

Environmental Product Declaration

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

HYNDS PIPE SYSTEMS

Hyspec Precast Concrete Manhole Flanged Bases

EPD of multiple products, based on a representative product. The products covered in the EPD are listed on page 18.



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HYNDS

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ABOUT US

Founded in 1973 by John and Léonie Hynds, the privately owned Hynds Group of Companies is New Zealand's premier product supplier for the management of water and water-based waste in the civil and rural infrastructure markets.

Hynds Pipe Systems Limited is the largest operating company within the Hynds Group, and is split into two operating divisions: Manufacturing and Sales & Distribution.

Hynds Concrete Manufacturing operates six factory sites across New Zealand, operating independently audited ISO9001 quality, ISO45001 health and safety, and ISO14001 environmental management systems (see hynds.co.nz/about-us/ for certificates).

Hynds operates a sales & distribution network of 36 branches and 3 distribution centres throughout New Zealand supplying over 40 000 product types for drainage, watermain, environmental, industrial process and rural applications.

The Hynds' fleet of 70 delivery trucks ensure reliable stock availability and delivery to all corners of the country.

From its early inception five decades ago, Hynds has been focused on delivering positive change with industry-leading, sustainable solutions. The manufacture of products to support stormwater and wastewater treatment, and ultimately to protect the environment, remains at the heart of our product innovation today.



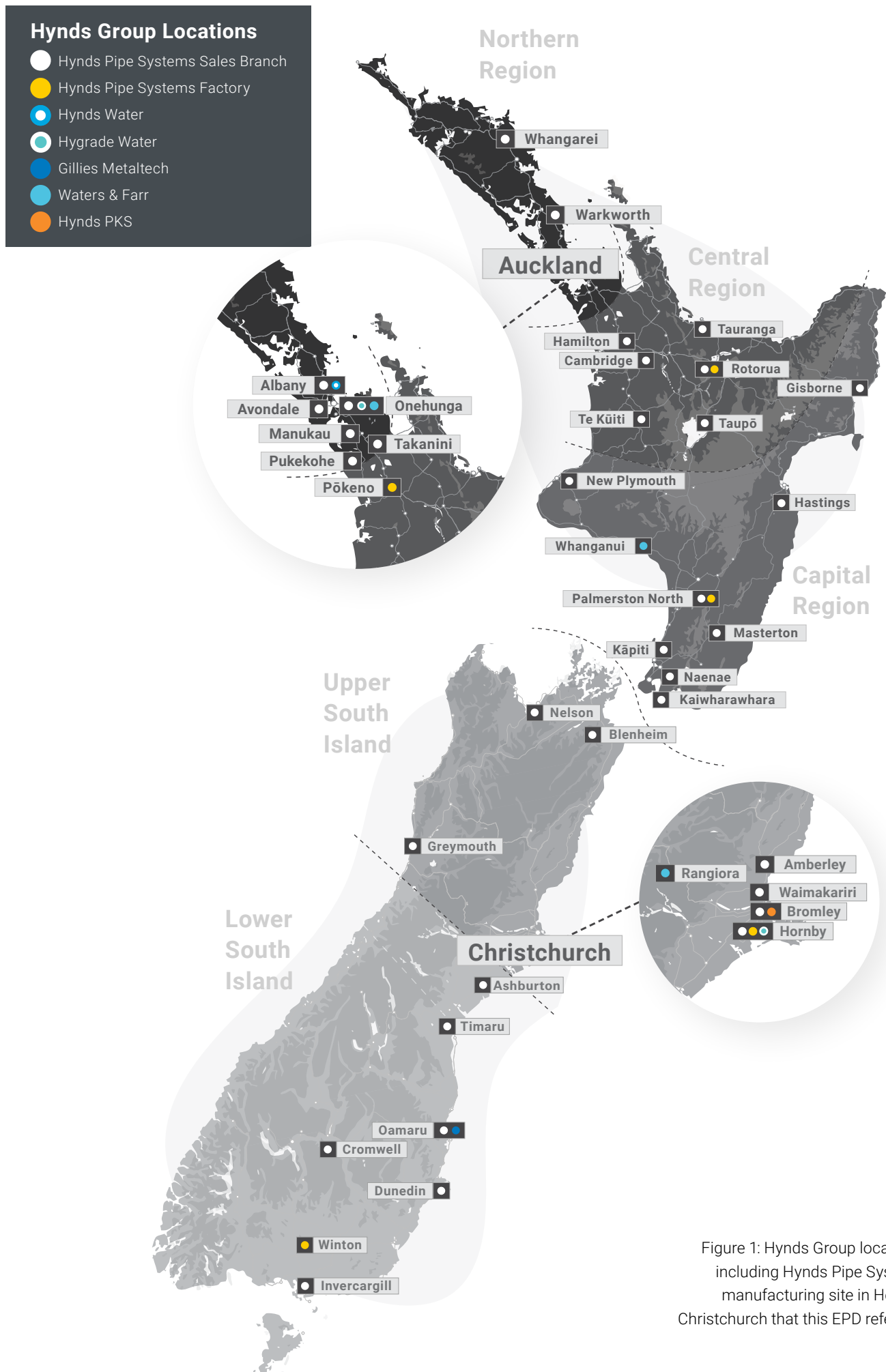


Figure 1: Hynds Group locations, including Hynds Pipe Systems manufacturing site in Hornby, Christchurch that this EPD refers to.

HYNDS SUSTAINABILITY

Our business was built around finding sustainable solutions to support the three waters (*drinking water, wastewater and stormwater infrastructure services*) and ultimately keeping our country's waterways clean and our communities safe – both for today and for future generations.

Hynds has adopted a sustainability framework which focuses on three strategic pillars; the planet (our natural environment), people (our people but also our wider communities and stakeholders) and products (innovating and building resilience into what we do to meet the needs of future generations).

Addressing the effects of climate change is a huge challenge that we all face. Hynds believes that addressing climate change will make us better off and is committed to New Zealand's transition to a low-emissions economy. Hynds has committed to a 42% reduction in Scope 1 (direct) and Scope 2 (indirect) carbon emissions by 2032.

To support our customer's sustainability goals, Hynds now offers a lower carbon product range, HyndsLC®. The new HyndsLC® range assists our customers in meeting their sustainability requirements without compromising on quality and durability.

For more information on Hynds sustainability framework and HyndsLC® range, visit

hynds.co.nz/sustainability/

or email sustainability@hynds.co.nz.

HYNDS[®]LC
Our low carbon future



PRODUCT INFORMATION

Products Covered by EPD

This EPD covers the Hyspec Precast Concrete Manhole Flanged Bases manufactured at Hynds precast concrete manufacturing plant in Hornby, Christchurch. The full range of products covered by this EPD are given in the Product Mass Table (Table 16).

The Hyspec Precast Concrete Manhole Flanged Bases range is generally only supplied to South Island projects.

Product Description

As the leading manufacturer of reinforced concrete pipe in New Zealand, Hynds' pipes are available in a wide range of diameters, wall thicknesses and heights.

Hynds Reinforced Concrete Manhole Flanged Bases are manufactured using high strength concrete (50 MPa or greater), hard drawn steel wire. The concrete consists of coarse and fine aggregates, cement and chemical admixtures.

Reinforced Concrete Manholes are primarily used for access manholes, drop manholes, pipeline junctions, pipeline direction changes and catchment inlet structures for both stormwater and wastewater applications.

Declared Unit

The declared unit for the EPD is one kg of reinforced concrete manhole Flanged Bases. A conversion table is provided with product weights for all products covered by this EPD, as required (see Table 16).

Design Standard

Hynds' Standard range of Flanged Bases are designed to the CPAA Guidance Note (NZ) – Loads on Circular Precast Concrete Manholes and Access Chambers and are manufactured to the material and geometric requirements of AS/NZS 4058:2007.

The Standard ranges of Hynds Reinforced Concrete Manhole Flanged Bases have a specified intended service life of 100 years when correctly installed in a non-aggressive environment.

Packaging

The product is transported without packaging.

Dangerous Substances

All products covered by this study as supplied are non-hazardous, and do not contain any substances of very high concern as defined by European REACH regulation in concentrations >0.1% (m/m). Precast concrete products and pipes are classified as non-dangerous goods according to the Land Transport Rule: Dangerous Goods 2005. Provide this reference here (ECHA, 2022)

When concrete products are cut, sawn, abraded or crushed, dust is created which contains crystalline silica, some of which may be respirable (particles small enough to go into the deep parts of the lung when breathed in), and which is hazardous. Exposure through inhalation should be avoided. Dust from these products is classified as Hazardous under the Hazardous Substances and New Organisms Act 1996 (HSNO Act) and is subject to Workplace Exposure Standards (WorkSafe NZ WES-BEI indices Edition 13, April 2022).

Table 1: Industry classification

Product	Classification	Code	Category
Product name/type	UN CPC Ver.2	3755	Prefabricated structural components for building or civil engineering, of cement, concrete or artificial stone
	ANZSIC 2006	2034	Concrete Product Manufacturing

Content Declaration

Table 2: Composition of Hyspec Precast Concrete Manhole Flanged Bases (per 1 kg)

Product components	Weight, kg	Post-consumer recycled material, weight-% of product	Biogenic material, weight-% of product	Biogenic material, kg C/product or declared unit
Aggregate	0.112 (0 - 0.314)	0	0	0
Fine sand	0.0561 (0 - 0.157)	0	0	0
GP Cement	0.812 (0.492 - 0.984)	0	0	0
Plasticiser	3.46E-04 (0 - 9.66E-04)	0	0	0
Water	0.00814 (0 - 0.0227)	0	0	0
Wire	0.00425 (0.00425 - 0.0119)	0	0	0
Bar	0.00719 (0.00356 - 0.00915)	0	0	0
Total	1	0	0	0

**Individual masses may not sum to total due to rounding. See Table 16 for mass conversion factors.*

No products declared within this EPD contain substances exceeding the limits for registration according to the European Chemicals Agency's "Candidate List of Substances of Very High Concern for authorisation" (European Union, 2024). Reinforced concrete manhole flanged bases are not classified as dangerous goods according to the Land Transport Rule: Dangerous Goods 2005.

Table 3: Composition of packaging (per 1 kg product)

Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg of product
Product's packaging	0	0	0
Total	0	0	0

Manufacturing Process

Hynds HySpec Reinforced Concrete Pipes Class 4 are manufactured at Hynds precast concrete manufacturing site in Hornby, Christchurch, using spun pipe technology.

To manufacture HySpec pipes, high strength concrete is batched on site and poured directly into steel moulds. The

moulds are then spun to compact the concrete, giving a uniform and strong pipe wall. The spun pipes are cured inside the steel moulds in controlled conditions. This eliminates relaxation stresses within the uncured pipe and ensures the integrity and durability of the pipe structure.



HYNDS PROCESS

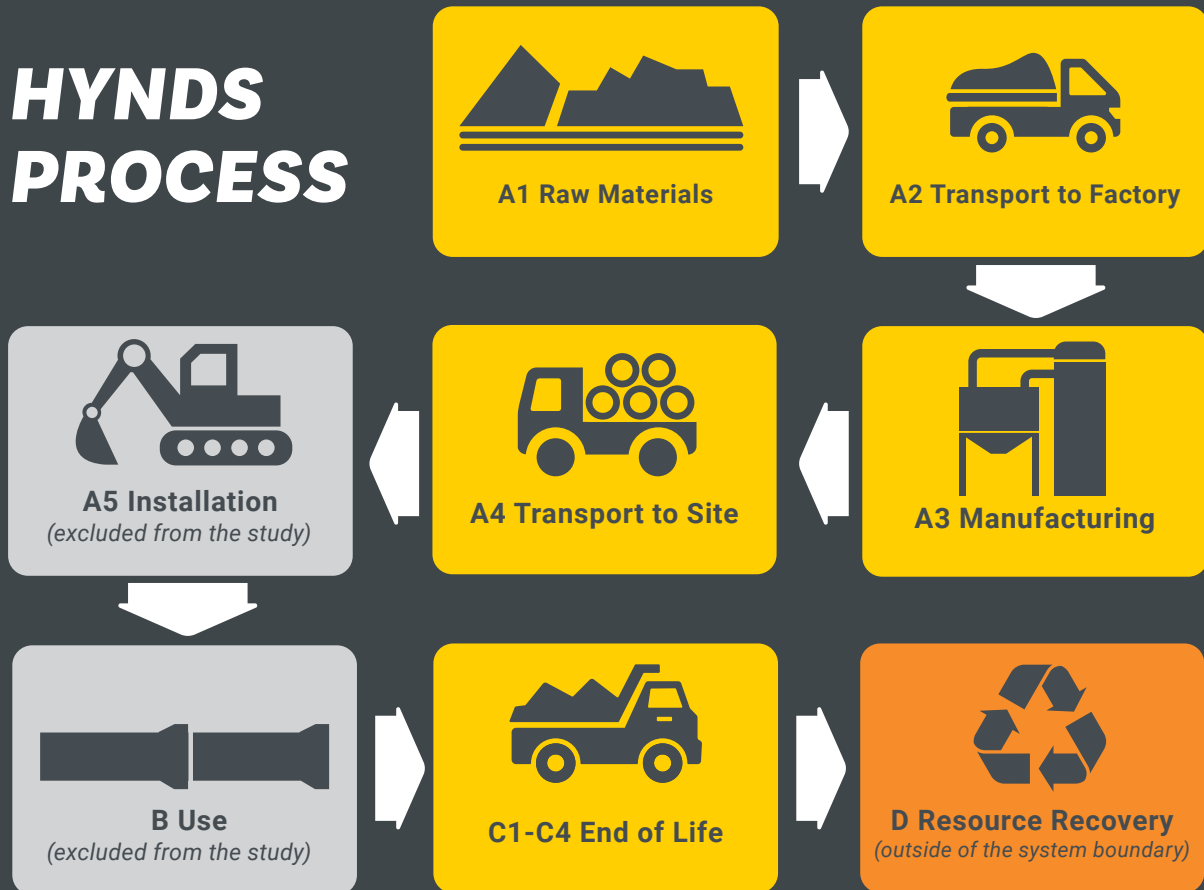


Diagram of Hynds process

System boundaries

As shown in the table below, this EPD has a scope of cradle-to-gate with options, modules C1-C4, module D and with additional modules (type b). The additional module is A4.

Table 4: Modules included in the scope of the EPD

	Product stage			Construction process stage		Use stage							End of life stage				Recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction / Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / demolition	Transport	Waste processing	Disposal	Future reuse, recycling or energy recovery potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	NZ	NZ	-	-	-	-	-	-	-	-	NZ	NZ	NZ	NZ	NZ
Share of specific data	89%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: product groups	11%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-

X = included in the EPD; ND = Module not declared

*Share of specific data is calculated based on the GWP-GHG results and A1-A3 processes. Energy data (e.g. electricity, LPG) and material data pertaining to primary resource inputs (e.g. concrete, slag, GGBFS, steel) is specific, however data pertaining to the consumables used in manufacturing are not specific. This is consistent across both manufacturing sites.

Production (Modules A1-A3)

The production stage includes the environmental impacts associated with raw materials extraction and processing of inputs, transport to, between and within the manufacturing site, and manufacturing of average product at the exit gate of the manufacturing site. CO₂ absorption effects due to concrete carbonation during the products' life cycle are not taken into account in any of the declared modules.

Transport to site (Module A4)

The average transport distance from Hynds Christchurch manufacturing site to customer sites is 100 km.

End of Life (Modules C1-C4)

When infrastructure reaches the end of its functional life, it is typically demolished and disposed of making way for new infrastructure. Manhole flanges bases are a special case since they are typically buried and are often simply abandoned. Other options are for the manhole flanges bases to be exhumed and sent for recycling or exhumed and sent to landfill.

Scenarios shall be realistic and representative of one of the most probable alternatives and shall not include processes or procedures that are not in current use, or which have not been demonstrated to be practical.

This study assumes that the most likely scenario is that the manhole flanges bases will be abandoned. It is not economically feasible to remove and recover pipes at the end of their service life. According to Hynds, decommissioned manhole flanges bases are usually left in ground. No additional processes are included at end-of-life to model the decommissioning of a manhole flanges base.

Recovery and Recycling potential (Module D)

Module D declares a potential credit or burden for the net scrap associated with a recycled product. As the manhole flanges base is modelled as abandoned in the ground there is no credit for concrete or steel recycled. Default factors from PEF R2 values are therefore not used and are replaced with 0 (European Commission, 2020).

Table 5: End of life scenario and processes, per declared unit (1 kg)

Scenario / Module	Parameter	Left in ground
Deconstruction (C1)	Process and assumptions	n/a
	kg collected	0
Transport (C2)	Process and assumptions	n/a
	kg transported	0
Waste processing (C3)	Process and assumptions	n/a
	kg for re-use	0
	kg for recycling	0
Disposal (C4)	Process and assumptions	n/a
	kg disposed	0

Life Cycle Inventory (LCI) Data and Assumptions

Primary data was used for all manufacturing operations up to the factory gate, including upstream data for general purpose (GP) cement. Primary data were collected based on output data from Hynds systems during July 2023 – June 2024, excluding the sourcing of steel reinforcing wire and mesh which uses 2023 calendar year data.

Background datasets were obtained from Environmental Product Declarations (EPD) specific to suppliers in the case of steel and cement (EPD details omitted because of confidentiality), and EPDs covering similar products i.e. admixtures. All other materials were from the ecoinvent database 3.11 (Wernet, 2016). The reference year for most datasets range from 2019-2024.

Steam curing using natural gas as an energy input, takes place based on the need to turn around a product to fulfill an order. Records associated with steam curing use on a product by product basis is not available. Therefore, natural gas use has been allocated according to the mass of the concrete.

Electricity

Purchased electricity accounts for 100% of electricity use at Pokeno. It has been modelled using the residual electricity mix of the market.

The composition of the residual electricity grid mix of New Zealand is modelled in LCA FE based on published data for the year 1 April 2021 – 31 March 2022 (BraveTrace, 2023). The New Zealand residual electricity mix is made up of hydro (56.6%), geothermal (19.7%) natural gas (12.5%), wind (6.55%), coal (4.25%), biomass (0.266%) and biogas (0.160%).

Onsite consumption (3.00%), and the low voltage (<1kV) grid's transmission and distribution losses (6.73%) are calculated based on data from the Ministry of Business, Innovation & Employment (MBIE, 2023). The emission factor for the New Zealand residual grid mix for the GWP-GHG indicator is 0.151 kg CO₂-eq./kWh (based on EF3.1).

Transport

Primary transport data was collected for most input materials to the product. The transport data included the transport modes and distances from suppliers. Transport distances were mapped against each line of Bill of Material (BOM) data and used to calculate upstream transport impacts.

All auxiliary materials and minor input materials were estimated to travel 24 km by truck and be shipped 10 622 km (from Shanghai).

Transport modes:

- Transport, freight, lorry 7.5-16 metric ton, EURO5.
- Transport, freight, sea, container ship.

Cut off criteria

thinkstep consistently exclude impacts from infrastructure, construction, production equipment, and tools that are not directly consumed in the foreground production process, ('capital goods') regardless of potential significance.

Infrastructure/capital goods are excluded from all MLC datasets. An important exception is the inclusion of capital goods for electricity generation, where the capital goods are very important for modelling of changes towards more renewable generation. Capital goods related to electricity generation are included in all MLC electricity datasets.

Note: The system boundaries on manufacturing of equipment and for employees are not regarded as limiting the scope of the inventory or as an incomplete inventory (i.e. a cut-off).

Cut-off criteria were applied to the following:

Cut-off was applied to the packaging of raw materials and the packaging materials which accompany the wooden dunnage (included) in minor quantities. Raw materials are delivered in bulk and represents a proportion below 1% of cumulative mass and environmental relevance of inputs to the product.

Allocation

It was not possible to discern the specific quantities of energy (natural gas, electricity, diesel), water, consumables, dunnage and wastes per product. Data was available at the site-wide level and is allocated to products.

Mass of concrete is used for allocation:

- Allocation of energy (natural gas, electricity and diesel) is based on mass of concrete per product as concrete production and movement is the main driver for on-site energy consumption.
- Water input is allocated based on mass of concrete as batching is the primary area of water use.
- Inputs and (outputs) such as consumables, dunnage and wastes (data collected at site-wide level) are allocated based on mass of concrete for consistency.

Waste generated by the site are not product specific and hence are allocated per product based on mass allocation (i.e. as a factor of specific product mass and total mass of products manufactured at the facility). Reinforcing steel wire and steel fibres including any steel scrap inputs is based on EPD data. The following allocation process occurred.

- Steel Supplier 1's reinforcing bar and wire co-product allocation is proportioned by physical mass according to EN15804 and ISO14044 guidance. Scrap steel input allocation is unclear and likely to have zero burden applied.
- Steel Supplier 2 did not require co-product allocation as data was provided for individual products. Scrap steel input was modelled with an environmental burden based on economic allocation.
- Steel fibre Supplier has a co-product allocation based on product mass basis (17% of total mass production in the manufacturer's facility). Scrap steel input allocation is unclear and likely to be zero burden.

Noting the above Steel Fibre Supplier and Steel Supplier 1 EPDs, PCR suggests that: “Some LCI databases include datasets that are described as being compliant with the allocation rules of EN 15804, but which have been modelled using cut-off allocation (i.e., waste allocation according to Section 4.5.2) for some production (A1-A3) scrap.... Such datasets can be used without adjustments, if the production scrap has no, negligible, or negative economic value (as co-product allocation then yields the same or nearly the same result as cut-off allocation, see Section 4.5.2) or if it can be justified that co-product allocation is not possible (if so, the use of cut-off allocation shall be declared in the EPD). Otherwise, such datasets shall be adjusted by manually adding an environmental burden in compliance with EN 15804 or as a conservative assumption” (section 4.5.5, (EPD International, 2024)).

In the case of Steel Supplier 1 and Steel Fibre Supplier EPDs (used as inputs for this study), any open scrap inputs into manufacturing remain unknown, and so have been treated as ‘burden free.’ This is not consistent with the PCR – however, adjusting Steel Supplier 1 and Steel Fibre Supplier EPDs is not possible. As per Section 4.5.2 of the PCR, if it can be justified that co-product allocation is not possible the use of cut-off allocation shall be declared in the EPD.

Explanation of Representative Products & Variation

This is an EPD of multiple products, based on a representative product. The representative product is closest to or matches the sales-weighted average GWP-GHG impacts of the product group. The variation between individual products in the group is up to 11% for modules A1-A3, for the GWP-GHG indicator



RESULTS

Assessment Indicators

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

The first section of each table contains the environmental impact indicators, describing the potential environmental impacts of the product as shown in Table 11. The second section shows the resource indicators, describing the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water, as shown in Table 12. The final section of each table displays the waste and other outputs, as shown in Table 13.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier as per option C in Annex 3 of the PCR (EPD International 2024).

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Energy indicators (MJ) are always given as net calorific value.

Table 6: Indicators for life cycle impact assessment

Impact category	Indicator	Unit
Climate change – total	GWP-total	kg CO ₂ -eq.
Climate change – fossil	GWP-fossil	kg CO ₂ -eq.
Climate change – biogenic	GWP-biogenic	kg CO ₂ -eq.
Climate change – land use and land use change	GWP-luluc	kg CO ₂ -eq.
Ozone depletion	ODP	kg CFC-11 eq.
Acidification	AP	Mole of H ⁺ eq.
Eutrophication aquatic freshwater	EP-freshwater	kgP eq.
Eutrophication aquatic marine	EP-marine	kgN eq.
Eutrophication terrestrial	EP-terrestrial	Mole of N eq.
Photochemical ozone formation	POCP	kgNMVOC eq.
Depletion of abiotic resources – minerals and metals ^{1,2}	ADP-m&m	kgSb eq.
Depletion of abiotic resources – fossil fuels ¹	ADP-fossil	MJ
Water use ¹	WDP	m ³ world equiv.

Table 7: Life cycle inventory indicators on use of resources

Indicator	Abbreviation	Unit
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ
Use of renewable primary energy resources used as raw materials	PERM	MJ
Total use of renewable primary energy resources	PERT	MJ
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ
Use of non-renewable primary energy resources used as raw materials	PENRM	MJ
Total use of non-renewable primary energy resources	PENRT	MJ
Use of secondary material	SM	kg
Use of renewable secondary fuels	RSF	MJ
Use of non-renewable secondary fuels	NRSF	MJ
Total use of net fresh water	FW	m ³

Table 8: Life cycle inventory indicators on waste categories and output flows

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

Table 9: Biogenic carbon content indicators

Indicator	Abbreviation	Unit
Biogenic carbon content - product	BCC-prod	kg
Biogenic carbon content - packaging	BCC-pack	kg

Table 10: Additional Environmental Impact Indicators

Indicator	Abbreviation	Unit
Climate Change ³	GWP-GHG	kg CO ₂ -eq.
Particulate Matter emissions	PM	Disease incidences
Ionising Radiation – human health ⁴	IRP	kBq U235 eq.
Eco-toxicity (freshwater) ⁵	ETP-fw	CTUe
Human Toxicity, cancer ⁵	HTP-c	CTUh
Human Toxicity, non-cancer ⁵	HTP-nc	CTUh
Land use related impacts / soil quality ⁵	SQP	Dimensionless

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

²The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, noncancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/ infrastructure in generic datasets, in case infrastructure/ capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

³ This indicator should be identical to GWP-total except that the CF for biogenic CO₂ is set to zero. It has been included in the EPD following the PCR (EPD International, 2024). In this study, it is calculated by subtracting the value of Climate change – biogenic (GWP-biogenic) from the value of Climate change – total (GWP-total) since the ecoinvent Excel LCIA results do not include the indicator.

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

⁵The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator



Environmental performance per 1 kg of Hyspec Precast Concrete Manhole Flanged Bases

Table 11: Core environmental indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D	A-C
GWP-total	kg CO ₂ -eq.	2.17E-01	2.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14.1%
GWP-fossil	kg CO ₂ -eq.	2.16E-01	2.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	14.1%
GWP-biogenic	kg CO ₂ -eq.	1.16E-03	1.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	37.1%
GWP-luluc	kg CO ₂ -eq.	1.18E-04	1.11E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32.4%
ODP	kg CFC11-eq.	1.70E-09	3.14E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	59.5%
AP	Mole of H ⁺ eq.	9.39E-04	8.49E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	24.7%
EP-freshwater	kg P eq.	5.14E-05	2.78E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	70.3%
EP-marine	kg N eq.	2.18E-04	2.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	29.3%
EP-terrestrial	Mole of N eq.	2.67E-03	2.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	16.8%
POCP	kg NMCOC eq.	1.68E-03	1.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	97.0%
ADP-m&m	kg Sb-eq.	9.53E-07	8.59E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	37.1%
ADP-fossil	MJ	1.42E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	27.7%
WDP	m ³ world eq.	1.13E+00	1.76E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.38%

Table 12: Resource use indicators

Environmental Impact	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	3.06E-01	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERM	MJ	1.16E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	3.06E-01	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRE	MJ	2.39E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRM	MJ	1.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	2.40E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	4.75E-02	1.45E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	4.40E-05	1.77E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	6.40E-03	4.48E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

The results for A1-A3 should not be analysed without considering the impacts represented by module C

Table 13: Waste output flow indicators

Waste and output flows	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	9.96E-03	7.89E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	1.52E-01	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RWD	kg	2.04E-06	2.07E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	kg	1.25E-04	3.95E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	2.84E-06	2.90E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	2.71E-04	2.84E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	2.61E-04	3.16E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14: Additional indicators

Waste and output flows	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ -eq.	2.16E-01	2.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	Disease incidences	2.00E-08	1.73E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRP	kBq U235 eq.	4.65E-03	2.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETP-fw	CTUe	1.40E+00	6.93E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPc	CTUh	1.75E-10	4.05E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPnc	CTUh	2.43E-09	2.03E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SQP	Pt	5.72E-01	1.77E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 15: Biogenic carbon indicators

Indicators	Units	A1 - A3
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

The results for A1-A3 should not be analysed without considering the impacts represented by module C.

WEIGHT CONVERSION TABLE

Table 16: Hyspec Precast Concrete Manhole Flanged Bases products covered by this EPD and their weights for conversion.

Product code	Product full name	Product mass (kg per 1 unit of pipe)	Representative product
FB06000600	Flange Base Conc Ø600 600Hx100Bmm	445	
FB06000900	Flange Base Conc Ø600 900Hx100Bmm	519	
FB06001200	Flange Base Conc Ø600 1200Hx150Bmm	593	
FB06001500	Flange Base Riser Ø600x1500Hx150Bmm	667	
FB06001800	Flange Base Conc Ø600 1800Hx150Bmm	741	
FB09000600	Flange Base & Riser 900x600mm	825	
FB09000900	Flange Base Conc Ø900 900Hmm	967	
FB09001200	Flange Base Conc Ø900 1200Hmm	1 109	
FB10500300NH	Flange Base Conc Ø1050 1200Hmm No Holes	848	Yes
FB10500450	Flange Base Conc Ø1050 450Hmm	940	
FB10500450NH	Flange Base Conc Ø1050 450Hmm	940	
FB10500600	Flange Base Conc Ø1050 600Hmm	1 031	
FB10500600NH	Flange Base Conc Ø1050 600Hmm No Holes	1 031	
FB10500600PC	Flange Base Conc Ø1050 600Hmm Precast	1 026	
FB10500600PCNH	Flange Base Conc Ø1050 600Hmm Precast No Holes	1 021	
FB10500600SNH	Flange Base Conc Ø1050 600Hmm No Step Holes Hyseal	1 439	
FB10500900	Flange Base Conc Ø1050 900Hmm	1 214	
FB10500900NH	Flange Base Conc Ø1050 900Hmm No Holes	1 214	
FB10500900NHBF	Flange Base Conc Ø1050 900Hmm No Hole 300mm Big Flange	2 274	
FB10500900PC	Flange Base Conc Ø1050 900Hmm Precast	1 250	
FB10500900PCNH	Flange Base Conc Ø1050 900Hmm Precast No Holes	1 244	
FB10500900S	Flange Base Conc Ø1050 900Hmm Manufacture use only Hyseal	4 154	
FB10500900S.SS	Flanged Base Riser 1050x900mm HYSEAL S/Steel Steps Installed	4 157	
FB10501200	Flange Base Conc Ø1050 1200Hmm	1 397	
FB10501200NH	Flange Base Conc Ø1050 1200Hmm Flange Base No Holes	1 397	

FB10501200NHBF	Flange Base Conc Ø1050 1200Hmm No Hole 300mm Big Flange	2 457	
FB10501200PC	Flange Base Conc Ø1050 1200Hmm Precast	1 499	
FB10501200PCNH	Flange Base Conc Ø1050 1200Hmm Precast NH	1 487	
FB10501500	Flange Base Conc Ø1050 1500Hmm	1 581	
FB1050150020NH	Flange Base & Riser Ø1050x1500x200 c/w Hydrophilic No Hole	1 776	
FB10501500NH	Flange Base Conc Ø1050 1500Hmm No holes	1 581	
FB10501500NHBF	Flange Base Conc Ø1050 1500Hmm No Hole 300mm Big Flange	2 640	
FB10501800	Flange Base Conc Ø1050 1800Hmm	1 764	
FB10501800NH	Flange Base Conc Ø1050 1800Hmm No Holes	1 764	
FB10501800NHBF	Flange Base Conc Ø1050 1800Hmm No Hole 300mm Big Flange	2 823	
FB10502100	Flange Base Conc Ø1050 2100Hmm	1 947	
FB10502100NH	Flange Base Conc Ø1050 2100Hmm No Holes	1 947	
FB10502100NHBF	Flange Base Conc Ø1050 2100Hmm No Hole 300mm Big Flange	3 006	
FB10502100TW	Flange Base Conc Ø1050 2100Hmm Thick Wall	2 387	
FB10502400	Flange Base Conc Ø1050 2400Hm mx150 Base	2 130	
FB10502400NH	Flange Base Conc Ø1050 2400Hmm No Holes No Holes	2 130	
FB10502400NHBF	Flange Base Conc Ø1050 2400Hmm No Hole 300mm Big Flange	3 189	
FB10502400NHTW	Flange Base & TW Riser Ø1050x2400x200 Thick Base NH	2 325	
FB12000600	Flange Base Conc Ø1200 600Hmm	1 267	
FB12000600NH	Flange Base Conc Ø1200 600Hmm No Holes No Holes	1 267	
FB12000900	Flange Base Conc Ø1200 900Hmm	1 495	
FB12000900NH	Flange Base Conc Ø1200 900Hmm No Holes	1 495	
FB12001200	Flange Base Conc Ø1200 1200Hmm	1 722	
FB12001200NH	Flange Base Conc Ø1200 1200Hmm No holes	1 722	
FB12001500	Flange Base Conc Ø1200 1500Hmm	1 949	
FB1200150020NH	FB Riser Ø1200x1500Hx200Bmm c/w Hydrophilic No Hole	1 571	
FB12001500NH	Flange Base Conc Ø1200 1500Hmm No Holes	1 949	
FB12001800	Flange Base Conc Ø1200 1800Hmm	2 177	

FB1200180020NH	Flange Base & Riser Ø1200x1800x200 c/w Hydrophilic No Hole	2 421	
FB12001800NH	Flange Base Conc Ø1200 1800Hmm No Holes	2 177	
FB12001800NHTW	Flange Base & Riser Ø1200x1800 Thick Wall	2 602	
FB12002100	Flange Base Conc Ø1200 2100Hmm	2 404	
FB1200210020NH	Flange Base & Riser Ø1200x2100x200 c/w Hydrophilic No Hole	2 648	
FB12002100NH	Flange Base Conc Ø1200 2100Hmm No Holes	2 404	
FB12002400	Flange Base Conc Ø1200 2400Hmm	2 631	
FB12002400NH	Flange Base Conc Ø1200 2400Hmm No Holes	2 631	
FB14000600	Flange Base Conc Ø1400 600Hmm	1 544	
FB14000600NH	Flange Base Conc Ø1400 600Hmm No Hole	1 544	
FB14000900	Flange Base Conc Ø1400 900Hmm	1 823	
FB14000900NH	Flange Base Conc Ø1400 900Hx200Bmm No Holes	1 823	
FB14001200	Flange Base Conc Ø1400 1200Hmm	2 103	
FB14001200NH	Flange Base Conc Ø1400 1200Hx200Bmm No Holes	2 103	
FB14001500	Flange Base Conc Ø1400 1500Hmm	2 383	
FB14001500NH	Flange Base Conc Ø1400 1500Hx200Bmm No Holes	2 383	
FB14001800	Flange Base Conc Ø1400 1800Hmm	2 663	
FB14001800NH	Flange Base Conc Ø1400 1800Hx200Bmm No Holes	2 663	
FB14002100	Flange Base Conc Ø1400 2100Hmm	2 943	
FB14002100NH	Flange Base Conc Ø1400 2100Hx200Bmm No Holes	2 943	
FB14002400	Flange Base Conc Ø1400 2400Hmm	3 223	
FB14002400NH	Flange Base Conc Ø1400 2400Hx200Bmm No Holes	3 223	
FB15000600	Flange Base Conc Ø1500 600Hmm	1 779	
FB15000600NH	Flange Base Conc Ø1500 600Hmm No Holes	1 779	
FB15000900	Flange Base Conc Ø1500 900Hmm	2 092	
FB15000900NH	Flange Base Conc Ø1500 900Hmm No Holes	2 092	
FB15001200	Flange Base Conc Ø1500 1200Hmm	2 404	
FB15001200NH	Flange Base Conc Ø1500 1200Hmm No Holes	2 404	
FB15001500	Flange Base Conc Ø1500 1500Hmm	2 716	
FB15001500NH	Flange Base Conc Ø1500 1500Hmm No Holes	2 716	
FB15001800	Flange Base Conc Ø1500 1800Hmm	3 028	

FB15001800NH	Flange Base Conc Ø1500 1800Hmm No Holes	3 028	
FB15002100	Flange Base Conc Ø1500 2100Hx150Bmm	3 340	
FB15002100NH	Flange Base Conc Ø1500 2100Hx200Bmm no Holes	3 340	
FB15002400	Flange Base Conc Ø1500 2400Hx150Bmm	3 652	
FB15002400NH	Flange Base Conc Ø1500 2400Hx200Bmm no Holes	3 652	
FB18000600	Flange Base Conc Ø1800 600Hmm	2 938	
FB1800060020NH	Flange Base & Riser Ø1800x600x200 No Holes	2 957	
FB18000600NH	Flange Base Conc Ø1800 600Hx200Bmm No Holes	2 957	
FB18000900	Flange Base Conc Ø1800 900Hmm	3 373	
FB18000900NH	Flange Base Conc Ø1800 900Hx200Bmm No Holes	3 402	
FB18001200	Flange Base Conc Ø1800 1200Hmm	3 808	
FB18001200NH	Flange Base Conc Ø1800 1200Hx200Bmm No Holes	3 847	
FB18001500	Flange Base Conc Ø1800 1500Hmm	4 242	
FB18001500NH	Flange Base Conc Ø1800 1500Hx200Bmm No Holes	4 292	
FB18001800	Flange Base Conc Ø1800 1800Hmm	4 737	
FB1800180020NH	Flange Base & Riser 1800x1800x200mm No Holes	4 750	
FB18001800NH	Flange Base Conc Ø1800 1800Hx200Bmm No Holes	4 737	
FB18002100	Flange Base Conc Ø1800 2100Hx150Bmm	4 678	
FB1800210020NH	Flange Base & Riser Ø1800x2100x200 No Holes	5 181	
FB18002100NH	Flange Base & Riser Ø1800x2100x200 No Holes	5 182	
FB18002100NHTW	Flange Base & Riser Ø1800x2100x200 Thick Wall No Holes	6 471	
FB18002400	Flange Base Conc Ø1800 2400Hx150Bmm	5 548	
FB18002400NH	Flange Base Conc Ø1800 2400Hx200Bmm	5 548	
FB18002400NHTW	Flange Base Conc Ø1800 2400Hx200Bmm Thick Wall No Holes	6 472	
FB20000600	Flange Base & Riser 2050mm x 600mm	3 015	
FB20000600NH	Flange Base Conc Ø2050 600Hx200Bmm No Holes	3 015	
FB20000900	Flange Base Conc Ø2050 900Hmm	3 558	
FB20000900NH	Flange Base Conc Ø2050 900Hx200Bmm No Holes	3 560	
FB20001200	Flange Base Conc Ø2050 1200Hmm	4 102	
FB20001200NH	Flange Base Conc Ø2050 1200Hx200Bmm No Holes	4 102	
FB20001500	Flange Base Conc Ø2050 1500Hmm	4 646	

FB20001500NH	Flange Base Conc Ø2050 1500Hx200Bmm No Holes	4 646	
FB20001800	Flange Base Conc Ø2050 1800Hmm	5 190	
FB20001800NH	Flange Base Conc Ø2050 1800Hx200Bmm No Holes	5 190	
FB2000210020NH	Flange Base & Riser Ø2050x2100x200 No Holes	6 319	
FB20002400NH	Flange Base Conc Ø2050 2400Hx200Bmm No Holes	6 278	
FB23001.2200	Flange Base Conc Ø2300 1200Hx200Bmm	6 723	
FB23002.4200NH	Flange Base Conc Ø2300 2400Hx200Bmm No Holes	10 016	

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General information

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Chair:	The most recent review chair: Claudia Peña, PINDA LCT SpA. The review panel may be contacted via the Secretariat: www.environdec.com/contact
Independent third-party verification of the declaration and data, according to ISO 14025:	☒ EPD verification (by individual verifier)
Third-party verifier: (Approved by: EPD Australasia)	Claudia A. Peña, PINDA LCT SpA Email: pinda.lct@gmail.com
Procedure for follow-up of data during EPD validity involved third-party verifier	☐ Yes ☒ No

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

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

HYNDS

A thick, bright yellow curved line that starts under the 'H' and ends under the 'S', resembling a stylized smile or a swoosh.