



Australian Green Star
Education 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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green building council australia
MEMBER



Sydney Brisbane Melbourne

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Powerscape Gypsum 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> — 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 refer page 16 USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208
IEQ-7	Internal Noise Levels	To encourage and recognise buildings that are designed to maintain internal noise levels at an appropriate level.	<p>Building Services Design</p> <ul style="list-style-type: none"> • One point is awarded where the building services noise meets the recommended design sound levels provided in Table 1 of AS/NZS2107:2000. <p>Overall Building</p> <ul style="list-style-type: none"> • One point is awarded where it is demonstrated that: <ul style="list-style-type: none"> - The nominated design sound levels measured in LAeq and reverberation times, for each functional space are provided in accordance with the lower values in Table 1 of AS/NZS2107:2000; and - All partitioning between adjoining academic offices or classrooms is constructed to achieve a weighted sound reduction index (Rw) of at least 45 between spaces. <p>For the purposes of this credit 'nominated area' is UFA, excluding external covered areas.</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. Example Rw48 can be achieved with a single layer of Powerscape 13mm each side of a 92mm steel stud with insulation Refer pages 8 of this document for system details. For more information on acoustical performance refer contact your local USG representative

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
IEQ-8.3 & IEQ8.4	Volatile Organic Compounds	To encourage and recognise specification of interior finishes that minimise the contribution and levels of Volatile Organic Compounds in buildings.	<p>Carpets and Flooring</p> <ul style="list-style-type: none"> • One point where all carpets meet the TVOC emissions limits outlined in Table IEQ 8.3 <p>OR</p> <ul style="list-style-type: none"> • 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 used to calculate the IEQ Category Score. <p>Tenancy Fitout items</p> <ul style="list-style-type: none"> • One point where 95% of tenancy fitout items (workstations, walls/partitions, chairs, tables and storage units) meet the TVOC emission limits outlined in Table IEQ 8.4. 	<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 products refer to the sustainable table in this document.</p>
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.	<p>One point is awarded where it is demonstrated that:</p> <ul style="list-style-type: none"> • 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; <p>OR</p> <ul style="list-style-type: none"> • The building is fully naturally ventilated or mechanically assisted naturally ventilated, (MANV). 	<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.</p> <p>USG Powerscape Health® sheets achieve the maximum score of 10 in the demanding ASTM D3273 mould propagation testes – outperforming fibre cement and wet area plasterboard.</p> <p>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-mold and mildew products will contribute to the goal of a healthy indoor environment.</p> <p>For more information refer page 4 USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p> <p>Moisture resistance is also covered on page 10 of this document.</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.	<p>Up to 20 points are awarded where it is demonstrated that the building's predicted greenhouse gas emissions have been further reduced below the Conditional Requirement.</p> <p>The number of points achieved is determined as follows: Predicted reduction in Greenhouse Gas Points Awarded Emissions (%)</p>	<p>(i) The use of timber framed structures with particleboard or plywood floors to replace high embodied energy concrete construction is sometimes made possible if USG Powerscape Health® 10mm is used to stiffen the floor, improve acoustics and reduce fire burn down risk. (ii) 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 refer page 5 USG Powerscape Health® booklet USGH-FS-AU-0707-1-31208</p>
Mat-3	Recycled-Content & Reused Products and Materials	To encourage and recognise designs that prolong the useful life of existing products and materials and encourage uptake of products with recycling content.	<p>One point is awarded where at least 2% of the project's total contract value is represented by:</p> <ul style="list-style-type: none"> • Re used products/materials; <p>OR</p> <ul style="list-style-type: none"> • Has a post consumer recycled content of at least 20%. <p>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').</p>	<p>USG Powerscape Health® wall linings are independently certified as being made from 95% recycled raw materials content.</p> <p>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.</p> <p>10% is post industrial cellulose, meaning no trees are harvested for the manufacture of USG HEALTH® linings.</p> <p>Points may not be allocated for this criterion as the aim is addressed in the materials calculator in Mat-14.</p>

Ref No.	Title	Aim of Credit	Credit Criteria Summary	USG Solution
Mat-8	Disassembly / Deconstruction	To encourage and recognise designs that minimise the embodied energy and resources associated with demolition.	<p>One point is awarded where:</p> <ul style="list-style-type: none"> • 50% (by area) of the structural framing, roofing, and façade cladding systems are designed for disassembly; <p>OR</p> <ul style="list-style-type: none"> • 95% of the total façade is designed for disassembly. <p>If the material cost of the structural framing, roofing, and facade cladding systems represent less than 1% of the project's total contract value, this credit is 'Not Applicable' and is excluded from the points available used to calculate the Materials Category Score.</p>	<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® linings can have new edge tapers machined in, making reuse both possible and practical.</p> <p>Although Green star rating do not address the reuse of other materials in this Credit, a holistic approach to Ecologically Sustainable Development (ESD) can be achieved if the disassembly and reuse of Powerscape Health® linings are included in the Building Users Guide.</p> <p>No points are allocated for this criterion as the aim is addressed in the materials calculator in Mat-14.</p>
Mat - 14	Ceilings, Walls and Partitions	To encourage and recognise the selection of ceilings, walls and partitions that have a reduced environmental impact.	<p>Up to two points are awarded where it is demonstrated that:</p> <ul style="list-style-type: none"> • The ceilings, walls and partitions used in the fitout have a reduced environmental impact as determined by the following assessment categories in the Green Star Ceilings, Walls and Partitions Calculator: <ul style="list-style-type: none"> - - Type of Flooring; - - Eco Preferred Content; - - Durability; - - Environmental Management System (EMS); - - Product Stewardship; - - Modularity; and - - Design for Disassembly 	<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>Generally the GECA certified USG Powerscape Health® will make up over 90% or more (by mass) of the components in a steel framed internal wall.</p> <p>So in most cases, USG Powerscape Health® can achieve the maximum Product Score of 100% in the Walls and Partitions Calculator for Mat-14.</p> <p>Please refer to page 6 of this brochure for the required information to complete the Walls and Partitions Calculator required for Mat-14.</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.

USG & Green Star - Education v1 Mat-14 Ceilings, Walls and Partitions Calculator

Total Area of Walls, Ceilings m² Total Percentage Score: Points Awarded for this

	Product Classification	Name of Ceilings, Walls and Partitions Products and Suppliers	Brief Description of Ceilings, Walls and Partitions	Area of Ceilings, Walls and Partitions (m ²)	Resource Utilisation		Management						Reusability		Product Score (%)	
					Eco Preferred Content	Durability	EMS	EMS ISO 14001 Certified	EMS Includes				Product Stewardship	Modular		Designed for Disassembly
									Waste Minimisation	Energy	Emissions	Materials Minimisation				
1	Environmentally Innovative	USG Powerscape Gypsum Fiberock Linings	GECA certified Gypsum Fibre board containing 95% recycled content suitable for impact, wet area, fire and acoustical walls and flush ceilings													100

USG Notes:

Items 1

Product Classification	Reason	USG Products GECA Certified
USG Powerscape: Environmentally Innovative	Generally the Powerscape will make up over 90% or more (by mass) of the components in a steel framed internal wall.	USG have the following products GECA certified: Powerscape Health 6.5mm, 10mm, 13mm and 16mm



Australian Sustainability Table

Relationship between Green Star Credits and USG Powerscape Fiberock

Can Contribute Green Star AU Credits	Management	Indoor Environmental Quality (IEQ)						Material (MAT)			Energy (EN)	Meets the aim of the Credit Criteria	Indoor Environmental Quality (IEQ)	Material
	Waste Management	Internal Noise levels	Thermal Comfort	Volatile Organic Compounds (including Formaldehyde)			Recycled Content & Re-used Products and Materials	Ceilings Wall & Partitions Material Calculators	Greenhouse Gas Emissions	Mould Prevention	Recycled Content & Re-used Products and Materials			
Office Design & As Built v3	Man-7	IEQ-12	IEQ-9	IEQ-13 ¹			Mat-3	N/A	Ene-1		IEQ-15	N/A		
Office Interiors v1.1	Man-6	IEQ-10	N/A	IEQ-11			N/A ²	Mat-3	Ene-2		N/A	N/A ²		
Education v1	Man-7	IEQ-7	IEQ-5	IEQ-8			N/A ²	N/A	Ene-1		N/A	N/A ²		
Healthcare v1	Man-7	IEQ-7	IEQ-5	IEQ-8 ¹			N/A ²	Mat-14	Ene-1		IEQ-10	N/A ²		
Multi-unit Residential v1	Man-7	IEQ-7	IEQ-5	IEQ-8 ¹			N/A ²	Mat-14	Ene-1		N/A	N/A ²		
Retail Centre v1	Man-7	IEQ-7	IEQ-5	IEQ-8 ¹			Mat-3	N/A	Ene-1		IEQ-10	Mat-3		
Substrate	Product Family: Powerscape Gypsum Panels	Off-cuts reusable	Rw	Thermal Mass	VOC			Recycled Content	Eco Preferred Content (GECA cert)	Thermal Mass	◆ ASTM D3273 rating	Can be re-used		
					Emission Levels	ppb	mg/m ³	Post Ind.						
Fiberock Gypsum Panel	POWERSCAPE HEALTH®	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	95%		1.1 kJ/kg	10	✓		
	POWERSCAPE HEALTH® Ultra-Mesh	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	95%	-	1.1 kJ/kg	10	✓		
	POWERSCAPE HEALTH® Go-Between	✓	*45 - 71	1.1 kJ/kg	Free	1.6ppb	0.002	95%		1.1 kJ/kg	10	✓		

Notes

1: Applicable when 6.5mm or 10mm Powerscape Health is used as a tile underlay
 2: No credits for this criteria as Powerscape is specially addressed in the materials calculator

POWERSCAPE HEALTH® Panels

Made of gypsum and post-consumer recycled cellulose fibres, these high-performance panels are in multiple applications including interior walls and floor underlayments. Engineered for strength and resistance to water and mould, 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 industrial 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 Mould on the Surface of Interior Coatings in an Environmental Chamber**

A "0" rating on D3273 means excessive disfigurement due to mould growth on gypsum wall or ceiling panel surfaces, while a "10" rating indicates that no mould 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 mould growth is invisible to the naked eye.



USG Powerscape Hospital and Education Wall Designs

For recommended wall designs for apartments, aged care, and other types of buildings, request a copy of the USG Powerscape Design Catalogue.

Hospital & Medical Wall Systems



All systems suited for both dry and wet area interior walls.



All systems shown below are resistant to soft & hard body impact

USG Powerscape® Interior Linings - Caring for Your Health in Hospital and Medical Applications



USG Powerscape Health 13mm linings are being used extensively throughout the Mater Hospital renovation and extensions (shown) in Brisbane.

Hospital and medical buildings require high quality indoor healing environments. USG Powerscape Health® linings offer many performance benefits for medical and hospital buildings due to their outstanding solidity, resistance to fire and impact, as well as excellent resistance to sound transmission. They also resist toxic mould formation, and are free from carcinogenic crystalline silica dust risk.

All USG Powerscape interior linings resist water absorption better than both fibre cement and wet area plasterboard, meaning they can be used in both dry and wet areas, simplifying design, estimating, site inventory management, and installation. Four typical systems are shown.

MINIMUM	ACOUSTIC SEPARATION	EXTRA HIGH IMPACT	PREMIUM
<p>PRSL30SiB 30/30/30 R_w 41</p>	<p>PRSL30SiC 30/30/30 R_w 48</p>	<p>PRSL60SiD 60/60/60 R_w 48</p>	<p>PRSL60SiE 60/60/60 R_w 55</p>

USG Powerscape® linings are now used in many health facilities, including; The Mater Hospital - Brisbane; The Alfred Hospital – Melbourne; The Monash Medical Centre – Clayton; Sea Lake Hospital – Sea Lake; and Campbelltown Acute Mental Hospital – NSW.

Key Educational Wall Systems



All systems suited for both dry and wet area interior walls.



All systems shown below are resistant to soft & hard body impact; see page 8 - 11.

USG Powerscape® Interior Linings - Helping to Create Superior Learning Environments



USG Powerscape 13mm linings are used throughout this school classroom block.

ACOUSTIC SEPARATION	EXTRA HIGH IMPACT
<p>PRSL30SiC R2.0 92 x 0.55</p> <p>Studs at 600 mm centres</p> <ul style="list-style-type: none"> • Sound R_w 48 • Fire 30/30/30 • 13 mm USG Powerscape Health® • As strong as 9 mm fibre cement or 13 mm scrim plasterboard 	<p>PRSL30SiC R2.0 92 x 0.55</p> <p>Studs at 400 mm centres</p> <ul style="list-style-type: none"> • Sound R_w 48 • Fire 30/30/30 • 13 mm USG Powerscape Health® Ultra-Mesh • Twice as strong as 9 mm fibre cement or 13 mm scrim plasterboard
<p>PRS60SiE R2.0 92 x 0.55 6.5 6.5 13</p> <p>Studs at 600 mm centres</p> <ul style="list-style-type: none"> • Sound R_w 55 • Fire 60/60/60 • Linings as above plus 6.5 mm USG Powerscape Go-Between® 	<p>PRS60SiD R2.0 92 x 0.55 16 16</p> <p>Studs at 400 mm centres</p> <ul style="list-style-type: none"> • Sound R_w 48 • Fire 60/60/60 • 16 mm USG Powerscape Health®

Surface Finish

- All USG Powerscape interior linings have a plaster face, not paper or cement.
- Paint and tiles bond with high integrity. Choose quality paint systems to the gloss level and abrasion resistance required.

Safety

- USG Powerscape interior linings resist mould formation as they have no paper layer to feed the mould.
- No crystalline silica arduous dust control need or carcinogenic risk.

Reverberation

- USG Powerscape interior linings work well with Composition® reverberation products. (www.autex.co.nz)
- See AS/NZS 2107:2000 for recommended design reverberation levels.

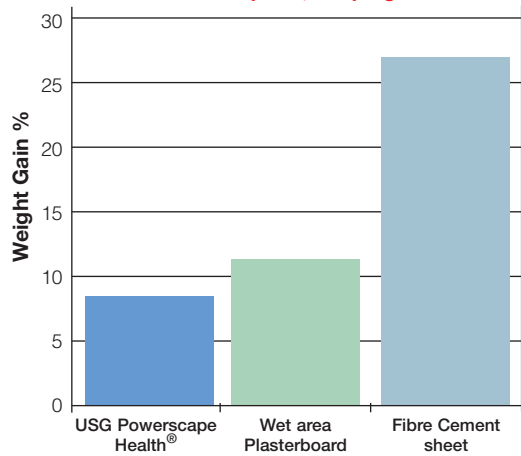
USG Powerscape interior linings are now in use in numerous state and private education facilities in Queensland, New South Wales and Victoria. Typically usage is throughout blocks of classrooms, and also in specialist rooms such as gymnasiums and rooms for teaching various technologies.

Care is taken in providing this information, but no liability is accepted for any incorrect interpretation of the BCA, or other errors. Not to take the place of professional design, fire, and acoustic advice. Ensure USG Powerscape full single page specifications are used when specifying.

Resisting Moisture Absorption and Lingering Dampness



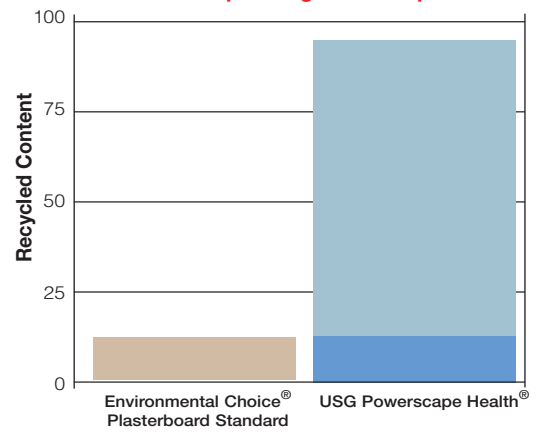
Weight gain % after 24 hour soak in water
USG Powerscape Health® resists severe water soak absorption, keeping home drier.



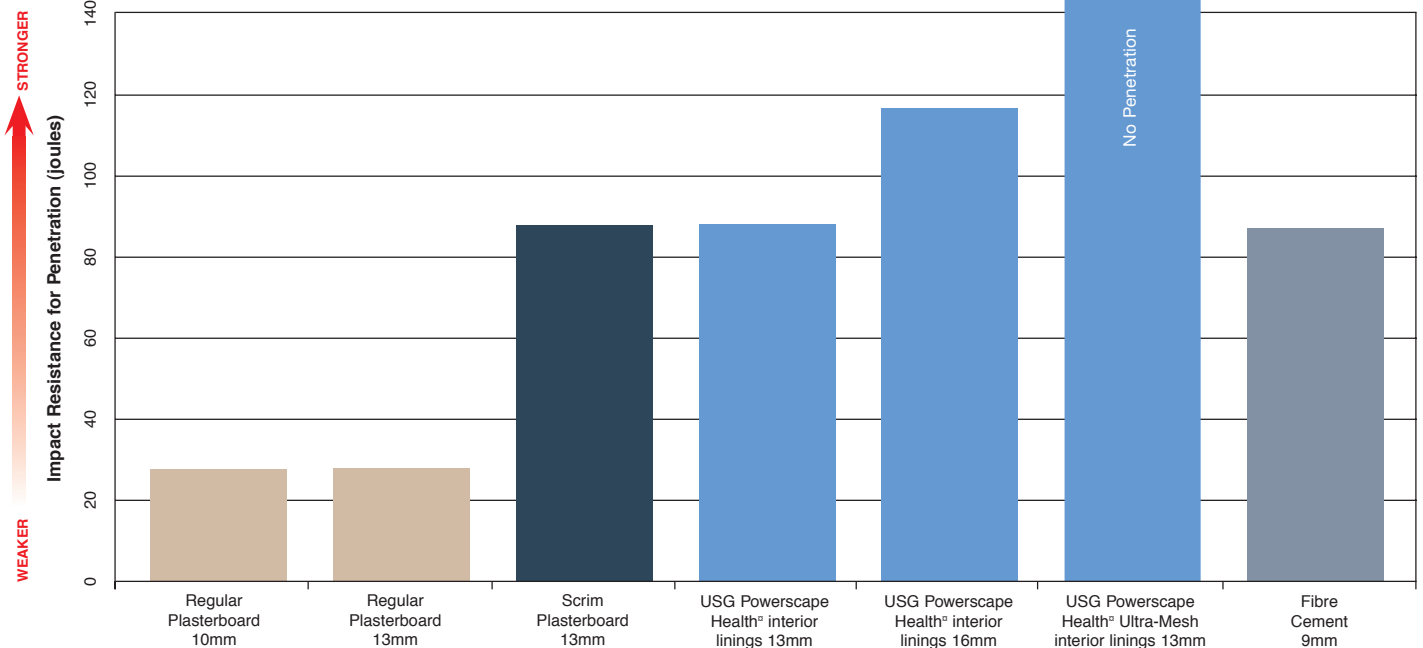
Outstanding Recycled Content



Recycled Content of Gypsum Wallboard in Australia
USG Powerscape linings 'Clean-up' the field.



Penetration, large hard body, steel frame
USG Powerscape Health® Ultra-Mesh, uniquely, could not be penetrated, even at 140 joules



Product Range, and Key Properties and Main Applications

The principle nominal properties of the range of USG Powerscape Health® products are documented below. Also shown are main applications for each product.

USG Powerscape Health® Range & Applications

Product Name	Thickness mm	Size mm	Edge TE/SE	Density Kg/m	Weight Kg/m²		Main Applications (both dry and wet areas)
USG Powerscape Health®	13	1200 x 3000	TE	950	12	✓	Interior wall and ceiling linings - widely used in education, medical, aged care, institutions, office, and in quality residential.
USG Powerscape Health® Ultra-Mesh®	13	1200 x 3000	TE	950	12	-	Interior linings where ultra high impact resistance is needed - containment ceilings, institutional walls.
USG Powerscape Health®	16	1200 x 3000	TE	950	15	✓	Interior wall and ceiling linings - especially apartment tenancy & corridor walls.
USG Powerscape Health®	10	1200 x 2700	SE	1000	10	✓	Tile backer wall lining; Lining of eaves, and canopies; Acoustic underlay on framed floors (see Powerscape Peace® Timber brochure).
USG Powerscape Health® Go-Between®	6.5	900 x 1800	SE	1200	8	-	Inner layer lining for acoustic walls - especially aged care timber frame structures; Stabilizer layer on framed floors under tiles etc (see Powerscape Go-Between® brochure).

Key Product Features - USG Powerscape Health®

- Four product thicknesses and suitable for interior linings in wet and dry areas.
- Exceptional impact resistance; USG Powerscape Health® is at least as strong as 9mm fibre cement and scrim reinforced plasterboard, and twice the strength of same thickness regular plasterboard. Powerscape Health® Ultra-Mesh, much stronger again, is in a class of its own.
- Joints easily to provide monolithic finishes.
- Screws, nails, glues and staples easily. Cut to size virtually dust free with multi-score and snap. Hand tools and powered standard wood working tools can also be used when using a dust mask.
- Two way fire rated systems up to 60 minutes (single layer) and 120 minutes (2 layers).
- High mass gives superior noise control, including inter-tenancy rated systems.
- Excellent substrate for paint and tiles, and a number of abrasion resistant coatings.



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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