Environmental Product Declaration

BOLIX IZO-STROP – MINERAL WOOL BASED - THERMAL INSULATION COMPOSITE SYSTEM FOR CEILINGS

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EPD program operator:
Building Research Institute (ITB), 00-611 Warsaw, Filtrowa 1
www.itb.pl; www.zb.itb.pl/epd

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Manufacturer
BOLIX S.A., Stolarska 8, 34-300 Żywiec, Poland
http://www.bolix.pl/

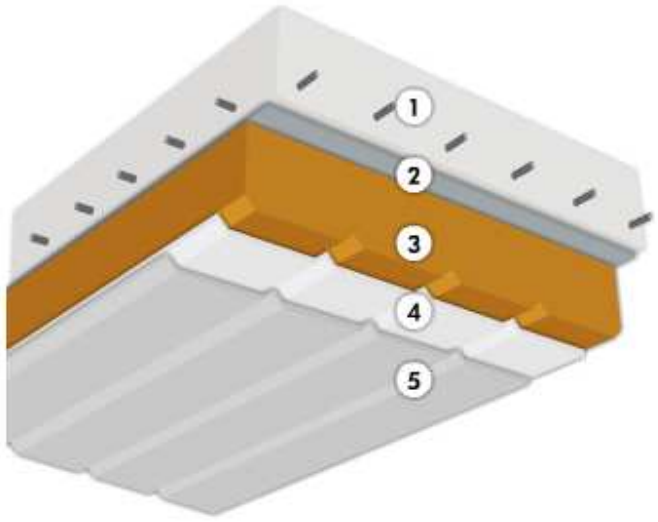
Basic information

This declaration is the type III environmental product declaration based on EN 15804+A1 rules and verified according to ISO 14025 and ECO guideline rules. It contains the environmental information on the impacts and aspects of declared construction materials verified by the independent 3rd party according to ISO 14025.

Life cycle: Cradle to Gate (EN 15804+A1, A1-A3 modules+A4)
Declared durability: 25 years
Declared Unit : 1 m^2 of THERMAL INSULATION COMPOSITE SYSTEM WITH MINERAL WOOL (PCR A ITB, EN 15804+A1)
Representative year of production: 2012
Reasons for performing LCA: B2B
Representativeness: Polish products

BOLIX IZO-STROP system is a thermal insulation composite system based on mineral wool boards. The distinguishing feature of BOLIX IZO-STROP is an omission of the fiber mesh and location of wool directly on primer. Surface layer (structural paint) is located on wool by spraying. In addition, thermal insulation does not require mechanical connectors. This solution allows for significant simplification and acceleration of work. BOLIX IZO-STROP provides insulation also classified as non-combustible. System becomes indispensable solution for insulation and protection ceilings of large garages and basements.

Systems is composed of mineral wool plate called “lamella plate”. The conventional mineral wool plates are characterized by a random arrangement of fibers, whereas the lamella plates have fiber orientation which is predominantly perpendicular to the major surface of the plate. The application of the insulation system consists of fixing the mineral wool plates to the ceiling by means of an adhesive. Adhesive for fixing insulation panels are BOLIX ZW or BOLIX WM. Lamella milled mineral wool; dimensions are 120× 20 cm, thickness 10 or 20 cm. Intermediate film is BOLIX STG. Finishing coat options are BOLIX STS10 or STS15 or BOLIX MP KA 15M.



BOLIX Izo-Strop

1. Garage ceiling
2. Adhesive BOLIX ZW or WM
3. Mineral wool - lamella plate
4. Intermediate film BOLIX STG
5. Option 1- Final coat - structural paint BOLIX STS10 or STS15
   Option II - Mineral coat BOLIX MP KA 15 M

Fig.1. BOLIX IZO-STROP - system composition

Intended use

BOLIX IZO-STROP is an innovative technical solution forming complete system of insulation of ceilings above not heated rooms, garages, basements, etc.
The IZO-STROP system is not intended to ensure the airtightness of the building structure. The provisions made in the Technical Approval (AT7322_2009) are based on an assumed working life of the system of at least 25 years, provided that the conditions laid down in AT for the packaging, transport, storage, installation as well as appropriate use, maintenance and repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or the Approval Body, but should only be regarded as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

LCI - raw materials, energy, emissions and waste.

Table 1. Raw materials used to produce system

Name of component Number of coat	Name of semi-finished product or raw material	Raw material used on whole production [Mg]
1. Fix for MW BOLIX WM, ZW (for calculation 5 kg/m^2)	Additives	38,4
	Mineral Filler	1594,4
	Modifier	7,54
	Binder CEM III	313,9
	Binder CEM II	313,9
	Binder CEM I	251,18
2. Thermal insulation (for calculation max 120 kg/m^3)	Lamella Mineral Wool (10cm and 20cm)	
Option 1		
3A Key coat BOLIX STG (for calculation 0,25 kg/m^2)	Water	20,3
	Additive	0,17
	Mineral fillers	22,8
	Dispersion	3,4
	Pigment	1,9
	Regulator	0,02
	Modifier	0,2
	Biocide	0,1
4A1 Finishing coat structural BOLIX STS 10 (for calculation 1,5 kg/m^2)	Water	4,04
	Additive	0,04
	Mineral fillers	16,62
	Dispersion	1,1
	Pigment	0,45
	Regulator	0,01
	Modifier	0,06
	Biocide	0,04
4A2 Finishing coat structural BOLIX STS 15 (for calculation 1,5 kg/m^2)	Water	12,24
	Additive	0,12
	Mineral fillers	17,84
	Dispersion	2,05
	Regulator	0,02
	Pigment	1,44
	Modifier	0,2
	Biocide	0,08
	Filler	6,9
Option 2		
3B – the same like 3A		
4B. Final coat BOLIX MP KA 15 M (for calculation 3 kg/m2)	Additives	9,65
	Mineral filler	419,3
	Filler	52,22
	Binder CEM I	31,3
	Pigment	7,83
	Modifier	2,61

Table 2 Packaging of the products

Packing		Use of packaging
Dry products ZW, WM, MP	Paper bags	71 kpcs
	Foil stretch	741 kg
	Pallets	1482 pcs
	Foil PE	177 kg
STS15 + STG	Plastic buckets	3603 pcs
	Pallets	151 pcs
	Foil stretch power	45 kg
	Paper	300 pcs
STS10	Foil stretch power	9 kg
	Paper	62 pcs
	Pallets	31 pcs
	Buckets	748 pcs

All inputs of raw materials and energy carriers have been included in LCA calculations.

Table 3.Primary energy consumption for A3module

Energy carriers	Unit	Total	Energy per m^2
Electricity	kWh	1321600	0,19
ON (only inside fabric)	l	11350	0,001
Oil	l	272300	0,04
LPG	l	43300	0,001

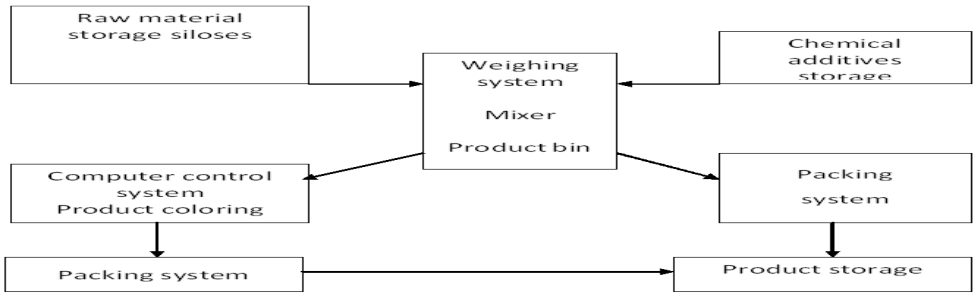


Fig.2. BOLIX production scheme (A3 module)

Table 4. Emissions into air generated during production stage A3(oil combustion)

Emission during production	Unit	Total amount	Emission per m^2 of product
CO	kg	1560	1,18E-05
CO_2	kg	560300	4,16E-03
NO_2	kg	1384	1,04E-05
SO_2	kg	570	4,24E-06
Aromatic hydrocarbons	kg	99	6,08E-07
NMVOC[1]	kg	392	6,00E-05
N_2O[1]	kg	3,4	5,36E-07
CH_4[1]	kg	117,7	2,16E-05
Note 1: Some values shown in table 4 were estimated basing on fuel consumption and combustion factors. Manufacturer doesn't provide measurement service for these substances.			

Table 5. Emissions into water generated during production stage A3

Sewage	Unit	Total amount	Emission mg/m^2 of product
Wastewater	m^3	4756	3,60E-05
Municipal sewage	m^3	1712	1,28E-05
Composition of wastewater after treatment			
COD	mg/l	348	4,44E+00
BOD	mg/l	200	2,55E+00
General suspended matter	mg/l	100	1,27E+00
Ammonia	mg/l	48,3	6,16E-01
Phosphates	mg/l	5,76	7,36E-02
Zn	mg/l	0,056	7,12E-04
Pb	mg/l	0,067	8,00E-04
Cu	mg/l	0,013	1,60E-04

Table 6. Waste generated in the phase of product manufacturing A3

Waste produced	Description of waste	EWC Code*	Quantity per year (Mg)	Destination type e.g. reuse, recycling, landfill, incineration
Controlled: Commercial	Municipal wastes	20 03 01	12,98	Disposal
	Used line elements	16 02 16	0,0025	Re-use
	Alkali batteries	16 06 04	0,005	Recycling
Controlled: Industrial	Paper packaging	15 01 01	17,4	Recycling
	Wooden	15 01 03	45,6	Re-use
	Mixed packing	15 01 06	25,6	Re-use
	Sorbents, filters	15 02 03	0,1	Recycling
	Industrial slag	19 08 14	325,4	Disposal
	Mineral /sand	01 04 09	340,5	Re-use
	Reject products	10 13 82	170,2	Recyling
	Organic	16 03 06	47,3	Disposal
	Tires	16 01 03	0,133	Recycling
	Steel	17 04 05	5,0	Recycling
	Plastic packaging	15 01 02	12,8	Recycling
Controlled: Hazardous	Hazardous material packings	15 01 10	0,086	Re-use
	Sorbents, filters, others	15 02 02	0,45	Re-use
	Used oils	13 02 08	0,370	Recyling
	Oil filters	16 01 07	0,030	Recycling
	Instalation elements	16 02 13	0,029	Re-use
	Organic mix with hazardous	16 03 05	0,03	Disposal

CALCULATION RULES

Allocation

The allocation rules used for this EPD are based on ITB-PCR A. Specific allocations for system's product are provided in EPD No. 1 for MW. 100% of input products according to table 1 were inventoried and allocated. Energy consumption (A3), emissions, municipal waste and waste water of whole factory in Żywiec were allocated on mass basis between all co-products. Electricity and gas consumption was inventoried for every production process separately.

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. All raw materials and energy consumption inventoried in RIGIPS factory all sub products were included in calculation. Office impacts were also taken into consideration. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 energy-%,. 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.

Data collection period

The data for manufacture of the examined IZO-STROP system refer to the year 2012, Mineral Wool refers to 2011. The life cycle assessments were prepared for Poland as the reference area.

Data quality

The values determined to calculate the LCIA originate from verified LCI BOLIX questionnaire. This data was verified by ISO auditor and was presented for external auditor.

Assumptions and estimates

Impacts for each product and factory process were inventoried and calculated separately. All raw material consumption, emission water used were specific. Selected emissions (see table 4) into air from production was estimated using formal conversion factors for carriers.

Databases

The data for the A1 processes come from the following databases: Dry BOLIX products ZW, WM, MP (specific BOLIX EPDs reports), MW (specific EPD), finishing coats (specific BOLIX EPDs reports) LCI questionnaire A3 (Energy, Waste, Water, Emissions, transport), ITB (additives, packing), Tauron (Electricity), Heat (Górzyński) and other scientific literature sources. Data quality analysis was a part of external audit. Specific data is not elder then 3 years, and generic not elder then 8 years.

Power Mix

Selection of the power mix for 2012-2014 in accordance with formal National Mix published by annual GUS report. Specific data for power production impact- Tauron provider for emissions (907 kg CO_2/MWh).

Note

Specific information on application and other actions with these system products are described in detail in the technical data sheet available on the producers website – www.bolix.pl.

Environmental characteristics (LCA)

Table 7. Environmental characteristic- 1m² of IZO-STROP (with BOLIX MP KA 15 M), 10 cm Mineral Wool

Environmental assessment information (MND – Module not declared, 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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Environmental impacts: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.]	21,02	0,19	0,11	21,33
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9,62E-07	1,28E-06	1,05E-09	2,25E-06
Acidification potential of soil and water	[kg SO_2 eq.]	0,0812	0,0014	0,0002	0,0829
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	0,0086	0,0016	0,00001	0,0102
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0032	0,0002	0,0023	0,0056
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,1200	1,92E-08	0,00E+00	0,1200
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	205,3	2,6	6,8	214,7
Environmental aspects on resource use: 1 m²					
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]	1,21	0,00	0,10	1,30
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]	226,49	2,82	6,90	236,20
Use of secondary material	[kg]	1,29	0,00	0,00	1,29
Use of renewable secondary fuels	[MJ]	2,45	0,00	0,00	2,45
Use of non-renewable secondary fuels	[MJ]	3,96	0,00	0,00	3,96
Net use of fresh water	[dm^3]	4,90	0,03	0,38	5,30
Other environmental information describing waste categories: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	0,001	0	0	0,001
Non-hazardous waste disposed	[kg]	1,47	0,011	0,075	1,556
Radioactive waste disposed	[kg]	0	0	0	0
Components for re-use	[kg]	0	0	0,041	0,041
Materials for recycling	[kg]	0,144	0	0,0075	0,1515
Materials for energy recovery	[kg]	0	0	0	0
Exported energy	[MJ]	0	0	0	0

Table 8. Environmental characteristic- 1m² of IZO-STROP (with BOLIX MP KA 15 M), 20 cm Mineral Wool

Environmental assessment information (MND – Module not declared, 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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**

Environmental impacts: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.]	39,43	0,19	0,11	39,73
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,80E-06	1,28E-06	1,05E-09	3,09E-06
Acidification potential of soil and water	[kg SO_2 eq.]	0,1537	0,0014	0,0002	0,1554
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	0,0164	0,0016	0,00001	0,0180
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0057	0,0002	0,0023	0,0082
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2280	1,92E-08	0,00E+00	0,2280
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	398,70	2,6	6,8	408,08
Environmental aspects on resource use: 1 m²					
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]	1,21	0,00	0,10	1,30
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]	439,23	2,82	6,90	448,95
Use of secondary material	[kg]	1,39	0,00	0,00	1,39
Use of renewable secondary fuels	[MJ]	2,45	0,00	0,00	2,45
Use of non-renewable secondary fuels	[MJ]	3,96	0,00	0,00	3,96
Net use of fresh water	[dm^3]	5,10	0,03	0,38	5,50
Other environmental information describing waste categories: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	0,0011	0	0	0,0011
Non hazardous waste disposed	[kg]	2,793	0,0112	0,075	2,8792
Radioactive waste disposed	[kg]	0	0	0	0
Components for re-use	[kg]	0	0	0,0405	0,0405
Materials for recycling	[kg]	0,288	0	0,0075	0,2955
Materials for energy recovery	[kg]	0	0	0	0
Exported energy	[MJ]	0	0	0	0

Table 9. Environmental characteristic- 1m² of IZO-STROP (with BOLIX STS), 10 cm Mineral Wool

Environmental assessment information (MND – Module not declared, 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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**

Environmental impacts: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.]	22,04	0,16	0,09	22,30
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9,25E-07	1,09E-06	8,48E-10	2,01E-06
Acidification potential of soil and water	[kg SO_2 eq.]	0,0796	1,22E-03	0,0002	0,0810
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	0,0086	0,0014	0,00001	0,010
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0031	0,0002	0,0018	0,0051
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,1214	0,0000	0,00E+00	0,121
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	211,0	2,17	5,5	218,7
Environmental aspects on resource use: 1 m²					
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]	1,5	0,00	0,1	1,5
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]	233,6	2,39	5,6	241,6
Use of secondary material	[kg]	1,3	0,00	0,0	1,3
Use of renewable secondary fuels	[MJ]	2,5	0,00	0,0	2,5
Use of non-renewable secondary fuels	[MJ]	4,0	0,00	0,0	4,0
Net use of fresh water	[dm^3]	5,1	0,03	0,3	5,5
Other environmental information describing waste categories: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	0,0	0,00	0,0	0,0
Non-hazardous waste disposed	[kg]	1,2	0,01	0,1	1,3
Radioactive waste disposed	[kg]	0,0	0,00	0,0	0,0
Components for re-use	[kg]	0,0	0,00	0,0	0,0
Materials for recycling	[kg]	0,1	0,00	0,0	0,2
Materials for energy recovery	[kg]	0,0	0,00	0,0	0,0
Exported energy	[MJ]	0,0	0,00	0,0	0,0

Table 10. Environmental characteristic- 1m² of IZO-STROP (with BOLIX STS), 20 cm Mineral Wool

Environmental assessment information (MND – Module not declared, 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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**

Environmental impacts: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Global warming potential	[kg CO_2 eq.]	40,64	0,16	0,09	40,89
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,77E-06	9,14E-07	8,48E-10	2,69E-06
Acidification potential of soil and water	[kg SO_2 eq.]	0,1528	1,03E-03	0,0002	0,1540
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	0,0165	0,0011	0,00001	0,0176
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0056	0,0001	0,0018	0,0076
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2305	0,0000	0,00E+00	0,2305
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	406,4	1,82	5,5	413,7
Environmental aspects on resource use: 1 m²					
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]	1,5	0,00	0,1	1,5
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]	448,5	2,01	5,6	456,1
Use of secondary material	[kg]	1,4	0,00	0,0	1,4
Use of renewable secondary fuels	[MJ]	2,5	0,00	0,0	2,5
Use of non-renewable secondary fuels	[MJ]	4,0	0,00	0,0	4,0
Net use of fresh water	[dm^3]	5,3	0,02	0,3	5,7
Other environmental information describing waste categories: 1 m²					
Indicator	**Unit**	**A1**	**A2**	**A3**	**A1-A3**
Hazardous waste disposed	[kg]	0,00	0	0,00001	0,0
Non hazardous waste disposed	[kg]	2,26	0,008	0,048	2,3
Radioactive waste disposed	[kg]	0,00	0	0	0,0
Components for re-use	[kg]	0,00	0	0,026	0,0
Materials for recycling	[kg]	0,29	0	0,005	0,3
Materials for energy recovery	[kg]	0,00	0	0	0,0
Exported energy	[MJ]	0,00	0	0	0,0

Environmental characteristics (LCA) - transport of product "A4"

Table 15. Environmental profile for transport of 1 m^2 BOLIX System to Poland, Germany, Scandinavia and Czech from manufacturing plant (transport TIR or TIR+ship)

Environmental impacts: transport of 1 m^2 to:					
Indicator	**Unit**	**Poland**	**Germany**	**Scandinavia**	**Czech**
Global warming potential	[kg CO_2 eq.]	0,08	0,13	0,34	0,1
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	0	0	0	0
Acidification potential of soil and water	[kg SO_2 eq.]	0,0009	0,0015	0,0040	0,0012
Eutrophication potential	[kg $(PO_4)^{3-}$ eq.]	3,39E-05	5,28E-05	0,00014	4,15E-05
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0002	0,0002	0,0007	0,00019
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	8,35E-09	1,3E-08	3,55645E-08	1,021E-08
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1,08	1,68	4,59	1,32
Environmental aspects on resource use: transport of 1 m^2 to:					
Indicator	**Unit**	**Poland**	**Germany**	**Scandinavia**	**Czech**
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]	0	0	0	0
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]	1,08	1,68	4,59	1,32
Use of secondary material	[kg]	0	0	0	0
Use of renewable secondary fuels	[MJ]	0	0	0	0
Use of non-renewable secondary fuels	[MJ]	0	0	0	0
Net use of fresh water	[dm^3]	0,01	0,012	0,04	0,012
Other environmental information describing waste categories: transport of 1 m^2 to:					
Indicator	**Unit**	**Poland**	**Germany**	**Scandinavia**	**Czech**
Hazardous waste disposed	[kg]	0	0	0	0
Non-hazardous waste disposed	[kg]	0,0054	0,008	0,023	0,0065
Radioactive waste disposed	[kg]	0	0	0	0
Components for re-use	[kg]	0	0	0	0
Materials for recycling	[kg]	0	0	0	0
Materials for energy recovery	[kg]	0	0	0	0
Exported energy	[MJ]	0	0	0	0

Verification

The process of verification of an EPD is in accordance with EN ISO14025, clause 8 and ISO 21930, clause 9 and ECO guideline. After verification this EPD is valid for a 5 years period. EPD does not have to be recalculated after 5 years if the underlying data has not changed significantly.

The basis for LCA analysis was EN 15804+A1 and PCR A ITB
Independent verification corresponding to ISO 14025 & 8.3.1 and ECO guideline [x] external [ ] internal
Verification of EPD: prof. Dariusz Heim (TU Łódź) LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski LCA: PhD. Eng. Michał Piasecki, m.piasecki@itb.pl Verification of procedures and declaration: PhD. Eng Halina Prejzner

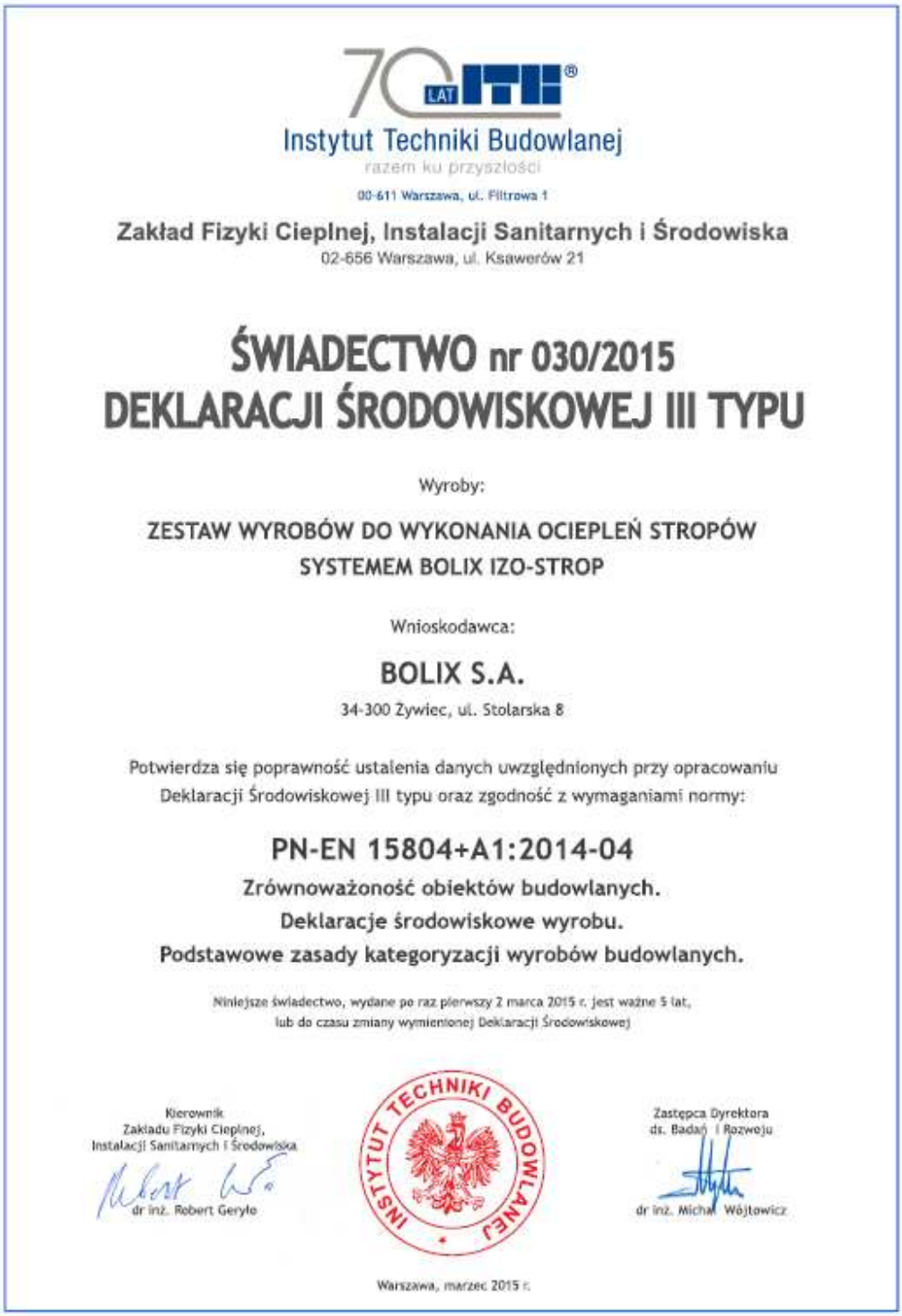
http://www.zb.itb.pl/epd

ITB is the member of ECO PLATFORM The European Platform of EPD program operators.

Normative references

- ISO 14025: 2006, Environmental management – Type III environmental declarations – Principles and procedure.
- ISO 21930: 2007, Sustainability in building and construction – Environmental declaration of building products.
- ISO 14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.
- ISO 15686-1: 2000, Buildings and constructed assets — Service life planning — Part 1: General principles
- ISO 15686-8: 2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN 15804+A1:2104, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- EN 15942: 2011, Sustainability of construction works. Environmental product declarations. Communication format business-to-business

ITB EPD No 30/15 verification certificate



Instytut Techniki Budowlanej
razem ku przyszłości
00-611 Warszawa, ul. Filtrowa 1

Zakład Fizyki Cieplnej, Instalacji Sanitarnych i Środowiska
02-656 Warszawa, ul. Ksawerów 21

ŚWIADECTWO nr 030/2015
DEKLARACJI ŚRODOWISKOWEJ III TYPU

Wyroby:

ZESTAW WYROBÓW DO WYKONANIA OCIEPLEŃ STROPÓW SYSTEMEM BOLIX IZO-STROP

Wnioskodawca:

BOLIX S.A.

34-300 Żywiec, ul. Stolarska 8

Potwierdza się poprawność ustalenia danych uwzględnionych przy opracowaniu Deklaracji Środowiskowej III typu oraz zgodność z wymaganiami normy:

PN-EN 15804+A1:2014-04

Zrównoważoność obiektów budowlanych.
Deklaracje środowiskowe wyrobu.
Podstawowe zasady kategoryzacji wyrobów budowlanych.

Niniejsze świadectwo, wydane po raz pierwszy 2 marca 2015 r. jest ważne 5 lat, lub do czasu zmiany wymienionej Deklaracji Środowiskowej

Kierownik
Zakładu Fizyki Cieplnej,
Instalacji Sanitarnych i Środowiska
dr inż. Robert Geryło

INSTYTUT TECHNIKI BUDOWLANEJ

Zastępca Dyrektora
ds. Badań i Rozwoju
dr inż. Michał Wójtowicz

Warszawa, marzec 2015 r.