Environmental

Product

Declaration

In accordance with ISO 14025 and EN 15804:2012+A2: 2019

MetecnoTherm Rigid Insulation Board

from

Metecno Pty Ltd t/a MetecnoPIR

Australian Made Insulated Building Systems

Program:	EPD Australasia, www.epd-australasia.com
Program operator:	EPD Australasia Limited
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An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com

General information

An Environmental Product Declaration (EPD) is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules known as a Product Category Rules (PCR). This is a specific EPD. The EPD owner has the sole ownership, liability, and responsibility for this EPD.

EPD's within the same product category from different programmes may not be comparable. EPD of construction products may not be comparable if they do not comply with EN15804. For further information on comparability, see EN 15804 and ISO 14025.

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CEN standard EN 15804+A2:2019/AC2021 serves as the Core Product Category Rules (PCR)

Product category rules (PCR):	PCR 2019:14; Construction products (EN 15804+A2) (1.11)
PCR review was conducted by:	The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com for a list of members. The review panel may be contacted via info@environdec.com. Review chair: Claudia A. Peña, University of Concepción, Chile.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☐ EPD process certification ☒ EPD verification
Procedure for follow-up of data during EPD validity involves third party verifier:	☐ Yes ☒ No

Company information

Table 1 Company Information

	Company Data
Owner of the EPD	Metecno Pty Ltd t/a MetecnoPIR®
Headquarters	103 Ingram Road, Acacia Ridge, QLD, 4110
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Bondor Metecno is Australia's largest manufacturer, distributor and installer of Insulated Sandwich Panels and associated high thermal performance insulation. Bondor was founded in 1951 and joined with the global Metecno Group in 2001. Metecno is one of the largest rigid insulation businesses in the world with operations in Europe, North and South America, China, South East Asia, South Asia, Australia, New Zealand and the Pacific.

Bondor Metecno has the most extensive coverage for manufacturing rigid insulation products in Australia with operations in every state. Bondor Metecno is the only Australian manufacturer of the three internationally recognised insulated panel types, namely EPS-FR cored, Mineral Wool cored, and PIR cored panels, in addition to flexible faced rigid insulation. Our portfolio of products means that we have a solution for any project requirement across thermal, fire, structural and acoustic performance.

We have nine manufacturing sites in Australia, namely in Townsville, Brisbane, Sydney, Melbourne, Launceston, Adelaide and Perth. We have a NATA certified testing and research facility in Brisbane, and are proud to be the only panel manufacturer in Australia to have such an asset.

The business has invested heavily in research and development including major research programs on sandwich panel performance with Queensland University of Technology and the University of Melbourne. These have included a number of studies into the development and implementation of energy efficient housing and further studies into plastics reduction and recycling in the construction sector.

Bondor Metecno is a strong supporter of Australian Standards and the National Construction Code, and advocates the importance of designing products for Australian conditions.

Additionally, with extensive experience as the manufacturer and an installer in the cold chain, Bondor has applied years of practical experience in developing installation guidelines, manuals and training materials for use by installers in the broader construction sectors of commercial, residential and architectural markets.

Our products have a number of inherent advantages over traditional building products in meeting the challenges for an energy efficient and sustainable built environment. The advantages of these products include:

- Superior thermal performance
- Light weight
- Quick and easy installation
- Continuous insulation with no gaps, crumbling or sagging
- Replacing multiple products in a traditional built-up system with one composite product, resulting in reduced material usage, site waste, transport journeys and improving productivity

Performance advantages of rigid insulation include the following:

- Ensure an energy efficient building envelope with best in class thermal performance as per AS/NZ4859.1 2018, significantly reducing the heating and cooling costs over the life of the building.
- The performance does not deteriorate as the insulation does not absorb water, sag or crumble over time.
- Rigid insulation boards conform to Australian Standard AS/NZ1530.3 for fire performance ranging from Group 1 with a substrate facing and Group 2 for flexible facings.

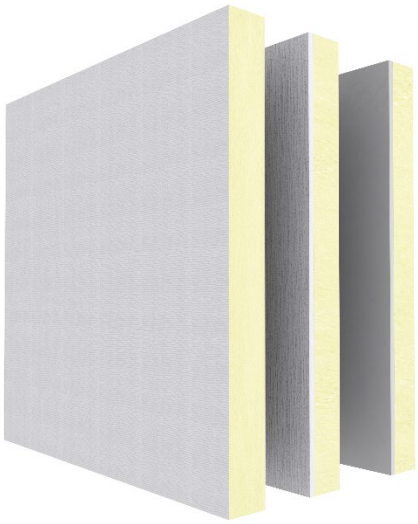
Product information

Table 2 Product Information

Product Type	Product Characteristics	Declared Unit	Products Included
PIR	PIR insulating board	1m^2	MetecnoTherm

Product description:

Thermo-formed rigid PIR Insulation Board with excellent thermal, acoustic and fire performance properties.



UN CPC code: 54650

LCA information

Table 3 LCA Information

Product Characteristics	
Declared Unit	1 m^2 of PIR insulating board
Modules Included	A1-A3, A4-A5, B2, C1–C4 and D
Reference Service Life (RSL)	40 years
Geographical Coverage	Australia
Time Period	Calendar year 2021

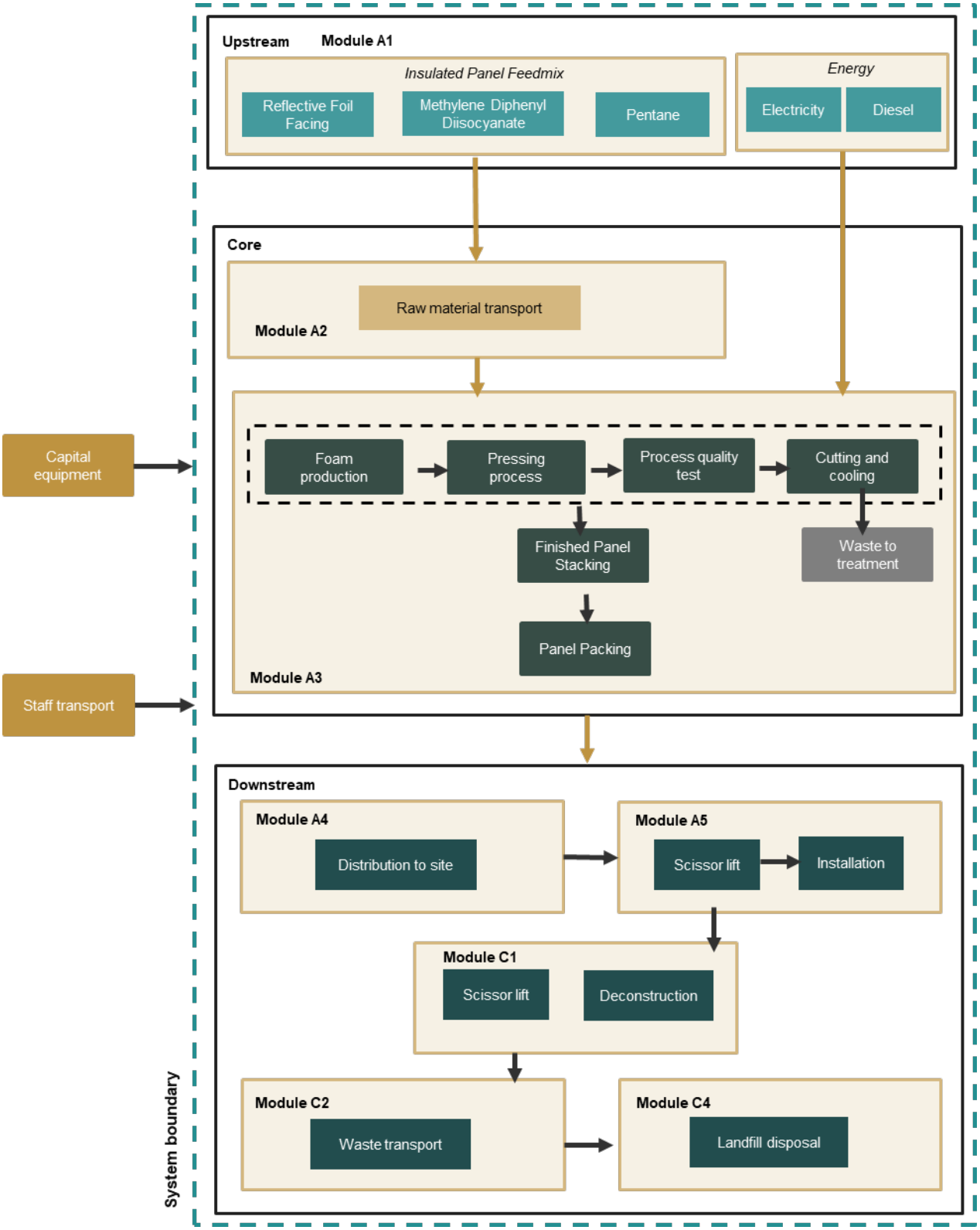


Figure 1 System Diagram

Life Cycle of building products: stage and modules included in this EPD:

The life cycle of a building product is divided into three process modules according to the General Program Instructions (GPI) and four information modules according to ISO 21930 and EN 15804 and supplemented by a module on potential loads and benefits beyond the building life cycle, as given in Table 4.

Table 4: The life cycle of a building product

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	ND	X	ND	ND	ND	ND	ND	X	X	X	X	ND
Geography	USA/ AU/ CN	USA/ AU/ CN	AU	AU	AU	-	AU	-	-	-	-	-	AU	AU	AU	AU	AU
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation sites	Not applicable					-	-	-	-	-	-	-	-	-	-	-	-

ND = not declared

Cut-off rules and Exclusion of Small Amounts

It is common practice in LCA/LCI protocols to propose exclusion limits for inputs and outputs that fall below a threshold % of the total, but with the exception that where the input/output has a “significant” impact it should be included. According to the PCR 2019:14 v1.11, Life cycle inventory data shall according to EN 15804 A2 include a minimum of 95% of total inflows (mass and energy) per module. Inflows not included in the LCA shall be documented in the EPD. Data gaps in included stages in the downstream modules shall be reported in the EPD, including an evaluation of their significance. In accordance with the PCR 2019:14 v1.11, the following system boundaries are applied to manufacturing equipment and employees:

- Environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in the LCI. Capital equipment and buildings typically account for less than a few percent of nearly all LCIs and this is usually smaller than the error in the inventory data itself. For this project, it is assumed that capital equipment makes a negligible contribution to the impacts as per Frischknecht et al. (Frischknecht, 2007) with no further investigation.
- Personnel-related impacts, such as transportation to and from work, are also not accounted for in the LCI. The impacts of employees are also excluded from inventory impacts on the basis that if they were not employed for this production or service function, they would be employed for another. It is very hard to decide what proportion of the impacts from their whole lives should count towards their employment. For this project, the impacts of employees are excluded.
- The transport of scissor lift to and from the installation site is excluded.
- Besides these exclusions, no energy or mass flows were excluded in this LCA report.

Allocation

According to EN 15804 A2:2019, in a process step where more than one type of product is generated, it is necessary to allocate the environmental stressors (inputs and outputs) from the process to the different products (functional outputs) in order to get product-based inventory data instead of process-based data. An allocation problem also occurs for multi-input processes. In an allocation procedure, the sum of the allocated inputs and outputs to the products shall be equal to the unallocated inputs and outputs of the unit process.

The following stepwise allocation principles shall be applied for multi-input/output allocations:

- The initial allocation step includes dividing up the system sub-processes and collecting the input and output data related to these sub-processes.
- The first (preferably) allocation procedure step for each sub-process is to partition the inputs and outputs of the system into their different products in a way that reflects the underlying physical relationships between them.
- The second (worst case) allocation procedure step is needed when physical relationship alone cannot be established or used as the basis for allocation. In this case, the remaining environmental inputs and outputs from a sub-process must be allocated between the products in a way that reflects other relationships between them, such as the economic value of the products.
- For electricity and gas used in the production of each panel, the total manufacturing electricity and gas consumption was divided by the volume of each produced product type.

Data quality and validation

The primary data used for the study is based on direct utility bills or feedstock quantities from Metecno's procurement records. Primary data was carefully reviewed in order to ensure completeness, accuracy and representativeness of the data supplied. Contribution analysis was used to focus on the key pieces of data contributing to the environmental impact categories. The data was benchmarked against relevant benchmark data in Ecoinvent. Overall, the data was deemed to be of high quality for the core module.

Assumptions, Choices, and Limitations

Assumption or limitation	Impact on LCA results	Discussion
Insulation foam ingredient composition.	Minor	Information obtained from Metecno Production Team
Panel distribution	Minor	Information obtained from Metecno Production Team
Construction energy	Minor	Direct construction energy use is based on conservative estimates, still not significant to the overall results.
Exclusion of employees, capital good and infrastructure	Minor	
Recycling of boards, incl flexible facings	Medium	Few boards are believed to be discarded or disposed into landfill after use. The assumption of 6% of boards being disposed of in landfill is based on assumptions as direct data for Australia was not available at the time of reporting. The recycling rate has impact on Module D avoided production calculation.
Maintenance during use	Low	The boards are assumed to be repainted once over 40 years of use. This is considered a conservative estimate.

Compliance with Standards

The methodology and report format has been modified to comply with:

- ISO 14040:2006 and ISO14044:2006+A1:2018 which describe the principles, framework, requirements and provides guidelines for life cycle assessment (LCA).
- ISO 14025:2006 Environmental labels and declarations – Type III environmental declarations -- Principles and procedures, which establishes the principles and specifies the procedures for developing Type III environmental declaration programmes and Type III environmental declarations.
- EN 15804:2012+A1:2013; Sustainability of construction works — Environmental product declarations.
- EN 15804:2012+A2:2019; Sustainability of construction works — Environmental product declarations.
- Product Category Rules (PCR) 2019:14, v1.11 – Construction products – Hereafter referred to as PCR 2019:14.
- General Programme Instructions (GPI) for the International EPD System V3.01 – containing instructions regarding methodology and the content that must be included in EPDs registered under the International EPD System.
- Instructions of EPD Australasia V3.01 – a regional annex to the general programme instructions of the International EPD System.

Environmental Performance Related Information

The potential environmental impacts, use of resources and waste categories included in this EPD were calculated using the SimaPro v9.4.0.1 tool and are listed in Table 5 . All tables from this point will contain the abbreviation only. The LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds and safety margins or risks.

Table 5 | Life cycle impact, resource and waste assessment categories, measurements and methods in accordance with EN15804+A2

Impact Category	Abbreviation	Measurement Unit	Assessment Method and Implementation
Global warming potential (fossil)	GWP - Fossil	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Global warming potential (biogenic)	GWP - Biogenic	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Land use/ land transformation	GWP - Luluc	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Total global warming potential	GWP - Total	kg CO_2 equivalents (GWP100)	Baseline model of 100 years of the IPCC based on IPCC 2013
Acidification potential	AP	mol H^+ eq.	Accumulated Exceedance, Seppälä et al. 2006, Posch et al., 2008
Eutrophication – aquatic freshwater	EP - freshwater	kg P equivalent	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe
Eutrophication – aquatic marine	EP - marine	kg N equivalent	EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe
Eutrophication – terrestrial	EP – terrestrial	mol N equivalent	Accumulated Exceedance, Seppälä et al. 2006, Posch et al.
Photochemical ozone creation potential	POCP	kg NMVOC equivalents	LOTOS-EUROS, Van Zelm et al., 2008, as applied in ReCiPe
Abiotic depletion potential (elements)*	ADPE	kg Sb equivalents	CML (v4.1)
Abiotic depletion potential (fossil fuels)*	ADPF	MJ net calorific value	CML (v4.1)
Ozone depletion potential	ODP	kg CFC 11 equivalents	Steady-state ODPs, WMO 2014
Water Depletion Potential*	WDP	m^3 equivalent deprived	Available WAter REmaining (AWARE) Boulay et al., 2016
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 equivalents (GWP100)	CML (v4.1)
Resource use			
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants[1]

[1] Method to calculate Cumulative Energy Demand (CED), based on the method published by Ecoinvent version 2.0 and expanded by PRé Consultants for raw materials available in the SimaPro database.

Impact Category	Abbreviation	Measurement Unit	Assessment Method and Implementation
Use of renewable primary energy resources used as raw materials	PERM	MJ, net calorific value	Manual for direct inputs[2]
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PERT	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ, net calorific value	Manual for direct inputs[3]
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants
Total use of non- renewable primary energy resources (primary energy and primary energy resources used as raw materials)	PENRT	MJ, net calorific value	ecoinvent version 3.6 and expanded by PRé Consultants [4]
Use of secondary material	SM	kg	Manual for direct inputs
Use of renewable secondary fuels	RSF	MJ, net calorific value	Manual for direct inputs
Use of non-renewable secondary fuels	NRSF	MJ, net calorific value	Manual for direct inputs
Use of net fresh water	FW	m^3	ReCiPe 2016
Waste categories			
Hazardous waste disposed	HWD	kg	EDIP 2003 (v1.05)
Non-hazardous waste disposed	NHWD	kg	EDIP 2003 (v1.05) [5]
Radioactive waste disposed/stored	RWD	kg	EDIP 2003 (v1.05)
Additional environmental impact indicators			
Particulate matter	Potential incidence of disease due to PM emissions (PM)	Disease incidence	SETAC-UNEP, Fantke et al. 2016
Ionising radiation - human health**	Potential Human exposure efficiency relative to U235 (IRP)	kBq U-235 eq	Human Health Effect model
Eco-toxicity (freshwater)*	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	CTUe	USEtox

[2] Calculated based on the lower heating value of renewable raw materials.

[3] Calculated based on the lower heating value of non-renewable raw materials.

[4] Calculated as sum of *Non-renewable, fossil*, *Non-renewable, nuclear* and *Non-renewable, biomass*.

[5] Calculated as sum of *Bulk waste* and *Slags/ash*.

Impact Category	Abbreviation	Measurement Unit	Assessment Method and Implementation
Human toxicity potential - cancer effects*	Potential Comparative Toxic Unit for humans (HTP-c)	CTUh	USEtox
Human toxicity potential - non cancer effects*	Potential Comparative Toxic Unit for humans (HTP-nc)	CTUh	USEtox
Soil quality*	Potential soil quality index (SQP)	dimensionless	Soil quality index (LANCA®

Table 6 | Environmental impact indicators in accordance with EN15804+A1

Impact Category	Abbreviation	Measurement Unit (eq. = equivalence)	Assessment Method and Implementation
Global warming potential (GWP100)	GWP	kg CO_2 eq.	CML (v4.02) based on IPCC AR4
Ozone depletion potential	ODP	kg CFC 11 eq.	CML (v4.02) based on WMO 1999
Acidification potential	AP	kg SO_2 e eq.	CML (v4.02)
Eutrophication potential	EP	kg PO_4^{3-} eq.	CML (v4.02)
Photochemical ozone creation potential	POCP	kg C_2H_4 eq.	CML (v4.2)
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq.	CML (v4.2)
Abiotic depletion potential for fossil resources	ADPF	MJ net calorific value	CML (v4.2)

Table 7 | Environmental impact indicators in accordance with Green Star v1.3

Impact Category	Abbreviation	Measurement Unit (eq. = equivalence)	Assessment Method and Implementation
Human toxicity cancer	HTPc	CTUh	USEtox – cancer effect
Human toxicity noncancer	HTPnc	CTUh	USEtox – noncancer effect
Land use	LU	kg C deficit-eq.	Soil Organic Matter method
Resource depletion - water	RDW	m^3	Water Stress Indicator
Ionising radiation	IR	kBq U-235-eq.	Human Health Effect model
Particulate matter	PM	kg PM2.5-eq.	RiskPoll

Content information

Product stage (Modules A1-A3)

Items		Mass (%)	Post-consumer material (%)	**Pre-consumer material** (%)
MetecnoTherm	Reflective Foil Facing	63-88	8.5	6.5
	Polyisocyanurate	11-35	0	0
	Pentane	1	0	0

None of the products contain one or more substances that are listed in the “Candidate List of Substances of Very High Concern for authorisation”. According to the PCR 2019:14, if one or more substances of the “Candidate List of Substances of Very High Concern (SVHC) for authorisation” are present in a product and their total content exceeds 0.1% of the weight of the product, they need to be reported.

Transport (Module A4)

The transport distances in the following table from manufacturing gate were calculated based on primary data from Metecno’s percentage of total products shipped to each state with the distance of 404 km. The transport is m^2 product constrained.

Installation (Module A5)

0.17 kWh of electricity is required for machinery used during the construction for boards under 100 mm and 0.24 kg of diesel is used for scissor lift for boards under 100mm. The boards are trimmed and prepared before being installed with fasteners and joints sealed with tape to hold the structure in place. The installation procedures are the same across all board products. Most panels/boards are installed without any offcuts. The offcuts is equivalent to 0.09% of panel weight.

Maintenance (Module B2)

The exterior facing (top) board side is assumed to be repainted once over the 40-year lifespan of the panel with two coating layers.

Table 8 I Maintenance process

Input	Description per functional unit
Maintenance process	Repaint
Maintenance cycle	1 per lifespan of 40 years
Acrylic paint 25 um	1 m^2

Disposal / Reuse / Recycling (Module C1-C4)

The scenarios included are currently in use and are representative for one of the most probable alternatives.

Following the use of the boards, Metecno has limited evidence of what the end-of-life fate for their panels. The recommended cradle to grave environmental profile will be based on the most common scenario as boards are deconstructed and transported to material recovery facilities. The included scenarios are based on the most likely outcomes of the products at the end-of-life.

The following assumptions have been used in this study to model board deconstruction and end of life scenarios:

- Diesel fuel consumption for deconstruction has been calculated based on the gravitational potential energy required to lift a typical board 10m above ground, assuming 15% diesel energy conversion into effective work.
- 100 km delivery distance to landfill, material recovery facility is assumed for waste collection process.
- 100% of the boards are assumed to eventually be disposed in landfill.

Environmental information

MetecnoTherm 25mm

Table 9 | Environmental impacts per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	1.64E+01	6.90E-05	1.53E-01	1.78E+00	1.39E-01	9.58E-04	0.00E+00	2.68E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	5.69E-02	4.42E-09	7.21E-02	2.94E-03	4.85E-04	2.27E-08	0.00E+00	1.77E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	1.87E-02	5.80E-10	5.84E-05	5.63E-06	2.87E-08	7.00E-09	0.00E+00	2.75E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**1.64E+01**	**6.90E-05**	**2.25E-01**	**1.78E+00**	**1.40E-01**	**9.58E-04**	**0.00E+00**	**2.69E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	1.37E-06	1.04E-11	4.21E-08	5.04E-08	2.66E-10	3.90E-11	0.00E+00	7.39E-09	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.10E-01	5.42E-07	1.44E-03	9.09E-03	1.02E-03	6.54E-06	0.00E+00	2.20E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	3.95E-03	2.44E-09	-1.21E-06	1.68E-04	5.50E-06	3.60E-08	0.00E+00	4.04E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	2.23E-02	1.54E-07	2.16E-04	1.55E-03	1.51E-04	1.84E-06	0.00E+00	4.90E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	2.25E-01	1.69E-06	2.35E-03	1.32E-02	1.62E-03	2.01E-05	0.00E+00	7.96E-04	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	6.17E-02	4.18E-07	6.61E-04	3.85E-03	4.26E-04	4.96E-06	0.00E+00	2.85E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	1.88E-04	2.61E-10	2.24E-06	4.06E-06	1.81E-07	4.63E-09	0.00E+00	8.54E-08	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	2.54E+02	9.77E-04	1.26E+00	3.19E+01	6.63E-01	4.87E-03	0.00E+00	6.23E-01	0.00E+00
Water Depletion Potential	WDP	m^3	8.49E+00	2.07E-05	3.98E-01	3.47E+01	2.28E-02	1.02E-02	0.00E+00	2.49E-02	0.00E+00

Table 10 | Resource use per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	1.54E+01	1.06E-05	3.25E-01	3.26E-01	1.20E-01	1.55E-04	0.00E+00	1.20E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**1.54E+01**	**1.06E-05**	**3.25E-01**	**3.26E-01**	**1.20E-01**	**1.55E-04**	**0.00E+00**	**1.20E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	2.16E+02	9.77E-04	3.10E+00	3.19E+01	6.63E-01	4.87E-03	0.00E+00	6.23E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	3.72E+01	0.00E+00	-9.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-2.92E+0.1	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**2.53E+02**	**9.77E-04**	**-6.10E+00**	**3.19E+01**	**6.63E-01**	**4.87E-03**	**0.00E+00**	**-2.86E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	7.46E-02	1.18E-07	3.58E-04	3.67E-03	1.14E-04	1.70E-06	0.00E+00	3.49E-04	0.00E+00

Table 11 | Waste generated per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	2.86E-04	1.30E-09	-2.13E-06	1.08E-05	4.50E-07	1.52E-08	0.00E+00	8.88E-07	0.00E+00
Non-hazardous waste disposed	NHWD	kg	1.55E+00	6.87E-06	2.32E-01	6.54E-02	8.58E-03	9.78E-05	0.00E+00	2.30E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	3.60E-04	5.22E-12	1.75E-05	6.94E-06	4.39E-09	6.62E-11	0.00E+00	3.44E-06	0.00E+00

Table 12 | Output flows per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 13 | Additional environmental impacts per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	1.58E+01	6.76E-05	1.53E-01	1.68E+00	1.37E-01	9.39E-04	0.00E+00	2.02E-01	0.00E+00
Particulate matter	PM	disease incidence	1.01E-06	3.58E-12	7.56E-09	8.57E-08	8.88E-09	5.10E-11	0.00E+00	4.16E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	8.66E-01	3.77E-08	1.70E-02	4.85E-02	3.05E-05	4.62E-07	0.00E+00	2.86E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	5.21E+02	5.27E-04	1.50E+00	7.90E+00	3.79E-01	1.64E-02	0.00E+00	1.23E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	9.56E-08	1.83E-14	2.35E-09	4.00E-10	2.43E-11	3.76E-13	0.00E+00	1.96E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	8.48E-07	6.53E-13	2.19E-09	7.25E-09	7.26E-10	1.59E-11	0.00E+00	5.19E-10	0.00E+00
Soil quality	SQP	Pt	4.90E+01	2.70E-04	1.07E+00	6.96E-01	4.26E-01	4.33E-03	0.00E+00	1.36E+00	0.00E+00

Table 14 | Environmental impacts per m² of MetecnoTherm 25mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	1.59E+01	6.77E-05	1.93E-01	1.72E+00	1.38E-01	9.41E-04	0.00E+00	2.30E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	1.32E-06	8.23E-12	3.72E-08	3.09E-11	2.33E-10	3.09E-11	0.00E+00	5.86E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	6.64E-02	2.86E-07	5.17E-04	3.02E-06	2.11E-04	3.02E-06	0.00E+00	1.68E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	2.20E-02	6.55E-08	7.66E-05	7.64E-07	7.30E-05	7.64E-07	0.00E+00	2.08E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	6.23E-03	1.92E-08	6.60E-05	1.96E-07	4.31E-06	1.96E-07	0.00E+00	4.02E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	1.88E-04	2.61E-10	2.24E-06	4.63E-09	1.81E-07	4.63E-09	0.00E+00	8.54E-08	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	2.57E+02	9.86E-04	3.63E+00	1.41E-02	1.55E+00	1.41E-02	0.00E+00	5.88E-01	0.00E+00

Table 15 | Environmental impacts per m² of MetecnoTherm 25mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	7.92E-08	1.48E-15	9.46E-12	9.30E-15	5.02E-12	9.30E-15	0.00E+00	1.86E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	4.54E-08	3.32E-16	1.30E-12	2.09E-15	8.52E-13	2.09E-15	0.00E+00	2.86E-13	0.00E+00
Land use	LU	kg C deficit eq.	1.52E+01	1.73E-04	4.78E-01	1.09E-03	1.23E-02	1.09E-03	0.00E+00	3.94E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	8.68E-01	3.55E-08	1.71E-02	2.24E-07	3.06E-05	2.24E-07	0.00E+00	2.86E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	1.80E-02	6.45E-08	1.52E-04	4.06E-07	7.30E-05	4.06E-07	0.00E+00	5.21E-05	0.00E+00
Resource depletion - water	RDW	m³	1.95E-01	3.16E-07	1.46E-03	1.99E-06	9.97E-04	1.99E-06	0.00E+00	7.98E-04	0.00E+00

MetecnoTherm 30mm

Table 16 | Environmental impacts per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	1.74E+01	9.97E-05	1.50E-01	1.78E+00	1.39E-01	1.02E-03	0.00E+00	2.85E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	5.73E-02	6.39E-09	7.57E-02	2.94E-03	4.85E-04	2.41E-08	0.00E+00	1.88E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	1.97E-02	8.37E-10	5.86E-05	5.63E-06	2.87E-08	7.44E-09	0.00E+00	2.93E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**1.75E+01**	**9.97E-05**	**2.26E-01**	**1.78E+00**	**1.40E-01**	**1.02E-03**	**0.00E+00**	**2.86E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	1.55E-06	1.50E-11	4.21E-08	5.04E-08	2.66E-10	4.15E-11	0.00E+00	7.86E-09	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.16E-01	7.83E-07	1.44E-03	9.09E-03	1.02E-03	6.96E-06	0.00E+00	2.34E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	4.25E-03	3.52E-09	-2.59E-06	1.68E-04	5.50E-06	3.83E-08	0.00E+00	4.29E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	2.41E-02	2.23E-07	2.15E-04	1.55E-03	1.51E-04	1.96E-06	0.00E+00	5.21E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	2.37E-01	2.44E-06	2.34E-03	1.32E-02	1.62E-03	2.14E-05	0.00E+00	8.47E-04	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	6.59E-02	6.04E-07	6.51E-04	3.85E-03	4.26E-04	5.27E-06	0.00E+00	3.03E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	2.11E-04	3.76E-10	2.26E-06	4.06E-06	1.81E-07	4.92E-09	0.00E+00	9.08E-08	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	2.79E+02	1.41E-03	1.15E+00	3.19E+01	6.63E-01	5.18E-03	0.00E+00	6.62E-01	0.00E+00
Water Depletion Potential	WDP	m^3	9.26E+00	2.99E-05	4.16E-01	3.47E+01	2.28E-02	1.08E-02	0.00E+00	2.65E-02	0.00E+00

Table 17 | Resource use per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	1.62E+01	1.53E-05	3.30E-01	3.26E-01	1.20E-01	1.65E-04	0.00E+00	1.28E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**1.62E+01**	**1.53E-05**	**3.30E-01**	**3.26E-01**	**1.20E-01**	**1.65E-04**	**0.00E+00**	**1.28E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	2.34E+02	1.41E-03	3.09E+00	3.19E+01	6.63E-01	5.18E-03	0.00E+00	6.62E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	4.34E+01	0.00E+00	-9.68E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.50E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**2.78E+02**	**1.41E-03**	**-6.59E+00**	**3.19E+01**	**6.63E-01**	**5.18E-03**	**0.00E+00**	**-3.43E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	8.22E-02	1.70E-07	3.48E-04	3.67E-03	1.14E-04	1.81E-06	0.00E+00	3.72E-04	0.00E+00

Table 18 | Waste generated per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	3.05E-04	1.88E-09	-2.51E-06	1.08E-05	4.50E-07	1.62E-08	0.00E+00	9.44E-07	0.00E+00
Non-hazardous waste disposed	NHWD	kg	1.65E+00	9.92E-06	2.40E-01	6.54E-02	8.58E-03	1.04E-04	0.00E+00	2.44E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	3.89E-04	7.54E-12	1.76E-05	6.94E-06	4.39E-09	7.04E-11	0.00E+00	3.66E-06	0.00E+00

Table 19 | Output flows per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 20 | Additional environmental impacts per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	1.68E+01	9.76E-05	1.50E-01	1.68E+00	1.37E-01	9.99E-04	0.00E+00	2.15E-01	0.00E+00
Particulate matter	PM	disease incidence	1.06E-06	5.17E-12	7.22E-09	8.57E-08	8.88E-09	5.43E-11	0.00E+00	4.42E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	9.25E-01	5.45E-08	1.73E-02	4.85E-02	3.05E-05	4.91E-07	0.00E+00	3.04E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	5.86E+02	7.62E-04	1.42E+00	7.90E+00	3.79E-01	1.74E-02	0.00E+00	1.30E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	1.10E-07	2.64E-14	2.42E-09	4.00E-10	2.43E-11	3.99E-13	0.00E+00	2.09E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	9.88E-07	9.43E-13	2.19E-09	7.25E-09	7.26E-10	1.70E-11	0.00E+00	5.52E-10	0.00E+00
Soil quality	SQP	Pt	5.17E+01	3.90E-04	1.08E+00	6.96E-01	4.26E-01	4.60E-03	0.00E+00	1.45E+00	0.00E+00

Table 21 | Environmental impacts per m² of MetecnoTherm 30mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	1.69E+01	9.79E-05	1.92E-01	1.72E+00	1.38E-01	1.00E-03	0.00E+00	2.45E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	1.49E-06	1.19E-11	3.71E-08	3.29E-11	2.33E-10	3.29E-11	0.00E+00	6.23E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	7.14E-02	4.13E-07	5.10E-04	3.21E-06	2.11E-04	3.21E-06	0.00E+00	1.78E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	2.38E-02	9.46E-08	7.20E-05	8.12E-07	7.30E-05	8.12E-07	0.00E+00	2.21E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	7.01E-03	2.77E-08	6.45E-05	2.08E-07	4.31E-06	2.08E-07	0.00E+00	4.28E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	2.11E-04	3.76E-10	2.26E-06	4.92E-09	1.81E-07	4.92E-09	0.00E+00	9.08E-08	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	2.77E+02	1.42E-03	3.60E+00	1.50E-02	1.55E+00	1.50E-02	0.00E+00	6.26E-01	0.00E+00

Table 22 | Environmental impacts per m² of MetecnoTherm 30mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	9.26E-08	2.13E-15	9.38E-12	9.89E-15	5.02E-12	9.89E-15	0.00E+00	1.98E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	5.41E-08	4.79E-16	1.30E-12	2.22E-15	8.52E-13	2.22E-15	0.00E+00	3.04E-13	0.00E+00
Land use	LU	kg C deficit eq.	1.64E+01	2.49E-04	4.79E-01	1.16E-03	1.23E-02	1.16E-03	0.00E+00	4.19E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	9.28E-01	5.13E-08	1.73E-02	2.38E-07	3.06E-05	2.38E-07	0.00E+00	3.04E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	1.92E-02	9.31E-08	1.48E-04	4.32E-07	7.30E-05	4.32E-07	0.00E+00	5.54E-05	0.00E+00
Resource depletion - water	RDW	m^3	2.12E-01	4.57E-07	1.43E-03	2.12E-06	9.97E-04	2.12E-06	0.00E+00	8.49E-04	0.00E+00

MetecnoTherm 40mm

Table 23 | Environmental impacts per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	1.95E+01	1.15E-04	1.44E-01	1.78E+00	1.39E-01	1.14E-03	0.00E+00	3.19E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	5.86E-02	7.37E-09	8.25E-02	2.94E-03	4.85E-04	2.70E-08	0.00E+00	2.10E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.15E-02	9.66E-10	5.91E-05	5.63E-06	2.87E-08	8.33E-09	0.00E+00	3.27E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**1.96E+01**	**1.15E-04**	**2.27E-01**	**1.78E+00**	**1.40E-01**	**1.14E-03**	**0.00E+00**	**3.20E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	1.90E-06	1.73E-11	4.20E-08	5.04E-08	2.66E-10	4.64E-11	0.00E+00	8.79E-09	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.28E-01	9.04E-07	1.43E-03	9.09E-03	1.02E-03	7.78E-06	0.00E+00	2.62E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	4.85E-03	4.06E-09	-5.12E-06	1.68E-04	5.50E-06	4.29E-08	0.00E+00	4.81E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	2.76E-02	2.57E-07	2.13E-04	1.55E-03	1.51E-04	2.19E-06	0.00E+00	5.83E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	2.60E-01	2.82E-06	2.32E-03	1.32E-02	1.62E-03	2.40E-05	0.00E+00	9.47E-04	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	7.41E-02	6.97E-07	6.33E-04	3.85E-03	4.26E-04	5.90E-06	0.00E+00	3.39E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	2.58E-04	4.34E-10	2.30E-06	4.06E-06	1.81E-07	5.50E-09	0.00E+00	1.02E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	3.29E+02	1.63E-03	9.43E-01	3.19E+01	6.63E-01	5.80E-03	0.00E+00	7.41E-01	0.00E+00
Water Depletion Potential	WDP	m^3	1.06E+01	3.45E-05	4.48E-01	3.47E+01	2.28E-02	1.21E-02	0.00E+00	2.97E-02	0.00E+00

Table 24 | Resource use per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	1.77E+01	1.76E-05	3.38E-01	3.26E-01	1.20E-01	1.84E-04	0.00E+00	1.43E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**1.77E+01**	**1.76E-05**	**3.38E-01**	**3.26E-01**	**1.20E-01**	**1.84E-04**	**0.00E+00**	**1.43E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	2.72E+02	1.63E-03	3.06E+00	3.19E+01	6.63E-01	5.80E-03	0.00E+00	7.41E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	5.59E+01	0.00E+00	-1.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-4.66E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**3.28E+02**	**1.63E-03**	**-7.50E+00**	**3.19E+01**	**6.63E-01**	**5.80E-03**	**0.00E+00**	**-4.58E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	9.78E-02	1.97E-07	3.30E-04	3.67E-03	1.14E-04	2.02E-06	0.00E+00	4.16E-04	0.00E+00

Table 25 | Waste generated per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	3.42E-04	2.17E-09	-3.20E-06	1.08E-05	4.50E-07	1.81E-08	0.00E+00	1.06E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	1.84E+00	1.14E-05	2.56E-01	6.54E-02	8.58E-03	1.16E-04	0.00E+00	2.73E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	4.47E-04	8.70E-12	1.78E-05	6.94E-06	4.39E-09	7.88E-11	0.00E+00	4.09E-06	0.00E+00

Table 26 | Output flows per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 27 | Additional environmental impacts per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	1.88E+01	1.13E-04	1.45E-01	1.68E+00	1.37E-01	1.12E-03	0.00E+00	2.41E-01	0.00E+00
Particulate matter	PM	disease incidence	1.16E-06	5.97E-12	6.59E-09	8.57E-08	8.88E-09	6.07E-11	0.00E+00	4.95E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.04E+00	6.28E-08	1.78E-02	4.85E-02	3.05E-05	5.50E-07	0.00E+00	3.40E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	7.15E+02	8.79E-04	1.26E+00	7.90E+00	3.79E-01	1.95E-02	0.00E+00	1.46E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	1.39E-07	3.05E-14	2.55E-09	4.00E-10	2.43E-11	4.47E-13	0.00E+00	2.34E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	1.27E-06	1.09E-12	2.18E-09	7.25E-09	7.26E-10	1.90E-11	0.00E+00	6.18E-10	0.00E+00
Soil quality	SQP	Pt	5.69E+01	4.50E-04	1.09E+00	6.96E-01	4.26E-01	5.15E-03	0.00E+00	1.62E+00	0.00E+00

Table 28 | Environmental impacts per m² of MetecnoTherm 40mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	1.89E+01	1.13E-04	1.90E-01	1.72E+00	1.38E-01	1.12E-03	0.00E+00	2.74E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	1.82E-06	1.37E-11	3.70E-08	3.68E-11	2.33E-10	3.68E-11	0.00E+00	6.97E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	8.13E-02	4.77E-07	4.97E-04	3.60E-06	2.11E-04	3.60E-06	0.00E+00	2.00E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	2.74E-02	1.09E-07	6.37E-05	9.08E-07	7.30E-05	9.08E-07	0.00E+00	2.48E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	8.57E-03	3.20E-08	6.17E-05	2.33E-07	4.31E-06	2.33E-07	0.00E+00	4.79E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	2.58E-04	4.34E-10	2.30E-06	5.50E-09	1.81E-07	5.50E-09	0.00E+00	1.02E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	3.15E+02	1.64E-03	3.55E+00	1.68E-02	1.55E+00	1.68E-02	0.00E+00	7.00E-01	0.00E+00

Table 29 | Environmental impacts per m² of MetecnoTherm 40mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	1.19E-07	2.46E-15	9.24E-12	1.11E-14	5.02E-12	1.11E-14	0.00E+00	2.22E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	7.15E-08	5.53E-16	1.32E-12	2.49E-15	8.52E-13	2.49E-15	0.00E+00	3.40E-13	0.00E+00
Land use	LU	kg C deficit eq.	1.89E+01	2.88E-04	4.80E-01	1.29E-03	1.23E-02	1.29E-03	0.00E+00	4.69E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.05E+00	5.91E-08	1.78E-02	2.66E-07	3.06E-05	2.66E-07	0.00E+00	3.40E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	2.16E-02	1.07E-07	1.40E-04	4.83E-07	7.30E-05	4.83E-07	0.00E+00	6.20E-05	0.00E+00
Resource depletion - water	RDW	m^3	2.47E-01	5.27E-07	1.38E-03	2.37E-06	9.97E-04	2.37E-06	0.00E+00	9.49E-04	0.00E+00

MetecnoTherm 50mm

Table 30 | Environmental impacts per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.15E+01	1.46E-04	1.39E-01	1.78E+00	1.39E-01	1.26E-03	0.00E+00	3.53E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	5.99E-02	9.34E-09	8.92E-02	2.94E-03	4.85E-04	2.98E-08	0.00E+00	2.32E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.34E-02	1.22E-09	5.95E-05	5.63E-06	2.87E-08	9.20E-09	0.00E+00	3.62E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.16E+01**	**1.46E-04**	**2.28E-01**	**1.78E+00**	**1.40E-01**	**1.26E-03**	**0.00E+00**	**3.53E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	2.24E-06	2.20E-11	4.20E-08	5.04E-08	2.66E-10	5.13E-11	0.00E+00	9.71E-09	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.41E-01	1.14E-06	1.42E-03	9.09E-03	1.02E-03	8.60E-06	0.00E+00	2.89E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	5.44E-03	5.14E-09	-7.65E-06	1.68E-04	5.50E-06	4.74E-08	0.00E+00	5.31E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	3.10E-02	3.26E-07	2.11E-04	1.55E-03	1.51E-04	2.42E-06	0.00E+00	6.45E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	2.83E-01	3.57E-06	2.30E-03	1.32E-02	1.62E-03	2.65E-05	0.00E+00	1.05E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	8.22E-02	8.82E-07	6.14E-04	3.85E-03	4.26E-04	6.52E-06	0.00E+00	3.75E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	3.04E-04	5.50E-10	2.34E-06	4.06E-06	1.81E-07	6.08E-09	0.00E+00	1.12E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	3.78E+02	2.06E-03	7.36E-01	3.19E+01	6.63E-01	6.40E-03	0.00E+00	8.19E-01	0.00E+00
Water Depletion Potential	WDP	m^3	1.20E+01	4.37E-05	4.81E-01	3.47E+01	2.28E-02	1.34E-02	0.00E+00	3.28E-02	0.00E+00

Table 31 | Resource use per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	1.92E+01	2.23E-05	3.46E-01	3.26E-01	1.20E-01	2.04E-04	0.00E+00	1.58E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**1.92E+01**	**2.23E-05**	**3.46E-01**	**3.26E-01**	**1.20E-01**	**2.04E-04**	**0.00E+00**	**1.58E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	3.09E+02	2.06E-03	3.02E+00	3.19E+01	6.63E-01	6.40E-03	0.00E+00	8.19E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	6.82E+01	0.00E+00	-1.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-5.80E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**3.77E+02**	**2.06E-03**	**-8.42E+00**	**3.19E+01**	**6.63E-01**	**6.40E-03**	**0.00E+00**	**-5.72E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.13E-01	2.49E-07	3.13E-04	3.67E-03	1.14E-04	2.23E-06	0.00E+00	4.59E-04	0.00E+00

Table 32 | Waste generated per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	3.78E-04	2.75E-09	-3.88E-06	1.08E-05	4.50E-07	2.00E-08	0.00E+00	1.17E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.04E+00	1.45E-05	2.72E-01	6.54E-02	8.58E-03	1.29E-04	0.00E+00	3.02E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	5.05E-04	1.10E-11	1.80E-05	6.94E-06	4.39E-09	8.70E-11	0.00E+00	4.52E-06	0.00E+00

Table 33 | Output flows per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 34 | Additional environmental impacts per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.07E+01	1.43E-04	1.39E-01	1.68E+00	1.37E-01	1.23E-03	0.00E+00	2.66E-01	0.00E+00
Particulate matter	PM	disease incidence	1.26E-06	7.56E-12	5.96E-09	8.57E-08	8.88E-09	6.71E-11	0.00E+00	5.47E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.16E+00	7.96E-08	1.82E-02	4.85E-02	3.05E-05	6.07E-07	0.00E+00	3.75E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	8.43E+02	1.11E-03	1.10E+00	7.90E+00	3.79E-01	2.15E-02	0.00E+00	1.61E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	1.67E-07	3.86E-14	2.68E-09	4.00E-10	2.43E-11	4.94E-13	0.00E+00	2.58E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	1.54E-06	1.38E-12	2.16E-09	7.25E-09	7.26E-10	2.10E-11	0.00E+00	6.83E-10	0.00E+00
Soil quality	SQP	Pt	6.22E+01	5.70E-04	1.10E+00	6.96E-01	4.26E-01	5.69E-03	0.00E+00	1.79E+00	0.00E+00

Table 35 | Environmental impacts per m² of MetecnoTherm 50mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.09E+01	1.43E-04	1.89E-01	1.72E+00	1.38E-01	1.24E-03	0.00E+00	3.03E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	2.15E-06	1.74E-11	3.70E-08	4.07E-11	2.33E-10	4.07E-11	0.00E+00	7.71E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	9.10E-02	6.04E-07	4.83E-04	3.97E-06	2.11E-04	3.97E-06	0.00E+00	2.21E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	3.09E-02	1.38E-07	5.54E-05	1.00E-06	7.30E-05	1.00E-06	0.00E+00	2.74E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.01E-02	4.06E-08	5.88E-05	2.57E-07	4.31E-06	2.57E-07	0.00E+00	5.29E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	3.04E-04	5.50E-10	2.34E-06	6.08E-09	1.81E-07	6.08E-09	0.00E+00	1.12E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	3.52E+02	2.08E-03	3.50E+00	1.85E-02	1.55E+00	1.85E-02	0.00E+00	7.74E-01	0.00E+00

Table 36 | Environmental impacts per m² of MetecnoTherm 50mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	1.46E-07	3.12E-15	9.10E-12	1.22E-14	5.02E-12	1.22E-14	0.00E+00	2.45E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	8.87E-08	7.01E-16	1.33E-12	2.75E-15	8.52E-13	2.75E-15	0.00E+00	3.76E-13	0.00E+00
Land use	LU	kg C deficit eq.	2.14E+01	3.65E-04	4.81E-01	1.43E-03	1.23E-02	1.43E-03	0.00E+00	5.18E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.16E+00	7.49E-08	1.82E-02	2.94E-07	3.06E-05	2.94E-07	0.00E+00	3.76E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	2.39E-02	1.36E-07	1.31E-04	5.34E-07	7.30E-05	5.34E-07	0.00E+00	6.85E-05	0.00E+00
Resource depletion - water	RDW	m^3	2.81E-01	6.68E-07	1.34E-03	2.62E-06	9.97E-04	2.62E-06	0.00E+00	1.05E-03	0.00E+00

MetecnoTherm 60mm

Table 37 | Environmental impacts per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.36E+01	1.76E-04	1.33E-01	1.78E+00	1.39E-01	1.38E-03	0.00E+00	3.86E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	6.11E-02	1.13E-08	9.60E-02	2.94E-03	4.85E-04	3.26E-08	0.00E+00	2.54E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.52E-02	1.48E-09	6.00E-05	5.63E-06	2.87E-08	1.01E-08	0.00E+00	3.96E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.37E+01**	**1.76E-04**	**2.29E-01**	**1.78E+00**	**1.40E-01**	**1.38E-03**	**0.00E+00**	**3.86E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	2.58E-06	2.66E-11	4.20E-08	5.04E-08	2.66E-10	5.61E-11	0.00E+00	1.06E-08	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.53E-01	1.39E-06	1.41E-03	9.09E-03	1.02E-03	9.41E-06	0.00E+00	3.17E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	6.03E-03	6.23E-09	-1.02E-05	1.68E-04	5.50E-06	5.18E-08	0.00E+00	5.81E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	3.44E-02	3.94E-07	2.09E-04	1.55E-03	1.51E-04	2.65E-06	0.00E+00	7.05E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	3.06E-01	4.32E-06	2.28E-03	1.32E-02	1.62E-03	2.89E-05	0.00E+00	1.15E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	9.02E-02	1.07E-06	5.96E-04	3.85E-03	4.26E-04	7.13E-06	0.00E+00	4.10E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	3.50E-04	6.66E-10	2.39E-06	4.06E-06	1.81E-07	6.65E-09	0.00E+00	1.23E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	4.27E+02	2.50E-03	5.29E-01	3.19E+01	6.63E-01	7.00E-03	0.00E+00	8.96E-01	0.00E+00
Water Depletion Potential	WDP	m^3	1.33E+01	5.29E-05	5.13E-01	3.47E+01	2.28E-02	1.46E-02	0.00E+00	3.59E-02	0.00E+00

Table 38 | Resource use per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	2.07E+01	2.70E-05	3.53E-01	3.26E-01	1.20E-01	2.23E-04	0.00E+00	1.73E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**2.07E+01**	**2.70E-05**	**3.53E-01**	**3.26E-01**	**1.20E-01**	**2.23E-04**	**0.00E+00**	**1.73E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	3.45E+02	2.50E-03	2.99E+00	3.19E+01	6.63E-01	7.00E-03	0.00E+00	8.96E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	8.04E+01	0.00E+00	-1.23E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-6.93E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**4.26E+02**	**2.50E-03**	**-9.33E+00**	**3.19E+01**	**6.63E-01**	**7.00E-03**	**0.00E+00**	**-6.84E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.28E-01	3.01E-07	2.95E-04	3.67E-03	1.14E-04	2.44E-06	0.00E+00	5.02E-04	0.00E+00

Table 39 | Waste generated per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	4.15E-04	3.33E-09	-4.57E-06	1.08E-05	4.50E-07	2.19E-08	0.00E+00	1.28E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.23E+00	1.75E-05	2.88E-01	6.54E-02	8.58E-03	1.41E-04	0.00E+00	3.30E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	5.63E-04	1.33E-11	1.82E-05	6.94E-06	4.39E-09	9.52E-11	0.00E+00	4.95E-06	0.00E+00

Table 40 | Output flows per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 41 | Additional environmental impacts per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.27E+01	1.73E-04	1.34E-01	1.68E+00	1.37E-01	1.35E-03	0.00E+00	2.91E-01	0.00E+00
Particulate matter	PM	disease incidence	1.36E-06	9.15E-12	5.34E-09	8.57E-08	8.88E-09	7.34E-11	0.00E+00	5.98E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.28E+00	9.64E-08	1.87E-02	4.85E-02	3.05E-05	6.64E-07	0.00E+00	4.11E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	9.70E+02	1.35E-03	9.48E-01	7.90E+00	3.79E-01	2.36E-02	0.00E+00	1.76E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	1.95E-07	4.67E-14	2.82E-09	4.00E-10	2.43E-11	5.40E-13	0.00E+00	2.82E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	1.82E-06	1.67E-12	2.15E-09	7.25E-09	7.26E-10	2.29E-11	0.00E+00	7.47E-10	0.00E+00
Soil quality	SQP	Pt	6.73E+01	6.90E-04	1.11E+00	6.96E-01	4.26E-01	6.22E-03	0.00E+00	1.96E+00	0.00E+00

Table 42 | Environmental impacts per m² of MetecnoTherm 60mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.29E+01	1.73E-04	1.87E-01	1.72E+00	1.38E-01	1.35E-03	0.00E+00	3.31E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	2.48E-06	2.10E-11	3.69E-08	4.45E-11	2.33E-10	4.45E-11	0.00E+00	8.43E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	1.01E-01	7.31E-07	4.70E-04	4.35E-06	2.11E-04	4.35E-06	0.00E+00	2.41E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	3.43E-02	1.67E-07	4.71E-05	1.10E-06	7.30E-05	1.10E-06	0.00E+00	2.99E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.16E-02	4.91E-08	5.60E-05	2.81E-07	4.31E-06	2.81E-07	0.00E+00	5.79E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	3.50E-04	6.66E-10	2.39E-06	6.65E-09	1.81E-07	6.65E-09	0.00E+00	1.23E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	3.90E+02	2.52E-03	3.44E+00	2.03E-02	1.55E+00	2.03E-02	0.00E+00	8.46E-01	0.00E+00

Table 43 | Environmental impacts per m² of MetecnoTherm 60mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	1.72E-07	3.77E-15	8.96E-12	1.34E-14	5.02E-12	1.34E-14	0.00E+00	2.68E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	1.06E-07	8.48E-16	1.34E-12	3.01E-15	8.52E-13	3.01E-15	0.00E+00	4.11E-13	0.00E+00
Land use	LU	kg C deficit eq.	2.39E+01	4.41E-04	4.83E-01	1.56E-03	1.23E-02	1.56E-03	0.00E+00	5.67E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.28E+00	9.07E-08	1.87E-02	3.22E-07	3.06E-05	3.22E-07	0.00E+00	4.11E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	2.63E-02	1.65E-07	1.23E-04	5.84E-07	7.30E-05	5.84E-07	0.00E+00	7.49E-05	0.00E+00
Resource depletion - water	RDW	m³	3.16E-01	8.09E-07	1.29E-03	2.87E-06	9.97E-04	2.87E-06	0.00E+00	1.15E-03	0.00E+00

MetecnoTherm 70mm

Table 44 | Environmental impacts per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.63E+01	1.99E-04	1.27E-01	1.78E+00	1.39E-01	1.54E-03	0.00E+00	4.31E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	6.28E-02	1.28E-08	1.03E-01	2.94E-03	4.85E-04	3.64E-08	0.00E+00	2.84E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.77E-02	1.67E-09	6.04E-05	5.63E-06	2.87E-08	1.12E-08	0.00E+00	4.41E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.64E+01**	**1.99E-04**	**2.30E-01**	**1.78E+00**	**1.40E-01**	**1.54E-03**	**0.00E+00**	**4.31E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	3.04E-06	3.00E-11	4.19E-08	5.04E-08	2.66E-10	6.25E-11	0.00E+00	1.19E-08	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.69E-01	1.57E-06	1.40E-03	9.09E-03	1.02E-03	1.05E-05	0.00E+00	3.53E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	6.83E-03	7.04E-09	-1.27E-05	1.68E-04	5.50E-06	5.78E-08	0.00E+00	6.48E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	3.90E-02	4.46E-07	2.07E-04	1.55E-03	1.51E-04	2.96E-06	0.00E+00	7.86E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	3.36E-01	4.89E-06	2.26E-03	1.32E-02	1.62E-03	3.23E-05	0.00E+00	1.28E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	1.01E-01	1.21E-06	5.77E-04	3.85E-03	4.26E-04	7.95E-06	0.00E+00	4.57E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	4.13E-04	7.53E-10	2.43E-06	4.06E-06	1.81E-07	7.42E-09	0.00E+00	1.37E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	4.92E+02	2.82E-03	3.22E-01	3.19E+01	6.63E-01	7.81E-03	0.00E+00	9.99E-01	0.00E+00
Water Depletion Potential	WDP	m^3	1.50E+01	5.98E-05	5.46E-01	3.47E+01	2.28E-02	1.63E-02	0.00E+00	4.00E-02	0.00E+00

Table 45 | Resource use per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	2.27E+01	3.05E-05	3.61E-01	3.26E-01	1.20E-01	2.48E-04	0.00E+00	1.93E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**2.27E+01**	**3.05E-05**	**3.61E-01**	**3.26E-01**	**1.20E-01**	**2.48E-04**	**0.00E+00**	**1.93E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	3.94E+02	2.82E-03	2.96E+00	3.19E+01	6.63E-01	7.81E-03	0.00E+00	9.99E-01	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	9.65E+01	0.00E+00	-1.32E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-8.45E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**4.91E+02**	**2.82E-03**	**-1.02E+01**	**3.19E+01**	**6.63E-01**	**7.81E-03**	**0.00E+00**	**-8.35E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.49E-01	3.41E-07	2.77E-04	3.67E-03	1.14E-04	2.72E-06	0.00E+00	5.60E-04	0.00E+00

Table 46 | Waste generated per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	4.63E-04	3.76E-09	-5.26E-06	1.08E-05	4.50E-07	2.45E-08	0.00E+00	1.42E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.49E+00	1.98E-05	3.04E-01	6.54E-02	8.58E-03	1.57E-04	0.00E+00	3.69E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	6.40E-04	1.51E-11	1.84E-05	6.94E-06	4.39E-09	1.06E-10	0.00E+00	5.52E-06	0.00E+00

Table 47 | Output flows per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 48 | Additional environmental impacts per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.53E+01	1.95E-04	1.29E-01	1.68E+00	1.37E-01	1.51E-03	0.00E+00	3.24E-01	0.00E+00
Particulate matter	PM	disease incidence	1.49E-06	1.03E-11	4.71E-09	8.57E-08	8.88E-09	8.18E-11	0.00E+00	6.67E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.43E+00	1.09E-07	1.92E-02	4.85E-02	3.05E-05	7.41E-07	0.00E+00	4.58E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	1.14E+03	1.52E-03	7.92E-01	7.90E+00	3.79E-01	2.63E-02	0.00E+00	1.97E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	2.33E-07	5.28E-14	2.95E-09	4.00E-10	2.43E-11	6.02E-13	0.00E+00	3.15E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	2.19E-06	1.89E-12	2.14E-09	7.25E-09	7.26E-10	2.56E-11	0.00E+00	8.33E-10	0.00E+00
Soil quality	SQP	Pt	7.43E+01	7.80E-04	1.12E+00	6.96E-01	4.26E-01	6.94E-03	0.00E+00	2.18E+00	0.00E+00

Table 49 | Environmental impacts per m² of MetecnoTherm 70mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.55E+01	1.96E-04	1.85E-01	1.72E+00	1.38E-01	1.51E-03	0.00E+00	3.69E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	2.92E-06	2.38E-11	3.68E-08	4.96E-11	2.33E-10	4.96E-11	0.00E+00	9.40E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	1.14E-01	8.27E-07	4.57E-04	4.85E-06	2.11E-04	4.85E-06	0.00E+00	2.69E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	3.90E-02	1.89E-07	3.88E-05	1.22E-06	7.30E-05	1.22E-06	0.00E+00	3.34E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.37E-02	5.55E-08	5.32E-05	3.14E-07	4.31E-06	3.14E-07	0.00E+00	6.45E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	4.13E-04	7.53E-10	2.43E-06	7.42E-09	1.81E-07	7.42E-09	0.00E+00	1.37E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	4.39E+02	2.85E-03	3.39E+00	2.26E-02	1.55E+00	2.26E-02	0.00E+00	9.44E-01	0.00E+00

Table 50 | Environmental impacts per m² of MetecnoTherm 70mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	2.08E-07	4.26E-15	8.82E-12	1.49E-14	5.02E-12	1.49E-14	0.00E+00	2.99E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	1.29E-07	9.59E-16	1.36E-12	3.35E-15	8.52E-13	3.35E-15	0.00E+00	4.58E-13	0.00E+00
Land use	LU	kg C deficit eq.	2.72E+01	4.99E-04	4.84E-01	1.74E-03	1.23E-02	1.74E-03	0.00E+00	6.32E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.44E+00	1.03E-07	1.92E-02	3.59E-07	3.06E-05	3.59E-07	0.00E+00	4.58E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	2.94E-02	1.86E-07	1.15E-04	6.51E-07	7.30E-05	6.51E-07	0.00E+00	8.36E-05	0.00E+00
Resource depletion - water	RDW	m³	3.62E-01	9.14E-07	1.25E-03	3.20E-06	9.97E-04	3.20E-06	0.00E+00	1.28E-03	0.00E+00

MetecnoTherm 80mm

Table 51 | Environmental impacts per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.79E+01	2.30E-04	1.22E-01	1.78E+00	1.39E-01	1.63E-03	0.00E+00	4.56E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	6.38E-02	1.47E-08	1.09E-01	2.94E-03	4.85E-04	3.85E-08	0.00E+00	3.00E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.91E-02	1.93E-09	6.09E-05	5.63E-06	2.87E-08	1.19E-08	0.00E+00	4.67E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.79E+01**	**2.30E-04**	**2.31E-01**	**1.78E+00**	**1.40E-01**	**1.63E-03**	**0.00E+00**	**4.56E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	3.30E-06	3.47E-11	4.19E-08	5.04E-08	2.66E-10	6.62E-11	0.00E+00	1.25E-08	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.78E-01	1.81E-06	1.39E-03	9.09E-03	1.02E-03	1.11E-05	0.00E+00	3.74E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	7.26E-03	8.12E-09	-1.52E-05	1.68E-04	5.50E-06	6.12E-08	0.00E+00	6.86E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	4.16E-02	5.14E-07	2.06E-04	1.55E-03	1.51E-04	3.13E-06	0.00E+00	8.32E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	3.53E-01	5.64E-06	2.25E-03	1.32E-02	1.62E-03	3.42E-05	0.00E+00	1.35E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	1.07E-01	1.39E-06	5.59E-04	3.85E-03	4.26E-04	8.42E-06	0.00E+00	4.84E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	4.47E-04	8.69E-10	2.47E-06	4.06E-06	1.81E-07	7.85E-09	0.00E+00	1.45E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	5.29E+02	3.26E-03	1.15E-01	3.19E+01	6.63E-01	8.27E-03	0.00E+00	1.06E+00	0.00E+00
Water Depletion Potential	WDP	m^3	1.61E+01	6.90E-05	5.78E-01	3.47E+01	2.28E-02	1.72E-02	0.00E+00	4.23E-02	0.00E+00

Table 52 | Resource use per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	2.38E+01	3.52E-05	3.69E-01	3.26E-01	1.20E-01	2.63E-04	0.00E+00	2.04E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**2.38E+01**	**3.52E-05**	**3.69E-01**	**3.26E-01**	**1.20E-01**	**2.63E-04**	**0.00E+00**	**2.04E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	4.22E+02	3.26E-03	2.93E+00	3.19E+01	6.63E-01	8.27E-03	0.00E+00	1.06E+00	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	1.06E+02	0.00E+00	-1.41E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.31E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**5.28E+02**	**3.26E-03**	**-1.11E+01**	**3.19E+01**	**6.63E-01**	**8.27E-03**	**0.00E+00**	**-9.20E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.60E-01	3.93E-07	2.60E-04	3.67E-03	1.14E-04	2.88E-06	0.00E+00	5.93E-04	0.00E+00

Table 53 | Waste generated per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	4.90E-04	4.34E-09	-5.95E-06	1.08E-05	4.50E-07	2.59E-08	0.00E+00	1.51E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.64E+00	2.29E-05	3.20E-01	6.54E-02	8.58E-03	1.66E-04	0.00E+00	3.90E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	6.83E-04	1.74E-11	1.87E-05	6.94E-06	4.39E-09	1.12E-10	0.00E+00	5.84E-06	0.00E+00

Table 54 | Output flows per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 55 | Additional environmental impacts per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.67E+01	2.25E-04	1.24E-01	1.68E+00	1.37E-01	1.59E-03	0.00E+00	3.43E-01	0.00E+00
Particulate matter	PM	disease incidence	1.57E-06	1.19E-11	4.08E-09	8.57E-08	8.88E-09	8.66E-11	0.00E+00	7.06E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.52E+00	1.26E-07	1.96E-02	4.85E-02	3.05E-05	7.84E-07	0.00E+00	4.85E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	1.23E+03	1.76E-03	6.35E-01	7.90E+00	3.79E-01	2.78E-02	0.00E+00	2.08E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	2.54E-07	6.10E-14	3.08E-09	4.00E-10	2.43E-11	6.38E-13	0.00E+00	3.33E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	2.39E-06	2.18E-12	2.13E-09	7.25E-09	7.26E-10	2.71E-11	0.00E+00	8.82E-10	0.00E+00
Soil quality	SQP	Pt	7.82E+01	9.00E-04	1.13E+00	6.96E-01	4.26E-01	7.34E-03	0.00E+00	2.31E+00	0.00E+00

Table 56 | Environmental impacts per m² of MetecnoTherm 80mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.70E+01	2.26E-04	1.84E-01	1.72E+00	1.38E-01	1.60E-03	0.00E+00	3.91E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	3.16E-06	2.74E-11	3.67E-08	5.25E-11	2.33E-10	5.25E-11	0.00E+00	9.95E-09	0.00E+00
Acidification potential	AP	kg SO_2 eq	1.21E-01	9.54E-07	4.43E-04	5.13E-06	2.11E-04	5.13E-06	0.00E+00	2.85E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	4.16E-02	2.18E-07	3.06E-05	1.30E-06	7.30E-05	1.30E-06	0.00E+00	3.53E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.49E-02	6.40E-08	5.03E-05	3.32E-07	4.31E-06	3.32E-07	0.00E+00	6.83E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	4.47E-04	8.69E-10	2.47E-06	7.85E-09	1.81E-07	7.85E-09	0.00E+00	1.45E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	4.67E+02	3.29E-03	3.33E+00	2.39E-02	1.55E+00	2.39E-02	0.00E+00	9.99E-01	0.00E+00

Table 57 | Environmental impacts per m² of MetecnoTherm 80mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	2.27E-07	4.92E-15	8.67E-12	1.58E-14	5.02E-12	1.58E-14	0.00E+00	3.16E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	1.41E-07	1.11E-15	1.37E-12	3.55E-15	8.52E-13	3.55E-15	0.00E+00	4.85E-13	0.00E+00
Land use	LU	kg C deficit eq.	2.91E+01	5.76E-04	4.85E-01	1.85E-03	1.23E-02	1.85E-03	0.00E+00	6.69E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.52E+00	1.18E-07	1.96E-02	3.79E-07	3.06E-05	3.79E-07	0.00E+00	4.85E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	3.12E-02	2.15E-07	1.07E-04	6.89E-07	7.30E-05	6.89E-07	0.00E+00	8.84E-05	0.00E+00
Resource depletion - water	RDW	m^3	3.87E-01	1.05E-06	1.20E-03	3.38E-06	9.97E-04	3.38E-06	0.00E+00	1.35E-03	0.00E+00

MetecnoTherm 90mm

Table 58 | Environmental impacts per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.83E+01	2.61E-04	1.16E-01	1.78E+00	1.39E-01	1.65E-03	0.00E+00	4.61E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	6.42E-02	1.67E-08	1.16E-01	2.94E-03	4.85E-04	3.90E-08	0.00E+00	3.04E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	2.94E-02	2.19E-09	6.13E-05	5.63E-06	2.87E-08	1.20E-08	0.00E+00	4.73E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.84E+01**	**2.61E-04**	**2.32E-01**	**1.78E+00**	**1.40E-01**	**1.65E-03**	**0.00E+00**	**4.62E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	3.36E-06	3.93E-11	4.19E-08	5.04E-08	2.66E-10	6.70E-11	0.00E+00	1.27E-08	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.80E-01	2.05E-06	1.38E-03	9.09E-03	1.02E-03	1.12E-05	0.00E+00	3.78E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	7.36E-03	9.21E-09	-1.78E-05	1.68E-04	5.50E-06	6.19E-08	0.00E+00	6.94E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	4.22E-02	5.83E-07	2.04E-04	1.55E-03	1.51E-04	3.17E-06	0.00E+00	8.43E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	3.58E-01	6.39E-06	2.23E-03	1.32E-02	1.62E-03	3.46E-05	0.00E+00	1.37E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	1.09E-01	1.58E-06	5.40E-04	3.85E-03	4.26E-04	8.52E-06	0.00E+00	4.90E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	4.55E-04	9.84E-10	2.51E-06	4.06E-06	1.81E-07	7.95E-09	0.00E+00	1.47E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	5.40E+02	3.69E-03	-9.17E-02	3.19E+01	6.63E-01	8.37E-03	0.00E+00	1.07E+00	0.00E+00
Water Depletion Potential	WDP	m^3	1.65E+01	7.82E-05	6.11E-01	3.47E+01	2.28E-02	1.75E-02	0.00E+00	4.29E-02	0.00E+00

Table 59 | Resource use per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	2.40E+01	3.99E-05	3.77E-01	3.26E-01	1.20E-01	2.66E-04	0.00E+00	2.07E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**2.40E+01**	**3.99E-05**	**3.77E-01**	**3.26E-01**	**1.20E-01**	**2.66E-04**	**0.00E+00**	**2.07E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	4.30E+02	3.69E-03	2.90E+00	3.19E+01	6.63E-01	8.37E-03	0.00E+00	1.07E+00	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	1.09E+02	0.00E+00	-1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.50E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**5.38E+02**	**3.69E-03**	**-1.21E+01**	**3.19E+01**	**6.63E-01**	**8.37E-03**	**0.00E+00**	**-9.40E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.63E-01	4.46E-07	2.42E-04	3.67E-03	1.14E-04	2.92E-06	0.00E+00	6.00E-04	0.00E+00

Table 60 | Waste generated per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	4.98E-04	4.92E-09	-6.64E-06	1.08E-05	4.50E-07	2.62E-08	0.00E+00	1.53E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.67E+00	2.59E-05	3.36E-01	6.54E-02	8.58E-03	1.68E-04	0.00E+00	3.95E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	6.93E-04	1.97E-11	1.89E-05	6.94E-06	4.39E-09	1.14E-10	0.00E+00	5.91E-06	0.00E+00

Table 61 | Output flows per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 62 | Additional environmental impacts per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.71E+01	2.55E-04	1.18E-01	1.68E+00	1.37E-01	1.61E-03	0.00E+00	3.48E-01	0.00E+00
Particulate matter	PM	disease incidence	1.58E-06	1.35E-11	3.46E-09	8.57E-08	8.88E-09	8.77E-11	0.00E+00	7.15E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.54E+00	1.42E-07	2.01E-02	4.85E-02	3.05E-05	7.94E-07	0.00E+00	4.91E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	1.26E+03	1.99E-03	4.79E-01	7.90E+00	3.79E-01	2.81E-02	0.00E+00	2.11E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	2.59E-07	6.91E-14	3.21E-09	4.00E-10	2.43E-11	6.46E-13	0.00E+00	3.38E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	2.44E-06	2.47E-12	2.12E-09	7.25E-09	7.26E-10	2.74E-11	0.00E+00	8.93E-10	0.00E+00
Soil quality	SQP	Pt	7.91E+01	1.02E-03	1.14E+00	6.96E-01	4.26E-01	7.44E-03	0.00E+00	2.34E+00	0.00E+00

Table 63 | Environmental impacts per m² of MetecnoTherm 90mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.74E+01	2.56E-04	1.82E-01	1.72E+00	1.38E-01	1.62E-03	0.00E+00	3.96E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	3.22E-06	3.11E-11	3.67E-08	5.32E-11	2.33E-10	5.32E-11	0.00E+00	1.01E-08	0.00E+00
Acidification potential	AP	kg SO_2 eq	1.23E-01	1.08E-06	4.30E-04	5.19E-06	2.11E-04	5.19E-06	0.00E+00	2.88E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	4.22E-02	2.47E-07	2.23E-05	1.31E-06	7.30E-05	1.31E-06	0.00E+00	3.58E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.51E-02	7.26E-08	4.75E-05	3.36E-07	4.31E-06	3.36E-07	0.00E+00	6.91E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	4.55E-04	9.84E-10	2.51E-06	7.95E-09	1.81E-07	7.95E-09	0.00E+00	1.47E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	4.75E+02	3.72E-03	3.28E+00	2.42E-02	1.55E+00	2.42E-02	0.00E+00	1.01E+00	0.00E+00

Table 64 | Environmental impacts per m² of MetecnoTherm 90mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	2.32E-07	5.58E-15	8.53E-12	1.60E-14	5.02E-12	1.60E-14	0.00E+00	3.20E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	1.44E-07	1.25E-15	1.39E-12	3.59E-15	8.52E-13	3.59E-15	0.00E+00	4.91E-13	0.00E+00
Land use	LU	kg C deficit eq.	2.95E+01	6.52E-04	4.86E-01	1.87E-03	1.23E-02	1.87E-03	0.00E+00	6.77E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.54E+00	1.34E-07	2.01E-02	3.84E-07	3.06E-05	3.84E-07	0.00E+00	4.91E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	3.16E-02	2.43E-07	9.87E-05	6.98E-07	7.30E-05	6.98E-07	0.00E+00	8.96E-05	0.00E+00
Resource depletion - water	RDW	m^3	3.94E-01	1.20E-06	1.15E-03	3.43E-06	9.97E-04	3.43E-06	0.00E+00	1.37E-03	0.00E+00

MetecnoTherm 100mm

Table 65 | Environmental impacts per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential - fossil	GWP - Fossil	kg CO_2 eq.	2.90E+01	2.91E-04	1.11E-01	1.78E+00	1.39E-01	1.68E-03	0.00E+00	4.71E-01	0.00E+00
Global warming potential - biogenic	GWP - Biogenic	kg CO_2 eq.	6.48E-02	1.87E-08	1.23E-01	2.94E-03	4.85E-04	3.98E-08	0.00E+00	3.10E-04	0.00E+00
Global warming potential - land use/ land transformation	GWP - Luluc	kg CO_2 eq.	3.00E-02	2.45E-09	6.18E-05	5.63E-06	2.87E-08	1.23E-08	0.00E+00	4.83E-05	0.00E+00
Global warming potential - total	**GWP - Total**	**kg CO_2 eq.**	**2.91E+01**	**2.91E-04**	**2.34E-01**	**1.78E+00**	**1.40E-01**	**1.68E-03**	**0.00E+00**	**4.71E-01**	**0.00E+00**
Ozone depletion potential	ODP	kg CFC 11 eq.	3.47E-06	4.39E-11	4.18E-08	5.04E-08	2.66E-10	6.84E-11	0.00E+00	1.30E-08	0.00E+00
Acidification potential	AP	mol H^+ eq.	1.84E-01	2.29E-06	1.37E-03	9.09E-03	1.02E-03	1.15E-05	0.00E+00	3.86E-04	0.00E+00
Eutrophication – freshwater	EP - F	kg P eq.	7.55E-03	1.03E-08	-2.03E-05	1.68E-04	5.50E-06	6.32E-08	0.00E+00	7.08E-06	0.00E+00
Eutrophication – marine	EP - M	kg N eq.	4.34E-02	6.52E-07	2.02E-04	1.55E-03	1.51E-04	3.23E-06	0.00E+00	8.60E-03	0.00E+00
Eutrophication – terrestrial	EP - T	mol N eq.	3.66E-01	7.14E-06	2.22E-03	1.32E-02	1.62E-03	3.53E-05	0.00E+00	1.40E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg NMVOC eq.	1.11E-01	1.76E-06	5.23E-04	3.85E-03	4.26E-04	8.70E-06	0.00E+00	5.00E-04	0.00E+00
Abiotic depletion potential - minerals and metals	ADP	kg Sb eq.	4.69E-04	1.10E-09	2.55E-06	4.06E-06	1.81E-07	8.11E-09	0.00E+00	1.50E-07	0.00E+00
Abiotic depletion potential - fossil fuels	ADPF	MJ	5.57E+02	4.13E-03	-2.97E-01	3.19E+01	6.63E-01	8.54E-03	0.00E+00	1.09E+00	0.00E+00
Water Depletion Potential	WDP	m^3	1.71E+01	8.74E-05	6.45E-01	3.47E+01	2.28E-02	1.78E-02	0.00E+00	4.37E-02	0.00E+00

Table 66 | Resource use per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	PERE	MJ	2.45E+01	4.46E-05	3.85E-01	3.26E-01	1.20E-01	2.72E-04	0.00E+00	2.11E-02	0.00E+00
Use of renewable primary energy resources used as raw materials	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Primary renewable energy - total	**PERT**	**MJ**	**2.45E+01**	**4.46E-05**	**3.85E-01**	**3.26E-01**	**1.20E-01**	**2.72E-04**	**0.00E+00**	**2.11E-02**	**0.00E+00**
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	PENRE	MJ	4.42E+02	4.13E-03	2.87E+00	3.19E+01	6.63E-01	8.54E-03	0.00E+00	1.09E+00	0.00E+00
Use of non- renewable primary energy resources used as raw materials	PENRM	MJ	1.13E+02	0.00E+00	-1.58E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-9.86E+01	0.00E+00
Primary non renewable energy - total	**PENRT**	**MJ**	**5.55E+02**	**4.13E-03**	**-1.30E+01**	**3.19E+01**	**6.63E-01**	**8.54E-03**	**0.00E+00**	**-9.76E+01**	**0.00E+00**
Use of secondary material	SM	kg	0.00E+00	0.00E+00	1.00E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	FW	m3	1.68E-01	4.98E-07	2.25E-04	3.67E-03	1.14E-04	2.98E-06	0.00E+00	6.13E-04	0.00E+00

Table 67 | Waste generated per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Hazardous waste disposed	HWD	kg	5.10E-04	5.49E-09	-7.32E-06	1.08E-05	4.50E-07	2.67E-08	0.00E+00	1.56E-06	0.00E+00
Non-hazardous waste disposed	NHWD	kg	2.74E+00	2.90E-05	3.62E-01	6.54E-02	8.58E-03	1.72E-04	0.00E+00	4.03E+00	0.00E+00
Radioactive waste disposed/stored	RWD	kg	7.11E-04	2.20E-11	1.91E-05	6.94E-06	4.39E-09	1.16E-10	0.00E+00	6.03E-06	0.00E+00

Table 68 | Output flows per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Components for reuse	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	MFRE	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - electricity	EE - e	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy - thermal	EE - t	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 69 | Additional environmental impacts per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A2:2019)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential, excluding biogenic uptake, emissions and storage	GWP-GHG	kg CO_2 eq	2.78E+01	2.85E-04	1.13E-01	1.68E+00	1.37E-01	1.65E-03	0.00E+00	3.55E-01	0.00E+00
Particulate matter	PM	disease incidence	1.62E-06	1.51E-11	2.84E-09	8.57E-08	8.88E-09	8.95E-11	0.00E+00	7.29E-09	0.00E+00
Ionising radiation - human health	IRP	kBq U-235 eq	1.58E+00	1.59E-07	2.06E-02	4.85E-02	3.05E-05	8.10E-07	0.00E+00	5.01E-03	0.00E+00
Ecotoxicity - freshwater	ETP - fw	CTUe	1.30E+03	2.23E-03	3.31E-01	7.90E+00	3.79E-01	2.87E-02	0.00E+00	2.15E+00	0.00E+00
Human toxicity potential - cancer effects	HTP - c	CTUh	2.68E-07	7.72E-14	3.34E-09	4.00E-10	2.43E-11	6.59E-13	0.00E+00	3.44E-11	0.00E+00
Human toxicity potential - non cancer effects	HTP - nc	CTUh	2.52E-06	2.76E-12	2.11E-09	7.25E-09	7.26E-10	2.80E-11	0.00E+00	9.11E-10	0.00E+00
Soil quality	SQP	Pt	8.08E+01	1.14E-03	1.15E+00	6.96E-01	4.26E-01	7.59E-03	0.00E+00	2.39E+00	0.00E+00

Table 70 | Environmental impacts per m² of MetecnoTherm 100mm (results are in accordance with EN15804+A1:2013)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Global warming potential	GWP	kg CO_2 eq	2.80E+01	2.86E-04	1.81E-01	1.72E+00	1.38E-01	1.65E-03	0.00E+00	4.04E-01	0.00E+00
Ozone layer depletion	ODP	kg CFC-11 eq	3.32E-06	3.47E-11	3.66E-08	5.43E-11	2.33E-10	5.43E-11	0.00E+00	1.03E-08	0.00E+00
Acidification potential	AP	kg SO_2 eq	1.26E-01	1.21E-06	4.18E-04	5.30E-06	2.11E-04	5.30E-06	0.00E+00	2.94E-04	0.00E+00
Eutrophication potential	EP	kg PO_4^{3-} eq	4.34E-02	2.77E-07	1.42E-05	1.34E-06	7.30E-05	1.34E-06	0.00E+00	3.65E-03	0.00E+00
Photochemical ozone creation potential	POCP	kg C2H4 eq	1.56E-02	8.11E-08	4.47E-05	3.43E-07	4.31E-06	3.43E-07	0.00E+00	7.05E-05	0.00E+00
Abiotic depletion potential for non-fossil resources	ADPE	kg Sb eq	4.69E-04	1.10E-09	2.55E-06	8.11E-09	1.81E-07	8.11E-09	0.00E+00	1.50E-07	0.00E+00
Abiotic depletion potential for fossil resources	ADPF	MJ	4.89E+02	4.16E-03	3.23E+00	2.47E-02	1.55E+00	2.47E-02	0.00E+00	1.03E+00	0.00E+00

Table 71 | Environmental impacts per m² of MetecnoTherm 100mm (results are in accordance with Green Star v1.3)

Indicator	ABR	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C4	D
Human Toxicity cancer	HTc	CTUh	2.41E-07	6.23E-15	8.40E-12	1.63E-14	5.02E-12	1.63E-14	0.00E+00	3.27E-12	0.00E+00
Human Toxicity non-cancer	HTnc	CTUh	1.50E-07	1.40E-15	1.40E-12	3.67E-15	8.52E-13	3.67E-15	0.00E+00	5.01E-13	0.00E+00
Land use	LU	kg C deficit eq.	3.03E+01	7.29E-04	4.88E-01	1.91E-03	1.23E-02	1.91E-03	0.00E+00	6.91E-01	0.00E+00
Ionising radiation	IR	kBq U235 eq	1.58E+00	1.50E-07	2.06E-02	3.92E-07	3.06E-05	3.92E-07	0.00E+00	5.01E-03	0.00E+00
Particulate Matter	PM	kg PM2,5-Equiv.	3.24E-02	2.72E-07	9.07E-05	7.12E-07	7.30E-05	7.12E-07	0.00E+00	9.14E-05	0.00E+00
Resource depletion - water	RDW	m^3	4.05E-01	1.34E-06	1.11E-03	3.50E-06	9.97E-04	3.50E-06	0.00E+00	1.40E-03	0.00E+00

Additional Information

Bondor Metecno is committed to developing products that are perpetually sustainable throughout their lifecycle, from manufacture, installation and occupancy through to end-of-life disposal. To this end the business has formalised collaboration with a number of research organisations, industry groups and other interested parties to work on means of improving the sustainability of the business and the construction sector overall. This has resulted in a series of studies, process improvements and new products that are progressively being rolled out across the business.

This approach is a non-linear, organic process as we test and develop approaches and solutions that align with Australian conditions, our customers and other key stakeholders.

These developments have included

- Transferring the inherent advantages of Insulated Sandwich Panel from its traditional place in the cold chain, to residential markets:
    - A home studied by QUT with a family of 4 residing for 12 months, with lived experience achieving 9.5-star energy rating, and the cost of heating & cooling being only 44 cents per day (QUT, 2014).
    - Optimised build time, system modularity and simplification:
        - One insulated roof sheet replacing roof sheet, trusses, insulation and ceiling lining
        - One insulated wall panel replacing external cladding, frames, insulation and internal wall lining
- Insulated sandwich panels can be reused, subject to careful deconstruction and appropriate design of the new building
- Component materials of panel can be recycled individually:
    - Steel facings are 100% recyclable
    - EPS- FR core material can be isolated and compacted for re-use in new forms
    - All core materials can be re-used in current forms, with significant research well advanced to reduce amounts to landfill, as a first step to achieving full circularity and meaningful recyclability/ re-use of materials

Bondor Metecno have partnered in a study with University of Melbourne aimed at reducing plastics in the construction sector. This study focuses on increasing the reuse and recycling opportunities for plastics within our manufacturing process and from the broader construction sector.

Additionally, Bondor Metecno group is heavily invested in and committed to sustainable manufacturing and building practices, and aligned to the Sustainability Leadership Framework as set out by the Chemistry Australia. Bondor Metecno products are manufactured using non ozone depleting substances, and 80% of our product portfolio are either reusable, or completely recyclable. We are a decentralised manufacturer, with multiple plants closer to the market we serve, reducing the emissions derived from long distance transport, and the overall carbon footprint. We actively employ passive energy techniques where practicable, including rainwater harvesting and aligning production with off peak energy demand periods.

In broad terms Bondor Metecno Group is committed to improving its carbon footprint and the sustainability of the Australian Built Environment as evidenced by:

Sustainable Environmental Performance

Bondor Metecno is committed to the continual improvement of our environmental policies and maintaining sustainable building practices, evident throughout involvement with Chemistry Australia's. The full range of Bondor Metecno products are designed and tested for Australian conditions and developed with the health of the Australian environment and community in mind. All of our products are non-ozone depleting with best-in-class thermal efficiency, which saves in energy costs and benefits the environment.

Recyclability

Where possible, Bondor Metecno actively source production inputs that are either recycled or recyclable to reduce our environmental footprint. We collaborate with supply partners and research institutions on a range of programs to evaluate opportunities for innovation, and continually invest in the latest technologies to support this.

Reusability

Metecno insulation boards are installed by a combination of fasteners and joints sealed with foil tape; and can be easily dissembled to be reused and reconstructed for other applications. The tape which joins the boards can be easily removed, whilst the fasteners which fix the boards to the steel supports or concrete soffit can be unfastened, and boards removed to be reused on other building sites.

Reduction

Metecno insulation boards significantly contribute to reducing the required energy to maintain the building's temperature within the comfort range, as they provide a building envelope in one highly insulated composite product. In comparison to standard framed construction methods with disrupted insulation resulting in heat loss/gain, Metecno insulation boards deliver continuous insulation significantly minimizing the effect of thermal bridging.

Metecno insulation boards greatly reduce the amount of material used in the construction process, which reduces landfill over standard framed construction methods due to custom project specific lengths minimising site waste. We have a range of initiatives in our production facilities to actively reclaim and convert production waste to minimise our impact on the environment.

Australia's Health

Metecno insulation boards use non-ozone depleting substances in the manufacture of its insulating core, helping to promote sustainable construction to protect Australia's future. These boards provide a consistent level of insulation that is impervious to compression, water vapor, vermin, termites and rot. This decreases the risks of structural damage whilst improving the living quality for Australia.

These insulation board products also contribute to Australia through their 'buildability'; as they significantly shorten the construction times, which provides economic, social and environmental benefits to the community.

Global Experience, Local Perspective

As Australia's largest manufacturer of Insulated Sandwich Panels and rigid insulation, Bondor Metecno allows its customers to benefit from our global experience coupled with local dedication to Australia. Purchasing high performance building products designed specifically for Australian conditions and using Australian materials wherever possible, reduces the users' impact on the environment, whilst supporting Australian industries.

For more information on Bondor Metecno sustainability practices and best-in-class R-values, please contact us.

Interpretation and Recommendations

The LCA of MetecnoPIR's insulated board products in this report establish the basis for development of Environmental Product Declarations compliant with PCR 2019:14 (Construction Products) and the overarching EN15804 A2 standard. These EPDs can be used to gain material credits in Green Star projects, contribute to whole building LCAs (following the EN 15978 standard) and to present MetecnoPIR's environmental credentials to customers and other stakeholders.

The scope of the LCA was cradle to gate with modules A1-A3, C1-C4, plus optional modules A4-A5 and B2. The declared unit is 1 m^2 of board available in varying product specifications which fulfils the specified quality criteria during the Reference Service Life of 40 years.

Interpretation

- The product stage (module A1-A3) is the most significant contributor to potential environmental impacts accounting for 88-92% of total GWP (GWP-T). The module with the second highest total GWP impacts is the maintenance phase (module B2).
- The primary material in the MetecnoTherm range is a lightweight fibreglass foil, rather than steel. The total GWP impacts are therefore lower than the other product ranges. However, the foil is currently not recyclable and therefore all materials are landfilled, with no recycling benefits.
- The product stage is the highest contributor across all impacts categories, ranging from 69% - 95%. For example, the product stage contributes 88% - 92% of fresh water use (FW) across all panel thicknesses in the MetecnoTherm range.
- In terms of resource use across all modules (A1-C4), the largest energy use comes from non-renewable primary energy resources (PENRT).
- Across all modules, 100% of the waste disposed is non-hazardous (NHWD).

Recommendation

Based on the results of this LCA, we recommend that MetecnoPIR:

- Explore using electric vehicles for distribution, due to the large radius of transportation.
- Work with its suppliers to establish specific/representative Insulation foam chemical production data, particularly for Polyphenyl Isocyanate Polymeric Resin production, which is currently modelled using background data with limited transparency (i.e., system process data).
- Extend the scope of the LCA to include the use and operation of it in buildings, as this will likely emphasise the true-life cycle impact and benefits of MetecnoTherm compared to alternatives.
- Investigate opportunities to substantiate and enable re-use of boards after their first service life.

References

(ALCAS), A. L. (2019). Australian Life Cycle Inventory (AusLCI) – v1.31.

British Standards Institution. (2014). *Sustainability of construction works. - Environmental product declarations - Product Category Rules for concrete and concrete elements, BS EN16757:2017.* British Standards Institution.

Cooke, A. M. (2000). *Durability of Autoclaved Cellulose Fiber Cement Composites.* Retrieved from http://fibrecementconsulting.com/publications/990925.DurabilityPaper.pdf

Department of the Environment. (2014). *National Greenhouse Accounts Factors - Australian National Greenhouse Accounts.* Australian Government. Retrieved from www.environment.gov.au

EPD International. (2019). *General Programme Instructions of the International EPD System, version 3.01.*

EPD International. (2021). *Product Category Rules (PCR) 2019:14, v1.11.* EPD International.

Frischknecht, R. (2007). The Environmental Relevance of Capital Goods in Life Cycle Assessments of Products and Services. *Int. J LCA*.

ISO. (2006). *ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations - Principles and procedures.* Geneva: International Organization for Standardization (ISO).

ISO. (2006). *ISO 14040:2006. Environmental management – Life cycle assessment – Principles and framework.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14040:2006/Amd1:2020. Environmental management – Life cycle assessment – Principles and framework.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14044:2006. Environmental management – Life cycle assessment – Requirements and guidelines.* Geneva: International Organization for Standardization.

ISO. (2006). *ISO 14044:2006/And1:2017/Amd2:2020. Environmental management – Life cycle assessment – Requirements and guidelines.* Geneva: International Organization for Standardization.

Lstiburek, J. (2006). *BSD-144: Increasing the Durability of Building Constructions.* Building Science Corporation. Retrieved from https://www.buildingscience.com/documents/digests/bsd-144-increasing-the-durability-of-building-constructions

Quantis. (2020). *Biogenic Carbon Footprint Calculator for Harvested Wood Products.* World Wildlife Fund.

QUT. (2014). *Bondor InsulLiving House: Performance Evaluation.* Queensland University of Technology.

Standards New Zealand. (2018). *AS/NZS 4859.1:2018.*

The British Standards Institution. (2021). *EN 15804:2012+A2:2019.* BSI Standards Limited 2020.

Wernet, G., Bauer, C., Steubing, B., Reinhard, J., Moreno-Ruiz, E., & & Weidema, B. (2019). The ecoinvent database version 3.6.