watercourses, in accordance with the prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>Emi-6: Discharge to Sewer</b></p> <p>Product is likely to assist in a project obtaining credits individually or in combination with other products in a project achieving four credit points by minimising discharge to the municipal sewerage system for occupant use against a 'best practice benchmark'. Points are awarded by the percentage reduction against benchmark in accordance with prescribed requirements. An additional point is awarded where a blackwater treatment system is used in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>

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## Green Star NZ™ Office 2009 Compatibility (see disclaimer below)

### WATER

<p><b>Wat-1: Occupant Amenity Potable Water Efficiency</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator. Additional points are awarded when no water based heat rejection systems are used OR when the water based heat rejection system use 90% non potable water.</p>	<p><i>Points Available</i></p> <p><b>7</b></p>
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<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits where design of systems reduce consumption of potable water used for landscape irrigation. One credit point is awarded where potable water consumption used for landscape irrigation is reduced by 90% OR where a xeriscape garden has been installed OR when a water efficient irrigation system is installed servicing at least half of the landscaped area, in accordance with prescribed requirements. Product may contribute as an individual component, in combination with other suitable components, in achieving reduction of potable water used for landscape irrigation that complies, in whole or in part, with the prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>1</b></p>
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EMISSIONS

<p><b>Emi-4: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
<p><b>EMI-5: Reduced Flow to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimising discharge to municipal sewerage systems. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>

**Green Star NZ™ Office Interiors 2009 Compatibility (see disclaimer below)**

WATER

<p><b>Wat-1: Base Building Water Efficiency</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>
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EMISSIONS

<p><b>EMI-5: Reduced Flow to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimising discharge to municipal sewerage systems. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator</p>	<p><i>Points Available</i></p> <p><b>1</b></p>
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**Green Star NZ™ Education 2009 Compatibility (see disclaimer below)**

WATER

<p><b>Wat-1: Base Building Water Efficiency</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator and when no water based heat rejection is used or when it uses 90% of non-potable water.</p>	<p><i>Points Available</i></p> <p><b>7</b></p>
<p><b>Wat-3 Landscape Irrigation Water Efficiency</b></p> <p>Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit point is awarded where either potable water used for landscape irrigation is sourced from non potable water, or a water efficient sub soil drip system with timers and/or soil moisture sensor control is installed or where a xeriscape garden has been installed.</p>	<p><i>Points Available</i></p> <p><b>2</b></p>

EMISSIONS

<p><b>Emi-4: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>EMI-5: Reduced Flow to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimising discharge to municipal sewerage systems. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>

**Green Star NZ™ Industrial 2009 Compatibility (see disclaimer below)**

WATER

<p><b>Wat-1: Base Building Water Efficiency</b></p> <p>Product may assist a project obtaining credits by reducing the potable water consumption of building occupants, especially through water reuse and recycling. Credit points are achieved by reducing predicted potable water consumption for sanitary use within the building against a 'best practice' benchmark. Points are determined by using the Green Star™ Potable Water Calculator.</p>	<p><i>Points Available</i></p> <p><b>5</b></p>
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<p><b>Wat-3 Note 1: Landscape Irrigation Water Efficiency</b>  Product may assist in a project obtaining credits by reducing potable water consumption for landscape irrigation. Credit point is awarded where either potable water used for landscape irrigation is sourced from non potable water, or a water efficient sub soil drip system with timers and/or soil moisture sensor control is installed or where a xeriscape garden has been installed.  Product may contribute as an individual component, in combination with other suitable components, in meeting the requirements of Wat-3: Landscape Irrigation Water Efficiency.</p>	<p><i>Points Available</i></p> <p><b>1</b></p>
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EMISSIONS

<p><b>Emi-4: Watercourse Pollution</b></p> <p>Product may assist a project obtaining credits, when used in combination with other appropriate materials and/or technologies and/or systems, by reducing potential pollution in storm water run off from buildings and hard surfaces to natural water courses, in accordance with prescribed requirements.</p>	<p><i>Points Available</i></p> <p><b>3</b></p>
<p><b>EMI-5: Reduced Flow to Sewer</b></p> <p>Product may assist a project obtaining credits, when used in combination with other materials, by minimising discharge to municipal sewerage systems. Credit points are achieved by reducing water flows from building occupants to sewerage systems against an average-practice benchmark. Points are determined by using the Green Star™ Sewerage Calculator.</p>	<p><i>Points Available</i></p> <p><b>4</b></p>

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## ASSESSMENT COMPARISON

Off-line and saltwater chlorination systems.

## RELATED TOPICS

None.

## CSI CATEGORY & NUMBER

13 11 49 Swimming Pool Cleaning Equipment  
22 51 19 Swimming Pool Water Treatment Equipment  
23 25 00 HVAC Water Treatment  
33 13 00 Disinfecting of Water Utility Distribution  
44 40 00 Water Treatment Equipment  
44 42 00 General Water Treatment Equipment  
44 44 16 Water Chlorinators

## NBS CATEGORY & NUMBER

### Building and Residential Services

Commercial Engineering & Services  
S12 Water treatment equipment  
S18 Swimming pool water treatment systems

## ASSESSMENT CRITERIA SATISFIED

WORKPLACE OH&S, OCCUPANT HEALTH, HUMAN WELL-BEING	
<input checked="" type="checkbox"/>	Low/Reduced offgassing
<input checked="" type="checkbox"/>	Reduced, or no toxicity/ carcinogens/mutagens/teratogens or ionizing agents through life cycle
<input checked="" type="checkbox"/>	Improved indoor environment
<input checked="" type="checkbox"/>	Improved Occupational Health and Safety (OH&S)
HABITAT & BIODIVERSITY CONSERVATION	
<input checked="" type="checkbox"/>	Reduced waste generation
<input checked="" type="checkbox"/>	Reduced generation of hazardous waste
AIR POLLUTION	
<input checked="" type="checkbox"/>	Reduced, or no toxicity/ carcinogens/mutagens/teratogens or ionizing agents through life cycle
<input checked="" type="checkbox"/>	Reduced smog-forming potential
RESOURCE DEPLETION	
<input checked="" type="checkbox"/>	Water production (potable)
<input checked="" type="checkbox"/>	Water production (non-potable)
<input checked="" type="checkbox"/>	Resource efficiency
ENERGY RESOURCES	
<input checked="" type="checkbox"/>	Reduced embodied energy
<input checked="" type="checkbox"/>	Contributes to downstream reduction of energy use
CORPORATE SOCIAL RESPONSIBILITY, ENVIRONMENTAL MANAGEMENT AND REPORTING	
<input checked="" type="checkbox"/>	Environmental policy
<input checked="" type="checkbox"/>	Social or environmental enhancement programmes
OTHER VITAL SIGNS	
<input checked="" type="checkbox"/>	Material Safety Data Sheet (MSDS)
<input checked="" type="checkbox"/>	Quality Management System
<input checked="" type="checkbox"/>	Documented manufacturer claims
<input checked="" type="checkbox"/>	Expert Assessment



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**David Baggs** | Technical Director & Principal Consultant  
Chartered Architect, FAIA, ABSA, Green Star AP, LEED AP, MRoySocAS



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