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EPD®

THE INTERNATIONAL EPD® SYSTEM

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Environmental Product Declaration

in accordance with ISO 14025:2006 for:

3M™ E-A-R™ UltraFit™ Earplugs

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com.

3M Sustainability, St. Paul, MN 55144-1000 | United States

Programme: The International EPD® System
Programme operator: EPD International AB
www.environdec.com

Contents

1 General Information

Programme information	EPD International AB (info@environdec.com) Box 210 60, SE-100 31 Stockholm, Sweden. E-mail: support@environdec.com
Product Category Rules (PCRs)	International norms, standard and PCR: General Programme Instructions for the International EPD System (GPI 5.0.1). PCR 2025:05 v1.0.0 - Hearing Protection Devices (Multiple CPC codes, date: 2025-10-20, valid until: 2029-10-20). PCR review was conducted by: The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. Review chair: Bárbara M. Civit. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Verification	External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via EPD verification through: ■ Individual EPD verification without a pre-verified LCA/EPD tool ☐ Individual EPD verification with a pre-verified LCA/EPD tool ☐ EPD process certification without a pre-verified LCA/EPD tool ☐ EPD process certification with a pre-verified LCA/EPD tool ☐ Fully pre-verified EPD tool
Third-party verifier	Maggie Wildnauer, WAP Sustainability Consulting. Approved by: The International EPD System.
Data follow-up	Procedure for follow-up of data during EPD validity involves third-pary verifier: ☐ Yes ■ No
Goal of the study	A cradle-to-grave assessment including modules A1-A3, A4-A5, B2 and C2-C4. The Life Cycle Assessment (LCA) study has been conducted in accordance with ISO 14040:2006 and ISO 14044:2006 and the requirements stated in the General Programme Instructions by The International EPD® System, and abovementioned PCRs. The goal of the LCA study is to assess the potential environmental impact for the product 3M™ E-A-R™ UltraFit™ Earplugs specifically available in this EPD.
Ownership and limitations on use of EPD	Life cycle assessment accountability: Yara Hammoud, 3M. The owner of the EPD is 3M and has the sole ownership, liability and responsibility of the EPD. All values provided in this EPD are a direct result from the use of characterisation factors and calculation rules as defined in the LCA for Experts™ software from Sphera™, and the requirements of the product category rules as mentioned above. For more information about this EPD or its contents, contact Yara Hammoud at yhammoud@mmm.com. Address: 3M Belgium BV, Hermeslaan 7, 1831 Machelen, Belgium. EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. The environmental impacts of EPDs resulting from this PCR may not be directly comparable, as they may refer to products that are either disposable or reusable or have significantly different technical lifespans and technical performances.

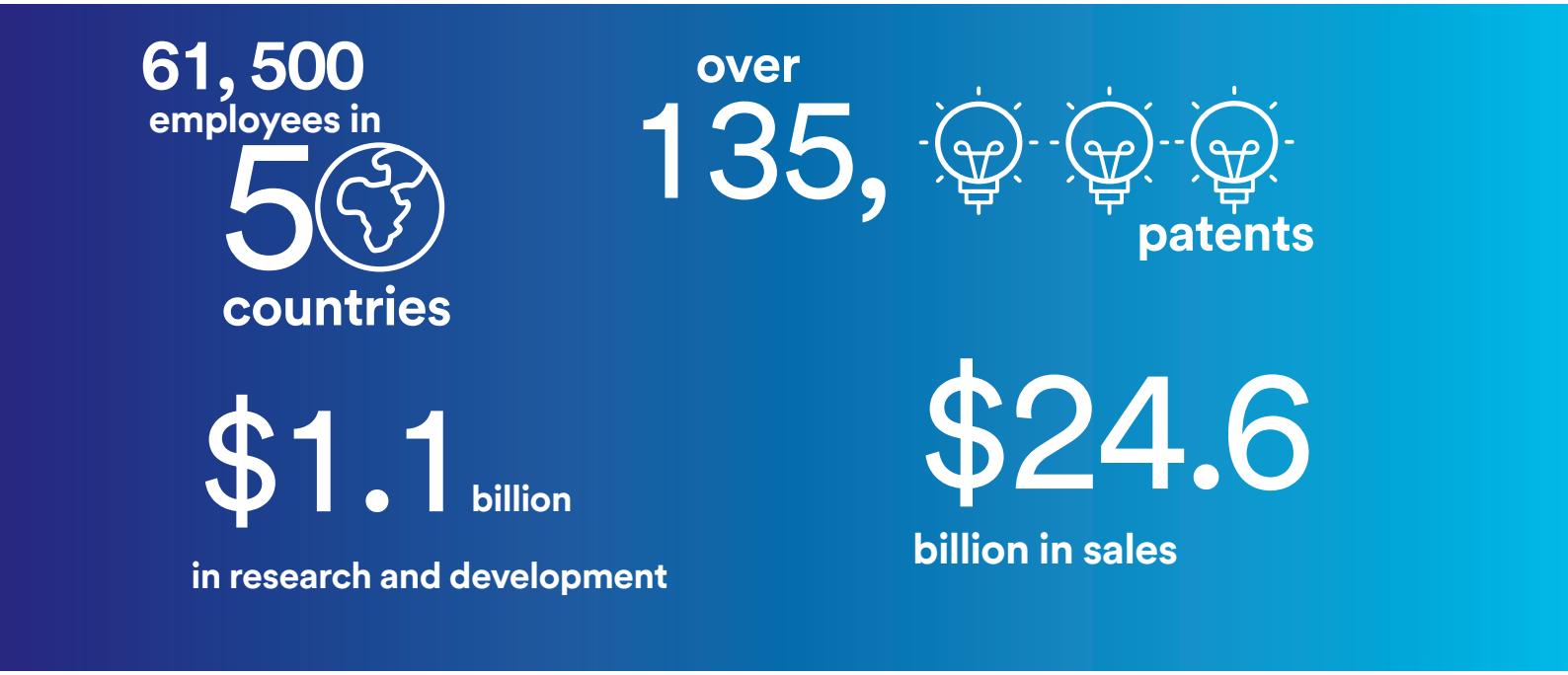
2 Information about EPD Owner

Over the last century 3M has grown into a global powerhouse, developing products that improve lives around the world. It began life as a small-scale mining venture in Northern Minnesota back in 1902, then named Minnesota Mining and Manufacturing Company.

3M's success and longevity weren't apparent from the start. Our five founders were looking for corundum, a mineral ideal for making sandpaper and grinding wheels. It turns out, what they thought was corundum was really a low-grade mineral. Despite the early setback they persevered with their operation, gained the trust of important investors and built up sales, giving birth to the spirit of innovation and collaboration that still shapes 3M today.

Over the following decades scientific, technical and marketing innovations produced success upon success, eventually making 3M a constant name on the Fortune 500 list. Our 49 Technology Platforms are shared and combined across businesses to invent products for a variety of industries.

With operations employing almost 61,500 employees in 50 different countries, 3M is a diverse technology company with $24.6 billion in sales. 3M has invested $1.1 billion in research and development to drive innovation. The company now has over 135,000 patents in its name.



3M brings solutions to different markets through three separate business groups, each one represents a core area of the company, with ideas and innovations shared between them. This collaborative approach has led to unexpected solutions by enabling designers to see problems from different perspectives.

Safety & Industrial is our biggest earning business group, with a vast range of products used in industrial production, electrical and safety markets. This includes automotive, bonding and protecting surfaces in construction, securing things together and developing lightweight parts to help reduce weight and increase efficiency, whilst protecting people at work, and enhancing visual and design communication.

Transportation & Electronics provides solutions for improving road safety and creating a more connected world, such as developing global telecommunications and power grids, restoring underground pipelines and locating key underground infrastructure. It's known for interacting with customers to create innovative solutions and providing opportunities for energy conservation and generation.

And finally, Consumer business group features many of our most familiar products and brands, including Post-It®, Scotch® and Command™. It develops solutions to make life easier and more productive at home and in the office, such as simplifying communication, cleaning and protecting surfaces, making home improvement easy and inspiring hobbies, crafts and creativity.[1]

[1]Company information mentioned in this section are included in 3M's 2025 Global Impact report that is referenced in section 10.

At 3M, we make what is indispensable to empower modern life, advance human progress, and deliver a bright future through 3M Science. We use science to build what's next as we rise to the challenges facing our planet and its people. As these challenges evolve, we're accelerating our exploration of emerging areas like climate technology, industrial automation, sustainable packaging, and automotive electrification.

Setting targets to drive sustainability progress is nothing new at 3M. We have been setting global environmental goals since 1990. A strong part of our company history, these goals have helped dramatically reduce our own environmental footprint.

3M's Pollution Prevention Program has been running since 1975. The programme has completed 16,700 projects, preventing nearly 2.99 million short tons of pollutants. Since 2021, we achieved a 98.2 million pound reduction in our use of virgin fossil-based plastic in our packaging and products toward our goal of 125 million pounds by the end of 2025.

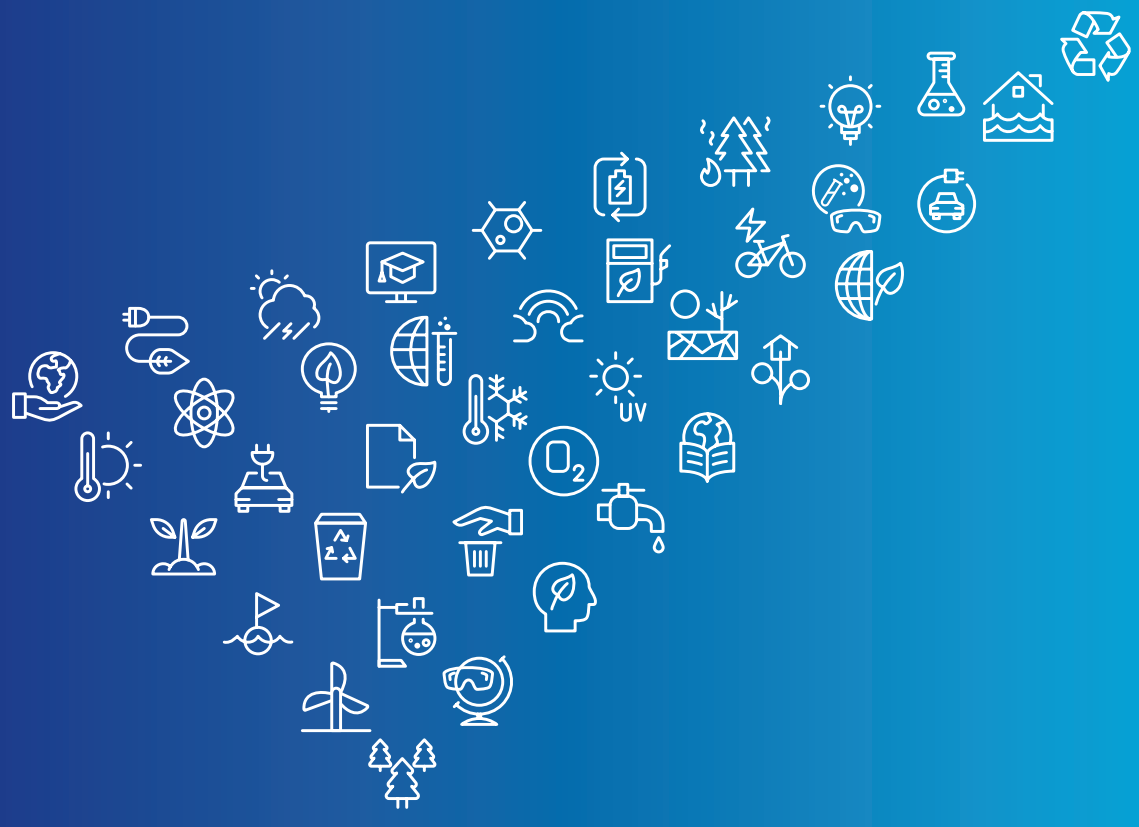
We've incorporated recycled and bio-based materials and reduced plastic use in products and packaging such as tapes and dispensers, sponges, packaging, workspace solutions, insulation, optical films, floor pads, sorbents, and more.

Since 2019, 3M has achieved 59.1% reduction in scope 1 and 2 greenhouse gas emissions and 21.4% decrease in water usage. At the same time, we've intensified our focus on creating a range of innovative solutions that help our customers be more sustainable — from glass bubbles that enable lower vehicle weight and improved fuel economy, to films that make homes, businesses, and electronics more energy efficient.

Another initiative led by 3M is the Sustainability Value Commitment, which expects every new product made by 3M from 2019 onwards is manufactured with sustainability in mind. It commits our product developers to focus on reusability, recyclability, energy, waste, water savings, responsible sourcing, and/or renewable materials appropriate to the specific product, from the beginning to the end of each product's lifecycle. This helps our products advance sustainability, improve competitiveness, and meet customer demands. Examples include technology for automotive electrification, industrial automation, data center efficiency, and consumer products like Post-it® 100% Recycled Paper Super Sticky Notes.

As a participant in the United Nations Global Compact (UNGC), 3M is committed to supporting all its principles, including Principle 10 on AntiCorruption. Our commitment and involvement with the UNGC and our community of peer companies provide us with the opportunity to collaborate and share best practices related to work against corruption in all its forms.[2]

[2]Company information mentioned in this section are included in 3M's 2025 Global Impact report that is referenced in section 10.



3 Product Information

The following products are covered by this EPD:

Product name	Reference
3M™ E-A-R™ UltraFit™ Earplugs	7000038199

The 3M™ E-A-R™ UltraFit™ Earplugs are reusable moulded earplugs designed for insertion into the ear canal to help reduce exposure to harmful levels of noise. Each set of plugs is supplied with a pre-tipped PVC cord and are supplied in a re-closable carton packaging. The earplugs are expertly designed to provide exceptional hearing protection and comfort. With a high SNR of 29 dB, they effectively reduce exposure to harmful noise levels across various environments, ensuring the user's hearing is well-protected. Their universal fit design features a three-flange, cone-shaped structure that accommodates a wide range of ear canal sizes, providing a secure and comfortable fit for most users. The earplugs are a passive product.

The earplugs are made from soft and durable Thermoplastic Elastomer (TPE) and offer optimum comfort even during extended wear. The firm, long stem design allows for easy insertion and removal, enhancing user-friendliness. They are available in a single size that fits the majority of wearers, they simplify the selection process.

These earplugs are both reusable and washable. The pre-tipped cord can be easily removed and re-inserted, allowing for versatile use as either corded or uncorded, based on user preference. Supplied in re-closable packaging, they are convenient to store and transport.

The technical lifespan of the Ultrafit Earplugs is estimated to be 672 operating hours based on internal company tests, provided that the specified conditions for packaging, transport, storage, use, and maintenance are followed. This originates from a defined reasonable use period of 84 days that is chosen based on results of a simulated wax absorption test performed internally, which shows that the product could still function normally after this period of time. Assuming a working day of 8 hours, the technical lifespan in operating hours was calculated by multiplying 84 days by 8 hours per day. Thus, the technical lifespan of the Ultrafit Earplugs defined for the purposes of this study is 672 operating hours.

The 3M™ E-A-R™ UltraFit™ Earplugs are classified under United Nations Standard Products and Services Code (UNSPSC) 46181900, hearing protectors.

4 Content Declaration

4.1 Product composition

3M™ E-A-R™ UltraFit™ Earplugs product covered by this EPD does not contain Substances of Very High Concern (SVHC) as defined by article 59 (10) of Regulation (CE) n° 1907/2006 (dated 2025-06-25), also known as the REACH candidate list, at a concentration at or above 0.1% in weight.

The tables below report respectively the product composition and the product packaging. Weight in kg and % is presented per the functional unit. The tables also present the biogenic carbon content (as kg of C[3] per functional unit, and as weight %).

Product materials	Weight [kg]	Weight [wt%]	Pre-consumer recycled content [wt% vs the product]	Biogenic material, weight % and kg C/product or functional unit
PVC	1.46E-03	41.8%	0.5%	0 resp. 0
TPU	2.04E-03	58.2%	0%	0 resp. 0
Total	**3.50E-03**	**100%**	**0.5%**	**0 resp. 0**

[3] 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Packaging components	Weight [kg]	Weight vs the product [wt%]	Weight biogenic carbon, kg C/ functional unit
Cardboard	8.03E-03	52.7%	3.54E-03
Paper	4.28E-04	2.8%	1.88E-04
Wood	3.27E-03	21.5%	1.64E-03
Total	**1.17E-02**	**77.0%**	**5.36E-03**

4.2 Recycling

3M has been recycling since 1975 when we established the Corporate Environmental Policy and adopted a voluntary Pollution Prevention Program based on the then-novel idea that pollution prevention is more environmentally effective, technically sound and economically advantageous than pollution control.

Today 3M practices responsible waste management at every company location to reduce the amount of waste materials generated, and deal with hazardous waste in the most efficient way possible.

Our 3M Waste Management Standard applies to all 3M sites and provides a framework for managing all waste types from the time of generation until reused, recycled, treated, or disposed. The standard sets a baseline for several core waste program elements and encourages waste minimization and recycling whenever possible.

3M strives to design products with recycled or renewable materials, using only one material when possible, to facilitate recycling.

During the manufacturing of 3M™ E-A-R™ UltraFit™ Earplugs, some materials are recycled or reused:

- Thermoplastic elastomer waste
- PVC waste
- Packaging material waste

During the end-of-life, statistical data is used to model the disposal of the product and packaging since no specific data is available. This data represents the main types of disposal (incineration and landfill) and recycling of the waste with the corresponding quantities (see sections 5.3.4 of this EPD for more details).

4.3 Manufacturing

At 3M, we approach our sustainability goals and strategy by delivering excellence in operations and across our supply chain, innovating to improve lives with our customers and partners, and enriching the communities where we live and work. Our ambition, working collaboratively, is to realise a world where every life is improved, where natural resources are reliably available, where people everywhere have access to education and opportunity, and where communities are safe, healthy, connected and thriving.

When it comes to fabrication, assembly or processing, 3M understand that increasing efficiency is vital for our selling partners and their bottom line. From ultra-strong abrasives that keep processes running smoothly to futuristic materials that can literally lighten your workload, we provide innovative solutions that help businesses and employees improve efficiency.

3M's International Environmental Operations group enhances and integrates our global environmental management system which guarantees compliance with environmental regulations and prepares facilities to meet the requirements of international standards.

The 3M™ E-A-R™ UltraFit™ Earplugs product covered Division, a division of the Safety and Industrial Business Group (SIBG) within the 3M Company. The 3M manufacturing site that is part of the supply chain is: 3M Wrocław (Poland), operating under ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certifications. Other non-3M manufacturing sites are also part of the supply chain and are located in Poland.

5 LCA Information

5.1 Functional unit

The functional unit in this EPD is 1 pair of earplugs including its packaging, to be used over a technical lifespan of 672 operating hours. The conversion factor from 1 each to kg is 0.0152, and the total reference flow is 0.0152 kg (0.0035 kg product, 0.0117 kg packaging).

5.2 Technical lifespan

The technical lifespan of the Ultrafit Earplugs is estimated to be 672 operating hours based on internal company tests, provided that the specified conditions for packaging, transport, storage, use, and maintenance are followed. This originates from a defined reasonable use period of 84 days that is chosen based on results of a simulated wax absorption test performed internally, which shows that the product could still function normally after this period of time. Assuming a working day of 8 hours, the technical lifespan in operating hours was calculated by multiplying 84 days by 8 hours per day. Thus, the technical lifespan of the Ultrafit Earplugs defined for the purposes of this study is 672 operating hours.

5.3 System boundaries

The LCA study supporting this EPD is a cradle-to-grave assessment with modules A1-A3, A4-A5, B2 and C2-C4. The included modules and life cycle stages are listed in the table below.

In addition to the declared modeles, the table below lists the geographical location per module and the share of the GWP-GHG indicator results in A1-A3 coming from product-specific LCI data.

This LCI data is defined as measured data, representative data or data that can be proven to be conservative. All other data is regarded as proxy data and identified as estimates during data collection.

Stage	Product			Distribution		Use			End-of-life		
	Raw materials	Transport	Manufacturing	Transport	Waste treatment	Operation of product	Maintenance	Operational energy use	Transport	Waste processing	Disposal
Module	A1	A2	A3	A4	A5	B1	B2	B6	C2	C3	C4
Declared	X	X	X	X	X	X	X	X	X	X	X
Geography	(1)	(1)	PL	EU	EU	EU	EU	EU	EU	EU	EU
Share of specific data	27.6%			-	-	-	-	-	-	-	-
Variation products	Not relevant			-	-	-	-	-	-	-	-
Variation sites	Not relevant			-	-	-	-	-	-	-	-

X = declared module; ND = module not declared
A1 = Upstream module; A2-A3 = Core module; A4-C5 = Downstream module

(1) PL, AT, DE, US

5.3.1 Product stage (A1 - A3)

Raw material supply includes the acquisition of raw materials from nature to create usable intermediates, as well as the packaging used to ship the raw materials (A1). Finished product packaging materials as well as ancillaries are also regarded as part of the RM supply (A1). All raw materials are transported from the source to the 3M manufacturing site by truck and/or boat (A2). Most of the time, raw materials need to be packed for transportation. Loading and unloading of raw materials are not included in the study.

Production includes all steps carried out at 3M manufacturing sites and other non-3M sites to produce the finished product, including treatment of waste produced and process utilities (e.g. electricity, steam, etc.) (A3). Disposal of raw material packaging is included in A3 as well. The environmental profile of these energy carriers is modeled for local conditions. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

5.3.2 Distribution stage (A4 - A5)

The distribution stage includes transportation of the finished product to the location of use, and waste treatment of distribution and product packaging.

For transportation (A4), the scope of the study is EMEA, and as such the assumption of a distribution distance of 905 km by EU truck (LC[4] 22,000 kg, FCFC[5] 55.7 l diesel/100 km, CU[6] 61%) from 3M Wrocław to Jüechen distribution center, Germany, and 2500 km by EU truck from Jüechen distribution center to any EU customer excluding Germany.

The distribution stage also includes waste treatment of the product packaging materials (different size slotted containers, label, booklet, paper tape) and the distribution packaging materials (pallet), including their transportation to the disposal/recovery site (module A5), with a distance of 100 km assumed. The pallets are re-used. The paper tape is categorized under the paper/cardboard waste category, as its main component is paper. No specific data is available on the disposal of these paper/cardboard packaging materials, and this can highly vary across markets, so Eurostat data is used to model the disposal of the materials. This data represents the main types of disposal (incineration and landfill) and recycling of the waste with the corresponding quantities

The disposal scenario applied for paper/cardboard waste assumes 0.03% of the waste is sent to landfill, 1.11% to incineration and 98.86% to recycling.

5.3.3 Use stage (B1 - B7)

The technical lifespan of the Ultrafit Earplugs has been estimated to be 672 operating hours based on internal company tests. Over the defined technical lifespan, it is assumed that the earplugs are washed once every week (i.e., once every 40 hours, considering 8 working hours per day and 5 working days per week). This results in 16.8 washes over the technical lifespan.

The washing procedure used during the testing and assumed to be applied by the user includes washing the earplugs by hand, using a drop of dish detergent and rinsing thoroughly under tap water for 20 seconds. Then the earplugs are patted dry using paper towels and left to further air-dry. The following amounts used are assumed per wash:

- 2.8 L of water: calculated using 8.5 L/min maximum allowed average flow rate for water taps in several countries across Europe, and assuming the tap is opened for 20 seconds
- 55 mg of dishwashing detergent: assuming one drop is used
- 8 g of paper towels: assuming 2 paper towels are used to pat dry the earplugs, one paper towel weighing 4 g.

The use phase also includes waste processing of the waste generated in this stage, including its transportation to disposal sites. Water and detergent are assumed to be sent to wastewater treatment, while the treatment methods assumed for the paper towels follow the Eurostat disposal assumption for the paper/cardboard waste category, as defined in the above section.

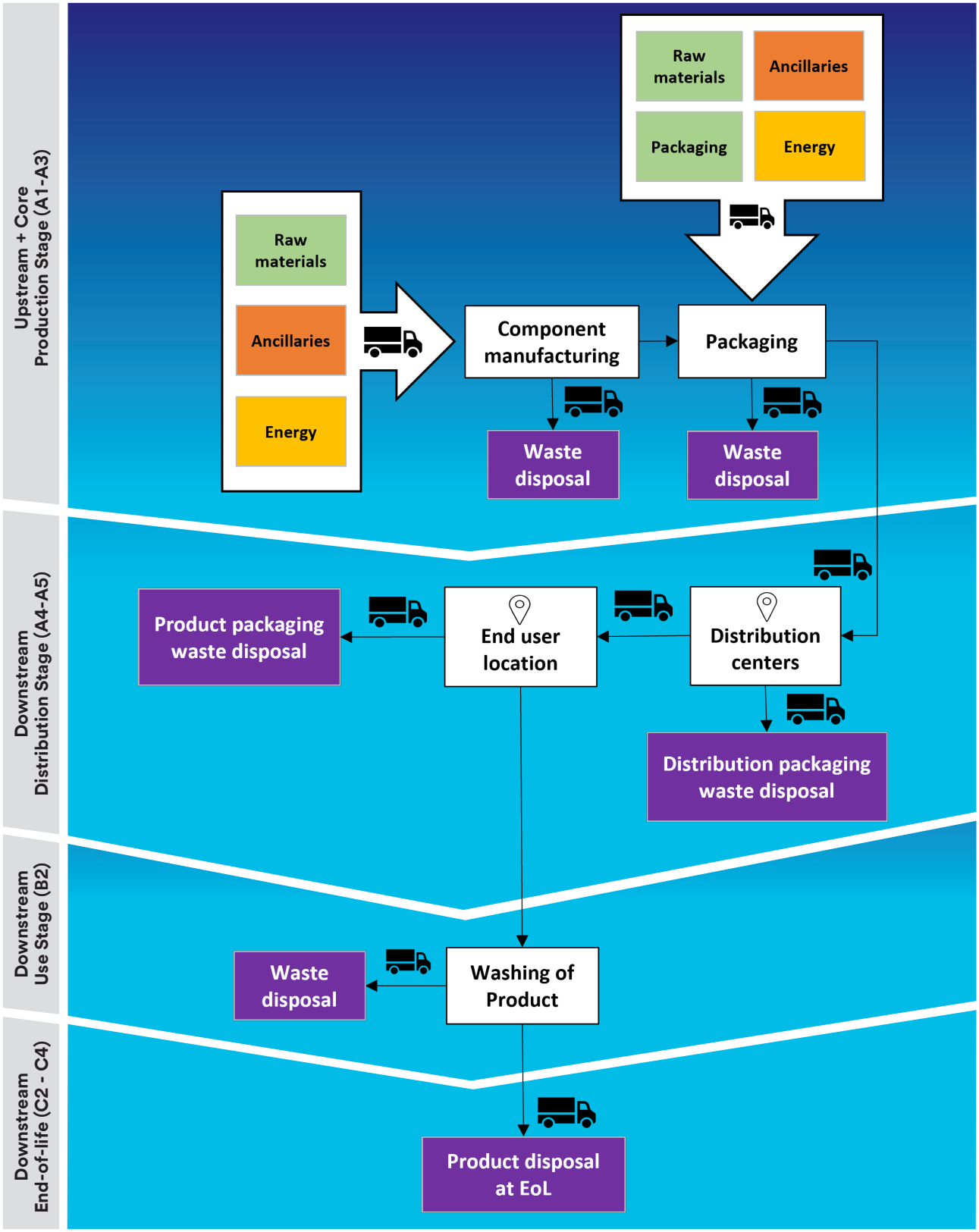
Operation of the product (module B1) and energy use during operation (module B6) are also included in the use phase. Since the product under study is passive and does not require any energy use during operation, these modules do not include any impacts.

5.3.4 End-of-life stage (C2 - C4)

The end-of-life phase includes disposal of the product at the end of its life (C3 and C4). Module C3 includes processing of waste for recovery and recycling, while module C4 includes waste to landfill. The end-of-life phase also includes the waste transport to the disposal/recovery site (C2), a distance of 100 km is assumed. Because specific data on the disposal of these materials is not available and can highly vary across markets, Eurostat data are used to model the disposal in the EU region. Both the cord and the earplugs are considered to belong to the plastics disposal category of statistics from Eurostat, the cord composing mainly from PVC, and the earplugs from TPU. Thus, the following disposal scenario is used: 4.7% of plastic waste is sent to landfill, 20.1% to incineration and 75.2% to recycling.

[4] LC = load capacity (kg)
[5] FCFC = full capacity fuel consumption (l/100 km)
[6] CU = capacity utilisation, including empty returns (%)

5.3.5 Flow diagram



5.4 Data collection and quality

Specific data was gathered by 3M for the core processes and are based on 2024-2025 production volumes and extrapolations of measurements on specific machines.

Generic data for upstream and downstream processes are used as available in the LCA for Experts™ (LCA FE) software and databases and are representative of the years 2023-2024.

Both specific and generic data are modelled to be specific to the technologies or technology mixes under analysis. Where technology-specific data are unavailable, proxy data are used. The technological representativeness is considered to be good.

All data are collected specific to the countries or regions under analysis. Where country or region specific data are unavailable, proxy data are used. The geographical representativeness is considered to be good.

Data quality analysis is performed based on the EU Product Environmental Footprint (PEF) Guidance. The overall data quality is at least very good, meaning that each indicator can be used in this EPD.

The table below lists the data sources, reference years, data categories and share of primary data (of GWP-GHG results for A1-A3) for all processes included in modules A1-A3, as well as processes in module A4-C that contribute more than 10% to the GWP-GHG results over all included life cycle stages. The table also includes the total share of primary data contributing to the GWP-GHG results in modules A1-A3.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3(1)
Waste treatment from manufacturing of product	Collected data Database	EPD owner, *Confidential*	2024-2025	Secondary data	0%
Generation of electricity used in manufacturing of product	Collected data	EPD owner, *Confidential*	2024-2025	Primary data	27.6%
Packaging materials for finished product	Database	Sphera v2025.2	2023-2025	Secondary data	0%
Packaging materials for raw materials	Database	Sphera v2025.2	2023-2025	Secondary data	0%
Production of raw materials and ancillaries	Database	Sphera v2025.2	2023-2025	Secondary data	0%
Other processes	Database	Sphera v2025.2	2023-2025	Representative secondary data, proxy data	0%
Use phase processes (waste water treatment and manufacturing of paper for paper towels)	Database	Sphera v2025.2	2023-2025	Secondary data	-
Total share of primary data, of GWP-GHG results for A1-A3					**27.6%**

(1) The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that do not capture all relevant aspects of data quality. The indicator is not comparable across product categories.

5.5 Calculation procedure

The LCA model was created using the LCA FE software (version 10.9.1.19, v2025.2) system for life cycle engineering. The modelling process used both primary data collected from the actual manufacturing process, and secondary data available in the LCA FE databases including industry-average data, data available from literature studies and data available from published databases.

All relevant process steps for each scenario are considered and modelled to represent each specific situation. The process chain is considered sufficiently complete with regard to the goal and scope of this study. Cross-checks concerning the plausibility of mass and energy flows are carried out on the data received. Similar checks are made on the software model developed during the study. To ensure consistency, all primary data are collected with the same level of detail, while all background data are selected from the LCA FE databases.

5.5.1 Key assumptions

Key assumptions made in this study relate to (1) waste data for certain manufacturing process steps, which is modelled based on main material components in the waste output, (2) energy source for some manufacturing processes, which is modelled using the residual grid mix where evidence of use of renewable sources is not available, (3) using statistical data at EoL for the main product material type in the absence of specific disposal information, and (4) for the use phase of the product, material usage for washing, which is based on assumptions.

Next to key assumptions, some general assumptions are included on different levels in the model:

- When no specific data for the raw material is available it is modelled based on the material content information in combination with generic production data.
- When specific raw material packaging data is not provided, a default packaging is assumed based on professional judgement and the type of raw material.
- Distances between raw material suppliers, manufacturers and 3M sites on the same continent are assumed to be 2500 km (or 1553 miles), whilst a distance of 1000 km (or 621 miles) is taken when located in the same country.
- 100 km (or 62.1 miles) transport distance is assumed for the disposal of materials.
- When the type of waste disposal is unknown, Eurostat data for EU-28 countries is used in order to represent the reality. The end-of-life of the product is modelled using statistical data.

5.5.2 Cut-off criteria and Allocation

All available data from the product production processes are considered, i.e. all pre-products/raw materials used, packaging material and relevant energy flows using best available LCI datasets (including data contributing <1% to mass or energy). Transport processes for raw material packaging as well as internal transport in the facilities is excluded. Production and/or energy consumption of machines, facilities and infrastructure/capital goods required during manufacture are excluded. In addition, the use of energy and water of any nonstrictly manufacturing processes is excluded from the study.

Infrastructure impacts for electricity production were included as modelled in the Sphera secondary datasets.

This study is based on an LCA that applies the simple cutoff method (also known as the 100:0 method), meaning that energy credits generated during waste disposal are excluded and a worst-case approach is applied. For recycling processes, a cut-off is applied before the recycling facility gate (i.e., Polluter Pays Principle).

No co-products are created in the production processes. The energy used in the manufacturing processes is obtained from direct metering devices, so no allocation was used to calculate it.

6 Environmental Performance

The environmental parameters are declared for upstream, core and downstream processes. The overall impact of the product is divided into potential environmental impacts, use of resources and other indicators. All environmental impacts are reported per functional unit.

6.1 Potential Environmental Impact

The reported environmental impacts, as required per PCR 2025:05 v1.0.0 result from characterisation models applied to the life cycle stages considered in the study.

Total pollutant emissions from the operations included in the system boundaries are reported as potential environmental impacts, using the version 3.0 core environmental impact indicators of EN15804:2012+A2:2019/AC:2021 and characterisation factors (CFs) based on EF 3.1 (EC-JRC, Feb. 2023).

Data refer to the functional unit.

The environmental performance results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

	Mandatory indicators according to EN 15804+A2									
	Product	Distribution		Use			End of life[5]			Total
	A1-A3	A4	A5	B1	B2	B6	C2	C3	C4	A-C
GWP-total [kg CO2 eq.]	1.20E-02	4.90E-03	3.09E-02	0.00E+00	9.33E-02	0.00E+00	9.53E-05	1.48E-03	4.93E-06	1.43E-01
GWP-fossil [kg CO2 eq.]	4.06E-02	4.84E-03	2.32E-04	0.00E+00	8.55E-02	0.00E+00	9.41E-05	1.48E-03	4.90E-06	1.33E-01
GWP-biogenic[1][2] [kg CO_2 eq]	-2.88E-02	1.16E-05	3.07E-02	0.00E+00	7.33E-03	0.00E+00	2.26E-07	3.58E-07	1.53E-08	9.23E-03
GWP-luluc [kg CO2 eq.]	1.36E-04	4.97E-05	2.36E-06	0.00E+00	5.38E-04	0.00E+00	9.68E-07	1.92E-07	1.34E-08	7.27E-04
ODP [kg CFC-11 eq.]	3.11E-13	8.01E-16	5.68E-17	0.00E+00	5.45E-13	0.00E+00	1.56E-17	5.26E-16	1.67E-17	8.57E-13
AP [Mole of H+ eq.]	9.50E-05	9.06E-06	1.36E-06	0.00E+00	3.81E-04	0.00E+00	5.42E-07	6.70E-07	2.92E-08	4.87E-04
EP-freshwater [kg P eq.	3.74E-07	1.30E-08	6.42E-10	0.00E+00	3.23E-05	0.00E+00	2.53E-10	8.43E-11	2.74E-09	3.27E-05
EP-marine [kg N eq.]	3.80E-05	3.88E-06	6.64E-07	0.00E+00	2.73E-04	0.00E+00	2.67E-07	3.04E-07	6.33E-09	3.16E-04
EP-terrestrial [Mole of N eq.]	3.80E-04	4.15E-05	7.25E-06	0.00E+00	1.56E-03	0.00E+00	2.91E-06	3.57E-06	6.90E-08	2.00E-03
POCP [kg NMVOC eq.]	1.04E-04	8.15E-06	1.24E-06	0.00E+00	4.28E-04	0.00E+00	4.96E-07	7.91E-07	2.00E-08	5.43E-04
ADP-min&met[3] [kg Sb eq.]	1.10E-08	3.21E-10	1.54E-11	0.00E+00	2.03E-07	0.00E+00	6.25E-12	5.85E-12	3.33E-13	2.14E-07
ADP-fossils[3] [MJ]	6.26E-01	6.18E-02	2.97E-03	0.00E+00	1.12E+00	0.00E+00	1.20E-03	1.16E-03	8.11E-05	1.82E+00
WDP[3][4] [m^3 world eq.]	2.42E-03	2.21E-05	1.76E-05	0.00E+00	2.15E-02	0.00E+00	4.30E-07	1.46E-04	6.04E-07	2.41E-02

See section 9 for a list acronyms used in this table.
(1) For each module, GWP-biogenic indicator is calculated as the sum of GWP-biogenic with CO_2 characterization factors set to zero in LCA FE, and the biogenic carbon content of product or packaging.
(2) The negative values for GWP-biogenic can be attributed to the production of the paper and/or wood products. Trees, used for the production of the paper, absorb CO_2 during the growth process which therefore gives a negative impact on CO_2 emissions.
(3) The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.
(4) Water consumption, i.e., the man-made removal of water from its watershed through shipment or evaporation, has also been selected due to its high political relevance. The UN estimates that roughly a billion people on the planet have no access to drinking water, which entails a variety of problems around ecosystem quality, health, and nutrition.
(5) The results of the end-of-life stage (module C) should be considered when using the results of the production stage (modules A1-A3).

In addition, the results of a supplementary indicator for climate impact is reported (GWP-GHG), as well as a selection of optional indicators. The GWP-GHG indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero (uptake and emissions are balanced out in modules A1-A3). This indicator creates comparability with how climate declarations are calculated in various regulative contexts, and allows for a direct comparison of the climate impact of modules A1-A3 of comparable products in different EPDs, without having to consider the biogenic content of the product(s).

	Additional mandatory impact indicator									
	Product	Distribution		Use			End of life			Total
	A1-A3	A4	A5	B1	B2	B6	C2	C3	C4	A-C
GWP-GHG [kg CO_2 eq]	4.26E-02	4.90E-03	2.38E-04	0.00E+00	9.33E-02	0.00E+00	9.53E-05	1.48E-03	4.93E-06	1.43E-01
Additional optional impact indicators (EN 15804+A2)										
PM [Disease inc.]	1.93E-09	7.54E-11	7.38E-12	0.00E+00	6.08E-09	0.00E+00	2.95E-12	4.45E-12	3.01E-13	8.10E-09
IRP(1) [kBq U235 eq.]	1.66E-03	1.68E-05	1.13E-06	0.00E+00	1.09E-02	0.00E+00	3.26E-07	4.22E-06	1.57E-07	1.26E-02
ETP-freshwater(2) [CTUe]	2.87E-01	8.04E-02	3.83E-03	0.00E+00	1.69E+00	0.00E+00	1.57E-03	7.65E-04	1.86E-04	2.07E+00
HT-cancer(2) [CTUh]	1.00E-11	1.08E-12	5.25E-14	0.00E+00	1.55E-10	0.00E+00	2.11E-14	2.75E-14	2.56E-15	1.66E-10
HT-non-cancer(2) [CTUh]	3.23E-10	6.06E-11	2.89E-12	0.00E+00	1.43E-08	0.00E+00	1.18E-12	1.78E-12	4.54E-14	1.47E-08
SQP(2) [Pt]	2.83E+00	2.73E-02	1.31E-03	0.00E+00	2.28E+01	0.00E+00	5.33E-04	2.43E-04	1.25E-05	2.56E+01

See section 9 for a list acronyms used in this table.
(1) This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.
(2) The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

6.2 Use of resources

The main resource consumption contributors for the 3M™ E-A-R™ UltraFit™ Earplugs are reported in the table below. Use of resources without energy content is expressed in kg or m³ per functional unit. Energy consumption data are expressed in MJ per functional unit and as net calorific value. The net calorific value or lower heating value is calculated by subtracting the heat of vaporisation of water from the higher heating value. The results from the tables should be interpreted over the different modules and as they are calculated by the LCA FE software.

The use of primary energy is separated into energy used as raw material and energy used as energy carrier using option B from the guidance on primary energy resources available on environdec[7].

Following this option, the energy used as raw materials is declared as an input to the module where it enters the product system (A1) and as an output from the product system, since it exits the product system as useful energy (C3). Energy content that is wasted in landfill remains as part of the indicator for energy used for raw materials.

	Use of resources according to EN 15804+A2									
	Product	Construction		Use			End of life			Total
	A1-A3	A4	A5	B1	B2	B6	C2	C3	C4	A-C
PERE(1) [MJ]	4.81E-01	4.66E-03	1.98E-01	0.00E+00	4.11E+00	0.00E+00	9.08E-05	1.89E-01	1.35E-05	4.98E+00
PERM(2) [MJ]	1.98E-01	0.00E+00	-1.98E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.89E-01	0.00E+00	-1.89E-01
PERT [MJ]	6.79E-01	4.66E-03	2.32E-04	0.00E+00	4.11E+00	0.00E+00	9.08E-05	2.60E-04	1.35E-05	4.80E+00
PENRE(1) [MJ]	5.43E-01	6.18E-02	2.97E-03	0.00E+00	1.12E+00	0.00E+00	1.20E-03	7.97E-02	8.11E-05	1.81E+00
PENRM(2) [MJ]	8.23E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-7.85E-02	0.00E+00	3.83E-03
PENRT [MJ]	6.26E-01	6.18E-02	2.97E-03	0.00E+00	1.12E+00	0.00E+00	1.20E-03	1.16E-03	8.11E-05	1.82E+00
SM [kg]	7.93E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.93E-03
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	0.00E+00
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	0.00E+00
FW [m³]	1.79E-04	2.30E-06	4.99E-07	0.00E+00	6.98E-04	0.00E+00	4.49E-08	3.52E-06	1.77E-08	8.83E-04

See section 9 for a list acronyms used in this table.
(1) For all declared modules, the difference between "Total use of primary energy" and "Use of primary energy used as raw materials" results in the value for "Use of primary energy".
(2) For all declared modules, the inventories for the basic materials contain the information on the "Total use of renewable/non-renewable primary energy". The indicators "Use of primary energy as raw materials" are assessed via the net calorific value of the product and packaging.

[7] This method is described in EN15804 and PCR 2019:14.

6.3 Output flows and waste categories

The important output flows and waste categories for the 3M™ E-A-R™ UltraFit™ Earplugs are reported in the tables below. All material flows are expressed in kg per functional unit while the exported energy data is expressed in MJ per functional unit and as net calorific value. CRU, MFR, MER, EEE and EET are required to be reported as per EN 15804. It should be noted that 3M processes do not generate radioactive waste and the values are presented as calculated in the LCA FE software.

	Waste categories according to EN 15804+A2									
	Product	Construction		Use			End of life			Total
	A1-A3	A4	A5	B1	B2	B6	C2	C3	C4	A-C
HWD [kg]	3.52E-09	2.48E-12	1.39E-13	0.00E+00	2.51E-08	0.00E+00	4.83E-14	5.32E-13	1.82E-14	2.86E-08
NHWD [kg]	5.81E-03	8.63E-06	1.18E-02	0.00E+00	4.78E+01	0.00E+00	1.68E-07	3.58E-03	3.24E-04	4.78E+01
RWD [kg]	1.18E-05	1.17E-07	7.67E-09	0.00E+00	6.79E-05	0.00E+00	2.27E-09	3.30E-08	1.17E-09	7.99E-05

See section 9 for a list acronyms used in this table.

	Output flows according to EN 15804+A2									
	Product	Construction		Use			End of life			Total
	A1-A3	A4	A5	B1	B2	B6	C2	C3	C4	A-C
CRU [kg]	2.02E-03	0.00E+00	3.26E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.28E-03
MFR [kg]	8.24E-05	0.00E+00	8.39E-03	0.00E+00	1.33E-01	0.00E+00	0.00E+00	2.62E-03	0.00E+00	1.44E-01
MER [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
EEE [MJ]	0.00E+00	0.00E+00	2.02E-04	0.00E+00	3.20E-03	0.00E+00	0.00E+00	2.32E-03	0.00E+00	5.72E-03
EET [MJ]	0.00E+00	0.00E+00	3.66E-04	0.00E+00	5.80E-03	0.00E+00	0.00E+00	4.18E-03	0.00E+00	1.03E-02

See section 9 for a list acronyms used in this table.

6.4 Electricity in A3

The electricity used in the manufacturing process of module A3 is sourced from residual grid mix in Poland for all manufacturing process steps except the earplugs moulding process. The environmental impact of the residual grid mix, for the GWP-GHG indicator is 0.873 kg CO_2 eq./kWh.

For the earplugs moulding process step at 3M Wroclaw manufacturing site, a specific energy mix coming from 77% wind energy, 3.5% photovoltaic and 19.4% gas combustion on-site, in Poland. The environmental impact of the specific energy mix used, for the GWP-GHG indicator is 0.107 kg CO_2 eq./kWh.

7 Additional Economic and Social Information

As a company which operates around the world, 3M has a history of helping build the communities in which we work and live through strategic investments. We invest in our communities to increase the availability of skilled talent and to attract and motivate employees who value working for a company that prioritizes corporate responsibility. Between 1953 and 2024, 3M and 3M Foundation invested $2.11 billion in cash and product contributions in communities where 3M operates.

Our portfolio of skills-based volunteer programs allows 3M employees to use their business skills, experience, and passion to make a difference in local and global communities. Through STEM and skilled trades education, environmental programs and hometown giving, we support initiatives that improve outcomes in communities and provide solutions to some of the world's most pressing challenges.[8]

8 Version History

This version of the EPD is valid until 2030-11-02.

Throughout its validity, on a yearly basis, or upon modifications in the production process, the supply chain is evaluated to assess the need for an update of the supporting LCA and corresponding EPD. If changes in the product's life cycle result in potential environmental impacts varying more than 10% from the numbers reported in the sections above, the EPD is revised accordingly. Regardless, the EPD shall be reviewed when approaching the end of its validity period. At that stage, a new version of the EPD shall be published as appropriate.

[8] Company information mentioned in this section are included in 3M's 2025 Global Impact report that is referenced in section 10.

9 Abbreviations

Acronym	Meaning
3M	Minnesota Mining and Manufacturing Company
ADP-fossil	Abiotic depletion potential for fossil resources
ADP-min&met	Abiotic depletion potential for non fossil resources (elements)
AP	Acidification potential
AT	Austria
CE	Conformité Européenne
CO_2	Carbon dioxide
CFC-11	Trichlorofluoromethane
CPC	Central Product Classification
CRU	Components for re-use
CTUe	Comparative Toxic Unit
CU	Capacity utilisation
DE	Germany
EEE	Exported electrical energy
EET	Exported thermal energy
EMEA	Europe, Middle East and Africa
EN	European norm
EoL	End of life
EPD ®	Environmental product declaration
EP-freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine	Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestrial	Eutrophication potential, Accumulated Exceedance
Eq.	Equivalent(s)
ET-freshwater	Ecotoxicity, freshwater
EU	European union
FCFC	Full capacity fuel consumption
FW	Use of net fresh water
GWP-biogenic	Global Warming Potential biogenic
GWP-fossil	Global Warming Potential fossil fuels
GWP-GHG	Global Warming Potential greenhouse gases
GWP-luluc	Global Warming Potential land use and land use change
GWP-total	Global Warming Potential total
HPD	Hearing Protection Device
HT-cancer	Potential Comparative Toxic Unit for humans carcinogenic effects
HT-non-cancer	Potential Comparative Toxic Unit for humans, non-carcinogenic effects
HWD	Hazardous waste disposed
IRP	Ionising radiation, human health
ISO	International Organisation for Standardisation
kBq	kilobecquerel
kg	kilogram
km	kilometer
LCA	Life cycle assessment
LCA FE	LCA for Experts™
LCI	Life cycle inventory
MER	Materials for energy recovery

MFR	Materials for recycling
MJ	Megajoule
ND	Not declared
NHWD	Non hazardous waste disposed
NRSF	Use of non renewable secondary fuels
ODP	Depletion potential of the stratospheric ozone layer
PCR	Product Category Rules
PEF	Product environmental footprint
PENRE	Use of non renewable primary energy as energy carrier
PENRM	Use of non renewable primary energy as raw materials
PENRT	Total use of non renewable primary energy (PENRE + PENRM)
PERE	Use of renewable primary energy as energy carrier
PERM	Use of renewable primary energy as raw materials
PERT	Total use of renewable primary energy (PERE + PERM)
PL	Poland
POCP	Formation potential of tropospheric ozone
PSD	Personal Safety Division
PVC	Polyvinyl Chloride
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RSF	Use of renewable secondary fuels
RWD	Radioactive waste disposed
SIBG	Safety and Industrial Buisness Group
SVHC	Substances of Very High Concern
SM	Use of secondary material
SNR	Signal-to-Noise Ratio
SQP	Potential soil quality index
TPU	Thermoplastic Polyurethane
US	United States
UNSPSC	United Nations Standard Products and Services Code
WDP	Water (user) deprivation potential, deprivation-weighted water consumption

10 References

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More information on Sustainability at 3M:
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