

Environmental Product Declaration

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

HYNDS PIPE SYSTEMS

Hynds Precast Concrete Channels

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



Programme: The International EPD® System,
www.environdec.com

Programme operator: EPD International AB

Regional Programme: EPD Australasia, www.epd-australasia.com

EPD registration number: EPD-IES-0023140:001

Publication date: 2030-06-16

Date of validity: 2025-06-17

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

Table of Contents



About us	4
Hynds Group Map	5
Hynds Sustainability	6
Product Information	7
General Information	21

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.



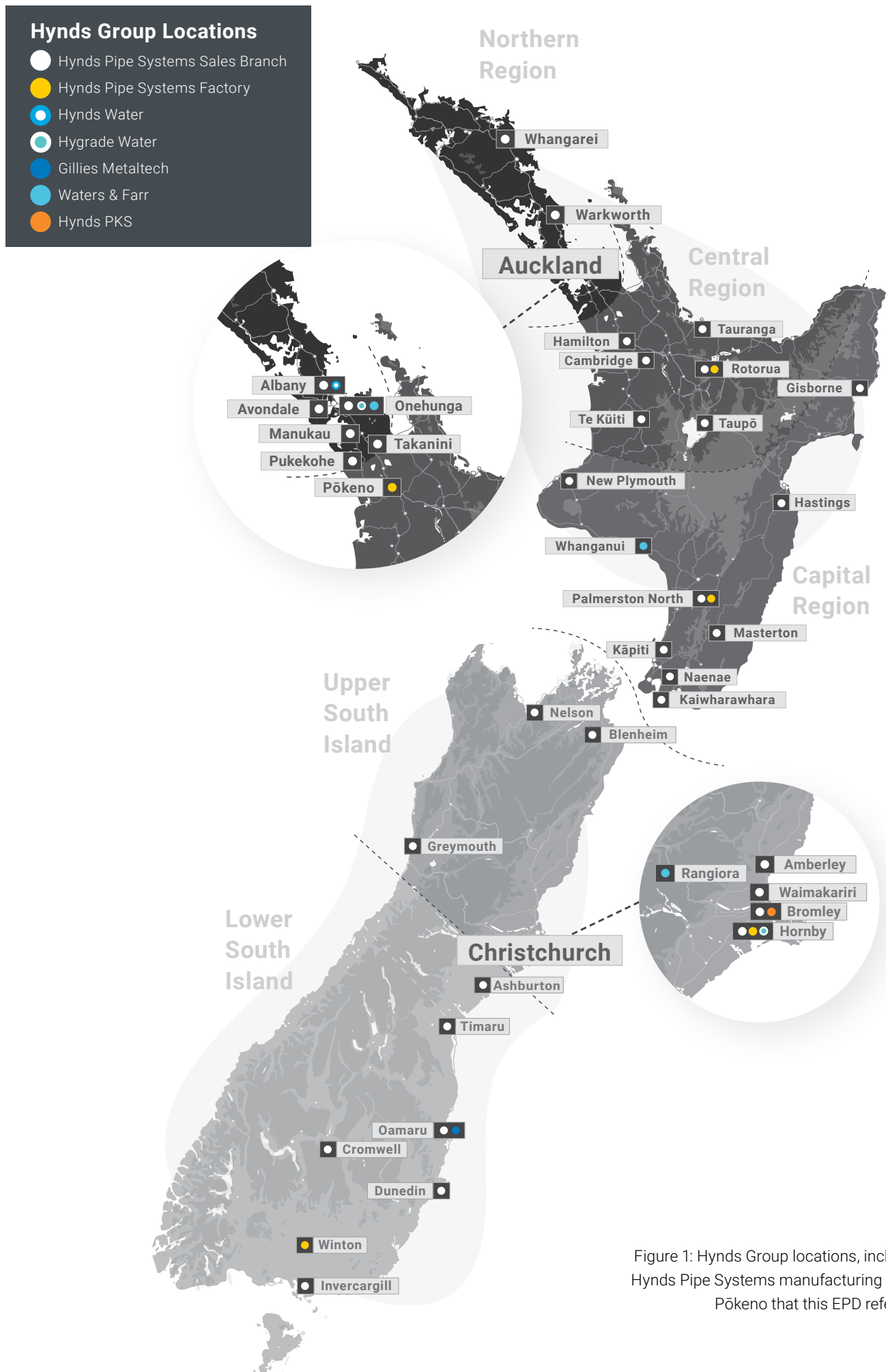


Figure 1: Hynds Group locations, including Hynds Pipe Systems manufacturing site in Pōkeno that this EPD refers to.

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 Hynds Precast Concrete Channels manufactured at Hynds state-of-the-art precast concrete manufacturing plant in Pōkeno. The full range of products covered by this EPD are given in the Product Mass Table (Table 16).

The Hynds Precast Concrete Channels range is generally only supplied to North Island projects but can be shipped to South Island projects when required.

Product Description

As the leading manufacturer of reinforced concrete products in New Zealand, Hynds' Channel are available in a wide range of sizes.

Hynds Reinforced Concrete Box Culvert are manufactured using high strength concrete (50 MPa or greater), hard drawn steel wire. The concrete consists of coarse and fine aggregates, cement, supplementary cementitious materials (SCMs) and chemical admixtures.

Hynds Precast Concrete Channels are designed to be used for water channels, cable ducting and pipe protection.

Declared Unit

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

Design Standard

Hynds Precast Concrete Channels are designed and manufactured to the requirements of NZS 3101 and NZS 3109.

The Standard ranges of Hynds Reinforced Concrete Channel 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 (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 Hynds Precast Concrete Channels (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	0.429 (0.400 - 0.440)	0	0	0
Fine sand	0.236 (0.221 - 0.243)	0	0	0
GP Cement	0.130 (0.121 - 0.133)	0	0	0
Slag	0.0299 (0.0279 - 0.0307)	0	0	0
Plasticiser	9.58E-04 (8.94E-04 - 9.84E-04)	0	0	0
Superplasticiser	9.58E-04 (8.94E-04 - 9.84E-04)	0	0	0
Limestone	0.0399 (0.0373 - 0.0410)	0	0	0
Water	0.103 (0.0966 - 0.106)	0	0	0
Bar	0.0209 (0 - 0.0948)	0	0	0
Mesh	0.00951 (0 - 0.0382)	0	0	0
Total	1	0	0	0

*Individual masses may not sum to total due to rounding. See Table 21 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 products are not classified as dangerous goods according to the Land Transport Rule: Dangerous Goods 2005.

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

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 Precast Concrete Channels are manufactured at Hynds state-of-the-art, precast concrete manufacturing site in Pōkeno, Auckland.

Hynds Precast Concrete Channels are manufactured using a manual wet-casting process, utilizing the latest European and Japanese mould technology to ensure that the product meets strict quality requirements. This process uses high strength, wet-cast concrete batched on-site and controlled curing conditions to provide high quality durable products.

When Hynds developed the state-of-the-art precast concrete manufacturing facility in Pōkeno in 2019, sustainability was front of mind. Rainwater is captured onsite and sent to a holding tank where it is mixed with onsite collected bore water and recovered wastewater from truck and machinery washdowns. This mixed water is used in concrete batching to reduce potable water use, with town supply water only used when there is insufficient recycled water. The on-site treatment of process water reduces the load on municipal infrastructure.

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
Modules	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	78%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation: product groups	22%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
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 Pōkeno 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. Channel are a special case since they are typically buried and are often simply abandoned. Other options are for the Channel 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 Channel will be abandoned. It is not economically feasible to remove and recover Channel at the end of their

service life. According to Hynds, decommissioned Channel are usually left in ground. No additional processes are included at end-of-life to model the decommissioning of a Channel.

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 Channel 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 55 km by truck and be shipped 9 358 km (from Shanghai).

Transport modes:

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

Cut off criteria

In this study capital goods and infrastructure have been included in the background datasets as provided by ecoinvent (Wernet, 2016). It is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from these datasets. The results, therefore, 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. In line with the PCR, personnel-related activities, such as transportation to and from work, are not accounted for in the LCI, while all process related transport are included.

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 22% 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 Hynds Precast Concrete Channels

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

Table 11: Core environmental indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D	A-C
GWP-total	kg CO ₂ -eq.	2.21E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39.6%
GWP-fossil	kg CO ₂ -eq.	2.20E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	39.5%
GWP-biogenic	kg CO ₂ -eq.	6.46E-04	1.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.84%
GWP-luluc	kg CO ₂ -eq.	2.09E-04	1.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	26.9%
ODP	kg CFC11-eq.	3.97E-09	3.15E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79%
AP	Mole of H ⁺ eq.	1.51E-03	8.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	35.2%
EP-freshwater	kg P eq.	1.23E-04	2.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30.1%
EP-marine	kg N eq.	2.70E-04	2.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32.7%
EP-terrestrial	Mole of N eq.	3.92E-03	2.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	23.9%
POCP	kg NMCOC eq.	4.50E-03	1.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.23%
ADP-m&m	kg Sb-eq.	3.67E-07	8.60E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	34.4%
ADP-fossil	MJ	1.76E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	30.7%
WDP	m ³ world eq.	2.02E-01	1.77E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.37%

Table 12: Resource use indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PERE	MJ	3.81E+00	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERM	MJ	2.13E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	5.94E+00	5.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRE	MJ	1.72E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRM	MJ	1.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	MJ	1.74E+00	3.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SM	kg	6.66E-02	1.46E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	5.73E-03	1.77E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	5.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	m ³	1.14E-02	4.49E-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	5.34E-03	7.90E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NHWD	kg	8.35E-02	1.55E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RWD	kg	3.49E-06	2.08E-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	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14: Additional indicators

Waste and output flows	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-GHG	kg CO ₂ -eq.	2.20E-01	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PM	Disease incidences	1.85E-08	1.73E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRP	kBq U235 eq.	3.55E-03	2.84E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETP-fw	CTUe	8.45E-01	6.94E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPc	CTUh	2.74E-10	4.06E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HTPnc	CTUh	8.55E-09	2.04E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SQP	Pt	7.42E-02	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

WEIGHT CONVERSION TABLE

Table 16: Hynds Precast Concrete Channels 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
CC100050150H	Channel Conc 1000Wx500Hx1500Lmm HDuty (CCL100175150H)	1 305	
CC100050150L	Channel Conc 1000Wx500Hx1500Lmm LDuty (CCL100150150L)	1 106	
CC100075150H	Channel Conc 1000Wx750Hx1500Lmm HDuty (CCL100175150H)	1 625	
CC100075150L	Channel Conc 1000Wx750Hx1500Lmm LDuty (CCL100150150L)	1 356	
CC100100150H	Channel Conc 1000Wx1000Hx1500Lmm HDuty (CCL100175150H)	1 944	
CC100100150L	Channel Conc 1000Wx1000Hx1500Lmm LDuty (CCL100150150L)	1 603	
CC100125150H	Channel Conc 1000Wx1250Hx1500Lmm HDuty (CCL100175150H)	2 273	
CC100125150L	Channel Conc 1000Wx1250Hx1500Lmm LDuty	1 908	
CC100150150H	Channel Conc 1000Wx1500Hx1500Lmm HDuty	2 696	
CC125050150H	Channel Conc 1250Wx500Hx1500Lmm HDuty (CCL125200150H)	1 453	
CC125050150L	Channel Conc 1250Wx500Hx1500Lmm LDuty (CCL125150150LH)	1 330	
CC125075150H	Channel Conc 1250Wx750Hx1500Lmm HDuty (CCL125200150H)	1 758	
CC125100150H	Channel Conc 1250Wx1000Hx1500Lmm HDuty (CCL125200150H)	2 068	
CC125100150L	Channel Conc 1250Wx1000Hx1500Lmm LDuty (CCL125150150L)	1 889	
CC125125150H	Channel Conc 1250Wx1250Hx1500Lmm HDuty (CCL125125150H)	2 427	
CC150050150H	Channel Conc 1500Wx500Hx1500Lmm HDuty (CCL150050150H)	1 832	
CC150075150H	Channel Conc 1500Wx750Hx1500Lmm HDuty (CCL150200150H)	2 151	
CC150100150H	Channel Conc 1500Wx1000Hx1500Lmm HDuty (CC150100150H)	2 471	
CC150100150L	Channel Conc 1500Wx1000Hx1500Lmm LDuty (CCL150175150L)	2 150	
CC150125150H	Channel Conc 1500Wx1250Hx1500Lmm HDuty (CCL150125150H)	2 844	
CC150150150H	Channel Conc 1500Wx1500Hx1500Lmm HDuty (CCL150200150H)	3 185	
CC150150150L	Channel Conc 1500Wx1500Hx1500Lmm LDuty (CCL150150150L)	2 816	
CC150175150H	Channel Conc 1500Wx1750Hx1500Lmm HDuty (CCL150200150H)	3 614	
CC200050150H	Channel Conc 2000Wx500Hx1500Lmm HDuty (CC200050150H)	2 417	
CC200050150HN	Channel Conc 2000Wx500Hx1500Lmm HN-HO-72	2 508	
CC200075150H	Channel Conc 2000Wx750Hx1500Lmm HDuty (CCL200200150H)	2 717	
CC200100150H	Channel Conc 2000Wx1000Hx1500Lmm HDuty (CCL200200150H)	3 030	

CCCOH.TYPE123	Outlet Headwall Structure	4 157	
CCL100150150L	Channel Lid Conc 1000Wx150Hx1500Lmm LDuty	745	
CCL100175150H	Channel Lid Conc 1000Wx175Hx1500Lmm HDuty	891	
CCL125150150L	Channel Lid Conc 1250Wx150Hx1500Lmm LDuty	868	
CCL150200150H	Channel Lid Conc 1500Wx200Hx1500Lmm HDuty	1 383	
CCL200200150H	Channel Lid Conc 2000Wx200Hx1500Lmm HDuty	1 819	
CCL200250150HN	Channel Lid Conc 2000Wx250Hx1500Lmm HN-HO-72	2 291	
CH2251000RBHD	Channel Conc Ø225 HDuty (Grt CG225.40.1000G)	946	
CH2251500DISH	Channel Conc Ø225 LD	128	
CH3001500DISH	Channel Conc Ø300 1500Lmm LD Dished	130	
CH3001500HDLID	Channel Lid Conc 300x150x1500mm Heavy Duty	285	
CH3001500LDLID	Channel Lid Conc 1500Lx300Wx100Hmm LD	179	
CH3001500RBHD	Channel Conc Ø300 1500Lmm HDuty Dished (Grt CG300.40.1500G)	167	
CH3002251500HD	Channel Conc 1500Lx300Wx225Hmm HDuty	398	
CH3003001500HD	Channel Conc 1500Lx300Wx300Hmm HDuty	432	
CH3003001500HDR	Channel Conc 1500Lx300Wx300Hmm HD (Grt CG385.40.1500G) RB	420	
CH3003001500LD	Channel Conc 1500Lx300Wx300Hmm LD	391	
CH300300150HD60	Channel Conc 300x300x1500mm Heavy Duty 60 Rebated	450	
CH4503802400LD	Channel Conc 2400Lx450Wx380Hmm LD	695	
CH450380LDLID	Channel Lid Conc 2400Lx450Wx380Hmm LD	444	
CH6004001200HD	Channel Conc 1200Lx600Wx400Hmm HDuty	551	
CH6004002400LD	Channel Conc 2400Lx600Wx400Hmm LD	759	
CH600400HDLID	Channel Lid Conc 1200Lx600Wx150Hmm HDuty	362	
CH600400LDLID	Channel Lid Conc 2400Lx600Wx125Hmm LD	542	
CH6005001200HD	Channel Conc 1200Lx600Wx500Hmm HDuty	591	
CH6005002400LD	Channel Conc 2400Lx600Wx500Hmm LD	873	
CH600500HDLID	Channel Lid Conc 1200Lx600Wx150Hmm HDuty	358	
CH600500LDLID	Channel Lid Conc 2400Lx600Wx125Hmm LD	569	
CH7507001500HD	Channel Conc 1500Lx750Wx700Hmm HDuty	1 378	
CH7507001500LD	Channel Conc 1500Lx750Wx700Hmm LD	915	
CH75070015HDLID	Channel Lid Conc 750x175x1500mm Heavy Duty	715	

References

- BraveTrace. (2023). NZECS Residual Supply Mix for electricity certification. New Zealand.
- CEN. (2021). EN 15804:2012+A2:2019/AC:2021 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products. Brussels: European Committee for Standardization.
- CEN. (2022). EN 16757:2022 Sustainability of construction works. Environmental product declarations - Product Category Rules for concrete and concrete elements. Brussels: European Committee for Standardization.
- ECHA. (2024). Candidate List of substances of very high concern for Authorisation. Retrieved from European Chemical Agency: www.echa.europa.eu/candidate-list-table
- EPD Australasia. (2024). Instructions of the Australasian EPD Programme v4.2 (published on 2024-04-12). Nelson: EPD Australasia.
- EPD International. (2021). General Programme Instructions for the International EPD(r) System. Version 4.0, dated 2021-03-29. Stockholm: EPD International AB.
- EPD International. (2025). Complementary Product Category Rules (C-PCR) to PCR 2019:14 for Concrete and Concrete Elements (version 1.0.0 of 2025-04-08 (valid until 2030-04-07). Stockholm: EPD International AB.
- EPD International. (2024). PCR 2019:14 Construction Products version 1.3.4 of 2024-04-30 (valid until 2025-06-20). Stockholm: EPD International AB.
- European Commission. (2020) Annex C V2.1 May 2020. <https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>
- IPCC. (2021). Climate Change 2021: The Physical Science Basis. Geneva: IPCC.
- ISO. (2006a). ISO 14040: Environmental management – Life cycle assessment – Principles and framework. Geneva: International Organization for Standardization.

General information

Declaration owner:



Hynds Pipe Systems Ltd

Jackson MacFarlane, jackson.macfarlane@hynds.co.nz

www.hynds.co.nz

Sustainability@hynds.co.nz

PO Box 58142, Botany, Auckland 2163

Geographical scope

New Zealand

Reference year for data

July 2023 - June 2024

LCA produced by:



thinkstep Ltd.

Barbara Nebel, thinkstep Ltd.

Rosie Dodd, thinkstep Ltd.

Joel Edwards, thinkstep Ltd.

www.thinkstep-anz.com | anz@thinkstep-anz.com

11 Rawhiti Road, Pukerua Bay, Wellington 5026, New Zealand

EPD programme operator:



EPD International AB

www.environdec.com

Box 210 60, SE-100 31, Stockholm, Sweden

info@environdec.com

Regional programme:



EPD Australasia Limited

www.epd-australasia.com

info@epd-australasia.com

315a Hardy Street, Nelson 7010, New Zealand

CEN standard EN 15804+A2 served as the core PCR

PCR:

PCR 2019:14 Construction Products, version 1.3.4 (published on 2024-04-30, valid until 2025-06-20)

c-PCR-003 (to 2019:14) Concrete and concrete elements, version 1.0.0 (published on 2025-04-08)

PCR review was conducted by:

The Technical Committee of the International EPD System.
See www.environdec.com for a list of members.

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:

Claudia A. Peña, PINDA LCT SpA

(Approved by: EPD Australasia)

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).

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

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 sweeps upwards and to the right, ending under the 'S', resembling a stylized smile or a swoosh.