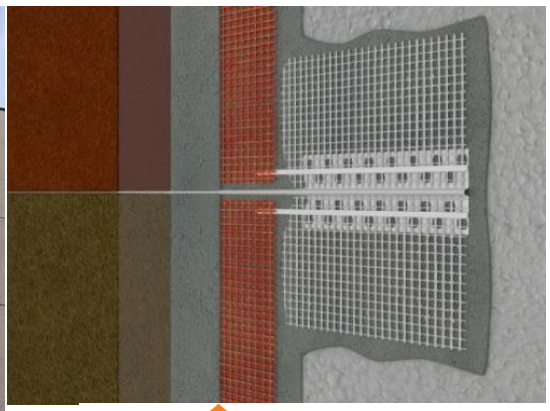
SOLTHERM HD external thermal insulation composite system (ETICS)



SOLTHERM
SYSTEMS BY BOLIX

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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 HD 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 m^2 of complete SOLTHERM HD ETICS
Reasons for performing LCA: B2B
Representativeness: Polish product

Manufacturer and Product Information

BOLIX S.A. 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 HD according to ETA-13/0927 is an external thermal insulation composite system (ETICS) with silicone rendering, dedicated for wide range of building types. It's especially recommended for buildings situated in the vicinity of big industrial areas and buildings exposed to adverse weather conditions. High flexibility of the silicone render enables it to accommodate a high degree of movement, thermal expansion and contraction, whilst at the same time prevents the surface crazing and cracking. Therefore silicone renders are highly resistant to mechanical damage, washing, changes in air humidity and abrupt changes in temperatures as well as temperature extremes. The system also provides a self-cleaning effect and is protected from organic growth. Since the system is vapour permeable, the moisture from the wall is driven to the exterior. The list of SOLTHERM HD components is presented in Table 1.

Key features of SOLTHERM HD systems:

- impact resistance,
- low water absorption,
- wind resistance,
- anti-fungal protection,
- early grip,
- wash off resistance.

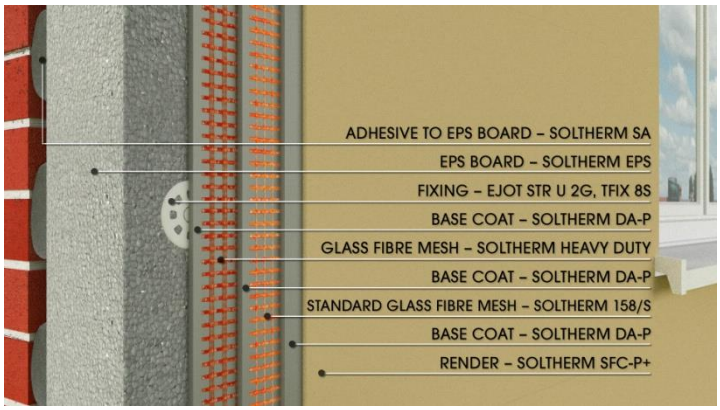

Fig. 1. Application of SOLTHERM HD Standard system

BOLIX S.A. offers SOLTHERM HD system with wide range of renders:

- SOLTHERM HD Standard with silicone render,
- SOLTHERM HD Weather Plus with silicone render,
- SOLTHERM HD Supreme with silicone render with 15J impact resistance,
- SOLTHERM HD Ultimate with silicone render with 130J impact resistance.

Table 1. Components of SOLTHERM HD systems.

Component	Product
1. Insulation material with associated methods of fixing	Insulation product: Factory prefabricated expanded polystyrene (EPS) according to PN- EN 13163 with thickness up to 25 cm Supplementary adhesives SOLTHERM UB-P – cement based powder SOLTHERM SA – cement based powder
2. Base coat	SOLTHERM UB-P - cement based powder SOLTHERM DA-P ready to use paste;
3. Glass fibre meshes	Standard and reinforced glass fibre meshes
4. Key coat (to be used with	SOLTHERM AP colour – ready to use liquid to be used with acrylic

SOLTHERM UB-P)	decorative finishing coats; SOLTHERM SNP - ready to use liquid to be used optionally with finishing coats; SOLTHERM SNP colour - ready to use liquid to be used optionally with finishing coats;
	Silicate-Silicone finishing coats - ready to use paste; SOLTHERM AF-P+ 20 SOLTHERM AF-P+ 15
	Silicone finishing coats – ready to use paste; SOLTHERM SFC-P 15 SOLTHERM SFC-P 20 SOLTHERM SFC-P 25wt SOLTHERM SFC-P 15 eco-shield SOLTHERM SFC-P 20 eco-shield SOLTHERM SFC-P 25wt eco-shield SOLTHERM SFC-P+ 15 SOLTHERM SFC-P+ 20
Acrylic decorative finishing coats	
	SOLTHERM DECO SOLTHERM DECO AMC SOLTHERM AMC
6. Primers	SOLTHERM SNP SOLTHERM SP
7. Decorative Paints	SOLTHERM ACP - ready to use liquid SOLTHERM ACP eco-shield - ready to use liquid SOLTHERM STC-P - ready to use liquid SOLTHERM STC-P eco-shield - ready to use liquid SOLTHERM STC-P+ ready to use liquid

Application of SOLTHERM HD systems:

- 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 HD ETICS are presented in a few cases, depending on:

- kind of finishing coat: silicate-silicone, silicone, acrylic decorative and
- thickness of EPS boards for reference ranging from 10cm up to 25cm.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. The SOLTHERM HD 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 HD 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, utilised 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 HD 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 HD 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 HD 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.

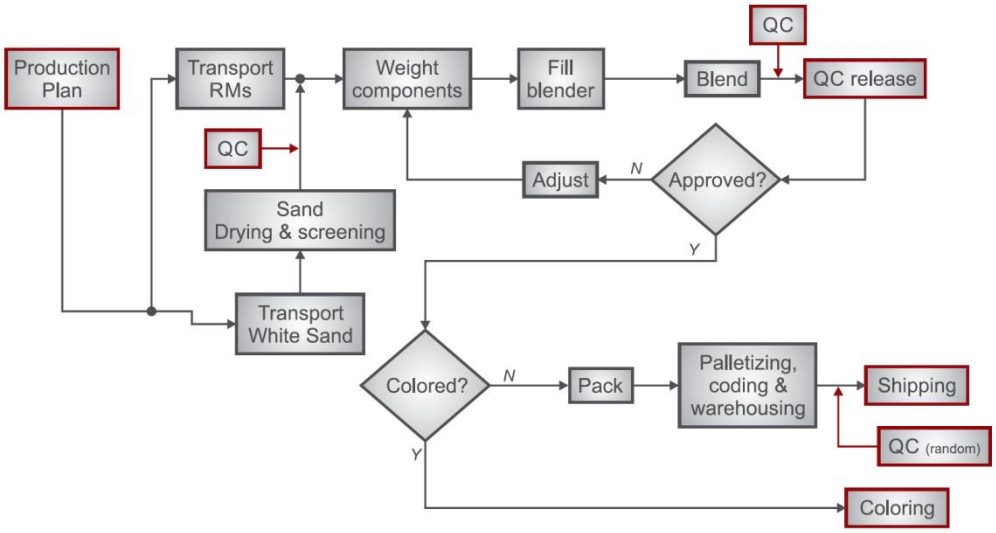

Fig. 2 Wet components production scheme for SOLTHERM HD system

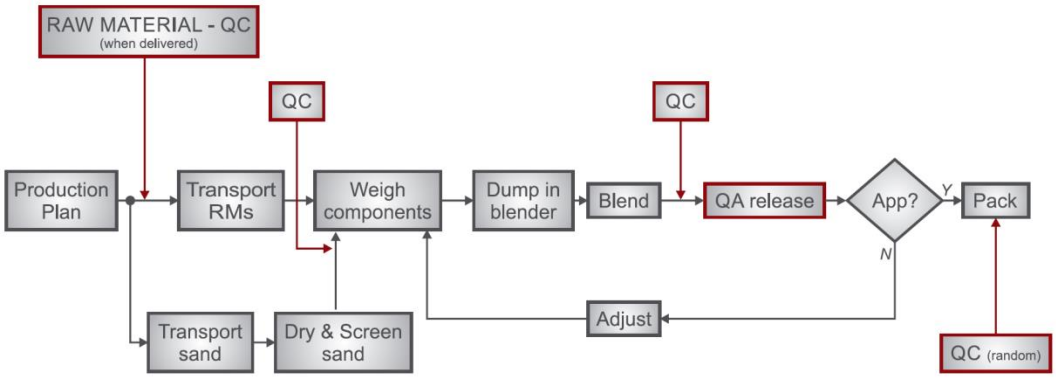

Fig. 3 Dry components production scheme for SOLTHERM HD system

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 HD layer were aggregated using weighted average. The weighted average method was used according to the percentage of each product in SOLTHERM HD 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 m^2 of complete SOLTHERM HD ETICS insulated with EPS.

Table 2. System boundaries for environmental characteristic for SOLTHERM HD

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 HD ETICS with Silicone Plasters

1 m² of ETICS with 10 cm EPS insulation

Environmental impacts: (1 m², EPS 10 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	13,20	0,55	0,12	13,87
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,37E-06	3,21E-07	7,93E-07	2,48E-06
Acidification potential of soil and water	[kg SO_2 eq.]	4,12E-02	3,89E-03	3,53E-04	4,55E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3,67E-03	2,89E-04	1,22E-06	3,96E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	2,59E-03	6,84E-04	4,18E-05	3,32E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	1,95E-01	0,00	4,42E-03	2,00E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	191,17	2,46	5,09	198,72
Environmental aspects on resource use: (1 m², 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]	1,16	0,12	0,19	1,47
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]	216,75	2,71	5,60	225,06
Use of secondary material	[kg]	0,13	0,00	0,00	0,13
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]	3,49	0,02	0,02	3,52
Other environmental information describing waste categories: 1 m², EPS 10 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	2,01E-03	0,00	2,37E-04	2,25E-03
Non-hazardous waste disposed	[kg]	4,90E-01	3,68E-03	3,82E-03	4,98E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,39E-01	1,39E-01
Materials for recycling	[kg]	5,96E-02	0,00	8,51E-03	6,81E-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 HD ETICS with Silicone Plasters

1 m² of ETICS with 12 cm EPS insulation

Environmental impacts: (1 m², EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	16,18	0,55	0,12	16,8
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,40E-06	3,21E-07	7,93E-07	2,52E-06
Acidification potential of soil and water	[kg SO_2 eq.]	5,09E-02	3,89E-03	3,53E-04	5,52E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	4,60E-03	2,89E-04	1,22E-06	4,89E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	3,18E-03	6,84E-04	4,18E-05	3,91E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,31E-01	0,00	4,42E-04	2,32E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	241,77	2,46	5,09	249,32
Environmental aspects on resource use: (1 m², EPS 12 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]	1,40	0,12	0,19	1,71
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]	272,41	2,71	5,60	280,72
Use of secondary material	[kg]	0,17	0,00	0,00	0,17
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]	3,80	0,02	0,02	3,84
Other environmental information describing waste categories: 1 m², EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	2,41E-03	0,00	2,37E-04	2,65E-03
Non-hazardous waste disposed	[kg]	5,88E-01	3,68E-03	3,82E-03	5,96E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,39E-01	1,39E-01
Materials for recycling	[kg]	7,15E-02	0,00	8,51E-03	8,00E-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 HD ETICS with Silicone Plasters

1 m² of ETICS with 15 cm EPS insulation

Environmental impacts: (1 m², EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	20,65	0,55	0,12	21,32
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,46E-06	3,21E-07	7,93E-07	2,57E-06
Acidification potential of soil and water	[kg SO_2 eq.]	6,55E-02	3,89E-03	3,53E-04	6,97E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	5,99E-03	2,89E-04	1,22E-06	6,28E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	4,07E-03	6,84E-04	4,18E-05	4,79E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,85E-01	0,00	4,42E-05	2,85E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	317,67	2,46	5,09	325,22
Environmental aspects on resource use: (1 m², EPS 15 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]	1,75	0,12	0,19	2,06
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]	355,90	2,71	5,60	364,21
Use of secondary material	[kg]	0,23	0,00	0,00	0,23
Use of renewable secondary fuels	[MJ]	0,39	0,00	0,00	0,39
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	4,27	0,02	0,02	4,31
Other environmental information describing waste categories: 1 m², EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	3,02E-03	0,00	2,37E-04	3,25E-03
Non-hazardous waste disposed	[kg]	7,35E-01	3,68E-03	3,82E-03	7,43E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,39E-01	1,39E-01
Materials for recycling	[kg]	8,94E-02	0,00	8,51E-03	9,79E-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 HD ETICS with Silicone Plasters

1 m² of ETICS with 20 cm EPS insulation

Environmental impacts: (1 m², EPS 20 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	28,11	0,55	0,12	28,77
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,54E-06	3,21E-07	7,93E-07	2,65E-06
Acidification potential of soil and water	[kg SO_2 eq.]	8,97E-02	3,89E-03	3,53E-04	9,39E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	8,30E-03	2,89E-04	1,22E-06	8,59E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	5,54E-03	6,84E-04	4,18E-05	6,27E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3,76E-01	0,00	4,42E-06	3,76E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	444,2	2,46	5,09	451,7
Environmental aspects on resource use: (1 m², 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]	2,33	0,12	0,19	2,64
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]	495,05	2,71	5,60	503,36
Use of secondary material	[kg]	0,33	0,00	0,00	0,33
Use of renewable secondary fuels	[MJ]	0,52	0,00	0,00	0,52
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,05	0,02	0,02	5,09
Other environmental information describing waste categories: 1 m², EPS 20 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	4,02E-03	0,00	2,37E-04	4,26E-03
Non-hazardous waste disposed	[kg]	9,80E-01	3,68E-03	3,82E-03	9,88E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,39E-01	1,39E-01
Materials for recycling	[kg]	1,19E-01	0,00	8,51E-03	1,28E-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 HD ETICS with Silicone Plasters

1 m² of ETICS with 25 cm EPS insulation

Environmental impacts: (1 m², EPS 25 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	35,56	0,55	0,12	36,2
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,63E-06	3,21E-07	7,93E-07	2,74E-06
Acidification potential of soil and water	[kg SO_2 eq.]	1,14E-01	3,89E-03	3,53E-04	1,18E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1,06E-02	2,89E-04	1,22E-06	1,09E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	7,02E-03	6,84E-04	4,18E-05	7,74E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,66E-01	0,00	4,42E-06	4,66E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	570,67	2,46	5,09	578,22
Environmental aspects on resource use: (1 m², 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]	2,91	0,12	0,19	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]	INA	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	634,20	2,71	5,60	642,51
Use of secondary material	[kg]	0,43	0,00	0,00	0,43
Use of renewable secondary fuels	[MJ]	0,65	0,00	0,00	0,65
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,83	0,02	0,02	5,87
Other environmental information describing waste categories: (1 m², EPS 25 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	5,03E-03	0,00	2,37E-04	5,26E-03
Non-hazardous waste disposed	[kg]	1,23E+00	3,68E-03	3,82E-03	1,23E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,39E-01	1,39E-01
Materials for recycling	[kg]	1,49E-01	0,00	8,51E-03	1,58E-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 HD ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 10 cm EPS insulation

Environmental impacts: (1 m², EPS 10 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	20,50	0,46	0,17	21,12
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5,11E-06	3,65E-07	8,33E-07	6,31E-06
Acidification potential of soil and water	[kg SO_2 eq.]	6,76E-02	3,24E-03	5,00E-04	7,14E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	6,16E-03	2,41E-04	1,73E-06	6,40E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	4,18E-03	5,71E-04	5,94E-05	4,81E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,47E-01	0,00	6,27E-03	2,54E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	274,73	2,06	7,22	284,01
Environmental aspects on resource use: (1 m², 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]	3,14	0,10	0,26	3,51
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]	317,03	2,26	7,94	327,24
Use of secondary material	[kg]	0,13	0,00	0,00	0,13
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]	3,45	0,02	0,02	3,49
Other environmental information describing waste categories: 1 m², EPS 10 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	3,07E-03	0,00	3,37E-04	3,41E-03
Non-hazardous waste disposed	[kg]	5,25E-01	4,78E-03	5,43E-03	5,35E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,97E-01	1,97E-01
Materials for recycling	[kg]	6,16E-02	0,00	1,21E-02	7,37E-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 HD ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 12 cm EPS insulation

Environmental impacts: (1 m², EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	23,48	0,46	0,17	24,1
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5,15E-06	3,65E-07	8,33E-07	6,34E-06
Acidification potential of soil and water	[kg SO_2 eq.]	7,73E-02	3,24E-03	5,00E-04	8,10E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	7,09E-03	2,41E-04	1,73E-06	7,33E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	4,77E-03	5,71E-04	5,94E-05	5,40E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,83E-01	0,00	6,27E-04	2,84E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	325,33	2,06	7,22	334,61
Environmental aspects on resource use: (1 m², EPS 12 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]	3,77	0,10	0,26	4,14
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]	372,69	2,26	7,94	382,90
Use of secondary material	[kg]	0,17	0,00	0,00	0,17
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]	3,76	0,02	0,02	3,80
Other environmental information describing waste categories: 1 m², EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	3,69E-03	0,00	3,37E-04	4,02E-03
Non-hazardous waste disposed	[kg]	6,30E-01	4,78E-03	5,43E-03	6,40E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,97E-01	1,97E-01
Materials for recycling	[kg]	7,39E-02	0,00	1,21E-02	8,60E-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 HD ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 15 cm EPS insulation

Environmental impacts: (1 m², EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	27,95	0,46	0,17	28,57
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5,20E-06	3,65E-07	8,33E-07	6,40E-06
Acidification potential of soil and water	[kg SO_2 eq.]	9,18E-02	3,24E-03	5,00E-04	9,56E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	8,47E-03	2,41E-04	1,73E-06	8,72E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	5,66E-03	5,71E-04	5,94E-05	6,29E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3,38E-01	0,00	6,27E-05	3,38E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	401,23	2,06	7,22	410,51
Environmental aspects on resource use: (1 m², EPS 15 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]	4,71	0,10	0,26	5,08
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]	456,18	2,26	7,94	466,39
Use of secondary material	[kg]	0,23	0,00	0,00	0,23
Use of renewable secondary fuels	[MJ]	0,39	0,00	0,00	0,39
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	4,23	0,02	0,02	4,27
Other environmental information describing waste categories: 1 m², EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	4,61E-03	0,00	3,37E-04	4,94E-03
Non-hazardous waste disposed	[kg]	7,88E-01	4,78E-03	5,43E-03	7,98E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,97E-01	1,97E-01
Materials for recycling	[kg]	9,24E-02	0,00	1,21E-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 HD ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 20 cm EPS insulation

Environmental impacts: (1 m², EPS 20 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	35,40	0,46	0,17	36,02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5,28E-06	3,65E-07	8,33E-07	6,48E-06
Acidification potential of soil and water	[kg SO_2 eq.]	1,16E-01	3,24E-03	5,00E-04	1,20E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1,08E-02	2,41E-04	1,73E-06	1,10E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	7,13E-03	5,71E-04	5,94E-05	7,76E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,28E-01	0,00	6,27E-06	4,28E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	527,7	2,06	7,22	537,0
Environmental aspects on resource use: (1 m², 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]	6,28	0,10	0,26	6,65
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]	595,33	2,26	7,94	605,54
Use of secondary material	[kg]	0,33	0,00	0,00	0,33
Use of renewable secondary fuels	[MJ]	0,52	0,00	0,00	0,52
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,01	0,02	0,02	5,05
Other environmental information describing waste categories: 1 m², EPS 20 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6,14E-03	0,00	3,37E-04	6,48E-03
Non-hazardous waste disposed	[kg]	1,05E+00	4,78E-03	5,43E-03	1,06E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,97E-01	1,97E-01
Materials for recycling	[kg]	1,23E-01	0,00	1,21E-02	1,35E-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 HD ETICS with Silicate-Silicone Plasters

1 m² of ETICS with 25 cm EPS insulation

Environmental impacts: (1 m², EPS 25 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	42,85	0,46	0,17	43,5
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	5,37E-06	3,65E-07	8,33E-07	6,57E-06
Acidification potential of soil and water	[kg SO_2 eq.]	1,40E-01	3,24E-03	5,00E-04	1,44E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1,31E-02	2,41E-04	1,73E-06	1,33E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	8,61E-03	5,71E-04	5,94E-05	9,24E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	5,18E-01	0,00	6,27E-06	5,18E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	654,23	2,06	7,22	663,51
Environmental aspects on resource use: (1 m², 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]	7,85	0,10	0,26	8,22
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]	734,48	2,26	7,94	744,69
Use of secondary material	[kg]	0,43	0,00	0,00E+00	0,43
Use of renewable secondary fuels	[MJ]	0,65	0,00	0,00	0,65
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,79	0,02	0,02	5,83
Other environmental information describing waste categories: (1 m², EPS 25 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	7,68E-03	0,00	3,37E-04	8,02E-03
Non-hazardous waste disposed	[kg]	1,31E+00	4,78E-03	5,43E-03	1,32E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,97E-01	1,97E-01
Materials for recycling	[kg]	1,54E-01	0,00	1,21E-02	1,66E-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 HD ETICS with Acrylic decorative finishing coats

1 m^2 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 CO2 eq.]	16,81	0,66	0,17	17,64
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,66E-06	6,20E-06	6,43E-07	9,51E-06
Acidification potential of soil and water	[kg SO_2 eq.]	5,63E-02	4,67E-03	5,05E-04	6,15E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	4,85E-03	3,47E-04	1,74E-06	5,20E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	3,44E-03	8,23E-04	5,99E-05	4,33E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,34E-01	0,00	6,32E-03	2,40E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	232,13	2,96	7,28	242,38
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]	1,95	0,15	0,27	2,37
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]	233,21	3,26	8,01	244,48
Use of secondary material	[kg]	0,13	0,00	0,00	0,13
Use of renewable secondary fuels	[MJ]	0,01	0,00	0,00	0,01
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	3,46	0,28	0,02	3,76
Other environmental information describing waste categories: 1 m^2, EPS 10 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	3,07E-03	0,00	3,40E-04	3,41E-03
Non-hazardous waste disposed	[kg]	5,25E-01	4,78E-03	5,47E-03	5,35E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,99E-01	1,99E-01
Materials for recycling	[kg]	6,16E-02	0,00	1,22E-02	7,38E-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 HD ETICS with Acrylic decorative finishing coats

1 m^2 of ETICS with 12 cm EPS insulation

Environmental impacts: (1 m^2, EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	19,79	0,66	0,17	20,62
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,69E-06	6,20E-06	6,43E-07	9,54E-06
Acidification potential of soil and water	[kg SO_2 eq.]	6,60E-02	4,67E-03	5,05E-04	7,11E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	5,78E-03	3,47E-04	1,74E-06	6,13E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	4,03E-03	8,23E-04	5,99E-05	4,92E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2,70E-01	0,00	6,32E-04	2,71E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	282,73	2,96	7,28	292,98
Environmental aspects on resource use: (1 m^2, EPS 12 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]	2,34	0,15	0,27	2,76
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]	288,87	3,26	8,01	300,14
Use of secondary material	[kg]	0,17	0,00	0,00	0,17
Use of renewable secondary fuels	[MJ]	0,01	0,00	0,00	0,01
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	3,77	0,28	0,02	4,07
Other environmental information describing waste categories: 1 m^2, EPS 12 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	3,69E-03	0,00	3,40E-04	4,03E-03
Non-hazardous waste disposed	[kg]	6,30E-01	4,78E-03	5,47E-03	6,40E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,99E-01	1,99E-01
Materials for recycling	[kg]	7,39E-02	0,00	1,22E-02	8,61E-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 HD ETICS with Acrylic decorative finishing coats

1 m^2 of ETICS with 15 cm EPS insulation

Environmental impacts: (1 m^2, EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO2 eq.]	24,26	0,66	0,17	25,09
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,75E-06	6,20E-06	6,43E-07	9,59E-06
Acidification potential of soil and water	[kg SO_2 eq.]	8,05E-02	4,67E-03	5,05E-04	8,57E-02
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	7,17E-03	3,47E-04	1,74E-06	7,52E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	4,92E-03	8,23E-04	5,99E-05	5,80E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3,24E-01	0,00	6,32E-05	3,24E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	358,63	2,96	7,28	368,88
Environmental aspects on resource use: (1 m^2, EPS 15 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]	2,93	0,15	0,27	3,34
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]	372,36	3,26	8,01	383,63
Use of secondary material	[kg]	0,23	0,00	0,00	0,23
Use of renewable secondary fuels	[MJ]	0,01	0,00	0,00	0,01
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	4,24	0,28	0,02	4,54
Other environmental information describing waste categories: 1 m^2, EPS 15 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	4,61E-03	0,00	3,40E-04	4,95E-03
Non-hazardous waste disposed	[kg]	7,88E-01	4,78E-03	5,47E-03	7,98E-01
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,99E-01	1,99E-01
Materials for recycling	[kg]	9,24E-02	0,00	1,22E-02	1,05E-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 HD ETICS with Acrylic decorative finishing coats

1 m^2 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 CO2 eq.]	31,71	0,66	0,17	32,54
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,83E-06	6,20E-06	6,43E-07	9,68E-06
Acidification potential of soil and water	[kg SO_2 eq.]	1,05E-01	4,67E-03	5,05E-04	1,10E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	9,48E-03	3,47E-04	1,74E-06	9,83E-03
Formation potential of tropospheric ozone	[kg Ethene eq.]	6,39E-03	8,23E-04	5,99E-05	7,28E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4,14E-01	0,00	6,32E-06	4,14E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	485,1	2,96	7,28	495,4
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]	3,91	0,15	0,27	4,32
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]	511,51	3,26	8,01	522,78
Use of secondary material	[kg]	0,33	0,00	0,00	0,33
Use of renewable secondary fuels	[MJ]	0,02	0,00	0,00	0,02
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,02	0,28	0,02	5,32
Other environmental information describing waste categories: 1 m^2, EPS 20 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	6,14E-03	0,00	3,40E-04	6,48E-03
Non-hazardous waste disposed	[kg]	1,05E+00	4,78E-03	5,47E-03	1,06E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,99E-01	1,99E-01
Materials for recycling	[kg]	1,23E-01	0,00	1,22E-02	1,35E-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 HD ETICS with Acrylic decorative finishing coats

1 m^2 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 CO2 eq.]	39,16	0,66	0,17	40,0
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,92E-06	6,20E-06	6,43E-07	9,76E-06
Acidification potential of soil and water	[kg SO_2 eq.]	1,29E-01	4,67E-03	5,05E-04	1,34E-01
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	1,18E-02	3,47E-04	1,74E-06	1,21E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	7,87E-03	8,23E-04	5,99E-05	8,75E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	5,05E-01	0,00	6,32E-06	5,05E-01
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	611,63	2,96	7,28	621,88
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]	4,89	0,15	0,27	5,30
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]	650,66	3,26	8,01	661,93
Use of secondary material	[kg]	0,43	0,00	0,00E+00	0,43
Use of renewable secondary fuels	[MJ]	0,02	0,00	0,00	0,02
Use of non-renewable secondary fuels	[MJ]	2,87	0,00	0,00	2,87
Net use of fresh water	[dm^3]	5,80	0,28	0,02	6,10
Other environmental information describing waste categories: (1 m^2, EPS 25 cm)					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	7,68E-03	0,00	3,40E-04	8,02E-03
Non-hazardous waste disposed	[kg]	1,31E+00	4,78E-03	5,47E-03	1,32E+00
Radioactive waste disposed	[kg]	0,00	0,00	0,00	0,00
Components for re-use	[kg]	0,00	0,00	1,99E-01	1,99E-01
Materials for recycling	[kg]	1,54E-01	0,00	1,22E-02	1,66E-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. ☒ external ☐ 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

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02-656 Warsaw, Ksawerów 21

CERTIFICATE № 057/2017
of TYPE III ENVIRONMENTAL DECLARATION

Product:

SOLTHERM HD

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

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director
for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, February 2017