ENVIRONMENTAL PRODUCT DECLARATION

SPEEDPANEL®
51MM, 64MM, 78MM

EPD of multiple products, based on a representative product. A full list of products covered by this EPD is presented within this document on page 21.

SPEEDPANEL

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021

AUSTRALASIA EPD®
INTERNATIONAL EPD SYSTEM

EPD
INTERNATIONAL EPD SYSTEM

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Programme:	The International EPD System www.environdec.com
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WHAT IS AN ENVIRONMENTAL PRODUCT DECLARATION?

An Environmental Product Declaration (EPD) tells the environmental story of a product over its life cycle in a format that is clear and transparent. It is science-based, independently verified and publicly available.

EPDs help manufacturers translate complex sustainability information about their product's environmental footprint into simpler information that governments, companies, industry associations and end consumers can trust to make decisions.

An EPD communicates the environmental impacts at different stages in a product's life cycle. This may include the carbon emitted when it's made, and any emissions that pollute the air, land or waterways during its use.

This EPD covers the environmental impacts of Speedpanel systems when used both inside and outside a building envelope subject to treatment level. The products are manufactured at Bayswater facility located in Bayswater, Victoria, Australia.

This EPD is based on a 'cradle-to-gate' Life Cycle Assessment (LCA), with end-of-life options included. 'Cradle' refers to the raw material extraction and 'the gate' is the gate of the Bayswater manufacturing facility as the product is ready to go out to customers.

Speedpanel Systems Pty Ltd©, as the EPD owner has the sole ownership, liability, and responsibility for the EPD.

SPEEDPANEL

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About Speedpanel

Speedpanel Systems Pty Ltd is an Australian-owned company specialising in the manufacture of modular, lightweight, fire rated, and acoustic building systems.

Speedpanel® is designed to meet the needs of various construction sectors, including residential, commercial, industrial, civil, and specialised applications.

Speedpanel, is a prefabricated modular building system designed for both fire rated and acoustic applications. Each panel consists of a roll-formed steel outer shell filled with a fire resistant, aerated cement core. This composition not only enhances fire protection but also provides effective sound insulation, making it a versatile solution for projects requiring both fire and acoustic performance.

Speedpanel is committed to delivering high-quality building solutions while optimising supply chains and adopting sustainable practices to reduce environmental impact.

Sustainability

At Speedpanel, we take pride in our sustainability initiatives and our commitment to minimising environmental impacts in the construction industry.

Speedpanel adopts a continuous development strategy to both our processes and facilities, ensuring our products can be reused and are made from ever increasing quantities of recycled materials.

PRODUCT CAN BE 100% REUSED / REDEPLOYED^

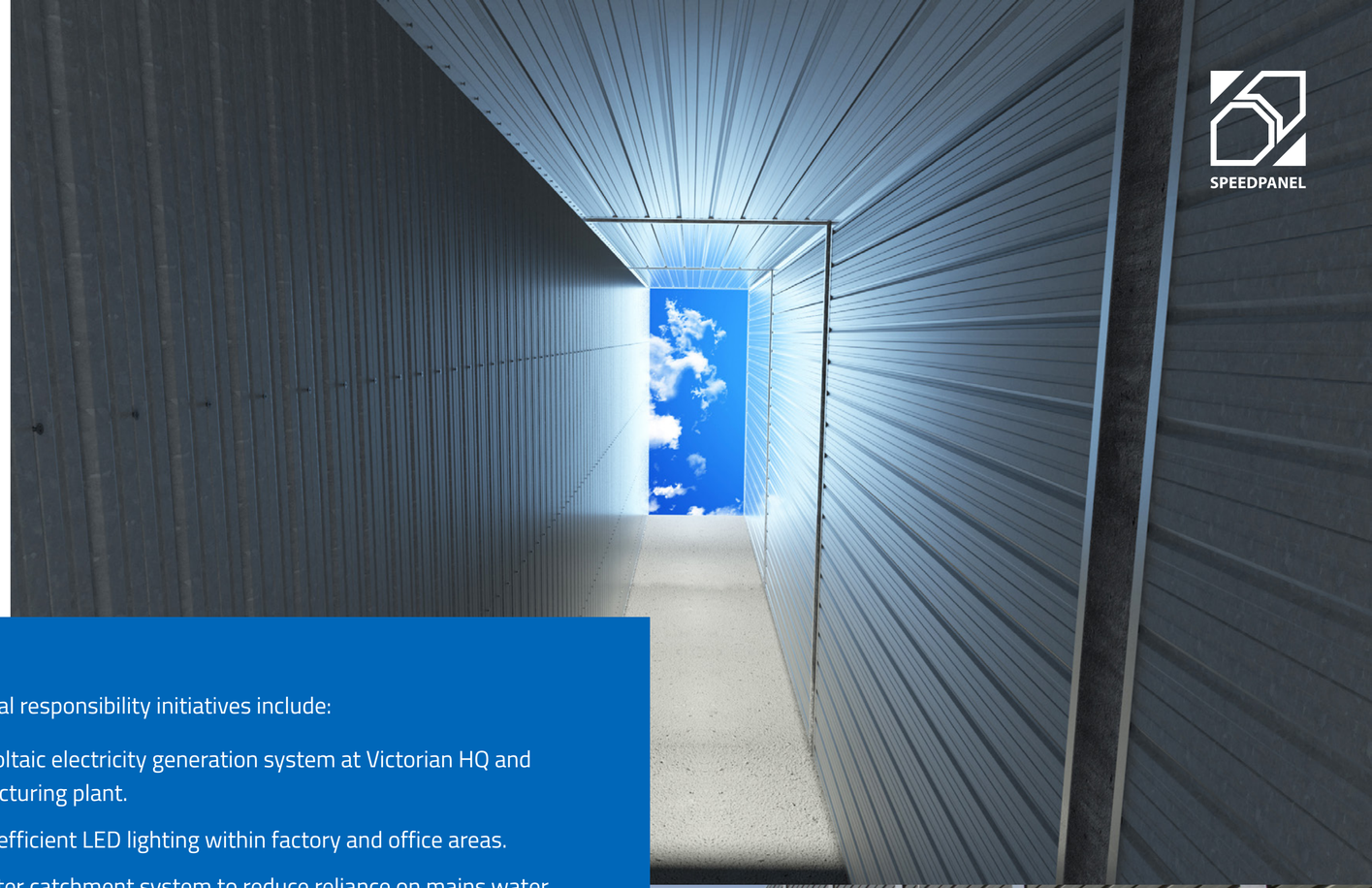
MADE USING RECYCLED STEEL & WATER

LIFESPAN DURABILITY ESTIMATE OF UP TO 100 YEARS*

4 SOCIAL RESPONSIBILITY INITIATIVES

Our 4 social responsibility initiatives include:

- Photovoltaic electricity generation system at Victorian HQ and manufacturing plant.
- Energy efficient LED lighting within factory and office areas.
- Rainwater catchment system to reduce reliance on mains water.
- Speedpanel inner core batching facility use of recycled water.



*Lifespan estimate based on specific environmental conditions. Actual durability may vary. Refer to the Speedpanel Warranty for details or contact us at +61 3 9115 6666.

^Reuse is project and application-specific and subject to fitness for purpose. Please contact Speedpanel at +61 3 9115 6666 for further information.

Products covered in this EPD

This is an EPD of multiple products, based on a representative product Speedpanel Galvanised Steel.
Below is the range of Speedpanel Galvanised Steel products and range of Speedpanel Prepainted Steel products covered by this EPD.

51

64

78

78

GALVANISED STEEL

SPEEDPANEL 51MM

51mm Speedpanel is a lightweight panel system with a Fire Resistance Level (FRL) of -/60/60.

Its compact profile allows for efficient use of space and ease of handling during installation. Common applications include intertenancy walls in high-rise buildings, as well as party walls in multi-residential projects.

SPEEDPANEL 64MM

64mm Speedpanel offers an FRL of -/90/90 and is designed for durability and straightforward installation.

This panel is commonly used in high-rise projects for intertenancy walls, corridor walls, as well as shaft and riser walls, where both fire resistance and acoustic performance are required.

SPEEDPANEL 78MM

78mm Speedpanel is engineered for demanding environments, providing an FRL of -/120/120.

Its design and extensive certification enables it to span large distances, reducing the need for additional structural supports and associated costs. Typical uses include fire rated escape stairs, car parks, plant rooms, shafts, services risers and as part of acoustic wall systems.

PREPAINTED STEEL

SPEEDPANEL 78MM

The 78mm Pre-Painted Speedpanel features a durable coating and achieves an FRL of -/120/120.

Designed for external applications, it combines fire rated and acoustic performance with enhanced weather and corrosion resistance. The pre-painted finish offers aesthetic flexibility, allowing for a choice of specific colours to meet design requirements, while also minimising maintenance needs. Common uses include external boundary walls, façade systems, and exterior fire rated barriers, delivering both functional and visual appeal with long-term durability.

Manufacturing

At Speedpanel, sustainability and continuous improvement are at the core of our Victoria manufacturing facility.

Where possible, we harness solar power through photovoltaic electricity generation, recycle water and rainwater and recycle scrap steel and concrete to reduce waste.

This commitment extends to procurement, sourcing raw materials from manufacturers with high-recycled content and reusing consumables like timber, ties, sponges and packaging to minimise our overall environmental impact.

We remain dedicated to reducing our footprint and continue to invest in sustainable infrastructure to further improve our manufacturing efficiency.

Speedpanel products are manufactured at the Speedpanel HQ in Bayswater, Victoria, Australia.

Bayswater, Victoria

MANUFACTURING PROCESS

Roll Forming
Steel sheets are roll formed into outer shells.

Seaming
Two roll formed sheets are seamed together to form outer shell.

Prepping
Outer shells are consolidated into packs and prepared for pouring.

Pouring
Aerated cement core is poured into pack.

Curing
Core is cured in a controlled environment.

Brushing
Packs are brushed and cleaned, ready for processing

Processing
Packs are processed in preparation for transport to site.

Technical information

Speedpanel is a pre-fabricated panel system comprised of a roll-formed steel outer shell, filled with an aerated fire resistant cement core material.

Speedpanel is suitable for applications requiring fire compartmentation systems or acoustic compartmentation solutions.

It is commonly used in a variety of settings, including shaft and riser wall systems, escape stairs, car parks, plant rooms, factory separation, and external boundary walls, as well as other applications where fire or acoustic performance is needed.

Speedpanel accessories like flashings, screws, sealant and other are not included in the scope of this EPD

CLASSIFICATION

Speedpanel products are made at Speedpanel's Bayswater plant. Data was collected for all Speedpanel products from the manufacturing plant, therefore the EPD is fully representative of Speedpanel production.

The UN CPC and ANZSIC codes applicable to Laminex product in this EPD are shown in Table 1.

Table 1: Industry classification

Product	Classification	Code	Category
Speedpanel galvanised steel/ Speedpanel prepainted steel	UN CPC Ver.2.1	37550	Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone
	ANZSIC 2006	2034	Concrete Product Manufacturing

DECLARED UNIT

The declared unit for the EPD is: **1 kg of packaged Speedpanel.**

For guidance on how to convert the results in this EPD to your practical application, see section 'How to use this EPD' on page 20.

DESIGN STANDARDS

Product	Relevant Standards
Speedpanel galvanised steel/ Speedpanel prepainted steel	AS 1530.4 to determine panels fire resistance performance
	AS 1530.1 to confirm panels non-combustible product properties
	AS 1191 to determine panels acoustic ratings
	AS 4040.2-1992 (non cyclone regions) to determine all wind loading and deflection rating
	AS/NZS 1170.0, AS 1170.4 (Australia Earthquake Actions) and AS 1170.5 (New Zealand Earthquake Actions) tested and accessed
	AS/NZS 1170.2 cyclonic wind load debris testing for regions as defined in AS 1770.2, up region D for a 10,000 year event
	AS.NZS 4284:2008 for fire rating of pressurised plenum or shaft that needs to be air tight

Content declaration

The content declaration for this EPD of multiple products is based on a representative product galvanised steel Speedpanel, where the representative product in the group was selected based on the production volumes.

Table 2: Content Declaration

Product components	Weight, kg	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material, kg C/product or declared unit
Steel coil	0.254	4.06%	0.0%	0
Cement	0.403	0%	0.0%	0
Fly ash	0.101	0%	0.0%	0
Aggregate	0.0451	0%	0.0%	0
Water	0.19	0%	0.0%	0
Accelerant	0.006	0%	0.0%	0
Foaming agent	0.00124	0%	0.0%	0
Fiber mesh (polypropylene)	9.59E-04	0%	0.0%	0
Total	**1**	**4.06%**	**0%**	**0**

Packaging materials	Weight (kg)	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
PUR foam	5.73E-06	0.001%	0
Galvanised steel clips	3.83E-04	0.038%	0
Timber brace	0.0289	2.890%	0.0129
Steel strapping	2.63E-04	0.026%	0
LDPE shrink-wrap	0.00255	0.255%	0
Labels	4.69E-06	0.0005%	1.85E-06
Total	**0.0321**	**3.21%**	**0.0129**

No products declared within this EPD contain substances exceeding the limits for registration according to the European Chemicals Agency's "Candidate List of Substances of Very High Concern for authorisation".

System boundaries

In Life Cycle Assessments (LCA), the system boundary is a line that divides the processes which are included from those which are excluded.

As shown in table 3, this EPD is of the type 'cradle to gate with modules C1–C4 and module D' (A1–A3 + C + D). This scope includes manufacture of raw materials (module A1), raw material transport (A2), manufacture (A3), end-of-life (C1-C4), and resource recovery (D). Other life cycle stages (Modules A4-A5, B1-B7) are dependent on particular scenarios and best modelled at the building level.

Since Module C is included in the EPD, the use of Module A1-A3 results without considering the results of Module C is discouraged

Table 3: Modules included in the scope of the EPD

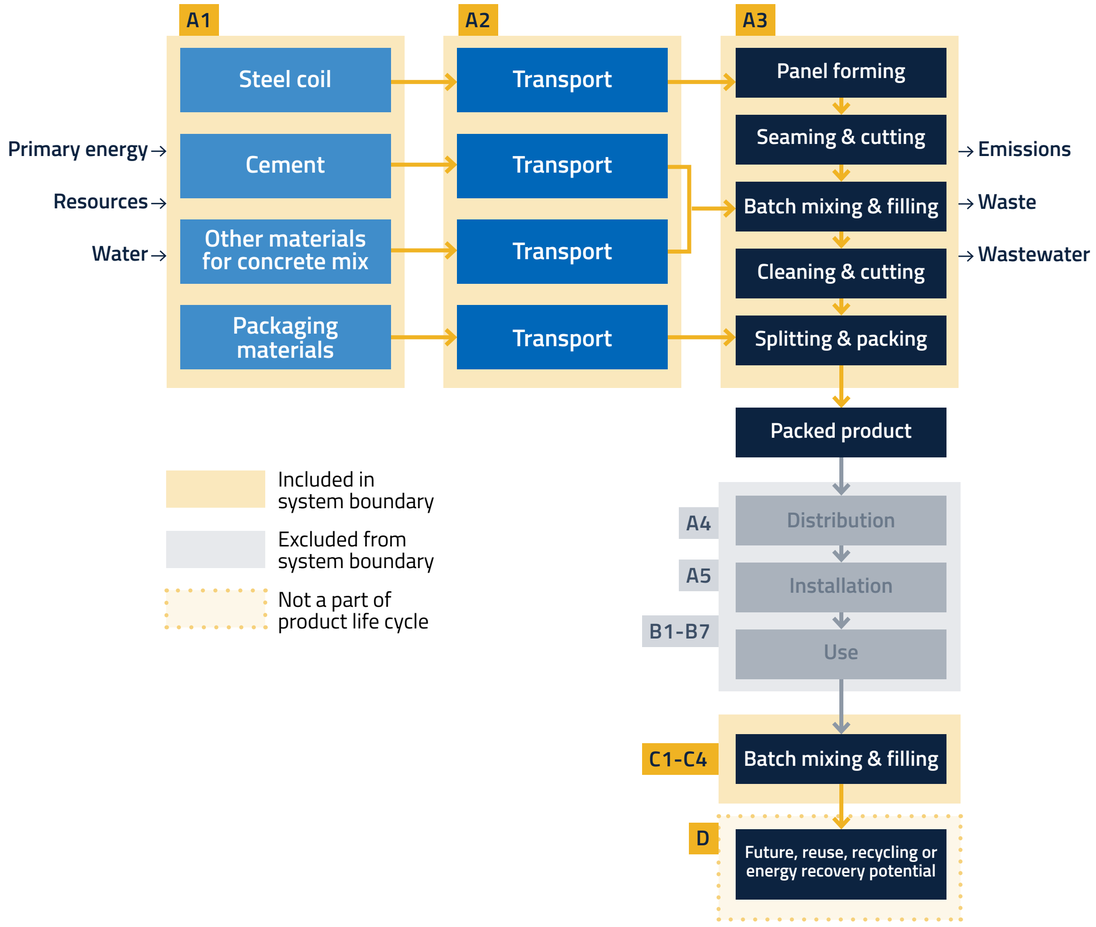
(X = declared module | ND = module not declared)

	Product stage			Construction process stage		Use stage							End-of-life				Recovery
	Raw material supply	Transport	Manufacturing	Transport	Construction Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	AU	-	-	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Specific data		68.0%		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products		<10.0%		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites		0.0%		-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = included in the EPD; ND = Module not declared (such a declaration shall not be regarded as an indicator result of zero)

Specific data includes GWP-GHG impacts related to the manufacturing processes primary steel production, electricity and raw materials transport

SYSTEM BOUNDARY



PRODUCTION

(MODULES A1-A3)

The production stage includes the environmental impacts associated with raw materials extraction and processing of inputs, transport to and within the manufacturing site, and manufacturing of the representative product at the exit of the production site. The impacts include the production and use of fuels and electricity, production of auxiliary materials and packaging materials, and waste treatment of production wastes.

A1-A3 results include the 'balancing-out reporting' of the biogenic CO_2, PERM and PENRM of packaging released in module A5. This was done according to Annex 3 of PCR.

MODULE A1 (RAW MATERIAL SUPPLY)

Includes the production of steel, cement and other materials, generation and transmission of electricity in Victoria, Australia. It also includes solar energy generation on site at Speedpanel. Speedpanel site uses 92% of energy from Victorian grid and 8% of self-generated solar electricity.

MODULE A2 (TRANSPORT)

Includes the transport steel, cement, product packaging and other materials from suppliers to Speedpanel site, via trucks. Transport of steel used in the product manufacturing is a combination of truck and sea freight.

MODULE A3 (MANUFACTURING)

Manufacturing of Speedpanel includes the use of ancillary materials, on-site transport by forklifts and the recycling and landfilling of manufacturing waste.

END OF LIFE STAGE

(MODULE C)

When a building reaches its end-of-life, Speedpanel products are processed as part of the construction waste. The end-of-life stage (Modules C1-C4) is modelled based on the published Australian construction waste data where the steel is assumed to be partially recycled (87%) and remaining disposed (13% of steel and 100% of cement core) (Australian Government, 2022). By mass, it is assumed 22% of panel will be recycled and 78% disposed.

MODULES C1 (DECONSTRUCTION/DEMOLITION)

Includes dismantling the Speedpanel after use. Dismantling includes use of a diesel fuelled excavator.

MODULES C2 (TRANSPORT TO END-OF-LIFE)

Includes transport of waste Speedpanel product to recycling and landfill after demolition of the building where it was used.

MODULE C3 (WASTE PROCESSING)

22% of Speedpanel product mass is assumed to be recycled. Includes steel processing for recycling, where steel is separated from the rest of the panel and 87% of steel is recycled (Australian Government, 2022). The European Union guidance on PEF and ratio/factor for R2 has not been used as it is more accurate to use published Australian values (Australian Government, 2022). The assumed R2 value is 0.87 (for steel) with quality of the recycled material set to 1 (ratio QR_{out}/Q_{Sub}).

MODULES C4 (DISPOSAL)

78% of Speedpanel product mass is assumed to be landfilled.

The emission of biogenic CO_2 in landfill is calculated, following EN15804, which does not allow consideration of permanent storage. The biogenic carbon balances in A1-A3 and C4, but due to methane emissions during production and landfill the GWP-biogenic values do not balance.

Table 4: End of life scenarios for products

Process	1kg
Excavator	Equivalent of 1 kg of Speedpanel product
Recovery system specified by type	22% of panel by mass (87% of steel for recycling)
Disposal specified by type	78% of panel by mass 13% of steel modelled as inert waste at landfill 100% of core material (concrete) modelled as inert waste at landfill
Assumptions for scenario development	C1 – Demolishing with an Excavator (100 kW)- Fuel consumption is calculated at 0.000207 L diesel input per kg of material. C2 – 100 km of transport by truck C3 – Energy use for steel separation at the sorting plant.

RECOVERY AND RECYCLING POTENTIAL

(MODULE D)

In Module C3, 87% of steel scrap is made available for recycling. Based on the galvanised steel mix used in Speedpanel, 16% of steel is made from post-consumer scrap. Therefore, module D has a benefit assigned from the positive net recycling balance.

The resource recovery stage (Module D) is modelled based on recycling assumptions in Galvabond EPD. As Galvabond steel is used in Australia it's end-of life assumptions and subsequent Module D calculations reflect the regional specifics for steel recycling including typical transport distances. The European Union guidance on PEF and correction factors for recycling rate (R2) have not been used to model benefit in module D, as it is more accurate to use published Australian values (Australian Government, 2022). The assumed R2 value is 0.87 with quality of the recycled material set to 1 (ratio QR_{out}/Q_{Sub}).

Life cycle inventory (LCI) and assumptions

UPSTREAM DATA

Specific data was used for all manufacturing operations up to the factory gate, including upstream data for production of steel by Speedpanel suppliers, based on published EPDs. Specific data for Speedpanel operations was collected for the 12-month period between 2022-12-01 to 2023-11-31. No changes to production technology have occurred since the data collection period and hence the data continues to be representative of current practice.

ELECTRICITY

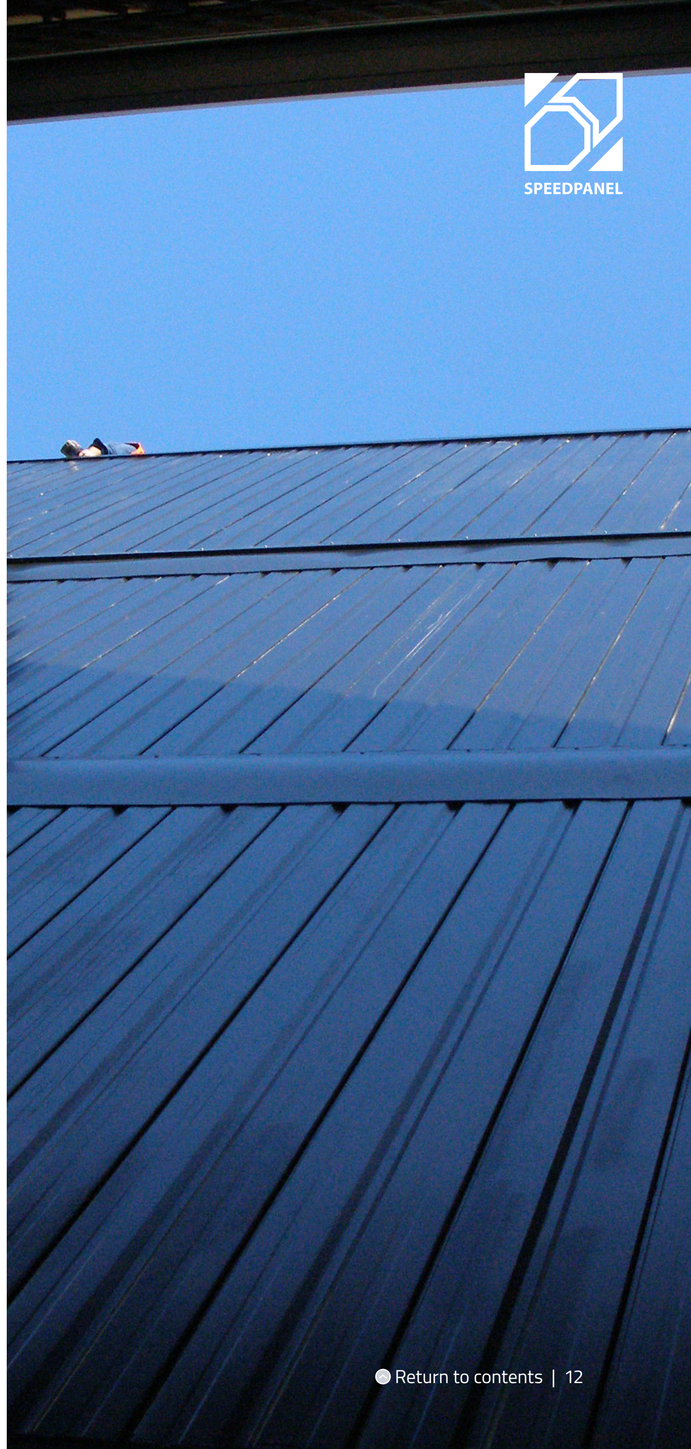
The composition of the residual electricity grid mix of Victorian is based on published data for the financial year 1st July 2022 – 30st June 2023 (Australian Government, 2023). The Victorian residual electricity mix is made up of Brown coal 64.2%, Wind 14.4%, Solar 7.41%, Hydro 5.83%, Natural gas 2.15%, Biogas 0.662%, and Biomass 0.0391%. The remaining electricity is imported: 2.38% is imported from Southern Australia, 1.56% is imported from Tasmania, and 1.43% is imported from New South Wales. The emission factor for the Victoria residual grid mix for the GWP-GHG indicator is 1.03 kg CO_2e/kWh (based on EF3.1).

The photovoltaic energy generation was modelled using regionalised Australian dataset from ecoinvent database version 3.10. The emission factor for the photovoltaic energy generation for the GWP-GHG indicator is 0.0637 kg CO_2e/kWh (based on EF3.1).

LCA SOFTWARE AND DATABASE

Background data for raw materials, energy, and transportation are all from AusLCI v2.45 database, the ecoinvent v3.10 database, and EPD International. The reference years for all datasets are between 2023-2025. Both primary and background data fall within the EN 15804 and PCR requirements of 10 years for generic data and 5 years for producer specific data.

The LCA was conducted in Microsoft Excel. The LCA utilises lifecycle inventory data from ecoinvent, Allocation, cut-off, EN15804, ecoinvent database version 3.10 for several of the raw and process materials obtained from the background system. The ecoinvent datasets have not been adapted as they are provided in Excel and have not been used in conjunction with an LCA software. This includes capital goods and infrastructure as they are included in the background datasets provided by ecoinvent database for Excel and it is not possible to subtract them in Excel. Regional averages for fuel inputs and electricity grid mixes were obtained from the AusLCI database version 2.45. The emission factors of regionalised fuels and electricity inputs are calculated in SimaPro. Then, these emission factors are imported into Excel to finish the calculation.



LIFE CYCLE INVENTORY (LCI) AND ASSUMPTIONS – CONTINUED

TRANSPORT

Specific transport data was used for transport of production inputs (A2). Steel is transported from Australia or from overseas mainly from New Zealand and Indonesia, by truck or combination of truck and container ship. Cement and other materials are transported within Australia by truck. Any wastes from the production process (A3) are assumed to be transported over a 100 km distance to a treatment or disposal site.

REPRESENTATIVE PRODUCT

This EPD of multiple products, is based on a representative product galvanised steel Speedpanel, where the representative product in the group was selected based on the production volumes.

CUT OFF CRITERIA

Personnel-related processes are excluded as per section 4.3.2 in the PCR.

In this study capital goods and infrastructure have been included in the background datasets as provided by ecoinvent database v3.10 and AusLCI database v.2.45. It is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from these datasets.

All other reported data were incorporated and modelled using the best available life cycle inventory data.

ALLOCATION

End-of-life allocation follows the requirements of EN 15804:2017+A2:2019 § 6.4.3.3 and generally follows the polluter pays principle.

ASSUMPTIONS

- Cut-off criteria, as per the PCR are reasonable in the context of the overall impacts of Speedpanel production. All data was included in the study.
- Use of electric energy (both grid supplied and self-generated photovoltaic supply) is assumed to be split as 70% for production and 30% for non-production site activities (e.g. office heating/cooling, lighting).
- Benefits in Module D are modelled based on recycling assumptions in Galvabond EPD. As Galvabond steel is used in Australia it's end-of life assumptions and subsequent Module D calculations reflect the regional specifics for steel recycling including typical transport distances.
- Where specific life cycle inventory data were unavailable, proxy data were used, giving preference to regional data.
- Use of any required generic data from outside Australia is sufficiently representative of the impacts of the material. Where the geography is expected to have an impact on the results, this is indicated as a geographical proxy.

Environmental impact indicators

An introduction the core environmental impact indicators is provided here. The best-known effect of each indicator is listed in the descriptions and the abbreviations, in brackets, correspond to the labels in the following results tables.

CLIMATE CHANGE (GLOBAL WARMING POTENTIAL)

(GWP-total, GWP-fossil, GWP-biogenic, GWP-luluc)

A measure of greenhouse gas emissions, such as CO_2 and methane. These emissions are causing an increase in the absorption of radiation emitted by the earth, increasing the natural greenhouse effect. This may in turn have adverse impacts on ecosystem health, human health and material welfare. The global warming potential (GWP-total) is split into three sub indicators: fossil (GWP-fossil), biogenic (GWP-biogenic), and land-use and land-use change (GWP-luluc).

OZONE DEPLETION POTENTIAL

(ODP)

Depletion of the ozone leads to higher levels of UVB ultraviolet rays reaching the earth's surface with detrimental effects on humans and plants. The ozone depletion potential is a measure of air emissions that contribute to the depletion of the stratospheric ozone layer.

ACIDIFICATION POTENTIAL

(AP)

Acidification potential is a measure of emissions that cause acidifying effects to the environment. A molecule's acidification potential indicates its capacity to increase the hydrogen ion (H+) concentration in the presence of water, thus decreasing the pH value. Potential effects include fish mortality, forest decline, and the deterioration of building materials.

EUTROPHICATION POTENTIAL

(EP-freshwater, EP-marine, EP-terrestrial)

Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which are nitrogen (N)and phosphorus (P). In aquatic ecosystems where this term is mostly applied, this typically describes a degradation in water quality. Eutrophication can result in an undesirable change in the type of species that flourish and an increase in the production of biomass. As the decomposition of biomass consumes oxygen, eutrophication may decrease the available oxygen level in the water column and threaten fish in their ability to respire.

PHOTOCHEMICAL OZONE FORMATION POTENTIAL

(POCP)

Photochemical ozone formation potential gives an indication of the emissions from precursors that contribute to ground level smog formation, mainly ozone (O3). Ground level ozone may be harmful to human health and ecosystems and may also damage crops. These emissions are produced by the reaction of volatile organic compounds (VOCs) and carbon monoxide in the presence of nitrogen oxides and UV light.

ABIOTIC RESOURCE DEPLETION

(ADP-mm, ADP-fossil)

The consumption of non-renewable resources decreases the availability of these resources and their associated functions in the future. Depletion of mineral resources and non-renewable energy resources are reported separately. Depletion of mineral resources is assessed based on total reserves.

WATER USE

(WDP)

Water scarcity is a measure of the stress on a region due to water consumption.

THE FOLLOWING TABLES SHOW THE RESULTS FOR ONE KG OF SPEEDPANEL PRODUCT PLUS ITS PACKAGING AT THE FACTORY GATE.

EN15804+A2 CORE ENVIRONMENTAL IMPACT INDICATORS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The EN 15804 reference package based on EF 3.1 is used.

Table 5: Environmental impact (EN15804+A2) covering modules A1-A3, C1-C4 and D.

EN15804+A2 – Environmental indicators			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential	A-C variation within group
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**	
Climate change – total	GWP-total	kg CO_2-eq.	1.49E+00	7.27E-04	1.51E-02	3.36E-03	7.72E-03	-2.01E-01	9.76%
Climate change – fossil	GWP-fossil	kg CO_2-eq.	1.49E+00	7.27E-04	1.51E-02	3.35E-03	7.71E-03	-2.01E-01	9.82%
Climate change – biogenic	GWP-biogenic	kg CO_2-eq.	1.44E-03	7.26E-08	4.64E-07	3.08E-06	6.30E-06	0.00E+00	-17.25%
Climate change – land use and land use change	GWP-luluc	kg CO_2-eq.	8.82E-04	6.32E-08	6.19E-06	4.65E-06	5.95E-06	-3.91E-06	-1.70%
Ozone Depletion	ODP	kg CFC 11-eq.	7.53E-09	1.11E-11	2.28E-10	4.94E-11	2.08E-10	3.83E-15	-59.45%
Acidification	AP	Mole of H+ eq.	1.05E-02	6.56E-06	6.25E-05	2.38E-05	5.43E-05	-1.84E-04	29.12%
Eutrophication aquatic freshwater	EP-fw	kg P eq.	3.73E-05	2.12E-08	1.21E-06	8.70E-07	6.67E-07	-3.56E-08	-30.97%
Eutrophication aquatic marine	EP-fm	kg N eq.	1.93E-03	3.04E-06	2.26E-05	9.04E-06	1.99E-05	-1.09E-05	16.57%
Eutrophication terrestrial	EP-tr	Mole of N eq.	2.25E-02	3.33E-05	2.47E-04	9.80E-05	2.17E-04	5.30E-05	11.27%
Photochemical ozone formation	POCP	kg NMVOC eq.	5.90E-03	9.94E-06	8.79E-05	3.05E-05	7.66E-05	-1.31E-04	16.00%
Depletion of abiotic resources – minerals and metals [1, 5]	ADP-mm	kg Sb-eq.	1.92E-05	2.61E-10	4.80E-08	7.84E-09	2.15E-08	-1.02E-08	-44.84%
Depletion of abiotic resources – fossil fuels[1]	ADP-fossil	MJ	1.34E+01	9.51E-03	2.16E-01	4.70E-02	1.75E-01	-1.82E+00	17.10%
Water use[1]	WDP	m^3 world equiv.	3.08E-01	2.33E-05	1.01E-03	2.74E-04	8.37E-03	-3.88E-02	42.34%

[1] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

[5] The results of the impact categories land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

Optional environmental impact categories provide further information on environmental impacts.

Table 6: Additional environmental impact indicators covering modules A1-A3, C1-C4 and D.

EN15804+A2 – Additional environmental indicators			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential	A-C variation within group
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**	
Climate Change [2]	GWP-GHG	kg CO_2-eq.	1.50E+00	7.27E-04	1.51E-02	3.36E-03	7.73E-03	-2.01E-01	9.83%
Climate Change[3]	GWP-GHG (IPCC AR5)	kg CO_2-eq	2.95E+00	1.16E-03	1.51E-02	3.36E-03	7.74E-03	-1.94E-01	9.80%
Respiratory inorganics	PM	Disease incidences	9.02E-08	1.86E-10	1.33E-09	2.16E-09	1.17E-09	-1.98E-09	19.08%
Ionising Radiation – human health [4]	IRP	kBq U235 eq.	1.54E-02	4.26E-06	1.86E-04	8.99E-05	1.32E-04	4.76E-03	16.32%
Eco-toxicity (freshwater) [1, 5]	ETP-fw	CTUe	6.59E+00	1.35E-03	5.60E-02	1.87E-02	1.73E-02	-5.41E-02	29.14%
Human Toxicity, cancer [1, 5]	HTPc	CTUh	1.50E-09	2.84E-12	7.72E-11	1.38E-11	3.51E-11	-8.43E-11	-5.07%
Human Toxicity, non-cancer [1, 5]	HTPnc	CTUh	1.21E-08	1.29E-12	1.39E-10	2.76E-11	4.10E-11	-2.76E-09	-19.15%
Land use related impacts / soil quality [1, 5]	SQP	Pt	1.73E+01	6.66E-04	1.64E-01	3.27E-02	9.85E-03	2.51E-02	37.01%

[1] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

[2] This indicator should be identical to GWP-total except that the CF for biogenic CO_2 is set to zero. It has been included in the EPD following the PCR (EPD International, 2023). In this study it is calculated by subtracting the value of climate change – biogenic (GWP-biogenic) from the value of Climate change – total (GWP-total) since the ecoinvent Excel LCIA results do not include the indicator.

[3] GWP-GHG (IPCC AR5) is an additional GWP100 indicator that is aligned with the Intergovernmental Panel on Climate Change (IPCC) 2013 Fifth Assessment Report (AR5) (IPCC 2013), national greenhouse gas reporting frameworks in Australia and New Zealand and previous versions of the Construction Products PCR (PCR2019:14v1.11). It excludes biogenic carbon and indirect radiative forcing.

[4] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and some construction materials, is also not measured by this indicator.

[5] The results of the impact categories land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/ infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

RESOURCE USE INDICATORS

The resource use indicators describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier as per option B in Annex 3 in the PCR. Energy indicators (MJ) are always given as net calorific value.

Table 7: Resource use impact indicators covering modules A1-A3, C1-C4 and D.

Inventory indicators – Resource use			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Renewable primary energy as energy carrier	PERE	MJ	3.06E+00	5.82E-05	2.91E-03	1.42E-03	0.00E+00	1.24E-01
Renewable primary energy resources as material utilization	PERM	MJ	4.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	PERT	MJ	3.48E+00	5.82E-05	2.91E-03	1.42E-03	0.00E+00	1.24E-01
Non-renewable primary energy as energy carrier	PENRE	MJ	2.02E+01	9.51E-03	2.16E-01	4.71E-02	0.00E+00	-1.82E+00
Non-renewable primary energy as material utilization	PENRM	MJ	1.08E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	PENRT	MJ	2.03E+01	9.51E-03	2.16E-01	4.71E-02	0.00E+00	-1.82E+00
Use of secondary material	SM	kg	4.34E-02	3.95E-06	9.58E-05	1.83E-05	5.05E-05	0.00E+00
Use of renewable secondary fuels	RSF	MJ	1.10E-02	1.03E-08	1.22E-06	1.53E-07	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	7.34E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m^3	3.48E-02	6.18E-07	3.00E-05	-9.28E-05	1.96E-04	-8.76E-04

WASTE MATERIAL AND OUTPUT FLOW INDICATORS

Waste indicators describe waste generated within the life cycle of the product. Waste is categorised by hazard class, end-of-life fate and exported energy content.

Table 8: Waste categories and output flow indicators covering modules A1-A3, C1-C4 and D.

Inventory indicators – Waste material and output flow			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	HWD	kg	7.31E-03	1.06E-05	3.77E-04	1.21E-04	2.22E-04	-1.32E-11
Non-hazardous waste disposed	NHWD	kg	3.55E-01	1.45E-04	7.08E-03	1.36E-01	7.85E-01	4.04E-02
Radioactive waste disposed	RWD	kg	1.41E-04	1.04E-09	4.55E-08	2.19E-08	3.23E-08	8.54E-07
Components for re-use	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	3.26E-02	2.57E-08	1.63E-06	2.19E-01	1.78E-06	0.00E+00
Materials for energy recovery	MER	kg	1.47E-05	1.30E-10	1.30E-08	2.04E-09	4.52E-09	0.00E+00
Exported electrical energy	EEE	MJ	6.65E-04	4.31E-07	1.66E-05	8.52E-06	1.30E-05	0.00E+00
Exported thermal energy	EET	MJ	4.63E-04	2.27E-07	2.60E-05	3.23E-06	9.19E-06	0.00E+00

BIOGENIC CARBON CONTENT

1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Table 9: Biogenic carbon content covering modules A1-A3, C1-C4 and D.

Inventory indicators – Biogenic carbon content			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Biogenic carbon content – product	BCC-prod	kg C	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Biogenic carbon content – packaging	BCC-pack	kg C	1.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

For Speedpanel product, the following indicator is not relevant, hence result in zero values:

- Components for re-use (CRU) is zero since there are none produced.

EN15804+A1 CORE ENVIRONMENTAL IMPACT INDICATORS

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks. The EN 15804 reference package based on EF 3.1 is used.

Table 10: EN15804+A1 Environmental Impact Indicators

EN15804+A2 – Environmental indicators			Product stage	Deconstruction	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Indicator	**Abbr.**	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global warming potential	GWP (EN15804+A1)	kg CO_2-eq.	1.47E+00	1.14E-03	1.49E-02	3.31E-03	7.55E-03	-1.91E-01
Ozone depletion potential	ODP (EN15804+A1)	kg CFC11-eq.	5.72E-09	6.46E-12	1.57E-10	3.37E-11	1.44E-10	4.44E-15
Acidification potential	AP (EN15804+A1)	kg SO_2-eq.	8.22E-03	4.32E-06	4.39E-05	1.66E-05	3.63E-05	-1.71E-04
Eutrophication potential	EP (EN15804+A1)	kg PO_4^{3-}- eq.	2.58E-04	0.00E+00	0.00E+00	0.00E+00	8.81E-06	0.00E+00
Photochemical ozone creation potential	POCP (EN15804+A1)	kg Ethane eq.	4.18E-04	1.44E-06	2.92E-05	7.25E-06	2.46E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE (EN15804+A1)	kg Sb-eq.	1.91E-05	3.75E-09	4.68E-08	7.70E-09	2.15E-08	-9.79E-09
Abiotic depletion potential for fossil resources	ADPF (EN15804+A1)	MJ	1.41E+01	1.45E-02	2.16E-01	4.70E-02	1.78E-01	-1.87E+00

How to use this EPD

Speedpanel has developed this product specific EPD to help to showcase the environmental credentials of their modular building products.

To apply the results from this EPD to a specific product, the example calculation to product area, in 1 m^2, was provided. The representative data from this EPD need to be multiplied by the product mass per 1 m^2 (product's area density for a specific product thickness). Area density for all products covered by this EPD is provided on page 21.

Example of calculations are provided for the life cycle impact of a **Speedpanel, galvanised steel, 78 mm thickness, 435 kg/m^3 panel density (Speedpanel-435-78 galvanised), per 1 m^2**. The examples given is for GWP-total for Modules A1-A3, but the calculation method is the same regardless of the desired indicator.

EXAMPLE CALCULATION (MODULES A1-A3):

GWP-total results for Modules A1-A3 (kg CO_2-eq.): **1.49 kg**

Area density for Speedpanel, (Speedpanel-435-78 galvanised) = **39.4 kg/m^2**

GWP-total (Module A1-A3) for Speedpanel, (Speedpanel-435-78 galvanised) per 1 m^2= 1.49 kg CO_2-eq x 39.4 kg/m^2 = **58.7 kg CO_2-eq**

Indicator results for modules can be taken from tables in section Environmental Performance.

These calculations maybe used by specifiers and developers to calculate and present the environmental impacts of the particular construction projects.

GREEN STAR

Green Star is Australasia's largest voluntary sustainability rating system for non-residential buildings, fitouts and communities

This EPD can allow the represented products to qualify for points under the Green Building Council Australia (GBCA) Green Star rating system.

The Green Star rating system has also been adopted and adapted for New Zealand conditions by the New Zealand Green Building Council.

EPDS ARE NOT ALWAYS COMPARABLE

When comparing EPDs it is important to consider:

- EPDs within the same product category but from different programmes or utilising different Product Category Rules (PCRs) may not be comparable.
- EPDs of construction products may not be comparable if they do not comply with EN 15804 or if they are produced using different Product Category Rules
- EPDs of construction products from a group of manufacturers (industry-wide EPD) may not be comparable to an EPD of a similar construction product that has been generated by a single manufacturer (product-specific or manufacturer specific EPD).
- Understanding the detail is important in comparisons. Expert analysis is often required to understand the detail and ensure data is truly comparable, to avoid unintended distortions.
- The best way to compare products and materiality of differences is to place them into the context of a structure across the whole life cycle.

Conversion factors

CONVERSION FACTOR TABLE FOR SPEEDPANEL PRODUCT COVERED BY THIS EPD:

51

SPEEDPANEL 51MM	Area density (kg/m²)*
Speedpanel-435-51 galvanized	28.7
Speedpanel-450-51 galvanized	34.0
Speedpanel-550-51 galvanized	35.2
Speedpanel-650-51 galvanized	44.3
Speedpanel-750-51 galvanized	44.5
Speedpanel-850-51 galvanized	53.8
Speedpanel-950-51 galvanized	54.2

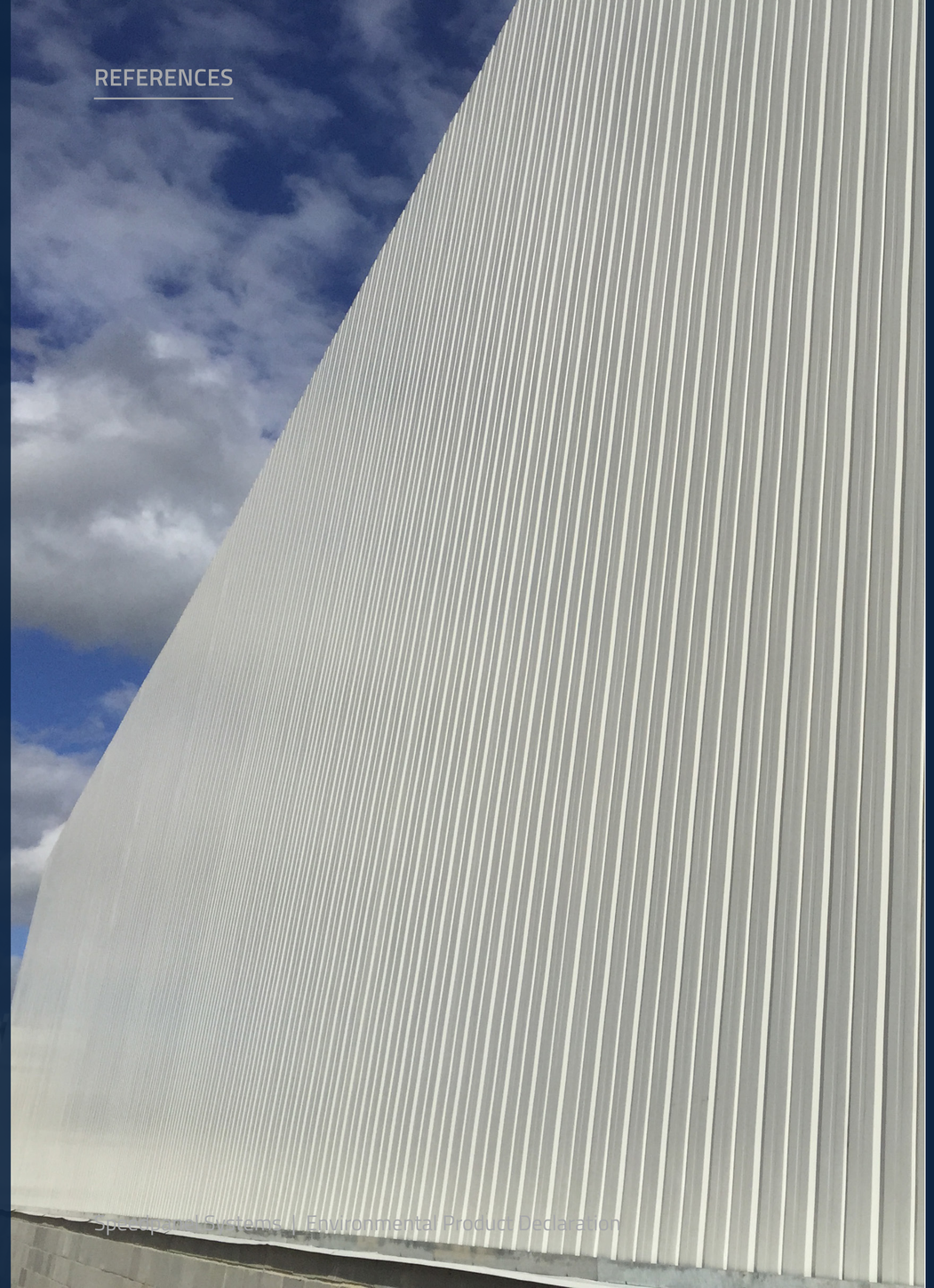
64

SPEEDPANEL 64MM	Area density (kg/m²)*
Speedpanel-435-64 galvanized	34.2
Speedpanel-550-64 galvanized	46.9
Speedpanel-650-64 galvanized	48.8
Speedpanel-750-64 galvanized	49.0
Speedpanel-850-64 galvanized	59.0
Speedpanel-950-64 galvanized	62.0

78

SPEEDPANEL 78MM	Area density (kg/m²)*
Speedpanel-435-78 galvanized	39.4
Speedpanel-435-78 galvanized and painted	39.4
Speedpanel-550-78 galvanized	52.2
Speedpanel-550-78 galvanized and painted	52.2
Speedpanel-650-78 galvanized	59.4
Speedpanel-650-78 galvanized and painted	59.4
Speedpanel-750-78 galvanized	60.1
Speedpanel-750-78 galvanized and painted	60.1
Speedpanel-850-78 galvanized	64.2
Speedpanel-850-78 galvanized and painted	64.2
Speedpanel-950-78 galvanized	87.4
Speedpanel-950-78 galvanized and painted	87.4

*Weight per square metre values are strictly indicative only. Panel weight subject to change based on, residual moisture, exposure to environmental factors and storage. Speedpanel strongly recommends seeking advice from a suitably qualified professional such as a engineer and/or other design consultant(s) when considering Speedpanel in project design.



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PROGRAMME-RELATED INFORMATION AND VERIFICATION

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Product Category Rules (PCR)		PCR 2019.14 Construction Products, version 1.3.4
PCR review conducted by		The Technical Committee of the International EPD® System See www.environdec.com for a list of members.
Review Chair		The most recent review chair: Claudia Peña, PINDA LCT SpA
Independent verification of the declaration and data, according to ISO 14025:2006		☐ EPD process certification (Internal) ☑ EPD verification (External)
Third party verifier		Mamoru Yanagisawa, Email: m.yanagisawa.epdverifier@gmail.com EPA Corporation, Japan Signature:
Verifier approved by		EPD Australasia
Procedure for follow-up of data during EPD validity involved third-party verifier		☐ Yes ☑ No

An Environmental Product Declaration, or EPD, is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a PCR (Product Category Rules).

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

The results for EN15804+A1 compliant EPDs are not comparable with EN15804+A2 compliant studies as the methodologies are different. Results that are EN15804+A1 compliant are given in this document to assist comparability across EPDs.

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