

# Environmental Product Declaration



## **BOLIX W – MINERAL WOOL BASED - EXTERNAL THERMAL INSULATION COMPOSITE SYSTEM (ETICS)**



# **BOLIX**<sup>®</sup>

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Validation date: 20.12.2014  
Validity date: 01.01.2020

### **EPD program operator:**

Building Research Institute (ITB), 00-611 Warsaw, Filtrowa 1

[www.itb.pl](http://www.itb.pl); [www.zb.itb.pl/epd](http://www.zb.itb.pl/epd)



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PLATFORM

The European Platform for EPD program operators.

### **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 3<sup>rd</sup> party according to ISO 14025.

Life cycle: Cradle to Gate (EN 15804+A1, A1-A3 modules+A4)

The year of preparing the characteristic: 2014

Declared durability: 25 years

Declared Unit : 1 m<sup>2</sup> of EXTERNAL THERMAL INSULATION COMPOSITE SYSTEM WITH MINERAL WOOL (PCR A ITB, EN 15804+A1)

BOLIX W systems are external thermal insulation composite systems (ETICS - formerly a light-wet method) based on mineral wool boards. Systems can be composed of either a conventional mineral wool plate or so-called “lamella plates”. The conventional mineral wool plates are characterized by a random arrangement of fibres, whereas the lamella plates have fibre 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 walls by means of an adhesive and dowels, applying the reinforcement on the mineral wool, i.e. adhesive coat with embedded fibreglass mesh, and finally applying a thin-layer top render coat. The top coat can be made of the silicate, silicone or mineral plasters (BOLIX W System). BOLIX W systems should be used on public utility buildings (e.g. schools, offices, hospitals) and on apartment buildings exceeding a height of 25m or 11 floors\*. The system also includes a system suitable for ceiling insulation using mineral wool boards (“garage” system).

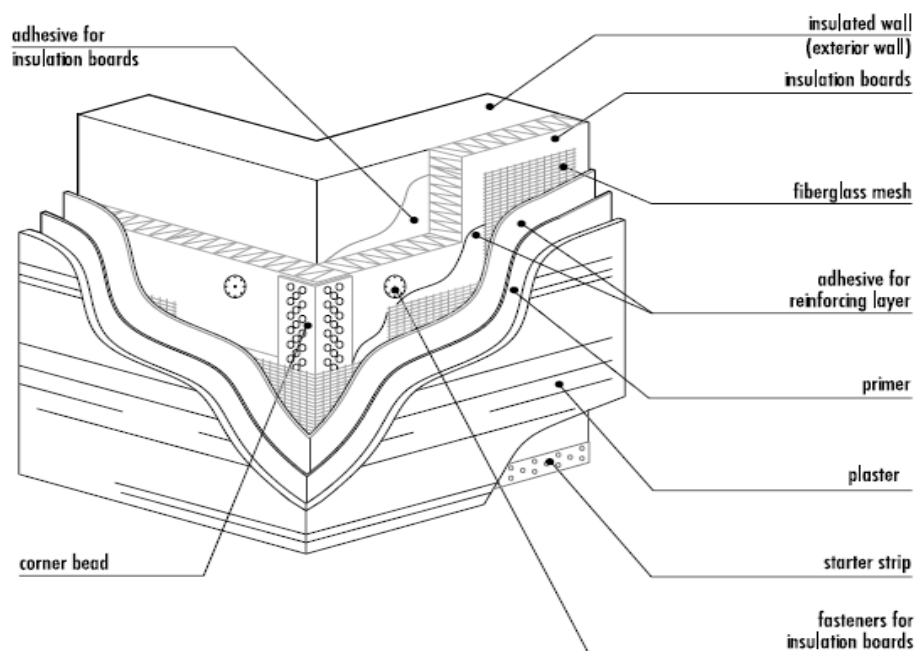


Fig.1. BOLIX - system composition

### Intended use

This ETICS is intended to be used as external insulation of buildings’ walls made of masonry (bricks, blocks, stones, ..) or concrete (cast on site or as prefabricated panels) with or without rendering (reaction to fire class A1 or A2-s2, d0 according to EN 13501-1). The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation. The ETICS is made of non load-bearing construction elements. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to durability by providing enhanced protection from the effects of weathering. The ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is not intended to ensure the airtightness of the building structure. The provisions made in the European Technical Approval (ETA-08/00205) are based on an assumed working life of the ETICS of at least 25 years, provided that the conditions laid down in ETA 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 ETICS

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 <sup>2</sup> )	Additives	18,2
	Mineral Filler	1333,4
	Modifier	13,7
	Binder CEM III	455,1
	Binder CEM I	455,1
2. Thermal insulation (for calculation 140 kg/m <sup>3</sup> )	Mineral Wool (14cm and 20cm)	68 264 m <sup>3</sup>
3. Base coat (Fix for mesh) BOLIX WM (for calculation 5 kg/m <sup>2</sup> )	Additives	29,7
	Mineral filler	892,9
	Binder CEM III	65,9
	Binder CEM II	329,5
4. Glassfibre Mesh AKE 145 (for calculation 0,145 kg/m <sup>2</sup> )	Glassfibre reinforcement	455 095 m <sup>2</sup>
5B. Silicone key coat BOLIX SIG color (for calculation 0,325 kg/m <sup>2</sup> )	Water	5,7
	Additive	0,1
	Quartz filler	2,4
	Mineral fillers	3,0
	Dispersion	1,5
	Disp. silicone	0,4
	Pigment	0,3
	Coalescent	1,1
	Biocide	0,03
6B. Silicone finishing coat BOLIX SIT (for calculation 3,25 kg/m <sup>2</sup> )	Water	6,1
	Additive	0,6
	Mineral fillers	96,2
	Fillers	1,2
	Disp. styro-acrylat	9,9
	Disp. silicone	5,0
	Pigment	2,5
	Coalescent	0,6
	Modifier	1,2
	Biocide	0,2
7B. Silicone primer BOLIX SIG (for calculation 0,15 kg/m <sup>2</sup> )	Water	0,6
	Disp. Silicone	0,04
	Biocide	0,001
8B. Decorative coat BOLIX SIL (for calculation 0,23 kg/m <sup>2</sup> )	Water	7,8
	Additive	0,1
	Mineral fillers	13,2
	Disp. styro-acrylat	3,9
	Disp. silicone	1,4
	Pigment	3,0
	Coalescent	0,1
	Biocide	0,25
5C. Silicate key coat BOLIX SG color (for calculation 0,13 kg/m <sup>2</sup> )	Water	1,5
	Additive	0,02
	Mineral fillers	2,7
	Disp. styro-acrylat	0,8
	Pigment	0,1
	Modifiers	0,06
	Binder	0,4
6C. Silicate finishing coat BOLIX S	Water	2,3
	Additive	0,4

(for calculation 3 kg/m <sup>2</sup> )	Mineral fillers	40,0
	Quartz filler	11,9
	Disp. styro-acrylat	4,7
	Binder	5,4
	Pigment	1,0
	Modifiers	2,0
7C. Silicate primer BOLIX SG (for calculation 0,15 kg/m <sup>2</sup> )	Water	0,2
	Additive	0,1
	Disp. styro-acrylat	0,03
8C. Decorative coat BOLIX SZ (for calculation 0,23 kg/m <sup>2</sup> )	Water	2,0
	Quartz filler	2,6
	Mineral filler	0,4
	Dispersion	1,1
	Pigment	1,0
	Additives	0,05
	Binder	1,2
5D. Key coat BOLIX OP (for calculation 0,32 kg/m <sup>2</sup> )	Water	20,3
	Additive	0,1
	Mineral fillers	25,6
	Disp. styro-acrylat	9,2
	Pigment	1,8
	Coalescent	0,3
	Biocide	0,1
	Additives	0,5
6D. Mineral finishing coat BOLIX MP (for calculation 3 kg/m <sup>2</sup> )	Quartz filler	35,2
	Filler	27,5
	CEM I	18,3
	Mineral fillers	184,7
	Pigment	4,6
	Modifier	1,5
	Water	0,6
7B. Silicone primer BOLIX SIG (for calculation 0,15 kg/m <sup>2</sup> )	Disp. Silicone	0,04
	Biocide	0,001
	Water	7,8
8B. Decorative coat BOLIX SIL (for calculation 0,23 kg/m <sup>2</sup> )	Additive	0,1
	Mineral fillers	13,2
	Disp. styro-acrylat	3,9
	Disp. silicone	1,4
	Pigment	3,0
	Coalescent	0,1
	Biocide	0,25
	Water	7,8

Table 2 Packaging of the products

Packing		Use of packaging material 2012y
Dry products ZW, WM	Paper bags	156 000 pcs
	Foil stretch	1626 kg
	Pallets	3249 pcs
	Foil PE	389 kg
Finishing coats 30 kg (acryl, silicone, silicate )	Plastic buckets	6406 pcs
	Pallets	267 pcs
	Foil stretch power	80 kg
	Paper	534 pcs
Paints 18 l (acryl, silicone, silicate)	Foil stretch power	18 kg
	Paper	119 pcs
	Pallets	59 pcs
	Buckets	1425 pcs

Key coats OP 25 kg	Buckets	2296 pcs
	Paper	192 pcs
	Pallets	96 pcs
	Foil stretch	29 kg
Primers 20 kg (N, SG, SG color, SIG, SIG color)	Buckets	999 pcs
	Paper	83 pcs
	Pallets	42 pcs
	Foil stretch power	12 kg

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

Table 3. Primary energy consumption for A3 module

Energy carriers	Unit	Total	Energy per m <sup>2</sup>
Electricity	kWh	1321600	0,12
ON (only inside fabric)	l	11350	0,001
Oil	l	272300	0,003
LPG	l	43300	0,0026

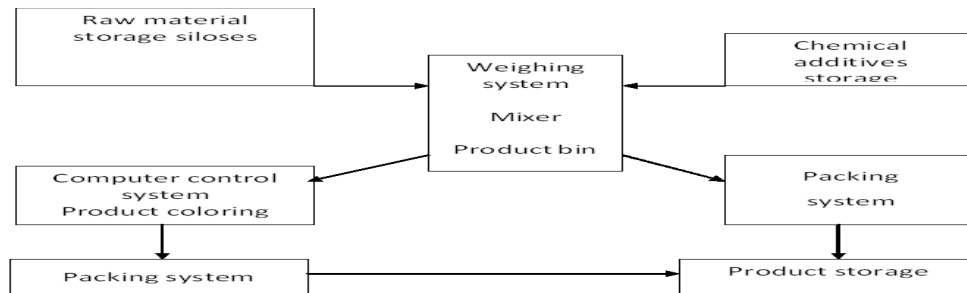


Fig.2. BOLIX production scheme (A3 module)

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

Emission during production	Unit	Total amount	Emission per m <sup>2</sup> of product
CO	kg	1560	1,47E-05
CO <sub>2</sub>	kg	560300	5,2E-03
NO <sub>2</sub>	kg	1384	1,3E-05
SO <sub>2</sub>	kg	570	5,3E-06
Aromatic hydrocarbons	kg	99	7,6E-07
NM VOC <sup>1</sup>	kg	392	7,5E-05
N <sub>2</sub> O <sup>1</sup>	kg	3,4	6,7E-07
CH <sub>4</sub> <sup>1</sup>	kg	117,7	2,7E-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 <sup>2</sup> of product
Wastewater	m <sup>3</sup>	4756	4,5E-05
Municipal sewage	m <sup>3</sup>	1712	1,6E-05
<b>Composition of wastewater</b>			
COD	mg/l	348	5,55
BOD	mg/l	200	3,19
General suspended matter	mg/l	100	1,59
Ammonia	mg/l	48,3	0,77
Phosphates	mg/l	5,76	0,092
Zn	mg/l	0,056	0,00089
Pb	mg/l	0,067	0,001
Cu	mg/l	0,013	0,0002

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	Recycling
	Organic	16 03 06	47,3	Disposal
	Tires	16 01 03	0,133	Recycling
	Steel	17 04 05	5,0	Recycling
Controlled: Hazardous	Plastic packaging	15 01 02	12,8	Recycling
	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	Recycling
	Oil filters	16 01 07	0,030	Recycling
	Installation elements	16 02 13	0,029	Re-use
Organic mix with hazardous	16 03 05	0,03	Disposal	

## Environmental characteristics (LCA)- ETICS



Table 7. Environmental characteristic for 1m<sup>2</sup> ETICS, acryl system, 14 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	34,52	0,15	0,20	34,87
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,53E-06	9,45E-06	1,61E-09	1,1E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1309	0,0011	0,0004	0,13
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0141	0,0002	0,0034	0,02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0053	0,0001	0,0000	0,01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2146	0,00	0,00	0,21
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	328,8	1,5	10,7	341,01
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	2,76	2,00E-02	0,16	2,94
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]	378,41	2,00	10,82	391,23
Use of secondary material	[kg]	1,33	0,00	0,00	1,33
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 <sup>3</sup> ]	5,74	0,03	0,10	5,87
Other environmental information describing waste categories: 1 m <sup>3</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,002	0,00	1,23E-05	0,00
Non-hazardous waste disposed	[kg]	1,089	0,01	0,01	1,11
Radioactive waste disposed	[kg]	0	0,00	0	0,00
Components for re-use	[kg]	0,13	0,00	0,005	0,14
Materials for recycling	[kg]	0,1	0,00	0,001	0,10
Materials for energy recovery	[kg]	0	0,00	0	0,00
Exported energy	[MJ]	0,0	0	0	0

Table 8. Environmental characteristic for 1m<sup>2</sup> ETICS, acryl system, 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	45,57	0,15	0,20	45,92
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,03E-06	9,45E-06	1,61E-09	1,1E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1743	0,0011	0,0004	0,18
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0188	0,0002	0,0034	0,02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0068	0,0001	0,0000	0,01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2794	0,00E+00	0,0000	0,28
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	444,88	1,5	10,7	457,05
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	2,76	0,02	0,16	2,94
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]	527,33	2,00	10,82	540,15
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 <sup>3</sup> ]	5,86	0,02	0,10	5,98
Other environmental information describing waste categories: 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,002	0,00	1,23E-05	0,002
Non hazardous waste disposed	[kg]	1,1	0,01	0,01	1,16
Radioactive waste disposed	[kg]	0	0,00	0	0,00
Components for re-use	[kg]	0,1365	0,00	0,01	0,15
Materials for recycling	[kg]	0,102	0,00	0,001	0,10
Materials for energy recovery	[kg]	0	0,00	0	0,00
Exported energy	[MJ]	0	0,00	0	0,00



Table 9. Environmental characteristic for 1m<sup>2</sup> ETICS, silicone system, 14 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	34,23	0,15	0,29	34,67
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,92E-06	9,45E-06	2,32E-09	1,14E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1319	0,0011	0,0005	0,1335
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0146	0,0002	0,0049	0,0197
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0053	0,0001	1,45E-05	0,0054
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,21	0,00	0,00	0,21
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	327,52	1,59	15,40	344,51
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	2,73	0,00	0,17	2,90
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]	277,54	2,12	16,17	295,83
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 <sup>3</sup> ]	5,76	0,03	0,11	5,89
Other environmental information describing waste categories: 1 m <sup>3</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,0022	0	1,30E-05	0,002
Non-hazardous waste disposed	[kg]	1,1	0,0088	0,0106	1,119
Radioactive waste disposed	[kg]	0	0	0	0
Components for re-use	[kg]	0,12	0	0,0106	0,131
Materials for recycling	[kg]	0,1	0	0,00106	0,101
Materials for energy recovery	[kg]	0	0	0	0
Exported energy	[MJ]	0	0	0	0

Table 10. Environmental characteristic for 1m<sup>2</sup> ETICS, silicone system, 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	45,28	0,15	0,29	45,71
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,43E-06	9,4523E-06	2,32E-09	1,19E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1754	0,0011	0,0005	0,18
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0193	0,0002	0,0049	0,02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0068	0,0001	1,45E-05	0,01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2711	0,0000	0,0000	0,27
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	443,56	1,59	15,40	460,55
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	2,73	0,00	0,17	2,90
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]	525,75	2,12	16,17	544,04
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 <sup>3</sup> ]	5,96	0,03	0,11	6,09
Other environmental information describing waste categories: 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,0023	0	1,30E-05	0,002
Non hazardous waste disposed	[kg]	1,155	0,0088	0,0106	1,174
Radioactive waste disposed	[kg]	0	0	0	0,000
Components for re-use	[kg]	0,126	0	0,0106	0,137
Materials for recycling	[kg]	0,105	0	0,00106	0,106
Materials for energy recovery	[kg]	0	0	0	0,000
Exported energy	[MJ]	0	0	0	0,000

Table 11. Environmental characteristic for 1m<sup>2</sup> ETICS, silicate system, 14 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	Returfishment	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
<b>Environmental impacts: 1 m<sup>2</sup></b>																
<b>Indicator</b>									<b>Unit</b>		<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>		
Global warming potential									[kg CO <sub>2</sub> eq.]		34,23	0,15	0,28	34,65		
Depletion potential of the stratospheric ozone layer									[kg CFC 11 eq.]		1,61E-06	9,66E-06	2,24E-09	1,13E-05		
Acidification potential of soil and water									[kg SO <sub>2</sub> eq.]		0,1309	0,0011	0,0005	0,13		
Eutrophication potential									[kg (PO <sub>4</sub> ) <sup>3</sup> eq.]		0,0143		0,0048	0,02		
Formation potential of tropospheric ozone									[kg Ethene eq.]		0,0052	0,0001	0,00001	0,01		
Abiotic depletion potential (ADP-elements) for non-fossil resources									[kg Sb eq.]		0,2007	0,0000	0,0000	0,20		
Abiotic depletion potential (ADP-fossil fuels) for fossil resources									[MJ]		327,5	1,5	14,8	343,81		
<b>Environmental aspects on resource use: 1 m<sup>2</sup></b>																
<b>Indicator</b>									<b>Unit</b>		<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>		
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]		2,73	1,55	0,14	4,42		
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]		277,50	2,00	15,54	295,04		
Use of secondary material									[kg]		1,31	0,00	0,00	1,31		
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 <sup>3</sup> ]		5,81	0,02	0,10	5,93		
<b>Other environmental information describing waste categories: 1 m<sup>3</sup></b>																
<b>Indicator</b>									<b>Unit</b>		<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>		
Hazardous waste disposed									[kg]		0,002	0	0,00001	0,00		
Non hazardous waste disposed									[kg]		1,111	0,00875	0,0102	1,13		
Radioactive waste disposed									[kg]		0,000	0	0	0,00		
Components for re-use									[kg]		0,133	0	0,0051	0,14		
Materials for recycling									[kg]		0,102	0	0,001	0,10		
Materials for energy recovery									[kg]		0,000	0	0	0,00		
Exported energy									[MJ]		0,000	0	0	0,00		

Table 12. Environmental characteristic for 1m<sup>2</sup> ETICS, silicate system, 20cm 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	45,27	0,15	0,28	45,70
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,12E-06	9,66E-06	2,24E-09	1,18E-05
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1744	0,0011	0,0005	0,18
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0190		0,0048	0,02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0068	0,00008	0,00001	0,01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2655	0,0000	0,0000	0,27
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	443,5	1,5	14,8	459,85
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	2,73	1,55	0,14	4,42
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]	525,71	2,00	15,50	543,21
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 <sup>3</sup> ]	5,88	0,02	0,10	6,00
Other environmental information describing waste categories: 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,002	0	1,25E-05	0,00
Non-hazardous waste disposed	[kg]	1,166	0,00875	0,0102	1,19
Radioactive waste disposed	[kg]	0,000	0	0	0,00
Components for re-use	[kg]	0,139	0	0,0051	0,14
Materials for recycling	[kg]	0,107	0	0,00102	0,11
Materials for energy recovery	[kg]	0,000	0	0	0,00
Exported energy	[MJ]	0,000	0	0	0,00

Table 13. Environmental characteristic for 1m<sup>2</sup> ETICS, mineral system, 14 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	33,45	0,15	0,20	33,80
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1,53E-06	9,66E-07	1,67E-09	2,50E-06
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1272	0,0010	0,0004	0,1286
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0136	0,0013	0,0036	0,0185
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0050	0,0001	0,00	0,0051
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,1926	0,00	0,00	0,1926
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	323,9	2,0	11,1	337,0
Environmental aspects on resource use: 1 m <sup>2</sup>					
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]	0,58	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3,08	0,00	0,10	3,18
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]	0,58	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	275,81	1,95	11,24	289,00
Use of secondary material	[kg]	1,56	0,00	0,00	1,56
Use of renewable secondary fuels	[MJ]	2,70	0,00	0,00	2,70
Use of non-renewable secondary fuels	[MJ]	4,35	0,00	0,00	4,35
Net use of fresh water	[dm <sup>3</sup> ]	6,49	0,02	0,10	6,61
Other environmental information describing waste categories: 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,0023	0,00	0,0000	0,0023
Non-hazardous waste disposed	[kg]	1,13	0,0097	0,0104	1,15
Radioactive waste disposed	[kg]	0,00	0,0000	0,0000	0,00
Components for re-use	[kg]	0,1349	0,00	0,0052	0,1401
Materials for recycling	[kg]	0,1038	0,00	0,0010	0,1048
Materials for energy recovery	[kg]	0,00	0,00	0,0000	0,00
Exported energy	[MJ]	0,00	0,00	0,0000	0,00

Table 14. Environmental characteristic for 1m<sup>2</sup> ETICS, mineral system, 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 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO <sub>2</sub> eq.]	44,49	0,15	0,20	44,85
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	2,03E-06	9,66E-07	1,67E-09	0,00
Acidification potential of soil and water	[kg SO <sub>2</sub> eq.]	0,1707	0,0010	0,0004	0,17
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> eq.]	0,0183	0,0013	0,0036	0,02
Formation potential of tropospheric ozone	[kg Ethene eq.]	0,0065	0,0001	0,00	0,01
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0,2574	0,00	0,00	0,26
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	440,0	2,0	11,1	453,01
Environmental aspects on resource use: 1 m <sup>2</sup>					
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	0,00	0,10	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]	0,58	INA	INA	INA
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	520,87	1,95	11,24	534,06
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 <sup>3</sup> ]	5,91	0,02	0,10	6,03
Other environmental information describing waste categories: 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	0,0023	0,00	0,00	0,0023
Non hazardous waste disposed	[kg]	1,1303	0,0097	0,0104	1,15
Radioactive waste disposed	[kg]	0,0000	0,00	0,00	0,00
Components for re-use	[kg]	0,1349	0,00	0,0052	0,1401
Materials for recycling	[kg]	0,104	0,00	0,0010	0,1048
Materials for energy recovery	[kg]	0,00	0,00	0,00	0,00
Exported energy	[MJ]	0,00	0,00	0,00	0,00

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



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

Environmental impacts: transport of 1 m <sup>2</sup> to:					
Indicator	Unit	Poland	Germany	Scandinavia	Czech
Global warming potential	[kg CO <sub>2</sub> 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 <sub>2</sub> eq.]	0,0009	0,0015	0,0040	0,0012
Eutrophication potential	[kg (PO <sub>4</sub> ) <sup>3-</sup> 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 <sup>2</sup> 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 <sup>3</sup> ]	0,01	0,012	0,04	0,012
Other environmental information describing waste categories: transport of 1 m <sup>2</sup> 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



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 <input checked="" type="checkbox"/> external <input type="checkbox"/> 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  The European Platform of EPD program operators.

### Normative references

- ISO14025: 2006, Environmental management – Type III environmental declarations – Principles and procedure.
- ISO 21930: 2007, Sustainability in building and construction – Environmental declaration of building products.
- ISO14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.
- ISO15686-1: 2000, Buildings and constructed assets — Service life planning — Part 1: General principles
- ISO15686-8: 2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN15804+A1, Sustainability in 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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## **ŚWIADECTWO nr 029/2015 DEKLARACJI ŚRODOWISKOWEJ III TYPU**

Wyrób:

**ZŁOŻONY SYSTEM IZOLACJI CIEPŁEJ NA WELNIE MINERALNEJ  
Z WYPRAWAMI TYNKARSKIMI BOLIX**

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**

**Zrównoważoność obiektów budowlanych.**

**Deklaracje środowiskowe wyrobu.**

**Podstawowe zasady kategoryzacji wyrobów budowlanych.**

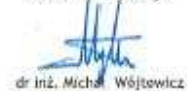
Niniejsze świadectwo, wydane po raz pierwszy 1 stycznia 2015 r. jest ważne 5 lat,  
lub do czasu zmiany wymienionej Deklaracji Środowiskowej

Kierownik  
Zakładu Fizyki Ciepłej,  
Instalacji Sanitarnych i Środowiska

  
dr inż. Robert Geryło



Zastępca Dyrektora  
ds. Badań i Rozwoju

  
dr inż. Michał Wójtowicz

Warszawa, styczeń 2015 r.