

Environmental Product Declaration

WHISPER[®] Acoustic Panel FR, UV, UV-ECO, NBO, NBI and NB-ECO

Sealed Air



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1. Introduction

Sealed Air

Sealed Air (NYSE: SEE) is in business to protect, to solve critical packaging and construction related challenges, and to make our world better than we found it.

SEE's Operating Model, along with industry-leading experts in materials, engineering, technology, and science are driving our innovative solution systems to be more sustainable, automated, and digitally connected.

Our Global Impact Report highlights how we are shaping the future of the industry we serve. . We are also committed to a diverse workforce and inclusive culture through our 2025 Diversity, Equity and Inclusion pledge.

Profile and Facts

Global Headquarters: Charlotte, North Carolina, U.S.

Employees: ~16,500

Countries/Territories Served: 117

Manufacturing Facilities: 106

Patents and Pending Applications: 2,950

2020 Revenue: \$4.9 Billion

SEE Priorities and Commitments

SEE's priorities and commitments exemplify the strategic imperatives we believe are vital to shaping a future that is sustainable.

- Accelerating the Advancement of a Circular Economy
 - 2025 Sustainability and Materials Pledge
- Mitigating Climate Change
 - Net-Zero Operations
 - Science-Based Targets
 - Greenhouse Gas Intensity Reductions
- Reducing Energy Consumption
- Diverting Waste from Landfills
- Conserving Water
- Achieving Zero Harm
- Creating a Diverse, Equitable and Inclusive Workplace and Culture

Product description

The World Health Organization has concluded that noise pollution is a major environmental issue, second only to air pollution. Excessive noise can trigger stress responses, impacting our physiological and mental health. Noise is becoming a part of our lives that should not be overlooked.

The increasing use of hard surfaces in the built environment enables noise to reflect, diffract, amplify, and travel. The remedy for noise pollution is to reduce and then absorb the unwanted noise. Traditional acoustic materials are open structured to allow noise to enter, but when dirt and moisture enters the open structure, acoustic performance is reduced. This means that these open structured materials need to be protected by moisture barriers and protective covers. Whisper uses alternative acoustic mechanisms enabling a predominantly closed structure, which provides sustained performance without the need for complex protective barriers.

Noise can be annoying, just make it Whisper! Whisper® Acoustic Panels are a honeycomb-like matrix of networked closed cells which efficiently absorb noise. This durable material remains acoustically 'soft' eliminating the problem of hard reflective surfaces that contribute to reverberation and echo. Whisper® Acoustic Panels are the right acoustic solution for challenging conditions such as exposure to water, moisture, humidity, dirt, dust, ultraviolet light, chlorine, and harsh chemicals.

Whisper® Acoustic Panels retain their structure in wet environments. Whispers' durability means protective covers can be eliminated. Whisper at 1.4kg/m² (50mm) is fast to install and it's a soft plastic, so cuts easily with a knife. Whispers' unique noise reduction qualities are proven in some of the most rigorous applications, such as road & rail noise barrier walls, enclosures, and industrial machinery. Whisper® panels help to safely reduce noise, make music sound better, allow people to speak and hear one another, and contribute to a safer and more productive work environment, indoors, or outside.



Figure 1. Whisper® acoustic panels performance attributes.

Whisper combines the following features in one product type:

SOUND ABSORPTION Whisper® sound absorption panels use an innovative networked honeycomb like structure to absorb sound using a minimum of materials. Absorption Class A to D, and In-Situ category A3 (Whisper NB) are available.

MOISTURE RESISTANT The structural and acoustic properties of Whisper® Acoustic Panels are demonstrably maintained following exposure to moisture. Therefore, there is no need for a water barrier, protective film or perforated metal facing to ensure acoustic properties are maintained.

WASHABLE Whisper is resistant to detergent, chlorine, salt, ammonia, caustic soda, alcohol, and hydrogen peroxide covering most common cleaning materials.

STRONG STRUCTURE With its semi-rigid self-supporting structure, Whisper® Acoustic Panels are resistant to impacts and movement. The durable material form means re-use should be considered as an end-of-life option.

LIGHT WEIGHT Whisper® Acoustic Panels are easy to handle with a weight of less than 1.4 kilograms per square meter at 50mm, demonstrating lower mass per unit of sound absorption than traditional polyester and mineral wool solutions.

FIBRE FREE Whisper® Acoustic Panels have no fibrous materials, low VOC and zero ODP. Whisper® Acoustic Panels do not cause irritation, are non-friable and do not crumble, fray, or emit dust or corrosive gasses. In the Danish Society of Indoor Climate's rigorous particle emissions test (for particles as small as 0.7 µm) Whisper® Acoustic Panels averaged 0.02mg/m² over the 15-hour period. This is only 1% of the target of 2mg/m² for low particle emissions. These features make Whisper ideal for Indoor Air Quality projects and sensitive environments.

UV RESISTANT Whisper® UV and Whisper® NB have been independently tested to exceed 50 years of outdoor durability by the BTI in Austria where it was exposed to UV and infra-red light, salt and water spray. Whisper® UV & Whisper® NB are rated as self-extinguishing materials to DIN 4102 Class B2 and to meet EN 1794-2 Class 1.

FIRE RETARDANT Whisper® FR foam panels achieved EN 13501 Class B S1 D0 at 20-30mm EN 13501 Class B S2 D0 at 40-100mm DIN 4102 Class B1; Fire testing data is available for rail & road noise barriers, passenger rail, marine and automotive applications.

TRANSMISSION LOSS Whisper® Acoustic Panels have high airflow resistance, enabling 50mm material to have an Rw 13; 60mm Rw 16 and 100mm Rw 18. This means that Whisper® Acoustic Panels don't just absorb sound, they also contribute to soundproofing of walls and enclosures.

RECYCLABLE Whisper® UV, UV-Eco, & NB series, are over 95% Low Density Polyethylene (LDPE), they are compatible with mechanical or chemical recycling of LDPE polyethylene. Consequently, Whisper Products are eligible to be labelled with a Resin Identification Code 4 (RIC #4), corresponding to low density polyethylene*.

*Degree of recyclability will vary depending on scope and availability of polyethylene foam collection and recycling programs.

The Whisper Eco branded products are available in a range of colours designed to blend with the natural environment. This new technology uses a durable, halogen free, REACH compliant fire retardant that is non-water soluble and suited to recycling facilities processing low density polyethylene. Whisper Eco resins are formulated to enable a future where we can close the loop on acoustic materials.

The currently available products on the market 2020 (reference year of the study) are Whisper® UV and Whisper® FR, with different thickness and colors. Whisper® - UV-ECO, NBO, NBI and NB-ECO - with different composition, are classified as product not yet on the market (during the reference year of the study).

Table 1 shows the specifications of the panels and the different thickness of the Whisper® Panels analyzed in this study.

Whisper® Panel	Density(kg/m3)	Panel size(mm)	Analyzed thickness (mm)
UV	30	1200x2400	50
FR	25	1200x2400	40-50
UV-ECO	25	1200x2400	50
NB-ECO	22	1200x1000	40-50
NBI	22	1200x1000	40-50
NBO	22	1200x1000	40-50

Table 1. Whisper® acoustic panels specifications.

The production of Whisper® Panels takes place in different stages, ranging from the acquisition of raw materials to the packaging of the final product. NBO, NBI and NB-ECO panels undergo an additional processing with respect to UV, UV-ECO and FR panels.

Production steps for Whisper are the following:

1. Extrusion: the raw materials in pellets form are fed by feeders into the extruder, while the gas is injected into the extruder. The extruder melts and mixes the raw materials. The Whisper foam expands when exits the die. In the downstream, the material is cooled and rolled in roll-stock. Material is then stored until curing is completed.
2. Lamination: after curing has finished, rolls are laminated into 2 or more layers by hot air blade. Material is then cut in planks in the needed dimension.
3. For NB materials, a third step is applied: material is slotted on a third machine, by blades.

The by-product generated by the production steps are recycled internally and used in foam production



Figure 2: Whisper® Panels production phases.

Table 2 contains the materials used for the creation of Whisper® Panels.

		WHISPER® PANELS					
	Materials	UV	UV-ECO	FR	NB-ECO	NBI	NBO
Panel	LDPE	89.2 %	91.1 %	76.6 %	87.7 %	88.8 %	85.4 %
	Color grey	-	1.5 %	-	1.5 %	-	-
	Color black	3.1 %	-	0.7 %	-	0.5 %	3.0 %
	Additive FR+UV	-	2.9 %	-	2.8 %	-	-
	Additive FR 1	2.9 %	-	13.6 %	-	1.9 %	2.8 %
	Additive FR 2	0.7 %	-	4.4 %	-	0.7 %	0.7 %
	Aging modifier	1.9 %	2.0 %	1.9 %	1.9 %	1.9 %	1.9 %
Packaging	LDPE film	2.1 %	2.5 %	2.7 %	0.4 %	0.4 %	0.4 %
	Wooden pallet	-	-	-	5.8%	5.8 %	5.8 %
Total		100 %	100 %	100 %	100 %	100 %	100 %

Table 2: Whisper® Panels and packaging composition.

Whisper® owns the following certifications:

- Fire resistance
- Fire resistance, construction:
 - EN 13501 Class B S2 D0 ($\geq 40\text{mm}$)
 - EN 13501 Class B S1 D0 ($\leq 30\text{mm S1}$)
 - DIN 4102 – B1
- Fire resistance, small boats:
 - ISO 9094-1:2003 -2:2002 DNV
 - EN 45545-2 R10 20-50mm
 - EN 45545-2 R1 20mm
 - EN 45545-2 R7 25mm
- Fire resistance, noise barriers (UV and NB version): EN 1794-2 (Class 1), please contact Sealed Air for more info.
- Marine: ISO 4589-2/3
- Bacterial non-proliferation: ASTM C 1333

Fire test results available upon requests.

2. LCA information

Declared Unit

The declared unit is represented by 1m³ of Whisper® Panel in its FR (40 and 50mm, 25 kg/m³ density), UV (50mm, 30 kg/m³ density), UV-ECO (50mm 25 kg/m³ density), NB-ECO (40 and 50mm, 22 kg/m³ density), NBI (40 and 50mm, 22 kg/m³ density) and NBO (40 and 50mm, 22 kg/m³ density) variants, including the packaging.

System boundaries

This EPD is a “from cradle to gate with options” analysis, in particular the life cycle of the product includes the production of raw materials and packaging materials, their transport, the construction phase of the panels, their packaging, distribution and the final disposal.

Table 3 shows the phases of the product life cycle and the information modules considered for the evaluation of construction products according to the EN 15804:2012+A2:2019 standard.

	BUILDING LIFE CYCLE INFORMATION																ADD. INFO
	Product stage			Manufacturing process stage		Use stage							End of life stage				Resource recovery stage
	Raw materials supply	Transport	Manufacturing	Transport	Construction	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
Module declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	WLD	EU	IT	EU	EU	-	-	-	-	-	-	-	EU	EU	EU	EU	EU
Specific data used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation-products	<10%					-	-	-	-	-	-	-	-	-	-	-	-
Variation-sites	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-

Table 3: Information modules for the evaluation of construction products according to the 15804:2012+A2:2019.

In *upstream* processes (A1) the extraction and production of raw materials and the impacts caused by generation of electricity, steam and heat from primary energy resources.

In *core* processes (A2 and A3) the transport of components to the production site, the primary and tertiary packaging productions, the production and packaging of the final product, the waste treatment in the production site.

In *downstream* processes (A4, A5, C2, C4) the transport for the packaged product distribution, the installation phase, end-of-life processes of the product and its packaging are included. The installation phase consists of a standard manual operation or gluing the panel to the wall or a suspended installation using nylon threads, in this study the wall application scenario by gluing was considered. The installation includes the packaging disposal. The uninstall of the panel (C1) consists of a standard manual operation with negligible impact and specific treatments before the disposal (C3) of the product are not expected.

Module B (use stage) is not included in the system boundaries.

Module D, which contains information about the potential reuse/repurpose/recycle of the product, is evaluated considering the benefit of avoiding future raw material extraction and production, brought by the recycling of the main materials. The necessary processes to make the material of the (exhausted) product new raw materials for the following life cycles are taken into account.

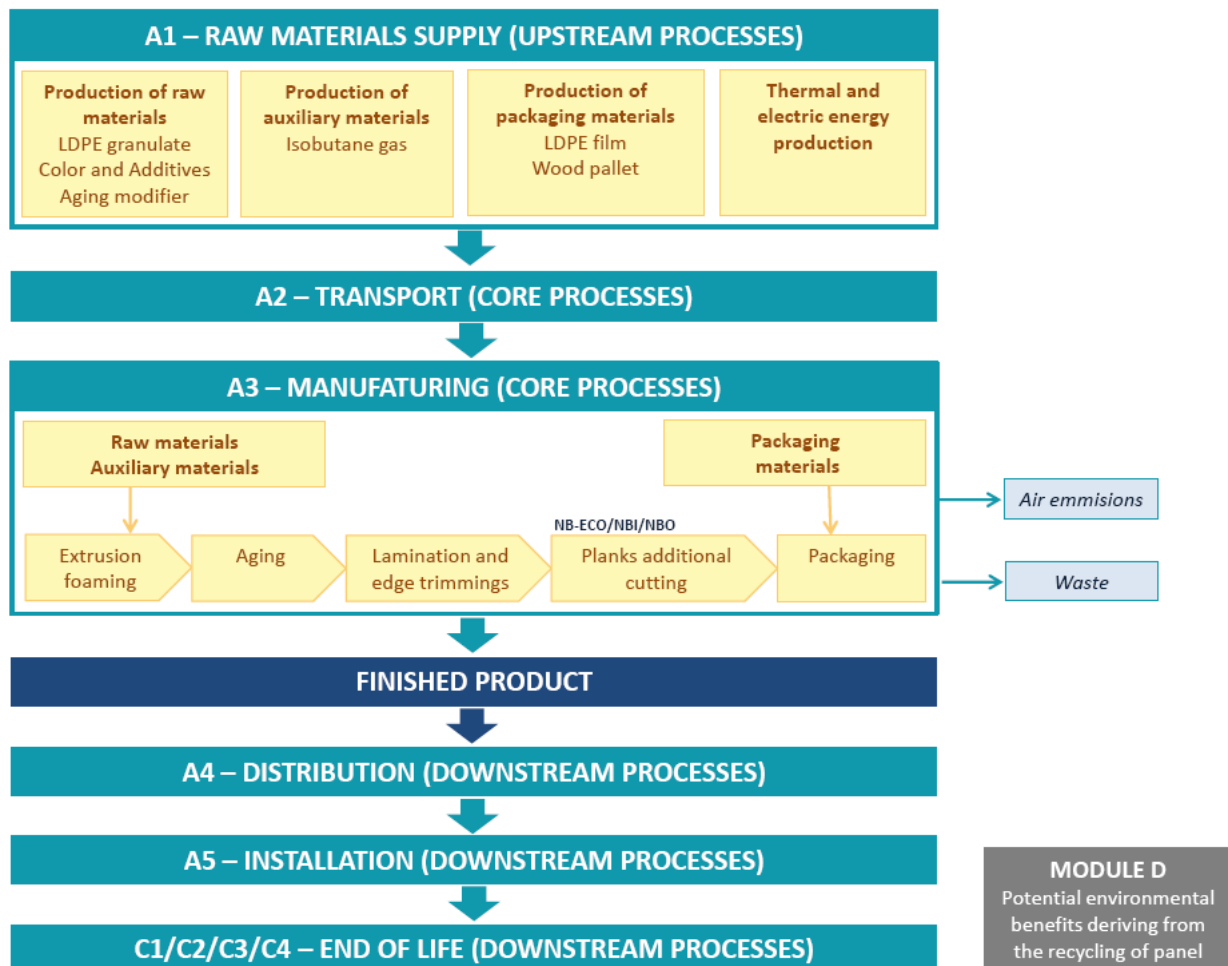


Figure 3: Life cycle phases of Whisper® panel.

Time boundaries

Primary data were provided by Sealed Air and refer to the year 2020. Secondary data are obtained by ecoinvent v3.7 database, published in 2021.

Geographical boundaries

The production and packaging of the final product are implemented in the Bellusco (province of Monza-Brianza) plant.

The materials of the product and its packaging are produced in Italy, Saudi Arabia, Germany and the United States. Since Whisper® FR and UV panels are sold both in Italy and abroad, the distribution and end-of-life scenarios take into account the sales of the current year. Distribution scenario of UV and FR panels has been considered representative for Whisper® UV-ECO, NB-ECO, NBI and NBO panels.

Life cycle boundaries

The following processes have been excluded: the building of production machinery, buildings and other equipment; personnel work trips; research and development activities, including the production and building of laboratory equipment; maintenance activities.

Infrastructures have not been excluded, when present, as the processes deriving from the ecoinvent database.

Data quality

Both primary and secondary data were used. Primary data were gathered and provided by Sealed Air through the filling of questionnaires and direct communication; when primary data were not available, secondary data were used.

As secondary data, the ecoinvent v3.7, allocation, cut-off by classification data and data found in literature were used. The ecoinvent database is available in SimaPro 9.2, the software used for calculations.

The life cycle analysis must consider at least 99% of the total energy and mass flows of the product and its packaging. Proxy data can be also used in case there are gaps in the required data, provided that their contribution in the environmental performance assessment does not exceed the 10% for every main impact category.

Allocation rules

Allocation represents the subdivision procedure through which inputs and outputs of the system are divided within the different products in order to represent their underlying physical relationships.

The processes influencing the environmental profile of the product during its life cycle must be allocated within the life cycle unit where those same processes occur. This way, the sum of the allocated flows at the entrance and at the exit corresponds to the sum of the flows at the entrance and at the exit: a double counting is avoided and none of the flows at the entrance and at the exit are omitted.

Electric Energy and heat consumption, water use, and production of waste of the plant and warehouse in the considered time frame were allocated according to the total Whisper® and Stratocell® production criterion of the reference year.

Raw materials and production processes were included for virgin resources. No allocation was applied on recyclable materials. As an input for the recycled resources the recycling process is included. The outputs subject to recycling are considered as inputs for the next life cycle.

Environmental impact indicators

In the evaluation of the impacts of the product, the information obtained by the inventory analysis are aggregated according to the effects on the different environmental issues. To evaluate the environmental performances of the product, the method EN 15804+A2 developed by PRé in SimaPro according to EN 15804:2012+A2:2019 regulation was used.

Inventory

This EPD is based on primary primary data for the fundamental aspects of the study, i.e. the weight of the materials for the panel and its packaging, the plant energy consumption and the sales statistics of the final product.

Primary data were gathered and provided by Sealed Air through the filling of questionnaires, bills, IT management, safety data sheets, internal report and direct communication. Secondary data are used for all the processes that lack primary data, e.g. the production of the individual components and the packaging, the processing of some raw materials and the disposal of the final product and its packaging. For the secondary data the ecoinvent v3.7, allocation, cut-off by classification database and literature data were used.

The life cycle analysis has been considered all total energy and mass flows of the product and its packaging, so no cut-off rules were applied. The maintenance activity carried out in the plant was not included in the study as they consist of periodic procedures. However all maintenance wastes are reported together with other wastes in the waste register and considered in the study.

As requested by PCR 2019:14 v1.11, the use of proxy data is limited and their contribution does not exceed 10% of the total impact of the considered impact categories.

Within the LCA all the constitutive elements of the Whisper® were evaluated.

With regards to the electricity consumption during the production and storage steps, the process “Electricity, medium voltage {IT}| market for |”, derived from ecoinvent database, was modified to make it more representative of the Italian situation, correcting the energy mix according to the single sources declared by the national residual mix from AIB Report 2020.

Data used to define the disposal scenarios of the waste production of the plant derive from ISPRA database 2019.

For the production and distribution steps, the data relative to the sales in the main Countries of destination were used. Road transport was considered and the distance between Sealed Air location and the capital city of the export country.

Country	Sales	Transport	Distance
Italy	34.5 %	lorry 16-32 ton, EURO4	600 km
Germany	26.9 %	lorry 16-32 ton, EURO4	1100 km
Belgium	7.1 %	lorry 16-32 ton, EURO4	1000 km
Denmark	7.0 %	lorry 16-32 ton, EURO4	1450 km
Great Britain	5.4 %	lorry 16-32 ton, EURO4	1300 km
Romania	5.2 %	lorry 16-32 ton, EURO4	1800 km
Spain	4.5 %	lorry 16-32 ton, EURO4	1650 km
France	4.2 %	lorry 16-32 ton, EURO4	900 km
Switzerland	2.4 %	lorry 16-32 ton, EURO4	300 km
Hungary	1.9 %	lorry 16-32 ton, EURO4	1000 km
Poland	1.1 %	lorry 16-32 ton, EURO4	1450 km
Total	100 %	-	-

Table 4: Whisper® sales of 2020.

For the transport to the disposal route of the product and its packaging, road transport was assumed (16-32 t EURO 4 lorry) for 100 km. For the end-of-life scenario average national data of the export Countries were used.

The installation phase consists of a standard manual operation of gluing panels with 200g of glue per single panel. The installation includes the packaging disposal.

The panel is easily disassembled and at the end of its life it was assumed to be disposed of as a plastic material. Data used to define the disposal scenarios in the different Countries derive from Eurostat database 2018: for the disposal of the panel, the percentages relating to plastic municipal solid waste, while for the PE film and the pallet the percentages relating to the disposal of packaging by type of material were used.

Module D assesses the impact of the net flows of recovered materials (recycled or reused) from the life cycle stages A to C, as required by EN 5804: 2012 + A2: 2019:

$$E_{\text{module D}} = E_{\text{module D1}} + E_{\text{module D2}} + E_{\text{module D3}} + E_{\text{module D4}}.$$

Where:

- $E_{\text{module D1}}$ being the loads and benefits related to the export of secondary materials;
- $E_{\text{module D2}}$ being the loads and benefits related to the export of secondary fuels;
- $E_{\text{module D3}}$ being the loads and benefits related to the export of energy as result of waste incineration;
- $E_{\text{module D4}}$ being the loads and benefits related to the export of energy result of landfilling.

3. Environmental impact indicators

Table 4, 5, 6, 7 show the environmental impact indicators of the life cycle of 1 m³ of of Whisper® Panel, as indicated by PCR 2019:14 v1.11 and EN 15804:2012+A2:2019.

The UNI EN 15804 + A2 method consists of impact categories (global warming - fossil fuels, global warming - biogenic carbon, global warming - land use, global warming - total, ozone layer depletion, photochemical oxidation, acidification, eutrophication - fresh water, eutrophication - marine, eutrophication - terrestrial, abiotic depletion, abiotic depletion - fossil fuels, use of water); additional indicators (particulate matter, ionizing radiation, freshwater ecotoxicity, human toxicity - non-cancer, human toxicity - cancer, land use); use of resources, waste and output flows indicators.

The indicators are subdivided into the contribution of the processes at the different product phases considered, as requested by PCR 2019:14, i.e. units A1-A5, C1-C4 and D.

LIFE CYCLE PHASE		DESCRIPTION
A1	Raw materials supply	<ul style="list-style-type: none"> - extraction and production of raw materials - generation of electricity and heat
A2	Transport	<ul style="list-style-type: none"> - transport of raw materials and packaging materials to the production site
A3	Manufacturing	<ul style="list-style-type: none"> - production of primary and tertiary packaging - the production and packaging of the final product - plant and warehouse consumption - the waste treatment in the production site
A4	Transport	<ul style="list-style-type: none"> - transport for the packaged product distribution
A5	Construction	<ul style="list-style-type: none"> - manual operation - packaging disposal
C1	De-construction / demolition	<ul style="list-style-type: none"> - manual operation
C2	Transport	<ul style="list-style-type: none"> - transport of panel to final disposal
C3	Waste processing	<ul style="list-style-type: none"> - no specific treatments before the disposal of the panel
C4	Disposal	<ul style="list-style-type: none"> - panel disposal

Table 5 Life cycle phase of 1m³ Whisper® Panel.

The results of the 50mm FR panel can be considered as representative of the 40mm FR panel and the results of the 40mm NBI panel can be considered as representative of the 50mm NBI panel. Furthermore the results of the NBI panel can be considered as representative of the NB-ECO and NBO panels.

The representativeness is demonstrated by the sensitivity analysis, where the difference between the values of the indicators of the different thickness does not exceed 10%.

1m³ Whisper® UV – 50mm

Environmental impact categories ¹		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Climate change - total	kg CO ₂ eq	1.34E+02	2.20E+00	1.38E+01	5.06E+00	3.95E+00	0.00E+00	5.18E-01	0.00E+00	1.27E+01	1.66E+01
Climate change - fossil	kg CO ₂ eq	1.35E+02	2.16E+00	1.32E+01	5.05E+00	3.95E+00	0.00E+00	5.16E-01	0.00E+00	1.27E+01	-1.61E+01
Climate change - biogenic	kg CO ₂ eq	-1.95E-01	2.86E-02	5.64E-01	1.22E-02	2.68E-03	0.00E+00	1.25E-03	0.00E+00	8.65E-04	3.26E+01
Climate change - land use	kg CO ₂ eq	6.13E-02	2.00E-03	2.14E-03	1.71E-03	1.09E-03	0.00E+00	1.75E-04	0.00E+00	2.48E-05	1.80E-01
Climate change - total (neutral GWP-GHG)	kg CO ₂ eq	1.31E+02	2.14E+00	1.34E+01	5.01E+00	3.84E+00	0.00E+00	5.13E-01	0.00E+00	1.27E+01	4.05E+00
Ozone depletion	Kg CFC ¹¹ eq	9.16E-06	3.36E-07	1.64E-07	1.15E-06	2.55E-07	0.00E+00	1.18E-07	0.00E+00	1.36E-08	1.26E-05
Acidification	mol H ⁺ eq	5.78E-01	1.63E-02	1.60E-02	2.53E-02	1.21E-02	0.00E+00	2.59E-03	0.00E+00	1.49E-03	-1.94E-02
Eutrophication aquatic freshwater	kg P eq	2.93E-02	6.54E-04	7.79E-04	3.42E-04	6.46E-04	0.00E+00	3.50E-05	0.00E+00	1.37E-05	5.60E-02
Eutrophication aquatic freshwater	kg PO ₄ ³⁻ eq	8.98E-02	2.01E-03	2.39E-03	1.05E-03	1.98E-03	0.00E+00	1.07E-04	0.00E+00	4.20E-05	1.72E-01
Eutrophication aquatic marine	kg N eq	1.28E-01	5.80E-03	5.25E-03	8.82E-03	2.35E-03	0.00E+00	9.03E-04	0.00E+00	1.39E-03	1.23E-01
Eutrophication terrestrial	mol N eq	1.23E+00	6.23E-02	4.74E-02	9.64E-02	2.48E-02	0.00E+00	9.86E-03	0.00E+00	7.72E-03	3.87E-01
Photochemical ozone formation	kg NMVOC eq	2.63E+00	1.71E-02	1.68E-02	2.74E-02	1.25E-02	0.00E+00	2.81E-03	0.00E+00	2.11E-03	-5.55E-01
Depletion of abiotic resources - minerals and metals*	kg Sb eq	6.80E-04	9.42E-06	1.53E-05	1.83E-05	2.12E-05	0.00E+00	1.88E-06	0.00E+00	2.89E-07	-1.94E-06
Depletion of abiotic resources - fossil fuels*	MJ	3.80E+03	3.24E+01	7.58E+01	7.69E+01	7.59E+01	0.00E+00	7.88E+00	0.00E+00	8.82E-01	-7.14E+03
Water use*	m ³ eq	6.74E+01	2.37E-01	4.31E+00	2.19E-01	1.96E+00	0.00E+00	2.24E-02	0.00E+00	2.13E-02	-2.94E+02
Additional environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Particulate Matter emissions	disease inc.	4.32E-06	1.54E-07	1.19E-07	3.63E-07	1.14E-07	0.00E+00	3.71E-08	0.00E+00	1.30E-08	4.53E-06
Ionizing radiation, human health	kBq U-235 eq	9.00E+00	3.54E-01	2.19E-01	4.02E-01	1.07E-01	0.00E+00	4.11E-02	0.00E+00	5.02E-03	3.03E+01
Ecotoxicity freshwater	CTUe	1.59E+03	2.90E+01	3.83E+01	5.88E+01	1.11E+02	0.00E+00	6.02E+00	0.00E+00	3.19E+00	3.71E+03
Human toxicity, cancer	CTUh	3.93E-08	2.36E-09	1.75E-09	2.10E-09	4.99E-09	0.00E+00	2.15E-10	0.00E+00	1.54E-09	2.63E-07
Human toxicity, non cancer effects	CTUh	9.04E-07	2.50E-08	2.40E-08	5.97E-08	5.40E-08	0.00E+00	6.11E-09	0.00E+00	1.15E-08	1.57E-06
Land use	Pt	3.12E+02	2.18E+01	1.18E+01	5.30E+01	5.52E+00	0.00E+00	5.42E+00	0.00E+00	1.08E+00	1.91E+03

Resource use indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Renewable resources, energy	MJ	1.02E+02	2.00E+00	3.13E+00	1.04E+00	1.28E+00	0.00E+00	1.06E-01	0.00E+00	4.47E-02	0.00E+00
Renewable resources, raw materials	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	0.00E+00
Renewable resources, total	MJ	1.02E+02	2.00E+00	3.13E+00	1.04E+00	1.28E+00	0.00E+00	1.06E-01	0.00E+00	4.47E-02	2.07E+02
Non renewable resources, energy	MJ	2.14E+03	3.24E+01	3.69E+01	7.69E+01	7.59E+01	0.00E+00	7.88E+00	0.00E+00	8.82E-01	0.00E+00
Non renewable resources, raw materials	MJ	1.66E+03	0.00E+00	3.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non renewable resources, total	MJ	3.80E+03	3.24E+01	7.58E+01	7.69E+01	7.59E+01	0.00E+00	7.88E+00	0.00E+00	8.82E-01	-7.14E+03
Use of secondary material	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	0.00E+00
Use of renewable secondary fuels	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	0.00E+00
Use of non renewable secondary fuels	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	0.00E+00
Use of net fresh water	m ³	1.53E+00	1.23E-02	1.01E-01	8.32E-03	4.81E-02	0.00E+00	8.52E-04	0.00E+00	2.69E-03	-2.18E+00
Waste indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.25E-03	6.54E-05	2.21E-05	2.00E-04	2.62E-05	0.00E+00	2.05E-05	0.00E+00	3.61E-06	3.09E-03
Non Hazardous waste	kg	9.10E+00	7.69E-01	7.26E-01	3.68E+00	3.05E-01	0.00E+00	3.77E-01	0.00E+00	1.55E+00	1.00E+02
Radioactive waste	kg	3.33E-03	2.07E-04	7.65E-05	5.27E-04	5.50E-05	0.00E+00	5.39E-05	0.00E+00	3.72E-06	1.24E-02
Output flows		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	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	0.00E+00
Materials for re cycling	kg	0.00E+00	0.00E+00	2.27E-02	0.00E+00	3.73E-01	0.00E+00	0.00E+00	0.00E+00	2.57E+01	0.00E+00
Materials for Energy recovery	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	0.00E+00
Exported energy	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	0.00E+00
Biogenic carbon content											
Carbon biogenic (product)	kg C	0.00E+00									
Carbon biogenic (packaging)	kg C	0.00E+00									

Table 6: 1m³ Whisper® UV 50mm characterisation results.

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

1m³ Whisper® FR – 50mm

Environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Climate change - total	kg CO ₂ eq	1.05E+02	2.10E+00	1.28E+01	4.24E+00	3.95E+00	0.00E+00	4.35E-01	0.00E+00	1.07E+01	9.16E+00
Climate change - fossil	kg CO ₂ eq	1.05E+02	2.08E+00	1.24E+01	4.23E+00	3.95E+00	0.00E+00	4.34E-01	0.00E+00	1.07E+01	-1.36E+01
Climate change - biogenic	kg CO ₂ eq	-3.23E-02	2.07E-02	4.62E-01	1.02E-02	2.68E-03	0.00E+00	1.05E-03	0.00E+00	7.27E-04	2.26E+01
Climate change - land use	kg CO ₂ eq	4.73E-02	1.55E-03	2.13E-03	1.43E-03	1.09E-03	0.00E+00	1.47E-04	0.00E+00	2.09E-05	1.25E-01
Climate change - total (neutral GWP-GHG)	kg CO ₂ eq	1.02E+02	2.06E+00	1.25E+01	4.20E+00	3.84E+00	0.00E+00	4.31E-01	0.00E+00	1.06E+01	4.62E-01
Ozone depletion	Kg CFC ¹¹ eq	7.82E-06	3.68E-07	1.51E-07	9.68E-07	2.55E-07	0.00E+00	9.94E-08	0.00E+00	1.14E-08	8.38E-06
Acidification	mol H ⁺ eq	4.57E-01	1.41E-02	1.56E-02	2.12E-02	1.21E-02	0.00E+00	2.18E-03	0.00E+00	1.26E-03	-1.53E-02
Eutrophication aquatic freshwater	kg P eq	2.31E-02	4.80E-04	7.74E-04	2.86E-04	6.46E-04	0.00E+00	2.94E-05	0.00E+00	1.15E-05	3.89E-02
Eutrophication aquatic freshwater	kg PO ₄ ³⁻ eq	7.08E-02	1.47E-03	2.38E-03	8.79E-04	1.98E-03	0.00E+00	9.03E-05	0.00E+00	3.53E-05	1.19E-01
Eutrophication aquatic marine	kg N eq	9.97E-02	4.99E-03	4.89E-03	7.39E-03	2.35E-03	0.00E+00	7.59E-04	0.00E+00	1.17E-03	8.48E-02
Eutrophication terrestrial	mol N eq	9.60E-01	5.38E-02	4.49E-02	8.08E-02	2.48E-02	0.00E+00	8.29E-03	0.00E+00	6.49E-03	2.64E-01
Photochemical ozone formation	kg NMVOC eq	2.49E+00	1.49E-02	1.62E-02	2.30E-02	1.25E-02	0.00E+00	2.36E-03	0.00E+00	1.77E-03	-3.87E-01
Depletion of abiotic resources - minerals and metals*	kg Sb eq	5.39E-04	8.58E-06	1.53E-05	1.54E-05	2.12E-05	0.00E+00	1.58E-06	0.00E+00	2.43E-07	-4.24E-06
Depletion of abiotic resources - fossil fuels*	MJ	2.95E+03	3.12E+01	7.57E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	-4.99E+03
Water use*	m ³ eq	5.24E+01	1.86E-01	3.93E+00	1.83E-01	1.96E+00	0.00E+00	1.88E-02	0.00E+00	1.79E-02	-2.04E+02
Additional environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Particulate Matter emissions	disease inc.	3.34E-06	1.48E-07	1.17E-07	3.04E-07	1.14E-07	0.00E+00	3.12E-08	0.00E+00	1.09E-08	3.14E-06
Ionizing radiation, human health	kBq U-235 eq	7.16E+00	2.87E-01	2.17E-01	3.37E-01	1.07E-01	0.00E+00	3.46E-02	0.00E+00	4.22E-03	2.10E+01
Ecotoxicity freshwater	CTUe	1.28E+03	2.67E+01	3.76E+01	4.93E+01	1.11E+02	0.00E+00	5.06E+00	0.00E+00	2.69E+00	2.58E+03
Human toxicity, cancer	CTUh	3.51E-08	1.84E-09	1.67E-09	1.76E-09	4.99E-09	0.00E+00	1.80E-10	0.00E+00	1.29E-09	1.82E-07
Human toxicity, non cancer effects	CTUh	7.28E-07	2.41E-08	2.32E-08	5.00E-08	5.40E-08	0.00E+00	5.13E-09	0.00E+00	9.67E-09	1.09E-06
Land use	Pt	2.47E+02	2.11E+01	1.17E+01	4.44E+01	5.52E+00	0.00E+00	4.56E+00	0.00E+00	9.07E-01	1.33E+03

Resource use indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Renewable resources, energy	MJ	8.00E+01	1.47E+00	3.12E+00	8.69E-01	1.28E+00	0.00E+00	8.92E-02	0.00E+00	3.76E-02	0.00E+00
Renewable resources, raw materials	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	0.00E+00
Renewable resources, total	MJ	8.00E+01	1.47E+00	3.12E+00	8.69E-01	1.28E+00	0.00E+00	8.92E-02	0.00E+00	3.76E-02	1.43E+02
Non renewable resources, energy	MJ	1.85E+03	3.12E+01	3.68E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	0.00E+00
Non renewable resources, raw materials	MJ	1.10E+03	0.00E+00	3.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non renewable resources, total	MJ	2.95E+03	3.12E+01	7.57E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	-4.99E+03
Use of secondary material	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	0.00E+00
Use of renewable secondary fuels	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	0.00E+00
Use of non renewable secondary fuels	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	0.00E+00
Use of net fresh water	m ³	1.20E+00	9.28E-03	9.21E-02	6.97E-03	4.81E-02	0.00E+00	7.16E-04	0.00E+00	2.26E-03	-1.51E+00
Waste indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.12E-03	6.86E-05	2.17E-05	1.68E-04	2.62E-05	0.00E+00	1.72E-05	0.00E+00	3.03E-06	2.10E-03
Non Hazardous waste	kg	7.18E+00	9.71E-01	6.50E-01	3.09E+00	3.05E-01	0.00E+00	3.17E-01	0.00E+00	1.30E+00	6.95E+01
Radioactive waste	kg	2.59E-03	2.04E-04	7.58E-05	4.41E-04	5.50E-05	0.00E+00	4.53E-05	0.00E+00	3.13E-06	8.61E-03
Output flows		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	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	0.00E+00
Materials for re cycling	kg	0.00E+00	0.00E+00	1.89E-02	0.00E+00	3.73E-01	0.00E+00	0.00E+00	0.00E+00	2.16E+01	0.00E+00
Materials for Energy recovery	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	0.00E+00
Exported energy	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	0.00E+00
Biogenic carbon content											
Carbon biogenic (product)	kg C	0.00E+00									
Carbon biogenic (packaging)	kg C	0.00E+00									

Table 7: 1m³ Whisper® FR 50mm characterisation results.

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

1m³ Whisper® UV-ECO – 50mm

Environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Climate change - total	kg CO ₂ eq	1.14E+02	1.90E+00	1.28E+01	4.24E+00	3.95E+00	0.00E+00	4.35E-01	0.00E+00	1.07E+01	9.16E+00
Climate change - fossil	kg CO ₂ eq	1.14E+02	1.87E+00	1.24E+01	4.23E+00	3.95E+00	0.00E+00	4.34E-01	0.00E+00	1.07E+01	-1.36E+01
Climate change - biogenic	kg CO ₂ eq	-1.03E-01	2.74E-02	4.62E-01	1.02E-02	2.68E-03	0.00E+00	1.05E-03	0.00E+00	7.27E-04	2.26E+01
Climate change - land use	kg CO ₂ eq	5.19E-02	1.86E-03	2.13E-03	1.43E-03	1.09E-03	0.00E+00	1.47E-04	0.00E+00	2.09E-05	1.25E-01
Climate change - total (neutral GWP-GHG)	kg CO ₂ eq	1.11E+02	1.85E+00	1.25E+01	4.20E+00	3.84E+00	0.00E+00	4.31E-01	0.00E+00	1.06E+01	4.62E-01
Ozone depletion	Kg CFC ¹¹ eq	8.00E-06	2.72E-07	1.51E-07	9.68E-07	2.55E-07	0.00E+00	9.94E-08	0.00E+00	1.14E-08	8.38E-06
Acidification	mol H ⁺ eq	4.97E-01	1.41E-02	1.56E-02	2.12E-02	1.21E-02	0.00E+00	2.18E-03	0.00E+00	1.26E-03	-1.53E-02
Eutrophication aquatic freshwater	kg P eq	2.49E-02	6.23E-04	7.74E-04	2.86E-04	6.46E-04	0.00E+00	2.94E-05	0.00E+00	1.15E-05	3.89E-02
Eutrophication aquatic freshwater	kg PO ₄ ³⁻ eq	7.64E-02	1.91E-03	2.38E-03	8.79E-04	1.98E-03	0.00E+00	9.03E-05	0.00E+00	3.53E-05	1.19E-01
Eutrophication aquatic marine	kg N eq	1.09E-01	5.10E-03	4.89E-03	7.39E-03	2.35E-03	0.00E+00	7.59E-04	0.00E+00	1.17E-03	8.48E-02
Eutrophication terrestrial	mol N eq	1.04E+00	5.47E-02	4.49E-02	8.08E-02	2.48E-02	0.00E+00	8.29E-03	0.00E+00	6.49E-03	2.64E-01
Photochemical ozone formation	kg NMVOC eq	2.81E+00	1.50E-02	1.62E-02	2.30E-02	1.25E-02	0.00E+00	2.36E-03	0.00E+00	1.77E-03	-3.87E-01
Depletion of abiotic resources - minerals and metals*	kg Sb eq	5.66E-04	8.35E-06	1.53E-05	1.54E-05	2.12E-05	0.00E+00	1.58E-06	0.00E+00	2.43E-07	-4.24E-06
Depletion of abiotic resources - fossil fuels*	MJ	3.24E+03	2.79E+01	7.57E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	-4.99E+03
Water use*	m ³ eq	5.70E+01	2.21E-01	3.93E+00	1.83E-01	1.96E+00	0.00E+00	1.88E-02	0.00E+00	1.79E-02	-2.04E+02
Additional environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Particulate Matter emissions	disease inc.	3.64E-06	1.34E-07	1.17E-07	3.04E-07	1.14E-07	0.00E+00	3.12E-08	0.00E+00	1.09E-08	3.14E-06
Ionizing radiation, human health	kBq U-235 eq	7.62E+00	3.26E-01	2.17E-01	3.37E-01	1.07E-01	0.00E+00	3.46E-02	0.00E+00	4.22E-03	2.10E+01
Ecotoxicity freshwater	CTUe	1.36E+03	2.56E+01	3.76E+01	4.93E+01	1.11E+02	0.00E+00	5.06E+00	0.00E+00	2.69E+00	2.58E+03
Human toxicity, cancer	CTUh	3.51E-08	2.20E-09	1.67E-09	1.76E-09	4.99E-09	0.00E+00	1.80E-10	0.00E+00	1.29E-09	1.82E-07
Human toxicity, non cancer effects	CTUh	7.74E-07	2.16E-08	2.32E-08	5.00E-08	5.40E-08	0.00E+00	5.13E-09	0.00E+00	9.67E-09	1.09E-06
Land use	Pt	2.64E+02	1.89E+01	1.17E+01	4.44E+01	5.52E+00	0.00E+00	4.56E+00	0.00E+00	9.07E-01	1.33E+03

Resource use indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Renewable resources, energy	MJ	8.68E+01	1.90E+00	3.12E+00	8.69E-01	1.28E+00	0.00E+00	8.92E-02	0.00E+00	3.76E-02	0.00E+00
Renewable resources, raw materials	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	0.00E+00
Renewable resources, total	MJ	8.68E+01	1.90E+00	3.12E+00	8.69E-01	1.28E+00	0.00E+00	8.92E-02	0.00E+00	3.76E-02	1.43E+02
Non renewable resources, energy	MJ	1.82E+03	2.79E+01	3.68E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	0.00E+00
Non renewable resources, raw materials	MJ	1.42E+03	0.00E+00	3.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non renewable resources, total	MJ	3.24E+03	2.79E+01	7.57E+01	6.45E+01	7.59E+01	0.00E+00	6.62E+00	0.00E+00	7.42E-01	-4.99E+03
Use of secondary material	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	0.00E+00
Use of renewable secondary fuels	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	0.00E+00
Use of non renewable secondary fuels	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	0.00E+00
Use of net fresh water	m ³	1.30E+00	1.17E-02	9.21E-02	6.97E-03	4.81E-02	0.00E+00	7.16E-04	0.00E+00	2.26E-03	-1.51E+00
Waste indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.11E-03	5.46E-05	2.17E-05	1.68E-04	2.62E-05	0.00E+00	1.72E-05	0.00E+00	3.03E-06	2.10E-03
Non Hazardous waste	kg	7.97E+00	5.85E-01	6.50E-01	3.09E+00	3.05E-01	0.00E+00	3.17E-01	0.00E+00	1.30E+00	6.95E+01
Radioactive waste	kg	2.75E-03	1.76E-04	7.58E-05	4.41E-04	5.50E-05	0.00E+00	4.53E-05	0.00E+00	3.13E-06	8.61E-03
Output flows		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	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	0.00E+00
Materials for re cycling	kg	0.00E+00	0.00E+00	1.89E-02	0.00E+00	3.73E-01	0.00E+00	0.00E+00	0.00E+00	2.16E+01	0.00E+00
Materials for Energy recovery	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	0.00E+00
Exported energy	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	0.00E+00
Biogenic carbon content											
Carbon biogenic (product)	kg C	0.00E+00									
Carbon biogenic (packaging)	kg C	0.00E+00									

Table 8: 1m³ Whisper® UV-ECO 50mm characterisation results.

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

1m³ Whisper® NBI – 40mm

Environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Climate change - total	kg CO ₂ eq	1.19E+02	2.24E+00	6.89E+00	3.97E+00	9.46E+00	0.00E+00	4.32E-01	0.00E+00	1.06E+01	5.57E+00
Climate change - fossil	kg CO ₂ eq	1.18E+02	2.21E+00	1.06E+01	3.96E+00	8.61E+00	0.00E+00	4.31E-01	0.00E+00	1.06E+01	-1.21E+01
Climate change - biogenic	kg CO ₂ eq	1.40E-01	2.96E-02	-3.72E+00	9.56E-03	8.53E-01	0.00E+00	1.04E-03	0.00E+00	7.21E-04	1.75E+01
Climate change - land use	kg CO ₂ eq	5.15E-02	2.06E-03	3.72E-03	1.34E-03	3.25E-03	0.00E+00	1.46E-04	0.00E+00	2.07E-05	9.66E-02
Climate change - total (neutral GWP-GHG)	kg CO ₂ eq	1.15E+02	2.18E+00	1.08E+01	3.93E+00	8.35E+00	0.00E+00	4.27E-01	0.00E+00	1.06E+01	-1.13E+00
Ozone depletion	Kg CFC ¹¹ eq	8.39E-06	3.39E-07	1.73E-07	9.06E-07	7.64E-07	0.00E+00	9.86E-08	0.00E+00	1.13E-08	6.26E-06
Acidification	mol H+ eq	5.07E-01	1.67E-02	9.01E-03	1.98E-02	3.60E-02	0.00E+00	2.16E-03	0.00E+00	1.24E-03	-1.29E-02
Eutrophication aquatic freshwater	kg P eq	2.58E-02	6.75E-04	3.48E-04	2.68E-04	1.94E-03	0.00E+00	2.92E-05	0.00E+00	1.14E-05	3.01E-02
Eutrophication aquatic freshwater	kg PO ₄ ³⁻ eq	7.91E-02	2.07E-03	1.07E-03	8.23E-04	5.95E-03	0.00E+00	8.95E-05	0.00E+00	3.50E-05	9.23E-02
Eutrophication aquatic marine	kg N eq	1.11E-01	5.94E-03	3.83E-03	6.92E-03	7.03E-03	0.00E+00	7.53E-04	0.00E+00	1.16E-03	6.54E-02
Eutrophication terrestrial	mol N eq	1.07E+00	6.38E-02	3.48E-02	7.56E-02	7.36E-02	0.00E+00	8.22E-03	0.00E+00	6.43E-03	2.02E-01
Photochemical ozone formation	kg NMVOC eq	2.20E+00	1.75E-02	1.10E-02	2.15E-02	3.71E-02	0.00E+00	2.34E-03	0.00E+00	1.76E-03	-3.01E-01
Depletion of abiotic resources - minerals and metals*	kg Sb eq	5.72E-04	9.62E-06	7.65E-06	1.44E-05	6.36E-05	0.00E+00	1.56E-06	0.00E+00	2.41E-07	-5.12E-06
Depletion of abiotic resources - fossil fuels*	MJ	3.27E+03	3.30E+01	2.32E+01	6.04E+01	2.28E+02	0.00E+00	6.56E+00	0.00E+00	7.35E-01	-3.89E+03
Water use*	m ³ eq	5.79E+01	2.44E-01	2.60E+00	1.72E-01	5.86E+00	0.00E+00	1.87E-02	0.00E+00	1.77E-02	-1.58E+02
Additional environmental impact categories		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Particulate Matter emissions	disease inc.	3.62E-06	1.57E-07	8.19E-08	2.85E-07	3.40E-07	0.00E+00	3.10E-08	0.00E+00	1.09E-08	2.43E-06
Ionizing radiation, human health	kBq U-235 eq	8.43E+00	3.63E-01	1.18E-01	3.15E-01	3.20E-01	0.00E+00	3.43E-02	0.00E+00	4.19E-03	1.63E+01
Ecotoxicity freshwater	CTUe	1.38E+03	2.97E+01	2.20E+01	4.61E+01	3.34E+02	0.00E+00	5.02E+00	0.00E+00	2.66E+00	1.99E+03
Human toxicity, cancer	CTUh	3.34E-08	2.43E-09	5.08E-09	1.64E-09	1.47E-08	0.00E+00	1.79E-10	0.00E+00	1.28E-09	1.41E-07
Human toxicity, non cancer effects	CTUh	7.79E-07	2.54E-08	1.94E-08	4.68E-08	1.60E-07	0.00E+00	5.09E-09	0.00E+00	9.59E-09	8.41E-07
Land use	Pt	2.68E+02	2.22E+01	2.82E+02	4.16E+01	1.67E+01	0.00E+00	4.52E+00	0.00E+00	9.00E-01	1.03E+03

Resource use indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Renewable resources, energy	MJ	8.98E+01	2.06E+00	1.33E+01	8.13E-01	3.84E+00	0.00E+00	8.85E-02	0.00E+00	3.73E-02	0.00E+00
Renewable resources, raw materials	MJ	0.00E+00	0.00E+00	3.85E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable resources, total	MJ	8.98E+01	2.06E+00	5.18E+01	8.13E-01	3.84E+00	0.00E+00	8.85E-02	0.00E+00	3.73E-02	1.11E+02
Non renewable resources, energy	MJ	1.84E+03	3.30E+01	1.70E+01	6.04E+01	2.28E+02	0.00E+00	6.57E+00	0.00E+00	7.35E-01	0.00E+00
Non renewable resources, raw materials	MJ	1.42E+03	0.00E+00	6.23E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non renewable resources, total	MJ	3.27E+03	3.30E+01	2.32E+01	6.04E+01	2.28E+02	0.00E+00	6.57E+00	0.00E+00	7.35E-01	-3.89E+03
Use of secondary material	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	0.00E+00
Use of renewable secondary fuels	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	0.00E+00
Use of non renewable secondary fuels	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	0.00E+00
Use of net fresh water	m ³	1.32E+00	1.27E-02	6.34E-02	6.53E-03	1.44E-01	0.00E+00	7.10E-04	0.00E+00	2.24E-03	-1.17E+00
Waste indicators		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.16E-03	6.62E-05	2.46E-05	1.57E-04	7.79E-05	0.00E+00	1.71E-05	0.00E+00	3.01E-06	1.59E-03
Non Hazardous waste	kg	7.76E+00	7.69E-01	6.31E-01	2.89E+00	1.25E+00	0.00E+00	3.14E-01	0.00E+00	1.29E+00	5.38E+01
Radioactive waste	kg	2.99E-03	2.10E-04	5.76E-05	4.13E-04	1.65E-04	0.00E+00	4.50E-05	0.00E+00	3.10E-06	6.66E-03
Output flows		A1	A2	A3	A4	A5	C1	C2	C3	C4	D
Components for reuse	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	0.00E+00
Materials for re cycling	kg	0.00E+00	0.00E+00	1.89E-02	0.00E+00	9.17E-01	0.00E+00	0.00E+00	0.00E+00	2.15E+01	0.00E+00
Materials for Energy recovery	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	0.00E+00
Exported energy	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	0.00E+00
Biogenic carbon content											
Carbon biogenic (product)	kg C	0.00E+00									
Carbon biogenic (packaging)	kg C	4.69E-01									

Table 9: 1m³ Whisper® NBI40mm characterisation results.

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

The results are also presented per 1m² of Whisper® panel for the available versions and thicknesses of the Whisper® panel family. The indicator to express the impacts is the GWP-GHG with a neutral approach.

Panel	Density (kg/m ³)	Panel size (mm)	Thickness (mm)	GWP –GHG for 1m ² of panel (kg CO ₂ eq)
Whisper® UV	30	1200x2400	50	8.50
Whisper® FR	25	1200x2400	40	5.46
Whisper® FR	25	1200x2400	50	6.78
Whisper® UV-ECO	25	1200x2400	50	7.30
Whisper® NB-ECO	22	1200x1000	40	6.18
Whisper® NBI	22	1200x1000	40	6.12
Whisper® NBO	22	1200x1000	40	6.13

Table 10: 1m² Whisper® GWP characterisation results.

4. Contact and other information

Sealed Air contacts

The LCA and EPD have been produced by Sealed Air in collaboration with 2B Srl (www.to-be.it).

The company references are:

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Verification and registration

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Reference year: 2020

ISO standard ISO 21930 and CEN standard EN 15804:2012+A2:2019 serves as the core Product Category Rules (PCR)
Product category rules (PCR): PCR 2019:14 Construction products, version 1.11 UN CPC 314 category
PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input checked="" type="checkbox"/> External <input type="checkbox"/> Internal covering <input type="checkbox"/> EPD process certification <input checked="" type="checkbox"/> EPD verification
Address of programme operator: EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: info@environdec.com <i>In case of individual verifiers: Paolo Simon Ostan</i> Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

According to ISO 14025, EPDs within the same product category but from different programmes may not be comparable.

EPDs of construction products may not be comparable if they do not comply with EN 15804:2012+A2:2019.

5. Bibliography

- PCR 2019:14 v1.11 “Construction products”, Product Category Rules (PCR) for preparing an environmental product declaration (EPD) for construction products and construction services, the Swedish Environmental Management Council (www.environdec.com).
- EN 15804:2012+A2:2019 “Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”.
- ISO 14025:2006. Environmental labels and declarations, type 3 environmental declarations, principles and procedures (www.iso.org).
- ISO 14040/14044:2006. ISO series on Life Cycle Assessment (Valutazione del ciclo di vita), UNI EN ISO 14040:2006 and 14044:2006 (www.iso.org).
- ecoinvent, 2021. Swiss Centre for Life Cycle Assessment, v3.7 (www.NB-ECOinvent.ch).
- PRé Consultants, 2021. Software SimaPro versione 9.2 (www.pre.nl).
- Eurostat Database (europa.eu).
- General Programme Instructions for Environmental Product Declaration EPD, Version 3.01, 2019-09-18. Swedish Environmental Management Council (www.environdec.com).
- Sealed Air (<https://sealedair.it/it>).
- 2B and Sealed Air, 2021. Data collection questionnaire (internal document).
- 2B and Sealed Air, 2021. LCA Report.
- ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale), 2020. Rapporto rifiuti urbani – Edizione 2020, rapporto 331/2020.
- Association of Issuing Bodies (AIB), European Residual Mixes 2020.
- www.plasticfinder.it
- Department for Environment Food & Rural Affairs, Incineration of Municipal Solid Waste, February 2013.