epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

Hollowcore Norrtälje Biobetong 3

The Norwegian EPD Foundation

Owner of the declaration:
Heidelberg Materials Precast Contiga AB – Concrete

Product:
Hollowcore Norrtälje Biobetong 3

Declared unit:
1 tonne

This declaration is based on Product Category Rules:
CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 020:2021 Part B for Concrete and concrete elements

Program operator:
The Norwegian EPD Foundation

Declaration number:
NEPD-7886-7557-EN

Registration number:
NEPD-7886-7557-EN

Issue date: 21.10.2024

Valid to: 21.10.2029

EPD software:
LCAno EPD generator ID: 616086

General information

Product

Hollowcore Norrtälje Biobetong 3

Owner of the declaration:

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Program operator:

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Manufacturer:

Heidelberg Materials Precast Contiga AB – Concrete
Kasenabbevägen 11A,
1662 451 91 Uddevalla, Sverige, Sweden

Declaration number:

NEPD-7886-7557-EN

Place of production:

Norrtälje, Heidelberg Materials Precast Contiga AB
Vintergatan 7 / P.B 94
SE-761 21 Norrtälje, Sweden

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 020:2021 Part B for Concrete and concrete elements

Management system:

Holds a local environmental diploma and is certified for ISO45001, 14001 and 9001

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Organisation no:

556270-5979

Declared unit:

1 tonne Hollowcore Norrtälje Biobetong 3

Issue date:

21.10.2024

Declared unit with option:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Valid to:

21.10.2029

Year of study:

2023

Functional unit:

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway. NEPDT03

Developer of EPD: Alexander Noré

Reviewer of company-specific input data and EPD: Håvard Nyman

Verification of EPD tool:

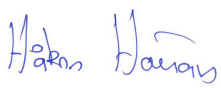
Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Jane Anderson, Construction LCA Ltd

(no signature required)

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

Hollow core is a type of slab that is made of concrete and contains prestressed reinforcement. The elements have longitudinal air channels to optimize material use and load-bearing capacity. The hollow cores are manufactured in different thicknesses depending on the desired function. This type of slabs allows for large spans, which also provides good conditions for a flexible use of the building over its lifetime. It is also a very resource-efficient product that utilizes the included material optimally.
The low w/c ratio and the high strength mean that the construction dries out quickly. With hollow core slabs, the building also receives very good properties in terms of sound insulation and good resistance against fire and moisture. Another of the concrete's important properties is its ability to store heat, which enables a low energy consumption and a lower power output during the building's entire operating time.
Hollow cores are 100% recyclable and enable fast, cost-effective and rational assembly in the construction project. This type of slab is also well suited for reuse.

Product specification

Materials	kg	%
Additives	62,70	6,27
Aggregate	793,29	79,33
Cement	90,23	9,02
Chemical	0,39	0,04
Water	41,85	4,19
Metal - Steel	11,54	1,15
Total	1000,00	100,00

Technical data:

Declared element is HD/F 120/27 in concrete quality C45/55, w/c ratio 0.40 and with 6 tension lines Ø12.9.
However, this EPD is applicable for dimensions HD/F 120/20 - HD/F 120/42 as the environmental impact indicators do not differ by more than 10% from the declared value.
Cement is Heidelberg Materials Bascement CEM II 42.5 R. See EPD-HCG-20210157-CAA1-EN
More technical data and information on load capacity for different hollow core dimensions is available at Heidelberg Materials Precast Contiga's concrete factory in Norrtälje.

Market:

Sweden

Reference service life, product

More than 50 years

Reference service life, building or construction works

More than 50 years

LCA: Calculation rules

Declared unit:

1 tonne Hollowcore Norrtälje Biobetong 3

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

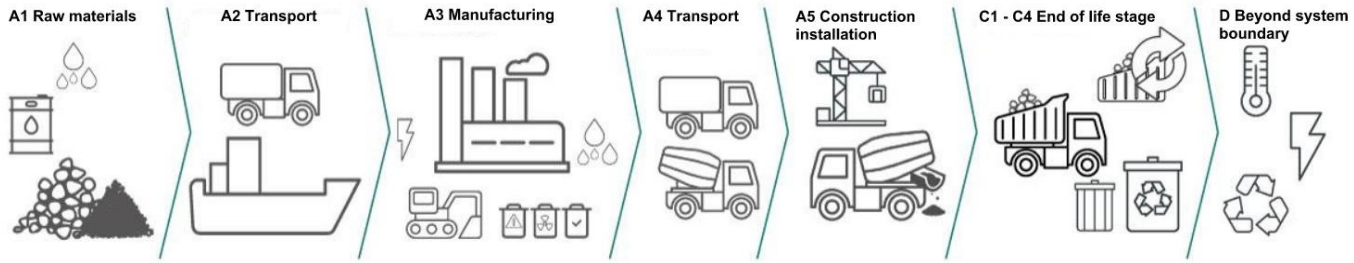
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Additives	Supplier	EPD	2022
Aggregate	ecoinvent 3.6	Database	2019
Cement	EPD-HCG-20210157-CAA1-EN	EPD	2021
Chemical	EPD-EFC-20210198-IBG1-EN	EPD	2021
Metal - Steel	S-P-07047	EPD	2022
Water	ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

The product can be recycled by crushing

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	85	0,023	l/tkm	1,96

Assembly (A5)	Unit	Value			
Diesel (L)	L/DU	0,87			

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg of cement-based product, C1 (kg)	kg/DU	988,68			
Diesel (L)	L/DU	0,87			
Demolition of building per kg of steel, C1 (kg)	kg/DU	11,32			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	85	0,023	l/tkm	1,96

Waste processing (C3)	Unit	Value			
Waste treatment of cement-based product after demolition (kg	kg	672,30			
Materials to recycling (kg)	kg	7,58			

Disposal (C4)	Unit	Value			
Waste, concrete sludge, rest concrete, to disposal (kg)	kg	316,38			
Waste, scrap steel, to disposal (kg)	kg	3,74			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of stone materials (kg)	kg	672,30			
Substitution of steel (kg)	kg	3,67			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact												
Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	7,65E+01	3,40E+00	2,90E+00	7,41E+00	3,08E+00	7,08E+00	7,41E+00	4,84E-01	1,37E+00	-5,61E+00
	GWP-fossil	kg CO_2 -eq	7,60E+01	3,40E+00	2,88E+00	7,40E+00	3,08E+00	7,08E+00	7,40E+00	4,77E-01	1,37E+00	-5,58E+00
	GWP-biogenic	kg CO_2 -eq	3,47E-01	1,38E-03	2,17E-02	3,17E-03	5,76E-04	1,33E-03	3,17E-03	4,12E-03	1,17E-03	-3,29E-02
	GWP-luluc	kg CO_2 -eq	1,37E-01	1,06E-03	1,56E-03	2,26E-03	2,42E-04	5,58E-04	2,26E-03	6,61E-04	2,69E-04	-2,85E-03
	ODP	kg CFC11 -eq	2,14E-06	8,05E-07	5,59E-07	1,79E-06	6,64E-07	1,53E-06	1,79E-06	9,41E-08	6,67E-07	-4,08E-07
	AP	mol H+ -eq	1,83E-01	1,95E-02	2,81E-02	2,38E-02	3,22E-02	7,40E-02	2,38E-02	3,86E-03	1,34E-02	-3,39E-02
	EP-FreshWater	kg P -eq	9,10E-03	2,54E-05	3,44E-05	5,89E-05	1,12E-05	2,58E-05	5,89E-05	3,02E-05	1,02E-05	-2,89E-04
	EP-Marine	kg N -eq	2,39E-02	4,33E-03	1,15E-02	5,22E-03	1,42E-02	3,27E-02	5,22E-03	1,13E-03	5,02E-03	-8,96E-03
	EP-Terrestial	mol N -eq	6,01E-01	4,85E-02	1,27E-01	5,82E-02	1,56E-01	3,56E-01	5,82E-02	1,30E-02	5,53E-02	-9,89E-02
	POCP	kg NMVOC -eq	1,77E-01	1,58E-02	3,49E-02	2,29E-02	4,28E-02	9,86E-02	2,29E-02	3,49E-03	1,58E-02	-3,51E-02
	ADP-minerals&metals[1]	kg Sb-eq	9,57E-04	5,62E-05	2,84E-05	1,32E-04	4,72E-06	1,09E-05	1,32E-04	6,06E-06	1,21E-05	-2,06E-04
	ADP-fossil[1]	MJ	3,59E+02	5,42E+01	3,88E+01	1,20E+02	4,23E+01	9,74E+01	1,20E+02	1,48E+01	4,42E+01	-6,00E+01
	WDP[1]	m^3	2,14E+03	3,93E+01	7,37E+02	9,22E+01	8,99E+00	2,07E+01	9,22E+01	1,64E+03	9,31E+01	-1,01E+03

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

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

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	2,26E-02	2,83E-07	6,90E-07	6,80E-07	8,51E-07	5,92E-06	6,80E-07	6,19E-08	2,85E-07	-6,30E-07
	IRP[2]	kgBq U235 -eq	3,75E+03	2,37E-01	2,25E-01	5,26E-01	1,81E-01	4,21E-01	5,26E-01	2,49E-01	1,92E-01	-2,24E-01
	ETP-fw[1]	CTUe	3,66E+02	3,87E+01	3,90E+01	8,79E+01	2,31E+01	5,32E+01	8,79E+01	1,05E+01	2,19E+01	-2,52E+02
	HTP-c[1]	CTUh	3,62E-07	0,00E+00	1,78E-09	0,00E+00	8,98E-10	1,90E-09	0,00E+00	6,72E-10	6,40E-10	-2,08E-08
	HTP-nc[1]	CTUh	4,76E-06	3,54E-08	4,16E-08	8,50E-08	2,13E-08	4,93E-08	8,50E-08	9,41E-09	1,28E-08	3,89E-07
	SQP[1]	dimensionless	1,40E+02	5,79E+01	7,84E+00	1,38E+02	5,37E+00	1,21E+01	1,38E+02	8,38E+00	1,61E+02	5,66E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. 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.

Resource use												
Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	1,02E+02	6,50E-01	5,38E+01	1,51E+00	2,29E-01	5,29E-01	1,51E+00	7,63E+00	6,81E-01	-8,86E+00
	PERM	MJ	4,56E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PERT	MJ	1,02E+02	6,50E-01	5,38E+01	1,51E+00	2,29E-01	5,29E-01	1,51E+00	7,63E+00	6,81E-01	-8,86E+00
	PENRE	MJ	4,29E+02	5,42E+01	3,88E+01	1,20E+02	4,23E+01	9,74E+01	1,20E+02	1,48E+01	4,42E+01	-6,15E+01
	PENRM	MJ	2,25E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	PENRT	MJ	4,31E+02	5,42E+01	3,88E+01	1,20E+02	4,23E+01	9,74E+01	1,20E+02	1,48E+01	4,42E+01	-6,15E+01
	SM	kg	7,60E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	5,75E+01	2,28E-02	5,29E-02	5,29E-02	5,63E-03	5,63E-03	5,29E-02	0,00E+00	1,41E-02	2,11E-02
	NRSF	MJ	9,42E+01	7,91E-02	1,82E-01	1,77E-01	8,29E-02	8,29E-02	1,77E-01	0,00E+00	4,04E-02	4,12E+00
	FW	m^3	5,63E-01	5,81E-03	4,89E-01	1,37E-02	2,18E-03	5,01E-03	1,37E-02	2,54E-02	5,27E-02	-9,65E-01

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	3,94E-02	2,87E-03	5,79E-02	6,58E-03	1,25E-03	2,87E-03	6,58E-03	1,48E-03	0,00E+00	-2,73E-02
	NHWD	kg	3,73E+02	4,35E+00	4,08E+00	1,05E+01	5,01E-02	1,15E-01	1,05E+01	4,68E-02	3,20E+02	-1,84E+00
	RWD	kg	6,83E-03	3,71E-04	2,72E-04	8,21E-04	2,94E-04	6,76E-04	8,21E-04	1,57E-04	0,00E+00	-1,95E-04

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	2,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0,00E+00	0,00E+00	2,42E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,80E+02	0,00E+00	0,00E+00
	MER	kg	0,00E+00	0,00E+00	4,28E-01	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	2,79E-01	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	4,22E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	9,67E-02

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

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Elektrisitet, Norge (kWh)	ecoinvent 3.6	24,33	g CO2-eq/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list.

Indoor environment

The product has a very small or no impact on the indoor climate

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products											
Indicator	**Unit**	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
GWPIOBC	kg CO_2 -eq	7,59E+01	3,40E+00	2,89E+00	7,41E+00	3,08E+00	7,08E+00	7,41E+00	4,78E-01	1,37E+00	-7,69E+00

GWP-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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NPCR 020 Part B for concrete and concrete elements, Ver. 3.0, 20.09.2021, EPD Norway.

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