

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804 + A1
Owner of the Declaration – Techrete

Declaration number: EPDIE-20-26
Issue date 15th December 2020
Valid to 15th December 2025





EPD Programme - EPD Ireland
Programme Operator - Irish Green Building Council
www.epdireland.org



Techrete

Architectural precast concrete cladding

1. General information

PROGRAMME OPERATOR		OWNER OF DECLARATION	
Irish Green Building Council, 19 Mountjoy Square, Dublin D01 E8P5		Techrete, Stephenstown Industrial Park, Balbriggan, Co. Dublin, K32 W665	
DECLARATION NUMBER		PRODUCTION SITE	
EPDIE-20-26		Stephenstown Industrial Park, Balbriggan, Co. Dublin, Ireland K32 W665	Station Road, Scawby, Brigg, North Lincolnshire, UK DN20 9DT
ECO PLATFORM EPD		DECLARED UNIT	
Yes		1m ³ of precast concrete cladding	
APPLICABLE PRODUCT CATEGORY RULES		DECLARED PRODUCT	
EN 15804:2012+A1:2013, EPD Ireland PCR Part A, Part B: Requirements on the EPD for Pre-cast concrete components, Institut Bauen und Umwelt e.V., 2014 [IBU 2014 Part B-6].		Techrete architectural precast concrete cladding	
DATE OF ISSUE		SCOPE OF EPD	
15.12.2020		Manufacturer specific. Cradle-to-Gate	
DATE OF EXPIRY		LCA CONSULTANT OR PERSON RESPONSIBLE FOR LCA	
15.12.2025		Matthew Butcher Sustainability and Product Group Executive British Precast	
TYPE OF EPD: SINGLE OR MULTI PRODUCT		LCA SOFTWARE AND DEVELOPER IF APPLICABLE	
Single Product EPD		Sphera (Thinkstep) Envision	
PRODUCT CLASSIFICATION OR NACE CODE		NAME AND VERSION OF INVENTORY USED	
Precast concrete cladding		GaBi Service Pack 33	
COMPARABILITY			
Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A1:2013. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A1:2013			
The CEN Norm /EN 15804 serves as the core PCR			
Independent verification of the declaration according to ISO 14025			
Internally <input type="checkbox"/> Externally <input checked="" type="checkbox"/>			
SIGNATURE OF PROGRAMME OPERATOR		SIGNATURE VERIFIER	
Pat Barry - CEO - Irish Green Building Council		Chris Foster - EuGeos	
 		 	

2. Scope and Type of EPD

This is a Cradle to Gate EPD. The Modules that are declared are shown in the table below.

PRODUCT STAGE			CONSTRUCTION ON PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

X - Module declared.

MND - Module not declared.

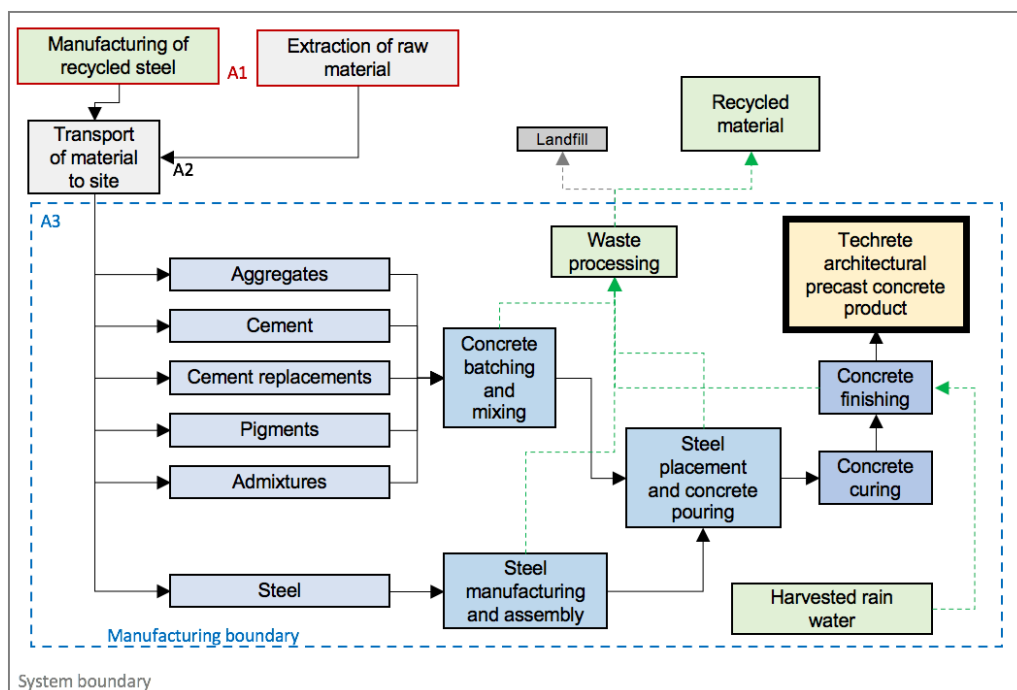
3. Detailed product description

Techrete produce bespoke architectural precast concrete cladding. This EPD covers Techrete’s precast cladding products constructed of reinforced concrete. The concrete itself is produced from raw materials – white and grey cement, powder cement replacements, fine and coarse aggregate, admixtures and pigments where required. The reinforcement used in these products is produced from 100% recycled steel while all fixings are made from stainless steel to enhance the product’s durability.

The bespoke nature of the product necessitates specific concrete mix designs and geometric configurations for a given project, resulting in a large number of different concrete recipes and precast forms produced each year. Consequently the Life Cycle Analysis (LCA), underpinning this EPD, is based on the production of an averaged Techrete precast concrete product across two factories, one in Dublin, Ireland, and the other in Brigg, UK. The data used in the LCA is from the year 2019. The environmental indicators in this EPD are therefore representative of an averaged Techrete product, rather than one specific product. Due to the geometric variability of the cladding, different volumes of concrete and steel are required for each product and so a declared unit of 1m³ of reinforced architectural concrete is used. The typical thickness for a flat cladding panel ranges between 125 and 150 mm. The different concrete mixes use a range of natural aggregates with varying colour, geometry and shades sourced from different quarries. All mix designs are capped with a minimum cement content and so have similar environmental impacts.

3.1 Detailed Process Description

The production process of a Techrete precast product is described in the figure below. Raw material is first procured. The reinforcement cage is then manufactured and assembled on site to meet the required specifications. Concrete is batched and then poured into a mould containing the steel in a temperature controlled factory. After early age strength assessment, the concrete is stripped and transported to the finishing area. Finally, the product is finished using one of the finishing methods including polishing, acid-etching and grit-blasting. All processes in the boundaries of A1 to A3 are included in the LCA and are illustrated below.



4.1 LCA results - Techrete architectural precast concrete cladding

Environmental impact per m³

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	X	X	X	5.75E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ODP	[kg CFC11-Eq.]	X	X	X	7.13E-06	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
AP	[kg SO ₂ -Eq.]	X	X	X	8.56E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EP	[kg (PO ₄) -Eq.]	X	X	X	2.46E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
POCP	[kg ethene-Eq.]	X	X	X	6.77E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPE	[kg Sb-Eq.]	X	X	X	4.35E-04	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
ADPF	[MJ]	X	X	X	3.52E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources.

Note - MND - Module not declared.

4.2 LCA results - Techrete architectural precast concrete cladding

Resource use per m³

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	X	X	X	1.93E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERM	[MJ]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PERT	[MJ]	X	X	X	1.93E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRE	[MJ]	X	X	X	3.80E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRM	[MJ]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
PENRT	[MJ]	X	X	X	3.80E+03	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
SM	[kg]	X	X	X	1.17E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RSF	[MJ]	X	X	X	2.83E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NRSF	[MJ]	X	X	X	1.77E+02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
FW	[m ³]	X	X	X	2.65E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

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 material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water. INA = Indicator not assessed.

Note - MND - Module not declared.

4.3 LCA results - Techrete architectural precast concrete cladding

Output flows and waste categories per m³

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
HWD	[kg]	X	X	X	3.03E-02	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
NHWD	[kg]	X	X	X	8.66E+01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
RWD	[kg]	X	X	X	1.13E-01	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
CRU	[kg]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MFR	[kg]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
MER	[kg]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EEE	[MJ]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
EET	[MJ]	X	X	X	0.00E+00	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.

Note - MND - Module not declared.

5. LCA results - Additional Impact Indicators - Techrete architectural precast concrete cladding

Environmental impact per m³

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
Human toxicity potential	kg 1,4-DB-eq	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	
Freshwater aquatic ecotoxicity potential	kg 1,4-DB-eq	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Marine aquatic ecotoxicity potential	kg 1,4-DB-eq	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Terrestrial ecotoxicity potential	kg 1,4-DB-eq	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

Note - INA - Indicator not assessed.

6. Additional LCI Indicators

N/A

7. Calculation rules

Representativeness

Technological: All primary and secondary data have been modelled to be specific to the technologies or technology mixes under study. Where technology-specific data are unavailable, proxy data have been used. Technological representativeness is considered to be good.

Geographical: All primary data collected are specific to the UK and Ireland. Secondary data are from the UK and Ireland wherever possible. Where UK/Ireland-specific data were unavailable, proxy data relating to the EU-27 or Germany were used. Geographical representativeness is considered to be good.

Temporal: All primary data have been collected for the year 2019. All secondary data come from the GaBi 2014 databases and are representative of the years 2009-2014.

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2019.

Comparability

A comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

8. Scenarios and additional technical information

A1. Raw materials supply

This module considers the extraction and processing of all raw materials and energy which occur upstream to the Techrete manufacturing process, as well as waste processing up to the end-of waste state. This includes the processing of secondary material input (e.g. recycling processes).

A2. Transport of raw materials to manufacturer

This includes the transport distance of the raw materials to the manufacturing facility via road, boat and/or train.

A3. Manufacturing

This module covers the manufacturing of Techrete's Products and includes all processes linked to production such as, mixing, casting and internal transportation. Use of electricity, fuels and auxiliary materials used during production is taken into account as well.

9. Mandatory additional information on release of dangerous substances to indoor air, soil and water

N/A

10. Other optional additional environmental information

N/A

11. References

EPD Ireland Product Category Rules: PART A Implementation and use of IS 15804:2012 and CEN TR 16970 in Ireland for the development of Environmental Product Declarations, 29.06.2018 - www.epdireland.org

Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data; CEN/TR 15941:2010.

Regulation (EU) No 305/2011 of the European parliament and of the council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC.

Department for Transport (2015). Average length of haul¹ by commodity: annual 2004 – 2014. Table RFS0112 <https://www.gov.uk/government/statistical-data-sets/rfs01-goods-lifted-and-distance-hauled>.

DIN EN 15804:2012-04: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products.

EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework.

EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines.

Engelsen, C. and Justnes, H. (2014) CO₂ binding by concrete - Summary of the state of the art and an assessment of the total binding of CO₂ by carbonation in the Norwegian concrete stock. SINTEF Building and Infrastructure, Oslo, Norway.

GaBi ts dataset documentation for the software-system and databases, LBP, University of Stuttgart and thinkstep, Leinfelden-Echterdingen, 2015 (<http://documentation.gabi-software.com/>).

Guinée et al, An operational guide to the ISO-standards, Centre for Milieukunde (CML), Leiden, the Netherlands, 2001.