

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804 for:

Mineral fiber insulation boards of the "TECHNO" family

from

LLC "Heat-Insulating Plant "TECHNO"



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Programme information

Programme:	<p>The International EPD® System</p> <p>EPD International AB Box 210 60 SE-100 31 Stockholm Sweden</p> <p>www.environdec.com info@environdec.com</p>
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PCR: PCR 2012:01. Construction products and construction services. 2.33 and c-PCR (I) Thermal insulation products (EN 16783:2017)

<p>Product category rules (PCR): PCR: PCR 2012:01. Construction products and construction services. 2.33. c-PCR (I) Thermal insulation products (EN 16783:2017) .</p> <p>UN CPC code: 37990</p>
<p>PCR review was conducted by:</p> <p>The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Review chair: Massimo Marino. Contact via info@environdec.com</p>
<p>Independent third-party verification of the declaration and data, according to ISO 14025:2006:</p> <p><input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification</p>
<p>Third party verifier: <i>Dr Hudaj Kara, Metsims Sustainability Consulting (www.metsims.com)</i></p> <p><i>In case of recognised individual verifiers:</i></p> <p>Approved by: The International EPD® System</p>
<p>Procedure for follow-up of data during EPD validity involves third party verifier:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

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Company information

Owner of the EPD:

Limited Liability Company "Heat-Insulating Plant "TECHNO",
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E-mail: techno@sweetondale.cz
Phone: +38-0472-71-97-90; +38-0472-71-98-05
Contact person: Khodakovskiy O.N., Executive General Manager

Description of the organisation:

The Heat-Insulating Plant "TECHNO" founded in 2007 and owned by TechnoNICOL Corporation, became part of the Czech company Sweetondale in 2018. Today, Sweetondale manages 3 plants for the production of various construction products, including the plant of insulating materials from mineral fiber in the city of Cherkassy, which is covered by this EPD.

Heat-Insulating Plant "TECHNO" is equipped with two production lines with a total capacity of 105 000 tons of products per year. Its product range includes thermal insulation boards, lamellar and regular rolls, technical insulation, as well as flame retardant boards. To date, the plant is one of the leaders in the production of mineral heat-insulating materials in Ukraine.

The need to meet the quality standards of the different national and international markets, in addition to the need to constantly demonstrate compliance with the regulations relating to environmental and safety aspects related to industrial production, made it necessary to implement an Integrated Quality (ISO 9001), Environmental (ISO 14001) and Safety (ISO 45001 System).

Name and location of production site:

Heat-Insulating Plant "TECHNO", Rizdvyana Street 300, Cherkasy, Ukraine, 18028

13162:2012+A1:2015 Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification.

Product information

Product name:

Mineral fiber insulation boards of the "TECHNO" family

Technical specification of product

Product identification:

TECHNO thermal insulation board of mineral wool is used as thermal insulation for buildings and technically defined by EN

Name	Unit	Value
Thermal conductivity	W/m ² K	0,0350,04
Thermal resistance*	m ² K/W	0,75-5,71

Reaction to fire	Non combustible	A1
Compressive strength	kPa at 10% compression	0-70
Tensile strength	kPa	0-15; 100**
Strength under concentrated load	N	0-700

*depends on a thickness; the company produce boards in a thickness range of 30-200 mm

Nomenclature*	Density, kg/m ³	Application area
TECHNOROOF N30/PowerRock RT 110/TECHNOROOF N30g	115	For the installing of the lower heat-insulating layer in multilayer roof structures
TECHNOROOF N40/TECHNOROOF N40g	125	
TECHNOROOF 45	140	For the installing of a heatinsulating layer in singlelayer roof structures
TECHNOROOF 50	160	
TECHNOROOF V50/TECHNOFACADE W/PowerRock RT 170	170	For the installation of the upper thermal insulation layer in multilayered roof structures
TECHNOROOF V60	180	
TECHNOROOF V70	190	
TECHNOBLOCK OPTIMA	55	As the main (inner) thermal insulation layer in the construction of ventilated facades of buildings with two layers of insulation.
TECHNOBLOCK STANDARD	45	
TECHNOBLOCK PROF	65	
TECHNOVENT STANDARD/PowerRock FA80/TECHNOVENT STANDARD FG	80	As a thermal insulation when installing ventilated systems for thermal insulation of facades during the construction or reconstruction of residential, public and industrial buildings
TECHNOVENT PROF	100	
TECHNOFACADE	145	for thermal insulation when installing adhesive systems for thermal insulation of facades using a reinforcing glass mesh
TECHNOFACADE EFFECT	135	
TECHNOFACADE EXTRA/PowerRock W 90: RtF:A1	90	As a heat-insulating layer in facade systems of "wet" type with "heavy", thick-layer plaster on a reinforced metal mesh

**for the TECHNOSANDWICH WALL board

Product description: "TECHNO" family boards under the EPD comprises a group of nomenclatures and produced in the density range from 30 up to 190 kg/m³. The range of thickness for these boards are laying in range of 30-200 mm. All the tradenames, as well as the application area of each nomenclature and the density of each board is presented in Table 1.

TECHNOFLOOR STANDARD	110	for thermal insulation of floors on the ground, floating floors, heated floors during the construction or reconstruction of residential, public and industrial buildings
TECHNOSANDWICH WALL	105	as a thermal insulation layer in three-layer concrete wall panels
TECHNOACOUSTIC	40	as a sound-absorbing layer in the structures of frames - sheathing partitions and claddings, in the structures of suspended ceilings, as well as in ceilings with an unloaded insulating material arrangement

TECHNOFACADE OPTIMA/CERESIT CT 320 Mineral Wool: RfF:A1	120	As a heat-insulating layer in facade systems of "wet" type with thin-layer plaster
TECHNOFACADE COTTAGE/CERESIT CT 320 FAÇADE WOOL/RÖFIX FIRESTOP 036:RfF:A1	105	
TECHNOLITE EXTRA	30	For insulation of ventilated coatings on pitched roofs, including mansard with a rigid roof carpet; insulation of attic floors; insulation of frame walls and partitions of the floors under any type of coprittany with laying the plates between the lags
TECHNOLITE OPTIMA	35	

Product name	Scaling compared to reference	Rvalue
TECHNOROOF V50/TECHNOFACADE W/PowerRock RT 170	1	1,05
TECHNOLITE EXTRA	1,25	1,32
TECHNOACOUSTIC	1,28	1,35
TECHNOLITE OPTIMA	1,32	1,39
TECHNOBLOCK STANDARD	1,32	1,39
TECHNOBLOCK OPTIMA	1,36	1,43
TECHNOBLOCK PROF	1,32	1,39
TECHNOVENT STANDARD/PowerRock FA80/TECHNOVENT STANDARD FG	1,36	1,43
TECHNOVENT PROF	1,32	1,39
TECHNOSANDWICH WALL	2,70	2,84
TECHNOROOF 45	1,00	1,05
TECHNOROOF 50	0,98	1,03
TECHNOROOF N30/PowerRock RT 110/TECHNOROOF N30g	1,32	1,39

Table 1. Application area

TECHNOROOF N40	1,32	1,39
TECHNOROOF N40g		
TECHNOROOF V60	0,71	0,75

*Some of the boards could be known under the other tradenames that indicated after the slashes

Product specific environmental impacts are compiled by applying the relevant scaling factor (listed in the Scaling Factor table) in the Product Specific Scaling formula.

Table 2. Scaling factor table

TECHNOROOF V70	0,71	0,75	<u>Product Specific Scaling formula:</u> Environmental impact per m ² = Environmental Impact reference product * scaling factor. <u>UN CPC code:</u> 37990 <u>Geographical scope:</u> Ukraine
TECHNOFACADE	0,98	1,03	
TECHNOFACADE EFFECT	1,25	1,32	
TECHNOFLOOR STANDARD	1,28	1,35	
TECHNOFACADE EXTRA/PowerRock W 90: RtF:A1	1,32	1,39	
TECHNOFACADE OPTIMA/CERESIT CT 320 Mineral Wool: RtF:A1	1,28	1,35	
TECHNOFACADE COTTAGE/CERESIT CT	1,32	1,39	

LCA information

320 FAÇADE WOOL/RÖFIX FIRESTOP 036:RtF:A1		
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Functional unit:

The functional unit of the product under research is 1 m² mineral wool heat insulating board, with thickness of 40 mm and with R-value of 1,05 m²K/W. Density of the board is 170 kg/m³. This amount of product under the study is also refers to 2,72 kg and 0,016 m³ respectively.

Time representativeness:

The primary data cover the period January 2019 - December 2019

Database(s) and LCA software used:

GaBi databases content version 2021.1; GaBi software version 10.0.1.92

System boundaries and lifecycle stages excluded

The system boundaries include the mandatory modules A1, A2, A3 provided by the Standard EN 15804 (CEN, 2012) as shown in the following table according to an application of type “from cradle-to-gate”.

It should be noted that lifecycle modules under construction, use, EoL stages and benefits beyond system boundaries are not included in the LCA. Therefore, the inclusion of these modules in the subsequent update of this EPD remains relevant.

More information:

All the relevant information regarding the product technical characteristics and other information you could find on the manufacturer official website – <http://ua.sweetondale.cz/>

The underlying LCA report was prepared by: Coordinating Informational Center of CIS Member States on approximation of regulatory practices (CIS Center) - <https://ciscenter.org/en/>

Assumptions:

In a product system within the system boundaries modelling some uncertainties are occurring and in particular the following:

- there is an output of co-products in the form of thermal insulation boards for other applications than the studied boards and which were not covered by the LCA-study. Nevertheless, all these boards are produced using the same technology and the same processing equipment, so allocation by mass was applied.
- when modelling module A2 there is assumption, that one type of transport (train) is used to transport each type of raw material (stone material);
- the impacts from the functional unit that is formed of the representative of TECHNO mineral fibers insulating boards may also be applicable to other board types not included in this study by applying the scaling factors listed in the table 2.

Cut-offs:

- Operating of the internal transport – gas and diesel powered forklifts are excluded from the LCA as the operating time of these machines per studied unit is remain small (so the amount of fuel consumption), and accordingly the impact of transport operation is practically insignificant.



Table 2. System boundaries and LCA modules included/excluded*

Product stage			Construction process stage		Use stage							End of life stage				Benefits beyond system boundaries
Raw materials	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
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

*X – module included in the EPD; ND – module not declared

The EPD covers the raw material extraction and energy production stages, the raw material transport as well as the production stage. The exploitation and EoL modules have been excluded.



Content declaration

Product

Materials / chemical substances	%	Environmental / hazardous properties
MMVF Note Q fibres*	95,5	According to confirmation of REACH compliance on assessed product the
Phenolic resin	No more than 4,5	product "Stone wool" does not contain a SVHC substance(s) listed on the Candidate List

*Man-made vitreous (silicate) fibres with random orientation with alkaline and alkali earth oxides content greater than 18% by weight and fulfilling one of the Nota Q conditions

<http://ua.sweetondale.cz/materials/teploizolyatsiin-i-materiali-z-kam-yanoi-vati/tekhnoruf-n/>

Packaging

Distribution packaging: TECHNO mineral fiber boards are packed with polyethylene film with printed pictures and stretch film. The packed boards are loaded on pallet (EURO) to be sent to customers.

Recycled material

Provenience of recycled materials (pre-consumer or post-consumer) in the product: In TECHNO mineral fiber boards recycled material in form of aluminum waste (SEROX or its analogues) and steelmaking waste (slags) are using, which are supplied externally.

As per the functional unit the percentage of recycled materials used in product is 21%, of which 13,7% is slag and 7,3% is aluminum production waste.

Additional information All relevant information about product specifications, safety, operating rules, etc. can be found on the manufacturer's website –

The percentage of aluminum production waste can be as high as 14.6%, depending on the charge formulation, as confirmed by the manufacturer's statement.

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Environmental performance

Potential environmental impact for 1m² mineral wool heat insulating board with R-value of 1.05 m²K/W.

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3
Global warming potential (GWP)	kg CO ₂ eq.	1,90E+01	6,16E-02	1,64E-01	1,92E+01
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	3,69E-15	6,18E-17	0	3,75E-15
Acidification potential (AP)	kg SO ₂ eq.	1,81E-01	1,86E-04	1,42E-03	1,83E-01

Eutrophication potential (EP)	kg PO ₄ ³⁻ eq.	6,98E-03	1,92E-05	4,18E-05	7,04E-03
Formation potential of tropospheric ozone (POCP)	kg C ₂ H ₄ eq.	8,60E-03	-2,53E-06	9,01E-05	8,69E-03
Abiotic depletion potential – Elements	kg Sb eq.	1,50E-06	3,88E-09	0	1,50E-06
Abiotic depletion potential – Fossil resources	MJ, net calorific value	4,67E+01	7,10E-01	0	4,74E+01

Use of resources

PARAMETER		UNIT	A1	A2	A3	TOTAL A1A3
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	2,74E+00	8,57E-02	0	2,83E+00
	Used as raw materials	MJ, net calorific value	0	0	8,53E-01	8,53E-01
	TOTAL	MJ, net calorific value	2,74E+00	8,57E-02	8,53E-01	3,68E+00
Primary energy resources – Nonrenewable	Use as energy carrier	MJ, net calorific value	3,28E+01	7,85E-01	7,06E+00	4,07E+01
	Used as raw materials	MJ, net calorific value	1,80E+01	0	0	1,80E+01
	TOTAL	MJ, net calorific value	5,08E+01	7,85E-01	7,06E+00	5,87E+01
Secondary material		kg	0	0	0,15E+00	0,15E+00
Renewable secondary fuels		MJ, net calorific value	0	0	0	0
Non-renewable secondary fuels		MJ, net calorific value	0	0	0	0
Net use of fresh water		m ³	1,15E+00	8,07E-02	7,65E-04	1,23E+00

Life cycle interpretation

Global warming potential



The GWP is mainly determined by the CO₂ flows. At the factory site, the greenhouse gas balance is dominated by the cupola furnace operating on natural gas and the total amount of GWP contribution on site is amounted to 1,64E-01 kg CO₂ eq. The greatest contribution to the global warming potential during the product's life cycle is made by electricity generation (electricity grid mix) and amount to 17,7 kg CO₂ eq, which is almost 92,2% of the product's life cycle contribution to GWP. Processes such as coke production and phenolformaldehyde resin also contribute to the global warming potential, but even their combined contribution is less than 1 kg of CO₂eq.

Ozone Depletion Potential (ODP)

The Ozone Depletion Potential (ODP) is calculated from the emissions of gases that can deplete the stratospheric ozone. ODP is almost negligible along the life cycle of product and the largest impact on this indicator is originated from the phenolformaldehyde resin production: 1,34E-15 kg CFC-11eq (35,73 %).

Eutrophication potential (EP)

The Eutrophication potential (EP) is calculated from the enrichment of nutrients in soils and bodies of water, which can lead to intensified alga growth and shifts in the spectrum of species. Electricity generation (6,59E-03 kg Phosphate eq.) makes a significant contribution to the eutrophication potential (93,6% of the product's life cycle impact), but coke production also plays an important role here (1,66 E-04 kg Phosphate eq).

Acidification Potential (AP)

The Acidification Potential (AP) results from the transformation of air pollutants into acids, which amongst other things can impair soil fertility. About 45 % of the AP is caused by SO₂ emissions and about 50 % by NO_x emissions.

Mainly, acidification potential of the product's life cycle comes from the electricity generation – 1,79E01 kg SO₂ eq. (97,8 %).

Formation potential of tropospheric ozone (POCP)

The 95,74% of impacts from POCP category is attributed to the electricity generation. The transport (module A2) results in negative POCP values, which must be attributed to the method specified in the /EN 15804/ standard (CML-IA Version (2001-Apr. 2013), according to which certain nitrogen oxides have a negative POCP. However, it cannot be concluded therefrom that the photochemical oxidation potential will improve by the emission of exhaust gas.

Resource use

In TECHNO MFI board LCA the use of non-renewable primary energy resources (in particular as energy carrier) are prevails over the use of renewable primary energy resources. Nevertheless, share of the renewable energy sources in the product life cycle remains quite high. The biggest contribution to the PERE in boards life cycle is from the polydimethylsiloxanes production – 0,528 Mj, where 0,388 MJ of it is comes from the primary energy from solar energy. In electricity grid mix (UA) 0,312 MJ of energy are produced from renewable energy sources.

The most significant impact on non-renewable resource use is coming from the coke production, where 17,1 MJ of non-renewable energy resources used as material utilization (PENRM) – in coke production (29,13% of product's life cycle PENRM contribution).

The production of a substance such as phenol-formaldehyde resin also uses quite a few nonrenewable energy sources. Therefore, the contribution from the production of this component in this category also has a great influence on the final result.

The production of the boards themselves remains quite energy-efficient due to the technological specifics of production, so the use of non-renewable and renewable energy sources at the main site, as well as in the process of generating electricity (A1) does not contribute much to the LCIA results. At the main production site, water consumption for cooling process equipment, per functional unit, remains low. In a perspective of product's life cycle, the electricity generation (mix) contributes to a greatest amount of fresh water consumed and amounted to 0,773 m³. Without electricity generation, the next process in terms of water consumption is phenolmermaldehyde resin (0,135 m³).

Waste production and output flows

Waste production

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3
Hazardous waste disposed	kg	6,15E-09	7,11E-11	0	6,22E-09
Non-hazardous waste disposed	kg	1,38E-01	2,67E-04	9,69E-02	2,35E-01
Radioactive waste disposed	kg	1,51E-03	2,81E-05	0	1,53E-03

Output flows

PARAMETER	UNIT	A1	A2	A3	TOTAL A1-A3
Components for reuse	kg	0	0	0	0
Material for recycling	kg	2,30E-01	0	2,69E-01	4,9E-01
Materials for energy recovery	kg	0	0	0	0
Exported energy, electricity	MJ	0	0	0	0
Exported energy, thermal	MJ	0	0	0	0

Differences between the versions

The revised EPD has been corrected for the percentage of recycled material in the product (p. 7).

References

EPD International (2017) General Programme Instructions for the International EPD® System. Version 4.0, 2021-03-29. www.environdec.com.

PCR 2012:01. Construction products and construction services. 2.33

PCR 2012:01-c-PCR (I) Thermal insulation products (EN 16783:2017) Date 2020-09-18

ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures, International Organization for Standardization (ISO)

ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework,
International Organization for Standardization (ISO)

ISO 14044:2017 Environmental management – Life cycle assessment – Requirements and
guidelines, International Organization for Standardization (ISO)

EN 15804:2012+A1:2013, Sustainability of construction works - Environmental product declarations -
Core rules for the product category of construction products

Official website of the company, URL: <http://ua.sweetondale.cz/>



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