

# Environmental Product Declaration

*according to ISO 14025 and EN 15804*



This declaration is for:  
**Interalu SAPP Ceiling**

Provided by:  
**Interalu NV**

**SAPP<sup>®</sup>** CEILING



program operator

**Stichting MRPI<sup>®</sup>**

publisher

**Stichting MRPI<sup>®</sup>**

**[www.mrpi.nl](http://www.mrpi.nl)**

MRPI<sup>®</sup> registration

**1.1.00259.2021**

date of first issue

**03-12-2021**

date of this issue

**03-12-2021**

expiry date

**03-12-2026**



Nationale

**Milieu** DATABASE



## COMPANY INFORMATION

**interalu**  
SMART CEILINGS

Interalu NV  
Fotografielaan 49-51  
2610 Wilrijk  
Town  
0032 3 830 74 00  
info@interalu.eu  
<https://www.interalu.eu/en>

## MRPI® REGISTRATION

1.1.00259.2021

## DATE OF ISSUE

03-12-2021

## EXPIRY DATE

03-12-2026

## SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Harry Van Ewijk, SGS Search**.

The LCA study has been done by **Hannah Van Hees, Enperas**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2 (incl. A1). It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2 (incl. A1). Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

## PROGRAM OPERATOR

Stichting MRPI®  
Kingsfordweg 151  
1043GR  
Amsterdam



ir. J-P den Hollander, Managing director MRPI®

## PRODUCT

Interalu SAPP Ceiling

## DECLARED UNIT/FUNCTIONAL UNIT

1 m<sup>2</sup> of smart acoustic passive power ceiling with a heat exchange function (heating + cooling), a thickness of 64 mm, a low thermal inertia (between 18-20°C for cooling and between 30-40°C for heating) and a high conductivity, an acoustic absorbance of 0,85 and a reference service life of 50 years.

## DESCRIPTION OF PRODUCT

SAPP® Ceiling climate control (suspended) ceiling for interior covering. The product is a kit consisting of ceiling panels, supporting profiles, insulation and ancillary materials for installation such as ceiling anchors.

## VISUAL PRODUCT



## MORE INFORMATION

<https://interalu.eu/be-nl/kennis/ontdek-sapp-ceiling>

## DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

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

Third party verifier:



Harry van Ewijk, SGS Search

[a] PCR = Product Category Rules

## DETAILED PRODUCT DESCRIPTION

The SAPP® Ceiling is used as climate control (suspended) ceiling for interior covering. Its design makes it possible to integrate the entire building in the energy plan through its use of night-time cooling. The open structure of the SAPP® Ceiling offers several different possibilities for optimising acoustics. SAPP® ceiling has an acoustic absorbance between 0,4 and 1 depending on the perforation of the panels, the orientation (vertical and/or horizontal) and type of insulation. The product is a kit consisting of the ceiling panels, supporting profiles, insulation and ancillary materials for installation of the product such as ceiling anchors. The ancillary materials and energy use necessary for installing the climate ceiling are included in this EPD. In this EPD a specific insulation material is considered: horizontal insulation with rockwool sealed with PE foil with a density of 100 kg/m<sup>3</sup> and a thickness of 20 mm (i.e. 2 kg insulation per m<sup>2</sup>). This scenario has an acoustic absorbance of 0,85. The SAPP® Ceiling has low thermal inertia (between 18 and 20°C for cooling and between 30 and 40°C for heating) and high conductivity. The cooling works with 65-70% radiation and 35-30% convection, 103W/m<sup>2</sup> at t 10K. The heating works with 100% radiation, 71 W/m<sup>2</sup> at t 15K. The open structure of the SAPP® Ceiling offers several different possibilities for optimising acoustics. SAPP® ceiling has an acoustic absorbance between 0,4 and 1 depending on the perforation of the panels, the orientation (vertical vs horizontal) and type of insulation. A variability study has been performed and shows that the impact of the perforation (additional energy consumption) is small.

The weight per reference flow is 10,80 kg.

### Production process:

The galvanised steel for the panels is if needed perforated and then roll formed to the correct sizes and wrapped. The galvanised steel for bearing profiles is punched to the correct module size, roll-formed and cut to a fixed length. They are packed in cardboard boxes. The galvanised steel for the edge finishing profiles are rolled and cut to a fixed length. They are packed in metal transport containers together with the panels and bearing profiles and transported to the site for installation. SAPP clips Ceiling anchors, fasteners and quick hangers are produced and packaged by third parties and delivered at the manufacturing site in Wilrijk. The PE-RT pipes are directly transported to the installation site.

### Reference service life:

The reference service life is estimated at 50 years.

The RSL is based on the Interalu product use recommendations ATG 3112 Thermoduct PE-RT and is valid under normal conditions.

The SAPP Ceiling does not require specific maintenance, apart from the usual operations of an installation of heating. With normal use of the ceiling, the ceilings do not need to be cleaned. No replacements are necessary over the lifetime of a building.

### Installation:

Materials for fixation and energy use necessary for installation are included. First holes are drilled into the concrete structure and ceiling anchors are installed. The upper part of a quick-release hanger is hooked into the ceiling anchor with a spring. The support profiles are suspended by inserting the support profile and sliding the quick release hanger on the spring. The edge trim is

placed against the wall. The clips are clicked into the support profiles. The pipes are braided in the form of loops and the PE-RT pipe is clicked into the clips. The ceiling panels are clicked into the support profiles.

Various loose parts are delivered per truck and are assembled on site by means of clamping and suspension.

Equipment needed during installation of the product on site are: a rotary hammer, rolling gountry, plate shear, small tools, stanleyknives, sawingmachine and a drill bit. The impacts of tools is not included and considered as cut-off.

Technical Data	Standard	Value	Unit
Modulation	EN 13964	50	mm
Width	EN 13964	30	mm
Height	EN 13964	39	mm
joint	EN 13964	20	mm

Physical Characteristics	Standard	Value	Value	Comment
Cooling	EN 14240	103	W/m2	
Heating	EN 14037	83	W/m2	[1]
Acoustic absorption $\hat{I}_{\pm_w}$	EN 11654	0.85	Hz	[2]
Reaction to fire	EN 13501-1	B-s2,d0	/	

#### Comments

[1] = at t = 10K, 65-70% radiation, 35-30% convection

[2] = Depends on the perforation and insulation scenario (type, orientation). Can vary between 0,4 and 1.

COMPONENT (> 1%)	[kg / %]
Pre-finished continuous hot dip galvanised steel	88%
PE-RT (temperature resistant polyethylene)	11%
HDPE (High Density Polyethylene Resin)	<1%
suspension points (galvanised steel)	<1%

(\*) > 1% of total mass

#### SCOPE AND TYPE

This is a specific EPD for SAPP® Ceiling produced by Interalu NV in Wilrijk, Belgium. The SAPP® Ceiling is installed in The Netherlands and at its end-of-life waste is treated according to the Dutch end-of-life scenario's. As a result, the EPD is representative for the Dutch market.

Company specific data for the product stage have been collected by Interalu and were provided to VITO/Enperas through an online data collection questionnaire. The LCI data has been checked by the EPD verifier. VITO/Enperas uses publicly available generic data provided by Ecoinvent 3.6 for all background processes such as the production of electricity, transportation by means of a specific truck, etc. Primary data is used for modules A1, A2, A3, and A5. The rest of the study is based on scenarios (module A4, modules B1-B7, modules C1-C4, and module D).

For the calculation of the LCA results, the software program SimaPro 9.2.0.1 (PRé Consultants, 2019) has been used.

PRODUCT STAGE			CONSTRUCTION					USE STAGE							END OF LIFE				BENEFITS AND	
			PROCESS												STAGE				LOADS BEYOND THE	
			STAGE																SYSTEM BOUNDARIES	
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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				
X	X	X	X	X	X	X	X	X	X	MND	MND	X	X	X	X	X				

X = Modules Assessed

ND = Not Declared

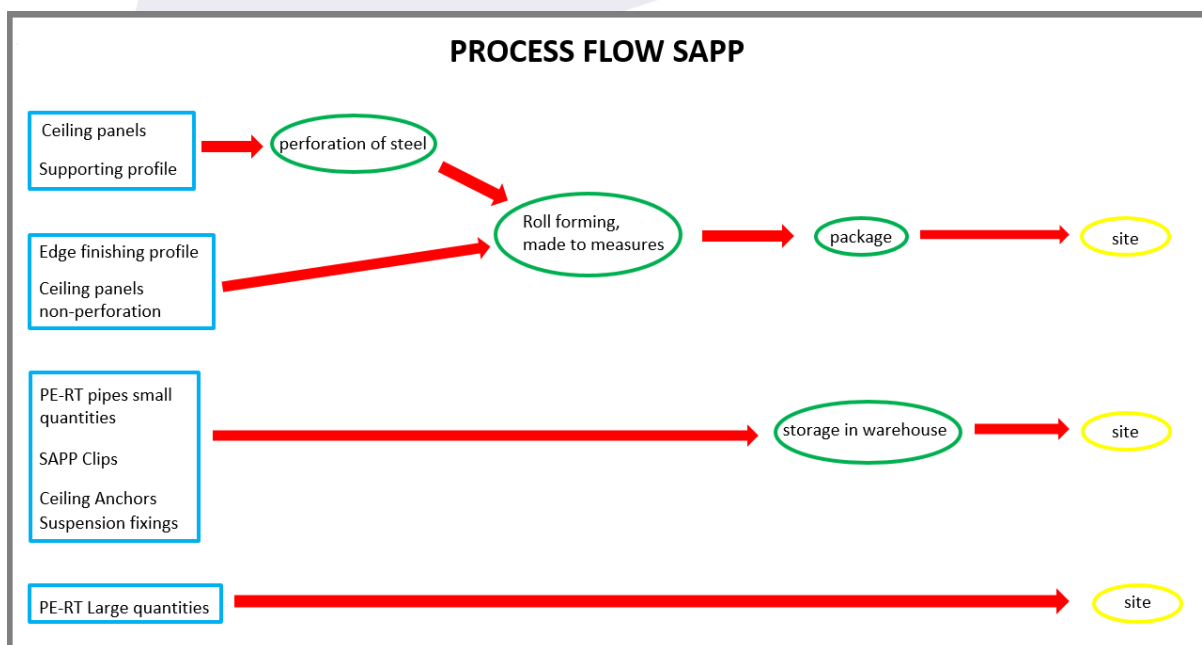


Figure: LCA process diagram according to EN 15804 (7.2.1)

## REPRESENTATIVENESS

The data used for the LCA are representative for the production of SAPP® Ceiling, manufactured by Interlu in Wilrijk, Belgium.



**ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
ADPE	kg Sb. eq.	3.33 E-4	3.76 E-7	5.53 E-6	3.39 E-4	2.94 E-7	1.62 E-5	0.00	0.00	0.00	0.00	0.00	7.76 E-9	1.27 E-7	1.01 E-8	2.42 E-8	-3.24 E-8
ADPF	MJ	3.14 E+2	2.80 E+0	1.88 E+1	3.35 E+2	2.44 E+0	6.12 E+1	0.00	0.00	0.00	0.00	0.00	1.51 E-1	1.05 E+0	1.75 E-1	2.42 E-1	-4.74 E+1
GWP	kg CO2 eq.	1.84 E+1	1.87 E-1	1.03 E+0	1.96 E+1	1.60 E-1	4.40 E+0	0.00	0.00	0.00	0.00	0.00	9.62 E-3	6.89 E-2	1.13 E-2	2.59 E+0	-2.49 E+0
ODP	kg CFC 11 eq.	1.08 E-6	3.40 E-8	1.24 E-7	1.24 E-6	2.84 E-8	5.67 E-7	0.00	0.00	0.00	0.00	0.00	4.75 E-10	1.22 E-8	6.32 E-10	2.97 E-9	-2.51 E-7
POCP	kg ethene eq.	2.13 E-2	1.01 E-4	7.06 E-4	2.21 E-2	9.65 E-5	3.17 E-3	0.00	0.00	0.00	0.00	0.00	1.43 E-6	4.16 E-5	2.49 E-6	4.19 E-5	-8.74 E-4
AP	kg SO2 eq.	8.02 E-2	6.15 E-4	4.53 E-3	8.54 E-2	7.03 E-4	1.67 E-2	0.00	0.00	0.00	0.00	0.00	1.80 E-5	3.03 E-4	2.51 E-5	2.27 E-4	-6.51 E-3
EP	kg (PO4)3- eq.	1.11 E-2	1.12 E-4	7.26 E-4	1.19 E-2	1.38 E-4	3.02 E-3	0.00	0.00	0.00	0.00	0.00	3.71 E-6	5.95 E-5	5.16 E-6	5.84 E-5	-1.80 E-3

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB-eq.	4.76 E+1	7.38 E-2	3.84 E-1	4.81 E+1	6.73 E-2	1.79 E+0	0.00	0.00	0.00	0.00	0.00	1.08 E-3	2.90 E-2	1.54 E-3	7.66 E-2	-6.63 E-1
FAETP	kg DCB-eq.	2.62 E-1	2.03 E-3	2.62 E-2	2.91 E-1	1.96 E-3	4.91 E-2	0.00	0.00	0.00	0.00	0.00	2.99 E-5	8.47 E-4	3.83 E-5	1.46 E-2	-1.69 E-2
MAETP	kg DCB-eq.	6.29 E+2	7.68 E+0	2.86 E+1	6.65 E+2	7.07 E+0	1.56 E+2	0.00	0.00	0.00	0.00	0.00	1.26 E-1	3.05 E+0	1.56 E-1	2.74 E+1	-9.07 E+1
TETP	kg DCB-eq.	2.83 E-1	2.68 E-4	1.02 E-2	2.94 E-1	2.38 E-4	6.60 E-3	0.00	0.00	0.00	0.00	0.00	4.90 E-5	1.02 E-4	5.44 E-5	4.06 E-5	-1.34 E-3
ECI	Euro	5.78 E+0	2.07 E-2	1.18 E-1	5.92 E+0	1.93 E-2	5.03 E-1	0.00	0.00	0.00	0.00	0.00	7.15 E-4	8.30 E-3	8.87 E-4	1.41 E-1	-2.42 E-1
ADPF	kg Sb. eq.	1.51 E-1	1.34 E-3	9.05 E-3	1.61 E-1	1.18 E-3	2.94 E-2	0.00	0.00	0.00	0.00	0.00	7.24 E-5	5.06 E-4	8.41 E-5	1.16 E-4	-2.28 E-2

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]

ND = Not Declared

**ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1.89 E+1	1.89 E-1	1.19 E+0	2.03 E+1	1.61 E-1	4.62 E+0	0.00	0.00	0.00	0.00	0.00	9.77 E-3	6.95 E-2	1.14 E-2	2.59 E+0	-2.54 E+0
GWP-fossil	kg CO2 eq.	1.91 E+1	1.89 E-1	1.04 E+0	2.04 E+1	1.61 E-1	4.47 E+0	0.00	0.00	0.00	0.00	0.00	9.74 E-3	6.95 E-2	1.14 E-2	2.59 E+0	-2.54 E+0
GWP-biogenic	kg CO2 eq.	-2.43 E-1	8.58 E-5	1.39 E-1	-1.04 E-1	6.76 E-5	1.55 E-1	0.00	0.00	0.00	0.00	0.00	2.89 E-5	2.91 E-5	3.18 E-5	1.95 E-5	-1.37 E-3
GWP-luluc	kg CO2 eq.	1.50 E-2	6.97 E-5	2.82 E-3	1.78 E-2	5.91 E-5	1.72 E-3	0.00	0.00	0.00	0.00	0.00	2.88 E-6	2.55 E-5	3.25 E-6	5.87 E-6	-1.32 E-3
ODP	kg CFC11 eq.	1.08 E-6	4.25 E-8	1.00 E-7	1.23 E-6	3.56 E-8	6.92 E-7	0.00	0.00	0.00	0.00	0.00	4.72 E-10	1.53 E-8	6.55 E-10	3.33 E-9	-2.79 E-7
AP	mol H+ eq.	9.83 E-2	7.92 E-4	5.74 E-3	1.05 E-1	9.35 E-4	2.18 E-2	0.00	0.00	0.00	0.00	0.00	2.28 E-5	4.03 E-4	3.23 E-5	3.28 E-4	-8.53 E-3
EP-freshwater	kg PO4 eq.	1.06 E-3	1.61 E-6	4.47 E-5	1.11 E-3	1.63 E-6	7.80 E-5	0.00	0.00	0.00	0.00	0.00	5.56 E-7	7.01 E-7	6.18 E-7	3.99 E-7	-1.05 E-4
EP-marine	kg N eq.	1.98 E-2	2.35 E-4	1.23 E-3	2.13 E-2	3.29 E-4	6.90 E-3	0.00	0.00	0.00	0.00	0.00	4.89 E-6	1.42 E-4	8.28 E-6	1.48 E-4	-3.44 E-3
EP-terrestrial	mol N eq.	2.15 E-1	2.60 E-3	1.31 E-2	2.31 E-1	3.63 E-3	7.60 E-2	0.00	0.00	0.00	0.00	0.00	5.99 E-5	1.56 E-3	9.77 E-5	1.65 E-3	-2.74 E-2
POCP	kg NMVOC eq.	8.64 E-2	8.01 E-4	3.45 E-3	9.07 E-2	1.04 E-3	2.36 E-2	0.00	0.00	0.00	0.00	0.00	1.48 E-5	4.47 E-4	2.56 E-5	4.46 E-4	-7.14 E-3
ADP-minerals&metals	kg Sb eq.	3.33 E-4	3.76 E-7	5.51 E-6	3.39 E-4	2.94 E-7	1.62 E-5	0.00	0.00	0.00	0.00	0.00	7.75 E-9	1.27 E-7	1.01 E-8	2.42 E-8	-3.21 E-8
ADP-fossil	MJ, net calorific value	2.69 E+2	2.84 E+0	2.54 E+1	2.97 E+2	2.43 E+0	5.83 E+1	0.00	0.00	0.00	0.00	0.00	1.28 E-1	1.05 E+0	1.50 E-1	2.26 E-1	-4.20 E+1
WDP	m3 world eq. deprived	7.02 E+0	8.21 E-3	8.08 E-1	7.83 E+0	8.70 E-3	5.67 E-1	0.00	0.00	0.00	0.00	0.00	9.82 E-4	3.75 E-3	1.12 E-3	7.28 E-3	1.33 E+0

GWP-total = Global Warming Potential total

GWP-fossil = Global Warming Potential fossil fuels

GWP-biogenic = Global Warming Potential biogenic

GWP-luluc = Global Warming Potential land use and land use change

ODP = Depletion potential of the stratospheric ozone layer

AP = Acidification Potential, Accumulated Exceedence

EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment

EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment

EP-terrestrial = Eutrophication Potential, Accumulated Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

ND = Not Declared

Disclaimer [2]

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PM	Disease incidence	1.53 E-6	1.35 E-8	4.93 E-8	1.59 E-6	1.45 E-8	3.38 E-7	0.00	0.00	0.00	0.00	0.00	7.48 E-11	6.24 E-9	2.62 E-10	3.02 E-9	-1.90 E-7
IRP	kBq U235 eq.	5.88 E-1	1.24 E-2	1.50 E-1	7.51 E-1	1.02 E-2	2.12 E-1	0.00	0.00	0.00	0.00	0.00	2.64 E-4	4.39 E-3	3.27 E-4	7.54 E-4	-3.40 E-2
ETP-fw	CTUe	7.75 E+2	2.34 E+0	2.08 E+1	7.98 E+2	2.17 E+0	7.13 E+1	0.00	0.00	0.00	0.00	0.00	1.30 E-1	9.34 E-1	1.55 E-1	7.12 E-1	-1.27 E+2
HTP-c	CTUh	1.33 E-7	8.17 E-11	6.48 E-10	1.33 E-7	7.03 E-11	5.78 E-9	0.00	0.00	0.00	0.00	0.00	2.23 E-12	3.03 E-11	4.33 E-12	3.13 E-10	-8.25 E-10
HTP-nc	CTUh	1.61 E-6	2.58 E-9	1.43 E-8	1.62 E-6	2.37 E-9	7.79 E-8	0.00	0.00	0.00	0.00	0.00	7.27 E-11	1.02 E-9	9.39 E-11	2.47 E-9	-1.27 E-8
SQP	---	1.06 E+2	1.91 E+0	1.37 E+1	1.22 E+2	2.11 E+0	4.30 E+1	0.00	0.00	0.00	0.00	0.00	2.63 E-2	9.08 E-1	1.41 E-1	2.49 E-1	-9.83 E-1

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235 [1]

ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]

HTP-c = Potential Comparative Toxic Unit for humans [2]

HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]

SQP = Potential soil quality index [2]

ND = Not Declared

### Disclaimer [1]

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

### Disclaimer [2]

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.



## RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PERE	MJ	2.17 E+1	4.19 E-2	4.91 E+0	2.67 E+1	2.99 E-2	1.63 E+0	0.00	0.00	0.00	0.00	0.00	1.35 E-2	1.29 E-2	1.49 E-2	1.03 E-2	-8.05 E-1
PERM	MJ	2.43 E+0	0.00	-7.09 E-1	1.72 E+0	0.00	-6.47 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	2.41 E+1	4.19 E-2	4.21 E+0	2.84 E+1	2.99 E-2	1.56 E+0	0.00	0.00	0.00	0.00	0.00	1.35 E-2	1.29 E-2	1.49 E-2	1.03 E-2	-8.05 E-1
PENRE	MJ	2.91 E+2	2.86 E+0	2.32 E+1	3.17 E+2	2.49 E+0	6.63 E+1	0.00	0.00	0.00	0.00	0.00	1.66 E-1	1.07 E+0	1.91 E-1	2.60 E+1	-4.79 E+1
PENRM	MJ	4.35 E+1	0.00	4.70 E+0	4.82 E+1	0.00	-3.16 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.58 E+1	0.00
PENRT	MJ	3.34 E+2	2.86 E+0	2.79 E+1	3.65 E+2	2.49 E+0	6.32 E+1	0.00	0.00	0.00	0.00	0.00	1.66 E-1	1.07 E+0	1.91 E-1	2.54 E-1	-4.79 E+1
SM	kg	1.45 E+0	0.00	0.00	1.45 E+0	0.00	7.24 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.50 E+0
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	1.95 E-1	2.95 E-4	2.44 E-2	2.19 E-1	2.59 E-4	1.51 E-2	0.00	0.00	0.00	0.00	0.00	7.82 E-5	1.12 E-4	8.65 E-5	5.71 E-4	3.11 E-2

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Use of secondary materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

ND = Not Declared

## OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
HWD	kg	2.02 E-3	1.09 E-5	5.58 E-5	2.09 E-3	6.16 E-6	2.41 E-4	0.00	0.00	0.00	0.00	0.00	9.85 E-8	2.65 E-6	1.43 E-7	8.33 E-7	-3.17 E-3
NHWD	kg	6.47 E+0	1.32 E-1	2.25 E-1	6.83 E+0	1.54 E-1	2.99 E+0	0.00	0.00	0.00	0.00	0.00	3.83 E-4	6.65 E-2	4.76 E-4	5.19 E-1	-1.91 E-1
RWD	kg	5.39 E-4	1.93 E-5	1.32 E-4	6.90 E-4	1.60 E-5	3.14 E-4	0.00	0.00	0.00	0.00	0.00	2.64 E-7	6.88 E-6	3.50 E-7	9.92 E-7	-3.40 E-5
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	2.05 E-1	2.05 E-1	0.00	3.82 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.44 E+0	0.00	-8.02 E+0
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	3.68 E-1	3.68 E-1	0.00	1.90 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09 E+1	-1.32 E+1
ETE	MJ	0.00	0.00	2.44 E-1	2.44 E-1	0.00	8.35 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.30 E+0	-8.38 E+0

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

ND = Not Declared

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy

**BIOGENIC CARBON CONTENT per functional unit or declared unit (A2)**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
BCCpr	kg C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BCCpa	kg C	-2.43 E-1	8.58 E-5	1.39 E-1	-1.04 E-1	6.76 E-5	1.55 E-1	0.00	0.00	0.00	0.00	0.00	2.89 E-5	2.91 E-5	3.18 E-5	1.95 E-5	-1.37 E-3

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

ND = Not Declared

TABLES FOR INSULATION SEPARATELY

**ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
ADPE	kg Sb. eq.	4.86 E-6	1.50 E-7	0.00	5.01 E-6	9.64 E-8	2.65 E-7	0.00	0.00	0.00	0.00	0.00	0.00	1.38 E-7	0.00	4.37 E-8	1.30 E-10
ADPF	MJ	3.88 E+1	8.54 E-1	0.00	3.97 E+1	7.35 E-1	2.13 E+0	0.00	0.00	0.00	0.00	0.00	0.00	1.05 E+0	0.00	8.53 E-1	-1.98 E-2
GWP	kg CO2 eq.	2.53 E+0	5.77 E-2	0.00	2.59 E+0	4.91 E-2	1.69 E-1	0.00	0.00	0.00	0.00	0.00	0.00	7.04 E-2	0.00	4.83 E-2	-1.13 E-3
ODP	kg CFC 11 eq.	1.70 E-7	1.03 E-8	0.00	1.80 E-7	8.97 E-9	1.07 E-8	0.00	0.00	0.00	0.00	0.00	0.00	1.29 E-8	0.00	9.85 E-9	-2.36 E-10
POCP	kg ethene eq.	3.50 E-3	2.85 E-5	0.00	3.53 E-3	2.49 E-5	1.85 E-4	0.00	0.00	0.00	0.00	0.00	0.00	3.57 E-5	0.00	4.88 E-5	-1.49 E-7
AP	kg SO2 eq.	1.92 E-2	1.82 E-4	0.00	1.94 E-2	1.57 E-4	1.02 E-3	0.00	0.00	0.00	0.00	0.00	0.00	2.25 E-4	0.00	3.15 E-4	-2.30 E-7
EP	kg (PO4)3- eq.	4.39 E-3	4.75 E-5	0.00	4.44 E-3	3.96 E-5	2.84 E-4	0.00	0.00	0.00	0.00	0.00	0.00	5.68 E-5	0.00	7.99 E-5	3.90 E-7

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB-eq.	3.37 E+0	3.16 E-2	0.00	3.40 E+0	2.65 E-2	1.96 E-1	0.00	0.00	0.00	0.00	0.00	0.00	3.80 E-2	0.00	3.15 E-2	2.62 E-4
FAETP	kg DCB-eq.	1.45 E+0	1.11 E-2	0.00	1.46 E+0	7.86 E-3	1.18 E-1	0.00	0.00	0.00	0.00	0.00	0.00	1.13 E-2	0.00	2.02 E-2	1.57 E-3
MAETP	kg DCB-eq.	2.13 E+3	1.59 E+1	0.00	2.15 E+3	1.17 E+1	1.55 E+2	0.00	0.00	0.00	0.00	0.00	0.00	1.68 E+1	0.00	1.54 E+1	8.31 E+0
TETP	kg DCB-eq.	3.56 E-3	8.57 E-5	0.00	3.65 E-3	7.08 E-5	1.98 E-4	0.00	0.00	0.00	0.00	0.00	0.00	1.02 E-4	0.00	7.38 E-5	1.66 E-7
ECI	Euro	8.11 E-1	8.87 E-3	0.00	8.19 E-1	7.29 E-3	5.22 E-2	0.00	0.00	0.00	0.00	0.00	0.00	1.05 E-2	0.00	9.48 E-3	8.47 E-4
ADPF	kg Sb. eq.	1.87 E-2	4.11 E-4	0.00	1.91 E-2	3.54 E-4	1.02 E-3	0.00	0.00	0.00	0.00	0.00	0.00	5.07 E-4	0.00	4.10 E-4	-9.54 E-6

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

ADPF = Abiotic Depletion Potential for fossil resources expressed in [kg Sb-eq.]

ND = Not Declared

## ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	2.60 E+0	5.82 E-2	0.00	2.66 E+0	4.95 E-2	4.44 E-1	0.00	0.00	0.00	0.00	0.00	0.00	7.11 E-2	0.00	4.91 E-2	-1.14 E-3
GWP-fossil	kg CO <sub>2</sub> eq.	2.59 E+0	5.82 E-2	0.00	2.64 E+0	4.95 E-2	1.72 E-1	0.00	0.00	0.00	0.00	0.00	0.00	7.10 E-2	0.00	4.90 E-2	-1.17 E-3
GWP-biogenic	kg CO <sub>2</sub> eq.	1.09 E-2	2.68 E-5	0.00	1.09 E-2	2.02 E-5	2.72 E-1	0.00	0.00	0.00	0.00	0.00	0.00	2.89 E-5	0.00	1.27 E-4	3.04 E-5
GWP-luluc	kg CO <sub>2</sub> eq.	1.45 E-3	2.50 E-5	0.00	1.47 E-3	1.73 E-5	7.66 E-5	0.00	0.00	0.00	0.00	0.00	0.00	2.48 E-5	0.00	1.26 E-5	-6.65 E-7
ODP	kg CFC11 eq.	1.62 E-7	1.28 E-8	0.00	1.75 E-7	1.12 E-8	1.08 E-8	0.00	0.00	0.00	0.00	0.00	0.00	1.61 E-8	0.00	1.22 E-8	-2.12 E-10
AP	mol H <sup>+</sup> eq.	2.38 E-2	2.33 E-4	0.00	2.40 E-2	2.02 E-4	1.27 E-3	0.00	0.00	0.00	0.00	0.00	0.00	2.90 E-4	0.00	4.29 E-4	-3.93 E-7
EP-freshwater	kg PO <sub>4</sub> eq.	1.09 E-4	5.31 E-7	0.00	1.10 E-4	3.89 E-7	5.58 E-6	0.00	0.00	0.00	0.00	0.00	0.00	5.58 E-7	0.00	4.75 E-7	1.10 E-8
EP-marine	kg N eq.	2.28 E-3	6.67 E-5	0.00	2.35 E-3	6.00 E-5	1.45 E-4	0.00	0.00	0.00	0.00	0.00	0.00	8.61 E-5	0.00	1.70 E-4	-2.28 E-7
EP-terrestrial	mol N eq.	4.08 E-2	7.39 E-4	0.00	4.16 E-2	6.63 E-4	2.38 E-3	0.00	0.00	0.00	0.00	0.00	0.00	9.52 E-4	0.00	1.87 E-3	-2.95 E-6
POCP	kg NMVOC eq.	1.23 E-2	2.27 E-4	0.00	1.25 E-2	2.03 E-4	7.11 E-4	0.00	0.00	0.00	0.00	0.00	0.00	2.91 E-4	0.00	5.30 E-4	-9.47 E-7
ADP-minerals&metals	kg Sb eq.	4.86 E-6	1.50 E-7	0.00	5.01 E-6	9.64 E-8	2.65 E-7	0.00	0.00	0.00	0.00	0.00	0.00	1.38 E-7	0.00	4.37 E-8	1.30 E-10
ADP-fossil	MJ, net calorific value	3.37 E+1	8.66 E-1	0.00	3.45 E+1	7.46 E-1	1.87 E+0	0.00	0.00	0.00	0.00	0.00	0.00	1.07 E+0	0.00	8.80 E-1	-2.96 E-2
WDP	m <sup>3</sup> world eq. deprived	8.13 E-1	2.65 E-3	0.00	8.16 E-1	2.08 E-3	4.11 E-2	0.00	0.00	0.00	0.00	0.00	0.00	2.98 E-3	0.00	1.91 E-2	-1.18 E-4

GWP-total = Global Warming Potential total

GWP-fossil = Global Warming Potential fossil fuels

GWP-biogenic = Global Warming Potential biogenic

GWP-luluc = Global Warming Potential land use and land use change

ODP = Depletion potential of the stratospheric ozone layer

AP = Acidification Potential, Accumulated Exceedence

EP-freshwater = Eutrophication Potential, fraction of nutrients reaching freshwater end compartment

EP-marine = Eutrophication Potential, fraction of nutrients reaching marine end compartment

EP-terrestrial = Eutrophication Potential, Accumulated Exceedence

POCP = Formation potential of tropospheric ozone photochemical oxidants

ADP-minerals&metals = Abiotic Depletion Potential for non fossil resources [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

ND = Not Declared

Disclaimer [2]

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PM	Disease incidence	1.30 E-7	3.54 E-9	0.00	1.34 E-7	3.44 E-9	7.89 E-9	0.00	0.00	0.00	0.00	0.00	0.00	4.94 E-9	0.00	1.13 E-8	1.47 E-12
IRP	kBq U235 eq.	7.40 E-2	3.78 E-3	0.00	7.78 E-2	3.26 E-3	4.49 E-3	0.00	0.00	0.00	0.00	0.00	0.00	4.68 E-3	0.00	3.84 E-3	-1.85 E-4
ETP-fw	CTUe	5.69 E+1	7.30 E-1	0.00	5.76 E+1	5.97 E-1	3.02 E+0	0.00	0.00	0.00	0.00	0.00	0.00	8.57 E-1	0.00	7.53 E-1	7.49 E-4
HTP-c	CTUh	1.00 E-8	2.27 E-11	0.00	1.01 E-8	1.68 E-11	5.31 E-10	0.00	0.00	0.00	0.00	0.00	0.00	2.41 E-11	0.00	3.53 E-11	-3.98 E-14
HTP-nc	CTUh	3.15 E-8	7.70 E-10	0.00	3.22 E-8	6.51 E-10	1.82 E-9	0.00	0.00	0.00	0.00	0.00	0.00	9.35 E-10	0.00	6.75 E-10	1.11 E-13
SQP	---	4.25 E+1	5.15 E-1	0.00	4.30 E+1	5.14 E-1	2.26 E+0	0.00	0.00	0.00	0.00	0.00	0.00	7.38 E-1	0.00	9.17 E-1	-2.95 E-3

PM = Potential incidence of disease due to PM emissions

IRP = Potential Human exposure efficiency relative to U235 [1]

ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]

HTP-c = Potential Comparative Toxic Unit for humans [2]

HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]

SQP = Potential soil quality index [2]

ND = Not Declared

### Disclaimer [1]

This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

### Disclaimer [2]

The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.

## RESOURCE USE per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
PERE	MJ	5.80 E+0	1.44 E-2	0.00	5.81 E+0	1.03 E-2	2.93 E-1	0.00	0.00	0.00	0.00	0.00	0.00	1.48 E-2	0.00	1.33 E-2	-8.30 E-4
PERM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	5.80 E+0	1.44 E-2	0.00	5.81 E+0	1.03 E-2	2.93 E-1	0.00	0.00	0.00	0.00	0.00	0.00	1.48 E-2	0.00	1.33 E-2	-8.30 E-4
PENRE	MJ	4.19 E+1	8.76 E-1	0.00	4.28 E+1	7.51 E-1	2.29 E+0	0.00	0.00	0.00	0.00	0.00	0.00	1.08 E+0	0.00	8.96 E-1	-3.14 E-2
PENRM	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	MJ	4.19 E+1	8.76 E-1	0.00	4.28 E+1	7.51 E-1	2.29 E+0	0.00	0.00	0.00	0.00	0.00	0.00	1.08 E+0	0.00	8.96 E-1	-3.14 E-2
SM	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	2.15 E-2	9.74 E-5	0.00	2.16 E-2	7.39 E-5	1.13 E-3	0.00	0.00	0.00	0.00	0.00	0.00	1.06 E-4	0.00	5.82 E-5	-1.95 E-6

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PERT = Total use of renewable primary energy resources

PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

PENRT = Total use of non-renewable primary energy resources

SM = Use of secondary materials

RSF = Use of renewable secondary fuels

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

ND = Not Declared

## OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
HWD	kg	3.06 E-5	2.33 E-6	0.00	3.29 E-5	1.96 E-6	2.05 E-6	0.00	0.00	0.00	0.00	0.00	0.00	2.81 E-6	0.00	1.88 E-6	-2.25 E-8
NHWD	kg	1.69 E-1	3.41 E-2	0.00	2.03 E-1	3.57 E-2	1.28 E-1	0.00	0.00	0.00	0.00	0.00	0.00	5.12 E-2	0.00	2.19 E+0	1.33 E-5
RWD	kg	7.04 E-5	5.84 E-6	0.00	7.62 E-5	5.09 E-6	4.73 E-6	0.00	0.00	0.00	0.00	0.00	0.00	7.30 E-6	0.00	5.74 E-6	-1.62 E-7
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

ND = Not Declared

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy



## BIOGENIC CARBON CONTENT per functional unit or declared unit (A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	D
BCCpr	kg C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BCCpa	kg C	1.09 E-2	2.68 E-5	0.00	1.09 E-2	2.02 E-5	2.72 E-1	0.00	0.00	0.00	0.00	0.00	0.00	2.89 E-5	0.00	1.27 E-4	3.04 E-5

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

ND = Not Declared

## CALCULATION RULES

Allocation:

At Interlu, different types of climate ceilings are produced. For the use of energy and the use of the surface area, only facility-level data were available. Energy consumed, and the surface area used during the manufacturing stage have been allocated to the analysed product based on the amount of m<sup>2</sup> that is produced (physical relationship).

The following processes are considered below cut-off:

- Losses during transport,
- Impact of tools used for installation (i.e. rotary hammer, sawing machine etc.). These tools are used several times, so it is assumed that the environmental impact per declared unit is negligible,
- The metal transport containers for transportation of the edge finishing profiles, panels and bearing profile. These metal containers are used several times, so it is assumed that the environmental impact per declared unit is negligible,
- In a few examples, the insulation is directly fixated to the ceiling instead of placed on top of the metal panels. Fixation materials of the insulation are not considered.
- Environmental impacts caused by the personnel of the production plants are not included in the LCA, e.g. waste from the cafeteria and sanitary installations, accidental pollution caused by human mistakes, or environmental effects caused by commuter traffic.

In all cases, it is assumed that the cut-off criteria of EN 15804 are met.

Manufacturer specific data have been collected for the year 2019.

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

### *A1 – RAW MATERIAL SUPPLY*

This module takes into account the extraction and processing of all raw materials and energy which occur upstream to the studied manufacturing process.

### *A2 – TRANSPORT TO THE MANUFACTURER*

The raw materials (including insulation material) are transported to the manufacturing site by truck (freight, light commercial vehicle, freight, lorry 3.5-7.5 metric ton euro5, freight, lorry 7.5-16 metric ton euro5 and a freight, lorry 16-32 metric ton euro5). Only the PE-RT tubes are directly transported to the construction site.

### *A3 – MANUFACTURING*

This module takes into account the production process. The galvanised steel for the panels is if needed perforated and then roll formed to the correct sizes and wrapped. The galvanised steel for bearing profiles is punched to the correct module size, roll-formed and cut to a fixed length. The galvanised steel for the edge finishing profiles is rolled and cut to a fixed length. They are packed together with the panels and bearing profiles and transported to the site for installation. SAPP clips Ceiling anchors, fasteners, quick hangers and insulation are produced and packaged by third parties and delivered at the manufacturing site in Wilrijk. The waste treatment of the packaging of the raw materials is modelled according to the default Belgian end of life scenarios.

### *A4 – TRANSPORT TO THE BUILDING SITE*

See table below

### *A5 – INSTALLATION IN THE BUILDING*

At the construction site, energy is consumed for fixation and packaging materials are released. Also 5% material losses have been taken into account. The waste treatment of the packaging is modelled according to the default end of life scenarios of the SBK Bepalingsmethode.

### *B – USE STAGE (EXCLUDING POTENTIAL SAVINGS)*

B1: No impacts or environmental aspects come from the use of the installed SAPP Ceiling.

B2: SAPP Ceiling does not need maintenance.

B3: The SAPP Ceiling does not require repair during the reference service life of 50 years when used as described.

B4: No replacement is required.

B5: The SAPP Ceiling does not need refurbishment during the reference service life of 50 years.

B6: Module not declared

B7: Module not declared

This EPD considers a specific insulation scenario: horizontal insulation with rockwool sealed with PE foil with a density of 100 kg/m<sup>3</sup> and a thickness of 20 mm (i.e. 2 kg/m<sup>2</sup>). This paragraph describes other widely used insulation scenarios. Note that other combinations can also be provided by Interalu NV (other type of insulation material, thickness, height of baffles, amount of baffles ...).

For rockwool insulation sealed with PE foil the impact of the additional scenarios can be calculated based on the reference scenario in this EPD using the following formula:

*Impact insulation = (amount of insulation per m<sup>2</sup>/amount of reference insulation per m<sup>2</sup>) \* impact reference insulation*

Type of insulation (HORIZONTAL)	Density (in kg/m <sup>3</sup> )	Thickness (in mm)	Amount of insulation (in kg/m <sup>2</sup> )	Perforated panels?	Acoustic absorbance
Rockwool + PE	100	20	2	No	0.85
Rockwool + PE	100	20	2	Yes	1
Polyesterwool	70	20	1.4	No	0.8
Polyesterwool	70	20	1.4	Yes	0.95

Type of insulation (VERTICAL)	Density (in kg/m <sup>3</sup> )	Thickness (in mm)	Vertical baffles per	Amount of insulation (in kg/m <sup>2</sup> )	Perforated panels?	Acoustic absorbance
Rockwool + PE	60	200	5	1.5	No/Yes	0,4/0,55
Rockwool + PE	60	400	10	6	No/Yes	0,55/0,7
Polyesterwool	40	200	5	1	No/Yes	0,4/0,55
Polyesterwool	40	400	10	4	No/Yes	0,55/0,7

## DECLARATION OF SVHC

The product does not contain materials listed in the “Candidate list of Substances of Very High Concern for authorisation”.

## REFERENCES

- ISO 14040:2006: Environmental Management-Life Cycle Assessment-Principles and framework.
- ISO 14044:2006: Environmental Management-Life Cycle Assessment-Requirements and guidelines.
- ISO 14025:2006: Environmental labels and Declarations-Type III Environmental Declarations-Principles and procedures.
- EN 15804+A2:2019
- Bepalingsmethode ‘Milieuprestatie Bouwwerken’ versie 1.0, juli 2020
- Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., and Weidema, B., 2016. The ecoinvent database version 3 (part I): overview and methodology. The International Journal of Life Cycle Assessment, [online] 21(9), pp.1218–1230. Available at: <<http://link.springer.com/10.1007/s11367-016-1087-8>> .
- ATG 3112 Thermoduct - INTERALU ClimaPipe 14x1,25 (NL)(geldig tot 2023).pdf. Available at: [http://www.butgb.be/content/technical\\_approval/download.cfm/ATG3112\\_180620\\_N.pdf](http://www.butgb.be/content/technical_approval/download.cfm/ATG3112_180620_N.pdf)
- Project report: Life cycle assessment of SAPP ® Ceiling
- Life cycle inventories of waste treatment services: Part V “Building material disposal” – Gabor Doka and Doka Life Cycle Assessments
- SimaPro 9.2.0.1

## REMARKS

Note that the EPD includes separate tables for the environmental impact of respectively the climate control panels and the insulation. In this EPD a specific insulation material is considered: horizontal insulation with rockwool sealed with PE foil with a density of 100 kg/m³ and a thickness of 20 mm (i.e. 2 kg insulation per m²). In the paragraph 'Scenarios and additional technical information' other widely used insulation scenarios are described. The impact of these additional insulation scenarios can be calculated as follows:

*Impact insulation = (amount of insulation per m²/amount of reference insulation per m²) \* impact reference insulation*