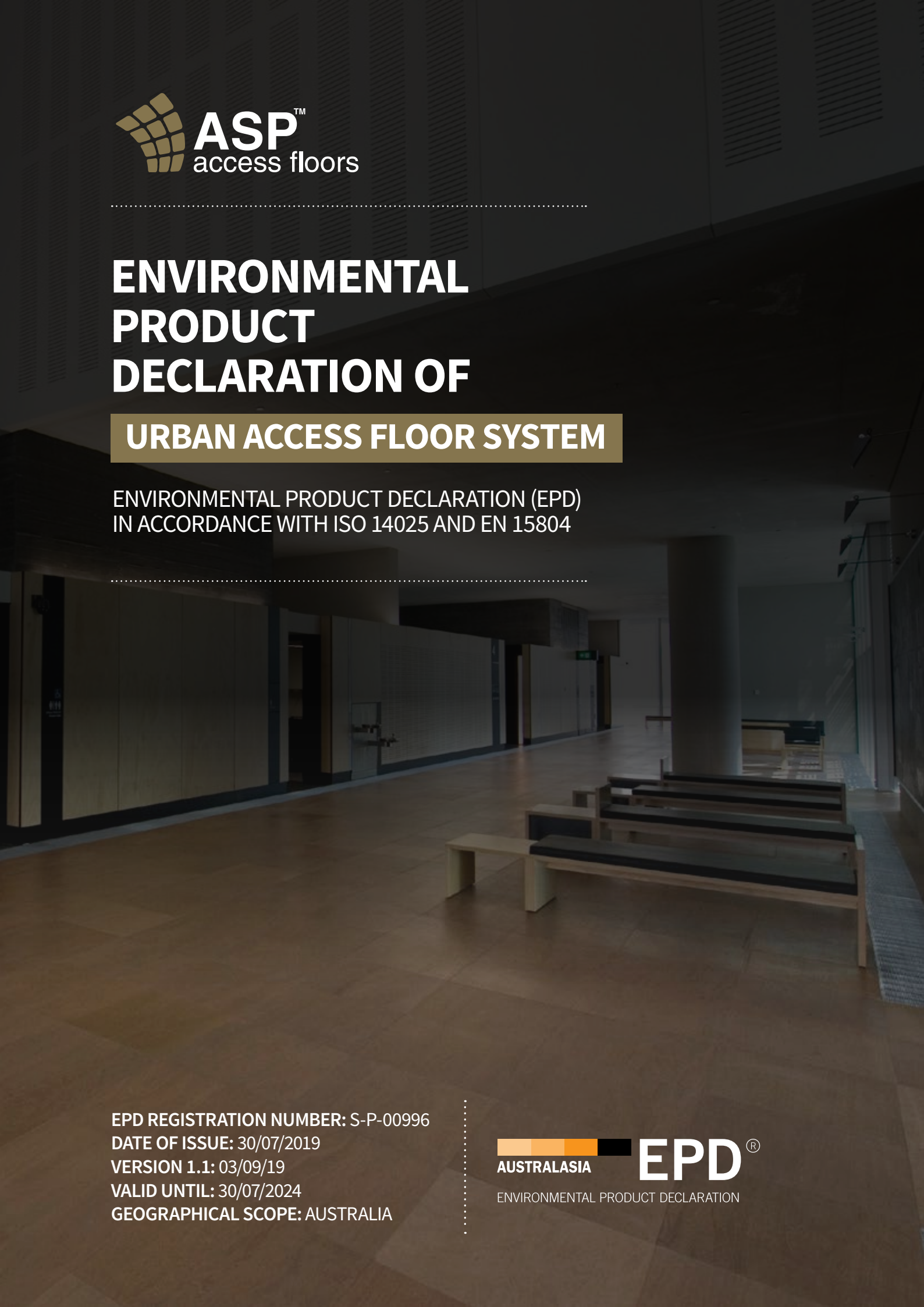
ASP™ access floors

ENVIRONMENTAL PRODUCT DECLARATION OF

URBAN ACCESS FLOOR SYSTEM

ENVIRONMENTAL PRODUCT DECLARATION (EPD)
IN ACCORDANCE WITH ISO 14025 AND EN 15804



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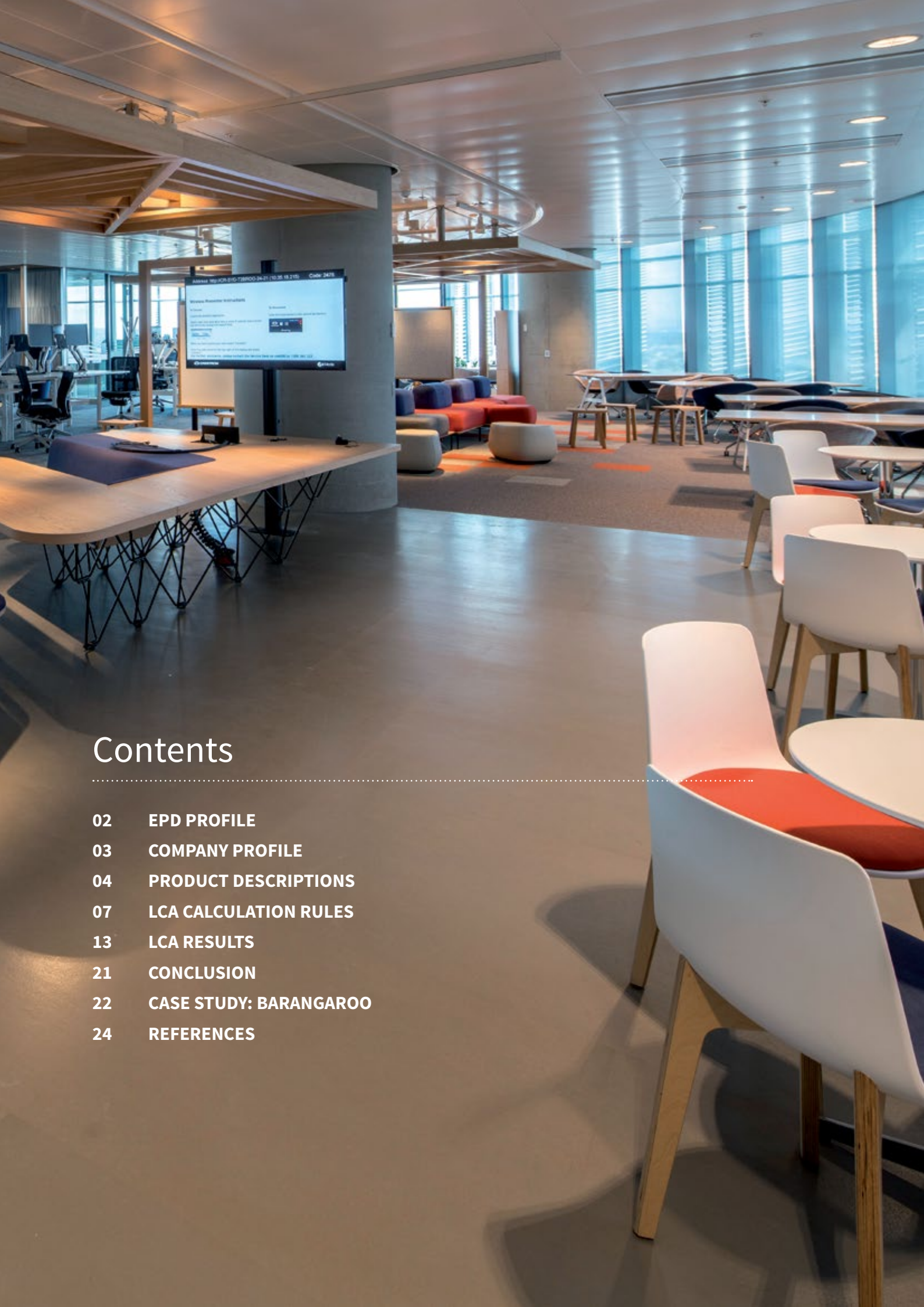
AUSTRALASIA EPD®
ENVIRONMENTAL PRODUCT DECLARATION



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EPD Profile

An Environmental Product Declaration (EPD) provides standardized and verified environmental performance indicators for specific product. An EPD is based on a Life Cycle Assessment (LCA) using a consistent set of rules known as a Product Category Rules (PCR).

Environmental product declarations within the same product category from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

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CEN standard EN 15804 served as the core PCR

PCR: PCR 2012:01 Construction products and Construction services, Version 2.01, 2016-03-09

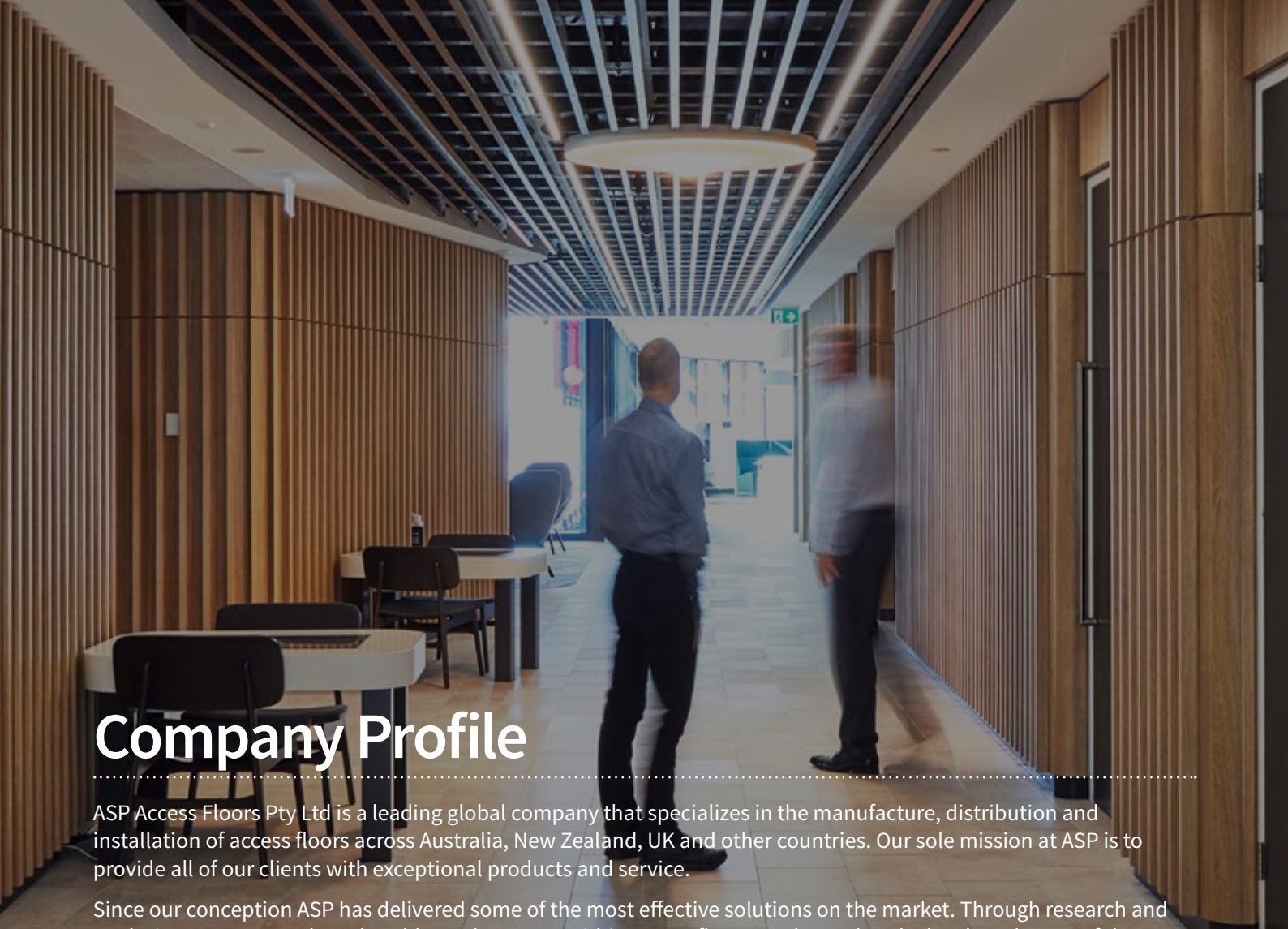
PCR review was conducted by: The Technical Committee of the International EPD® System.
Chair: Martin Erlandsson, IVL Swedish Environment Research Institute, martin.erlandsson@ivl.se

Independent verification of the declaration and data, according to ISO 14025:
☑ EPD process certification (Internal)
☐ EPD verification (External)

This EPD can be used to claim 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 total) in the Green Star Design & As Built tool.

The EPD owner has the sole ownership, liability and responsibility for the EPD.

This version of the EPD has been updated to correct environmental impact results for Urban IL S2 A1-A3 and A4 modules and table headings for Urban IL environmental impact, use of resources and other indicators.



Company Profile

ASP Access Floors Pty Ltd is a leading global company that specializes in the manufacture, distribution and installation of access floors across Australia, New Zealand, UK and other countries. Our sole mission at ASP is to provide all of 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 analyzing current trends and problems that occur within access floors, we have already developed some of the most unique and effective products on the market.

Other key benefits include:

Ease of reconfiguration

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 the services.

Project time line

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 particular zones as required, which minimizes the interruptions to your work.

Comfort

With HVAC system installed in the floor, employees are able to 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, developers, designers and facility managers.

**The declarations presented in page 6, 12 and 20 and the boxed quote page 22 are ASP Access Floors self-declarations aim to describe our value proposition.*

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.

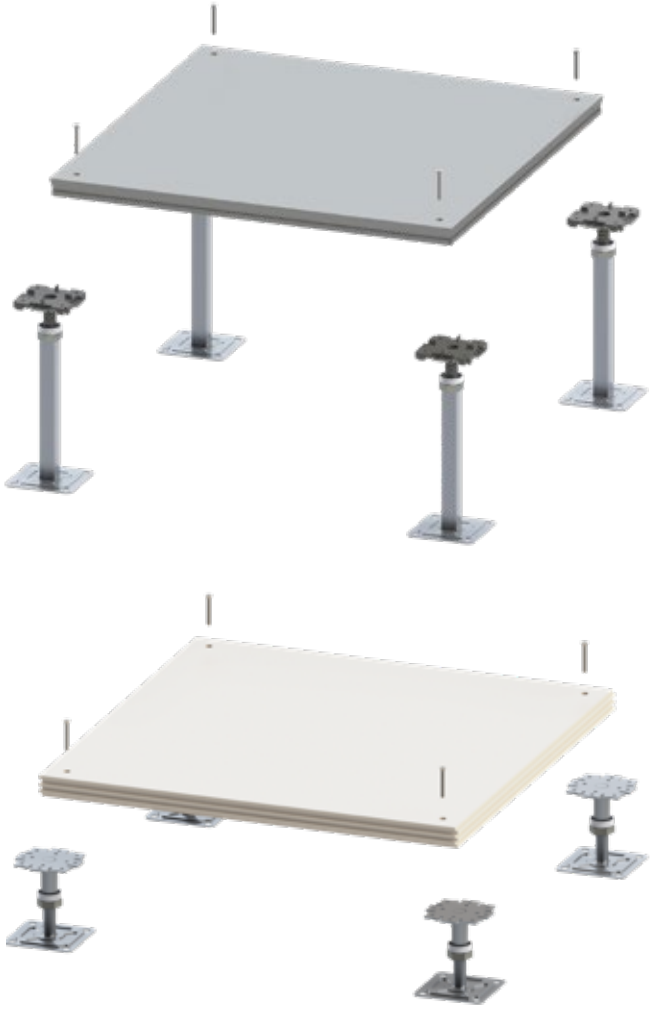
An access floor is used to provide a controlled cavity in-between the slab and access floor panel where all electrical, data and power services can be distributed. The modular design of the access floor allows you the flexibility to alter a building's service layouts to accommodate your technological 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

Products covered within this EPD are presented below, more information is available on the Table.

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.

PRODUCT	CLASSIFICATION	CODE	CATEGORY
Urban Access Floor System	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

PRODUCT NAME	PANEL	FFH	PEDESTALS
Urban X S2	Medium grade (3.0kN) 600x600mm Urban panel	65 – 110mm	S2 pedestal
	Heavy grade (4.5kN) 600x600mm Urban panel		
	Extra heavy grade (6.0kN) 600x600mm Urban panel		
Urban X S4	Medium grade (3.0kN) 600x600mm Urban panel	110 – 180mm	S4 pedestal
	Heavy grade (4.5kN) 600x600mm Urban panel		
	Extra heavy grade (6.0kN) 600x600mm Urban panel		
Urban X S6	Medium grade (3.0kN) 600x600mm Urban panel	180 – 800mm	S6 pedestal
	Heavy grade (4.5kN) 600x600mm Urban panel		
	Extra heavy grade (6.0kN) 600x600mm Urban panel		
Urban IL S2	Extra heavy grade (6.0kN) 600x600mm Urban panel	65 – 110 mm	S2 pedestal
Urban IL S4		110 – 180 mm	S4 pedestal
Urban IL S6		180 – 800mm	S6 pedestal

The declared unit (DU) is 1 square meter (m2) of access floor installed. Materials used in each product composition are presented in the Table below.

Material composition of included products per declared unit

	Urban X S2			Urban X S4			Urban X S6			Urban IL (Extra heavy)		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy	S2	S4	S6
PANEL												
Steel	6.09	9.141	11.025	6.09	9.141	11.025	6.09	9.141	11.025	4.017	4.017	4.017
Gypsum powder	21.78	23.06	24.34	21.78	23.06	24.34	21.78	23.06	24.34	27.54	27.54	27.54
Water	10.89	11.53	12.17	10.89	11.53	12.17	10.89	11.53	12.17	13.77	13.77	13.77
Cement	5.43	5.75	6.07	5.43	5.75	6.07	5.43	5.75	6.07	6.87	6.87	6.87
Fibre	4.10	4.34	4.59	4.10	4.34	4.59	4.10	4.34	4.59	5.19	5.19	5.19
Pulp	3.53	3.74	3.95	3.53	3.74	3.95	3.53	3.74	3.95	4.47	4.47	4.47
Glue	1.36	1.44	1.52	1.36	1.44	1.52	1.36	1.44	1.52	1.72	1.72	1.72
PEDESTAL												
Steel	1.711	1.711	1.711	2.041	2.041	2.041	2.701	2.701	2.701	1.711	2.041	2.701
FIXING SCREWS												
Steel	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106
PACKAGING												
Cardboard	.078	.078	.078	.078	.078	.078	.078	.078	.078	.078	.078	.078
Wood	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388	0.388
Steel	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
TOTAL (kg)	55.963	61.784	66.448	56.293	62.114	66.778	56.953	62.774	67.438	66.36	66.69	67.35

FFH[1] = Finished Floor Height

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

LCA Calculation Rules

System Boundary

ASP Access Floors has decided to include all life cycle stages from the extraction of raw materials to product installation at the client's site. The scope is therefore a Cradle to Gate plus options.

Modules of the production life cycle included in the EPD

PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				RESOURCE RECOVERY STAGE
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

MND = Module Not Declared; the module shall not be considered as equal to zero

Production

All components of the Urban X and Urban IL flooring system are manufactured, assembled and supplied by Changzhou Wujin Zhongtian Computer-Room Equipment Co. Ltd in China. Electricity used in the manufacturing and assembly process is assumed to come from Chinese national grid mix and the steel used has a verified recycled content of 97%. Most processes don't use any water, no industrial wastewater is released in the environment, and therefore it has been assumed that 100% of water consumed is evaporated.

The materials and manufacturing process for each component is described briefly below.

PANELS

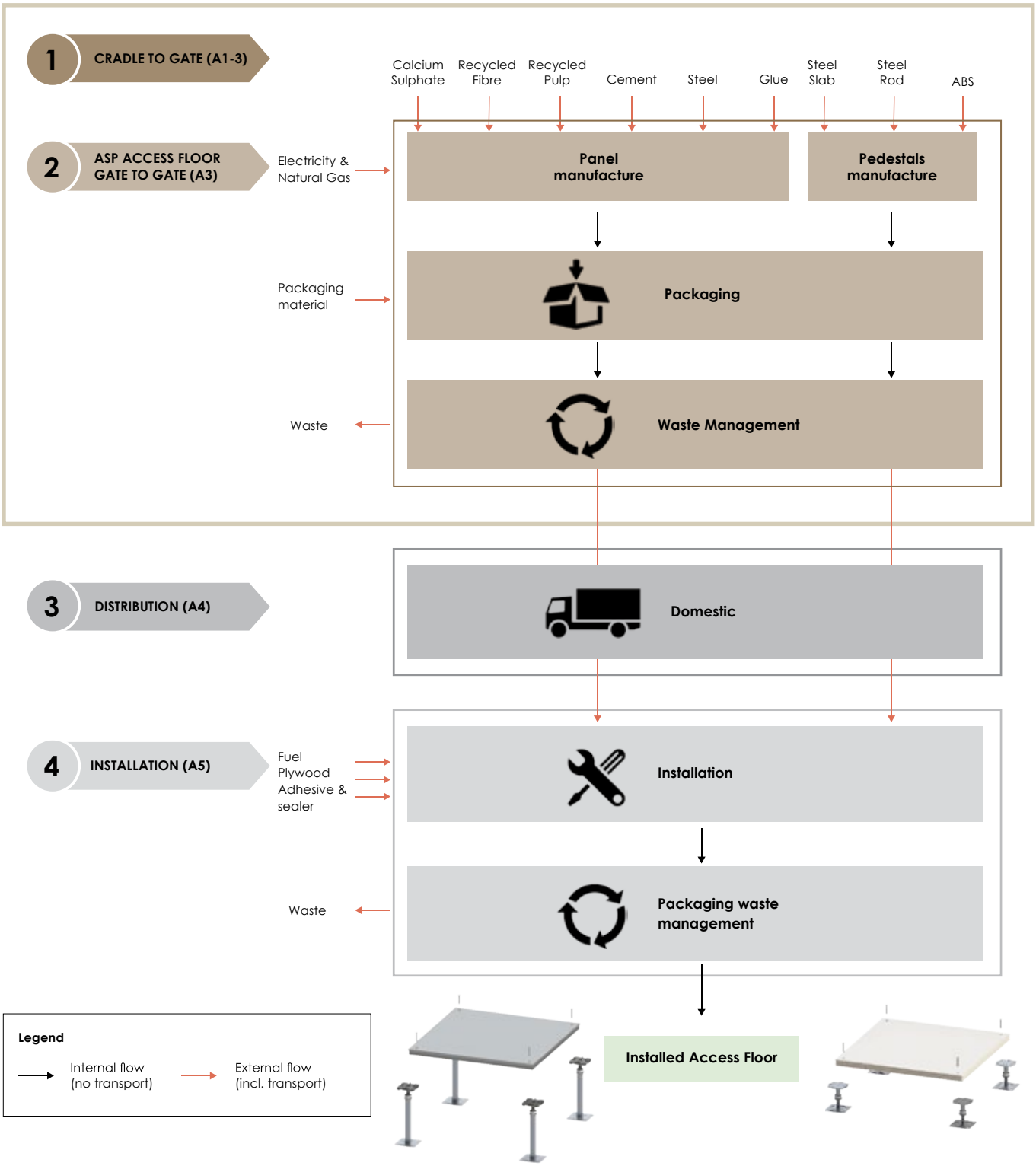
The Urban X panels consist of a hardened steel top and bottom sheet plate with corrosion resistant protection, inside and out, encapsulating a core consisting of calcium sulphate (gypsum), cement, fibre, pulp and grey water. The panel finish is galvanized steel.

The Urban Interlock panels consist of a bare calcium sulphate surface and a bottom hardened galvanized steel plate. It also has a specially designed interlock edge profile to ensure panels remain locked together with minimal movement.

PEDESTALS

The pedestal head is manufactured out of steel to form a solid support to which the access floor panel is fixed through Screw Fix Locators on every corner. A steel tube located below the head acts as an adjustment shaft. A steel washer acts as a sound and impact buffer and is encased in an ABS gasket intended to eliminate metal on metal sound transfer to the slab. The gasket is used in Urban X products only. The pedestal base is made up of an 18mm diameter steel threaded rod which inserts into a 20mm steel square tube which is welded to a 100mm x 100mm steel plate. A nut adjusts the required length of the steel threaded rod and an inbuilt vibration proof locking device ensures that once locked the pedestal height is static.

Access floor system boundary



Distribution

The distribution includes 4 legs:

LEG 1: Changhzou factory to Shanghai Port by truck

LEG 2: Shanghai Port to Australian Ports by container ship

LEG 3: Australian Port to regional warehouses by truck

LEG 4: Regional warehouses to installation site by truck

Installation

Depending on the building site, the product may be mechanically lifted into position using Diesel-powered machinery. Pedestals are screwed into position and the panels screwed onto these. An acrylic adhesive and an epoxy based sealer are used for finishing. In some case, plywood may be used after installation to protect the access panel when there is further building activity on site. Volatile Organic Compounds (VOC) emissions from the sealer and adhesive were calculated and included.

Packaging waste treatment is included to its end of waste state.

Key assumptions

Primary data were used for all manufacturing operations up to the factory gate (Module A3). Bills of materials for the year 2017. Energy and water consumption at the manufacturing plant were collected over the period June 2015-May 2016.

Distribution data was collected for the year 2015 using a weighted average distance was applied for each leg.

As a conservative assumption, fuel for mechanical lifting of product to the installation site and plywood covering after installation have been systematically included. Gravitational energy potential for the heaviest product (HPL system) lifted to a height of 20m with a 10% Diesel efficiency was used to estimate fuel consumption.

All datasets are within the 5 year limit allowable for specific data under EN 15804 and applicable PCR.

Cut-off criteria

In accordance with the Construction PCR v2.01, a minimum of 95% of total inflows to the upstream and core module has be included in the Life Cycle Inventory.

In accordance with the Construction PCR v2.01, environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary. All other reported data were incorporated and modeled using the best available life cycle inventory data without the use of cut-off criteria.

Personnel-related impacts, such as transportation to and from work, are also not accounted for in the Life Cycle Inventory.

Production of capital equipment, facilities and infrastructure required for manufacture are outside the scope of the study.

Allocations

PRIMARY DATA

For the manufacturing data (electricity, natural gas and water consumption) no break down was available. Physical allocation by mass was used on total access floor production. No information on the different floor type production over the reporting period was available. As a conservative approach, it has been assumed that all the access floor systems manufactured were Icon X S3/S4 as it is the lightest system leading to the highest input per kg of material produced. No other allocation was used for the primary data.

SECONDARY DATA

For all refinery products, allocation by mass and net calorific value has been applied. The specific manufacturing route of every refinery product is modeled and the impacts associated with the production of these products are calculated individually.

Materials and chemicals used in the manufacturing process are modeled using the allocation rule most suitable for the respective material. For further information on a specific material see available GaBi documentation (documentation. gabi-software.com).

In addition to the above mentioned allocation methods for refinery products and materials, inventories for electricity and thermal energy generation also include allocation by economic value for some by-products (e.g. gypsum, boiler ash and fly ash). In case of plants for the co-generation of heat and power, allocation by energy is applied.

Background data

Data for all energy inputs, transport processes, packaging and raw materials (except steel manufacturing) are from the GaBi 8.7 Database 2018 (thinkstep 2018).

No dataset was available in GaBi for 100% EAF steel manufacturing. Steel manufacturing processes were modeled using data from The Best Available Technology Reference Document for the Iron and Steel Industry issued by the European Commission in 2013. Recycled scrap content of 97% and a Chinese electricity mix has been applied.

Chinese electricity is assumed to be the 2015 national average with a Global Warming Potential of 864 gCO2eq/kWh, made up of 73% fossil fuel energy (70% hard coal, 3% natural gas), 27% renewable energy (19% hydro, 3% wind, 1% solar PV and 1% biofuels) and 3% nuclear energy.

Adhesive and floor sealer used at installation were modelled based on Material Safety Data Sheet (MSDS) provided by supplier. Plywood used for covering the floors after installation was modelled using the recently published EPD for Australian plywood.

The reference year for background data ranges from 2011-2015 and therefore all datasets are within 10 year limit allowable for generic data under EN 15804 and applicable PCR.

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

LCA Results

The LCA results are calculated for 1 square meter of installed access floor for the indicators presented in the Tables below.

Potential environmental impacts

INDICATOR	UNIT	ACRONYM
Global warming	kg CO_2 equivalents	GWP
Acidification of land and water	kg SO_2 equivalents	AP
Eutrophication	kg PO_4^{3-} equivalents	EP
Depletion of abiotic resources (elements)	kg Sb equivalents	ADPe
Depletion of abiotic resources (fossil)	MJ net calorific value	ADPf
Ozone depletion	kg CFC 11 equivalents	ODP
Photochemical ozone creation	kg C_2H_2 equivalents	POCP

Use of resources

INDICATOR	UNIT	ACRONYM
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value	PERE
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	PERM
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	PERT
Use of non- renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	PENRE
Use of non- renewable primary energy resources used as raw materials	MJ, net calorific value	PENRM
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	PENRT
Use of net fresh water	m3	FW
Use of secondary material	kg	SM
Use of renewable secondary fuels	MJ, net calorific value	RSF
Use of non-renewable secondary fuels	MJ, net calorific value	NRSF

LCA Results

Other indicators

INDICATOR	UNIT	ACRONYM
Components for re-use	kg	CRU
Materials for energy recovery	kg	MER
Materials for recycling	kg	MFR
Hazardous waste (deposited)	kg	HWD
Waste (deposited)	kg	NHWD
EDIP 1997, Nuclear waste [kg]	kg	RWD
Exported electrical energy	MJ	EEE
Exported thermal energy	MJ	EET

Potential environmental impacts

Urban X S2 potential environmental impacts

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
GWP (kgCO2 eq)	1.9E+01	2.3E+01	2.5E+01	7.5E+00	8.3E+00	8.9E+00	6.6E+00	6.6E+00	6.6E+00
AP (kgSO2 eq)	4.8E-02	5.8E-02	6.4E-02	2.0E-01	2.2E-01	2.4E-01	1.5E-03	1.5E-03	1.5E-03
EP (kgPO42- eq)	8.4E-03	1.0E-02	1.2E-02	2.0E-02	2.2E-02	2.4E-02	3.0E-04	2.9E-04	2.9E-04
ADPE (kgSb eq)	1.9E-04	1.9E-04	1.9E-04	2.4E-07	2.7E-07	2.9E-07	2.1E-06	2.1E-06	2.1E-06
ADPF (MJ eq)	2.1E+02	2.4E+02	2.7E+02	9.3E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
ODP (kgCFC-11 eq)	5.5E-09	6.6E-09	7.3E-09	9.5E-16	1.1E-15	1.1E-15	2.6E-11	2.6E-11	2.6E-11
POCP (kg C2H2 eq)	4.2E-03	5.2E-03	5.8E-03	1.1E-02	1.2E-02	1.3E-02	9.1E-03	9.1E-03	9.1E-03

LCA Results

Urban X S4 potential environmental impacts

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
GWP (kgCO2 eq)	2.0E+01	2.3E+01	2.6E+01	7.5E+00	8.3E+00	9.0E+00	6.6E+00	6.6E+00	6.6E+00
AP (kgSO2 eq)	4.9E-02	5.9E-02	6.6E-02	2.0E-01	2.3E-01	2.4E-01	1.5E-03	1.5E-03	1.5E-03
EP (kgPO42- eq)	8.6E-03	1.0E-02	1.2E-02	2.0E-02	2.2E-02	2.4E-02	3.0E-04	2.9E-04	2.9E-04
ADPE (kgSb eq)	1.9E-04	1.9E-04	1.9E-04	2.4E-07	2.7E-07	2.9E-07	2.1E-06	2.1E-06	2.1E-06
ADPF (MJ eq)	2.1E+02	2.5E+02	2.7E+02	9.3E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
ODP (kgCFC-11 eq)	5.6E-09	6.7E-09	7.4E-09	9.6E-16	1.1E-15	1.1E-15	2.6E-11	2.6E-11	2.6E-11
POCP (kg C2H2 eq)	4.3E-03	5.3E-03	5.9E-03	1.1E-02	1.2E-02	1.3E-02	9.1E-03	9.1E-03	9.1E-03

Urban X S6 potential environmental impacts

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
GWP (kgCO2 eq)	2.03E+01	2.40E+01	2.65E+01	7.61E+00	8.41E+00	9.07E+00	6.64E+00	6.64E+00	6.64E+00
AP (kgSO2 eq)	5.20E-02	6.16E-02	6.81E-02	2.07E-01	2.29E-01	2.46E-01	1.49E-03	1.49E-03	1.49E-03
EP (kgPO42- eq)	9.04E-03	1.09E-02	1.21E-02	2.04E-02	2.25E-02	2.42E-02	2.94E-04	2.94E-04	2.94E-04
ADPE (kgSb eq)	1.89E-04	1.89E-04	1.90E-04	2.44E-07	2.70E-07	2.91E-07	2.09E-06	2.09E-06	2.09E-06
ADPF (MJ eq)	2.18E+02	2.55E+02	2.81E+02	9.45E+01	1.04E+02	1.13E+02	7.68E+01	7.68E+01	7.68E+01
ODP (kgCFC-11 eq)	5.81E-09	6.87E-09	7.58E-09	9.72E-16	1.07E-15	1.16E-15	2.63E-11	2.63E-11	2.63E-11
POCP (kg C2H2 eq)	4.53E-03	5.50E-03	6.14E-03	1.12E-02	1.24E-02	1.34E-02	9.09E-03	9.09E-03	9.09E-03

Urban IL S2, S4 and S6 potential environmental impacts

	A1-3			A4			A5		
	S2	S4	S6	S2	S4	S6	S2	S4	S6
GWP (kgCO2 eq)	2.0E+01	2.1E+01	2.1E+01	9.1E+00	9.1E+00	9.2E+00	6.6E+00	6.6E+00	6.6E+00
AP (kgSO2 eq)	5.0E-02	5.1E-02	5.3E-02	2.5E-01	2.5E-01	2.5E-01	1.5E-03	1.5E-03	1.5E-03
EP (kgPO42- eq)	8.7E-03	8.9E-03	9.3E-03	2.4E-02	2.4E-02	2.5E-02	3.0E-04	3.0E-04	3.0E-04
ADPE (kgSb eq)	1.9E-04	1.9E-04	1.9E-04	2.9E-07	2.9E-07	3.0E-07	2.1E-06	2.1E-06	2.1E-06
ADPF (MJ eq)	2.3E+02	2.3E+02	2.4E+02	1.1E+02	1.1E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
ODP (kgCFC-11 eq)	5.5E-09	5.6E-09	5.8E-09	1.2E-15	1.2E-15	1.2E-15	2.6E-11	2.6E-11	2.6E-11
POCP (kg C2H2 eq)	4.2E-03	4.3E-03	4.5E-03	1.3E-02	1.4E-02	1.4E-02	9.1E-03	9.1E-03	9.1E-03

LCA Results

Use of resources

Urban X S2 use of resources

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
PERE (MJ)	1.5E+02	1.6E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PERM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT (MJ)	1.5E+02	1.6E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PENRE (MJ)	2.2E+02	2.6E+02	2.9E+02	9.3E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
PENRM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT (MJ)	2.2E+02	2.6E+02	2.9E+02	9.3E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
FW (m3)	1.1E-01	1.2E-01	1.3E-01	2.2E-03	2.4E-03	2.6E-03	3.0E-03	3.0E-03	3.0E-03
SM (kg)	1.7E+01	2.1E+01	2.4E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Urban X S4 use of resources

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
PERE (MJ)	1.5E+02	1.7E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PERM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT (MJ)	1.5E+02	1.7E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PENRE (MJ)	2.2E+02	2.6E+02	2.9E+02	9.4E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
PENRM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT (MJ)	2.2E+02	2.6E+02	2.9E+02	9.4E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
FW (m3)	1.1E-01	1.2E-01	1.3E-01	2.2E-03	2.4E-03	2.6E-03	3.0E-03	3.0E-03	3.0E-03
SM (kg)	1.8E+01	2.2E+01	2.4E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

LCA Results

Use of resources

Urban X S6 use of resources

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
PERE (MJ)	1.5E+02	1.7E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PERM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT (MJ)	1.5E+02	1.7E+02	1.8E+02	1.3E+00	1.4E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PENRE (MJ)	2.3E+02	2.7E+02	2.9E+02	9.5E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
PENRM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT (MJ)	2.3E+02	2.7E+02	2.9E+02	9.5E+01	1.0E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
FW (m3)	1.1E-01	1.2E-01	1.3E-01	2.2E-03	2.4E-03	2.6E-03	3.0E-03	3.0E-03	3.0E-03
SM (kg)	1.8E+01	2.2E+01	2.5E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Urban IL S2, S4 and S6 use of resources

	A1-3			A4			A5		
	S2	S4	S6	S2	S4	S6	S2	S4	S6
PERE (MJ)	1.9E+02	1.9E+02	1.9E+02	1.8E+00	1.5E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PERM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PERT (MJ)	1.9E+02	1.9E+02	1.9E+02	1.8E+00	1.5E+00	1.5E+00	4.9E-01	4.9E-01	4.9E-01
PENRE (MJ)	2.3E+02	2.4E+02	2.4E+02	1.2E+02	1.1E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
PENRM (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
PENRT (MJ)	2.3E+02	2.4E+02	2.4E+02	1.2E+02	1.1E+02	1.1E+02	7.7E+01	7.7E+01	7.7E+01
FW (m3)	1.3E-01	1.3E-01	1.3E-01	3.2E-03	2.6E-03	2.7E-03	3.0E-03	3.0E-03	3.0E-03
SM (kg)	1.7E+01	1.7E+01	1.8E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
RSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
NRSF (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

LCA Results

Other indicators

Urban X S2 other indicators

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
CRU (kg)	2.1E-02	2.3E-02	2.5E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MER (kg)	1.6E-02	1.7E-02	1.9E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
MFR (kg)	8.8E-01	1.2E+00	1.4E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
HWD (kg)	6.8E-04	8.3E-04	9.3E-04	1.0E-06	1.1E-06	1.2E-06	5.7E-04	5.7E-04	5.7E-04
NHWD (kg)	2.5E+00	3.0E+00	3.2E+00	1.9E-03	2.1E-03	2.3E-03	3.9E+00	3.9E+00	3.9E+00
RWD (kg)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
EEE (MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.5E-01	6.5E-01	6.5E-01
EET(MJ)	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Urban X S4 other indicators

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
CRU (kg)	2.09E-02	2.32E-02	2.51E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER (kg)	1.57E-02	1.74E-02	1.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR (kg)	9.18E-01	1.26E+00	1.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HWD (kg)	6.92E-04	8.43E-04	9.43E-04	1.01E-06	1.11E-06	1.20E-06	5.68E-04	5.68E-04	5.68E-04
NHWD (kg)	2.57E+00	3.01E+00	3.29E+00	1.93E-03	2.13E-03	2.30E-03	3.90E+00	3.90E+00	3.90E+00
RWD (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	0.00E+00
EEE (MJ)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.48E-01	6.48E-01	6.48E-01
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	0.00E+00

LCA Results

Other indicators

Urban X S6 other indicators

	A1-3			A4			A5		
	medium	heavy	extra heavy	medium	heavy	extra heavy	medium	heavy	extra heavy
CRU (kg)	2.09E-02	2.32E-02	2.51E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER (kg)	1.57E-02	1.74E-02	1.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR (kg)	9.94E-01	1.34E+00	1.55E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HWD (kg)	7.21E-04	8.72E-04	9.72E-04	1.02E-06	1.13E-06	1.21E-06	5.68E-04	5.68E-04	5.68E-04
NHWD (kg)	2.66E+00	3.10E+00	3.38E+00	1.95E-03	2.16E-03	2.32E-03	3.90E+00	3.90E+00	3.90E+00
RWD (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	0.00E+00
EEE (MJ)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.48E-01	6.48E-01	6.48E-01
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	0.00E+00

The use of renewable secondary fuel (RSF) and non-renewable secondary fuel (NRSF) are listed as 'INA' (indicator not assessed). ASP Access Floors is not directly using secondary fuel and inclusion of these indicators in the EPD has been deemed not useful or necessary. The same applies for exported electrical energy (EEE) and exported thermal energy (EET).

Urban IL S2, S4 and S6 other indicators

	A1-3			A4			A5		
	S2	S4	S6	S2	S4	S6	S2	S4	S6
CRU (kg)	2.56E-02	2.56E-02	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER (kg)	1.92E-02	1.92E-02	1.92E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR (kg)	6.42E-01	6.79E-01	7.54E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HWD (kg)	6.68E-04	6.83E-04	7.11E-04	1.51E-06	1.21E-06	1.22E-06	5.68E-04	5.68E-04	5.68E-04
NHWD (kg)	2.27E+00	2.32E+00	2.41E+00	2.76E-03	2.32E-03	2.35E-03	3.90E+00	3.90E+00	3.90E+00
RWD (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	0.00E+00
EEE (MJ)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.48E-01	6.48E-01	6.48E-01
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	0.00E+00

ASP provides business and developers the **perfect balance** between **optimum design and functionality**

Conclusion

Most environmental impacts and use of resources come from the Module A1 (raw material). Module A1 accounts for 43-53% of the Global Warming Potential (GWP) of the system: 100% of the ADPE, 55-60% of ADPF, 100% of ODP and 17-21% of POCP. The largest impact comes from the steel needed to produce the panel and the pedestals.

Distribution from the manufacturing plant in China to final customers in Australia (Module A4) represent 22% of the total GWP. Module A4 also accounts for 78-80% of Acidification Potential (AP), 45-47% of Photochemical Ozone Creation Potential (POCP) and 67-70% of total Eutrophication Potential (EP).

Installation (Module A5) accounted for 16-20% ADPF and 8% to 16-20% of total GWP and 32-37% total POCP.

ASP Access Floor Sustainability Policy

As a member of the Green Building Council of Australia, ASP Access Floors' Environmental Policy outlines how ASP endeavours to use recycled materials and optimize its supply chain. The implementation of the policy will ensure ASP:

- Considers sustainability in all relevant decision making,
- Reduce their greenhouse gas emissions,
- Produce less waste and increase recycling

The aim of this policy is to incorporate ecologically sustainable development principles in every facet of design, manufacturing and installation with the introduction of five key objectives:

1 Indoor Environment Quality

2 Waste Management

3 Recycled Content

4 Life Cycle

5 Environmental Product Declarations

In implementing this policy ASP Access Floors offers its clients, project specific, carbon neutral certification on the Icon and Urban Series of products. ASP has completed numerous Green Star and LEED projects. A few examples of these are:

- Barangaroo International Towers,
- ANZ Head Office Docklands,
- Commonwealth Bank Darling Walk,
- 1 Bligh St Sydney,
- Australian Catholic University VIC, and
- University of Adelaide New Engineering Building

A compliance proof can be provided on demand, if required, please email ***sales@aspfloors.com.au***

Case Study

Base Building Environmental Initiatives Pave the Way for Fitout

BACKGROUND

ASP Access Floors completed the supply and installation of 300,000m2 of base building access flooring to the Barangaroo International Towers in 2018.

The tender was won after ASP was able to demonstrate its product would support Lendlease's significant commitment to reduce the embodied carbon of building materials by 20% compared to standard construction practices.

ASP Access Floors then, took on the challenge of measuring and offsetting its flooring system's carbon footprint and gaining carbon neutral certification. The outcome was not only a reduction in the embodied carbon for all three International Tower buildings; it also helped ASP to improve its environmental performance and operational efficiency.

Since the base building completion, ASP Access Floors has been involved in many fitout projects for various organisations who have set up home in the three Barangaroo International Towers.

THE FITOUT

ASP Access Floors worked with Developer Lendlease on its own fitout as they moved into their new global headquarters at Barangaroo's International Tower 3. More than 2000 staff now take up space on levels 8 to 19 of the 39-storey building – 24,550 square metres in total.

Levels 13 and 14 are considered the heart of the Lendlease tenancy and feature the hero design element – a six-metre high, "breathing" green wall with more than 5000 plants.

According to Lendlease, the green wall system is scientifically proven to accelerate the removal of air pollutants, such as carbon dioxide and volatile organic compounds. The wall is also designed to cool the surrounding air and contribute to energy efficiency.

Surrounding the green wall on both Levels 13 and 14 are two systems from the ASP Access Floors Urban Series.

Level 13 showcases the Urban panel finished with ASP's FSC Concept + Timber. Level 14 showcases ASP's Urban Interlock panel, scientifically designed to allow the travertine covering to be directly applied eliminating the need for substrates.

As a member of the Green Building Council of Australia (GBCA) and the US Green Building Council (USGBC), ASP Access Floors' endeavours to use recycled materials, reduce the Carbon Footprint of its products and optimise its supply chain.

ASP’s sustainability initiatives support the transition from base build projects to tenancy fitouts

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