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Gypsum plasters ALFA, BETA, GAMMA, ZETA, SPRINT, TEMPO



EPD Program Operator:

Instytut Techniki Budowlanej (ITB)
Address: Filtrowa 1, 00-611 Warsaw, Poland
Website: www.itb.pl
Contact: Justyna Tomaszewska
j.tomaszewska@itb.pl
energia@itb.pl

Owner of the EPD:

Atlas Sp. z o.o.
Address: leszcze 15
28-400 Pinczów, Poland
Website: <http://www.dolina-nidy.com.pl/>
Tel.: +48 (41) 35 78 125
Fax: +48 (41) 35 78 124

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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: 2019

Product standard: PN-EN 13279

Service Life: under normal conditions, gypsum plaster have an expected service life well in excess of 50 years

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

Declared unit: 1 kg

Reasons for performing LCA: B2B

Representativeness: Polish product

MANUFACTURER

The Gypsum Industry Company Dolina Nidy was established in 1952. Since 2000 Dolina Nidy sp. z o.o. belongs to Altas Group, the Polish manufacturer of construction chemicals. The company offers gypsum binders, projection or manual gypsum plasters, different types of finishing coats, adhesives to plasterboard, and gypsum used in mining. Dolina Nidy is a manufacturer of gypsum plasters intended for plastering internal walls and ceilings. These plasters are based on two types of raw materials: natural, exploited from gypsum quarry, and FGD (synthetic) gypsum, which is a by-product in the process of desulfurization of fumes in a power plant. Depending on the type of raw material, the following products are distinguished:

- based on FGD (synthetic) gypsum:
 - Tynk gipsowy maszynowy lekki plus ALFA
 - Tynk gipsowy maszynowy lekki BETA
 - Tynk gipsowy ręczny GAMMA
 - Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA
- based on natural gypsum:
 - Tynk gipsowy maszynowy lekki SPRINT
 - Tynk gipsowy maszynowy TEMPO.

FGD gypsum is a unique synthetic product derived from flue gas desulfurization systems at electric power plants. Both natural and FGD gypsum are inert, non-toxic materials, harmless to human life in their natural state. They have Radiation Hygiene Certificate (see Appendix no. 1-2) and in 2010 have been registered in accordance with REACH Regulation (EC) No 1907/2006 (registration number 01-2119444918-26-0138)

Based on these two types of raw materials, as the only in Poland, Dolina Nidy gypsum plasters are healthy, ecological and human friendly. They create a comfortable living environment by humidity regulation and enhance thermal insulation properties.

Dolina Nidy has implemented an Integrated Management System consisting of three complementary subsystems:

- the quality management ISO 9001:2008 (since 2002)
- environmental management ISO 14001:2004 + Cor 1:2009 (since 2004);
- the management of occupational health and safety PN-N 18001:2004 (since 2008).

The Integrated Management System Policy defines the principal directions of DOLINA NIDY activities with a view to offering products that are safe and environmentally friendly. This is achieved by professional product development, state-of-the-art production process and meticulous quality control. The System is based on the process approach, this means that all the processes that have an impact on quality have been identified and described and members of the staff have been appointed and authorized to manage these processes.

FGD gypsum is a synthetic product derived from flue gas desulfurization systems at electric power plants. Both natural and FGD gypsum are inert, non-toxic materials, harmless to human life in their natural state. They have Radiation Hygiene Certificate and in 2010 have been registered in accordance with REACH Regulation (EC) No 1907/2006 (registration number 01-2119444918-26-0138).

Dolina Nidy has implemented and maintains a Quality and Environmental Management System fulfilling requirements of the following standards:

- ISO 9001:2008 and ISO 14001:2004 + Cor1:2009 (registration number 255019 QM08/UM),
- Occupational health and safety Management System PN-EN 18001:2004 (registration number 255019 OH/PL).

Scope of certificates: Formula design, production and sale of gypsum binder and dry mix gypsum.

Certification body DQS-PSA accreditation number AC 087, Deutsche Akkreditierungsstelle D-ZM16074-01-00.

Since 2007, Dolina Nidy has implemented European Eco-Management and Audit Scheme (EMAS) which sets additional requirements connected with active involvement of employees, adaption of undertaken actions to legal regulations, transparency of undertaken actions and obtained results, as well as dialogue with the community. EMAS registration number PL 2.26-001-8.

PRODUCT DESCRIPTION AND APPLICATION

Gypsum plasters are produced in accordance with standard PN-EN 13279-1:2009. There are ready to internal use as a one coat plaster system. Depending on the application, there are distinguished projection and manual plasters. Projection plaster is formulated for mechanical application, mixed with water to the required consistency and applied by the projection machine to the background. Manual plaster is formulated for manual application, batch mixed with water to the required consistency and applied manually to the background. According to PN-EN 13279-1:2009 standard plasters are divided into following types:

Table 1. General formulation of gypsum plasters

Components	% of mass
Gypsum binder	45÷65
Anhydrite binder	5÷20
Limestone filler	30÷35
Hydrated lime	1÷3
Expanded perlite	1÷3
Additives, each	< 0.5%

Table 2. Characteristics of the gypsum plasters

Description	Dry mortar, gypsum based plaster blended at the factory that requires only mixing with a required quantity of water
Destination	For interior use only, on mineral walls and ceilings made of: concrete, lightweight concrete, ceramic and lime-sand block and brick
Components	Gypsum hemihydrates, anhydrite, mineral fillers (calcium, dolomite and perlite), hydrated lime, chemical additives
Package	20, 25 or 30 kg paper bags and silo system
Colour	ALFA, BETA, GAMMA, ZETA – yellow, SPRINT, TEMPO – grey

Table 3. Application of the gypsum plasters

Standard designation	Type of application	Trade name
Lightweight gypsum building plaster	projection gypsum plaster	Tynk gipsowy maszynowy lekki plus ALFA, Tynk gipsowy maszynowy lekki BETA, Tynk gipsowy maszynowy lekki SPRINT
Gypsum building plaster	projection gypsum plaster	Tynk gipsowy maszynowy TEMPO
Gypsum building plaster	manual gypsum plaster	Tynk gipsowy ręczny GAMMA

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Gypsum plaster for plasterwork with enhanced surface hardness	projection gypsum plaster	Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA
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Tynk Gipsowy maszynowy lekki plus ALFA, Tynk gipsowy maszynowy lekki BETA, Tynk gipsowy maszynowy lekki SPRINT, Tynk gipsowy maszynowy TEMPO, Tynk gipsowy ręczny GAMMA, Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA there are one-coat, interior use, gypsum based plasters, designed for machine or manual application. The plasters after applying, finishing and drying give a protecting and decorative layer for walls and ceilings. It can provide a background for decorative elements or a smooth surface direct for painting or wallpapering.

Gypsum plasters advantages are the following: comfortable living environment by humidity regulation, increase a thermal insulation of walls, fire resistant, no shrinkage cracks, smooth and aesthetic surface.

TECHNICAL PARAMATERES

Technial parameters of Tynk Gipsowy maszynowy lekki plus ALFA, Tynk gipsowy maszynowy lekki BETA, Tynk gipsowy maszynowy lekki SPRINT, Tynk gipsowy maszynowy TEMPO, Tynk gipsowy ręczny GAMMA, Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA are listed in tables 4 – 9.

Tabel 4. Characteristics of Tynk gipsowy maszynowy lekki plus ALFA

Trade name	Tynk gipsowy maszynowy lekki plus ALFA
Standard designation	B4/50/2 – PN-EN 13279-1:2009
CE number	EC 26/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.1 N/mm ²
Compressive strength	≥ 3.0 N/mm ²
Flexural strength	≥ 1.0 N/mm ²
Thermal conductivity	0.26 W/(m·K)
Bulk density	800 kg/m ³
Dry density	900 kg/m ³
Yield	130 dm ³ /100 kg
Coat thickness	8-30 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 26/CPR, Radiation Hygiene Certificate no HR/B/104/2011 Hygienic Certificate no HK/B/0124/01/2015 Technical Data Sheet Material Safety Data Sheet

Tabel 5. Characteristics of Tynk gipsowy maszynowy lekki BETA

Trade name	Tynk gipsowy maszynowy lekki BETA
Standard designation	B4/50/2 – PN-EN 13279-1:2009
CE number	EC 19/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.1 N/mm ²
Compressive strength	≥ 2.0 N/mm ²
Flexural strength	≥ 1.0 N/mm ²
Thermal conductivity	0.27 W/(m·K)
Bulk density	780 kg/m ³
Dry density	850 kg/m ³
Yield	130 dm ³ /100 kg
Coat thickness	8-30 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 19/CPR, Radiation Hygiene Certificate no HR/B/105/2011 Hygienic Certificate no HK/B/0124/01/2015 Technical Data Sheet Material Safety Data Sheet

Tabel 6. Characteristics of Tynk gipsowy maszynowy lekki SPRINT

Trade name	Tynk gipsowy maszynowy lekki SPRINT
Standard designation	B4/50/2- PN-EN 13279:2009
CE number	EC 10/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.1 N/mm ²
Compressive strength	≥ 2.0 N/mm ²
Flexural strength	≥ 1.0 N/mm ²
Thermal conductivity	0.30 W/(m·K)
Bulk density	800 kg/m ³
Dry density	850 kg/m ³
Yield	120 dm ³ /100 kg
Coat thickness	8-30 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 10/CPR, Radiation Hygiene Certificate no HR/B/106/2011 Hygienic Certificate no HK/B/0891/02/2017 Technical Data Sheet Material Safety Data Sheet

Tabel 7. Characteristics of Tynk gipsowy maszynowy TEMPO

Trade name	Tynk gipsowy maszynowy TEMPO
Standard designation	B1/50/2- PN-EN 1327-1:2009
CE number	EC 09/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.1 N/mm ²
Compressive strength	≥ 2.0 N/mm ²
Flexural strength	≥ 1.0 N/mm ²
Thermal conductivity	0.32 W/(m·K)
Bulk density	900 kg/m ³
Dry density	900 kg/m ³
Yield	110 dm ³ /100 kg
Coat thickness	8-25 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 09/CPR, Radiation Hygiene Certificate no HR/B/72/2009 Hygienic Certificate no HK/B/0891/02/2017 Technical Data Sheet Material Safety Data Sheet

Tabel 8. Characteristics of Tynk gipsowy ręczny GAMMA

Trade name	Tynk gipsowy ręczny GAMMA
Standard designation	B1/20/2- PN-EN 13279:2009
CE number	EC 25/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.3 N/mm ²
Compressive strength	≥ 3.0 N/mm ²
Flexural strength	≥ 1.5 N/mm ²
Thermal conductivity	0.28 W/(m·K)
Bulk density	800 kg/m ³
Dry density	950 kg/m ³
Yield	120 dm ³ /100 kg
Coat thickness	8-30 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 25/CPR, Radiation Hygiene Certificate no HR/B/108/2011 Hygienic Certificate no HK/B/0124/01/2015 Technical Data Sheet Material Safety Data Sheet

Tabel 9. Characteristics of Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA

Trade name	Tynk gipsowy maszynowy o zwiększonej twardości powierzchni ZETA
Standard designation	B7/50/6- PN-EN 13279:2009
CE number	EC 28/CPR
Gypsum binder content	≥ 60 %
Adhesive strength	≥ 0.1 N/mm ²
Compressive strength	≥ 6.0 N/mm ²
Flexural strength	≥ 2.0 N/mm ²
Surface hardness	12 N/mm ²
Thermal conductivity	0.45 W/(m·K)
Bulk density	1000 kg/m ³
Dry density	1100 kg/m ³
Yield	110 dm ³ /100 kg
Coat thickness	8-30 mm
Reaction to fire	A1
Product reference documents	Declaration of conformity no EC 28/CPR, Radiation Hygiene Certificate no HR/B/38/2012 Hygienic Certificate no HK/B/0873/01/2017 Technical Data Sheet Material Safety Data Sheet

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of the gypsum plasters is a line process in two production plants of Dolina Nidy in Leszcze and Konin (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction are allocated in A1 module of the EPD (including materials and energy consumption, transportation, emissions and wastes resulting from the production of the gypsum plasters). 100% of impacts from line production of Dolina Nidy were inventoried and were allocated to the gypsum plasters production. Municipal waste and waste water of Leszcze and Konin factories were allocated to module A3. Energy supply was inventoried for whole production processes. Emissions in the factories were measured and were allocated to module A3.

System limits

The life cycle analysis of the declared products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB PCR A. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factories and were included in calculation. 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. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A1, 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 such as gypsum stone, FGD gypsum, limestone, anhydrite, perlite and lime used in the production process come from local suppliers while additives and packaging materials originate from more distant suppliers. 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

a) Zakład produkcyjny Leszcze

The production plant in Leszcze, built in 2003-2007 is a modern full automation complex, consisting of a gypsum stone quarry, a stone storage, a calcination plant, a gypsum binder mixing plant and a storage hall.

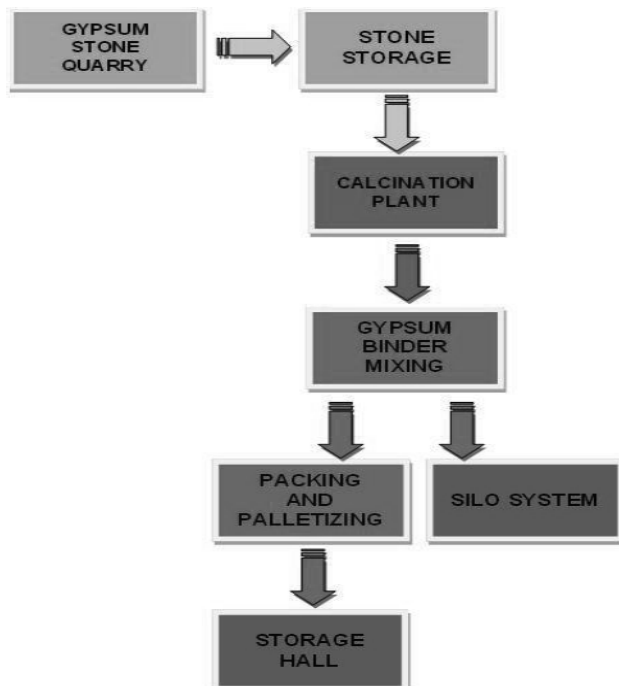


Fig. 2. Diagram of the production process.

Gypsum stone after excavation in the quarry is hold in the store from where goes to further processing. The calcination plant provides mechanical processing and heat treatment of stone. The first stage of the gypsum stones treating is a mechanical process which consists in stones breaking, grinding and drying in a bowl-roll mill. Depending on mill separator speed, different graining rock is obtained, that determines its further use. Then the milled and dried gypsum stone is dispensed to calcinators, where it is heat treated. For various type of binders, some or all crystallization water is removed. In this way, gypsum hemihydrate ($\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$) or anhydrite binder (CaSO_4 - high-burn gypsum) are obtained. Afterwards gypsum is transported from calcinators to silos, and pneumatically transported to the mixing plant subsequently. In the mixing plant - depending on binder type - gypsum is blended in the mixer with different mineral fillers and chemical compounds.

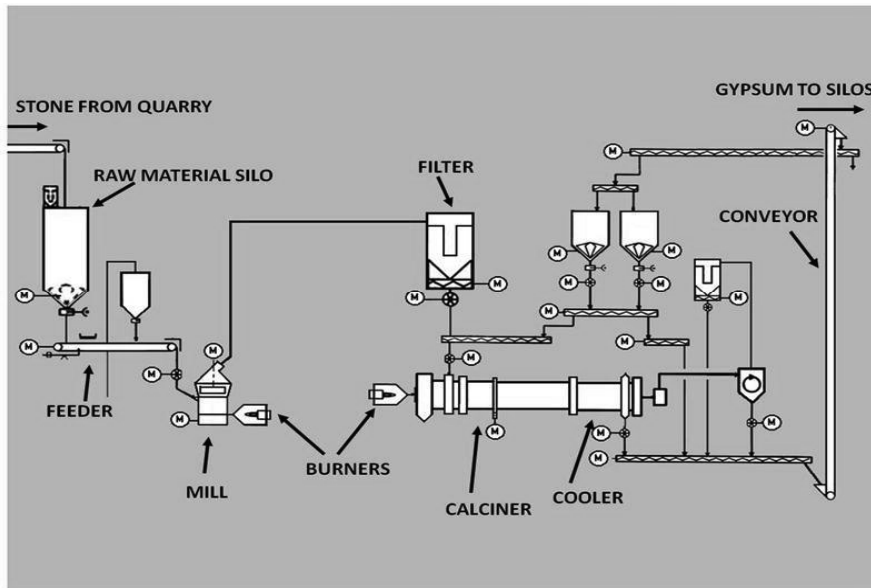


Fig. 3. Calcination process – gypsum and anhydrite binders based on natural stone.

b) Zakład produkcyjny Konin

Gypsum Processing Plant in Konin was built in 2009. The factory produces gypsum binders based on FGD (synthetic) raw material, obtained as by-product in the process of desulfurization of fumes in a power plant. As a heating agent in calcination process in this factory, saturated water vapour from a power plant is used. It is the only installation of this type in Poland. This innovative process of gypsum calcination provides no emission of CO_2 , NO_x , SO_x and combustion dust. Moreover usage of synthetic gypsum as a waste material leads to reduction of natural resources consumption. The Konin plant consist of a gypsum calcination plant, a mixing plant, a packing and a palletizing line. Raw material is transported directly through a converted belt conveyor to a calcination plant, where is heat treated. Gypsum binder is transported from calcinator to silos and next to mixing plant.

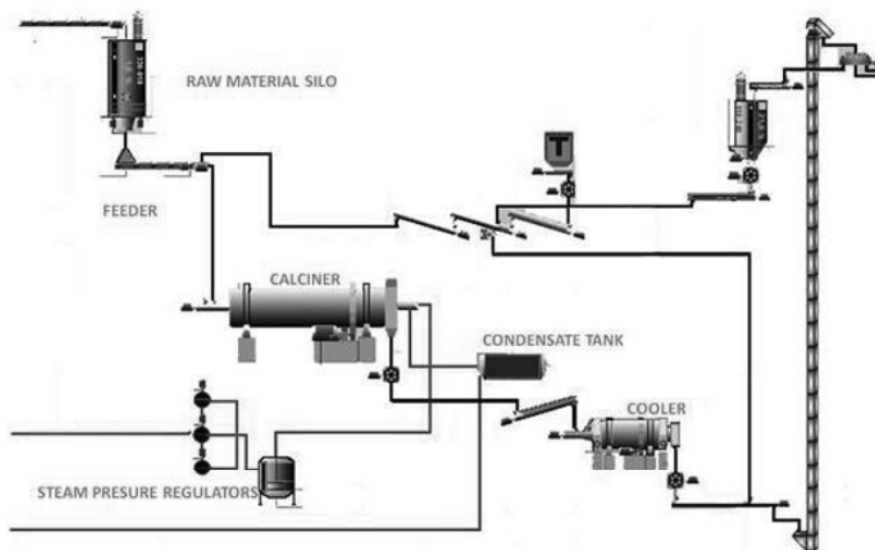


Figure 5. Calcination process – binders based on FGD gypsum.

Data collection period

The data for the production of the declared products refer to period between 01.01.2017 – 31.12.2017 (1 year). The life cycle assessments were prepared for Poland as reference area.

Data quality

The values determined to calculate the LCA originate from verified Dolina Nidy inventory data.

Assumptions and estimates

The impacts of the representative gypsum plasters were aggregated using weighted average. Impacts were inventoried and calculated for all products of the gypsum plasters.

Calculation rules

LCA was done in accordance with ITB PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.5, specific EPDs, ELCD, Ullmann’s, 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 functional unit (FU) – 1 kg of the gypsum plasters manufactured by Dolina Nidy.

Table 10. System boundaries for the environmental characteristic of the gypsum plasters.

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 processes	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

ALFA gypsum plaster (unpacked, Konin)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	5.80E-02	7.45E-03	1.89E-03	6.73E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8.67E-09	0.00E+00	0.00E+00	8.67E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	1.72E-04	5.44E-05	0.00E+00	2.26E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	1.90E-05	9.60E-06	0.00E+00	2.86E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3.60E-06	3.97E-06	0.00E+00	7.57E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.23E-04	0.00E+00	7.00E-09	3.23E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6.13E-01	4.91E-02	1.95E-02	6.73E-02
Environmental aspects on resource use: (FU) 1 kg					
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]	8.71E-01	3.44E-03	1.33E-03	8.76E-01
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]	6.77E-01	5.16E-02	2.05E-02	7.49E-01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	2.58E-03	0.00E+00	2.58E-03
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.59E-09	1.41E-07	0.00E+00	1.47E-07
Non-hazardous waste disposed	[kg]	3.10E-03	1.31E-04	5.16E-05	3.28E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	1.42E-03	1.42E-03
Materials for recycling	[kg]	9.86E-06	0.00E+00	1.16E-04	1.26E-04
Materials for energy recover	[kg]	0.00E+00	0.00E+00	3.17E-05	3.17E-05
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ALFA gypsum plaster (packed, Konin)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7.20E-02	6.52E-03	1.89E-03	8.04E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.12E-09	0.00E+00	0.00E+00	9.12E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.27E-04	4.76E-05	0.00E+00	2.75E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.61E-05	8.39E-06	0.00E+00	3.45E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.09E-05	3.47E-06	0.00E+00	1.44E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.77E-04	0.00E+00	7.00E-09	3.77E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6.79E-01	4.52E-02	1.95E-02	7.44E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	8.71E-01	3.17E-03	1.33E-03	8.76E-01
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]	6.90E-01	4.75E-02	2.05E-02	7.58E-01
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	2.38E-03	0.00E+00	5.38E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.59E-09	7.72E-08	0.00E+00	8.28E-08
Non-hazardous waste disposed	[kg]	3.10E-03	7.17E-05	5.16E-05	3.22E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	1.42E-03	1.42E-03
Materials for recycling	[kg]	9.86E-06	0.00E+00	1.16E-04	1.26E-04
Materials for energy recover	[kg]	0.00E+00	0.00E+00	3.17E-05	3.17E-05
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ALFA gypsum plaster (unpacked, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	5.80E-02	2.00E-03	1.32E-02	7.32E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8.67E-09	0.00E+00	0.00E+00	8.67E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	1.72E-04	1.46E-05	0.00E+00	1.87E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	1.90E-05	2.57E-06	0.00E+00	2.16E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3.60E-06	1.06E-06	0.00E+00	4.66E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.23E-04	0.00E+00	4.88E-08	3.23E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6.12E-01	1.33E-02	1.36E-01	7.61E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	6.10E-02	9.33E-04	9.95E-03	7.19E-02
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]	6.77E-01	1.40E-02	1.42E-01	8.33E-01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	7.00E-04	0.00E+00	7.00E-04
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.58E-09	1.15E-08	2.37E-09	1.94E-08
Non-hazardous waste disposed	[kg]	3.08E-03	1.07E-05	4.67E-06	3.10E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.70E-06	0.00E+00	3.91E-09	9.70E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ALFA gypsum plaster (packed, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7.20E-02	2.14E-03	1.32E-02	8.73E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.12E-09	0.00E+00	0.00E+00	9.12E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.26E-04	1.56E-05	0.00E+00	2.42E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.61E-05	2.75E-06	0.00E+00	2.89E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.09E-05	1.14E-06	0.00E+00	1.20E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.77E-04	0.00E+00	4.88E-08	3.77E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	6.78E-01	1.58E-02	1.36E-01	8.29E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	6.10E-02	1.10E-03	9.95E-03	7.21E-02
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]	6.89E-01	1.66E-02	1.42E-01	8.48E-01
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	8.28E-04	0.00E+00	3.83E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.58E-09	1.67E-08	2.37E-09	2.47E-08
Non-hazardous waste disposed	[kg]	3.08E-03	1.55E-05	4.67E-06	3.10E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.70E-06	0.00E+00	3.91E-09	9.70E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BETA gypsum plaster (unpacked, Konin)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7.60E-02	9.39E-03	1.89E-03	8.73E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.10E-09	0.00E+00	0.00E+00	9.10E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	1.90E-04	6.85E-05	0.00E+00	2.59E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.34E-05	1.21E-05	0.00E+00	3.55E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3.92E-06	5.00E-06	0.00E+00	8.92E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.33E-04	0.00E+00	7.00E-09	3.33E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	7.63E-01	6.14E-02	1.95E-02	8.44E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	7.49E-01	4.30E-03	1.33E-03	7.55E-01
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]	8.31E-01	6.45E-02	2.05E-02	9.16E-01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	3.23E-03	0.00E+00	3.23E-03
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4.41E-07	1.41E-07	0.00E+00	5.82E-07
Non-hazardous waste disposed	[kg]	3.00E-03	1.31E-04	5.16E-05	3.18E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	1.42E-03	1.42E-03
Materials for recycling	[kg]	9.13E-06	0.00E+00	1.16E-04	1.25E-04
Materials for energy recover	[kg]	0.00E+00	0.00E+00	3.17E-05	3.17E-05
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BETA gypsum plaster (packed, Konin)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	9.10E-02	9.48E-03	1.89E-03	1.02E-01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.55E-09	0.00E+00	0.00E+00	9.55E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.45E-04	6.92E-05	0.00E+00	3.14E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.05E-05	1.22E-05	0.00E+00	4.27E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.12E-05	5.05E-06	0.00E+00	1.62E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.87E-04	0.00E+00	7.00E-09	3.87E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	8.29E-01	6.38E-02	1.95E-02	9.12E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	7.49E-01	4.47E-03	1.33E-03	7.55E-01
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]	8.43E-01	6.70E-02	2.05E-02	9.30E-01
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	3.35E-03	0.00E+00	6.35E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4.41E-07	8.08E-08	0.00E+00	5.22E-07
Non-hazardous waste disposed	[kg]	3.00E-03	7.50E-05	5.16E-05	3.13E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	1.42E-03	1.42E-03
Materials for recycling	[kg]	9.13E-06	0.00E+00	1.16E-04	1.25E-04
Materials for energy recover	[kg]	0.00E+00	0.00E+00	3.17E-05	3.17E-05
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BETA gypsum plaster (unpacked, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	7.60E-02	1.70E-03	1.32E-02	9.09E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.10E-09	0.00E+00	0.00E+00	9.10E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	1.90E-04	1.24E-05	0.00E+00	2.02E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.34E-05	2.19E-06	0.00E+00	2.56E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	3.92E-06	9.07E-07	0.00E+00	4.83E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.33E-04	0.00E+00	4.88E-08	3.33E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	7.63E-01	1.14E-02	1.36E-01	9.10E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	8.40E-02	7.98E-04	9.95E-03	9.48E-02
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]	1.64E+00	1.20E-02	1.42E-01	1.80E+00
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	5.98E-04	0.00E+00	5.98E-04
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4.41E-07	0.00E+00	2.37E-09	4.43E-07
Non-hazardous waste disposed	[kg]	3.00E-03	0.00E+00	4.67E-06	3.00E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.13E-06	0.00E+00	3.91E-09	9.13E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

BETA gypsum plaster (packed, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	9.10E-02	1.85E-03	1.32E-02	1.06E-01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	9.55E-09	0.00E+00	0.00E+00	9.55E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.45E-04	1.35E-05	0.00E+00	2.58E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.05E-05	2.38E-06	0.00E+00	3.29E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.12E-05	9.83E-07	0.00E+00	1.22E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.87E-04	0.00E+00	4.88E-08	3.87E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	8.29E-01	1.38E-02	1.36E-01	9.78E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	8.30E-02	9.63E-04	9.95E-03	9.39E-02
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]	1.65E+00	1.45E-02	1.42E-01	1.81E+00
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	7.23E-04	0.00E+00	3.72E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4.41E-07	2.26E-10	2.37E-09	4.44E-07
Non-hazardous waste disposed	[kg]	2.95E-03	2.10E-07	4.67E-06	2.95E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.13E-06	0.00E+00	3.91E-09	9.13E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SPRINT gypsum plaster (unpacked, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1.21E-01	1.45E-03	1.32E-02	1.36E-01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8.45E-09	0.00E+00	0.00E+00	8.45E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.07E-04	1.06E-05	0.00E+00	2.18E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.15E-05	1.87E-06	0.00E+00	3.34E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	4.16E-06	7.73E-07	0.00E+00	4.93E-06
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2.94E-04	0.00E+00	4.88E-08	2.94E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.10E+00	9.87E-03	1.36E-01	1.24E+00
Environmental aspects on resource use: (FU) 1 kg					
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]	2.00E-02	6.91E-04	9.95E-03	3.06E-02
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]	1.16E+00	1.04E-02	1.42E-01	1.31E+00
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	0.00E+00	5.18E-04	0.00E+00	5.18E-04
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.82E-06	7.19E-10	2.37E-09	1.82E-06
Non-hazardous waste disposed	[kg]	1.30E-03	6.68E-07	4.67E-06	1.31E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	2.91E-06	0.00E+00	3.91E-09	2.91E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

SPRINT gypsum plaster (packed. Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1.36E-01	2.14E-03	1.32E-02	1.51E-01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8.89E-09	0.00E+00	0.00E+00	8.89E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.62E-04	1.56E-05	0.00E+00	2.78E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.87E-05	2.75E-06	0.00E+00	4.15E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.14E-05	1.14E-06	0.00E+00	1.25E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.48E-04	0.00E+00	4.88E-08	3.48E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.16E+00	1.58E-02	1.36E-01	1.31E+00
Environmental aspects on resource use: (FU) 1 kg					
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]	2.00E-02	1.10E-03	9.95E-03	3.11E-02
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]	1.17E+00	1.66E-02	1.42E-01	1.33E+00
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	8.28E-04	0.00E+00	3.83E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.82E-06	6.80E-10	2.37E-09	1.82E-06
Non-hazardous waste disposed	[kg]	1.30E-03	6.31E-07	4.67E-06	1.31E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	2.91E-06	0.00E+00	3.91E-09	2.91E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

GAMMA gypsum plaster (packed, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	8.20E-02	2.24E-03	1.32E-02	9.74E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	1.12E-08	0.00E+00	0.00E+00	1.12E-08
Acidification potential of soil and water	[kg SO ₂ eq.]	2.54E-04	1.64E-05	0.00E+00	2.70E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.86E-05	2.89E-06	0.00E+00	3.15E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.09E-05	1.19E-06	0.00E+00	1.21E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4.45E-04	0.00E+00	4.88E-08	4.45E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	8.20E-01	1.67E-02	1.36E-01	9.72E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	8.20E-02	1.17E-03	9.95E-03	9.31E-02
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]	8.45E-01	1.75E-02	1.42E-01	1.00E+00
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	8.75E-04	0.00E+00	3.87E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	5.06E-10	6.62E-10	2.37E-09	3.54E-09
Non-hazardous waste disposed	[kg]	3.20E-03	6.15E-07	4.67E-06	3.21E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	1.02E-05	0.00E+00	3.91E-09	1.02E-05
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TEMPO gypsum plaster (packed, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1.36E-01	1.60E-03	1.32E-02	1.51E-01
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	8.89E-09	0.00E+00	0.00E+00	8.89E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	2.64E-04	1.16E-05	0.00E+00	2.76E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.90E-05	2.05E-06	0.00E+00	4.11E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.15E-05	8.49E-07	0.00E+00	1.23E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	3.48E-04	0.00E+00	4.88E-08	3.48E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.16E+00	1.32E-02	1.36E-01	1.31E+00
Environmental aspects on resource use: (FU) 1 kg					
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]	2.00E-02	9.23E-04	9.95E-03	3.09E-02
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]	1.28E+00	1.38E-02	1.42E-01	1.43E+00
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	6.92E-04	0.00E+00	3.69E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.82E-06	6.99E-10	2.37E-09	1.82E-06
Non-hazardous waste disposed	[kg]	1.30E-03	6.49E-07	4.67E-06	1.31E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	2.91E-06	0.00E+00	3.91E-09	2.91E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ZETA gypsum plaster (packed, Leszcze)

Environmental impacts: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	6.10E-02	2.07E-02	1.32E-02	9.49E-02
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	6.63E-09	0.00E+00	0.00E+00	6.63E-09
Acidification potential of soil and water	[kg SO ₂ eq.]	1.87E-04	1.51E-04	0.00E+00	3.38E-04
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.12E-05	2.67E-05	0.00E+00	4.79E-05
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.04E-05	1.10E-05	0.00E+00	2.14E-05
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	2.98E-04	0.00E+00	4.88E-08	2.98E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5.23E-01	0.00E+00	1.36E-01	6.59E-01
Environmental aspects on resource use: (FU) 1 kg					
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]	8.15E-01	2.98E-05	9.95E-03	8.25E-01
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]	5.14E-01	0.00E+00	1.42E-01	6.56E-01
Use of secondary material	[kg]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Use of renewable secondary fuels	[MJ]	3.00E-03	0.00E+00	0.00E+00	3.00E-03
Use of non-renewable secondary fuels	[MJ]	2.00E-03	0.00E+00	0.00E+00	2.00E-03
Net use of fresh water	[m ³]	INA	INA	INA	INA
Other environmental information describing waste categories: (FU) 1 kg					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	4.58E-10	1.09E-06	2.37E-09	1.10E-06
Non-hazardous waste disposed	[kg]	2.90E-03	1.01E-03	4.67E-06	3.92E-03
Radioactive waste disposed	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	9.22E-06	0.00E+00	3.91E-09	9.22E-06
Materials for energy recover	[kg]	0.00E+00	0.00E+00	1.52E-07	1.52E-07
Exported energy	[MJ per energy carrier]	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. 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 (subclause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA. LCI audit and input data verification: PhD. Eng. Justyna Tomaszewska. j.tomaszewska@itb.pl Verification of LCA: PhD. Eng. Michał Piasecki. m.piasecki@itb.pl

Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006. Environmental labels and declarations – Type III environmental declarations – Principles and procedure
- 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 in construction works – Environmental product declarations – Core rules for the product category of construction products
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO₂. SO₂. NO_x. CO i pyłu całkowitego dla energii elektrycznej. grudzień 2017
- PN-EN 13279-1:2009 – Spoiwa gipsowe i tynki gipsowe -- Część 1: Definicje i wymagania



Building Research Institute

00-611 Warszawa, ul. Filtrowa 1



Instytut Techniki Budowlanej

00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE No 083/2019 of TYPE III ENVIRONMENTAL DECLARATION

Product:

**DOLINA NIDY Gypsum plasters:
ALFA, BETA, GAMMA, ZETA, SPRINT, TEMPO**

Manufacturer:

DOLINA NIDY Sp. z o.o.

Leszcze 15, 28-400 Pińczów, Poland

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

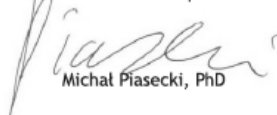
Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 15th May 2019 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics
and Environment Department


Michał Piasecki, PhD



Deputy Director
for Research and Innovation


Krzysztof Kuczyński, PhD

Warsaw, May 2019