

# Environmental Product Declaration

*according to ISO 14025 and EN 15804*



This declaration is for:  
**PROMATECT® -T**

Provided by:  
**ETEX BUILDING PERFORMANCE NV**



program operator  
**Stichting MRPI®**  
publisher  
**Stichting MRPI®**  
[www.mrpi.nl](http://www.mrpi.nl)

MRPI® registration  
**1.1.00453.2023**  
date of first issue  
**15-12-2023**  
date of this issue  
**15-12-2023**  
expiry date  
**15-12-2028**





### COMPANY INFORMATION



NEVER COMPROMISE ON SAFETY

ETEX BUILDING PERFORMANCE NV  
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### PRODUCT PROMATECT® -T

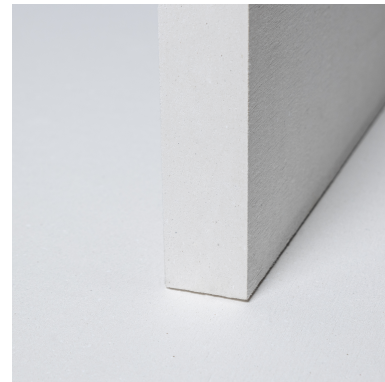
### DECLARED UNIT/FUNCTIONAL UNIT

1 m<sup>2</sup> of fire protective board (PROMATECT®-T with thickness 20mm), installed in The Netherlands with a reference service life of 60 years. The weight per functional unit is 18.8 kg/m<sup>2</sup>.

### DESCRIPTION OF PRODUCT

PROMATECT®-T is a calcium silicate board for fire protection in multiple applications

### VISUAL PRODUCT



### MORE INFORMATION

[www.promat.com](http://www.promat.com)

### MRPI® REGISTRATION

1.1.00453.2023

### DATE OF ISSUE

15-12-2023

### EXPIRY DATE

15-12-2028

### SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Agnes Schuurmans** under authorization of **Ulbert Hofstra**, **SGS Intron BV**. The LCA study has been done by **Arthur De Jaegher**, **Enperas**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2/Bepalingsmethode. 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/Bepalingsmethode. 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®

### 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:

Agnes Schuurmans under authorization of Ulbert Hofstra, SGS Intron

[a] PCR = Product Category Rule

## DETAILED PRODUCT DESCRIPTION

### *Manufacturing process*

PROMATECT®-T is produced in the ETEX plant in Tisselt. Sand, water and lime are mixed in water and blended in a reactor to form calcium silicate. This is combined in a mixer with the other raw materials to form thick slurry. The slurry is formed to a board. PROMATECT®-T boards are dried and edges are trimmed and the upper surface sanded to the specific thickness. All material which is cut off or sanded away is fully recycled within the process. The quality management system of the company and the production facility are certified according to ISO 9001.

### *Applications*

PROMATECT®-T boards are versatile multi-purpose fire protection boards, for multiple applications:

- Tunnel lining, concrete floor and wall upgrading
- M&E services enclosure
- Access panels and hatches, fire doors

### *Installation*

The fire protective board is cut and machined using conventional woodworking equipment with cement suitable blades. Fixing the boards will require appropriate means, which will depend upon the application and bearing structure. In this EPD the installation scenario using stainless steel anchors and rings was calculated.

### Technical information

Technical characteristic	Value	Unit
Gross density	ca 900	kg/m <sup>3</sup>
Compressive strength (perpendicular to the surface) à€" 1% deformation	1.2	MPa
Compressive strength (perpendicular to the surface) à€" 10% deformation	7.8	MPa
Tensile strength - longitudinal / Bending strength	1.2 / 4.5	MPa
Thermal conductivity	0.212	W/mK
Water vapour diffusion resistance factor	ca 5	mu
Equilibrium moisture content	5	%

The reference service life of Promat fire protective boards is estimated at 60 years under strict application of the guidelines for handling, installation and maintenance.

**Notes:**

A RSL of 60 years applies for boards used on the inside of the tunnel upon condition that the tunnel is well maintained (e.g. no aggressive cleaning method used in tunnel) and that in case of accidental damages the panels are replaced. For the boards used on the in and out of the tunnel, where possibly leakage may occur, 50 years is considered more appropriate.

The product is mainly composed of cement, sand, lime, calcium silicate, water and fibres.

COMPONENT > 1% of total mass	[%]
Composition classified	----

**SCOPE AND TYPE**

This is a specific EPD from a single company, ETEX.

The EPD is representative for PROMATECT®-T calcium silicate boards produced by ETEX at their production site in Tisselt (Belgium), and sold on the Dutch market.

*Software and background database*

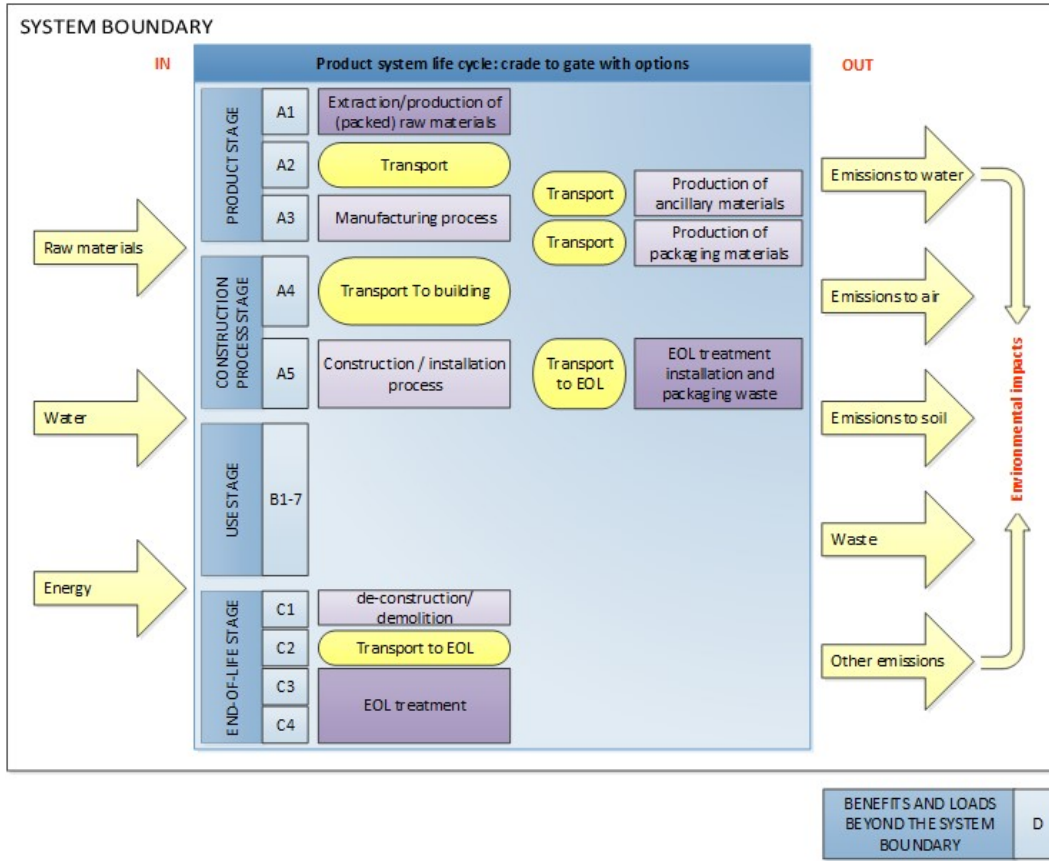
For the calculation of the LCA results, the software program SimaPro 9.3.0.3 (PRé Consultants, 2021) has been used, in combination with a specific LCA software developed by Enperas and customized for ETEX.

Ecoinvent 3.6 is used as LCA background database.

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			x	x	x	x	x

X = Modules Assessed

ND = Not Declared



LCA process diagram according to EN 15804 (7.2.1)



**REPRESENTATIVENESS**

The EPD is representative for PROMATECT®-T produced by a single manufacturer (ETEX) in Tisselt (Belgium) and installed in The Netherlands.

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb eq.	7.81 E-6	4.22 E-6	2.01 E-6	1.40 E-5	9.58 E-7	1.63 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11 E-7	1.93 E-10	9.75 E-8	-1.23 E-7
ADPF	MJ	7.91 E+1	3.32 E+1	1.32 E+2	2.44 E+2	7.29 E+0	1.62 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36 E+0	2.92 E-3	3.28 E+0	-2.27 E+0
GWP	kg CO2 eq.	1.09 E+1	2.21 E+0	7.45 E+0	2.06 E+1	4.78 E-1	1.40 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55 E-1	2.20 E-4	1.31 E-1	-1.46 E-1
ODP	kg CFC11 eq.	8.83 E-7	3.99 E-7	1.01 E-6	2.29 E-6	8.76 E-8	1.17 E-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.84 E-8	1.10 E-11	3.45 E-8	-1.49 E-8
POCP	kg ethene eq.	2.41 E-3	1.24 E-3	1.80 E-3	5.45 E-3	2.38 E-4	6.33 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.72 E-5	3.75 E-8	9.95 E-5	-1.79 E-4
AP	kg SO2 eq.	2.43 E-2	9.27 E-3	9.06 E-3	4.27 E-2	1.14 E-3	4.98 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.68 E-4	4.27 E-7	7.15 E-4	-6.52 E-4
EP	kg (PO4)3- eq.	3.41 E-3	1.26 E-3	2.20 E-3	6.86 E-3	1.76 E-4	6.19 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.71 E-5	8.69 E-8	1.53 E-4	-1.48 E-4

#### Toxicity indicators for Dutch market

HTP	kg DCB eq.	1.58 E+0	9.07 E-1	6.90 E-1	3.18 E+0	1.92 E-1	9.75 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.22 E-2	2.66 E-5	4.49 E-2	-7.39 E-2
FAETP	kg DCB eq.	6.14 E-2	2.40 E-2	2.24 E-2	1.08 E-1	5.30 E-3	1.49 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72 E-3	7.11 E-7	1.07 E-3	-1.03 E-3
MAETP	kg DCB eq.	1.88 E+2	9.33 E+1	3.94 E+1	3.21 E+2	2.03 E+1	5.16 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.58 E+0	2.96 E-3	3.71 E+0	-2.28 E+0
TETP	kg DCB eq.	2.16 E-2	3.18 E-3	4.79 E-3	2.95 E-2	6.83 E-4	1.32 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.21 E-4	1.11 E-6	3.18 E-4	-3.01 E-4
ECI	Euro	8.51 E-1	2.56 E-1	5.09 E-1	1.62 E+0	5.06 E-2	9.81 E-1	-1.83 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64 E-2	1.66 E-5	1.57 E-2	-1.87 E-2
ADPF	kg Sb. eq.	3.88 E-2	1.57 E-2	6.05 E-2	1.15 E-1	3.46 E-3	8.33 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12 E-3	1.66 E-6	1.60 E-3	-1.25 E-3

- 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.]

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1.02 E+1	2.23 E+0	6.71 E+0	1.92 E+1	4.83 E-1	1.84 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57 E-1	2.24 E-4	7.79 E-1	-3.64 E-1
GWP-fossil	kg CO2 eq.	1.10 E+1	2.22 E+0	7.60 E+0	2.09 E+1	4.82 E-1	1.41 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56 E-1	2.23 E-4	1.32 E-1	-1.51 E-1
GWP-biogenic	kg CO2 eq.	-8.02 E-1	8.99 E-4	-8.93 E-1	-1.69 E+0	2.00 E-4	4.21 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.47 E-5	6.54 E-7	6.47 E-1	-2.12 E-1
GWP-luluc	kg CO2 eq.	3.18 E-3	8.62 E-4	2.95 E-3	7.00 E-3	1.72 E-4	7.58 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56 E-5	6.58 E-8	2.98 E-5	-2.77 E-4
ODP	kg CFC11 eq.	9.46 E-7	5.00 E-7	1.06 E-6	2.50 E-6	1.10 E-7	1.27 E-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.56 E-8	1.10 E-11	4.28 E-8	-1.60 E-8
AP	mol H+ eq.	3.07 E-2	1.15 E-2	1.19 E-2	5.40 E-2	1.38 E-3	6.10 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49 E-4	5.40 E-7	9.59 E-4	-8.89 E-4
EP-freshwater	kg PO4 eq.	1.51 E-4	1.73 E-5	8.75 E-5	2.56 E-4	3.85 E-6	3.92 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25 E-6	1.27 E-8	3.23 E-6	-5.90 E-6
EP-marine	kg N eq.	7.14 E-3	2.59 E-3	4.68 E-3	1.44 E-2	2.74 E-4	1.23 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.89 E-5	1.18 E-7	3.46 E-4	-2.37 E-4
EP-terrestrial	mol N eq.	8.29 E-2	2.88 E-2	4.12 E-2	1.53 E-1	3.07 E-3	1.35 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.94 E-4	1.44 E-6	3.84 E-3	-3.16 E-3
POCP	kg NMVOC eq.	2.25 E-2	9.07 E-3	1.27 E-2	4.43 E-2	1.18 E-3	4.08 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81 E-4	3.64 E-7	1.09 E-3	-9.02 E-4
ADP-minerals & metals	kg Sb eq.	7.81 E-6	4.22 E-6	1.99 E-6	1.40 E-5	9.58 E-7	1.63 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11 E-7	1.93 E-10	9.75 E-8	-1.23 E-7
ADP-fossil	MJ, net calorific value	7.91 E+1	3.32 E+1	1.32 E+2	2.44 E+2	7.29 E+0	1.62 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36 E+0	2.92 E-3	3.28 E+0	-2.27 E+0
WDP	m3 world eq. deprived	2.65 E+0	9.19 E-2	-1.37 E+0	1.37 E+0	2.06 E-2	1.54 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.69 E-3	2.26 E-5	1.26 E-2	-7.00 E-2

- 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]

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 experience 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	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	2.02 E-7	1.36 E-7	7.74 E-8	4.15 E-7	3.06 E-8	6.97 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.93 E-9	2.21 E-12	1.88 E-8	-1.54 E-8
IRP	kBq U235 eq.	2.69 E-1	1.44 E-1	3.72 E-1	7.85 E-1	3.19 E-2	5.28 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03 E-2	6.07 E-6	1.29 E-2	-2.92 E-3
ETP-fw	CTUe	1.49 E+2	2.65 E+1	5.24 E+1	2.28 E+2	5.87 E+0	3.11 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90 E+0	3.04 E-3	2.11 E+0	-6.10 E+0
HTP-c	CTUh	1.05 E-8	7.94 E-10	1.39 E-9	1.27 E-8	1.64 E-10	1.02 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.30 E-11	7.18 E-14	4.67 E-11	-3.90 E-10
HTP-nc	CTUh	2.56 E-7	2.75 E-8	2.63 E-8	3.10 E-7	6.19 E-9	3.91 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01 E-9	1.77 E-12	1.19 E-9	-3.98 E-9
SQP	---	1.25 E+2	2.19 E+1	1.14 E+2	2.61 E+2	5.10 E+0	1.26 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65 E+0	1.96 E-3	6.14 E+0	-4.08 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]

**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 experience 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	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.38 E+1	4.49 E-1	7.51 E+0	2.18 E+1	1.02 E-1	4.91 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.32 E-2	3.67 E-4	1.27 E-1	0.00
PERM	MJ	7.25 E+0	0.00	8.47 E+0	1.57 E+1	0.00	-3.77 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09 E+0
PERT	MJ	2.11 E+1	4.49 E-1	1.60 E+1	3.75 E+1	1.02 E-1	1.14 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.32 E-2	3.67 E-4	1.27 E-1	2.09 E+0
PENRE	MJ	8.86 E+1	3.33 E+1	1.46 E+2	2.68 E+2	7.33 E+0	2.07 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38 E+0	3.40 E-3	3.34 E+0	0.00
PENRM	MJ	6.26 E-1	0.00	5.46 E-2	6.80 E-1	0.00	-5.64 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51 E-1
PENRT	MJ	8.92 E+1	3.33 E+1	1.46 E+2	2.68 E+2	7.33 E+0	2.01 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.38 E+0	3.40 E-3	3.34 E+0	2.51 E-1
SM	kg	3.40 E-2	0.00	0.00	3.40 E-2	0.00	1.02 E-3	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	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	0.00	0.00
FW	m3	8.98 E-2	2.33 E-3	5.85 E-2	1.51 E-1	5.36 E-4	1.03 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74 E-4	1.38 E-6	3.34 E-3	-1.69 E-3

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

### 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	B6	B7	C1	C2	C3	C4	D
HWD	kg	8.68 E-2	8.30 E-5	1.64 E-4	8.71 E-2	1.90 E-5	2.62 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.17 E-6	3.16 E-9	3.73 E-6	-8.11 E-6
NHWD	kg	1.81 E+0	1.62 E+0	9.42 E-1	4.37 E+0	3.82 E-1	1.41 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24 E-1	9.47 E-6	1.88 E+1	-7.32 E-3
RWD	kg	2.81 E-4	2.24 E-4	3.11 E-4	8.16 E-4	4.93 E-5	5.63 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60 E-5	5.62 E-9	1.91 E-5	-3.15 E-6
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	0.00	0.00
MFR	kg	0.00	0.00	2.28 E-2	2.28 E-2	0.00	1.30 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.14 E-2	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	0.00	0.00
EEE	MJ	0.00	0.00	5.68 E-2	5.68 E-2	0.00	2.91 E-1	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	1.14 E-1	1.14 E-1	0.00	5.82 E-1	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

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 (A1 / A2)

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BCCpr	kg C	1.78 E-1	0.00	0.00	1.78 E-1	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	0.00	0.00	2.78 E-1	2.78 E-1	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

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

## CALCULATION RULES

The following processes are considered below cut-off:

- Transport of packaging of raw materials
- Ancillary materials used for manufacturing the product
- Packaging and transport of ancillary materials used during installation
- Infrastructure and land use of the factory
- 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. Heating or cooling of the plants in order to ensure a comfortable indoor climate for the personnel for example is also neglected.

For the calculations according to EN15804+A2 the characterization factors from EC-JRC (EF 3.0) were applied. No additional or deviating characterisation factors were used.

For the calculations according to EN15804+A1 (and additional requirements for NMD) the characterization factors from the NMD Bepalingsmethode were applied.

Manufacturer specific data have been collected for the year 2019.

Company specific data for the production at the factory in Tisselt (Belgium) have been collected by ETEX. The LCI data has been checked by the EPD verifier (Agnes Schuurmans, SGS Intron BV). Enperas uses publicly available generic data 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 (modules A4, C1-C4, and module D).

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

### A4 - Transport to the building site

The transportation of the boards to the installation site is shown in the table below. The distance between the factory and Utrecht has been used, as described by 'NMD Environmental performance assessment method for construction works version 1.1 (March 2022)'.

Name	Scenario
Fraction	100% coming from Tisselt (Belgium)
Fuel type and consumption of vehicle or vehicle type used for transport	Truck 16-32 ton EURO6 - 0,254 l diesel / km
Distance (in km)	151
Capacity utilisation (including empty returns)	Default Ecoinvent
Bulk density of transported products	Default Ecoinvent
Volume capacity utilisation factor	Default Ecoinvent

### A5 - Installation in the building

The fire protective board is cut and machined using conventional woodworking equipment. Fixing the boards will require appropriate means, which will depend upon the application and bearing structure. In the EPDs anchor and rings in stainless steel are considered.

Losses during installation and waste treatment of packaging of the final product are also considered in module A5.

The packaging of the ancillary materials used during installation are considered below cut-off.

Inputs/Outputs during installation	Value	Unit
Stainless steel anchor + ring	1.05E-01	kg
Electricity	1.30E-02	kWh
Installation losses (x% of module A1, A2, A3, A4, C2, C3 and C4 is taken into account) [*]	3	%
Packaging waste - Coverage carton	7.28E-02	kg
Packaging waste - PET straps	2.00E-03	kg
Packaging waste - PE cover foil	1.42E-02	kg
Packaging waste - Wooden pallet	5.50E-01	kg

[\*] Comment: However, for rings/anchors this seems not realistic as only the prescribed amount of screws will be used. A few rings/anchors could be lost on the installation site, but this impact is negligible.

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

B1: As the product is produced with cement and lime, uptake of CO<sub>2</sub> due to carbonation has been included in module B1. For the calculations of carbonation the following scenario is considered: boards used for tunnel linings, which is considered as an outdoor, sheltered use, without an impermeable layer in front of the boards. The degree of carbonation may differ in other conditions than 'outdoor, sheltered with no impermeable layer'.

B2: The product does not require maintenance.

B3: The product does not require repair.

B4: No replacement required.  
 B5: No refurbishment  
 B6: MND  
 B7: MND

C: END OF LIFE

*Scenario 1: 100% landfill*

C1: The boards are manually removed (i.e. crowbar), so no impact are expected in module C1  
 C2: 50 km to sorting facility, 50 km from sorting to landfill  
 C3: 95% of steel rings/anchors  
 C4: 100% landfill of the boards, 5% landfill of steel rings/anchors

*Scenario 2: 100% recycling (see results in Annex)*

Currently a machine is being constructed together with an external partner to recycle Etex boards. Therefore, an additional scenario has been calculated in which 100% recycling of the boards at end-of-life has been assumed. The results can be found in the Annex.  
 It is assumed that in the recycling scenario the end-of-waste state is reached after sorting and milling/crushing the waste. The impact of the sorting and milling/crushing process aiming at recycling or reuse is included in module C3.

*C1: The boards are manually removed (i.e. crowbar), so no impact are expected in module C1*

*C2: 50 km to sorting facility, 200 km from sorting to recycling*  
*C3: 100% recycling of the boards, 95% recycling of steel rings/anchors. It is assumed that the end-of-waste-state is reached after sorting and crushing*  
*C4: 5% landfill of steel rings/anchors*

Type of vehicle (truck/boat/etc.)	Fuel consumption	Distance	Capacity utilisation	Transport
Truck 16-32 ton EURO6	0,254 l diesel / km	50 km	Default Ecoinvent	to sorting facility
Truck 16-32 ton EURO6	0,254 l diesel / km	50 km	Default Ecoinvent	sorting facility -> landfill
Truck 16-32 ton EURO6	0,254 l diesel / km	200 km	Default Ecoinvent	sorting facility -> recycling

**D – BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES**

In module D, the benefits and loads beyond the system boundaries are quantified. For recycling, it concerns both the loads of the recycling processes after the end-of-waste and the benefits of the avoided virgin materials, when the recycled components are used for other purposes. In case of incineration, it concerns the benefits from the avoided production of energy grace to energy recovery.

In this case module D includes:

- benefits of steel recycling
- benefits of recycling the calcium silicate boards: filler replacing limestone in concrete applications, and energy recovery from incineration of recuperated cellulose fibers (only for scenario 2 - 100% recycling, included in the Annex)

*Green electricity*

The data collection for Promatect-T is based on production data for 2019. From 2020, the plant switched to green energy. Therefore, this section includes additional results for the Global warming potential considering the use of renewable electricity (hydropower from Norway). For the renewable electricity the Ecoinvent 3.6 data record 'Electricity, high voltage {NO} electricity production, hydro, reservoir, alpine region | Cut-off, U' is used.

Description	Module A3	Total (modules A1-C4)
Global warming potential EN15804+A2 (in kg CO2 eq/FU)	6.04E+00	2.23E+01
Global warming potential NMD Bepalingsmethode (in kg CO2 eq/FU)	6.78E+0	2.26E+01

*Recalculation for various board thicknesses*

The product is currently available in thicknesses between 15-40 mm (increasing per mm). The environmental impact of a product can be considered to be proportional with the thickness of the product, so products with another thickness can be calculated by the below formula:

$E = t \cdot E_{ref} / t_{ref}$  with:

$E$  = environmental impact of a product with a specific thickness  $t$ ;

$t$  = thickness of the product for which the environmental impact is to be calculated;

$E_{ref}$  = environmental impact of the reference product with a thickness of 20 mm;

$t_{ref}$  = thickness of the reference product being 20 mm.

### DECLARATION OF SVHC

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

### REFERENCES

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- ISO 14040:2006: Environmental management – Life cycle assessment – Principles and framework.
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### REMARKS

None

**ANNEX: 100% RECYCLING**

**ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb eq.	7.81 E-6	4.22 E-6	2.01 E-6	1.40 E-5	9.58 E-7	1.64 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50 E-6	6.61 E-8	6.28 E-12	-3.37 E-7
ADPF	MJ	7.91 E+1	3.32 E+1	1.32 E+2	2.44 E+2	7.29 E+0	1.64 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14 E+1	8.93 E-1	1.88 E-4	-3.26 E+0
GWP	kg CO2 eq.	1.09 E+1	2.21 E+0	7.45 E+0	2.06 E+1	4.78 E-1	1.41 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.49 E-1	6.60 E-2	7.96 E-6	-2.11 E-1
ODP	kg CFC11 eq.	8.83 E-7	3.99 E-7	1.01 E-6	2.29 E-6	8.76 E-8	1.19 E-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37 E-7	6.74 E-9	1.93 E-12	-2.86 E-8
POCP	kg ethene eq.	2.41 E-3	1.24 E-3	1.80 E-3	5.45 E-3	2.38 E-4	6.40 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73 E-4	3.32 E-5	6.21 E-9	-2.92 E-4
AP	kg SO2 eq.	2.43 E-2	9.27 E-3	9.06 E-3	4.27 E-2	1.14 E-3	5.01 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78 E-3	2.77 E-4	4.46 E-8	-1.42 E-3
EP	kg (PO4)3- eq.	3.41 E-3	1.26 E-3	2.20 E-3	6.86 E-3	1.76 E-4	6.23 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75 E-4	6.01 E-5	8.65 E-9	-3.65 E-4

Toxicity indicators for Dutch market

HTP	kg DCB eq.	1.58 E+0	9.07 E-1	6.90 E-1	3.18 E+0	1.92 E-1	9.75 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00 E-1	4.31 E-2	2.76 E-6	-1.42 E-1
FAETP	kg DCB eq.	6.14 E-2	2.40 E-2	2.24 E-2	1.08 E-1	5.30 E-3	1.51 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.29 E-3	1.55 E-3	6.64 E-8	-2.27 E-3
MAETP	kg DCB eq.	1.88 E+2	9.33 E+1	3.94 E+1	3.21 E+2	2.03 E+1	5.25 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18 E+1	1.17 E+1	2.42 E-4	-4.63 E+0
TETP	kg DCB eq.	2.16 E-2	3.18 E-3	4.79 E-3	2.95 E-2	6.83 E-4	1.33 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07 E-3	2.80 E-4	1.90 E-8	-7.18 E-4
ECI	Euro	8.51 E-1	2.56 E-1	5.09 E-1	1.62 E+0	5.06 E-2	9.83 E-1	-1.83 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.91 E-2	1.02 E-2	9.57 E-7	-3.38 E-2
ADPF	kg Sb. eq.	3.88 E-2	1.57 E-2	6.05 E-2	1.15 E-1	3.46 E-3	8.42 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.41 E-3	4.72 E-4	9.29 E-8	-1.66 E-3

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.]

**ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1.02 E+1	2.23 E+0	6.71 E+0	1.92 E+1	4.83 E-1	1.85 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.55 E-1	7.14 E-1	8.11 E-6	-4.31 E-1
GWP-fossil	kg CO2 eq.	1.10 E+1	2.22 E+0	7.60 E+0	2.09 E+1	4.82 E-1	1.43 E+0	-3.66 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.54 E-1	6.69 E-2	8.09 E-6	-2.17 E-1
GWP-biogenic	kg CO2 eq.	-8.02 E-1	8.99 E-4	-8.93 E-1	-1.69 E+0	2.00 E-4	4.21 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.12 E-4	6.47 E-1	1.12 E-8	-2.14 E-1
GWP-luluc	kg CO2 eq.	3.18 E-3	8.62 E-4	2.95 E-3	7.00 E-3	1.72 E-4	7.64 E-4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.69 E-4	3.40 E-5	2.30 E-9	-5.77 E-4
ODP	kg CFC11 eq.	9.46 E-7	5.00 E-7	1.06 E-6	2.50 E-6	1.10 E-7	1.30 E-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72 E-7	6.88 E-9	2.40 E-12	-3.05 E-8
AP	mol H+ eq.	3.07 E-2	1.15 E-2	1.19 E-2	5.40 E-2	1.38 E-3	6.13 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17 E-3	3.74 E-4	5.87 E-8	-2.04 E-3
EP-freshwater	kg PO4 eq.	1.51 E-4	1.73 E-5	8.75 E-5	2.56 E-4	3.85 E-6	3.94 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.03 E-6	3.53 E-6	2.07 E-10	-9.44 E-6
EP-marine	kg N eq.	7.14 E-3	2.59 E-3	4.68 E-3	1.44 E-2	2.74 E-4	1.24 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.29 E-4	1.28 E-4	1.94 E-8	-5.94 E-4
EP-terrestrial	mol N eq.	8.29 E-2	2.88 E-2	4.12 E-2	1.53 E-1	3.07 E-3	1.35 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.80 E-3	1.45 E-3	2.15 E-7	-8.41 E-3
POCP	kg NMVOC eq.	2.25 E-2	9.07 E-3	1.27 E-2	4.43 E-2	1.18 E-3	4.11 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.84 E-3	3.79 E-4	6.20 E-8	-1.96 E-3
ADP-minerals & metals	kg Sb eq.	7.81 E-6	4.22 E-6	1.99 E-6	1.40 E-5	9.58 E-7	1.64 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50 E-6	6.61 E-8	6.28 E-12	-3.37 E-7
ADP-fossil	MJ, net calorific value	7.91 E+1	3.32 E+1	1.32 E+2	2.44 E+2	7.29 E+0	1.64 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14 E+1	8.93 E-1	1.88 E-4	-3.26 E+0
WDP	m3 world eq. deprived	2.65 E+0	9.19 E-2	-1.37 E+0	1.37 E+0	2.06 E-2	1.55 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23 E-2	1.13 E-2	7.19 E-6	-1.12 E-1

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]

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 experience with the indicator.



**ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease incidence	2.02 E-7	1.36 E-7	7.74 E-8	4.15 E-7	3.06 E-8	7.04 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.80 E-8	3.43 E-9	1.04 E-12	-3.39 E-8
IRP	kBq U235 eq.	2.69 E-1	1.44 E-1	3.72 E-1	7.85 E-1	3.19 E-2	5.37 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.99 E-2	2.93 E-3	7.04 E-7	-1.07 E-2
ETP-fw	CTUe	1.49 E+2	2.65 E+1	5.24 E+1	2.28 E+2	5.87 E+0	3.13 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.19 E+0	1.75 E+0	1.35 E-4	-1.43 E+1
HTP-c	CTUh	1.05 E-8	7.94 E-10	1.39 E-9	1.27 E-8	1.64 E-10	1.02 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56 E-10	1.57 E-10	3.14 E-15	-5.25 E-10
HTP-nc	CTUh	2.56 E-7	2.75 E-8	2.63 E-8	3.10 E-7	6.19 E-9	3.93 E-8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.68 E-9	1.44 E-9	9.17 E-14	-8.01 E-9
SQP	---	1.25 E+2	2.19 E+1	1.14 E+2	2.61 E+2	5.10 E+0	1.26 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.98 E+0	4.71 E-1	3.47 E-4	-7.13 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]

**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 experience with the indicator.

**RESOURCE USE per functional unit or declared unit (A1 / A2): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1.38 E+1	4.49 E-1	7.51 E+0	2.18 E+1	1.02 E-1	4.91 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60 E-1	1.03 E-1	5.50 E-6	0.00
PERM	MJ	7.25 E+0	0.00	8.47 E+0	1.57 E+1	0.00	-3.93 E+0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-5.64 E+0	0.00	7.73 E+0
PERT	MJ	2.11 E+1	4.49 E-1	1.60 E+1	3.75 E+1	1.02 E-1	9.75 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60 E-1	-5.54 E+0	5.50 E-6	7.73 E+0
PENRE	MJ	8.86 E+1	3.33 E+1	1.46 E+2	2.68 E+2	7.33 E+0	2.09 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15 E+1	1.03 E+0	1.94 E-4	0.00
PENRM	MJ	6.26 E-1	0.00	5.46 E-2	6.80 E-1	0.00	-5.64 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.51 E-1
PENRT	MJ	8.92 E+1	3.33 E+1	1.46 E+2	2.68 E+2	7.33 E+0	2.03 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15 E+1	1.03 E+0	1.94 E-4	2.51 E-1
SM	MJ	3.40 E-2	0.00	0.00	3.40 E-2	0.00	1.02 E-3	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	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	0.00	0.00
FW	m3	8.98 E-2	2.33 E-3	5.85 E-2	1.51 E-1	5.36 E-4	1.02 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.39 E-4	6.50 E-4	1.76 E-7	-2.79 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

**OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 / A2): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	8.68 E-2	8.30 E-5	1.64 E-4	8.71 E-2	1.90 E-5	2.62 E-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.98 E-5	1.15 E-6	2.70 E-10	-1.07 E-5
NHWD	kg	1.81 E+0	1.62 E+0	9.42 E-1	4.37 E+0	3.82 E-1	8.63 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.97 E-1	9.91 E-3	1.05 E-3	-2.26 E-2
RWD	kg	2.81 E-4	2.24 E-4	3.11 E-4	8.16 E-4	4.93 E-5	5.76 E-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.71 E-5	2.83 E-6	1.08 E-9	-9.70 E-6
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	0.00	0.00
MFR	kg	0.00	0.00	2.28 E-2	2.28 E-2	0.00	6.94 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.89 E+1	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	0.00	0.00
EEE	MJ	0.00	0.00	5.68 E-2	5.68 E-2	0.00	2.91 E-1	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	1.14 E-1	1.14 E-1	0.00	5.82 E-1	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

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 (A1 / A2): 100% RECYCLING**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BCCpr	kg C	1.78 E-1	0.00	0.00	1.78 E-1	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	0.00	0.00	2.78 E-1	2.78 E-1	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

BCCpr = Biogenic carbon content in product  
 BCCpa = Biogenic carbon content in packaging