TERMOKIR

EPD

Environmental Product Declaration

In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

Termokir Thermal Insulating Plaster (TH Series)

Validated by the Israeli Institute of Standards, based on the guidelines of The International EPD® System.
Publication date: 3.2022

EPD VERIFIED

THE STANDARDS INSTITUTION OF ISRAEL

General information

Product category rules (PCR)	CEN standard EN 15804 serves as the Core Product Category Rules (PCR). Product category rules (PCR): PCR 2019:14 Construction products (EN 15804:A2) (1.11) published by the The International EPD® System.
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Publication date	3.2022

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.
For further information about comparability, see EN 15804 and ISO 14025.

Company information

About the Company

Established in 1983, Termokir Industries Ltd. (1980) is a kibbutz-owned company based in Kibbutz Horshim providing innovative construction and building solutions for the Israeli market. Termokir supplies more than 50 different mortar products, providing high-quality technological solutions based on sustainability principles and designed for building claddings, floorings, adhesion, sealing, insulation and acoustics applications, as well as for concrete repair and grout products.

All of the company's products are manufactured on the grounds of the Kibbutz.

Company Strategy

Over the years, Termokir has become a mainstay in the Israeli construction market due to the company's clear value proposition based on three main strategic anchors: **Technology** - developing innovative and environmentally-minded products tailored to the local construction industry; **Quality** – putting our stakeholders first by developing high-quality solutions based on international standards and certification frameworks, while also providing related services and training, and thorough technical guidance in implementation of the company's systems and products; and **Sustainability** – the anchor at the core of the company's value proposition, beginning with the development of it's first "Thermal Plaster" product recognized for its contribution to building energy savings and efficiency in construction. The company continues to develop environmental products and to operate its factory and manufacturing processes in a sustainable way.

In addition, the company strives to achieve green office principles, by recycling, reusing and minimizing the use of paper, and other materials, and by encouraging the use of digital means. Finally, Termokir engages in social impact projects with the community to implement its recycling program, for example, by working with organizations that employ individuals with disabilities.

Through the implementation of these anchors, Termokir strives to continuously challenge, improve and be innovative in the Israeli construction market.

Product-related or management system-related certifications: Termokir's manufacturing site has received the Israeli Standards Institute Diamond mark which reflects a recipient company's conformity to seven Israeli and international standard quality marks related to their management systems, processes, and products. These include: ISO 9001, ISO 14001, ISO 50001, ISO 45001 and ISO 27001, the Israeli Green Label, and the Standards Mark. All are certified under the scope "Manufacture of thermal insulation plasters, industrial plasters, coating & finishing layers, glues for tiles, sealing materials, etc.".

Name and location of production site(s): All data utilized for the life cycle assessment is related to the Company's production plant located in in Kibbutz Horshim, Israel.

Product information

Product name: This EPD describes the environmental impact of 3 different thermal insulating plasters produced by Termokir.

- TH 200 - Thermal Insulating Plaster for buildings up to 5 floors and Security rooms
- TH 300 - Thermal Insulating Plaster for buildings up to 9 floors and Security rooms
- TH 400 - Thermal Insulating Plaster for high-rise buildings and Security rooms

Product identification, description and use:

All Termokir products are manufactured in Israel in a dry mix process at the company's manufacturing site in Kibbutz Horshim. Raw materials are fed automatically from silos, additives are premixed and added automatically as a compound or added without premixing through automatic or manual addition based on the type of additive. The ready-mixed product is filled in paper bags, size depending on the intended use or application.

Termokir products contain no substances that appear in the REACH candidate list of SVHC ("Candidate list of substances of very high concern").

The Termokir TH series is intended for insulation of the entire building shell, including thermal bridges.

TH products save energy and are breathable, allowing passage of water vapor, and thus preventing condensation inside the building and formation of mold and fungi. The Termokir TH series is suitable for the following substrates: concrete, concrete block, cellular concrete block cured in autoclave, pumice block, and ceramic block.

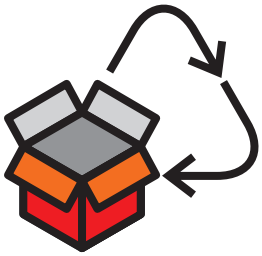
All the products in the series comply with Israeli Standard 1414 and were awarded the Israeli Green Label. Work must be done according to the instructions of Israeli standard 1045 for thermal insulation and Israeli standard 5282 for green construction.

The products are marketed in a paper bag as dry mix products; a mixture ready for use with water addition only. The bags are transported on wooden pallets, packaged under polyethylene film (24 x 15 kg bags per pallet for Termokir TH 200, 24 x 16 kg bags per pallet for Termokir TH 300, and 24 x 23 kg bags per pallet for Termokir TH 400).

Product Contents:

Component	TH Family
Cement	81-85%
Fillers	6-12%
Expanded polystyrene beads	4-9%
Special additives	0-3%

UN CPC code: 375 – Articles of concrete, cement and plaster.



LCA information

Functional unit / declared unit: The declared units are:

- 5 kg of TH 200 (required to cover 1m2 of surface with a 30 mm layer).
- 7 kg of TH 300 (required to cover 1m2 of surface with a 30 mm layer).
- 10 kg of TH 400 (required to cover 1m2 of surface with a 30 mm layer).

Time representativeness: The data used to model product manufacturing corresponds to 2021, the data from LCA generic databases is from 2011 – 2018.

Database(s) and LCA software used: SimaPro 9.1 software and its service pack databases (including ecoinvent 3.6 database).

Description of system boundaries:

The life cycle analysis presented is a cradle to gate analysis (meets the requirements of type "d" EPD as defined in PCR 2019:14, Construction products, version 1.11, section 2.2.2).

The EPD includes the analysis of the upstream processes (A1 & A2) and the core process (A3).

This study includes the transport of raw materials and packaging materials to the production site, by road or sea.

Packaging-related flows in the production process are included in the manufacturing module (wooden pallets, paper sack and LDPE film).

A small amount of process waste is produced that is reprocessed as filling material. A conservative assumption has been made that all the environmental impact is allocated to the product and not the co-product (i.e. the filling material). The amount of filling materials differs between the Company's products.

Packaging waste was not included in the LCA study as it is repurposed fully (100%) and used to make bags & notebooks by 'Orange Heart' (a rehabilitation project which employs people with mental illness). The notebooks are designed by designers from the 'terminal'- a social enterprise which promotes young Israeli designers while sponsoring social and educational enterprises in the arts.

System diagram

Raw Material Extraction (A1)

Transport of Raw Materials (A2)

Manufacturing & Packaging (A3)

More information

Cut-off

The upstream processes include extraction and processing of raw materials, primary fuels used and transportation to the facility. The core process includes all product manufacturing processes at the manufacturing facility itself. The study applies a cut-off criterion of 1%. More than 99 mass % of the materials have been included in the LCA. As some raw materials were not found in the available databases, these were cut-off after finding that the contribution from those materials was less than 1% of the product mass.

Raw materials

Relevant datasets for raw materials are not available for Israel. Therefore, most datasets were taken from the Ecoinvent 3.6 which is relevant mostly for Europe. As Israel is following EU environmental regulation very closely, we assume the results will not differ much when local data becomes available.

Transportation distances

Raw materials and packaging materials are imported from several countries; travel distances were calculated based on the location of manufacture, and assuming arrival via the Ashdod port, from which most of the raw materials arrive before being sent to the company's manufacturing facility.

Declared Modules

The life cycle stages included in the analysis are illustrated in the table below, according to EN 15804. If a module is included, it is indicated with “X” and if it is excluded with a “ND” (Not Declared).

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL	IL

Environmental Information

LCA results are detailed in the following tables.

TH 200

Potential environmental impact – mandatory indicators according to EN 15804

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-fossil	kg CO_2 eq.	3.83E+00	7.61E-02	1.38E+02	1.42E+02
GWP-biogenic	kg CO_2 eq.	2.25E+00	3.64E-06	-2.42E-01	2.01E+00
GWP-luluc	kg CO_2 eq.	7.12E-04	3.99E-05	6.59E-04	1.41E-03
GWP-total	kg CO_2 eq.	6.08E+00	7.62E-02	1.38E+02	1.44E+02
ODP	kg CFC 11 eq.	3.24E-07	1.60E-08	1.94E-08	3.60E-07
AP	mol H+ eq.	2.21E-02	1.42E-03	2.99E-01	3.22E-01
EP-freshwater	kg PO_4^{3-} eq.	1.58E-03	1.46E-05	3.05E-04	1.90E-03
EP-freshwater	kg P eq.	5.14E-04	4.74E-06	9.93E-05	6.19E-04
EP-marine	kg N eq.	5.91E-03	3.66E-04	1.14E-01	1.20E-01
EP-terrestrial	mol N eq.	6.58E-02	4.06E-03	1.23E+00	1.30E+00
POCP	kg NMVOC eq.	2.25E-02	1.07E-03	3.97E-01	4.21E-01
ADP-minerals & metals*	kg Sb eq.	1.92E-05	1.30E-06	1.59E-06	2.21E-05
ADP-fossil*	MJ	6.88E+01	1.05E+00	1.81E+03	1.88E+03
WDP	m^3	2.12E+02	2.56E-03	1.65E-01	2.12E+02
Acronyms	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				

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

Potential environmental impact – additional mandatory indicator

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-GHG[1]	kg CO2 eq.	3.74E+00	7.56E-02	1.36E+02	1.40E+02

Use of resources

Indicator	Unit	Total A1-A3
PERE	MJ	5.82
PERM	MJ	0
PERT	MJ	5.82
PENRE	MJ	1881
PENRM	MJ	0
PENRT	MJ	1881
SM	kg	0
RSF	MJ	0
NRSF	MJ	0
FW	m^3	0
Acronyms	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 re-sources; SM = Use of secondary material; SF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water		

Information on biogenic carbon content

Results per functional or declared unit		
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.024

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

1 The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

TH 300

Potential environmental impact– mandatory indicators according to EN 15804

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-fossil	kg CO_2 eq.	4.83E+00	1.02E-01	1.31E+02	1.36E+02
GWP-biogenic	kg CO_2 eq.	3.15E+00	8.74E-06	-2.93E-01	2.86E+00
GWP-luluc	kg CO_2 eq.	9.06E-04	5.15E-05	7.99E-04	1.76E-03
GWP-total	kg CO_2 eq.	7.98E+00	1.02E-01	1.31E+02	1.39E+02
ODP	kg CFC 11 eq.	4.44E-07	2.14E-08	2.01E-08	4.86E-07
AP	mol H^+ eq.	2.87E-02	1.74E-03	2.84E-01	3.15E-01
EP-freshwater	kg PO_4^{3-} eq.	1.99E-03	2.02E-05	3.17E-04	2.33E-03
EP-freshwater	kg P eq.	6.49E-04	6.59E-06	1.03E-04	7.58E-04
EP-marine	kg N eq.	7.96E-03	4.54E-04	1.08E-01	1.16E-01
EP-terrestrial	mol N eq.	8.88E-02	5.03E-03	1.17E+00	1.26E+00
POCP	kg NMVOC eq.	2.81E-02	1.33E-03	3.78E-01	4.08E-01
ADP-minerals & metals*	kg Sb eq.	2.85E-05	1.85E-06	1.85E-06	3.22E-05
ADP-fossil*	MJ	8.22E+01	1.42E+00	1.72E+03	1.81E+03
WDP	m^3	2.98E+02	3.58E-03	1.97E-01	2.98E+02
Acronyms	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				

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Potential environmental impact – additional mandatory indicator

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-GHG [2]	kg CO2 eq.	4.73E+00	1.01E-01	1.29E+02	1.34E+02

Use of resources

Indicator	Unit	Total A1-A3
PERE	MJ	7.03
PERM	MJ	0
PERT	MJ	7.03
PENRE	MJ	1806
PENRM	MJ	0
PENRT	MJ	1806
SM	kg	0
RSF	MJ	0
NRSF	MJ	0
FW	m^3	0
Acronyms	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Information on biogenic carbon content

Results per functional or declared unit		
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.029

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

2 The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

TH 400

Potential environmental impact– mandatory indicators according to EN 15804

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-fossil	kg CO_2 eq.	6.21E+00	1.49E-01	1.16E+02	1.23E+02
GWP-biogenic	kg CO_2 eq.	4.25E+00	1.91E-05	-2.91E-01	3.96E+00
GWP-luluc	kg CO_2 eq.	9.34E-04	7.21E-05	7.86E-04	1.79E-03
GWP-total	kg CO_2 eq.	1.05E+01	1.49E-01	1.16E+02	1.27E+02
ODP	kg CFC 11 eq.	5.93E-07	3.15E-08	1.95E-08	6.44E-07
AP	mol H+ eq.	3.69E-02	2.29E-03	2.52E-01	2.92E-01
EP-freshwater	kg PO_4^{3-} eq.	2.58E-03	3.09E-05	3.11E-04	2.92E-03
EP-freshwater	kg P eq.	8.40E-04	1.01E-05	1.01E-04	9.51E-04
EP-marine	kg N eq.	1.05E-02	6.05E-04	9.59E-02	1.07E-01
EP-terrestrial	mol N eq.	1.17E-01	6.70E-03	1.04E+00	1.16E+00
POCP	kg NMVOC eq.	3.53E-02	1.78E-03	3.36E-01	3.73E-01
ADP-minerals & metals*	kg Sb eq.	3.38E-05	2.88E-06	1.81E-06	3.85E-05
ADP-fossil*	MJ	1.03E+02	2.09E+00	1.53E+03	1.63E+03
WDP	m^3	4.52E+02	5.51E-03	1.93E-01	4.52E+02
Acronyms	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				

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Potential environmental impact – additional mandatory indicator

Indicator	Unit	A1	A2	A3	Tot.A1-A3
GWP-GHG[3]	kg CO_2 eq.	6.10E+00	1.48E-01	1.15E+02	1.21E+02

Use of resources

Indicator	Unit	Total A1-A3
PERE	MJ	7.46
PERM	MJ	0
PERT	MJ	7.46
PENRE	MJ	1634
PENRM	MJ	0
PENRT	MJ	1634
SM	kg	0
RSF	MJ	0
NRSF	MJ	0
FW	m_3	0
ACRONYMS	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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water	

Information on biogenic carbon content

Results per functional or declared unit		
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0
Biogenic carbon content in packaging	kg C	0.029

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2.

3 The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. This indicator is thus almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

General Program Instructions

- General programme instructions of the International EPD® System. Version 4.0
- PCR 2019:14 Construction products (EN 15804:A2) (1.11)
- EN 15804:2012 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14025: Environmental labels and declarations – type III Environmental declarations principles and procedure (2009)
- ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework
- ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.
- Termokir product declaration catalog for construction products.
- SimaPro 9.1 Software and database