



ConCore™ Access Floor Systems

This Environmental Product Declaration (EPD) provides a detailed account of environmental footprint for Tate's ConCore access floor systems and is based on a cradle to gate (with options) Life Cycle Assessment (LCA) in accordance with ISO 14025 and EN 15804.

Tate's LCA calculated the environment footprint for the raw material extraction and processing, manufacturing, shipping processes and product installation stages of the supply chain. Life cycle environmental impacts associated with the ConCore line of products, including resource use, wastes, and materials for recycling, were reported based on the requirements of the Product Category Rule (PCR).

Tate is part of the Kingspan Group plc, the world's largest manufacturer of access floor panels, and is committed to corporate transparency and minimizing the environmental impact of our business operations, products, and services on the communities we work with.

Learn more about Tate's sustainability mission at:
www.Tateapac.com/sustainability

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ConCore™ Access Floor Systems

Declaration Owner: Tate Asia-Pacific Pty td 3 Herbert Place, Smithfield NSW 2164, Australia. +61 2 9612 2300; www.tateapac.com		
Product: <u>ConCore™ Access Floor Systems:</u> ConCore™ 800, ConCore™ 1000, ConCore™ 1250, ConCore™ 1500, ConCore™ 2000, ConCore™ 2500, and ConCore™ 3000 (with and without High Pressure Laminate) <u>ConCore™ Understructure:</u> Cornerlock, Bolted Stringer 60 cm and Bolted Stringer 120 cm - 150 to 1000 mm Finished Floor Height (FFH)		
Declared Unit: 1 m ² of panel installed		
Geographic scope: Australia		
Program operator EPD Australasia Limited 315a Hardy Street Nelson 7010 New Zealand info@epd-australasia.com ; epd-australasia.com		
<i>Disclaimer: The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.</i>		
Product category rules (PCR): PCR 2012:01 Construction products and construction services, Version 2.3 and UN CPC code 37550 (Ver.2)		
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair: Massimo Marino. Contact via info@environdec.com		
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Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification		
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Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☐ No		

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1 ABOUT TATE ASIA-PACIFIC PTY LTD

Tate Asia-Pacific Pty Ltd provides high performance, sustainable solutions for commercial buildings and Data Centres, offering a wide range of products to improve efficiency and indoor environmental quality using underfloor service distribution. The products include access floors and wide range of integrated high-end architectural finishes.

Why Tate

Tate has been an industry leading global provider of innovative next generation products for both commercial and data centre applications for over 50 years. Our world-class manufacturing plants have the flexibility to create modular solutions quickly with up-front cost optimization and Tate's in-house engineering team has the experience and industry knowledge to design the best solutions from concept to completion.

Commercial

Tate raised access floor systems offer the ability to capture your building's signature style with high-end architectural finishes, while maintaining the sustainability, high-performance, and long-term return on investment advantages associated with a flexible and adaptive raised access floor. With Tate's raised access floors and underfloor service distribution systems, you have the ability to address all of the factors required to create the perfect indoor environment that will reflect the goals and image of your organization.

Data Centre

Our wide range of custom manufactured data centre products include raised access floors, structural ceilings, and containment as well as airflow panels and controls which work together to maximize your data centre's performance. Tate is your single source solution builder for your data centre.

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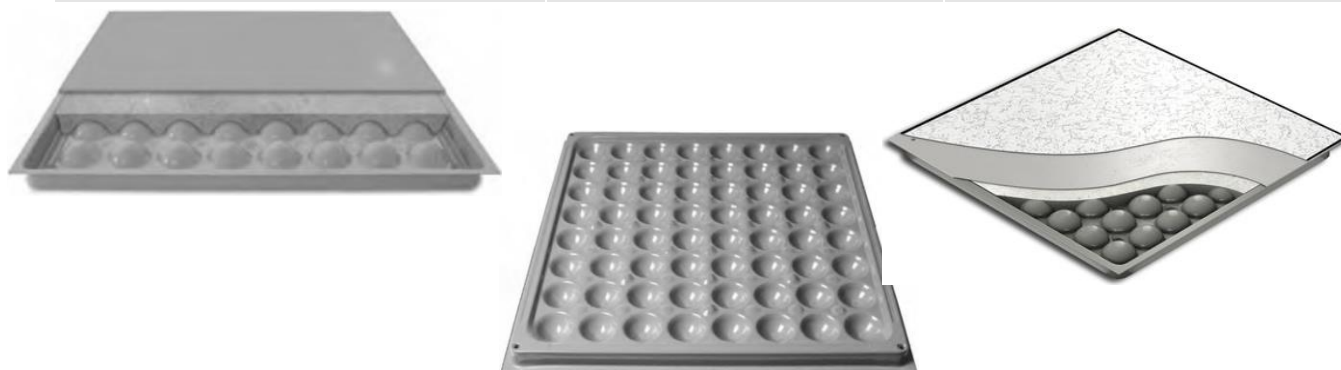
2 Product description

2.1 Concore panels

ConCore™ access floor panels are epoxy coated unitized shells. The shells consist of a flat steel top sheet welded to a formed steel bottom sheet. The panels are then filled with a highly controlled mixture of lightweight cement. Manufactured to exact tolerances, these non-combustible, rigid panels deliver the ultimate in design, performance, plenum integrity, service, and usability. There are seven panel grades that meet all Tate Standards and Cisca Testing Requirements, as well as Australian Standards (ConCore™ 800, ConCore™ 1000, ConCore™ 1250, ConCore™ 1500, ConCore™ 2000, ConCore™ 2500, and ConCore™ 3000) and an extensive selection of understructure supports to meet specific performance requirements. The understructure includes two different support structures for different load requirements including Bolted Stringer and Cornerlock. The table below presents the representative panel and understructure combination for each ConCore™ access floor systems.

Table 1. Representative panel and understructure combination for each ConCore™ access floor system.

Product	Percent Sold with Bolted Stringer	Percent Sold with Corner Lock
ConCore™ 800	30%	70%
ConCore™ 1000	30%	70%
ConCore™ 1250	60%	40%
ConCore™ 1500	80%	20%
ConCore™ 2000	100%	0%
ConCore™ 2500	100%	0%
ConCore™ 3000	100%	0%



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2.2 Understructure Systems

Corner Lock

Understructure Features

- Precision pin design provides self-engagement and positive positioning of floor panels
- 4mm thick steel pedestal head provides maximum strength
- Pedestal nut provides anti-vibration and locking features
- Typical floor heights from 15cm-60cm



Bolted Stringers

Understructure Features

- Designed for data centres and commercial applications with high-end finishes
- Allows floors to be built over 60cm high
- Panels can be gravity-held in understructure for fast removal and replacement
- Stringers provide lateral resistance to heavy rolling loads and seismic loading
- Typical floor heights from 60cm-90cm
- Heavy Duty Bolted Stringer options are available

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2.3 Application

ConCore™ access floor systems can be used for any commercial or data center application. They are expected to last at least 30 years after the initial installation. ConCore™ access floor systems can be used with a variety of finishes, including porcelain, terrazzo, wood, various soft tile, high pressure laminate, and carpet. Finishes and the materials required for their installation and use are not included in this EPD.

2.4 Technical Data

System performance criteria for each ConCore™ access floor system is presented below. System design load is based on permanent set $\leq 0.010''$ and is verified by loading panels in accordance with the Ceilings & Interior Systems Construction Association (CISCA) Standards and Procedures for concentrated load methods, but with panels installed on actual understructure instead of steel blocks. Ultimate, rolling, and impact load tests are performed using CISCA test procedures.

Table 2: Performance criteria for ConCore™ panels

Panel	Understructure	Static Loads			Rolling Loads		Impact Loads
		Design Loads (kN)	Minimum Ultimate Loads (kN)	Safety Factor (min 2.0)2	10 Passes	10,000 Passes	
ConCore® 800	Corner Lock	3.5kN	8.8kN	PASS	2.6kN	1.8kN	0.6kN
ConCore® 1000	Corner Lock	4.4kN	8.9kN	PASS	3.6kN	2.7kN	0.6kN
ConCore® 1250	Corner Lock	5.6kN	11.1kN	PASS	4.4kN	3.5kN	0.6kN
ConCore® 1500	Corner Lock	6.7kN	13.3kN	PASS	5.6kN	4.4kN	0.6kN
ConCore® 1000	Bolted Stringer	4.4kN	8.9kN	PASS	3.6kN	2.7kN	0.6kN
ConCore® 1250	Bolted Stringer	5.6kN	11.1kN	PASS	4.4kN	3.5kN	0.6kN
ConCore® 1500	Bolted Stringer	6.7kN	13.3kN	PASS	5.6kN	4.4kN	0.6kN
ConCore® 2000	Bolted Stringer	8.9kN	17.8kN	PASS	6.7kN	5.6kN	0.8kN
ConCore® 2500	Bolted Stringer	11.1kN	22.2kN	PASS	8.9kN	8.9kN	0.8kN
ConCore® 3000	Bolted Stringer	13.3kN	26.6kN	PASS	8.9kN	8.9kN	0.8kN

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2.5 Product inclusions in EPD

Table 3 provides a list of the panels and understructure included in this EPD. Overall, 43 products including 13 panels and 30 understructure types were assessed as a part of this EPD.

Table 3: Products included in the EPD

Product type	Product name
Panel	Concore 800
	Concore 1000
	Concore 1250
	Concore 1500
	Concore 2000
	Concore 2500
	Concore 3000
	Concore 1000 with HPL
	Concore 1250 with HPL
	Concore 1500 with HPL
	Concore 2000 with HPL
	Concore 2500 with HPL
	Concore 3000 with HPL
Understructure	Cornerlock 150 mm FFH
	Cornerlock 200 mm FFH
	Cornerlock 300 mm FFH
	Cornerlock 400 mm FFH
	Cornerlock 500 mm FFH
	Cornerlock 600 mm FFH
	Cornerlock 700 mm FFH
	Cornerlock 800 mm FFH
	Cornerlock 900 mm FFH
	Cornerlock 1000 mm FFH
	Bolted Stringer 60 cm_150 mm FFH
	Bolted Stringer 60 cm_200 mm FFH
	Bolted Stringer 60 cm_300 mm FFH
	Bolted Stringer 60 cm_400 mm FFH
	Bolted Stringer 60 cm_500 mm FFH
	Bolted Stringer 60 cm_600 mm FFH
	Bolted Stringer 60 cm_700 mm FFH
	Bolted Stringer 60 cm_800 mm FFH
	Bolted Stringer 60 cm_900 mm FFH
	Bolted Stringer 60 cm_1000 mm FFH
	Bolted Stringer 120 cm_150 mm FFH
	Bolted Stringer 120 cm_200 mm FFH
	Bolted Stringer 120 cm_300 mm FFH
	Bolted Stringer 120 cm_400 mm FFH
	Bolted Stringer 120 cm_500 mm FFH
	Bolted Stringer 120 cm_600 mm FFH
	Bolted Stringer 120 cm_700 mm FFH
	Bolted Stringer 120 cm_800 mm FFH
	Bolted Stringer 120 cm_900 mm FFH
	Bolted Stringer 120 cm_1000 mm FFH

HPL – High Pressure Laminate; FFH – Finished Floor Height

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2.5.1 Material composition of included products – Concore™ Panels

Table 4 provides materials used for each type of panel per declared unit i.e. 1m² of Concore access floor installed. Water used for cement mixing eventually evaporates and hence is not included while calculating the weight of panels per m². However, its environmental impacts are considered in the Life Cycle Assessment (LCA)

Table 4: Materials composition of Concore Panels

Product type	Product name	Panel materials									Packaging materials				
		Steel	Concrete	Water	Powder coating	Plastics	Paper	Aluminium Oxide	Glue	Total weight (kg/m ²)	Timber	Cardboard	Steel	Plastics	Total weight (kg/m ²)
Panel	Concore 800	13.8	14.9	7.4	0.2	0.8	0.0	0.00	0.0	29.7	0.5	0.02	0.2	0.00	0.72
	Concore 1000	15.8	14.9	7.4	0.2	0.8	0.0	0.00	0.0	31.7	0.5	0.02	0.2	0.00	0.72
	Concore 1250	17.7	14.9	7.4	0.2	0.8	0.0	0.00	0.0	33.6	0.5	0.02	0.2	0.00	0.72
	Concore 1500	25.3	14.9	7.4	0.2	0.9	0.0	0.00	0.0	41.3	0.6	0.02	0.2	0.00	0.81
	Concore 2000	31.9	14.9	7.4	0.2	0.9	0.0	0.00	0.0	47.9	0.6	0.02	0.2	0.00	0.81
	Concore 2500	35.9	14.9	7.4	0.2	0.9	0.0	0.00	0.0	52.0	0.7	0.03	0.2	0.00	0.92
	Concore 3000	41.1	14.9	7.4	0.2	0.9	0.0	0.00	0.0	57.1	0.7	0.03	0.2	0.00	0.92
	Concore 1000 with HPL	15.8	14.9	7.4	0.2	0.9	1.4	0.04	0.3	33.6	0.5	0.02	0.2	0.00	0.72
	Concore 1250 with HPL	17.7	14.9	7.4	0.2	0.9	1.4	0.04	0.3	35.5	0.5	0.02	0.2	0.00	0.72
	Concore 1500 with HPL	25.3	14.9	7.4	0.2	0.9	1.4	0.04	0.3	43.1	0.6	0.02	0.2	0.00	0.81
	Concore 2000 with HPL	31.9	14.9	7.4	0.2	0.9	1.4	0.04	0.3	49.7	0.6	0.02	0.2	0.00	0.81
	Concore 2500 with HPL	35.9	14.9	7.4	0.2	0.9	1.4	0.04	0.3	53.7	0.7	0.03	0.2	0.00	0.92
	Concore 3000 with HPL	41.1	14.9	7.4	0.2	0.9	1.4	0.04	0.3	58.8	0.7	0.03	0.2	0.00	0.92

2.5.2 Material composition of included products – Cornerlock understructure

Table 5 provides the materials used in production of Cornerlock type of understructure with finished floor height ranging from 150 to 1000 mm. Quantities of materials provided are per declared unit

Table 5: Materials composition of Cornerlock understructure products

Product type	Product name	Understructure materials		Packaging materials				
		Steel	Total weight (kg/m ²)	Timber	Cardboard	Steel	Plastics	Total weight (kg/m ²)
Understructure - Cornerlock	Cornerlock 150 mm FFH	1.9	1.9	0.2	0.02	0.0	0.001	0.25
	Cornerlock 200 mm FFH	2.0	2.0	0.3	0.02	0.0	0.001	0.28
	Cornerlock 300 mm FFH	2.3	2.3	0.3	0.02	0.0	0.001	0.34
	Cornerlock 400 mm FFH	2.6	2.6	0.3	0.02	0.0	0.001	0.34
	Cornerlock 500 mm FFH	2.8	2.8	0.3	0.02	0.0	0.001	0.34
	Cornerlock 600 mm FFH	3.3	3.3	0.3	0.02	0.0	0.001	0.34
	Cornerlock 700 mm FFH	3.6	3.6	0.3	0.02	0.0	0.001	0.36
	Cornerlock 800 mm FFH	3.9	3.9	0.3	0.02	0.0	0.001	0.36
	Cornerlock 900 mm FFH	4.2	4.2	0.3	0.02	0.0	0.001	0.36
	Cornerlock 1000 mm FFH	4.5	4.5	0.3	0.02	0.0	0.001	0.36

2.5.3 Material composition of included products – Bolted stringer understructure

Table 6 provides the materials used in production of Bolted stringer type of understructure with finished floor height ranging from 150 to 1000 mm. Quantities of materials provided are per declared unit

Table 6: Materials composition of Cornerlock understructure products

Product type	Product name	Understructure materials		Packaging materials				
		Steel	Total weight (kg/m ²)	Timber	Cardboard	Steel	Plastics	Total weight (kg/m ²)
Understructure - Bolted stringer	Bolted Stringer 60 cm_150 mm FFH	4.3	4.3	0.5	0.02	0.0	0.012	0.54
	Bolted Stringer 60 cm_200 mm FFH	4.4	4.4	0.5	0.02	0.0	0.012	0.57
	Bolted Stringer 60 cm_300 mm FFH	4.6	4.6	0.6	0.02	0.0	0.012	0.63
	Bolted Stringer 60 cm_400 mm FFH	4.9	4.9	0.6	0.02	0.0	0.012	0.63
	Bolted Stringer 60 cm_500 mm FFH	5.2	5.2	0.6	0.02	0.0	0.012	0.63
	Bolted Stringer 60 cm_600 mm FFH	5.7	5.7	0.6	0.02	0.0	0.012	0.63
	Bolted Stringer 60 cm_700 mm FFH	6.0	6.0	0.6	0.02	0.0	0.012	0.65
	Bolted Stringer 60 cm_800 mm FFH	6.3	6.3	0.6	0.02	0.0	0.012	0.65
	Bolted Stringer 60 cm_900 mm FFH	6.6	6.6	0.6	0.02	0.0	0.012	0.65
	Bolted Stringer 60 cm_1000 mm FFH	6.9	6.9	0.6	0.02	0.0	0.012	0.65
	Bolted Stringer 120 cm_150 mm FFH	6.7	6.7	0.5	0.02	0.0	0.023	0.55
	Bolted Stringer 120 cm_200 mm FFH	6.8	6.8	0.5	0.02	0.0	0.023	0.58
	Bolted Stringer 120 cm_300 mm FFH	7.1	7.1	0.6	0.02	0.0	0.023	0.64
	Bolted Stringer 120 cm_400 mm FFH	7.4	7.4	0.6	0.02	0.0	0.023	0.64
	Bolted Stringer 120 cm_500 mm FFH	7.7	7.7	0.6	0.02	0.0	0.023	0.64
	Bolted Stringer 120 cm_600 mm FFH	8.2	8.2	0.6	0.02	0.0	0.023	0.64
	Bolted Stringer 120 cm_700 mm FFH	8.5	8.5	0.6	0.02	0.0	0.023	0.66
	Bolted Stringer 120 cm_800 mm FFH	8.8	8.8	0.6	0.02	0.0	0.023	0.66
	Bolted Stringer 120 cm_900 mm FFH	9.1	9.1	0.6	0.02	0.0	0.023	0.66
	Bolted Stringer 120 cm_1000 mm FFH	9.4	9.4	0.6	0.02	0.0	0.023	0.66

3 LCA calculation rules

3.1 Declared unit:

The declared unit used in this EPD is 1 m² of Concore access floor system installed.

3.2 System boundary

This EPD includes all life cycle stages from extraction of raw materials to installation at a construction site. The scope of this EPD is this cradle to gate with options. All modules included in this EPD are marked as X in Table 7 and those excluded are marked as 'Module not declared'(MND). The system boundary for this EPD is depicted in Figure 1. The subsequent sections provide details about the processes included in the upstream, core and downstream modules.

3.2.1 Upstream processes

The upstream processes include those involved in Module A1 – Raw material supply. It includes:

- Extraction, transport and manufacturing of raw materials.
- Generation of electricity from primary and secondary energy resources, also including their extraction, refining and transport for Modules A1 and A3.

Table 7: Life Cycle of building products: stages and modules included in this LCA

GPI Module		Asset life cycle stage	Information module	Declared modules
Upstream	A1	Raw material supply	A1-3. Manufacturing stage	X
Core	A2	Transport		X
	A3	Manufacturing		X
Downstream	A4	Transport	A4-5. Construction stage	X
	A5	Construction, installation process		X
	B1	Material emissions from usage	B. Usage stage	MND
	B2	Maintenance		MND
	B3	Repair		MND
	B4	Replacement		MND
	B5	Refurbishment		MND
	B6	Operational energy use		MND
	B7	Operational water use		MND
	C1	Deconstruction and demolition	C. End of life	MND
	C2	Transport		MND
	C3	Waste processing		MND
	C4	Disposal		MND
Other environmental information	D	Reuse, recycle or recovery	D. Recyclability potentials	MND

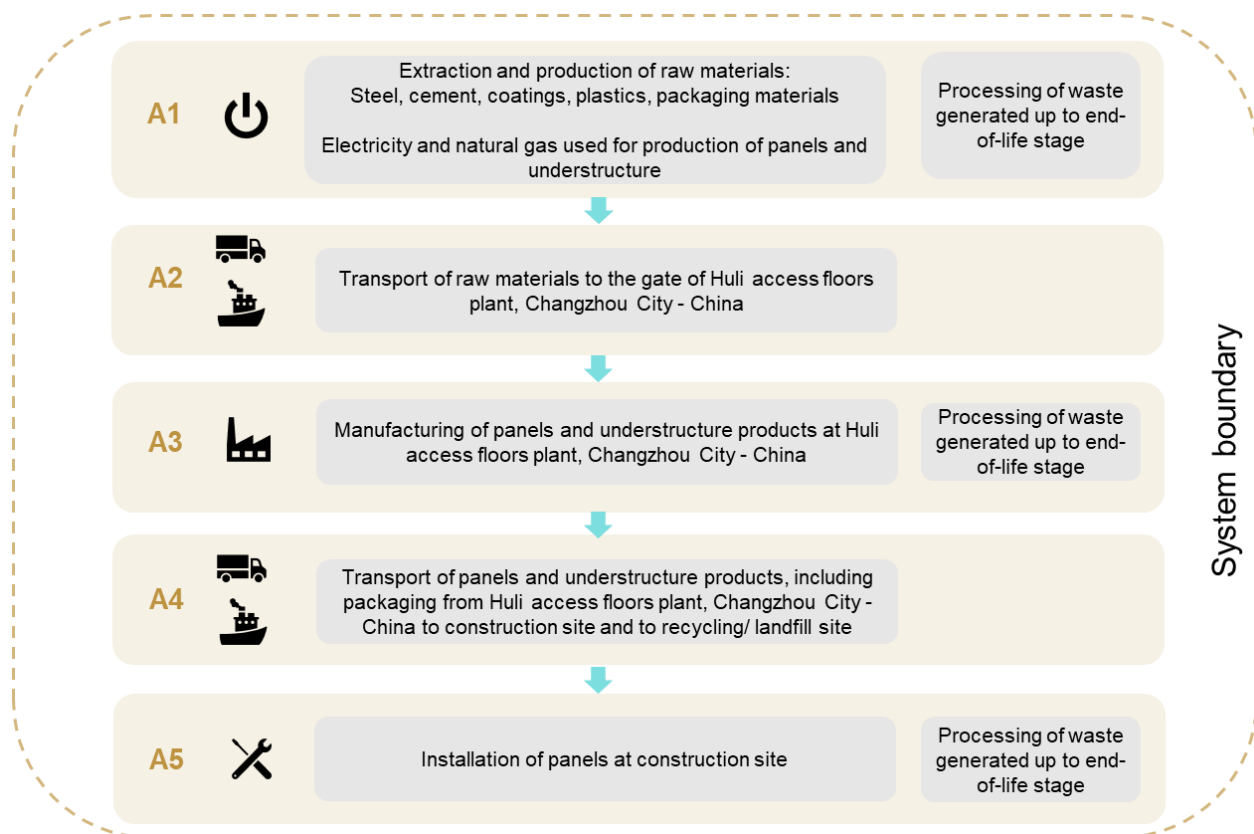


Figure 1: System boundary for this EPD

The steel used for manufacturing has a post-consumer and post-industrial recycled content of 23.4 % and 28.10 % respectively (51.5% total), while the cement has 35% post-consumer recycled content. The timber pallet used for packing of panels has 50% recycled content.

Province specific grid data for China (2018) was sourced from the ecoinvent v3.5 library¹ and was utilised to model the electricity used for producing all material inputs (e.g. steel, cement, plastics etc.), manufacturing of the panels and water extraction from river; while global average data was utilised for natural gas usage.

3.2.2 Core processes

The core processes include those involved in Module A2 and Module A3, including:

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- Specific data for distances from suppliers to manufacturing plant was utilised to model transportation impacts for the A2 module. Since the suppliers of packaging materials were unknown, a 150 km distance for these materials was assumed based on the distance from Shanghai to manufacturing site
- Manufacturing of the panels and understructure.
- Impacts from packaging materials including timber pallet/ crate, cardboard corners, steel strapping, cartons, clear packaging wrap are covered in module A3

All products included in this EPD are manufactured at the Huili access floors plant in Changzhou, China.

3.2.3 Downstream processes

The downstream processes include those involved in Module A4 and A5, including:

- Transportation from the production gate to the construction site. This includes 5 sectors:
 1. Factory to Shanghai port by Truck
 2. Shanghai to Port in Australia by Ship
 3. Port in Australia to local Tate warehouse by Truck
 4. Local Tate warehouse to construction site by Truck
 5. Construction site to landfill site or metal recycling location by Truck
- Transport of waste generated from the construction site.
- Installation of the product into the building.
- Wastage of construction products (additional production processes to compensate for the loss of construction products included in module A1-A3). Waste processing of the waste from product packaging and product wastage during the construction processes up to the end-of-waste state or disposal of final residues.
- The wastage factor during installation is 1.5%. This mean that 1.5% (by weight) of all materials at construction site go to waste. Post installation at the construction site, all packaging (except steel strapping) was assumed to be landfilled.
- The concrete from off-cuts of panels was assumed to be landfilled, while steel from off-cuts and strapping was assumed to be recycled. Based on the 'Polluter pays principle' methodology, the impacts from recycling and landfilling processes are accounted for in Module A5 and allocated to Tate.

3.2.4 Exclusions

- The treatment of waste generated from manufacturing was excluded in the material flows. The waste generated during manufacturing process is expected to be less than 1% of the material flows for module A3. This is also why Tate does not have quantifiable data available data pertaining to this. No other flows have been excluded.

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- Downstream life cycle stages from modules B1 to C4 and module D have not been assessed in this study. As such downstream modules not assessed and are marked as MND (Module Not Declared) in Table 7. The impacts of excluded life cycle stages are not considered to be zero.

3.2.5 Application of cut-off rules

- The treatment of waste generated from manufacturing was excluded in the material flows. The waste generated during manufacturing process is expected to be less than 1% of the material flows for module A3. This is also why as the manufacturer does not have quantifiable data available data pertaining to this. No other flows have been excluded.
- In accordance with the Construction PCR v2.3², environmental impacts relating to personnel, infrastructure, and production equipment not directly consumed in the process are excluded from the system boundary. 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.

3.2.6 Background data modelling

The inventory data for the processes are entered in the SimaPro® LCA software (v8.4) and linked to the pre-existing background data for upstream feedstocks and services. Inventory data was selected per the standards, in the following order of preference:

- Ecoinvent 3.5 database (Ecoinvent Centre, 2018) for all processes taking place overseas i.e. outside Australia, using global average processes¹. At the time of this EPD, the Ecoinvent database was 2 years old.
- The Australian Life Cycle Inventory (AusLCI) v1.28 being compiled by the Australian Life Cycle Assessment Society (ALCAS) – this data will comply with the AusLCI Data Guidelines (Australian Life Cycle Inventory Database Initiative (AusLCI), 2018)³. At the time of this EPD, the AusLCI database was 2 years old.
- Australasian Unit Process LCI v 2014.09 based on Australian LCA database developed from 1998 up to 2007 by Centre for Design from data originally developed with the CRC for Waste Management and Pollution Control as part of an Australian Inventory data project.⁴ At the time of this report, the database was 6 years old.

3.2.7 Data quality and temporal scope

The temporal scope of the foreground data on raw material requirements and manufacture inputs and is the calendar year of 2018. The data sources and their assessed quality are detailed in Table 8. Overall, the data quality for this LCA was considered as High.

Table 8: Data quality and temporal scope

Module	Input/ Output	Data source	Temporal scope	Geographic scope	Quality
A1	Steel used for panels and understructure products	Production manager (Huili Access Floors) and & Technical Services & Procurement Manager (Tate)	2018	China	High
	Portland cement				
	Epoxy resin for powder coating				
	Polyethylene screw sleeve and plug				
	Kraft paper				
	Aluminium oxide				
	Melamine formaldehyde resin				
	Spray contact adhesive				
	River water				
A2	Transport distances from raw material suppliers to Huili factory gate	Google Maps, based on locations provided by Tate	2018	China	High
A3	Electricity and natural gas used for manufacturing of panels and understructure products	Production manager (Huili Access Floors) and & Technical Services & Procurement Manager (Tate)	2018	China	High
A4	Transport stages and distances from Huli factory gate to construction site in finally to landfill/ recycling site. Please refer to Appendix B for more details	Google Maps	2018	China, Australia	High - Medium
A5	Energy required for installation	Technical Services & Procurement Manager (Tate)	2018	Australia	Medium
	Waste generated at construction site				Medium

3.3 Allocation

According to the PCR 2012:01 Construction Products and Construction Services, in a process step where more than one type of product is generated, it is necessary to allocate the environmental stressors (inputs and outputs) from the process to the different products (functional outputs) to get product-based inventory data instead of process-based data. An allocation problem also occurs for multi-input processes.

3.3.1 Recycled content in steel and cement

Tate's panels and understructure incorporate varying levels of recycled content in the steel and cement used to manufacture them. Based on the guidelines from PCR 2012:01 Construction Products and Construction Services, the burden of impact from recycled materials has been excluded, but the impacts from processing of the recycled material have been allocated to Tate. Essentially, secondary (recycled) materials bear only the impacts of the recycling processes.

3.3.2 Background data

The allocation approach for the generic databases utilised in this LCA is also compliant with the PCR. More specifically, the burden of primary production of materials is always allocated to the primary user of a material, while secondary (recycled) materials bear only the impacts of the recycling processes.

3.4 Compliance with standards

The LCA and EPD have been developed to comply with:

- ISO 14040:2006⁵, ISO 14044:2006+A1:2018⁶, ISO 14025:2006⁷
- EN15804:2012+A1:2013⁸
- The General Program Instructions (GPI) for the International EPD system v3.0⁹
- Instructions of the EPD Australasia Programme V3.0¹⁰
- PCR 2012:02 Construction products and construction services (V2.3)²

3.5 Key Assumptions

- All foreground data used for the manufacturing processes (up to factory gate), transportation to port in China, distribution and installation in Australia was collected from Tate via a 'Request for Information' spreadsheet. This data was collected for the calendar year of 2018. For installation, a conservative estimate of 2 minutes forklift usage to unload 1 m² of panels was considered. This was based on on-site installation data from Tate.
- Weighted average distance was calculated for each sector of transport, wherein the weighting factor was based on the primary sales/ shipment data provided by Tate.
- All data used in this LCA are within the prescribed 5-year limit for specific data as per the PCR 2012:01 Construction products and construction services v2.3 and EN15804.
- In terms of methodology, the only exclusion is the treatment of waste generated from manufacturing (apart from the steel scrap) manufacturing process is expected to be less than 1% of the material flows for module A3.

4 Life Cycle Assessment (LCA) results

4.1 Impact categories

The indicators for potential environmental impacts, use of resources, waste categories and output flow presented in Table 9 have been calculated using the SimaPro (v9) tool. The LCA results are relative expressions and do not predict impacts on category endpoints, exceeding of thresholds and safety margins or risks. The impact assessment results are presented in section 4.2 and 4.3.

Table 9: Impact categories for LCA

Impact Category	Abbreviation	Measurement Unit	Assessment Method and Implementation
Potential Environmental Impacts			
Global warming potential	GWP	kg CO ₂ equivalents (GWP100)	CML (v4.02)
Ozone depletion potential	ODP	kg CFC 11 equivalents	CML (v4.02)
Acidification potential	AP	kg SO ₂ equivalents	CML (v4.02)
Eutrophication Potential	EP	kg PO ₄ ³⁻ equivalents	CML (v4.02)
Photochemical ozone creation potential	POCP	kg C ₂ H ₂ equivalents	CML (v4.02)
Abiotic depletion potential (elements)	ADPE	kg Sb equivalents	CML (v4.02)
Abiotic depletion potential (fossil fuels)	ADPF	MJ net calorific value	CML (v4.02)
Resource use			
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value	ecoinvent version 2.0 and expanded by PRé Consultants ^{1 2}
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value	Manual for direct inputs ³
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ, net calorific value	ecoinvent version 2.0 and expanded by PRé Consultants
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value	Manual for direct inputs ⁴
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value	ecoinvent version 2.0 and expanded by PRé Consultants
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ, net calorific value	ecoinvent version 2.0 and expanded by PRé Consultants ⁵
Use of secondary material	SM	kg	Manual for direct inputs
Use of renewable secondary fuels	RSF	MJ, net calorific value	Manual for direct inputs
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value	Manual for direct inputs
Use of net fresh water	FW	m ³	ReCiPe 2016
Waste categories			
Hazardous waste disposed	HWD	kg	EDIP 2003 (v1.05)
Non-hazardous waste disposed	NHWD	kg	EDIP 2003 (v1.05) ⁶
Radioactive waste disposed/stored	RWD	kg	EDIP 2003 (v1.05)
Output flows			
Components for reuse	CRU	kg	Manual for direct inputs
Materials for recycling	MFR	kg	Manual for direct inputs
Materials for energy recovery	MFRE	kg	Manual for direct inputs
Exported energy	EE	MJ per energy carrier	Manual for direct inputs

¹ Method to calculate Cumulative Energy Demand (CED), based on the method published by Ecoinvent version 2.0 and expanded by PRé Consultants for raw materials available in the SimaPro database. ² Calculated as sum of *Renewable, biomass, Renewable, wind, solar, geoth* and *Renewable, water*. ³ Calculated based on the lower heating value of renewable raw materials. ⁴ Calculated based on the higher heating value of non-renewable raw materials. ⁵ Calculated as sum of *Non-renewable, fossil, Non-renewable, nuclear* and *Non-renewable, biomass*. ⁶ Calculated as sum of *Bulk waste* and *Slags/ash*.

4.1.1 Guidance for calculating environmental impacts of panels and understructure

To calculate the combined environmental impact of a panel or understructure based on the LCA scope of this EPD, add the impacts for an indicator of interest for module A1-A3, A4 and A5. For example, the total GWP impact for Concore 1500 panel is 49.6 (A1-A3) + 10.1 (A4) + 2.6 (A5) = 62.3 kg CO₂ eq. Similarly, the total GWP impact for a 60 cm Bolted Stringer understructure with 150 FFH is 17.1 (A1-A3) + 1.15 (A4) + 2.03 (A5) = 20.3 kg CO₂ eq.

So, for the total GWP impact for an access floor system with a Concore 1500 panel and a 60 cm Bolted Stringer understructure with 150 mm FFH is 62.3 + 20.3 = 82.6 kg CO₂ eq. This the cumulative GWP impact across all life cycle stages covered in this EPD i.e. product stage (A1-A3) + transportation to construction site (A4) and installation (A5)

4.2 LCA results for panels

4.2.1 Concore panels environmental impacts for inputs and manufacturing (A1-A3)

Table 10 - Concore panels environmental impact A1- A3: EPD primary impact categories

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Concore 800	3.4E+01	1.7E-06	1.2E-02	1.3E-01	6.1E-02	1.9E-04	4.3E+02
Concore 1000	3.7E+01	1.8E-06	1.3E-02	1.4E-01	6.8E-02	2.1E-04	4.7E+02
Concore 1250	3.9E+01	1.9E-06	1.4E-02	1.6E-01	7.5E-02	2.3E-04	5.1E+02
Concore 1500	5.0E+01	2.4E-06	1.8E-02	2.0E-01	1.0E-01	3.2E-04	6.5E+02
Concore 2000	5.9E+01	2.8E-06	2.2E-02	2.4E-01	1.2E-01	4.0E-04	7.8E+02
Concore 2500	6.4E+01	3.0E-06	2.5E-02	2.7E-01	1.4E-01	4.4E-04	8.6E+02
Concore 3000	7.1E+01	3.4E-06	2.8E-02	3.0E-01	1.6E-01	5.0E-04	9.6E+02
Concore 1000 with HPL	4.1E+01	2.5E-06	1.4E-02	1.7E-01	7.8E-02	2.4E-04	5.2E+02
Concore 1250 with HPL	4.5E+01	2.7E-06	1.6E-02	1.8E-01	8.6E-02	2.6E-04	5.8E+02
Concore 1500 with HPL	5.5E+01	3.1E-06	2.0E-02	2.3E-01	1.1E-01	3.5E-04	7.2E+02
Concore 2000 with HPL	6.4E+01	3.5E-06	2.4E-02	2.7E-01	1.3E-01	4.2E-04	8.5E+02
Concore 2500 with HPL	6.9E+01	3.8E-06	2.6E-02	2.9E-01	1.5E-01	4.7E-04	9.2E+02
Concore 3000 with HPL	7.6E+01	4.1E-06	2.9E-02	3.3E-01	1.7E-01	5.3E-04	1.0E+03

Table 11 - Concore panels environmental impact A1- A3: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Concore 800	2.5E+01	5.1E+00	3.0E+01	3.8E+02	4.1E+01	4.2E+02	1.2E+01	0.0E+00	0.0E+00	2.0E-01
Concore 1000	2.7E+01	5.1E+00	3.2E+01	4.1E+02	4.1E+01	4.5E+02	1.4E+01	0.0E+00	0.0E+00	2.1E-01
Concore 1250	2.9E+01	5.1E+00	3.4E+01	4.4E+02	4.1E+01	4.8E+02	1.5E+01	0.0E+00	0.0E+00	2.3E-01
Concore 1500	3.7E+01	5.9E+00	4.3E+01	5.6E+02	4.4E+01	6.1E+02	1.8E+01	0.0E+00	0.0E+00	2.9E-01
Concore 2000	4.3E+01	5.9E+00	4.9E+01	6.7E+02	4.6E+01	7.2E+02	2.2E+01	0.0E+00	0.0E+00	3.4E-01
Concore 2500	4.7E+01	6.4E+00	5.4E+01	7.3E+02	4.6E+01	7.8E+02	2.4E+01	0.0E+00	0.0E+00	3.7E-01
Concore 3000	5.2E+01	6.4E+00	5.9E+01	8.1E+02	4.6E+01	8.6E+02	2.6E+01	0.0E+00	0.0E+00	4.1E-01
Concore 1000 with HPL	1.2E+02	3.0E+01	1.5E+02	4.6E+02	4.6E+01	5.1E+02	1.4E+01	0.0E+00	0.0E+00	4.1E-01
Concore 1250 with HPL	1.2E+02	3.0E+01	1.5E+02	5.1E+02	4.6E+01	5.6E+02	1.5E+01	0.0E+00	0.0E+00	4.3E-01
Concore 1500 with HPL	1.3E+02	3.0E+01	1.6E+02	6.3E+02	4.6E+01	6.7E+02	1.9E+01	0.0E+00	0.0E+00	4.9E-01
Concore 2000 with HPL	1.3E+02	3.0E+01	1.6E+02	7.3E+02	4.6E+01	7.8E+02	2.2E+01	0.0E+00	0.0E+00	5.4E-01
Concore 2500 with HPL	1.4E+02	3.1E+01	1.7E+02	7.9E+02	4.6E+01	8.4E+02	2.4E+01	0.0E+00	0.0E+00	5.7E-01
Concore 3000 with HPL	1.4E+02	3.1E+01	1.7E+02	8.7E+02	4.6E+01	9.2E+02	2.7E+01	0.0E+00	0.0E+00	6.1E-01

Table 12 - Concore panels environmental impact A1- A3: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Concore 800	9.3E-04	7.3E+00	6.1E-04
Concore 1000	1.1E-03	8.2E+00	6.6E-04
Concore 1250	1.2E-03	9.0E+00	7.0E-04
Concore 1500	1.6E-03	1.2E+01	8.8E-04
Concore 2000	2.0E-03	1.5E+01	1.0E-03
Concore 2500	2.2E-03	1.7E+01	1.1E-03
Concore 3000	2.5E-03	1.9E+01	1.2E-03
Concore 1000 with HPL	1.2E-03	8.8E+00	9.2E-04
Concore 1250 with HPL	1.3E-03	9.7E+00	9.9E-04
Concore 1500 with HPL	1.7E-03	1.3E+01	1.2E-03
Concore 2000 with HPL	2.1E-03	1.6E+01	1.3E-03
Concore 2500 with HPL	2.4E-03	1.8E+01	1.4E-03
Concore 3000 with HPL	2.7E-03	2.0E+01	1.5E-03

Table 13 - Concore panels environmental impact A1- A3: EPD output flow indicators

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Concore 800	0.0E+00	1.3E-01	0.0E+00	0.0E+00
Concore 1000	0.0E+00	1.7E-01	0.0E+00	0.0E+00
Concore 1250	0.0E+00	2.0E-01	0.0E+00	0.0E+00
Concore 1500	0.0E+00	4.4E-01	0.0E+00	0.0E+00
Concore 2000	0.0E+00	5.4E-01	0.0E+00	0.0E+00
Concore 2500	0.0E+00	5.9E-01	0.0E+00	0.0E+00
Concore 3000	0.0E+00	6.6E-01	0.0E+00	0.0E+00
Concore 1000 with HPL	0.0E+00	1.7E-01	0.0E+00	0.0E+00
Concore 1250 with HPL	0.0E+00	2.0E-01	0.0E+00	0.0E+00
Concore 1500 with HPL	0.0E+00	4.4E-01	0.0E+00	0.0E+00
Concore 2000 with HPL	0.0E+00	5.4E-01	0.0E+00	0.0E+00
Concore 2500 with HPL	0.0E+00	5.9E-01	0.0E+00	0.0E+00
Concore 3000 with HPL	0.0E+00	6.6E-01	0.0E+00	0.0E+00

4.2.2 Concore panels environmental impacts for transportation to construction site (A4)

Table 14 - Concore panels environmental impact A4: EPD primary impact categories

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Concore 800	7.3E+00	1.1E-06	2.5E-03	7.3E-02	9.2E-03	1.2E-05	1.0E+02
Concore 1000	7.8E+00	1.2E-06	2.7E-03	7.8E-02	9.8E-03	1.3E-05	1.1E+02
Concore 1250	8.2E+00	1.2E-06	2.8E-03	8.3E-02	1.0E-02	1.4E-05	1.2E+02
Concore 1500	1.0E+01	1.5E-06	3.5E-03	1.0E-01	1.3E-02	1.7E-05	1.4E+02
Concore 2000	1.2E+01	1.8E-06	4.0E-03	1.2E-01	1.5E-02	1.9E-05	1.7E+02
Concore 2500	1.3E+01	1.9E-06	4.3E-03	1.3E-01	1.6E-02	2.1E-05	1.8E+02
Concore 3000	1.4E+01	2.1E-06	4.8E-03	1.4E-01	1.7E-02	2.3E-05	2.0E+02
Concore 1000 with HPL	8.2E+00	1.2E-06	2.8E-03	8.3E-02	1.0E-02	1.4E-05	1.2E+02
Concore 1250 with HPL	8.7E+00	1.3E-06	3.0E-03	8.7E-02	1.1E-02	1.4E-05	1.2E+02
Concore 1500 with HPL	1.1E+01	1.6E-06	3.6E-03	1.1E-01	1.3E-02	1.8E-05	1.5E+02
Concore 2000 with HPL	1.2E+01	1.8E-06	4.1E-03	1.2E-01	1.5E-02	2.0E-05	1.7E+02
Concore 2500 with HPL	1.3E+01	2.0E-06	4.5E-03	1.3E-01	1.6E-02	2.2E-05	1.9E+02
Concore 3000 with HPL	1.4E+01	2.2E-06	4.9E-03	1.4E-01	1.8E-02	2.4E-05	2.0E+02

Table 15 - Concore panels environmental impact A4: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Concore 800	1.4E+00	0.0E+00	1.4E+00	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	2.6E-02
Concore 1000	1.5E+00	0.0E+00	1.5E+00	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	2.7E-02
Concore 1250	1.6E+00	0.0E+00	1.6E+00	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-02
Concore 1500	2.0E+00	0.0E+00	2.0E+00	1.5E+02	0.0E+00	1.5E+02	0.0E+00	0.0E+00	0.0E+00	3.5E-02
Concore 2000	2.3E+00	0.0E+00	2.3E+00	1.7E+02	0.0E+00	1.7E+02	0.0E+00	0.0E+00	0.0E+00	4.1E-02
Concore 2500	2.5E+00	0.0E+00	2.5E+00	1.9E+02	0.0E+00	1.9E+02	0.0E+00	0.0E+00	0.0E+00	4.5E-02
Concore 3000	2.7E+00	0.0E+00	2.7E+00	2.0E+02	0.0E+00	2.0E+02	0.0E+00	0.0E+00	0.0E+00	4.9E-02
Concore 1000 with HPL	1.6E+00	0.0E+00	1.6E+00	1.2E+02	0.0E+00	1.2E+02	0.0E+00	0.0E+00	0.0E+00	2.9E-02
Concore 1250 with HPL	1.7E+00	0.0E+00	1.7E+00	1.3E+02	0.0E+00	1.3E+02	0.0E+00	0.0E+00	0.0E+00	3.0E-02
Concore 1500 with HPL	2.1E+00	0.0E+00	2.1E+00	1.5E+02	0.0E+00	1.5E+02	0.0E+00	0.0E+00	0.0E+00	3.7E-02
Concore 2000 with HPL	2.4E+00	0.0E+00	2.4E+00	1.8E+02	0.0E+00	1.8E+02	0.0E+00	0.0E+00	0.0E+00	4.3E-02
Concore 2500 with HPL	2.6E+00	0.0E+00	2.6E+00	1.9E+02	0.0E+00	1.9E+02	0.0E+00	0.0E+00	0.0E+00	4.6E-02
Concore 3000 with HPL	2.8E+00	0.0E+00	2.8E+00	2.1E+02	0.0E+00	2.1E+02	0.0E+00	0.0E+00	0.0E+00	5.0E-02

Table 16 - Concore panels environmental impact A4: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Concore 800	7.8E-05	9.5E-01	3.5E-04
Concore 1000	8.4E-05	1.0E+00	3.8E-04
Concore 1250	8.9E-05	1.1E+00	4.0E-04
Concore 1500	1.1E-04	1.3E+00	4.9E-04
Concore 2000	1.3E-04	1.5E+00	5.7E-04
Concore 2500	1.4E-04	1.6E+00	6.1E-04
Concore 3000	1.5E-04	1.8E+00	6.7E-04
Concore 1000 with HPL	8.9E-05	1.1E+00	4.0E-04
Concore 1250 with HPL	9.3E-05	1.1E+00	4.2E-04
Concore 1500 with HPL	1.1E-04	1.4E+00	5.1E-04
Concore 2000 with HPL	1.3E-04	1.6E+00	5.9E-04
Concore 2500 with HPL	1.4E-04	1.7E+00	6.3E-04
Concore 3000 with HPL	1.5E-04	1.9E+00	6.9E-04

Table 17 - Concore panels environmental impact A4: EPD output flow indicators

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Concore 800	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1000	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1250	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1500	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 2000	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 2500	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 3000	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1000 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1250 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 1500 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 2000 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 2500 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Concore 3000 with HPL	0.0E+00	0.0E+00	0.0E+00	0.0E+00

4.2.3 Concore panels environmental impacts for installation (A5)

Table 18 - Concore panels environmental impact A5: EPD primary impact indicators

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Concore 800	2.3E+00	2.5E-08	7.3E-04	1.1E-02	3.1E-03	3.0E-06	2.9E+01
Concore 1000	2.5E+00	2.7E-08	7.9E-04	1.1E-02	3.3E-03	3.4E-06	3.0E+01
Concore 1250	2.6E+00	2.9E-08	8.1E-04	1.2E-02	3.4E-03	3.7E-06	3.1E+01
Concore 1500	2.6E+00	3.5E-08	8.4E-04	1.2E-02	3.7E-03	4.9E-06	3.2E+01
Concore 2000	2.7E+00	4.1E-08	9.0E-04	1.3E-02	4.0E-03	6.0E-06	3.4E+01
Concore 2500	2.9E+00	4.5E-08	9.4E-04	1.3E-02	4.3E-03	6.7E-06	3.5E+01
Concore 3000	3.0E+00	4.9E-08	9.9E-04	1.4E-02	4.5E-03	7.6E-06	3.7E+01
Concore 1000 with HPL	2.6E+00	3.7E-08	8.1E-04	1.2E-02	3.4E-03	3.7E-06	3.1E+01
Concore 1250 with HPL	2.7E+00	4.0E-08	8.4E-04	1.2E-02	3.6E-03	4.1E-06	3.2E+01
Concore 1500 with HPL	2.9E+00	4.7E-08	9.2E-04	1.3E-02	4.0E-03	5.5E-06	3.4E+01
Concore 2000 with HPL	3.1E+00	5.3E-08	9.7E-04	1.4E-02	4.3E-03	6.6E-06	3.6E+01
Concore 2500 with HPL	3.2E+00	5.6E-08	1.0E-03	1.4E-02	4.6E-03	7.3E-06	3.8E+01
Concore 3000 with HPL	3.3E+00	6.1E-08	1.1E-03	1.5E-02	4.8E-03	8.2E-06	4.0E+01

Table 19 - Concore panels environmental impact A5: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Concore 800	8.9E-01	7.6E-02	9.7E-01	6.2E+00	6.1E-01	6.8E+00	1.8E-01	0.0E+00	0.0E+00	3.3E-03
Concore 1000	1.2E+00	7.6E-02	1.2E+00	7.0E+00	6.1E-01	7.6E+00	2.0E-01	0.0E+00	0.0E+00	3.8E-03
Concore 1250	1.2E+00	7.6E-02	1.3E+00	7.5E+00	6.1E-01	8.1E+00	2.1E-01	0.0E+00	0.0E+00	4.1E-03
Concore 1500	1.1E+00	8.8E-02	1.2E+00	8.9E+00	6.5E-01	9.6E+00	2.7E-01	0.0E+00	0.0E+00	4.7E-03
Concore 2000	1.2E+00	8.8E-02	1.3E+00	1.1E+01	6.8E-01	1.1E+01	3.2E-01	0.0E+00	0.0E+00	5.5E-03
Concore 2500	1.4E+00	9.6E-02	1.5E+00	1.1E+01	6.8E-01	1.2E+01	3.6E-01	0.0E+00	0.0E+00	6.0E-03
Concore 3000	1.4E+00	9.6E-02	1.5E+00	1.3E+01	6.8E-01	1.3E+01	4.0E-01	0.0E+00	0.0E+00	6.6E-03
Concore 1000 with HPL	2.5E+00	4.4E-01	3.0E+00	7.8E+00	6.9E-01	8.5E+00	2.0E-01	0.0E+00	0.0E+00	6.8E-03
Concore 1250 with HPL	2.5E+00	4.4E-01	3.0E+00	8.5E+00	6.9E-01	9.2E+00	2.2E-01	0.0E+00	0.0E+00	7.1E-03
Concore 1500 with HPL	2.8E+00	4.6E-01	3.2E+00	1.0E+01	6.9E-01	1.1E+01	2.8E-01	0.0E+00	0.0E+00	8.2E-03
Concore 2000 with HPL	2.9E+00	4.6E-01	3.3E+00	1.2E+01	6.9E-01	1.3E+01	3.3E-01	0.0E+00	0.0E+00	9.1E-03
Concore 2500 with HPL	3.0E+00	4.6E-01	3.5E+00	1.3E+01	6.9E-01	1.4E+01	3.6E-01	0.0E+00	0.0E+00	9.7E-03
Concore 3000 with HPL	3.1E+00	4.6E-01	3.5E+00	1.5E+01	6.9E-01	1.5E+01	4.0E-01	0.0E+00	0.0E+00	1.0E-02

Table 20 - Concore panels environmental impact A5: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Concore 800	1.4E-05	7.7E-01	8.7E-06
Concore 1000	1.6E-05	1.2E+00	9.4E-06
Concore 1250	1.8E-05	1.3E+00	1.0E-05
Concore 1500	2.4E-05	9.5E-01	1.2E-05
Concore 2000	3.0E-05	9.9E-01	1.5E-05
Concore 2500	3.4E-05	1.1E+00	1.6E-05
Concore 3000	3.8E-05	1.1E+00	1.7E-05
Concore 1000 with HPL	1.8E-05	1.3E+00	1.3E-05
Concore 1250 with HPL	2.0E-05	1.3E+00	1.4E-05
Concore 1500 with HPL	2.6E-05	1.6E+00	1.7E-05
Concore 2000 with HPL	3.2E-05	1.7E+00	1.9E-05
Concore 2500 with HPL	3.6E-05	1.9E+00	2.0E-05
Concore 3000 with HPL	4.0E-05	2.0E+00	2.2E-05

Table 21 - Concore panels environmental impact A5: EPD output flow indicators

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Concore 800	0.0E+00	3.8E-01	0.0E+00	0.0E+00
Concore 1000	0.0E+00	4.1E-01	0.0E+00	0.0E+00
Concore 1250	0.0E+00	4.4E-01	0.0E+00	0.0E+00
Concore 1500	0.0E+00	5.8E-01	0.0E+00	0.0E+00
Concore 2000	0.0E+00	6.8E-01	0.0E+00	0.0E+00
Concore 2500	0.0E+00	7.7E-01	0.0E+00	0.0E+00
Concore 3000	0.0E+00	8.5E-01	0.0E+00	0.0E+00
Concore 1000 with HPL	0.0E+00	4.1E-01	0.0E+00	0.0E+00
Concore 1250 with HPL	0.0E+00	4.4E-01	0.0E+00	0.0E+00
Concore 1500 with HPL	0.0E+00	5.8E-01	0.0E+00	0.0E+00
Concore 2000 with HPL	0.0E+00	6.8E-01	0.0E+00	0.0E+00
Concore 2500 with HPL	0.0E+00	7.7E-01	0.0E+00	0.0E+00
Concore 3000 with HPL	0.0E+00	8.5E-01	0.0E+00	0.0E+00

4.3 LCA results for Concore understructure

4.3.1 Concore understructure environmental impacts for inputs and manufacturing (A1-A3)

Table 22 - Concore understructure environmental impact A1- A3: EPD primary impact categories

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Cornerlock 150	1.1E+01	7.8E-07	2.5E-03	4.0E-01	9.2E-02	2.9E-04	1.7E+02
Cornerlock 200	1.2E+01	7.9E-07	2.6E-03	4.0E-01	9.2E-02	2.9E-04	1.7E+02
Cornerlock 300	1.2E+01	8.1E-07	2.7E-03	4.0E-01	9.3E-02	2.9E-04	1.7E+02
Cornerlock 400	1.2E+01	8.3E-07	2.9E-03	4.0E-01	9.4E-02	4.3E-04	1.8E+02
Cornerlock 500	1.3E+01	8.5E-07	3.1E-03	4.0E-01	9.5E-02	4.8E-04	1.8E+02
Cornerlock 600	1.4E+01	8.9E-07	3.3E-03	4.1E-01	9.7E-02	5.8E-04	2.0E+02
Cornerlock 700	1.4E+01	9.1E-07	3.5E-03	4.1E-01	9.8E-02	6.5E-04	2.0E+02
Cornerlock 800	1.4E+01	9.3E-07	3.6E-03	4.1E-01	9.9E-02	7.0E-04	2.1E+02
Cornerlock 900	1.5E+01	9.6E-07	3.8E-03	4.1E-01	1.0E-01	7.6E-04	2.1E+02
Cornerlock 1000	1.5E+01	9.8E-07	3.9E-03	4.2E-01	1.0E-01	8.2E-04	2.2E+02
Bolted Stringer 60 cm_150	1.7E+01	9.8E-07	4.3E-03	4.3E-01	1.0E-01	7.2E-04	2.4E+02
Bolted Stringer 60 cm_200	1.7E+01	9.9E-07	4.4E-03	4.3E-01	1.0E-01	7.2E-04	2.5E+02
Bolted Stringer 60 cm_300	1.8E+01	1.0E-06	4.5E-03	4.3E-01	1.1E-01	7.2E-04	2.5E+02
Bolted Stringer 60 cm_400	1.8E+01	1.0E-06	4.7E-03	4.3E-01	1.1E-01	8.6E-04	2.6E+02
Bolted Stringer 60 cm_500	1.8E+01	1.1E-06	4.9E-03	4.3E-01	1.1E-01	9.1E-04	2.6E+02
Bolted Stringer 60 cm_600	1.9E+01	1.1E-06	5.1E-03	4.4E-01	1.1E-01	1.0E-03	2.7E+02
Bolted Stringer 60 cm_700	2.0E+01	1.1E-06	5.3E-03	4.4E-01	1.1E-01	1.1E-03	2.8E+02
Bolted Stringer 60 cm_800	2.0E+01	1.1E-06	5.5E-03	4.4E-01	1.1E-01	1.1E-03	2.8E+02
Bolted Stringer 60 cm_900	2.0E+01	1.2E-06	5.6E-03	4.4E-01	1.1E-01	1.2E-03	2.9E+02
Bolted Stringer 60 cm_1000	2.1E+01	1.2E-06	5.8E-03	4.4E-01	1.1E-01	1.2E-03	3.0E+02
Bolted Stringer 120 cm_150	2.0E+01	1.1E-06	5.6E-03	4.4E-01	1.1E-01	1.2E-03	2.9E+02
Bolted Stringer 120 cm_200	2.1E+01	1.1E-06	5.7E-03	4.4E-01	1.1E-01	1.2E-03	2.9E+02
Bolted Stringer 120 cm_300	2.1E+01	1.2E-06	5.9E-03	4.4E-01	1.1E-01	1.2E-03	3.0E+02
Bolted Stringer 120 cm_400	2.1E+01	1.2E-06	6.0E-03	4.5E-01	1.1E-01	1.4E-03	3.0E+02
Bolted Stringer 120 cm_500	2.2E+01	1.2E-06	6.2E-03	4.5E-01	1.2E-01	1.4E-03	3.1E+02
Bolted Stringer 120 cm_600	2.3E+01	1.2E-06	6.4E-03	4.5E-01	1.2E-01	1.5E-03	3.2E+02
Bolted Stringer 120 cm_700	2.3E+01	1.3E-06	6.6E-03	4.5E-01	1.2E-01	1.6E-03	3.3E+02
Bolted Stringer 120 cm_800	2.3E+01	1.3E-06	6.8E-03	4.6E-01	1.2E-01	1.6E-03	3.3E+02
Bolted Stringer 120 cm_900	2.4E+01	1.3E-06	6.9E-03	4.6E-01	1.2E-01	1.7E-03	3.4E+02
Bolted Stringer 120 cm_1000	2.4E+01	1.3E-06	7.1E-03	4.6E-01	1.2E-01	1.7E-03	3.4E+02

Table 23 - Concore understructure environmental impact A1- A3: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Cornerlock 150	1.6E+01	4.4E+00	2.0E+01	1.5E+02	2.4E-02	1.5E+02	1.4E+00	0.0E+00	0.0E+00	6.1E-02
Cornerlock 200	1.6E+01	5.0E+00	2.1E+01	1.5E+02	2.4E-02	1.5E+02	1.4E+00	0.0E+00	0.0E+00	6.2E-02
Cornerlock 300	1.8E+01	6.0E+00	2.4E+01	1.5E+02	2.4E-02	1.5E+02	1.1E+00	0.0E+00	0.0E+00	6.5E-02
Cornerlock 400	1.8E+01	6.0E+00	2.4E+01	1.6E+02	2.4E-02	1.6E+02	1.8E+00	0.0E+00	0.0E+00	6.8E-02
Cornerlock 500	1.8E+01	6.0E+00	2.4E+01	1.6E+02	2.4E-02	1.6E+02	1.9E+00	0.0E+00	0.0E+00	7.0E-02
Cornerlock 600	1.9E+01	6.0E+00	2.5E+01	1.7E+02	2.4E-02	1.7E+02	0.0E+00	0.0E+00	0.0E+00	7.4E-02
Cornerlock 700	1.9E+01	6.4E+00	2.6E+01	1.8E+02	2.4E-02	1.8E+02	2.5E+00	0.0E+00	0.0E+00	7.7E-02
Cornerlock 800	2.0E+01	6.4E+00	2.6E+01	1.8E+02	2.4E-02	1.8E+02	2.6E+00	0.0E+00	0.0E+00	7.9E-02
Cornerlock 900	2.0E+01	6.4E+00	2.6E+01	1.9E+02	2.4E-02	1.9E+02	0.0E+00	0.0E+00	0.0E+00	8.1E-02
Cornerlock 1000	2.0E+01	6.4E+00	2.7E+01	1.9E+02	2.4E-02	1.9E+02	3.0E+00	0.0E+00	0.0E+00	8.4E-02
Bolted Stringer 60 cm_150	2.4E+01	9.5E+00	3.4E+01	2.1E+02	2.4E-02	2.1E+02	2.0E+00	0.0E+00	0.0E+00	8.8E-02
Bolted Stringer 60 cm_200	2.5E+01	1.0E+01	3.5E+01	2.1E+02	2.4E-02	2.1E+02	2.1E+00	0.0E+00	0.0E+00	8.9E-02
Bolted Stringer 60 cm_300	2.6E+01	1.1E+01	3.7E+01	2.1E+02	2.4E-02	2.1E+02	1.8E+00	0.0E+00	0.0E+00	9.2E-02
Bolted Stringer 60 cm_400	2.7E+01	1.1E+01	3.8E+01	2.2E+02	2.4E-02	2.2E+02	2.4E+00	0.0E+00	0.0E+00	9.5E-02
Bolted Stringer 60 cm_500	2.7E+01	1.1E+01	3.8E+01	2.2E+02	2.4E-02	2.2E+02	2.6E+00	0.0E+00	0.0E+00	9.7E-02
Bolted Stringer 60 cm_600	2.7E+01	1.1E+01	3.8E+01	2.3E+02	2.4E-02	2.3E+02	1.5E+00	0.0E+00	0.0E+00	1.0E-01
Bolted Stringer 60 cm_700	2.8E+01	1.1E+01	4.0E+01	2.4E+02	2.4E-02	2.4E+02	3.1E+00	0.0E+00	0.0E+00	1.0E-01
Bolted Stringer 60 cm_800	2.8E+01	1.1E+01	4.0E+01	2.4E+02	2.4E-02	2.4E+02	3.3E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 60 cm_900	2.9E+01	1.1E+01	4.0E+01	2.5E+02	2.4E-02	2.5E+02	3.5E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 60 cm_1000	2.9E+01	1.1E+01	4.0E+01	2.5E+02	2.4E-02	2.5E+02	3.7E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 120 cm_150	2.7E+01	9.5E+00	3.6E+01	2.5E+02	2.4E-02	2.5E+02	3.5E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 120 cm_200	2.7E+01	1.0E+01	3.7E+01	2.5E+02	2.4E-02	2.5E+02	3.6E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 120 cm_300	2.9E+01	1.1E+01	4.0E+01	2.5E+02	2.4E-02	2.5E+02	3.3E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 120 cm_400	2.9E+01	1.1E+01	4.0E+01	2.6E+02	2.4E-02	2.6E+02	3.9E+00	0.0E+00	0.0E+00	1.1E-01
Bolted Stringer 120 cm_500	2.9E+01	1.1E+01	4.0E+01	2.6E+02	2.4E-02	2.6E+02	4.1E+00	0.0E+00	0.0E+00	1.2E-01
Bolted Stringer 120 cm_600	3.0E+01	1.1E+01	4.1E+01	2.7E+02	2.4E-02	2.7E+02	3.0E+00	0.0E+00	0.0E+00	1.2E-01
Bolted Stringer 120 cm_700	3.0E+01	1.1E+01	4.2E+01	2.8E+02	2.4E-02	2.8E+02	4.6E+00	0.0E+00	0.0E+00	1.2E-01
Bolted Stringer 120 cm_800	3.1E+01	1.1E+01	4.2E+01	2.8E+02	2.4E-02	2.8E+02	4.8E+00	0.0E+00	0.0E+00	1.3E-01
Bolted Stringer 120 cm_900	3.1E+01	1.1E+01	4.2E+01	2.9E+02	2.4E-02	2.9E+02	5.0E+00	0.0E+00	0.0E+00	1.3E-01
Bolted Stringer 120 cm_1000	3.1E+01	1.1E+01	4.3E+01	2.9E+02	2.4E-02	2.9E+02	5.2E+00	0.0E+00	0.0E+00	1.3E-01

Table 24 - Concore understructure environmental impact A1- A3: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Cornerlock 150	3.4E-04	4.4E+00	2.3E-04
Cornerlock 200	3.5E-04	4.5E+00	2.3E-04
Cornerlock 300	3.6E-04	4.6E+00	2.4E-04
Cornerlock 400	4.3E-04	4.7E+00	2.5E-04
Cornerlock 500	4.7E-04	4.8E+00	2.6E-04
Cornerlock 600	5.4E-04	6.5E+00	2.8E-04
Cornerlock 700	5.8E-04	5.2E+00	2.9E-04
Cornerlock 800	6.2E-04	5.3E+00	3.0E-04
Cornerlock 900	6.6E-04	5.4E+00	3.1E-04
Cornerlock 1000	7.0E-04	5.6E+00	3.2E-04
Bolted Stringer 60 cm_150	6.8E-04	6.5E+00	3.2E-04
Bolted Stringer 60 cm_200	6.9E-04	6.6E+00	3.2E-04
Bolted Stringer 60 cm_300	7.0E-04	6.7E+00	3.3E-04
Bolted Stringer 60 cm_400	7.7E-04	6.8E+00	3.4E-04
Bolted Stringer 60 cm_500	8.1E-04	6.9E+00	3.5E-04
Bolted Stringer 60 cm_600	8.8E-04	8.6E+00	3.7E-04
Bolted Stringer 60 cm_700	9.2E-04	7.3E+00	3.8E-04
Bolted Stringer 60 cm_800	9.6E-04	7.4E+00	3.9E-04
Bolted Stringer 60 cm_900	1.0E-03	7.5E+00	4.0E-04
Bolted Stringer 60 cm_1000	1.0E-03	7.6E+00	4.1E-04
Bolted Stringer 120 cm_150	1.0E-03	7.5E+00	3.9E-04
Bolted Stringer 120 cm_200	1.0E-03	7.6E+00	3.9E-04
Bolted Stringer 120 cm_300	1.0E-03	7.7E+00	4.0E-04
Bolted Stringer 120 cm_400	1.1E-03	7.8E+00	4.1E-04
Bolted Stringer 120 cm_500	1.1E-03	7.9E+00	4.2E-04
Bolted Stringer 120 cm_600	1.2E-03	9.6E+00	4.3E-04
Bolted Stringer 120 cm_700	1.3E-03	8.3E+00	4.4E-04
Bolted Stringer 120 cm_800	1.3E-03	8.4E+00	4.5E-04
Bolted Stringer 120 cm_900	1.3E-03	8.5E+00	4.6E-04
Bolted Stringer 120 cm_1000	1.4E-03	8.6E+00	4.7E-04

Table 25 - Concore understructure environmental impact A1- A3: EPD output flow indicators

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Cornerlock 150	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 200	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 300	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 400	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 500	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 600	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 700	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 800	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 900	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Cornerlock 1000	0.0E+00	6.0E-04	0.0E+00	0.0E+00
Bolted Stringer 60 cm_150	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_200	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_300	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_400	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_500	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_600	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_700	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_800	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_900	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_1000	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_150	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_200	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_300	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_400	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_500	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_600	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_700	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_800	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_900	0.0E+00	1.1E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_1000	0.0E+00	1.1E-02	0.0E+00	0.0E+00

4.3.2 Concore understructure environmental impacts for transportation to construction site (A4)

Table 26 - Concore understructure environmental impact A4: EPD primary impact categories

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Cornerlock 150	5.1E-01	7.7E-08	1.7E-04	5.1E-03	6.4E-04	8.5E-07	7.2E+00
Cornerlock 200	5.4E-01	8.2E-08	1.8E-04	5.4E-03	6.8E-04	9.0E-07	7.7E+00
Cornerlock 300	6.2E-01	9.4E-08	2.1E-04	6.3E-03	7.8E-04	1.0E-06	8.8E+00
Cornerlock 400	7.9E-01	1.2E-07	2.6E-04	7.6E-03	9.6E-04	1.4E-06	1.1E+01
Cornerlock 500	8.8E-01	1.3E-07	2.8E-04	8.3E-03	1.1E-03	1.5E-06	1.2E+01
Cornerlock 600	8.8E-01	1.3E-07	3.0E-04	8.9E-03	1.1E-03	1.5E-06	1.3E+01
Cornerlock 700	9.6E-01	1.5E-07	3.3E-04	9.7E-03	1.2E-03	1.6E-06	1.4E+01
Cornerlock 800	1.0E+00	1.6E-07	3.5E-04	1.0E-02	1.3E-03	1.7E-06	1.5E+01
Cornerlock 900	1.1E+00	1.7E-07	3.8E-04	1.1E-02	1.4E-03	1.8E-06	1.6E+01
Cornerlock 1000	1.2E+00	1.8E-07	4.0E-04	1.2E-02	1.5E-03	1.9E-06	1.7E+01
Bolted Stringer 60 cm_150	1.2E+00	1.7E-07	3.9E-04	1.2E-02	1.4E-03	1.9E-06	1.6E+01
Bolted Stringer 60 cm_200	1.2E+00	1.8E-07	4.0E-04	1.2E-02	1.5E-03	2.0E-06	1.7E+01
Bolted Stringer 60 cm_300	1.3E+00	1.9E-07	4.3E-04	1.3E-02	1.6E-03	2.1E-06	1.8E+01
Bolted Stringer 60 cm_400	1.4E+00	2.2E-07	4.8E-04	1.4E-02	1.8E-03	2.4E-06	2.0E+01
Bolted Stringer 60 cm_500	1.5E+00	2.3E-07	5.0E-04	1.5E-02	1.9E-03	2.6E-06	2.2E+01
Bolted Stringer 60 cm_600	1.5E+00	2.3E-07	5.2E-04	1.5E-02	1.9E-03	2.5E-06	2.2E+01
Bolted Stringer 60 cm_700	1.6E+00	2.4E-07	5.5E-04	1.6E-02	2.0E-03	2.7E-06	2.3E+01
Bolted Stringer 60 cm_800	1.7E+00	2.5E-07	5.7E-04	1.7E-02	2.1E-03	2.8E-06	2.4E+01
Bolted Stringer 60 cm_900	1.7E+00	2.6E-07	6.0E-04	1.8E-02	2.2E-03	2.9E-06	2.5E+01
Bolted Stringer 60 cm_1000	1.8E+00	2.7E-07	6.2E-04	1.8E-02	2.3E-03	3.0E-06	2.6E+01
Bolted Stringer 120 cm_150	1.7E+00	2.6E-07	6.0E-04	1.8E-02	2.2E-03	2.9E-06	2.5E+01
Bolted Stringer 120 cm_200	1.8E+00	2.7E-07	6.1E-04	1.8E-02	2.2E-03	3.0E-06	2.5E+01
Bolted Stringer 120 cm_300	1.9E+00	2.8E-07	6.4E-04	1.9E-02	2.3E-03	3.1E-06	2.6E+01
Bolted Stringer 120 cm_400	2.0E+00	3.1E-07	6.8E-04	2.0E-02	2.5E-03	3.4E-06	2.9E+01
Bolted Stringer 120 cm_500	2.1E+00	3.2E-07	7.1E-04	2.1E-02	2.6E-03	3.6E-06	3.0E+01
Bolted Stringer 120 cm_600	2.1E+00	3.2E-07	7.3E-04	2.1E-02	2.7E-03	3.5E-06	3.0E+01
Bolted Stringer 120 cm_700	2.2E+00	3.3E-07	7.5E-04	2.2E-02	2.8E-03	3.7E-06	3.1E+01
Bolted Stringer 120 cm_800	2.3E+00	3.4E-07	7.7E-04	2.3E-02	2.8E-03	3.8E-06	3.2E+01
Bolted Stringer 120 cm_900	2.3E+00	3.5E-07	8.0E-04	2.4E-02	2.9E-03	3.9E-06	3.3E+01
Bolted Stringer 120 cm_1000	2.4E+00	3.6E-07	8.2E-04	2.4E-02	3.0E-03	4.0E-06	3.4E+01

Table 27 - Concore understructure environmental impact A4: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Cornerlock 150	9.9E-02	0.0E+00	9.9E-02	7.5E+00	0.0E+00	7.5E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-03
Cornerlock 200	1.1E-01	0.0E+00	1.1E-01	8.0E+00	0.0E+00	8.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-03
Cornerlock 300	1.2E-01	0.0E+00	1.2E-01	9.2E+00	0.0E+00	9.2E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-03
Cornerlock 400	1.5E-01	0.0E+00	1.5E-01	1.2E+01	0.0E+00	1.2E+01	0.0E+00	0.0E+00	0.0E+00	2.8E-03
Cornerlock 500	1.6E-01	0.0E+00	1.6E-01	1.3E+01	0.0E+00	1.3E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-03
Cornerlock 600	1.7E-01	0.0E+00	1.7E-01	1.3E+01	0.0E+00	1.3E+01	0.0E+00	0.0E+00	0.0E+00	3.1E-03
Cornerlock 700	1.9E-01	0.0E+00	1.9E-01	1.4E+01	0.0E+00	1.4E+01	0.0E+00	0.0E+00	0.0E+00	3.4E-03
Cornerlock 800	2.0E-01	0.0E+00	2.0E-01	1.5E+01	0.0E+00	1.5E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-03
Cornerlock 900	2.2E-01	0.0E+00	2.2E-01	1.6E+01	0.0E+00	1.6E+01	0.0E+00	0.0E+00	0.0E+00	3.9E-03
Cornerlock 1000	2.3E-01	0.0E+00	2.3E-01	1.7E+01	0.0E+00	1.7E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-03
Bolted Stringer 60 cm_150	2.3E-01	0.0E+00	2.3E-01	1.7E+01	0.0E+00	1.7E+01	0.0E+00	0.0E+00	0.0E+00	4.1E-03
Bolted Stringer 60 cm_200	2.3E-01	0.0E+00	2.3E-01	1.7E+01	0.0E+00	1.7E+01	0.0E+00	0.0E+00	0.0E+00	4.2E-03
Bolted Stringer 60 cm_300	2.5E-01	0.0E+00	2.5E-01	1.9E+01	0.0E+00	1.9E+01	0.0E+00	0.0E+00	0.0E+00	4.5E-03
Bolted Stringer 60 cm_400	2.8E-01	0.0E+00	2.8E-01	2.1E+01	0.0E+00	2.1E+01	0.0E+00	0.0E+00	0.0E+00	5.1E-03
Bolted Stringer 60 cm_500	2.9E-01	0.0E+00	2.9E-01	2.2E+01	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-03
Bolted Stringer 60 cm_600	3.0E-01	0.0E+00	3.0E-01	2.2E+01	0.0E+00	2.2E+01	0.0E+00	0.0E+00	0.0E+00	5.4E-03
Bolted Stringer 60 cm_700	3.1E-01	0.0E+00	3.1E-01	2.4E+01	0.0E+00	2.4E+01	0.0E+00	0.0E+00	0.0E+00	5.6E-03
Bolted Stringer 60 cm_800	3.3E-01	0.0E+00	3.3E-01	2.5E+01	0.0E+00	2.5E+01	0.0E+00	0.0E+00	0.0E+00	5.9E-03
Bolted Stringer 60 cm_900	3.4E-01	0.0E+00	3.4E-01	2.6E+01	0.0E+00	2.6E+01	0.0E+00	0.0E+00	0.0E+00	6.1E-03
Bolted Stringer 60 cm_1000	3.5E-01	0.0E+00	3.5E-01	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	6.4E-03
Bolted Stringer 120 cm_150	3.4E-01	0.0E+00	3.4E-01	2.6E+01	0.0E+00	2.6E+01	0.0E+00	0.0E+00	0.0E+00	6.1E-03
Bolted Stringer 120 cm_200	3.5E-01	0.0E+00	3.5E-01	2.6E+01	0.0E+00	2.6E+01	0.0E+00	0.0E+00	0.0E+00	6.3E-03
Bolted Stringer 120 cm_300	3.6E-01	0.0E+00	3.6E-01	2.7E+01	0.0E+00	2.7E+01	0.0E+00	0.0E+00	0.0E+00	6.5E-03
Bolted Stringer 120 cm_400	3.9E-01	0.0E+00	3.9E-01	3.0E+01	0.0E+00	3.0E+01	0.0E+00	0.0E+00	0.0E+00	7.2E-03
Bolted Stringer 120 cm_500	4.1E-01	0.0E+00	4.1E-01	3.1E+01	0.0E+00	3.1E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-03
Bolted Stringer 120 cm_600	4.1E-01	0.0E+00	4.1E-01	3.1E+01	0.0E+00	3.1E+01	0.0E+00	0.0E+00	0.0E+00	7.5E-03
Bolted Stringer 120 cm_700	4.3E-01	0.0E+00	4.3E-01	3.2E+01	0.0E+00	3.2E+01	0.0E+00	0.0E+00	0.0E+00	7.7E-03
Bolted Stringer 120 cm_800	4.4E-01	0.0E+00	4.4E-01	3.3E+01	0.0E+00	3.3E+01	0.0E+00	0.0E+00	0.0E+00	8.0E-03
Bolted Stringer 120 cm_900	4.6E-01	0.0E+00	4.6E-01	3.4E+01	0.0E+00	3.4E+01	0.0E+00	0.0E+00	0.0E+00	8.2E-03
Bolted Stringer 120 cm_1000	4.7E-01	0.0E+00	4.7E-01	3.5E+01	0.0E+00	3.5E+01	0.0E+00	0.0E+00	0.0E+00	8.5E-03

Table 28 - Concore understructure environmental impact A4: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Cornerlock 150	5.5E-06	6.6E-02	2.4E-05
Cornerlock 200	5.8E-06	7.0E-02	2.6E-05
Cornerlock 300	6.7E-06	8.1E-02	3.0E-05
Cornerlock 400	8.6E-06	9.8E-02	3.5E-05
Cornerlock 500	9.6E-06	1.1E-01	3.9E-05
Cornerlock 600	9.5E-06	1.1E-01	4.3E-05
Cornerlock 700	1.0E-05	1.2E-01	4.6E-05
Cornerlock 800	1.1E-05	1.3E-01	5.0E-05
Cornerlock 900	1.2E-05	1.4E-01	5.3E-05
Cornerlock 1000	1.3E-05	1.5E-01	5.6E-05
Bolted Stringer 60 cm_150	1.2E-05	1.5E-01	5.6E-05
Bolted Stringer 60 cm_200	1.3E-05	1.5E-01	5.7E-05
Bolted Stringer 60 cm_300	1.4E-05	1.6E-01	6.1E-05
Bolted Stringer 60 cm_400	1.6E-05	1.8E-01	6.6E-05
Bolted Stringer 60 cm_500	1.7E-05	1.9E-01	7.0E-05
Bolted Stringer 60 cm_600	1.6E-05	2.0E-01	7.4E-05
Bolted Stringer 60 cm_700	1.7E-05	2.1E-01	7.8E-05
Bolted Stringer 60 cm_800	1.8E-05	2.2E-01	8.1E-05
Bolted Stringer 60 cm_900	1.9E-05	2.3E-01	8.4E-05
Bolted Stringer 60 cm_1000	2.0E-05	2.4E-01	8.8E-05
Bolted Stringer 120 cm_150	1.9E-05	2.3E-01	8.4E-05
Bolted Stringer 120 cm_200	1.9E-05	2.3E-01	8.6E-05
Bolted Stringer 120 cm_300	2.0E-05	2.4E-01	9.0E-05
Bolted Stringer 120 cm_400	2.2E-05	2.6E-01	9.5E-05
Bolted Stringer 120 cm_500	2.3E-05	2.7E-01	9.9E-05
Bolted Stringer 120 cm_600	2.3E-05	2.8E-01	1.0E-04
Bolted Stringer 120 cm_700	2.4E-05	2.9E-01	1.1E-04
Bolted Stringer 120 cm_800	2.4E-05	2.9E-01	1.1E-04
Bolted Stringer 120 cm_900	2.5E-05	3.0E-01	1.1E-04
Bolted Stringer 120 cm_1000	2.6E-05	3.1E-01	1.2E-04

Table 29 - Concore understructure environmental impact A4: EPD output flow categories

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Cornerlock 150	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 200	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 300	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 400	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 500	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 600	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 700	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 800	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 900	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cornerlock 1000	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_150	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_200	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_300	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_400	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_500	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_600	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_700	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_800	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_900	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 60 cm_1000	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_150	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_200	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_300	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_400	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_500	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_600	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_700	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_800	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_900	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Bolted Stringer 120 cm_1000	0.0E+00	0.0E+00	0.0E+00	0.0E+00

4.3.3 Concore understructure environmental impacts for installation (A5)

Table 30 - Concore understructure environmental impact A5: EPD primary impact categories

Impact category	GWP	ODP	AP	EP	POCP	ADPE	ADPF
Unit	kg CO ₂ eq	kg CFC-11 eq	kg C ₂ H ₄ eq	kg SO ₂ eq	kg PO ₄ --- eq	kg Sb eq	MJ
Cornerlock 150	1.8E+00	1.2E-08	5.5E-04	1.5E-02	3.5E-03	4.3E-06	2.5E+01
Cornerlock 200	1.8E+00	1.2E-08	5.5E-04	1.5E-02	3.5E-03	4.4E-06	2.5E+01
Cornerlock 300	1.9E+00	1.2E-08	5.6E-04	1.5E-02	3.5E-03	4.4E-06	2.5E+01
Cornerlock 400	1.9E+00	1.3E-08	5.6E-04	1.5E-02	3.5E-03	6.5E-06	2.5E+01
Cornerlock 500	1.9E+00	1.3E-08	5.7E-04	1.5E-02	3.6E-03	7.3E-06	2.5E+01
Cornerlock 600	1.9E+00	1.3E-08	5.7E-04	1.5E-02	3.6E-03	8.8E-06	2.5E+01
Cornerlock 700	1.9E+00	1.4E-08	5.8E-04	1.5E-02	3.6E-03	9.7E-06	2.5E+01
Cornerlock 800	1.9E+00	1.4E-08	5.8E-04	1.5E-02	3.6E-03	1.1E-05	2.5E+01
Cornerlock 900	1.9E+00	1.4E-08	5.8E-04	1.5E-02	3.6E-03	1.1E-05	2.5E+01
Cornerlock 1000	1.9E+00	1.4E-08	5.8E-04	1.5E-02	3.6E-03	1.2E-05	2.6E+01
Bolted Stringer 60 cm_150	2.0E+00	1.5E-08	6.1E-04	1.5E-02	3.7E-03	1.1E-05	2.6E+01
Bolted Stringer 60 cm_200	2.0E+00	1.5E-08	6.2E-04	1.5E-02	3.7E-03	1.1E-05	2.6E+01
Bolted Stringer 60 cm_300	2.1E+00	1.5E-08	6.3E-04	1.5E-02	3.8E-03	1.1E-05	2.6E+01
Bolted Stringer 60 cm_400	2.1E+00	1.5E-08	6.3E-04	1.5E-02	3.8E-03	1.3E-05	2.6E+01
Bolted Stringer 60 cm_500	2.1E+00	1.6E-08	6.4E-04	1.6E-02	3.8E-03	1.4E-05	2.6E+01
Bolted Stringer 60 cm_600	2.1E+00	1.6E-08	6.4E-04	1.6E-02	3.8E-03	1.5E-05	2.6E+01
Bolted Stringer 60 cm_700	2.1E+00	1.6E-08	6.5E-04	1.6E-02	3.8E-03	1.6E-05	2.6E+01
Bolted Stringer 60 cm_800	2.1E+00	1.7E-08	6.5E-04	1.6E-02	3.9E-03	1.7E-05	2.6E+01
Bolted Stringer 60 cm_900	2.1E+00	1.7E-08	6.5E-04	1.6E-02	3.9E-03	1.8E-05	2.6E+01
Bolted Stringer 60 cm_1000	2.1E+00	1.7E-08	6.5E-04	1.6E-02	3.9E-03	1.9E-05	2.7E+01
Bolted Stringer 120 cm_150	2.1E+00	1.7E-08	6.3E-04	1.6E-02	3.9E-03	1.8E-05	2.7E+01
Bolted Stringer 120 cm_200	2.1E+00	1.7E-08	6.4E-04	1.6E-02	3.9E-03	1.8E-05	2.7E+01
Bolted Stringer 120 cm_300	2.1E+00	1.7E-08	6.5E-04	1.6E-02	3.9E-03	1.8E-05	2.7E+01
Bolted Stringer 120 cm_400	2.2E+00	1.7E-08	6.5E-04	1.6E-02	3.9E-03	2.0E-05	2.7E+01
Bolted Stringer 120 cm_500	2.2E+00	1.8E-08	6.6E-04	1.6E-02	3.9E-03	2.1E-05	2.7E+01
Bolted Stringer 120 cm_600	2.2E+00	1.8E-08	6.6E-04	1.6E-02	4.0E-03	2.3E-05	2.7E+01
Bolted Stringer 120 cm_700	2.2E+00	1.8E-08	6.7E-04	1.6E-02	4.0E-03	2.4E-05	2.7E+01
Bolted Stringer 120 cm_800	2.2E+00	1.9E-08	6.7E-04	1.6E-02	4.0E-03	2.5E-05	2.7E+01
Bolted Stringer 120 cm_900	2.2E+00	1.9E-08	6.7E-04	1.6E-02	4.0E-03	2.5E-05	2.7E+01
Bolted Stringer 120 cm_1000	2.2E+00	1.9E-08	6.7E-04	1.6E-02	4.0E-03	2.6E-05	2.7E+01

Table 31 - Concore understructure environmental impact A5: EPD resource use parameters

Impact category	PERE	PERM	PERT	PENRE	PENRM	PENRT	SM	RSF	NRSF	FW
Unit	MJ	MJ	MJ	MJ	MJ	MJ	kg	MJ	MJ	m ³
Cornerlock 150	4.6E-01	6.6E-02	5.2E-01	2.7E+00	3.6E-04	2.7E+00	2.0E-02	0.0E+00	0.0E+00	1.1E-03
Cornerlock 200	4.9E-01	7.4E-02	5.7E-01	2.7E+00	3.6E-04	2.7E+00	2.1E-02	0.0E+00	0.0E+00	1.2E-03
Cornerlock 300	5.7E-01	9.1E-02	6.6E-01	2.7E+00	3.6E-04	2.7E+00	1.7E-02	0.0E+00	0.0E+00	1.2E-03
Cornerlock 400	5.7E-01	9.1E-02	6.6E-01	2.8E+00	3.6E-04	2.8E+00	2.7E-02	0.0E+00	0.0E+00	1.2E-03
Cornerlock 500	5.8E-01	9.1E-02	6.7E-01	2.9E+00	3.6E-04	2.9E+00	2.9E-02	0.0E+00	0.0E+00	1.3E-03
Cornerlock 600	5.8E-01	9.1E-02	6.7E-01	3.0E+00	3.6E-04	3.0E+00	1.3E-02	0.0E+00	0.0E+00	1.4E-03
Cornerlock 700	6.1E-01	9.6E-02	7.1E-01	3.1E+00	3.6E-04	3.1E+00	3.7E-02	0.0E+00	0.0E+00	1.4E-03
Cornerlock 800	6.2E-01	9.6E-02	7.1E-01	3.2E+00	3.6E-04	3.2E+00	3.9E-02	0.0E+00	0.0E+00	1.4E-03
Cornerlock 900	6.2E-01	9.6E-02	7.2E-01	3.2E+00	3.6E-04	3.2E+00	1.3E-02	0.0E+00	0.0E+00	1.5E-03
Cornerlock 1000	6.2E-01	9.6E-02	7.2E-01	3.3E+00	3.6E-04	3.3E+00	4.5E-02	0.0E+00	0.0E+00	1.5E-03
Bolted Stringer 60 cm_150	8.3E-01	1.4E-01	9.7E-01	3.5E+00	3.6E-04	3.5E+00	3.0E-02	0.0E+00	0.0E+00	1.6E-03
Bolted Stringer 60 cm_200	8.7E-01	1.5E-01	1.0E+00	3.5E+00	3.6E-04	3.5E+00	3.1E-02	0.0E+00	0.0E+00	1.6E-03
Bolted Stringer 60 cm_300	9.4E-01	1.7E-01	1.1E+00	3.6E+00	3.6E-04	3.6E+00	2.7E-02	0.0E+00	0.0E+00	1.6E-03
Bolted Stringer 60 cm_400	9.4E-01	1.7E-01	1.1E+00	3.7E+00	3.6E-04	3.7E+00	3.7E-02	0.0E+00	0.0E+00	1.7E-03
Bolted Stringer 60 cm_500	9.5E-01	1.7E-01	1.1E+00	3.7E+00	3.6E-04	3.7E+00	3.9E-02	0.0E+00	0.0E+00	1.7E-03
Bolted Stringer 60 cm_600	9.6E-01	1.7E-01	1.1E+00	3.9E+00	3.6E-04	3.9E+00	2.3E-02	0.0E+00	0.0E+00	1.8E-03
Bolted Stringer 60 cm_700	9.8E-01	1.7E-01	1.2E+00	4.0E+00	3.6E-04	4.0E+00	4.7E-02	0.0E+00	0.0E+00	1.8E-03
Bolted Stringer 60 cm_800	9.9E-01	1.7E-01	1.2E+00	4.0E+00	3.6E-04	4.0E+00	5.0E-02	0.0E+00	0.0E+00	1.9E-03
Bolted Stringer 60 cm_900	9.9E-01	1.7E-01	1.2E+00	4.1E+00	3.6E-04	4.1E+00	2.3E-02	0.0E+00	0.0E+00	1.9E-03
Bolted Stringer 60 cm_1000	1.0E+00	1.7E-01	1.2E+00	4.2E+00	3.6E-04	4.2E+00	5.5E-02	0.0E+00	0.0E+00	2.0E-03
Bolted Stringer 120 cm_150	8.7E-01	1.4E-01	1.0E+00	4.2E+00	3.6E-04	4.2E+00	5.3E-02	0.0E+00	0.0E+00	1.9E-03
Bolted Stringer 120 cm_200	9.1E-01	1.5E-01	1.1E+00	4.2E+00	3.6E-04	4.2E+00	5.4E-02	0.0E+00	0.0E+00	2.0E-03
Bolted Stringer 120 cm_300	9.8E-01	1.7E-01	1.1E+00	4.2E+00	3.6E-04	4.2E+00	4.9E-02	0.0E+00	0.0E+00	2.0E-03
Bolted Stringer 120 cm_400	9.8E-01	1.7E-01	1.2E+00	4.3E+00	3.6E-04	4.3E+00	5.9E-02	0.0E+00	0.0E+00	2.0E-03
Bolted Stringer 120 cm_500	9.9E-01	1.7E-01	1.2E+00	4.4E+00	3.6E-04	4.4E+00	6.2E-02	0.0E+00	0.0E+00	2.1E-03
Bolted Stringer 120 cm_600	1.0E+00	1.7E-01	1.2E+00	4.5E+00	3.6E-04	4.5E+00	4.6E-02	0.0E+00	0.0E+00	2.1E-03
Bolted Stringer 120 cm_700	1.0E+00	1.7E-01	1.2E+00	4.6E+00	3.6E-04	4.6E+00	6.9E-02	0.0E+00	0.0E+00	2.2E-03
Bolted Stringer 120 cm_800	1.0E+00	1.7E-01	1.2E+00	4.7E+00	3.6E-04	4.7E+00	7.2E-02	0.0E+00	0.0E+00	2.2E-03
Bolted Stringer 120 cm_900	1.0E+00	1.7E-01	1.2E+00	4.7E+00	3.6E-04	4.7E+00	4.6E-02	0.0E+00	0.0E+00	2.3E-03
Bolted Stringer 120 cm_1000	1.0E+00	1.7E-01	1.2E+00	4.8E+00	3.6E-04	4.8E+00	7.7E-02	0.0E+00	0.0E+00	2.3E-03

Table 32- Concore understructure environmental impact A5: EPD waste categories

Impact category	HW	NHW	RW
Unit	kg	kg	kg
Cornerlock 150	5.3E-06	3.1E-01	3.2E-06
Cornerlock 200	5.3E-06	3.4E-01	3.3E-06
Cornerlock 300	5.6E-06	4.0E-01	3.4E-06
Cornerlock 400	6.7E-06	4.0E-01	3.5E-06
Cornerlock 500	7.3E-06	4.1E-01	3.6E-06
Cornerlock 600	8.3E-06	4.4E-01	3.8E-06
Cornerlock 700	8.9E-06	4.4E-01	3.9E-06
Cornerlock 800	9.4E-06	4.5E-01	4.0E-06
Cornerlock 900	1.0E-05	4.5E-01	4.2E-06
Cornerlock 1000	1.1E-05	4.6E-01	4.3E-06
Bolted Stringer 60 cm_150	1.0E-05	6.3E-01	4.4E-06
Bolted Stringer 60 cm_200	1.0E-05	6.6E-01	4.4E-06
Bolted Stringer 60 cm_300	1.1E-05	7.2E-01	4.5E-06
Bolted Stringer 60 cm_400	1.2E-05	7.2E-01	4.7E-06
Bolted Stringer 60 cm_500	1.2E-05	7.3E-01	4.8E-06
Bolted Stringer 60 cm_600	1.3E-05	7.6E-01	5.0E-06
Bolted Stringer 60 cm_700	1.4E-05	7.6E-01	5.1E-06
Bolted Stringer 60 cm_800	1.5E-05	7.7E-01	5.2E-06
Bolted Stringer 60 cm_900	1.5E-05	7.7E-01	5.3E-06
Bolted Stringer 60 cm_1000	1.6E-05	7.8E-01	5.4E-06
Bolted Stringer 120 cm_150	1.5E-05	6.9E-01	5.1E-06
Bolted Stringer 120 cm_200	1.5E-05	7.2E-01	5.2E-06
Bolted Stringer 120 cm_300	1.6E-05	7.8E-01	5.3E-06
Bolted Stringer 120 cm_400	1.7E-05	7.8E-01	5.4E-06
Bolted Stringer 120 cm_500	1.7E-05	7.9E-01	5.5E-06
Bolted Stringer 120 cm_600	1.8E-05	8.2E-01	5.7E-06
Bolted Stringer 120 cm_700	1.9E-05	8.2E-01	5.8E-06
Bolted Stringer 120 cm_800	2.0E-05	8.3E-01	5.9E-06
Bolted Stringer 120 cm_900	2.0E-05	8.4E-01	6.1E-06
Bolted Stringer 120 cm_1000	2.1E-05	8.4E-01	6.2E-06

Table 33 - Concore understructure environmental impact A5: EPD output flow categories

Impact category	CRU	MFR	MER	EE
Unit	kg	kg	kg	MJ
Cornerlock 150	0.0E+00	2.8E-02	0.0E+00	0.0E+00
Cornerlock 200	0.0E+00	3.0E-02	0.0E+00	0.0E+00
Cornerlock 300	0.0E+00	3.4E-02	0.0E+00	0.0E+00
Cornerlock 400	0.0E+00	3.8E-02	0.0E+00	0.0E+00
Cornerlock 500	0.0E+00	4.3E-02	0.0E+00	0.0E+00
Cornerlock 600	0.0E+00	5.0E-02	0.0E+00	0.0E+00
Cornerlock 700	0.0E+00	5.5E-02	0.0E+00	0.0E+00
Cornerlock 800	0.0E+00	5.9E-02	0.0E+00	0.0E+00
Cornerlock 900	0.0E+00	6.3E-02	0.0E+00	0.0E+00
Cornerlock 1000	0.0E+00	6.8E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_150	0.0E+00	2.8E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_200	0.0E+00	3.0E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_300	0.0E+00	3.4E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_400	0.0E+00	3.8E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_500	0.0E+00	4.3E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_600	0.0E+00	5.0E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_700	0.0E+00	5.5E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_800	0.0E+00	5.9E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_900	0.0E+00	6.3E-02	0.0E+00	0.0E+00
Bolted Stringer 60 cm_1000	0.0E+00	6.8E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_150	0.0E+00	2.8E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_200	0.0E+00	3.0E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_300	0.0E+00	3.4E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_400	0.0E+00	3.8E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_500	0.0E+00	4.3E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_600	0.0E+00	5.0E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_700	0.0E+00	5.5E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_800	0.0E+00	5.9E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_900	0.0E+00	6.3E-02	0.0E+00	0.0E+00
Bolted Stringer 120 cm_1000	0.0E+00	6.8E-02	0.0E+00	0.0E+00

5 Interpretation of results

5.1 Panels

The product stage (modules A1-A3) is the most significant contributor to potential environmental impacts accounting for 78%-81% of the Global warming potential (GWP) indicator. It also accounts for 60-65% of ODP, 78-83% of AP, 61-67% of EP, 84-88% of POCP, 93-94% of ADPE and 76-81% of ADPF indicators. Transportation from manufacturing to construction site (module A4) is the next most significant contributor to the impacts followed by the construction installation (module A5).

Production of steel used for panel manufacturing is the largest contributor of impacts in the product stage. The product stage also accounts for 92-96% of renewable energy inputs and 77-80% of non-renewable energy inputs and 87-91 % of water inputs. Majority of the waste produced in the lifecycle of Concore panels is non-hazardous waste (>99%) and the product stage contributes to 81-84% of it.

5.2 Understructure products

Similar to the panels, the product stage (modules A1-A3) is the most significant contributor to environmental impacts for all understructure products. It accounts for 83-84% of GWP, 78-90% of ODP, 78-83% of AP, 92-95% of EP, 95-96% of POCP, 98% of ADPE and 84-85% of ADPF. In this case too, steel used for manufacturing of understructure products is the largest contributor to impacts in the product stage.

For all understructure products, transportation from manufacturing to construction site (module A4) has a higher impact for the OPD indicator compared to the construction installation (module A5). However, for all other indicators i.e. GWP, AP, EP, OCP, ADPE and ADPF construction installation has a higher impact for majority of understructure products compared to transportation. This is attributed to forklift usage for unloading relatively light materials.

Majority of the waste generated during the lifecycle of understructure products is non-hazardous (>99%) and the product stage accounts for 88-92% of it. The product stage is also the largest contributor to the renewable energy, non-renewable energy and water inputs accounting for 95-97%, 88-94% and 92-95% of it respectively.

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