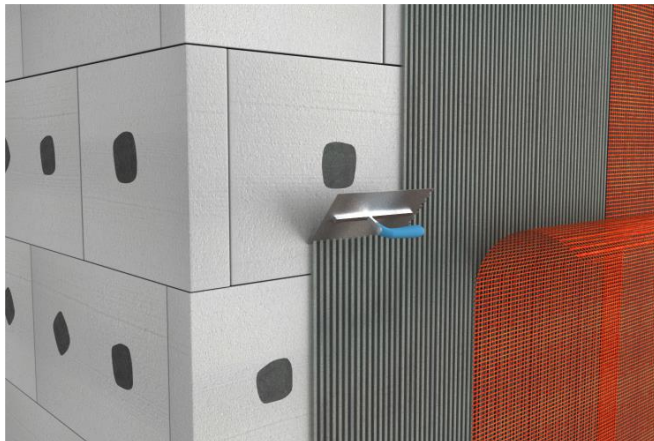


SOLTHERM PDQ thermal insulation composite system (ETICS)



Issuance date: 9.02.2017

Validity date: 9.02.2022

EPD program operator:

Building Research Institute (ITB), 00-611 Warsaw, Poland, Filtrowa 1, www.itb.pl

Contact person: Dominik Bekierski d.bekierski@itb.pl

ITB is the verified member of The European Platform for EPD program operators and LCA practitioners. www.eco-platform.org

NO PRIMING

EXTREMELY FAST
CURING

ANTI-FUNGAL
PROTECTION

EXTENDED LIFE
SYSTEM

Manufacturer:

BOLIX S.A.

Address: Stolarska 8; 34-300 Żywiec

Telephone number: +48 (33) 475 0 600

Fax number: +48 (33) 475 0 612

Website: <https://bolix.pl>

E-mail address: sekretariat@bolix.pl



Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA): A1-A3 modules in accordance with EN 15804 (Cradle to Gate)

The year of preparing the EPD: 2017

Declared durability: Under normal conditions, SOLTHERM PDQ ETICS has reference service life (RSL) of 25 years according to ETAG 004

PCR: ITB PCR A (PCR based on EN 15804)

Declared unit: 1 m² of complete SOLTHERM PDQ ETICS

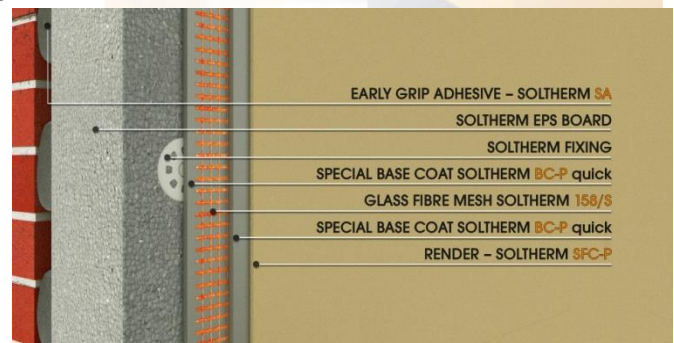
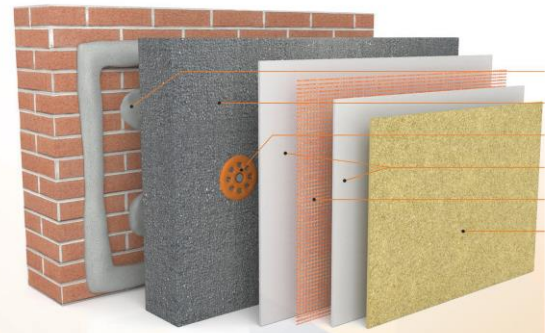
Reasons for performing LCA: B2B

Representativeness: Polish product

Manufacturer and Product Information

BOLIX is a producer of building chemistry, specializing in the production of facade systems. The company have implemented an Integrated Quality and Environmental Management System, which has been granted an ISO certificate for the conformity with the EN-ISO 9001 and EN-ISO 14001 standards by Global Group. BOLIX mission is to supply building materials and solutions of the highest quality to the European market.

SOLTHERM Premium Durable Quick System "PDQ" according to ETA 17/0158 is an external thermal insulation composite system (ETICS) with rendering, designed especially for harsh weather conditions. The BC-P Quick base coat is a solution to lengthy application processes: not only does it cure faster than a standard adhesive, but it allows to begin the rendering process directly on the base coat, without the need for primer. In addition, users can benefit from all the advantages of silicone render, such as low water absorption, high UV radiation resistance, excellent vapour permeability and high flexibility, which prevents surface cracking. The system is suitable for EPS boards insulation material.



Key features of SOLTHERM PDQ system:

- no priming needed
- fast curing
- anti-fungal protection
- extended life system

Fig. 1. Application scheme of SOLTHERM PDQ system

The list of SOLTHERM PDQ components is presented in Table 1.

Table 1. Components of SOLTHERM PDQ system.

Component	Product
1. Insulation materials with associated methods of fixing	<u>Insulation product</u> Factory prefabricated expanded polystyrene (EPS) according to PN- EN 13163 with thickness up to 50 cm <u>Supplementary adhesives:</u> SOLTHERM SA cement based powder SOLTHERM AL cement based powder SOLTHERM UB cement based powder SOLTHERM WB cement based powder
2. Base coat	SOLTHERM BC-P QUICK cement based powder
3. Reinforcement	Standard glass fibre meshes applied in one or two layers - AKE 145 - SOLTHERM HD158 - SOLTHERM HD160 - SOLTHERM HD174
4. Key coat	SOLTHERM SNP colour ready to use liquid to be used optionally with finishing coats
5. Finishing coat	Silicate-silicone finishing coats SOLTHERM AF-P+ ready to use pastes Silicone finishing coats



	SOLTHERM SFC-P ready to use pastes
6. Ancillary materials	SOLTHERM S4 SEASONS – ready to use liquid

Application of SOLTHERM PDQ:

- external insulation of building's walls; the walls made of masonry (bricks, blocks, stones) or concrete (cast on site or as prefabricated panels);
- new and/or existing (retrofit) vertical walls; it can also be used on horizontal or inclined surfaces which are not exposed to precipitation;
- does not contribute directly to the stability of the wall on which it is installed (made of non-load-bearing construction elements), but it can contribute to durability by providing enhanced protection from the effect of weathering;

Environmental characteristics (LCA) for SOLTHERM PDQ ETICS are presented in a few cases, depending on:

- kind of finishing coat: silicate-silicone, silicone, and
- thickness of EPS boards for reference ranging from 2cm up to 50cm.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. The SOLTHERM PDQ system products production is a line process with multiple co-products was done on product mass basis.

All impacts from raw materials extraction are allocated in A1 module of EPD. 99,9% of impacts from line production were inventoried and allocated to SOLTHERM PDQ system ETICS production. Municipal waste and waste water of whole factory were allocated to module A3. Electricity was inventoried for whole production process. Emissions are measured separately as well and presented in A3 module.

System limits

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. Details on systems limits are provided in product specific report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilized thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 %. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Raw materials for SOLTHERM PDQ components production come from local suppliers and more distant locations. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

A3: Production

The Fig. 2 and 3. show the working process during the production of SOLTHERM PDQ system wet and dry products. The raw materials are stored in the production factory in silos, big bags, or sacks accordingly. According to the applicable formulation, they are dosed and intensely mixed. Next, products are filled into containers (or packed into paper bags – dry mixes) and send to quality control. Then, they are temporarily stored, or delivered directly as ready-to-use products.

Manufacture covers all processes linked to production, which comprises various related operations besides on-site activities, including SOLTHERM PDQ components production process, packaging and internal transportation. The manufacturing process also yields data on the combustion of refinery products, such as diesel and gasoline, related to the production process. Use of electricity, fuels and auxiliary materials in the production is taken into account using national data. The environmental profile of these energy carriers is modelled by ITB for average Polish and European conditions. Packaging-related flows in the production process and all upstream packaging are included in the manufacturing module. Apart from production of packaging material, the supply and transport of packaging material are also considered in the LCA model. It is assumed that packaging waste generated in the course of production and up-stream processes is 100% collected based on a multi-input and multi-output process specific to the elementary composition of the waste. Energy (e.g. electricity) are credited using national production averages.

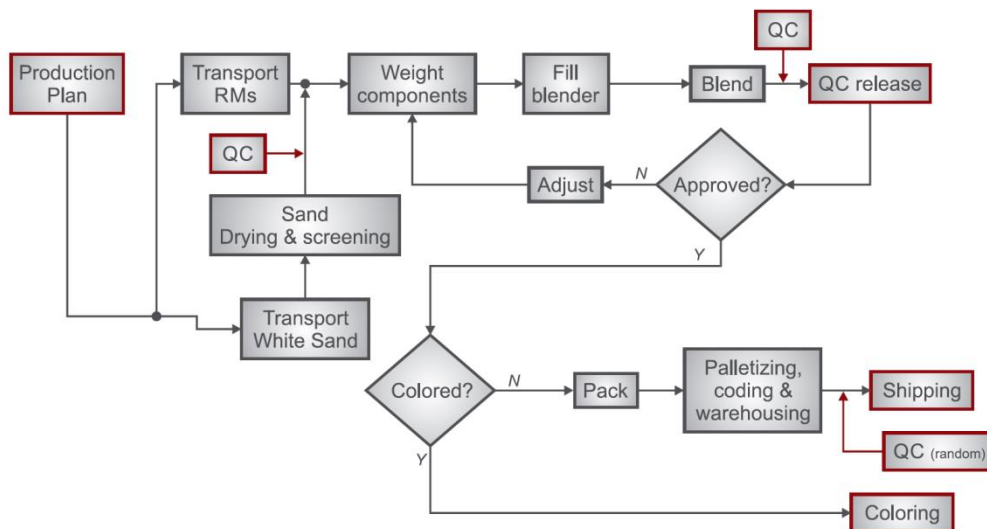


Fig. 2 Wet components production scheme for SOLTHERM PDQ system

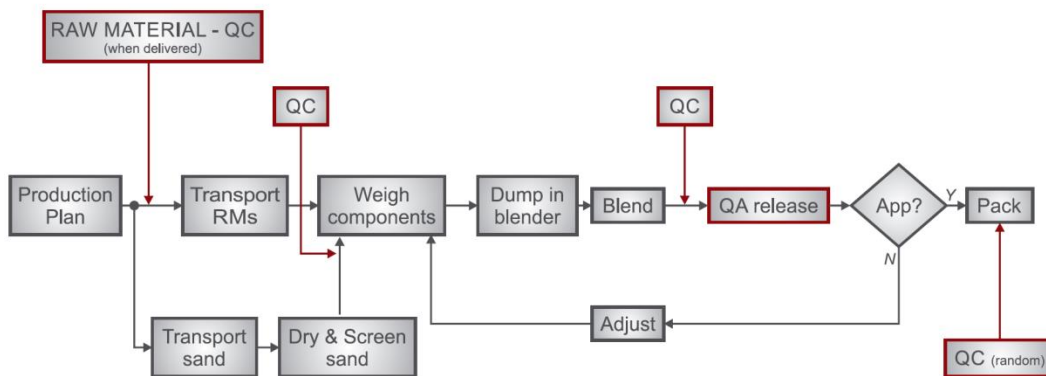


Fig. 3 Dry components production scheme for SOLTHERM PDQ system

Data collection period

The data for manufacture of the examined products refer to period between 01.01.2015-31.12.2015. The life cycle assessments were prepared for Poland as reference area.

Data quality

The values determined to calculate the LCA originate from verified BOLIX S.A. inventory data.

Assumptions and estimates

The impacts of the representative BOLIX S.A. products for each SOLTHERM PDQ layer were aggregated using weighted average. The weighted average method was used according to the percentage of each product in SOLTHERM PDQ based on the relation to whole production quantity. Impacts for each product and factory were inventoried and calculated separately.

Calculation rules

LCA was done in accordance with PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version. (PN EN 15804+A1:2014-04)



LIFE CYCLE ASSESSMENT (LCA) - Results

Declared unit

The declaration refers to 1 m² of complete SOLTHERM PDQ ETICS insulated with EPS.

Table 2. System boundaries for environmental characteristic for SOLTHERM PDQ

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction 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
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA



SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 2 cm EPS insulation

Environmental impacts: (1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7,78	0,50	0,40	8,68
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,16E-07	5,22E-06	6,83E-07	6,72E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	2,29E-02	3,59E-03	1,19E-03	2,77E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1,98E-03	2,67E-04	4,10E-06	2,25E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	1,52E-03	6,32E-04	1,41E-04	2,29E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	9,63E-02	0,00	1,49E-02	1,11E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	96,50	2,28	4,28	103,05
Environmental aspects on resource use: (1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,24	0,11	0,62	1,98
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	113,27	2,50	4,71	120,48
Use of secondary material	[kg]	0,02	0,00	0,00	0,02
Use of renewable secondary fuels	[MJ]	0,23	0,00	0,00	0,23
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	4,44	0,22	0,05	4,71
Other environmental information describing waste categories: 1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	2,47E-03	0,00	7,98E-04	3,27E-03
Non-hazardous waste disposed	[kg]	6,20E-01	5,18E-03	1,29E-02	6,38E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	5,96E-02	0,00	2,86E-02	8,82E-02
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 5 cm EPS insulation

Environmental impacts: (1 m ² , EPS 5 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	10,01	0,50	0,40	10,9
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,42E-07	5,22E-06	6,83E-07	6,74E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	3,02E-02	3,59E-03	1,19E-03	3,50E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,67E-03	2,67E-04	4,10E-06	2,95E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	1,96E-03	6,32E-04	1,41E-04	2,73E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,23E-01	0,00	1,49E-03	1,25E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	134,45	2,28	4,28	141,00
Environmental aspects on resource use: (1 m ² , EPS 5 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,49	0,11	0,62	2,23
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	155,01	2,50	4,71	162,22
Use of secondary material	[kg]	0,05	0,00	0,00	0,05
Use of renewable secondary fuels	[MJ]	0,28	0,00	0,00	0,28
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	5,57	0,22	0,05	5,83
Other environmental information describing waste categories: 1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	2,96E-03	0,00	7,98E-04	3,76E-03
Non-hazardous waste disposed	[kg]	7,44E-01	5,18E-03	1,29E-02	7,62E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	7,15E-02	0,00	2,86E-02	1,00E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00



SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 10 cm EPS insulation

Environmental impacts: (1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	14,86	0,50	0,40	15,77
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9,13E-07	5,22E-06	6,83E-07	6,81E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	4,36E-02	3,59E-03	1,19E-03	4,84E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3,81E-03	2,67E-04	4,10E-06	4,08E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,77E-03	6,32E-04	1,41E-04	3,54E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,78E-01	0,00	1,49E-04	1,78E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	194,10	2,28	4,28	200,65
Environmental aspects on resource use: (1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,86	0,11	0,62	2,60
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	210,17	2,50	4,71	217,38
Use of secondary material	[kg]	0,10	0,00	0,00	0,10
Use of renewable secondary fuels	[MJ]	0,35	0,00	0,00	0,35
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	6,22	0,22	0,05	6,48
Other environmental information describing waste categories: 1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	3,71E-03	0,00	7,98E-04	4,50E-03
Non-hazardous waste disposed	[kg]	9,30E-01	5,18E-03	1,29E-02	9,48E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	8,94E-02	0,00	2,86E-02	1,18E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 20 cm EPS insulation

Environmental impacts: (1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	29,77	0,50	0,40	30,67
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,08E-06	5,22E-06	6,83E-07	6,98E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	9,21E-02	3,59E-03	1,19E-03	9,69E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	8,44E-03	2,67E-04	4,10E-06	8,71E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	5,72E-03	6,32E-04	1,41E-04	6,49E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3,59E-01	0,00	1,49E-05	3,59E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	447,1	2,28	4,28	453,7
Environmental aspects on resource use: (1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	2,49	0,11	0,62	3,22
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	0,87	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	488,47	2,50	4,71	495,68
Use of secondary material	[kg]	0,30	0,00	0,00	0,30
Use of renewable secondary fuels	[MJ]	0,47	0,00	0,00	0,47
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	7,69	0,22	0,05	7,96
Other environmental information describing waste categories: 1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4,94E-03	0,00	7,98E-04	5,74E-03
Non-hazardous waste disposed	[kg]	1,24E+00	5,18E-03	1,29E-02	1,26E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	1,19E-01	0,00	2,86E-02	1,48E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 25 cm EPS insulation

Environmental impacts: (1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	37,22	0,50	0,40	38,1
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,17E-06	5,22E-06	6,83E-07	7,07E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	1,16E-01	3,59E-03	1,19E-03	1,21E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1,08E-02	2,67E-04	4,10E-06	1,10E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	7,19E-03	6,32E-04	1,41E-04	7,96E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,49E-01	0,00	1,49E-05	4,49E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	573,60	2,28	4,28	580,15
Environmental aspects on resource use: (1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3,11	0,11	0,62	3,84
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	627,62	2,50	4,71	634,83
Use of secondary material	[kg]	0,40	0,00	0,00	0,40
Use of renewable secondary fuels	[MJ]	0,58	0,00	0,00	0,58
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	8,22	0,22	0,05	8,49
Other environmental information describing waste categories: 1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	6,18E-03	0,00	7,98E-04	6,97E-03
Non-hazardous waste disposed	[kg]	1,55E+00	5,18E-03	1,29E-02	1,57E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	1,49E-01	0,00	2,86E-02	1,78E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 50 cm EPS insulation

Environmental impacts: (1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	74,47	0,50	0,40	75,4
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,59E-06	5,22E-06	6,83E-07	7,49E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	0,24	3,59E-03	1,19E-03	2,42E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	0,02	2,67E-04	4,10E-06	2,26E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,01	6,32E-04	1,41E-04	1,53E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,90	0,00	1,49E-05	9,00E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1206,10	2,28	4,28	1212,65
Environmental aspects on resource use: (1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,21	0,11	0,62	6,95
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1323,37	2,50	4,71	1330,58
Use of secondary material	[kg]	0,00	0,00	0,00	0,00
Use of renewable secondary fuels	[MJ]	1,17	0,00	0,00	1,17
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	9,67	0,22	0,05	9,94
Other environmental information describing waste categories: 1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	7,41E-03	0,00	7,98E-04	8,21E-03
Non-hazardous waste disposed	[kg]	1,86E+00	5,18E-03	1,29E-02	1,88E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,67E-01	4,67E-01
Materials for recycling	[kg]	1,79E-01	0,00	2,86E-02	2,07E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00



SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 2 cm EPS insulation

Environmental impacts: (1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7,93	0,50	0,39	8,82
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,24E-07	6,20E-06	9,17E-07	1,74E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	2,34E-02	3,52E-03	1,16E-03	2,81E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,01E-03	2,62E-04	4,03E-06	2,28E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	1,54E-03	6,21E-04	1,38E-04	2,30E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	9,84E-02	0,00	1,46E-02	1,13E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	98,16	2,23	16,81	117,20
Environmental aspects on resource use: (1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,25	0,11	0,61	1,97
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	115,26	2,46	18,49	136,21
Use of secondary material	[kg]	0,02	0,00	0,00	0,02
Use of renewable secondary fuels	[MJ]	0,26	0,00	0,00	0,26
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	4,43	0,21	0,05	4,70
Other environmental information describing waste categories: 1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	2,27E-03	0,00	7,84E-04	3,05E-03
Non-hazardous waste disposed	[kg]	6,30E-01	4,53E-03	1,26E-02	6,47E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	6,36E-02	0,00	2,81E-02	9,17E-02
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00



SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 5 cm EPS insulation

Environmental impacts: (1 m ² , EPS 5 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	10,16	0,50	0,39	11,1
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,50E-07	6,20E-06	9,17E-07	1,77E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	3,07E-02	3,52E-03	1,16E-03	3,54E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2,71E-03	2,62E-04	4,03E-06	2,97E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	1,99E-03	6,21E-04	1,38E-04	2,74E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,25E-01	0,00	1,46E-03	1,27E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	136,11	2,23	16,81	155,15
Environmental aspects on resource use: (1 m ² , EPS 5 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,50	0,11	0,61	2,22
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	157,00	2,46	18,49	177,95
Use of secondary material	[kg]	0,05	0,00	0,00	0,05
Use of renewable secondary fuels	[MJ]	0,31	0,00	0,00	0,31
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	5,56	0,212	0,05	5,82
Other environmental information describing waste categories: 1 m ² , EPS 2 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	2,72E-03	0,00	7,84E-04	3,51E-03
Non-hazardous waste disposed	[kg]	7,56E-01	4,53E-03	1,26E-02	7,73E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	7,63E-02	0,00	2,81E-02	1,04E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 10 cm EPS insulation

Environmental impacts: (1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	13,89	0,50	0,39	14,78
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8,60E-07	6,20E-06	9,17E-07	1,78E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	4,05E-02	3,52E-03	1,16E-03	4,52E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3,60E-03	2,62E-04	4,03E-06	3,87E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,58E-03	6,21E-04	1,38E-04	3,34E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,64E-01	0,00	1,46E-04	1,65E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	183,14	2,23	16,81	202,18
Environmental aspects on resource use: (1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1,87	0,11	0,61	2,60
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	207,12	2,46	18,49	228,07
Use of secondary material	[kg]	0,10	0,00	0,00	0,10
Use of renewable secondary fuels	[MJ]	0,38	0,00	0,00	0,38
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	6,21	0,212	0,05	6,47
Other environmental information describing waste categories: 1 m ² , EPS 10 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	3,41E-03	0,00	7,84E-04	4,19E-03
Non-hazardous waste disposed	[kg]	9,45E-01	4,53E-03	1,26E-02	9,62E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	9,54E-02	0,00	2,81E-02	1,24E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00



SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 20 cm EPS insulation

Environmental impacts: (1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	28,79	0,50	0,39	29,68
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,03E-06	6,20E-06	9,17E-07	1,95E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	8,89E-02	3,52E-03	1,16E-03	9,36E-02
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	8,23E-03	2,62E-04	4,03E-06	8,50E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	5,53E-03	6,21E-04	1,38E-04	6,29E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3,45E-01	0,00	1,46E-05	3,45E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	436,1	2,23	16,81	455,2
Environmental aspects on resource use: (1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	2,50	0,11	0,61	3,22
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	0,87	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	485,42	2,46	18,49	506,37
Use of secondary material	[kg]	0,30	0,00	0,00	0,30
Use of renewable secondary fuels	[MJ]	0,51	0,00	0,00	0,51
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	7,68	0,212	0,05	7,94
Other environmental information describing waste categories: 1 m ² , EPS 20 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4,54E-03	0,00	7,84E-04	5,32E-03
Non-hazardous waste disposed	[kg]	1,26E+00	4,53E-03	1,26E-02	1,28E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	1,27E-01	0,00	2,81E-02	1,55E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 25 cm EPS insulation

Environmental impacts: (1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	36,24	0,50	0,39	37,1
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,12E-06	6,20E-06	9,17E-07	2,03E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	1,13E-01	3,52E-03	1,16E-03	1,18E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1,05E-02	2,62E-04	4,03E-06	1,08E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	7,01E-03	6,21E-04	1,38E-04	7,77E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,35E-01	0,00	1,46E-05	4,35E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	562,64	2,23	16,81	581,68
Environmental aspects on resource use: (1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3,12	0,11	0,61	3,85
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	624,57	2,46	18,49	645,52
Use of secondary material	[kg]	0,40	0,00	0,00	0,40
Use of renewable secondary fuels	[MJ]	0,64	0,00	0,00	0,64
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	8,21	0,212	0,05	8,48
Other environmental information describing waste categories: 1 m ² , EPS 25 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5,68E-03	0,00	7,84E-04	6,46E-03
Non-hazardous waste disposed	[kg]	1,58E+00	4,53E-03	1,26E-02	1,59E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	1,59E-01	0,00	2,81E-02	1,87E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

SOLTHERM PDQ ETICS with Silicone Plasters

1 m² of ETICS with 50 cm EPS insulation

Environmental impacts: (1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	73,50	0,50	0,39	74,4
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,54E-06	6,20E-06	9,17E-07	8,66E-06
Acidification potential of soil and water	[kg SO ₂ eq.]	0,23	3,52E-03	1,16E-03	2,39E-01
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	0,02	2,62E-04	4,03E-06	2,24E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,01	6,21E-04	1,38E-04	1,51E-02
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,89	0,00	1,46E-05	8,86E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1195,14	2,23	16,81	1214,18
Environmental aspects on resource use: (1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6,25	0,11	0,61	6,97
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	1320,32	2,46	18,49	1341,27
Use of secondary material	[kg]	0,00	0,00	0,00	0,00
Use of renewable secondary fuels	[MJ]	1,28	0,00	0,00	1,28
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm ³]	9,67	0,212	0,05	9,93
Other environmental information describing waste categories: 1 m ² , EPS 50 cm)					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	6,81E-03	0,00	7,84E-04	7,59E-03
Non-hazardous waste disposed	[kg]	1,89E+00	4,53E-03	1,26E-02	1,91E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	4,59E-01	4,59E-01
Materials for recycling	[kg]	1,91E-01	0,00	2,81E-02	2,19E-01
Materials for energy recover	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ per energy carrier]	0,00	0,00	0,00	0,00

Verification

The process of verification of this EPD is in accordance with EN ISO 14025, ISO 21930 and ECO checklist document. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 & 8.3.1. <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl PhD Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl

References

- ITB PCR A- General Product Category Rules for Construction Products
- ISO 14025:2006, Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- ISO 21930:2017, Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services
- ISO 14044:2006, Environmental management -- Life cycle assessment -- Requirements and guidelines
- ISO 15686-1:2011, Buildings and constructed assets -- Service life planning -- Part 1: General principles and framework
- ISO 15686-8:2008, Buildings and constructed assets -- Service-life planning -- Part 8: Reference service life and service-life estimation
- EN 15804:2012+A1:2013, Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.
- EN15942:2011, Sustainability of construction works. Environmental product declarations. Communication format business-to-business



Building Research Institute

00-611 Warszawa, ul. Filtrów 1

KIEROWNIK
 Zakładu Fizyki Ciepłej, Akustyki i Środowiska
 dr inż. Michał Piasecki



Instytut Techniki Budowlanej

00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE No 058/2017
of TYPE III ENVIRONMENTAL DECLARATION

Product:

SOLTHERM PDQ
thermal insulation system

Manufacturer:

BOLIX S.A.
34-300 Żywiec, Stolarska 8

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

PN-EN 15804+A1:2014-04

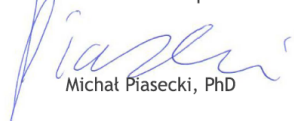
Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 9th February 2017 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department



Michał Piasecki, PhD



Deputy Director
for Research and Innovation



Krzysztof Kuczyński, PhD

Warsaw, February 2017