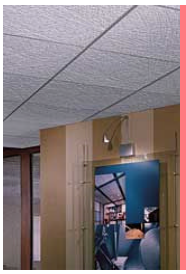

Australian Green Star Retail Centre v1 And USG Powerscape

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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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.	Up to two points are awarded where: • The contractor implements a Waste Management Plan (WMP), retains waste records and submits quarterly reports to the building owner; and • A percentage (by mass) of all demolition and construction waste is re used or recycled as follows: — One point for 60% of the waste; and —— Two points for 80% of waste.	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. 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
IEQ-5	Thermal Comfort	To encourage and recognise buildings that achieve a high level of thermal comfort.	One point is awarded where a high level of thermal comfort is achieved for 60% of the nominated area through any combination of the following: **Naturally Ventilated and Mechanically Assisted Naturally Ventilated Spaces:** Where the Acceptability Limits of ASHRAE Standard 55 2004 are achieved during Standard Operating Hours of Occupancy for 98% of the year: • One point is awarded for internal temperatures within 70% of Acceptability Limit 1. **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 values: • One point is awarded for PMV levels between -1.5 and +1.5, inclusive. **Mixed-Mode Ventilated Spaces:** For mixed-mode buildings, the above mechanical and natural ventilation thermal comfort criteria must be met. For the purposes of this credit 'nominated area' is GLA and common areas (excluding open air mall areas, car parks and tenancies that provide their own air). If 'open air mall' areas make up more than 95% of the project's total common areas, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Indoor Environment Quality Category Score.	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). 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

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
IEQ - 7	Internal Noise Levels	To encourage and recognise buildings that are designed to maintain internal noise levels at an appropriate level.	One point is awarded where it is demonstrated that: • The internal noise levels from building services meets the recommended design sound levels provided in Table 1 of AS/NZS2107:2000 for 95% of the project's nominated area. For the purposes of this credit 'nominated area' is GLA and common areas (excluding open air mall areas, car parks and tenancies that provide their own air). If 'open air mall' areas make up more than 95% of the project's total common areas, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Indoor Environment Quality Category Score.	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. 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
IEQ-8	Volatile Organic Compounds	To encourage and recognise specification of interior finishes that minimise the contribution and levels of Volatile Organic Compounds in buildings	Up to three points are awarded where the various finishes used in the project meet the benchmarks as follows: **Paints** • One point where at least 95% of all internal painted surfaces meet the Total Volatile Organic Compound (TVOC) Content Limits outlined in Table IEQ 8.1 or where no paint is used in the project. **Carpets and Flooring** • One point where all carpets meet the TVOC emissions limits outlined in Table IEQ 8.3; OR • Where no carpet has been installed in the project and projects wish to use low VOC flooring, one point is awarded where all the flooring installed in the project meet the emissions limits outlined in Table IEQ 8.3. Where no carpet has been installed in the project, the carpet point is 'Not Applicable' and is excluded from the points available Adhesives and sealants • One point where 95% of all adhesives and sealants meet the TVOC Content Limits outlined in Table IEQ 8.2 or where no adhesives or sealants are used. used to calculate the IEQ Category Score	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. Specifying USG Powerscape Health® will help deliver a holistic approach to the reduction of VOCs in the indoor environment. One point is possible where no carpet is installed and Powerscape 10mm or 6mm is used as an underlayment for low-VOC flooring. 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

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
IEQ-9	Formaldehyde Minimisation	To encourage and recognise the specification of products with low formaldehyde emission levels.	One point is awarded where all engineered wood products (including exposed and concealed applications) either: • Have low formaldehyde emissions; OR • Contain no formaldehyde. If no engineered wood products are used within the project, this credit is 'Not Applicable' and excluded from the total number of points available to calculate the IEQ Category Score.	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. 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. Specifying USG Powerscape Health® will help contribute to the goal of a healthy indoor environment. 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
IEQ-10	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.	One point is awarded where it is demonstrated that: • The mechanically air-conditioned ventilation system actively controls humidity to be no more than 60% relative humidity in the space and no more than 80% relative humidity in the supply ductwork; OR • The building is fully naturally ventilated or mechanically assisted naturally ventilated, (MANV).	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. Although Green Star Rating do not address materials that may provide a food source for mould spores, the use of anti-mold and mildew products will contribute to the goal of a healthy indoor environment. 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

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 'standard practice benchmark'. The Green Star – Retail Centre v1 Energy Calculator determines the benchmark for each project based on the composition of space types within each project.	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). 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
Mat-3	Reused Materials	To encourage and recognise designs that prolong the useful life of existing products and materials.	Up to three points are awarded as follows: • One point where at least 2% of the project's total contract value is represented by re-used products/materials. • Up to two points where materials for base building construction have a post consumer recycled content of at least 50% — One point where the recycled materials represent 1% of the project's total value. — Two points where the recycled materials represent 2% of the project's total value. This credit excludes materials specifically addressed by other credits (i.e. steel, concrete, PVC and timber); neither does it address the re-use of the original building(s) on the site (addressed in Mat 2 'Building Re-use').	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. Powerscape Health® linings is independently certified as containing 95% recycled materials sourced from external waste streams: • 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. The use of Powerscape Health® wall linings can help contribute the percentage of reused material required to achieve this credit criteria.

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	Management	Indoor Environmental Quality (IEQ)					Material (MAT)			Energy (EN)	USG ESD Advantages	IEQ	Material	
		Waste Management	Internal Noise levels	Thermal Comfort	Volatile Organic Compounds (Including Formaldyhe)			Recycled Content & Re-used Products and Materials		Ceilings Wall & Partitions	Greenhouse Gas Emissions		Mould Prevention	Design for Disassembly	Reused Products & Materials
	Office Design & As Built v3	Man-7	IEQ-12	IEQ-9	IEQ-13*			Mat-3		N/A	Ene-1				
	Office Interiors v1.1	Man-6	IEQ-10	N/A	IEQ-11			N/A		Mat-3	Ene-2				
	Education v1	Man-7	IEQ-7	IEQ-5	IEQ-8			Mat-3		N/A	Ene-1				
	Retail Centre v1	Man-7	IEQ-7	IEQ-5	IEQ-8			Mat-3		N/A	Ene-1				
Substrate	Product Family: Powerscape Gypsum Panels	Off-cuts reusble	Rw	Thermal Mass	VOC			Recycled Content		Eco Preferred Content (GECA cert)	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	✓	✓

Notes

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

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 underlayments. 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 included 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.

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