

Environmental Product Declaration



In accordance with
EN 15 804
ISO 14 025




Alternative products:	UniFloc, WARMCEL, THERMOCEL, LACELLULOSA® in fiocchi, EASYCELL, CELLISOL, ZELLOFIX, SOUNDCEL INSULATION
Manufactured by:	CIUR a.s.
EPD programme:	Národní program environmentálního značení
Declaration number:	3013EPD-16-0539
Issued:	1.12.2016
Valid until:	30.11.2021
Verified by:	Building Research Institute - Certification company Ltd. Accredited third party verifier



Climatizer Plus® cellulose blown insulation

General Information



Manufacturer	CIUR a.s.
Official address	Malé náměstí 142/3, 110 00 Prague 1, Czech Republic
Manufacturing site	Pražská 1012, 250 01 Brandýs nad Labem, Czech Republic
About	CIUR a.s. is a manufacturing company with a successful history of producing cellulose fibres since 1991. We have researched, developed and implemented processes, that allow paper to be taken back to its original fibrous state with specific structural and performance properties. Our main manufacturing focus is the production of cellulose fibre, Climatizer Plus [®] , which is used for thermally insulating buildings. Gradually since 1993 we have also introduced the production processes for the manufacturing of industrial fibres that are used for various industrial applications.
	
Website	www.ciur.cz; www.climatizer.com
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Product	Climatizer Plus[®]
Alternative products	UniFloc, WARMCEL, THERMOCEL, LACELLULOSA [®] in fiocchi, EASYCELL, CELLISOL, ZELLOFIX, SOUNDCEL INSULATION
Description	Climatizer Plus[®] is a Superior Ecological Thermal Insulation for walls, floors, lofts and roofs manufactured from 100% recycled newsprint with fire-retardant salts.
Product code (HS)	48239085, (CPC2.1 32199)
EPD	Environmental Product Declaration
EPD Programme	Národní program environmentálního značení (National programme of environmental labelling)
Declaration number	3013EPD-16-0539
Registration date	1.12.2016
Valid until	30.11.2021
General PCR	EN 15 804
Prepared by	Jan Weinzettel, Charles University, Environment Centre (e-mail: weinzettel@seznam.cz)
Based on	Weinzettel J. and D. Kapitulčinová, LCA studie vybraných produktů firmy CIUR a.s. (LCA study of selected CIUR products), CIUR, 2016
Verified by	Barbora Vlasatá, Bulding Research Institute – Certification Company Ltd. (e-mail: vlasata@vups.cz)
Accredited by	Czech Accreditation Institute (a national accreditation body)

Product



Description

Climatizer Plus® cellulose blown insulation has been manufactured based on the original Canadian license since 1991. The raw material of cellulose insulation is 100% recycled newsprint, which is shredded, milled and impregnated with mineral additives.

Climatizer Plus® is **not attractive** to vermin and small organisms and is resistant to mould and mildew. Mineral fire retardants are added to **Climatizer Plus®** in order to provide excellent reaction to fire performance.

With this unique production technology **Climatizer Plus®** not only has a superior performance in thermal and sound insulation, but also has long-term efficiency and durability.

The product is supplied with a guarantee when it is installed by trained professional and certified companies.

Choose Climatizer Plus® cellulose insulation over other types of insulation, it is:

- Environmentally responsible and environmentally safe
 - Made from recycled materials
 - No known associated health risks for humans and their pets
- Superior thermal insulator: reduces air leakage and convective heat loss
- Achieves a tight building envelope, protecting against air infiltration
- Completely fills cavities and hard-to-reach places that are difficult to insulate with traditional insulation
- Maintains its specified R-value over a wide range of densities and temperatures
- Specified and sold at „settled“ density
- Proven as a cost-effective solution with results that stand the test of time
- Suitable for new construction or retrofits
- Has a high thermal mass (decrement delay), which prevents over heating in the summer
- Excellent acoustic insulation properties

Insulation of Horizontal Surfaces (lofts, ceilings and floors)

Insulation of Sloping Roofs

Insulation of Twin-Canopy Ventilated Roofs

Insulation of Vertical Wall Structures (external and internal partition)

Insulation Spray for walls and ceilings

More than just Insulation



General Information



More than just Insulation

For homeowners or builders, there are many reasons to choose Climatizer Plus® insulation. Working with a high quality product is one. Being environmentally responsible is another. Climatizer Plus® is designed for thermal and acoustic insulation in both external and internal building element structures - pitched roofs, attics, ceilings, floors between joists or beams, partition walls, ceilings and others.

Installation is carried out by using blowing machines (dry application or by spraying). Dry insulation application is possible by open blowing (e.g. lofts) or, more commonly by injection filling into prepared cavity walls, roofs or ceilings. The system penetrates very easily into the smallest corners and hence provides a full fill installation without any air gaps. Blowing technology ensures quick, easy and effective work. When using the open blowing application it is necessary to apply a settlement value of about 10% - 15% (install the product at 10-15% increased depth in order to meet a target settled U value). For dry cavity injection, the manufacturer installation instructions regarding minimum required density should be followed, in order to avoid any settlement.

The damp spray technique can be applied to internal and external wall structures using a fine mist of moisture or glue. For horizontal application the damp spray technique can be used in combination with approved glue only.

Minimal density for dry cellulose insulation application

(actual density depends on the specific application and can be higher):

- Open blowing in horizontal surfaces and ceiling cavities with gradient up to 10°: 30 kg/m³
- Volume filling of cavities of sloping roofs and ceilings: 40 kg/m³
- Volume filling in walls: 50 kg/m³

Table 1 Selected properties.

Parameter	Measured Value	Unit	Harmonized Technical Specification
THERMAL PROPERTIES			
Thermal conductivity $\lambda_{D(23/50)}$ - dry injection/dry open blowing	0.038	W·m ⁻¹ ·K ⁻¹	EN 12667
Specific heat capacity c_d	2020 ± 6%	J·kg ⁻¹ ·K ⁻¹	EN ISO 8990, EN 675
PHYSICAL PROPERTIES			
Settling rate (volume filling – ceilings, roofs, partitions)	undetectable (≤1)	%	-
FIRE PROPERTIES			
Reaction to fire – dry material	E	-	EN 13501-1
Maximum used temperature	80 (105 for short time)	°C	-
OTHER PROPERTIES			
Diffusion resistance factor μ	2	-	EN 12086

Details

Function and declared unit

The main function of Climatizer Plus® is to provide thermal insulation. The declared unit is a provision of the thermic isolation of a 1m² structure with a thermal resistance of 1m²KW⁻¹ for a non-loadbearing panel located under a waterproof surface over a 50 year period.

Reference flow

The amount of the product required to fulfill the declared unit depends on application type and the corresponding density:

- 1.14 kg for density of 30 kg.m⁻³ (open blowing in horizontal surfaces and ceiling cavities with gradient up to 10°)
- 1.52 kg for density of 40 kg.m⁻³ (volume filling of cavities of sloping roofs and ceilings)
- 1.9 kg for density of 50 kg.m⁻³ (volume filling in walls)

As the overall results are determined by the reference flow, three sets of results are reported, one for each amount of the reference flow. In addition, results per 1 kg of the product are also reported.

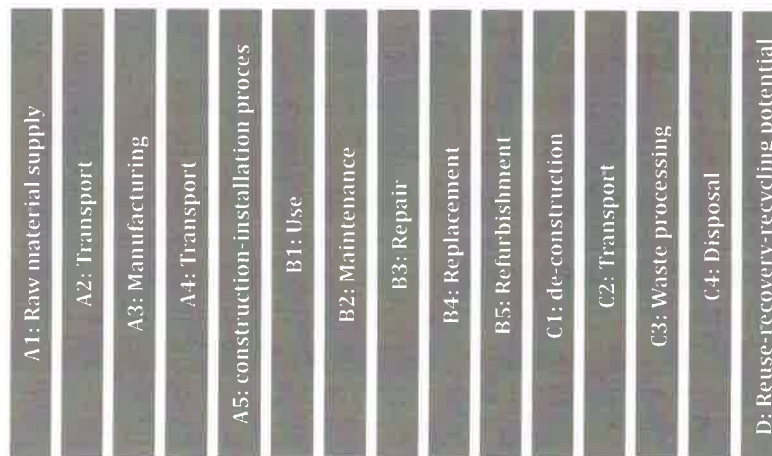


Figure 1 Overview of life cycle modules.

Reference service life

The reference service life is assumed to be 50 years.

Life cycle stages

The life cycle stages covered by this EPD include modules A1-A4, C2-C4, i.e. A1 – raw material supply, A2 – transport of raw materials, A3 – manufacturing, A4 – transport from the manufacturing site, C2 – transport for disposal, C3 – waste processing, and C4 – disposal.

EPD-type

Cradle to gate with options – modules B1-B5 are not relevant for this product and are not part of this EPD.

Comparability of EPD

EPD of construction products may not be comparable if they do not comply with EN 15 804.

Key assumptions

Environmental impacts of upstream processes of all secondary materials are excluded. However, the transport processes to the manufacturing site over a distance of 50 km are included in the assessment.

Due to organic origin of the product and content of materials used as fertilizers (see section on the material content); composting is assumed as the product disposes.

General Information



Electricity mix

Electricity mix used in LCA is the Ecoinvent 3 process Electricity, medium voltage {CZ}| market for | Alloc Def, U with these inputs:

Electricity, high voltage {CZ} electricity production, nuclear, pressure water reactor Alloc Def, U	31%
Electricity, high voltage {CZ} electricity production, lignite Alloc Def, U	30%
Electricity, high voltage {CZ} import from PL Alloc Def, U	9,8%
Electricity, high voltage {CZ} heat and power co-generation, lignite Alloc Def, U	9,5%
Electricity, high voltage {CZ} import from DE Alloc Def, U	2,9%
Electricity, high voltage {CZ} heat and power co-generation, hard coal Alloc Def, U	2,6%
Electricity, high voltage {CZ} treatment of blast furnace gas, in power plant Alloc Def, U	2,4%
Electricity, high voltage {CZ} electricity production, hard coal Alloc Def, U	2,3%
Electricity, high voltage {CZ} heat and power co-generation, wood chips, 6667 kW, state-of-the-art 2014 Alloc Def, U	2,0%
Electricity, high voltage {CZ} electricity production, hydro, run-of-river Alloc Def, U	1,7%
Electricity, high voltage {CZ} heat and power co-generation, biogas, gas engine Alloc Def, U	1,6%
Electricity, high voltage {CZ} heat and power co-generation, natural gas, conventional power plant, 100MW electrical Alloc Def, U	1,2%
Electricity, high voltage {CZ} electricity production, hydro, pumped storage Alloc Def, U	0,80%
Electricity, high voltage {CZ} electricity production, hydro, reservoir, non-alpine region Alloc Def, U	0,58%
Electricity, high voltage {CZ} electricity production, wind, 1-3MW turbine, onshore Alloc Def, U	0,40%
Electricity, high voltage {CZ} treatment of coal gas, in power plant Alloc Def, U	0,27%
Electricity, high voltage {CZ} heat and power co-generation, oil Alloc Def, U	0,07%
Electricity, high voltage {CZ} import from AT Alloc Def, U	0,06%
Electricity, high voltage {CZ} electricity production, wind, <1MW turbine, onshore Alloc Def, U	0,05%
Electricity, high voltage {CZ} electricity production, natural gas, conventional power plant Alloc Def, U	0,04%
Electricity, high voltage {CZ} import from SK Alloc Def, U	0,03%
Electricity, high voltage {CZ} electricity production, oil Alloc Def, U	0,02%
Electricity, high voltage {CZ} electricity production, natural gas, combined cycle power plant Alloc Def, U	0,01%

Allocation

Mass allocation is applied on the processes within the manufacturing site.

System boundaries

Secondary materials are assumed with zero environmental impacts at their production site, then only the transport is included for input materials and no impacts are allocated to waste for re-use generated at the production site. Complete production chains are included for other input products and materials.

Reference year and geographical scope

The EPD is based on data collected for year 2015. The geographical scope is global, however the EPD is only relevant to products manufactured at the specified production site at Brandýs nad Labem, Czech Republic.

Content Declaration



Climatizer Plus® is composed of those materials:

Material	Content
Waste paper	84-91.5%
Boric acid	<4.5%
Magnesium sulfate	5-15%

The main component of **Climatizer Plus®** is waste paper which is a secondary material obtained mainly from surplus production of paper products, such as newsprint.

Boric acid and magnesium sulphate are popular substances used as fertilizers. In **Climatizer Plus®** they serve as a fire retardant and protection against biological degradation. Due to both additional materials used as fertilizers, composting is considered as a suitable product disposal.

Environmental Performance



Resource use

Table 2 Use of resources per 1 kg of product and per declared unit (3 values of reference flow displayed)

Indicator	Unit	1kg	1.14 kg	1.52 kg	1.9kg
Use of renewable primary energy excluding renewable energy used as raw materials	MJ, net calorific value	0.43	0.49	0.65	0.81
Use of renewable primary energy resources used as raw materials	MJ, net calorific value	0.00	0.00	0.00	0.00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	0.43	0.49	0.65	0.81
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value	5.88	6.70	8.93	11.16
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value	0.00	0.00	0.00	0.00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value	5.88	6.70	8.93	11.16
Use of secondary material	kg	0.88	1.00	1.34	1.67
Use of renewable secondary fuels	MJ, net calorific value	0.00	0.00	0.00	0.00
Use of non renewable secondary fuels	MJ, net calorific value	0.00	0.00	0.00	0.00
Use of net fresh water	m ³	0.00	0.00	0.00	0.00

Potential environmental impacts

Table 3 Potential environmental impacts per 1 kg of product.

Impact category	Unit	Total	A1-A3	A4	C2	C3-C4
Abiotic depletion	kg Sb _{eq}	1.7*10 ⁻⁶	1.5*10 ⁻⁶	8.8*10 ⁻⁸	2.2*10 ⁻⁸	5.8*10 ⁻⁹
Abiotic depletion (fossil fuels)	MJ	4.8	3.50	0.54	0.13	0.62
Global warming (GWP100a)	kg CO _{2eq}	0.69	0.27	3.3*10 ⁻²	8.2*10 ⁻³	0.37
Global warming (GWP100a) C-content, given as a negative number	kg CO _{2eq}	-0.7	-1.3	-	-	-0.7
Ozone layer depletion (ODP)	kg CFC-11 _{eq}	3.5*10 ⁻⁸	2.1*10 ⁻⁸	6.2*10 ⁻⁹	1.5*10 ⁻⁹	6.3*10 ⁻⁹
Photochemical oxidation	kg C ₂ H _{4eq}	1.5*10 ⁻⁴	6.5*10 ⁻⁵	6.3*10 ⁻⁶	1.3*10 ⁻⁶	7.8*10 ⁻⁵
Acidification	kg SO _{2eq}	3.8*10 ⁻³	1.5*10 ⁻³	1.7*10 ⁻⁴	2.1*10 ⁻⁵	2.1*10 ⁻³
Eutrophication	kg PO _{4⁻eq}	1.4*10 ⁻³	8.3*10 ⁻⁴	4.0*10 ⁻⁵	4.3*10 ⁻⁶	5.7*10 ⁻⁴

Table 4 Potential environmental impacts per declared unit for reference flow of 1.14kg (density of 30 kg.m⁻³, open blowing in horizontal surfaces and ceiling cavities with gradient up to 10°)

Impact category	Unit	Total	A1-A3	A4	C2	C3-C4
Abiotic depletion	kg Sb _{eq}	1.9*10 ⁻⁶	1.8*10 ⁻⁶	1.0*10 ⁻⁷	2.5*10 ⁻⁸	6.6*10 ⁻⁸
Abiotic depletion (fossil fuels)	MJ	5.50	4.00	0.61	0.15	0.71
Global warming (GWP100a)	kg CO _{2eq}	0.78	0.31	3.8*10 ⁻²	9.4*10 ⁻³	0.43
Global warming (GWP100a) C-content, given as a negative number	kg CO _{2eq}	-0.80	-1.50	-	-	-0.80
Ozone layer depletion (ODP)	kg CFC-11 _{eq}	4.0*10 ⁻⁹	2.4*10 ⁻⁹	7.1*10 ⁻⁹	1.7*10 ⁻⁹	7.2*10 ⁻⁹
Photochemical oxidation	kg C ₂ H _{4eq}	1.7*10 ⁻⁴	7.5*10 ⁻⁵	7.2*10 ⁻⁶	1.5*10 ⁻⁶	8.9*10 ⁻⁵
Acidification	kg SO _{2eq}	4.3*10 ⁻³	1.7*10 ⁻³	2.0*10 ⁻⁴	2.3*10 ⁻⁵	2.4*10 ⁻³
Eutrophication	kg PO ₄ ^{---eq}	1.6*10 ⁻³	9.5*10 ⁻⁴	4.6*10 ⁻⁵	4.9*10 ⁻⁶	6.5*10 ⁻⁴

Table 5 Potential environmental impacts per declared unit for reference flow of 1.52kg (density of 40 kg.m⁻³, volume filling of cavities of sloping roofs and ceilings)

Impact category	Unit	Total	A1-A3	A4	C2	C3-C4
Abiotic depletion	kg Sb _{eq}	2.6*10 ⁻⁶	2.3*10 ⁻⁶	1.3*10 ⁻⁷	3.3*10 ⁻⁸	8.8*10 ⁻⁸
Abiotic depletion (fossil fuels)	MJ	7.30	5.40	0.81	0.20	0.95
Global warming (GWP100a)	kg CO _{2eq}	1.00	0.41	5.1*10 ⁻²	1.2*10 ⁻²	0.57
Global warming (GWP100a) C-content, given as a negative number	kg CO _{2eq}	-1.10	-2.00			-1.10
Ozone layer depletion (ODP)	kg CFC-11 _{eq}	5.4*10 ⁻⁸	3.3*10 ⁻⁸	9.4*10 ⁻⁹	2.3*10 ⁻⁹	9.6*10 ⁻⁹
Photochemical oxidation	kg C ₂ H _{4eq}	2.3*10 ⁻⁴	9.9*10 ⁻⁵	9.6*10 ⁻⁶	1.9*10 ⁻⁶	1.2*10 ⁻⁴
Acidification	kg SO _{2eq}	5.7*10 ⁻³	2.2*10 ⁻³	2.6*10 ⁻⁴	3.1*10 ⁻⁵	3.2*10 ⁻³
Eutrophication	kg PO ₄ ^{---eq}	2.2*10 ⁻³	1.3*10 ⁻³	6.1*10 ⁻⁵	6.5*10 ⁻⁶	8.6*10 ⁻⁴

Table 6 Potential environmental impacts per declared unit for reference flow of 1.9kg (density of 50 kg.m⁻³, volume filling in walls)

Impact category	Unit	Total	A1-A3	A4	C2	C3-C4
Abiotic depletion	kg Sb _{eq}	3.2*10 ⁻⁶	2.9*10 ⁻⁶	1.7*10 ⁻⁷	4.2*10 ⁻⁸	1.1*10 ⁻⁷
Abiotic depletion (fossil fuels)	MJ	9.20	6.70	1.00	0.25	1.20
Global warming (GWP100a)	kg CO _{2eq}	1.30	0.52	6.4*10 ⁻²	1.6*10 ⁻²	0.71
Global warming (GWP100a) C-content, given as a negative number	kg CO _{2eq}	-1.30	-2.50			-1.30
Ozone layer depletion (ODP)	kg CFC-11 _{eq}	6.7*10 ⁻⁸	4.1*10 ⁻⁸	1.2*10 ⁻⁸	2.9*10 ⁻⁹	1.2*10 ⁻⁸
Photochemical oxidation	kg C ₂ H _{4eq}	2.9*10 ⁻⁴	1.2*10 ⁻⁴	1.2*10 ⁻⁵	2.4*10 ⁻⁶	1.5*10 ⁻⁴
Acidification	kg SO _{2eq}	7.1*10 ⁻³	2.8*10 ⁻³	3.3*10 ⁻⁴	3.9*10 ⁻⁵	4.0*10 ⁻³
Eutrophication	kg PO ₄ ^{---eq}	2.7*10 ⁻³	1.6*10 ⁻³	7.7*10 ⁻⁵	8.2*10 ⁻⁶	1.1*10 ⁻³

Environmental Performance



Waste generation

Table 7 Waste generation per 1 kg of product and per declared unit (3 values of reference flow displayed)

Waste type	Unit	1kg	1.14 kg	1.52 kg	1.9kg
Hazardous waste disposed	kg	$5 \cdot 10^{-6}$	$5.7 \cdot 10^{-06}$	$7.6 \cdot 10^{-06}$	$9.5 \cdot 10^{-06}$
Non hazardous waste disposed	kg	0.026	0.03	0.04	0.05
Radioactive waste disposed	kg	-	-	-	-

Other environmental information describing output flows

Table 8 Other environmental information describing output flows

Parameter	Unit	Amount
Components for re-use	kg	0
Materials for recycling	kg	0
Materials for energy recovery	kg	0
Exported energy	MJper energy carrier	0

Transport to the building site

Table 9 Information describing transport to the building site.

Parameter	Unit	Value
Vehicle type	European Emission Standard	Euro 3 (Lorry 16-32 metric ton)
Distance	km	200
Capacity utilization (including empty returns)	%	~50%
Bulk density of transported products	kg/m ³	141
Volume capacity utilization factor	-	1

End of life

Table 10 End of life information.

Processes	Unit	Amount
Collection process specified by type	kg collected separately	100%
	kg collected with mixed construction waste	0
Recovery system specified by type	kg for re-use	0
	kg for recycling	0
	kg for energy recovery	0
Disposal specified by type	kg product or material for final deposition	100%
Assumptions for scenario development, e.g. transportation	-	It is assumed that the product will be collected separately and composted.

Verification

CEN standard EN 15804 serves as the core PCR (product category rules)

Independent verification of the declaration and data, according to EN ISO 14025:2010

internal

external

Third party verifier:

Building Research Institute - Certification company Ltd.



Additional information

Climatizer Plus was certified by Nature Plus 0107-1502-135-1 certificate for the award of the quality label.

CIUR a.s. was certified according to ISO 9001:2008 (Quality Management), ISO14001:2004 (Environmental Management) and OHSAS 18001:2007 (Occupational Health and Safety Management).

References

Weinzettel, J., D. Kapitulčinová, LCA studie vybraných produktů firmy CIUR a.s. (LCA study of selected products manufactured by CIUR a.s.), CIUR, 2016.

EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products

ISO 14 025:2006 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures

