ASP™ access floors INTERNATIONAL

ENVIRONMENTAL PRODUCT DECLARATION OF

URBAN ACCESS FLOOR SYSTEMS

ENVIRONMENTAL PRODUCT DECLARATION (EPD)
IN ACCORDANCE WITH
ISO 14025: 2006 AND EN 15804+A2:2019/AC:2021

PROGRAMME: THE INTERNATIONAL EPD® SYSTEM www.environdec.com
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EPD of multiple products, based on the average results of the product group. The products covered in the EPD are Urban X heavy grade and Urban Interlock extra heavy grade.

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.coom

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AUSTRALASIA EPD® INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

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EPD Profile

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+A2 compliant EPDs are not comparable with EN15804+A1 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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CEN standard EN 15804 serve as the core Product Category Rules (PCR)
(PCR): PCR 2019.14 Construction Products, version 1.3.4 (published on 2024-04-30, valid until 2025-06-20)
PCR review was 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. The review panel may be contacted via the Secretariat: www.environdec.com/contact

Independent verification of the declaration and data, according to ISO 14025:2006, via:
[X] EDP verification by individual verifier

This EPD can help projects to achieve points under Green Building Council Australia (GBCA) Green Star rating tools, specifically Material credits (up to 7 credits total) and Responsible Building Material Credits (up to 3 credits) in the Green Star Design & As Built tool.

This version of the EDP has been updated to correct environmental impacts for Urban.

Third-party verification
Independent verification of the declaration and data, according to ISO 14025: 2006, via:
EPD verification by individual verification by individual verifier.

Third-party verifier: *Sazal Kundu (Edge Impact)*
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Verifier approved by: *EPD Australasia*

Procedure for follow-up of data during EPD validity involved third-party verifier
Yes [X]
No [ ]

Company Profile

ASP Access Floors Pty Ltd is a global leading company that specializes in manufacture, distribution, and installation of access floors around the world. Our sole mission at ASP is to provide all our clients with exceptional products and service.

Since our conception ASP has delivered some of the most effective solutions on the market. Through research and analysing current trends and problems that occur with access floors, we have already developed some of the most unique and effective products on the market.

Ease of Configuration

The modular design of the access floor enables businesses to re-configure their offices.

Cost

The cost differentiation between the installation and maintenance of traditional suspended ceiling system vs. ASP access floor system are exceptionally high. Overall access floors are approximately 40% cheaper to install and maintain services.

Project Timeline

Installing services in the floor in lieu of the suspended ceiling system dramatically cuts the time of installation, which in turn cuts the overall project construction time.

Maintenance

Services can be maintained regularly and without lengthy time delays as service personnel are able to isolate and service zones as required, which minimizes the interruptions to your work.

Comfort

With HVAC system installed in the floor, employees can individually control air pressure and temperature through their office floor diffusers.

The use of access floors in the workplace is rapidly gaining popularity within the construction industry. Their specifically designed flexibility and capacity to change has made access floors the perfect solution for many owners, developer, designers and facility managers.

Product Description

The use of access floors in the workplace is rapidly gaining popularity within the construction industry. Their specifically designed flexibility and capacity to change has made access floors the perfect solution for many owners, developers, designers and facility managers.
An access floor is used to provide a controlled cavity in-between the slab and access floor panel where all electrical, data and power services can be distributed. The modular design of the access floor allows you the flexibility to alter a building's service layouts to accommodate your technological and space driven operations.
An access flooring system is made up of floor panels and pedestals designed to allow for easy access to various under floor service cabling for power, data, hydraulics and fire.

To meet the wide range of needs in such a diverse market, ASP Access Floors have developed a number of flexible access floor systems. This EPD covers the Urban Series. ASP Access Floor's Urban Series is used in a variety of applications e.g. general office areas, education facilities, banks, libraries and many more. Before designing the layout and functionality of an access floor, the load capacity and tolerance is determined (concentrated load, ultimate load, uniform load, impact load, rolling load) and the relevant ASP Access Floors componentry is selected. The Urban Series allows for both functionality and design flexibility with its strength and composition. It is comprised of 2 different panel types, the Urban Panel and the Urban Interlock Panel.

EPD Product Inclusions

Urban X System is a stringer-less system where the panels are individually screw fixed onto the pedestal heads. This system is widely used for electrical and data cable management. This system is recommended for applications such as general offices, banks, learning institutions and libraries.

The **Urban Interlock** Panel has been designed for applications where stone or tile finishes are to be applied. The panels specially designed interlock edge profile ensures panels remain locked together, eliminating movement. The Interlock system provides an interlocked design, which ensures no movement and so eliminates the need for substrates. This elimination of substrates means the Interlock System is a cost and time efficient design solution.

Table 1: Industry Classification

PRODUCT	CLASSIFICATION	CODE	CATEGORY
Urban Access Floor Systems	UN CPC Ver.2	37550	Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone
	ANZSIC 2006	324	Building Completion Services

The EPD will be of multiple products, based on the weighted average results of the product group. Grouping is done based on the weighted average production of the products. The products included within the study are:

→ Urban X Heavy grade (4.5kN) with S4 Pedestal
→ Urban Interlock Extra Heavy Grade (6.0kN) with S4 Pedestal

EPD Product Inclusions

PRODUCT NAME	PANEL	FFH	PEDESTALS
Urban S S2	Heavy grade (4.5kN) 600x600mm Urban panel	65 – 110mm	S2 Pedestal
Urban X S4	Heavy grade (4.5kN) 600x600mm Urban panel	110 – 180mm	S4 Pedestal
Urban X S6	Heavy grade (4.5kN) 600x600mm Urban panel	180 - 800mm	S6 Pedestal
Urban IL S2	Extra heavy grade (6.0kN) 600x600mm Urban panel	65 – 110mm	S6 Pedestal
Urban IL S4		110 – 180mm	
Urban IL S6		180 – 800mm	

The declared unit (DU) and reference flow is 1 square meter (m^2) of access floor installed, which converts to a mass of 55.6kg. The Technical service life of the product is 100 years. The product is expected to last the lifespan of the building.

Content Declaration

The content declaration for this EPD of multiple products is based on the average results of the product group.

Table 2: Content declaration for one square meter of product

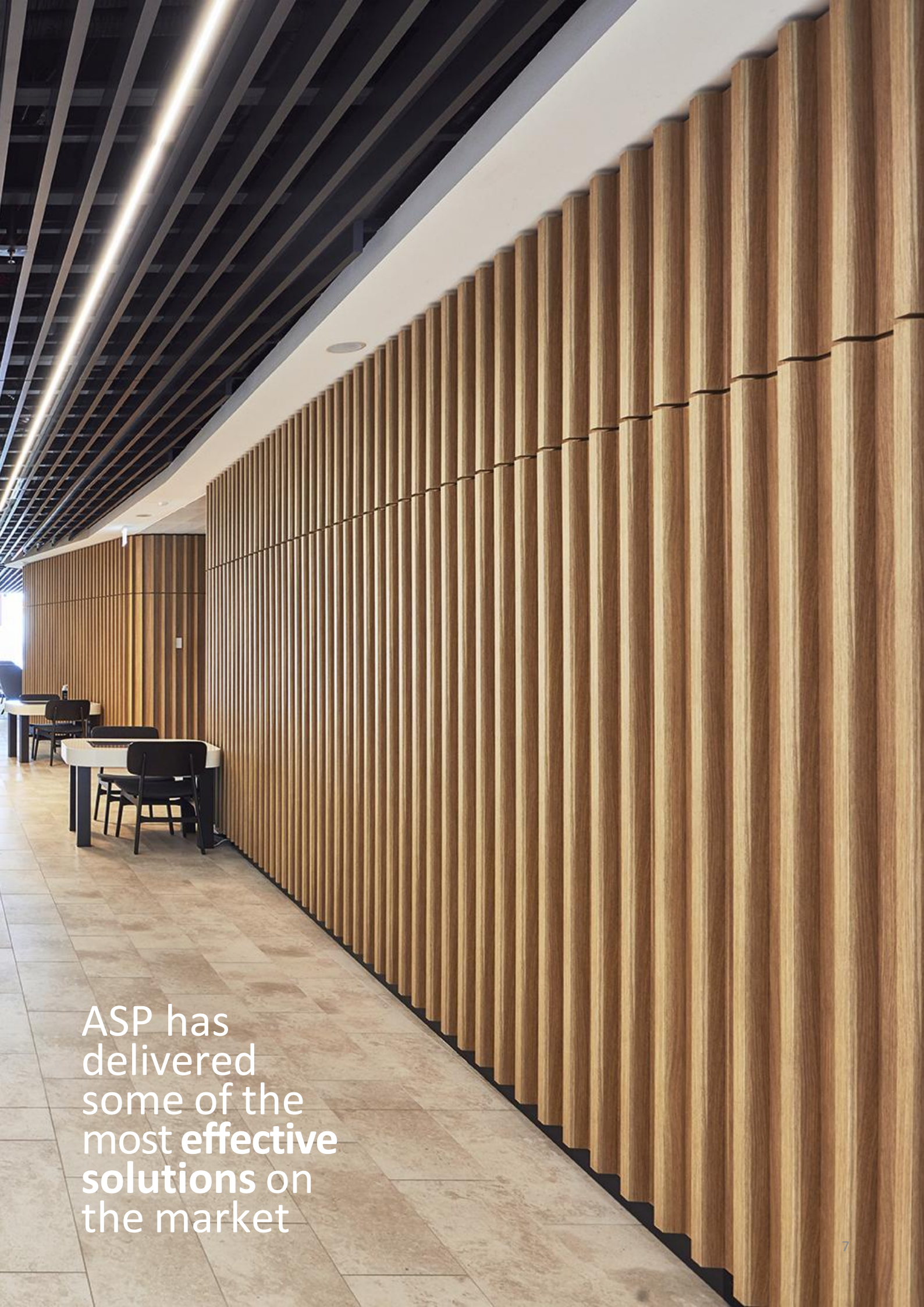
PRODUCT COMPONENTS	AVERAGE URBAN ACCESS FLOOR WEIGHT, KG	POST-CONSUMER RECYCLED MATERIAL, WEIGHT-% OF PRODUCT	BIOGENIC MATERIAL, WEIGHT-% OF PRODUCT	BIOGENIC MATERIAL, KG C/M2
Steel	8.47	14.9	0	0
Gypsum powder	28.6	0	0	0
Water	10.5	0	0	0
Cement	2.72	4.79	0	0
Pulp - fibre	2.86	0	2.98	1.49
Glue	0.832	0	0	0
Screws	0.980	0	0	0
Sum	**55.1**	**19.7**	**2.98**	**1.49**

Table 3: Content declaration for one square meter of product

PACKING MATERIALS	AVERAGE URBAN ACCESS FLOOR WEIGHT, KG	WEIGHT-% (VERSUS THE PRODUCT)	BIOGENIC MATERIAL, KG C/M2
Cardboard	0.388	0.704	0.0655
Wood	0.0776	0.140	0.265
Steel	0.0499	0.906	0
Sum	**0.515**	**1.675**	**0.331**

Dangerous substances from the candidate list of SVHC for Authorisation

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".



ASP has delivered some of the most **effective solutions** on the market

Production

Urban X Panel

The Urban X panel is composed of calcium sulphate core, wrapped in galvanised steel, creating a strong durable panel suitable for commercial environments. The standard Urban panel (600mm x 600mm) consists of a die formed steel top and lower sheet with corrosion resistant protection. The steel used has a verified recycled content of 97%.
These steel sheets encapsulate the calcium sulphate core, which is composed of predominately calcium sulphate (gypsum) and recycled pulp fibre. The background data for recycled pulp inputs is recycled paper in China. This provides a conservative estimate of environmental impact, as the panel inputs are only part of the recycled paper process.

Urban Interlock Panel

The urban interlock system is designed for applications where stone or tile flooring finishes are to be installed. Interlock panels remain locked together and eliminate movement through the specially designed interlocking edge. Similar to the Urban X panel, urban interlock consists of a reinforcing steel bottom plate and calcium sulphate core, however the interlock system has no top plate. Panels interlock to adjacent panels and are screw fixed to the pedestal head at all four corners.

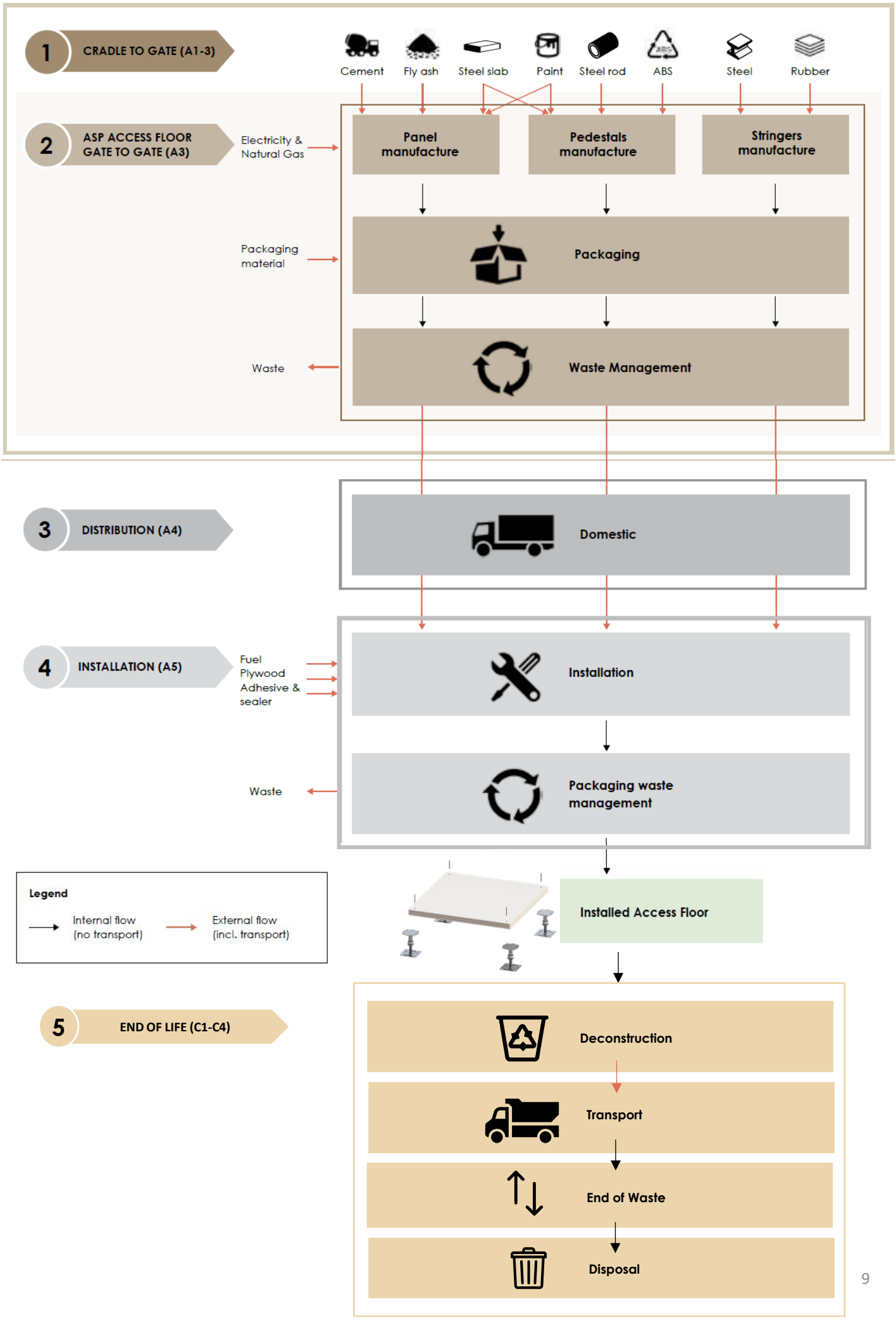
System Under Structure

The under-structure system is composed of Field and Perimeter Pedestals consisting of a head and a base, attached together with a gasket. Different combinations are available to control the cavity height. This EPD relates to perimeter pedestal S4.

Perimeter Pedestal S4

The pedestal base, head and rod are hot dipped, galvanised steel, to form a solid support to which the access floor panel is fixed. The pedestals are finished with an ABS locating gasket. A 90mm x 90mm steel flat head plate provides a solid base for the panelspanels, and an attached plastic gasket allows for panel alignment. A steel tube located below the head acts as an adjustment shaft.

Manufacturing Process



System Boundaries

This study and EPD have a scope of 'cradle-to-gate with modules A4, A5, C1-C4 and module D', as shown in Table 2 5. The production stage (Modules A1-A3) includes all aspects of access floor production from cradle to gate, utilising elementary and product flows.

Table 4: Modules included in the scope of the EPD

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
	Raw material supply	Transport of raw materials	Manufacturing	Transport to customer	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport to waste processing	Waste processing	Disposal	Reuse - Recovery- Recycling- potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	CN	AU	AU	-	-	-	-	-	-	-	AU	AU	AU	AU	AU
Specific Data	<2.4					-	-	-	-	-	-	-	-	-	-	-	-
Variation: Products	15%					-	-	-	-	-	-	-	-	-	-	-	-
Variation: Sites	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 impacts related to the manufacturing processes (primarily electricity and natural gas) and raw material transportation.

The processes below are included in the product system to be studied. For modules beyond A3, the scenarios included are currently in use and are representative for one of the most probable alternatives.

Product stage (Modules A1-A3)

All components of the Urban flooring system are manufactured, assembled and supplied by Changzhou Wujin Zhongtian Computer-Room Equipment Co. Ltd in China.

Angela Zlater (ASP's Marketing manager) provided primary data for product manufacturing, distribution, installation, and end-of-life for the calendar year 2022 (1st January 2022- 31st December 2022).

Module A1 (raw material supply) includes the production of metals, panel raw materials, plastics as received by the supplier. Module A2 (transportation) includes the transport of these raw materials from producers to the supplier. All raw materials are produced within 100 km distance, and transport by truck was assumed. Module A3 (manufacturing) includes the processing of the raw materials into the finalised components ready to be assembled; this includes the production of the galvanised steel, calcium sulphate core and pedestals. Module A3 also includes the packaging of the finished components.

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

Construction stage (Modules A4, A5)

Distribution includes transport of product to customers (A4) in Australia. The weighted average transport distances and mode (Table 5) is based on sales freight information. This is an average scenario that may not be representative for any given customer. Customers should individually establish the transport requirements between distribution centre and their site rather than relying on the average.

Table 5: Transport to building site

SCENARIO INFORMATION	UNIT (EXPRESSED PER FUNCTIONAL UNIT OR PER DECLARED UNIT)
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat etc.	Truck, Euro 0 - 6 mix, 20 - 26t gross weight / 17.3t payload capacity Container ship, 5,000 to 200,000 dwt payload capacity, deep sea
Distance	235 km truck 8584 km ship
Capacity utilisation (including empty returns)	50% truck 48% ship
Bulk density of transported products	1300 kg/m^3
Volume capacity utilisation factor (factor: =1 or < 1 or ≥ 1 for compressed or nested packaged products)	Not applicable

After being delivered on site, access floor parts (panels, pedestals, and fixing screws) are unpacked and installed. Depending on the building site, the product can be mechanically lifted using diesel machinery. As a conservative assumption, fuel consumption was estimated using the gravitational energy potential for the heaviest product from ASP Access Floors, lifted 20 m with a 10% diesel efficiency.

Table 6: Installation of the product in the building

SCENARIO INFORMATION	UNIT (EXPRESSED PER FUNCTIONAL UNIT OR PER DECLARED UNIT)
Ancillary materials for installation (specified by material);	0.005 L Floor sealer (Epoxy resin) 0.0003 kg Sealer packaging PP 0.0346 kg Glue 0.0014 kg Glue packaging PP 3.45 kg Plywood
Water use	0 m^3
Other resource use	0 kg
Quantitative description of energy type and consumption during the installation process	0.002 L Diesel
Waste materials on the building site before waste processing, generated by the product's installation (specified by type	0 kg
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	1 m^2 Plywood to landfill
Direct emissions to ambient air, soil and water	0 kg

End of Life (Modules C1-C4)

When a building reaches its end-of-life it will be demolished (C1) and the demolition waste transported to a processing facility (C2). The waste processing (C3) includes the separation of steel waste from other building materials and shredding activities. Material that cannot be recycled will be disposed (C4). The end-of-life stage (Modules C1-C4) and resource recovery stage (Module D) are modelled using a scenario reflecting end-of-life recycling/ landfilling rates for steel products in the construction sector.

Table 7: End of life scenarios for products

PROCCESS	UNIT (PER DECLARED UNIT AND BY TYPE OF MATERIAL)	SOURCE
Collection process specified by type	Equivalent weight of 1 m^2 of access flooring	
Recovery system specified by type	Metals, 13% to landfill, 87% recycled	(Australian Government, 2022)
	Plastics, 95% to landfill, 5% energy recovery. The Australian Government informs 11% of construction and demolition plastic waste is recycled, but since disassembling of components would be challenging for this product, we assumed this share is landfilled.	
	All other material landfilled	
Disposal specified by type	Steel: 2% modelled as ferrous metals in landfill Waste core: 100% Inert matter on landfill Plastic: 95% Plastic waste on landfill Plastic: 5% Plastic in municipal waste incineration plant	
Assumptions for scenario development	C1 - Demolishing with an Excavator (100 kW)- Fuel consumption is calculated at 0.172 kg diesel input per tonne of material. C2 - 50 km of transport by truck C3 - 0.2 MJ of electrical energy from the Australian grid needed to process 1 kg of scrap.	

Recovery and Recycling potential (Module D)

Module D declares a potential credit or burden for the net scrap associated with ASP Access Floors' products. Net scrap is the amount of scrap left after scrap from post-consumer needs are removed from scrap produced from product. That is, secondary product used in product manufacture is subtracted from the overall amount of recycled product after the first life cycle. If the net balance is positive, a credit given. The credit is calculated by comparing the impacts associated with primary product produced.

Life cycle inventory (LCI) data and assumptions

Primary data were used for all manufacturing operations up to the factory gate, including upstream data for raw materials and packaging inputs. Primary data were collected for ASP Urban products manufactured by ASP for the 12-month period between 1 January 2022 to 31 December 2022. No changes to production technology have occurred since the data collection period and hence the data continues to be representative of current practice.

Upstream data

Australian and Chinese-specific datasets have been used where available, including the Chinese electricity mix regionalised for East China. Other energy sources generally use Chinese (for production) or Australia (for installation) datasets, for example, diesel. Water inputs are modelled as tap water, regionalised for China. The upstream production impacts for materials used in the products were calculated based on the quantities in the Bill of Materials, uplifted for any production waste, and using dataset specific impacts extracted from Sphera databases.

LCA software and database

Sphera Solutions LCA for Experts (LCAFE, formerly known as GaBi) software version 10.7 was used together with Sphera Managed LCA Content database version 2024.1 (Sphera 2024) for all data in the background system. Most datasets have a reference year between 2015 and 2023 and all fall within the 10-year limit allowable for generic data under EN 15804.

Electricity

At the time of conducting this LCA, ASP was using 100% hydroelectricity at their manufacturing site. Prior to publication, ASP has installed solar at their site. The significance of this change is likely to be small, but ASP will review it once they have a full 12 months of data with the solar and hydroelectricity mix.

ASP Access Floors has committed to source electricity with a Guarantee of Origin for the next six months and beyond.

The composition of the electricity grid mix is modelled in LCAFE based on published data for the year 1 January 2022 – 31 December 2022. Purchased electricity accounts for approximately 100% of electricity used for Access Floor manufacture.

For the ASP manufacturing facility 100% renewable electricity is contracted from Three Gorges hydroelectric power generation, China. Manufacture of Access floor systems and related parts is 100% generated from hydroelectric power, provided in Annex A.

The emission factor for the Chinese hydroelectric power for the GWP-GHG indicator is 0.00749 kg CO2e/kWh (based on EF 3.1).

Transport

Transport data was collected from ASP for all input materials to all sites. The transport data included the transport modes and distances from suppliers. Transport distances were mapped against each line of BOM data and used to calculate upstream transport impacts using the calculated input volumes. Where transport data was not available, a standard value of 100 km was used.

Explanation of Average Products & Variation

This EPD is of multiple products, based on the average results of the product group. The grouping is based on the weighted average production of Urban X heavy grade and Urban interlock extra heavy grade.

The variation of GWP-GHG is 15% for modules A1-A3, so the variation range across all indicators for modules A-C is declared in Range/variability.

Cut off criteria

Personnel-related processes are excluded as per section 4.3.2 in the PCR (EPD International, 2024).

thinkstep-anz consistently excludes environmental impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the foreground production process, ('capital goods') regardless of potential significance. High-quality infrastructure-related data isn't always available and there is no clear cut-off for what to include. For this reason, capital goods data are applied to LCA studies inconsistently. This is expected to lead to reduced consistency and comparability of EPDs. Capital goods were previously excluded from EPDs, thus including capital goods in current EPDs would further reduce their comparability.

Infrastructure used in electricity generation is included as standard in the LCAFE datasets, as this is important for renewable [1]generation .

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

[1]The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, non-cancer 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. (CEN, 2019).

Allocation

Where subdivision of processes was not possible, allocation rules listed in PCR chapter 4.5 have been applied. Multi-output allocation generally follows the requirements of ISO 14044, section 4.3.4.2. When allocation becomes necessary during the data collection phase, the allocation rule most suitable for the respective process step is applied and documented along with the data collection procedures and product system. Allocation of background data (energy and materials) taken from the MLC databases is documented online at https://sphera.com/product-sustainability-gabi-data-search/

Assumptions

The main assumptions concern the use of secondary data and end-of-life modelling.

For modules A1-A3, two of the most impactful materials are steel and calcium sulphate core used in the production of the panels and pedestals. We tested the variation of impacts of these two elements upon variation of ±10% of the materials inputs. We see that ±10% steel and core vary most impacts from ±13%, and up to 9% for the calcium sulphate core. In another words, the proxy data used for steel and gypsum may have influence in the LCA results.

Plywood used to protect the ASP flooring during installation was assumed to be used in all cases, which is the conservative approach. Also, when plywood is used, it's usually sent to landfill as final destination, but other end-of-life options, such as reuse, could apply.

The scenarios included are currently in use and are representative for one of the most probable alternatives for modules A4, A5, and C1-C4.

Our sole mission at ASP is to provide all of our clients with **exceptional sustainable products**

Assessment Indicators

The results tables describe the different environmental indicators for each product per declared unit, for each declared module. The EN 15804+A2 reference package based on EF 3.1 is used.

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.

Table 8: Core environmental impact indicators (based on EF3.1)

INDICATOR	DESCRIPTION	ABBREVIATION	UNIT	REFERENCE
Climate change - total	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	GWP-total	kg CO_2-eq.	(IPCC, 2021)
Climate change - fossil		GWP-fossil	kg CO_2-eq.	(IPCC, 2021)
Climate change - biogenic		GWP-biogenic	kg CO_2-eq.	(IPCC, 2021)
Climate change - land use and land use change		GWP-luluc	kg CO_2-eq.	(IPCC, 2021)
Ozone Depletion	A measure of air emissions that contribute to the depletion of the stratospheric ozone layer. Depletion of the ozone leads to higher levels of UVB ultraviolet rays reaching the earth's surface with detrimental effects on humans and plants	ODP	kg CFC11-eq.	(WMO, 2014)
Acidification	A measure of emissions that cause acidifying effects to the environment. The acidification potential is a measure of a molecule's 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.	AP	Mole of H^+ eq.	(Seppälä, 2016; Posch, 2008)
Eutrophication aquatic freshwater	Eutrophication covers all potential impacts of excessively high levels of macronutrients, the most important of which nitrogen (N) and phosphorus (P). Nutrient enrichment may cause an undesirable shift in species composition and elevated biomass production in both aquatic and terrestrial ecosystems. In aquatic ecosystems increased biomass production may lead to depressed oxygen levels, because of the additional consumption of oxygen in biomass decomposition.	EP-fw	kg P eq.	(Struijs, 2009)
Eutrophication aquatic marine		EP-fm	kg N eq.	(Struijs, 2009)
Eutrophication terrestrial		EP-tr	Mole of N eq.	(Seppälä, 2016; Posch, 2008)
Photochemical ozone formation	A measure of emissions of precursors that contribute to ground level smog formation (mainly ozone O_3), produced by the reaction of VOC and carbon monoxide in the presence of nitrogen oxides under the influence of UV light. Ground level ozone may be injurious to human health and ecosystems and may also damage crops.	POCP	kg NMVOC eq.	(van Zelm, 2008)
Depletion of abiotic resources - minerals and metals*	The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources. Depletion of mineral resources is assessed based on ultimate reserves.	ADP-mm	kg Sb-eq.	(van Oers, de Koning, Guinée, & Huppes, 2002; Guinée, et al., 2002)
Depletion of abiotic resources - fossil fuels*	The consumption of non-renewable resources leads to a decrease in the future availability of the functions supplied by these resources.	ADP-fossil	MJ	(van Oers, de Koning, Guinée, & Huppes, 2002)
Water use*	A measure of the net intake and release of fresh water across the life of the product system.	WDP	m^3 world equiv.	(Boulay, Bare, Benini, & et al, 2018)

*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.

Table 9: Resource use indicators

INDICATOR	ABBREVIATION	UNIT
Renewable primary energy as energy carrier	PERE	MJ
Renewable primary energy resources as material utilization	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Non-renewable primary energy as energy carrier	PENRE	MJ
Non-renewable primary energy as material utilization	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material;	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Total use of net fresh water	FW	m^3

Table 10: Waste material and output flow indicators

INDICATOR	ABBREVIATION	UNIT
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste disposed	RWD	kg
Components for reuse	CRU	kg
Materials for energy recovery	MER	kg
Materials for recycling	MFR	kg
Exported electrical energy	EEE	MJ
Exported thermal energy	EET	MJ

Assessment Indicators

Table 11: Additional Environmental Impact Indicators

INDICATOR	DESCRIPTION	ABBREVIATION	UNIT	REFERENCE
GWP-GHG*	Impact of low dose ionizing radiation on human health of the nuclear fuel cycle and ionizing radiation from the soil, radon, and some construction materials. Effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities are not considered.	IRP	kBq U235-eq.	(Frischknecht, Braunschweig, Hofstetter, & Suter, 2000)
Respiratory inorganics	Toxic effect on aquatic freshwater species in the water column	ETP-fw	Comparative toxic units (CTU_h)	(Rosenbaum, et al., 2008)
Ionizing radiation - human health**	A measure of the impact of chemical emissions on human health	HTPc	Comparative toxic units (CTU_h)	(Rosenbaum, et al., 2008)
Eco-toxicity - freshwater	A measure of the impact of chemical emissions on human health	HTPnc	Comparative toxic units (CTU_h)	(Rosenbaum, et al., 2008)
Human toxicity, cancer***	This index is the result of the aggregation, performed by JRC, of the 4 indicators provided by LANCA model for assessing impacts due to land use	SQP	Dimensionless, aggregated index of: kg biotic production / (m^2 *a) kg soil / (m^2 *a)	(Bos, Horn, Beck, Lindner, & Fischer, 2016)
Human toxicity, non-cancer***	Impact of low dose ionizing radiation on human health of the nuclear fuel cycle and ionizing radiation from the soil, radon, and some construction materials. Effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities are not considered.	IRP	kBq U235-eq.	(Frischknecht, Braunschweig, Hofstetter, & Suter, 2000)
Land use related impacts / soil quality***	Toxic effect on aquatic freshwater species in the water column	ETP-fw	Comparative toxic units (CTU_h)	(Rosenbaum, et al., 2008)

*This indicator is calculated according to provisions from PCR 1.3.4, section 5.4.5, that is, "GWP-GHG indicator is identical to GWP-total except that the characterisation factor (CF) for biogenic CO_2 is set to zero". Please note that due to biogenic CH_4 emissions in landfill, the results from modules A-C are not identical for GWP-GHG and GWP-total, as required in the PCR, because they will have different CF for biogenic CO_2 but not for CH_4. Similarly, due to biogenic CH_4 emissions in landfill, uptake and emissions of biogenic CO_2 are not "balanced out", as also required in the PCR. Details of EoL modelling are in section 3.2.6.

** 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 from some construction materials is also not measured by this indicator.

***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. It shall be noted that the above impact categories represent impact potentials, i.e., they are approximations of environmental impacts that could occur if the emissions would (a) actually follow the underlying impact pathway and (b) meet certain conditions in the receiving environment while doing so. In addition, the inventory only captures that fraction of the total environmental load that corresponds to the functional unit (relative approach). LCIA results are therefore relative expressions only and do not predict actual impacts, the exceeding of thresholds, safety margins, or risks.

Table 12: Biogenic Carbon Content Indicators

INDICATOR	ABBREVIATION	UNIT
Biogenic carbon content - product	BCC-prod	kg
Biogenic carbon content - packaging	BCC-pack	kg

Table 13: Biogenic Carbon Content Indicators

INDICATOR	ABBREVIATION	UNIT
Global warming potential (total)	GWP	kg CO_2-eq.
Depletion potential of the stratospheric ozone layer	ODP	kg CFC11-eq.
Acidification potential of land and water	AP	kg SO_2-eq.
Eutrophication potential	EP	kg PO_4^{3-}- eq.
Photochemical ozone creation potential	POCP	kg C_2H_4-eq.
Abiotic depletion potential – elements	ADPE	kg Sb-eq.
Abiotic depletion potential – fossil fuels	ADPF	MJ

For Urban X heavy grade and Urban Interlock extra heavy grade the following indicators are not relevant, hence result in zero values:

- Materials for energy recovery (MER) is zero since no credits are claimed for any incinerated wastes, applying the cut-off approach.
- Exported thermal energy (EET) is zero since there is none produced.

Environmental Performance

The following tables show the results for one results for one square meter of Urban installed.

Table 14: Core environmental impact indicators for 1m² of access floor installed

ABB.	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq.	1.06E+01	9.19E+00	9.83E+00	3.65E-02	2.13E-01	0.00E+00	4.62E+00	1.23E+01
GWP-fossil	kg CO_2 eq.	2.17E+01	9.19E+00	3.92E+00	3.49E-02	2.13E-01	0.00E+00	1.68E-03	1.23E+01
GWP-biogenic	kg CO_2 eq.	-1.11E+01	-8.99E-05	5.90E+00	1.52E-03	-4.67E-05	0.00E+00	4.62E+00	-7.73E-02
GWP-luluc	kg CO_2 eq.	1.87E-02	2.36E-04	9.65E-04	1.00E-06	5.99E-06	0.00E+00	1.65E-06	1.72E-03
ODP	kg CFC 11 eq.	6.24E-11	2.92E-13	7.27E-12	1.22E-15	7.30E-15	0.00E+00	1.65E-15	-3.41E-11
AP	mol H^+ eq.	8.24E-02	2.65E-01	2.90E-02	1.67E-04	1.19E-03	0.00E+00	4.26E-06	2.78E-02
EP-freshwater	kg P eq.	5.51E-05	1.46E-06	5.61E-06	5.96E-09	3.56E-08	0.00E+00	3.00E-07	2.96E-06
EP-marine	kg N eq.	2.06E-02	6.75E-02	1.26E-02	8.12E-05	5.97E-04	0.00E+00	3.49E-06	4.28E-03
EP-terrestrial	mol N eq.	2.19E-01	7.39E-01	1.12E-01	8.89E-04	6.56E-03	0.00E+00	1.53E-05	3.66E-02
POCP	kg NMVOC eq.	5.51E-02	1.87E-01	5.07E-02	2.31E-04	1.14E-03	0.00E+00	8.41E-06	1.85E-02
ADP-m&m	kg Sb eq.	1.81E-04	1.78E-07	1.16E-06	7.56E-10	4.51E-09	0.00E+00	3.60E-11	7.41E-05
ADP-fossil	MJ	2.50E+02	1.11E+02	6.32E+01	4.72E-01	2.82E+00	0.00E+00	1.23E-02	1.22E+02
WDP	m^3 world eq. deprived	3.75E+00	1.42E-02	1.76E+00	5.89E-05	3.52E-04	0.00E+00	6.12E-05	5.24E-01

Table 15: Resource use indicators for 1m² of access floor installed

ABB.	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	1.06E+02	1.74E-01	1.14E+02	1.09E-03	6.51E-03	0.00E+00	4.10E+01	-1.03E+01
PERM	MJ	4.87E+01	0.00E+00	-6.23E+00	0.00E+00	0.00E+00	0.00E+00	-4.10E+01	0.00E+00
PERT	MJ	1.54E+02	1.74E-01	1.08E+02	1.09E-03	6.51E-03	0.00E+00	1.30E-03	-1.03E+01
PENRE	MJ	2.46E+02	1.11E+02	6.31E+01	4.72E-01	2.82E+00	0.00E+00	3.39E+00	1.22E+02
PENRM	MJ	3.38E+00	0.00E+00	8.11E-02	0.00E+00	0.00E+00	0.00E+00	-3.38E+00	0.00E+00
PENRT	MJ	2.50E+02	1.11E+02	6.32E+01	4.72E-01	2.82E+00	0.00E+00	1.23E-02	1.22E+02
SM	kg	5.32E+01	0.00E+00	1.35E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FWT	m^3	1.05E-01	2.86E-04	3.47E-02	1.19E-06	7.12E-06	0.00E+00	1.86E-06	1.32E+00

Table 16: Waste material and output flow indicators for 1m² of access floor installed

ABB.	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	7.79E-07	2.42E-09	4.13E-08	1.03E-11	6.14E-11	0.00E+00	2.19E-12	9.68E-07
NHWD	kg	2.02E+00	1.85E-03	2.02E+00	7.84E-06	4.68E-05	0.00E+00	1.45E-02	-1.58E+00
RWD	kg	4.57E-03	1.65E-05	2.57E-04	6.98E-08	4.17E-07	0.00E+00	1.50E-07	-1.62E-05
CRU	kg	0.00E+00	0.00E+00	6.57E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	1.55E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.96E-04	0.00E+00	0.00E+00
MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	3.62E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 17: Additional environmental impact indicators for 1m² of access floor installed

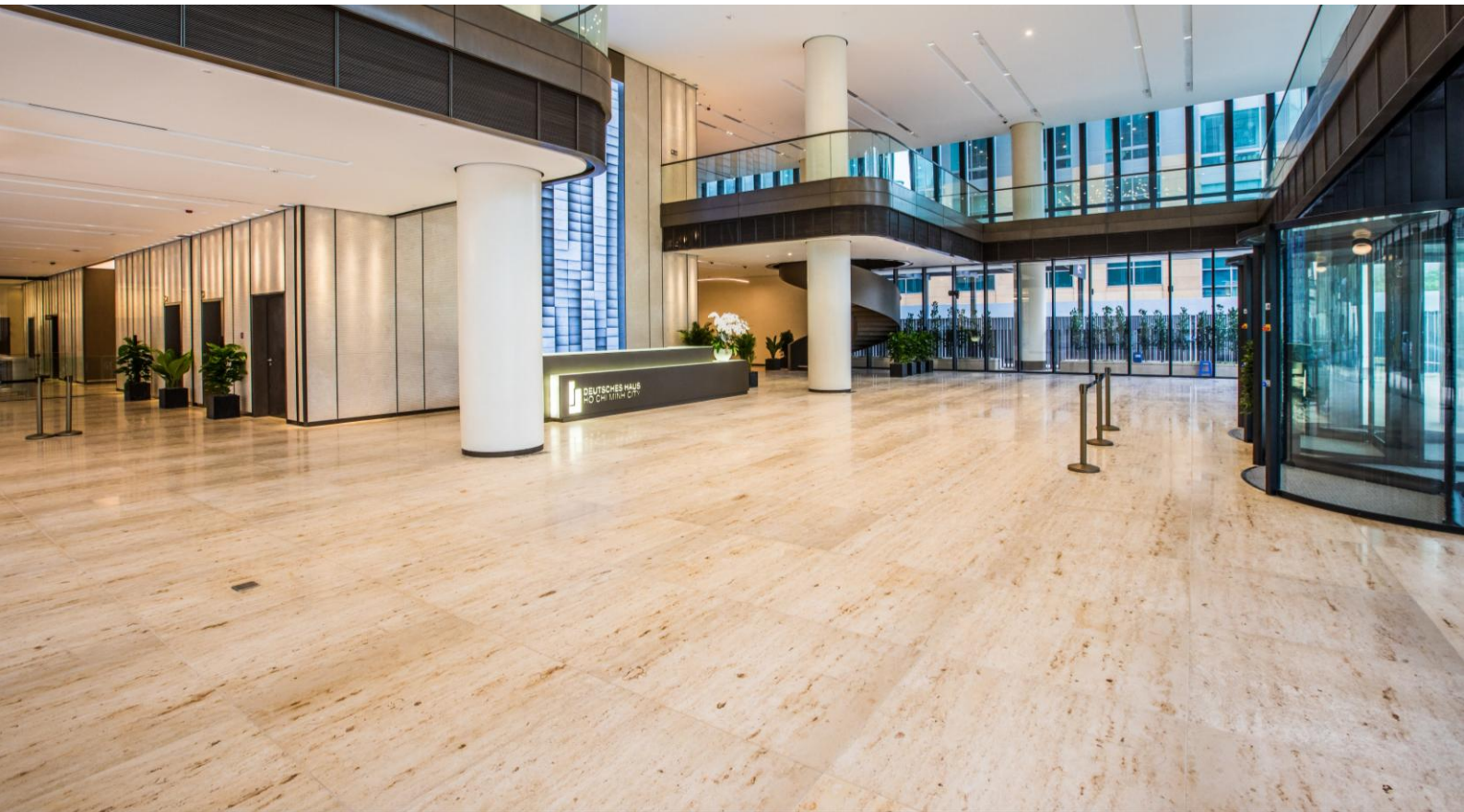
ABB.	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG	kg CO_2-eq.	2.23E+01	9.34E+00	1.46E+01	3.56E-02	2.17E-01	0.00E+00	1.42E-02	1.28E+01
GWP-GHG (IPCC AR5)	kg CO_2-eq.	9.88E+00	-6.82E-01	-4.44E+00	2.54E-02	4.89E-02	1.99E-02	1.90E+00	1.64E-01
PM	Disease incidences	1.60E-06	4.67E-06	4.00E-07	2.02E-09	7.58E-09	0.00E+00	4.36E-11	2.57E-07
IR	kBq U235 eq.	4.98E-01	1.45E-03	2.93E-02	6.15E-06	3.67E-05	0.00E+00	2.22E-05	-2.94E-01
ETf	CTUe	7.28E+01	2.70E+01	2.41E+01	1.14E-01	6.83E-01	0.00E+00	1.43E-02	5.01E+00
HTc	CTUh	1.52E-06	4.65E-10	3.68E-09	1.97E-12	1.19E-11	0.00E+00	3.26E-13	-5.44E-09
HTnc	CTUh	1.94E-07	1.14E-08	3.55E-08	4.71E-11	2.79E-10	0.00E+00	2.15E-11	-2.75E-08
LU	Pt	1.62E+02	1.47E-01	2.84E+00	6.23E-04	3.72E-03	0.00E+00	1.37E-03	1.50E+00

Table 18: Biogenic carbon content indicators for 1m² of access floor installed

ABB.	UNIT	A1-A3
BCC-prod	kg	1.43E+00
BCC-pack	kg	2.18E-01

Table 19: EN15804+A1 indicators for 1m² of access floor installed

ABB.	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	kg CO_2 eq.	1.04E+01	9.12E+00	8.19E+00	3.61E-02	2.11E-01	0.00E+00	4.62E+00	1.21E+01
ODP	kg CFC-11 eq.	7.35E-11	3.44E-13	1.22E-11	1.44E-15	8.59E-15	0.00E+00	1.94E-15	-4.02E-11
AP	kg SO_2 eq.	6.59E-02	2.12E-01	2.18E-02	1.16E-04	8.09E-04	0.00E+00	3.26E-06	2.39E-02
EP	kg PO_4^{3-} eq.	7.73E-03	2.26E-02	4.56E-03	2.72E-05	2.01E-04	0.00E+00	1.17E-05	1.45E-03
POCP	kg C_2H_4 eq.	3.12E-03	8.72E-03	8.80E-03	1.30E-05	-3.53E-04	0.00E+00	2.91E-06	6.03E-03
ADPE	kg Sb eq.	1.81E-04	1.78E-07	1.15E-06	7.56E-10	4.52E-09	0.00E+00	3.70E-11	7.41E-05
ADPF	MJ	2.29E+02	1.10E+02	6.24E+01	4.66E-01	2.78E+00	0.00E+00	1.16E-02	1.28E+02



Range/variability

Variation of the grouped results across modules A-C in relation to the weighted average result for each group is shown in Table 0 7. The variation of the indicator GWP-GHG across modules A1-A3 is >10%, hence the variation of all core indicators is presented.

Table 12: Variation of individual results across modules A-C

INDICATOR	VARIATION TO WEIGHTED AVERAGE RESULTS	
	Urban X Heavy grade (4.5kN) with S4 Pedestal	Urban Interlock Extra Heavy Grade (6.0kN) with S4 Pedestal
Climate change	109%	99%
Climate change (fossil)	110%	98%
Climate change (biogenic)	141%	94%
Climate change (land use change)	111%	98%
Ozone layer depletion	113%	98%
Acidification	105%	99%
Eutrophication freshwater	106%	99%
Eutrophication marine	105%	99%
Eutrophication terrestrial	105%	99%
Summer smog	105%	99%
Mineral & metal depletion	100%	100%
Fossil fuel depletion	110%	99%

Differences to previous versions

The original EPD followed EN 15804+A1 but this EPD update aligns with EN 15804+A2, whilst still declaring results for EN 15804+A1 to retain comparability.

The key change between EPDs is the panel composition. In the updated study, the cement and pulp concentrations decrease, and some amount of fibre is removed, while the gypsum powder concentration is increased.
Since the original study was conducted, ASP's manufacturing facility has also switched to using 100% renewable electricity. These changes have significantly decreased the A1-A3 impact on GWP for both products, compared to the previous EPD.

Sustainability Initiative

DECLARE LABEL

Urban Interlock holds a Declare Label, offering complete transparency around its ingredients and lifecycle. As a Red List Free product, it supports healthier buildings and aligns with leading green building standards like WELL and Living Building Challenge.

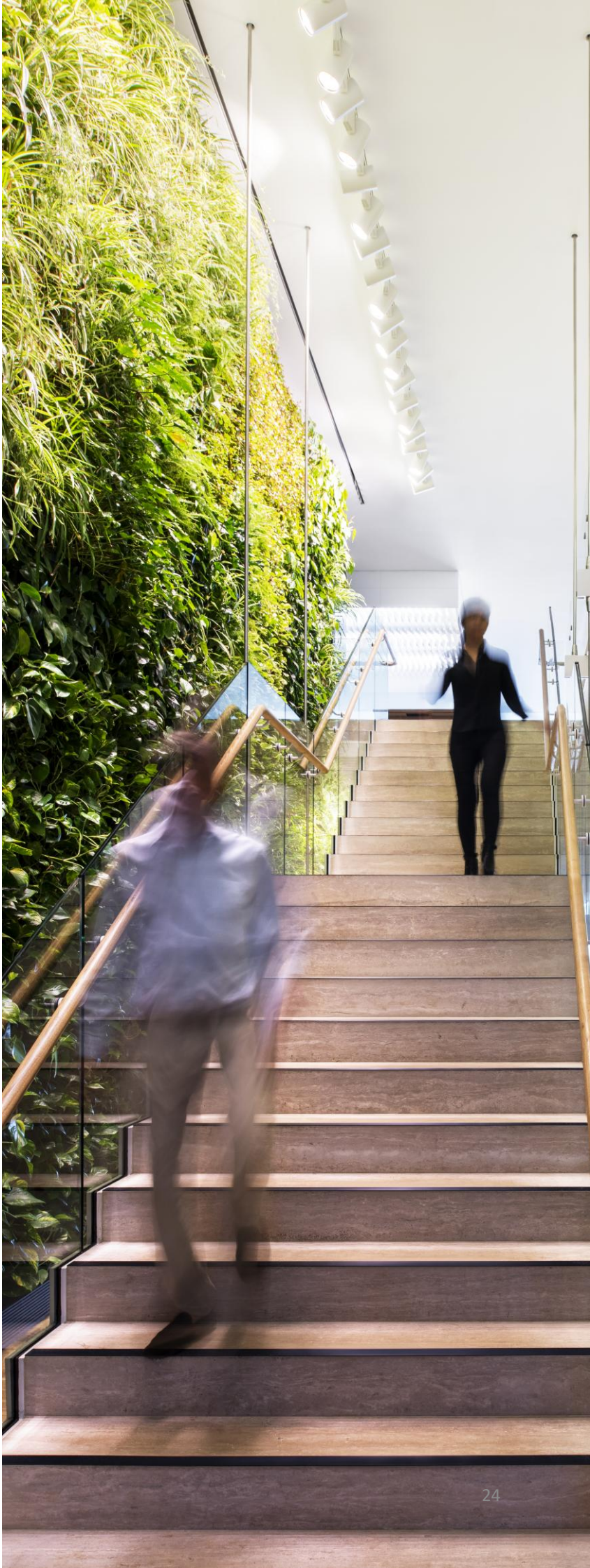
Project Feature

T3 COLLINGWOOD, WELLINGTON ST, VIC

T3 encompassed over 96,000 sq ft / 9,000m2 of ASP's commercial ICON X System. Icon X features numerous sustainability credentials including an LCA, EPD and 97% recycled content.

Also used in the tower was ASP's Urban Interlock System, powered environmentally with its own EPD. Urban Interlock is a technologically advanced raised floor system designed specifically to disseminate loads in stone and tiled areas to ensure the surface finish does not crack.

ASP's sustainability initiatives helped Hines and Icon to successfully facilitate a successful 6 Star Green Star build



Version History
- 001 (2019-07-03) - original version
- 1.1 (2019-09-03) – intermediate version
- 002 (2025-06-18) – updated in line with 5-year validity. Includes updated panel formulation, renewable electricity data and declares results as EN15804+A2

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