



Australian Green Star
Office Design & Built v3
And USG Powerscape

GREENER gypsum board

As an industry leader with a proud heritage spanning more than 100 years, USG understands the need to safeguard the world around us and protect the vital natural resources we all share. Long before conservation became a mainstream concern, USG was finding innovative ways to reduce waste, operate efficiently and transform manufacturing byproducts into valuable new resources.

With a firm belief that health, safety and environmental well-being are compatible with economic prosperity, USG maintains a longstanding commitment with our employees, customers and communities to reduce environmental impact, use recycled materials whenever feasible and eliminate manufacturing waste. We have a solid history of environmental leadership and responsibility, and we are constantly seeking environmentally friendly product and manufacturing solutions.

Consumers have become increasingly aware of the need to conserve energy, manage the use of raw materials, reduce waste and safeguard against pollutants. In response, many developers and owners now demand buildings with materials and technologies that will help save energy, preserve the integrity of the surrounding land and assure a clean, healthy indoor environment.

USG emphasises innovation in our products, from the ingredients we choose to the processes we employ. Take a closer look at the advantages that let you choose USG products with confidence.



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green building council australia
MEMBER

www.powerscape.com.au
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Powerscape Gypsum Fiberock® Panels

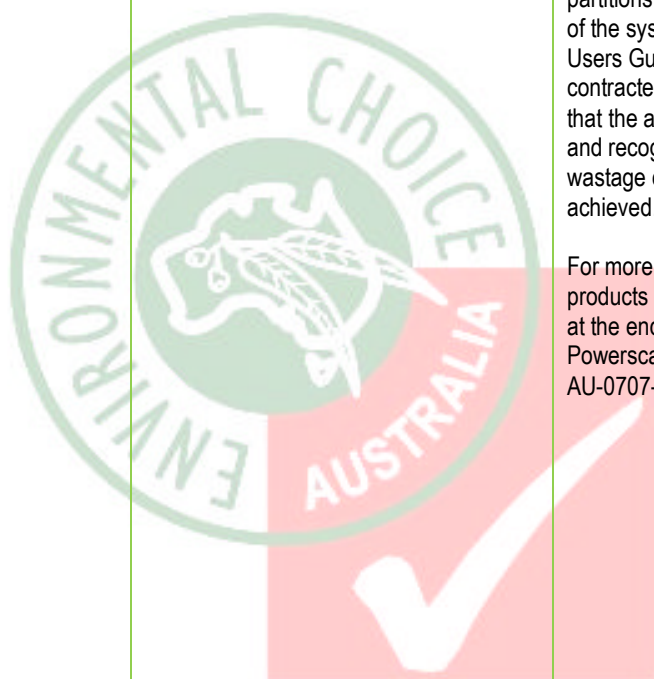
Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
Man-7	Waste Management	To encourage and recognise management practices that minimise the amount of construction waste going to disposal.	<p>Up to two points are awarded where:</p> <p>The contractor implements a Waste Management Plan (WMP), retains waste records and quarterly reports to the building owner; and</p> <p>A percentage (by mass) of all demolition and construction waste is reused or recycled as follows:</p> <ul style="list-style-type: none"> One point for 60% of the waste; and Two points for 80% of waste. 	<p>USG Powerscape Health® wall linings will assist with waste reduction as most sheet off-cuts can have rebates formed on them on site and then be used, rather than going to the dump.</p> <p>For more information on the wall systems design and acoustical performance refer to the Sustainability Table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>
IEQ - 9	Thermal Comfort	To encourage and recognise buildings that achieve a high level of thermal comfort.	<p>Up to two points are awarded where high level of thermal comfort is achieved for all of the Class 5 Commercial NLA through any combination of the below:</p> <p>Naturally ventilated and mechanically assisted naturally ventilated spaces: Where naturally ventilated buildings achieve credit criteria for IEQ-10 'Individual Comfort Control', up to two points are awarded for if Accessibility Limits of ASHRAE Standard 55-2004 are achieved during Standard Operating Hours of Occupancy for 98% of the year:</p> <ul style="list-style-type: none"> - One point for internal temperatures within 80% Acceptability Limit 1; and - Two points for internal temperatures within 90% Acceptability Limit 1. <p>Mechanically Air-Conditioned Spaces: Where Predicted Mean Vote (PMV) levels, calculated in accordance with ISO7730, are achieved during Standard Operating Hours of Occupancy for 98% of the year using standard clothing and metabolic rate value:</p> <ul style="list-style-type: none"> - One point for PMV levels between -1 and +1, inclusive; and - Two points for PMV levels are between -0.5 and +0.5, inclusive. <p>Mixed-mode Ventilated Spaces:</p> <p>For mixed-mode buildings, the above mechanical and natural ventilation thermal comfort criteria must be met.</p>	<p>Thermal mass is improved by using USG Powerscape Health® linings instead of plasterboard. The thermal mass of USG Powerscape Health® linings is approximately 1.1 kJ/kg. (iii) The USG Powerscape Health® linings has lower embodied energy than most concrete and fibre cement wall systems, and can also be better than plasterboard (particularly if product demounting and reuse is included).</p> <p>For more information of specific USG products refer to the Sustainability Table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
IEQ - 12	Internal Noise Levels	To encourage and recognise buildings that are designed to maintain internal noise levels at an appropriate level.	<p>Up to two points are awarded where 95% of the project's NLA does not exceed the 'Satisfactory' ambient internal noise levels in accordance with AS/NZS 2107:2000, as follows:</p> <p>Building Services Design - One point is awarded where, within the entire base building general office space, noise from the building services does not exceed 40dBAeq.</p> <p>Overall Building - One point is awarded where within the base building office space, the sound level does not exceed 40dBAeq (assuming open plan offices).</p>	<p>USG Powerscape Health® wall linings and wall system designs have documented sound transmission reduction ratings, compliant with the BCA (Building Code Australia). In most cases these are superior to the same thickness plasterboard due to the stiffness and mass of the Health® Linings.</p> <p>For more information on the wall systems design and acoustical performance refer to the Sustainability Table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>
IEQ - 13	Volatile Organic Compounds	To encourage and recognise specification of interior finishes that minimise the contribution and levels of Volatile Organic Compounds in buildings.	<p>Up to three points are awarded where the various finishes used in the project meet the benchmarks outlined below as follows:</p> <p>Paints One point where at least 95% of all painted surfaces meet the TVOC Content Limits outlined in Table IEQ-13.1 (low-VOC) or where no paint is used in the project</p>	<p>The USG Powerscape Health® products have no VOC emissions. The products are pre-coated in the factory with an acrylic sealer creating a surface suited for use with most low and non VOC paints and adhesives.</p> <p>Specifying USG Powerscape Health® will help deliver a holistic approach to the reduction of VOCs in the indoor environment.</p> <p>One point is possible where no carpet is installed and Powerscape 10mm or 6mm is used as an underlayment for low-VOC flooring.</p> <p>For more information on the specific VOC levels of USG Powerscape refer to the table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>

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IEQ - 14	Formaldehyde Minimisation	To encourage and recognise the specification of products with low formaldehyde emission levels.	<p>One point is awarded where all composite wood products (including exposed and concealed applications) either:</p> <p>Contain low-emission formaldehyde. OR Contain no formaldehyde.</p> <p>If no engineered wood products are used within the project, this credit is 'Not Applicable' and is removed from the total number of points available for the category; type "na" in the appropriate 'No. of Points Achieved' column of the rating tool.</p>	<p>Although Green Star Rating does not address formaldehyde emissions for internal linings, they should be considered when internal walls are part of the base building, or are included in an integrated fitout.</p> <p>USG Powerscape Health® products do not emit formaldehyde as they use an inorganic, rather than organic, binder, and normally use mechanical fixings rather than adhesives.</p> <p>Specifying USG Powerscape Health® will help contribute to the goal of a healthy indoor environment.</p> <p>For more information on the specific Formaldehyde levels of USG Powerscape refer to the table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>
IEQ - 15	Mould Prevention	To encourage and recognise the design of services that eliminate the risk of mould growth and its associated detrimental impact on occupant health.	<p>One point is awarded where the building includes a dedicated tenant's exhaust riser with the following characteristics:</p> <ul style="list-style-type: none"> - Complies with section 5.7 of AS1668.2-2002; - Provides no less than 0.2 L/s/m² for 100% of the NLA; - Has a capacity of 0.35 L/s/ m² for 100% of NLA on any individual floor; and - The exhaust system is not recycled to other enclosures of different use. 	<p>Because mould spores are everywhere and they can grow on virtually any surface where moisture is present, preventing mould also requires the reduction of possible food sources. USG Powerscape Health® sheets achieve the maximum score of 10 in the demanding ASTM D3273 mould propagation testes – outperforming wet area plasterboard. USG Powerscape Health® has also been independently certified by the Australian Good Environmental Choice as an eco-preferred product.</p> <p>Although Green Star Rating do not address materials that may provide a food source for mould spores, the use of anti-mould and mildew products will contribute to the goal of a healthy indoor environment.</p> <p>For more information on the specific mould prevention levels of USG products refer to the table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
Ene - 1	Greenhouse Gas Emissions	To encourage and recognise designs that minimise greenhouse gas emissions associated with operational energy consumption.	Up to twenty points are awarded where it is demonstrated that the building's predicted greenhouse gas emissions have been further reduced below the Conditional Requirement. No evidence is required in addition to that submitted for Ene – Conditional Requirement.	<p>Thermal mass is improved by using USG Powerscape Health® linings instead of plasterboard. The thermal mass of USG Powerscape Health® linings is approximately 1.1 kJ/kg. (iii) The USG Powerscape Health® linings has lower embodied energy than most concrete and fibre cement wall systems, and can also be better than plasterboard (particularly if product demounting and reuse is included).</p> <p>For more information of specific USG products refer to the Sustainability Table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>
Mat - 3	Reused Materials	To encourage and recognise designs that prolong the useful life of existing products and materials.	<p>One point is awarded where: At least 2% of the project's total contract value is represented by reused products/materials.</p> <p>This credit excludes materials specifically addressed by other credits (i.e. steel, concrete, PVC and timber); neither does it address the reuse of the original building(s) on the site (addressed in Mat-2 'Building Reuse').</p>	<p>USG Powerscape Health® products are produced with a proprietary new manufacturing technology to achieve improved eco and health outcomes, versus regular plasterboard and fibre cement. The manufacturing process has many patents.</p> <p>Powerscape Health® linings is independently certified as containing 95% recycled materials sourced from external waste streams:</p> <ul style="list-style-type: none"> • 85% is post industrial gypsum, a waste product obtained from an electricity generator. No open cast or underground mining of gypsum is needed for the manufacture of USG Health® linings; • 10% is recycled cellulose, meaning no trees are harvested for the manufacture of USG Health® linings. <p>The use of Powerscape Health® wall linings can help contribute the percentage of reused material required to achieve this credit criteria.</p>

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
Mat - 4	Shell and Core or Integrated Fit-out	To encourage and recognise base building delivery mechanisms that eliminate the need for immediate tenant refits.	<p>Two points are available as follows: Up to two points are awarded where a percentage of the (NLA) of the project is delivered as any combination of shell and core or integrated fitout.</p> <ul style="list-style-type: none"> - One point for 60% of NLA; or - Two points for 90% of NLA. 	<p>USG Powerscape Health® linings can be demounted and removed during demolition, and then be reused again on another structure (something that is normally impossible with plasterboard and fibre cement). USG Health® lings can have new edge tapers machined in, making reuse both possible and practical.</p> <p>This is applicable for an integrated fitout a set out in Mat-4.</p> <p>This is also an advantage for shell and core developments that include partitions. If the disassembly and reuse of the system are included in the Building Users Guide and are part of the contracted lease, then it could be argued that the aim of this credit (to encourage and recognise the reduction of material wastage during tenancy fitouts) is achieved.</p> <p>For more information of specific USG products refer to the Sustainability Table at the end of this document and the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>



Note: use of the particular products/solutions listed in this table contribute toward the efforts to achieve Green Star points in these specific categories, however, use of these products/solutions alone does not guarantee achievement of point criteria or Green Star certification of a building.



Australian Sustainability Table

Relationship between Green Star Credits and USG Powerscape Fiberock

	Green Star AU Credits		Indoor Environmental Quality (IEQ)				Material (MAT)			Energy (EN)	USG ESD Advantages		IEQ	Material	
	Waste Management	Internal Noise levels	Thermal Comfort	Volatile Organic Compounds (including Formaldehyde)		Recycled Content & Re-used Products and Materials	Ceilings Wall & Partitions	Greenhouse Gas Emissions		Mould Prevention	Design for Disassembly	Reused Products & Materials			
	Man-7	IEQ-12	IEQ-9	IEQ-13*			Mat-3	N/A	Ene-1						
	Man-6	IEQ-10	N/A	IEQ-11			N/A	Mat-3	Ene-2						
	Man-7	IEQ-7	IEQ-5	IEQ-8			Mat-3	N/A	Ene-1						
	Man-7	IEQ-7	IEQ-5	IEQ-8			Mat-3	N/A	Ene-1						
Substrate	Product Family: Powerscape Gypsum Panels	Off-cuts reusable	Rw	Thermal Mass	VOC		Recycled Content		Eco Preferred Content (GECACert)	Thermal Mass	◆ ASTM D3273 rating	Can be disassembled for re-use	Can be re-used		
				Emission Levels	ppb	mg/m³	Post Ind.	Post Cons.							
Fiberock Gypsum Panel	POWERSCAPE HEALTH®	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	85%	10%		1.1 kJ/kg	10	✓	✓	
	POWERSCAPE HEALTH® Ultra-Mesh	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	85%	10%	-	1.1 kJ/kg	10	✓	✓	
	POWERSCAPE HEALTH® Go-Between	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	85%	10%		1.1 kJ/kg	10	✓	✓	

* IEQ-13 is Applicable when 10mm Powerscape Health is used as a tile underlay

Notes

POWERSCAPE HEALTH® Panels

Made of gypsum and post-consumer recycled cellulose fibers, these high-performance panels are in multiple applications including interior walls and floor underlays. Engineered for strength and resistance to water and mold, these panels offer an excellent sustainable alternative to wood-based products, most notably lauan, which is harvested from endangered, old-growth forests. POWERSCAPE HEALTH Panels contain no VOCs.

POWERSCAPE HEALTH® Panels Recycled Content

95% of the raw materials for USG POWERSCAPE HEALTH® linings come from external waste systems.

- 85% is post industrial gypsum, a waste product obtained from an electricity generator. No open cast or underground mining of gypsum is needed for the manufacture of USG HEALTH® linings.
- 10% is post consumer cellulose, meaning no trees are harvested for the manufacture of USG HEALTH® linings.

POWERSCAPE HEALTH® Panels and Internal Noise levels

* Dependent on wall systems specified. An Rw of 48 can be achieved with a single layer of 13mm Powerscape Health on both sides of a 92mm steel stud partition (partition to include thermal insulation).

Re the USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208 for more information.



ASTM D3273-00(2005) Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

A "0" rating on **D3273** means excessive disfigurement due to mold growth on gypsum wall or ceiling panel surfaces, while a "10" rating indicates that no mold grew on the panel. This grade is determined by inspecting the panel with a microscope and comparing the findings with standardized photographs of allowable growth for each score level. With this stringent method, a panel may not receive the top "10" rating even if mold growth is invisible to the naked eye.



Working with the Environment

USG Australasia's philosophy is to be the regional leader in providing, through USG's various global manufacturing operations, interior building product options that minimise the impact on the environment.

In addition to being members of both the Australian and New Zealand Green Building Councils, USG Corporation was a founding member of the United States Green Building Council in 1993.



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